Ecola Creek Forest Reserve Stewardship Plan

December 5, 2006

Prepared by

ecotrust

721 NW Ninth Ave, Suite 200
Portland, OR 97209
www.ecotrust.org

For the City of Cannon Beach

Contact: Barry Sims
Tel 503.233.2131

1. Executive Summary **1**
2. Introduction **2**
Environmental Context 2
Forest Management Plan Development Process 3
Planning Team 4
Public Involvement 4
Project Timeline 5
Implementation 5
3. Inventory and Assessment **7**
Mature Forest 10
Regeneration 12
Non-native Plant Species 13
Dead Wood (Snags and Logs) 14
Wildlife 15
Birds 15
Amphibians 16
Other Species 17
Fish 18
Snorkel Survey 18
Habitat assessment 19
Existing Man-made Features 20
Access 20
Roads 21
Stream Channel Modifications 22
4. Resource Policies **23**
Management statement 23
Planning Goals 23
Policies, Objectives, and Guidelines 23
Forest Health & Native Biodiversity 23
Municipal Water Quality 24
Salmon Habitat 25
Community involvement 26
5. Management recommendations **28**
Forest Health 28
Municipal water quality 30
Salmon habitat 31
Community involvement 32
6. Implementation Timeline **33**

Appendices

A. References
B. Opinion Survey Summary Report
C. Ecola Creek Forest Reserve Conservation Easement
D. Bird species table
E. Amphibian count data
F. Recreation Use Findings
G. Aerial Photo and Map
H. Timber Inventory

1. Executive Summary

In 2004, the City of Cannon Beach added a 120-acre tract of commercial timberland to the Ecola Creek Forest Reserve, the forested area containing the City's municipal water source. Funding for the acquisition of this land from the Weyerhaeuser Company was provided by Friends of the Ecola Creek Forest Reserve, the City of Cannon Beach, and by the Oregon Watershed Enhancement Board (OWEB). OWEB support was made contingent on a conservation easement being placed on the land, which in turn requires the development of a forest stewardship plan. In October 2005, the City of Cannon Beach contracted with Ecotrust to provide a stewardship plan for the entire 220-acre forest reserve.

Ecotrust's consulting forester Barry Sims (Trout Mountain Forestry) met with the Ecola Creek Forest Reserve Advisory Committee and attended public forums to discuss the creation of this plan. Barry Sims, wildlife biologist Mike Patterson (Celata Research Associates), and fisheries biologist Charley Dewberry (Ecotrust) each visited the Reserve to conduct inventories and assessments. These inventories, as well as a discussion of management guidelines and a set of management recommendations, comprise the main components of this plan.

Guiding the development of this management plan have been the Ecola Creek Forest Reserve Planning Goals adopted in 2005 by the Cannon Beach City Council. The goals, briefly stated, are to: (1) Protect and enhance forest health; (2) Protect municipal water quality; (3) Protect and enhance salmon habitat; and (4) Foster community involvement with the forest reserve.

Overall forest health and native biodiversity in the Reserve can be enhanced through greater attention to vertical and horizontal forest heterogeneity. Active forest management for a wide mixture of forest age classes, distribution patterns that mimic natural disturbance, and the presence of dead wood will foster greater forest regeneration and native biodiversity.

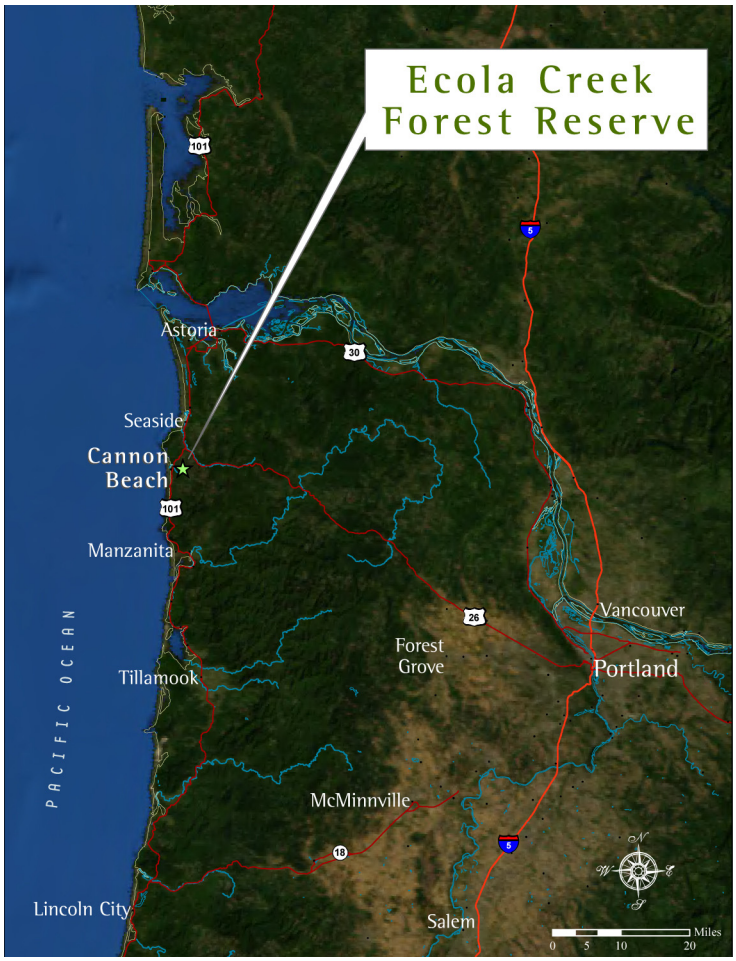
Concerns noted in the forest resources inventory of the Reserve include: a failure of cedar regeneration; a high density of trees in younger forests, which reduces understory vegetation and diminishes the potential for wildlife diversity; a lack of large woody debris on the forest floor; evidence of sedimentation in the West Fork of Ecola Creek; a lack of older conifers in riparian areas, which reduces soil stability and contributes to a lack of large wood in the creeks; and a presence of roads in proximity to stream channels. Because of the need for additional large woody debris, it is recommended that no logs be removed for commercial purposes during this ten-year plan period.

By promoting forest health and biodiversity and addressing sedimentation, the forest management recommendations in this plan will enhance the protection of municipal water resources located in the Reserve, as well as enhancing salmon habitat. In addition, a plan for active engagement with the Reserve cannot but serve to foster greater community involvement.

2. Introduction

Environmental Context

Located approximately one-mile from the Pacific Ocean, the Ecola Creek Forest Reserve covers 220 acres and is owned by the City of Cannon Beach. An acquisition of 120 acres of commercial timberland from the Weyerhaeuser Company in 2004 adjoins a 40-acre parcel acquired from the Weyerhaeuser Company in 2003 and a previously owned 60-acre parcel that is the site of the city's primary water source.



The Reserve sits at the lower end of the Ecola Creek watershed, a 22 square mile basin that drains directly into the Pacific Ocean and includes the town of Cannon Beach. With a maximum elevation of 3,075 feet, the headwaters of the watershed are steep and mountainous. The West Fork and North Fork of Ecola Creek run separately through the Reserve and converge in a large valley bottom before passing through the city. Because of the watershed's steep gradient, stream flow in Ecola Creek fluctuates greatly and is generally high from October to April and low from July through September.

Over 95 percent of the lands in the watershed are managed for industrial timber production, with private land ownership over the last few decades passing from Crown Zellerbach, to Willamette Industries, to the Weyerhaeuser Company. In 2005, Weyerhaeuser sold a portion of the upper watershed to Stimson Lumber. Harvest activity continues on lands adjoining the Reserve, with the lands abutting the southeast corner of the Reserve harvested by Weyerhaeuser in 2005.

An additional 957 acres are managed by the Oregon Department of Forestry. These lands include the access road to the reserve from the City of Cannon Beach. This area is under an "older forest structure" designation, meaning it will generally be allowed to develop late successional forest characteristics. It has no formal protection as a reserve – some

harvesting is still allowed, but is considered unlikely during the next ten years (Oregon Department of Forestry 2001).

The 120-acre parcel acquired by Cannon Beach in 2004 includes approximately one mile of frontage on the West Fork of Ecola Creek and 3/10 of a mile of frontage on the North Fork of Ecola Creek. These stream reaches provide passage, spawning and rearing for steelhead, sea-run cutthroat trout, and Chinook and Coho salmon. Ecola Creek has been listed as critical habitat for Coho salmon. The parcel also includes a 19-acre stand of old-growth cedar, in which individual trees may be as old as 500 years or greater.

Cannon Beach draws its primary water supply from a groundwater source located within the Reserve near the West Fork of Ecola Creek. The 800 to 1,000 gallons per minute provided by these three springs are adequate for the town's resident population of 1,620 throughout most of the year.

During the peak summer tourist season, when over 10,000 people can occupy the town, a secondary, surface-water source is utilized to augment water needs. The water is withdrawn from the West Fork of Ecola Creek and passes through a sand filtration plant. Both the withdrawal point and the filtration plant are located in the Reserve. A 2001 Source Water Assessment by Oregon's Department of Environmental Quality found a higher relative risk of contaminants to the surface-water source from forestry operations by then-owner Willamette Industries. Ecola Creek has been identified as a high priority stream for streamflow restoration by the Oregon Department of Fish and Wildlife and the Oregon Water Resources Department.

The water resources of the Reserve are critically important to the community of Cannon Beach, which relies on the Reserve for its drinking water. In addition, the fish and wildlife habitat provided by the streams is remarkably good. The overall goal of forest stewardship will be to maintain or improve the current water resources. The Ecola Creek Watershed Assessment (Parker *et al*. 2001) contains extensive data and a detailed discussion of key water issues, including stream hydrology, land use, City water use and water rights, and streamflow restoration priority areas within the watershed

Forest Management Plan Development Process

The Cannon Beach City Council appointed an *ad hoc* Advisory Committee to work with Ecotrust and City staff in the preparation of the management plan. The committee consists of ten members who represent the City's Public Works Committee, Planning Commission, Parks and Community Services Committee, the Ecola Creek Watershed Council, and the Friends of Ecola Creek Forest Reserve.

The Advisory Committee met periodically throughout the plan development process, providing key oversight and input on critical issues addressed in the plan.

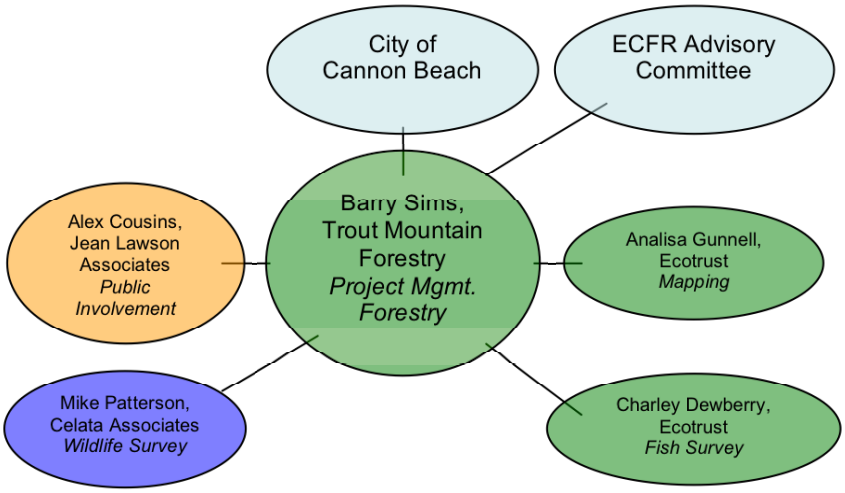
Table 1. Advisory Committee Members

Name	Committee Representation
Ron Logan	Planning Commission
Malcolm Reed	Planning Commission
Mark Morgans	Public Works Committee
Mike Stanley	Public Works Committee
Melissa Cadwallader	Parks & Community Services Committee
Robin Risley	Parks & Community Services Committee
Jim Litherland	Friends of Ecola Creek Forest Reserve
Jerome Arnold	Ecola Creek Watershed Council
Phyllis Knutson	Friends of Ecola Creek Forest Reserve
Doug Deur	Friends of Ecola Creek Forest Reserve
Rainmar Bartl	City Planner

Planning Team

The planning team consisted of City staff and advisors, as well as Ecotrust employees and consultants. A schematic representation of the planning team is presented in Figure 1.

Figure 1. Planning Team



Public Involvement

In order to ensure that the plan reflects the interests of the community, public involvement was solicited and engaged in several ways. Two public meetings were held to present initial findings and draft recommendations. The firm of Jean Lawson and Associates was retained to facilitate these public meetings and to develop and implement a survey to gauge public opinion on issues of concern. The survey was posted online and was available in hard copy at the Cannon Beach City Hall. A summary report is included in Appendix B. In addition, the City of Cannon Beach posted a number of documents and a summary of the planning process on its official website.

Table 2. Geographic Distribution of Survey Respondents

Zip code	City, State	Number of respondents
97110	Cannon Beach, OR	18
97201-55	Portland, OR	15
97145	Tolovana Park, OR	2
97102	Arch Cape, OR	2
97138	Seaside, OR	1
97103	Astoria, OR	1
97146	Warrenton, OR	1
97006	Beaverton, OR	1
97009	Boring, OR	1
97015	Clackamas, OR	1
97034	Lake Oswego, OR	1
98632	Longview, WA	1
11231	Brooklyn, NY	1
45701	Athens, OH	1
22032	Fairfax, VA	1
85255	Scottsdale, AZ	1
	Cannon Beach area	51%
	Portland area	38%
	Other areas	11%

Project Timeline

The project commenced in October 2005 with the field inventory work phase. The plan development process and key mileposts are listed in Table 3.

Table 3. Project Timeline

Activity	Date	Purpose
AC meeting	October 2005	Project scoping
Site tour	October 19, 2005	Field team visits site and begins inventory work
AC meeting	December 12, 2005	Review initial findings
Online survey	December 2005	Posted on City's website
Public meeting	January 11, 2006	Present initial findings and issues
Surveys due	January 15, 2006	Cutoff date for surveys
AC meeting	February 28, 2006	Review draft recommendations
Public meeting	March 13, 2006	Present draft recommendations
Presentation to City Council	June 27, 2006	Present draft plan
City Council Public Hearing	August 1, 2006	Obtain public comment on draft plan
City Council	December 6, 2006	Plan adoption

Implementation

Following the public involvement period, the final draft plan, developed with the close input of the Advisory Committee, will be presented to the City Council for final adoption.

The approved and adopted plan will be implemented by City Public Works staff members, who will also be responsible for ongoing monitoring and evaluation. Yearly written operational plans will guide watershed activities. An annual public meeting will be held to inform citizens about planned activities and to seek public input.

The ultimate decision on resource policy and management direction rests with the City of Cannon Beach City Council. Once adopted, any policy changes to the Ecola Creek Forest Reserve Management Plan would require approval by the City Council.

3. Inventory and Assessment

As part of the plan development process, a team of forest scientists was assembled with the goal of establishing baseline inventories of key resources on the Reserve. This team included:

- Barry Sims, forester (Trout Mountain Forestry)
- Mike Patterson, wildlife biologist (Celata Research Associates)
- Charley Dewberry, fisheries biologist (Ecotrust)

Inventory work was conducted in the fall of 2005.

The Reserve contains a diversity of upland and riparian forests, portions of the North and West Forks of Ecola Creek, and one wetland. The Reserve contains six different forest types. These types are identified on the Reserve Map, and Table 4 identifies key attributes of these types.

Table 4. Forest Types Present on the Reserve

Type	Area (acres)	Age range	Species
Alder riparian	75	30-40	Alder with scattered spruce; floodplains around creeks
Young conifer plantations	22	0-10	Planted hemlock and spruce with abundant natural regeneration of alder
Old growth	19	50-500	Old growth cedar and second growth hemlock; contains springs
Hemlock plantations	59	45	Hemlock and some spruce; very densely stocked
Spruce flat	5	140	Very large spruce with some hemlock and alder
Middle-aged conifer stands	28	40-60	Hemlock and spruce

[Insert Reserve map here]

Insert aerial photo here

Vegetation

We studied several aspects of forest vegetation that can inform management decisions. These include mature and regenerating forests, non-native plant species, and snags and down wood on the forest floor. No formal botanical survey has been completed for the Reserve.

Mature Forest

The inventory identified 10 distinct stands of mature forest (and one stand of young planted conifers), which fall into 6 timber types. Although commercial timber management is not being contemplated on the Reserve, data on timber volumes and stand characteristics were gathered to inform the community's discussion of forest restoration.

The property is presently very well stocked with mature timber. Site quality is generally site class II, representing very good inherent productive potential due to deep, adequately drained soils. Total sawtimber volume is 6.18 million board feet, for an average stocking over the 209.23 acres in timber production of 29.6 MBF per acre. Volumes by species are presented in Table 5.

Table 5. Total Net Timber Volumes by Species

Species	Net board feet	% of total
Red alder	1,772,759	28.7%
Sitka spruce	1,476,259	23.9%
Western hemlock	2,885,206	46.7%
Western red cedar	49,493	0.8%
Total	6,183,717	100.0%

All sawtimber volumes are in west-side Scribner scale.

Depending on specific forest conditions, active forest management that is consistent with the planning goals adopted by the Cannon Beach City Council can also include the harvest of commercial timber. The cities of Astoria and Forest Grove, for example, practice conservative forest management on their municipal watersheds. Both cities have acquired third-party certification from the Forest Stewardship Council (FSC) to provide guidelines for forest management and assurances for all their citizens that their harvests serve the long-term interests of the communities. However, because of the need for woody debris in the Reserve, we do not recommend that any trees be removed during this first 10-year planning period.

Of the total forested area in the Reserve, approximately 156 acres, or about three quarters of the area, is comprised of relatively young, mostly single-species stands that are generally lacking in forest structural elements associated with biodiversity. These include the alder riparian areas, the 45 year-old hemlock plantations, and the young conifer plantations.

The forest structural elements that are lacking in these stands that would contribute to greater forest biodiversity and stability are:

- Vertical heterogeneity
- Horizontal heterogeneity
- Dead wood

Vertical heterogeneity is the diversity of canopy layers in the forest. In many managed forests, a single canopy layer (age class) dominates the site, with relatively little understory vegetation.

Horizontal heterogeneity is the degree to which the trees are spatially grouped in a non-uniform way. For example, inclusion of areas of hardwoods or shrubs and patchy distribution of trees contributes significantly to the number of ecological niches the forest contains. This is a key driver of biodiversity (Hayes and Burris 2006). Figures 2 and 3 compare vertical and horizontal vegetation distribution patterns.

These 45 year-old hemlock plantations have low species diversity.

Figure 2. Vertical diversity (above) and vertical uniformity (below) in forest stands (modified from Hayes and Burris 2006)

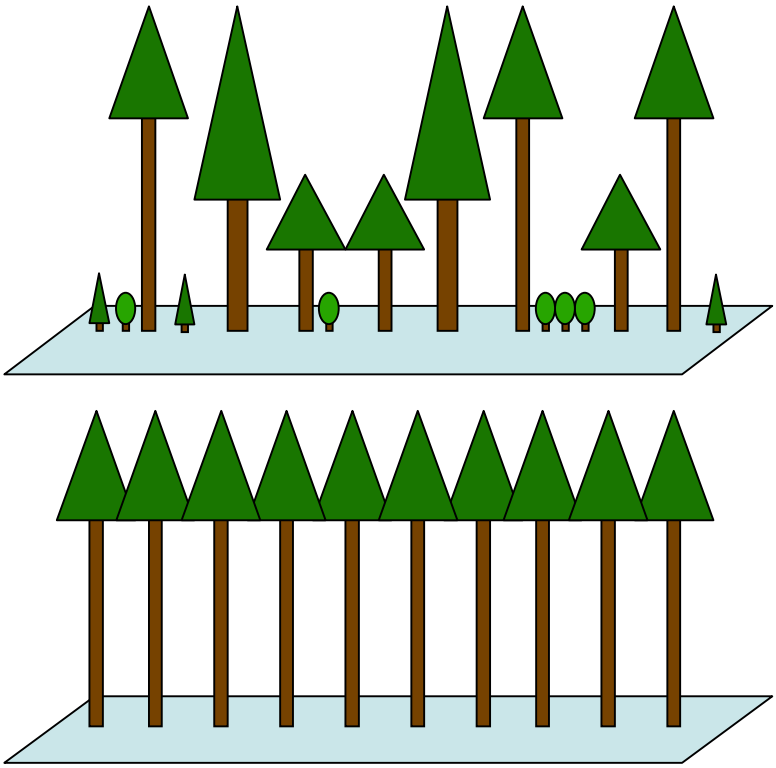
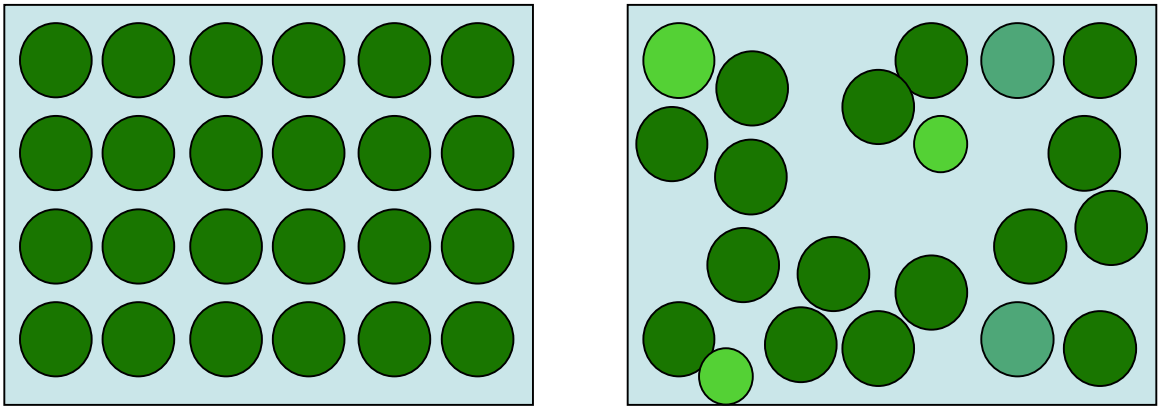


Figure 3. Horizontal distribution of forest vegetation. Simple (left) and complex (right) (modified from Hayes and Burris 2006)



Dead wood also plays an important role in contributing to biodiversity and is discussed later in this chapter.

Regeneration

The forest inventory also measured natural regeneration of tree species within the Reserve. Regeneration is defined as young trees smaller than 5 inches dbh (diameter at

breast height). The species composition of young trees indicates the likely future species composition of the forest, particularly under conditions of light or no management.

Table 6. Regeneration Density and Species Composition

Regeneration per acre			
Alder	Spruce	Hemlock	Cedar
4.5	6.6	22.4	0
13.4%	19.7%	66.9%	0.0%

Table 6 summarizes the regeneration data. Most striking is the absence of cedar regeneration in the Reserve. Because the old growth cedar is one of the most recognizable features of the Reserve, the failure of this species to successfully regenerate throughout the Reserve is a concern. The mature cedar trees are all in various stages of senescence, and as these trees decline in vigor, their ability to produce robust cone crops will be increasingly limited. This suggests that if cedar is to remain a vital component of the Reserve over the long-term, artificial regeneration (planting) may be necessary.

Although we do not have any concrete data on pre-settlement frequency of cedar, anecdotal evidence suggests that the Reserve may have been covered by as much as 20% cedar.

English Holly and English Ivy are two invasive exotic plants found on the Reserve.

Non-native Plant Species

Although not specifically surveyed for, numerous non-native plant species do occur in the Reserve and have been identified throughout the forest inventory process. The threat

posed by these invasive species to native biodiversity is generally low at this point. Infestations are limited mainly to areas along roads. Forest interior areas show only limited sign of changes in native species composition due to spread of non-native species.

However, due to the aggressive nature and potential risk for increased occurrence of invasive plants, some limited control measures are recommended. Experience of land managers attempting to address threats posed by invasive species indicate that the best time to control is before the species has become ubiquitous in the forest.

Key species identified include:
Himalayan blackberry (*Rubus armeniacus (discolor*))
Scotch broom (*Cytisus scoparius)*
English ivy (*Hedera helix)*
English holly (*Ilex aquifolium)*
Tansy ragwort (*Senecio jacobaea*)

In addition, herbaceous invasives present mainly in riparian areas have been documented. These include:
Creeping buttercup (*Ranunculus repens*)
Self-heal (*Prunella vulgaris*)
Curly dock (*Rumex crispus*)
Velvetgrass (*Holcus spp.*)
Bluegrasses (*Poa spp*.)
Creeping clover (*Trifolium repens*)
Thistle (*Cirsium spp*.)

Snags provide important habitat for many bird and mammal species.

Dead Wood (Snags and Logs)

During the survey, we inventoried dead wood, including standing snags and logs on the forest floor, to assess this important component of forest structure. In general, down wood on the forest floor is present in relatively small amounts. The average quantity of wood over the forested portions of the Reserve is 5.86 dry tons per acre. In general, this is a very low quantity relative to what would be expected in undisturbed coastal forests, and is attributed to the logging history of the site. The down wood is also typically very decayed, further diminishing its wildlife habitat value.

The distribution of down wood and snags is highly variable depending on stand age and past management practices. Table 7 presents key dead wood parameters, comparing conditions in the old growth cedar stand with those in a 45 year-old hemlock plantation.

Table 7. Dead wood.

Stand type	Snags/ acre	Mean snag diameter (inches)	Down logs/acre	Mean log diameter (inches)	Dry tons/acre
Old growth cedar	24.4	25.0	57.7	17.1	18.4
Hemlock plantation	19.3	14.0	36.7	7.3	2.1

Snags and down wood provide necessary nesting, caching, roosting, and hiding sites for a variety of birds, mammals, and amphibians. Presence of snags in particular is correlated with biological diversity, because more than 50 species of birds and mammals in Oregon use snags for nesting, feeding, and shelter (Logan 2002). In general, the larger the snag, the greater are the opportunities for the use by a variety of wildlife species

This rare stand of old-growth Western redcedar may be providing habitat for the endangered Marbled Murrelet.

Wildlife

The Reserve contains a stand of old-growth cedar, which is fairly unique on Oregon's North Coast. Because of the diversity of forest age classes and the mixture of species occurring, the Reserve's wildlife habitat potential is strong. A wildlife habitat inventory was conducted as part of the planning process, focusing mainly on birds and amphibians, but also addressing mammals and invertebrates.

Birds

Based on field confirmation and extrapolations from similar nearby habitats, 74 avian species occur or are likely to occur in the Reserve, including 67 species that are likely to breed in the area.

Habitat was assessed for three species that are on the Threatened and Endangered Species list and for "species of concern," species considered sensitive because of limited distribution and/or specialized habitat needs.

Marbled Murrelet - The Marbled Murrelet is unique among seabirds, being the only species to breed inland in large conifer trees. The Marbled Murrelet appears to require old-growth habitat and is currently listed as threatened by the federal government and the State of Oregon. The species prefers trees averaging about 6 feet dbh with large, moss covered lateral branches larger than 5 inches in diameter. The average stand size for nests found in Oregon is 200 acres with a range from 7-370 acres. Preferred tree density

averages about 50 trees/acre and mixed age stands are preferred over even-aged stands (Hamer and Nelson 1995).

The old growth cedar stand in the Reserve appears to meet minimum requirements for potential nest sites. This site should be inventoried during the peak breeding season (June-July) to determine if murrelets are present.

Bald Eagle - Bald Eagles are currently listed as threatened at both federal and state levels. Though presence was not confirmed for this species, they would be likely during salmon spawning events. There are also several large trees along the main creeks that would be candidate nest trees.

Northern Spotted Owl - The site does not appear to contain a sufficiently large enough old-growth forest stand to support this species.

Species of concern - There are at least four species considered "species of concern" or "sensitive." The Northern Pygmy Owl and Pileated Woodpecker were both confirmed as present in the Reserve. The Olive-sided Flycatcher and Willow Flycatcher are neotropical migrants and are only likely to be seen in breeding seasons. Other species that routinely turn up on watch lists but are not on state or federal lists include the Rufous Hummingbird and Hermit Warbler. Both species are almost certain to occur on the site during breeding seasons.

The habitat requirements of these species can be summarized as follows:

Northern Pygmy Owls prefer forests with large diameter trees. They nest in cavities excavated by woodpeckers (Giese and Forsman 2003).

Pileated Woodpeckers require large trees for roost and nest sites. They prefer stands greater than 70 years, with a mean dbh of approximately 30 inches. 44% of their foraging occurs in dead trees and 36% in downed logs; large diameter snags are preferred for foraging (Bull 2003).

Olive-sided Flycatchers require mixed age forests with prominent snags, usually along forest edges. Their mean nest height is about 30 feet (Altman 2003).

Willow Flycatchers are most strongly associated with wetland/riparian edge habitats without overstory, particularly dense willow breaks, but also use young conifer stands (4-15 years old) near stream corridors (Altman 2003a).

Amphibians

Terrestrial amphibians have been shown to be good indicators of overall habitat health in forest ecosystems. They are often the most numerous vertebrate group in a forest environment; they have small territories and high site fidelity. These characteristics make them reliable indicator species for comparisons between sites and across successional stages (Welsh and Droege 2001).

The wetland/riparian components within the flood zone of the main creeks seem quite healthy, all common associated species being confirmed as present. The failure to locate Western Red-backed Salamander (*Plethodon vehiculum*) in the forested upland components is somewhat puzzling, since it is the most common terrestrial salamander in similar forest habitats. This may be due to a general lack of large woody debris on the ground in the areas surveyed. Amphibian densities are closely associated with large woody debris on the ground, which is often absent in managed forests (Corn and Bury 1991).

The most common species found during sampling was Rough-skinned Newt (*Taricha granulosa*), which was present throughout most of the site, particularly in wetland and riparian zones. Also identified were Columbia Torrent Salamander (*Rhyacotriton kezeri*) and Red-legged frog (*Rana aurora*), both listed as sensitive species in Oregon. A full list of amphibian counts is included in Appendix E.

Other Species

The following species (or signs of these species) were noted while inventorying for birds and amphibians. This listing should in no way be considered thorough or definitive.

Mammals

Aplodonia rufa - Mountain Beaver
Tamias townsendii - Townsend's Chipmunk
Tamiasciurus douglasii - Douglas Squirrel
Microtus spp. - vole sp. (differences in trackway size suggest at least 2 species)
Canis latrans - Coyote
Cervus elaphus - Wapiti
Odocoileus hemionus columbianus - Columbian Black-tailed Deer

Invertebrates

Ancotrema hybridum - Oregon Lancetooth (snail)
Ancotrema sportella - Beaded Lancetooth (snail)
Haplotrema vancouverense - Robust Lancetooth (snail)
Juga sp. - conical-shaped aquatic snail
Ariolimax columbianus - Pacific Bananaslug

Pacifastacus sp. - crayfish

Aquarius remigis - Stream Skater
Aeschna palmata - Paddle-tailed Darner (dragonfly)
Scaphinotus sp. - snail eating ground beetle
Vanessa cardui - Painted Lady (butterfly)

Harpaphe haydeniana - Clown Millipede

Fish

Ecola Creek is an important salmon spawning stream on the North Coast of Oregon. In the late 1990s when coho salmon numbers were low, Ecola Creek had one of the better populations on the North Coast of Oregon. We completed a one-day snorkel survey in the area on October 20, 2005 and recorded observations concerning restoration opportunities. The numbers of coho, steelhead, and cutthroat trout observed during the survey were roughly average compared with other Oregon Coast Range streams. For coho, the numbers observed were slightly higher than other North Coast streams (C. Dewberry, pers comm.). However, it should be noted that the numbers observed in the survey are not directly comparable with other estimates as the survey was conducted later in the season than normal. The number of surviving fish at that time is typically lower, and visibility is also normally lower due to the increased organic acids in the water and a large number of leaves.

The West Fork of Ecola Creek.

Snorkel Survey

Our October 20, 2005 reconnaissance consisted of walking the stream reaches in the project area and diving every 5th pool and approximately 8th glide. During the survey the visibility in the water was approximately 10 feet. The stream was considerably higher than the summer low flow and stream height had been at least a foot higher in the few days preceding the survey.

Coho salmon require clean gravel beds for spawning.

Along the West Fork portion of the project area, there were 10–40 coho, 2–10 steelhead 1+'s, and 1–4 cutthroat trout in each pool. In the North Fork portion of the project area there were from 0–40 coho, 0–6 steelhead 1+'s, and 0–4 cutthroat in each pool. (We dove only 2 pools in the North Fork portion of the project area). The densities of each salmonid species were lower than is usually found during a summer survey. The wetted area of each habitat unit was considerably larger than found in the summer because stream flows were higher than summer base flow. It is possible that a number of coho smolts had recently moved out of the stream system. Many of the coho juveniles remaining in the system were large and

some of them were also possibly migrating downstream at the time of the survey. The coho were schooled up rather than evenly distributed and maintaining a territory.

In summary, coho, steelhead, and cutthroat juveniles were present in the project area. The number of juvenile salmonids found in the project area is probably average for similar North Coast streams. Also, the habitat was probably average for a mostly second growth watershed.

Habitat assessment

The branches of Ecola Creek in the Reserve occupy wide valley floors. The vegetation on the valley floor is dominated by second-growth alder and a few large conifers. The stream channel is moderately sinuous with a dominant substrate of cobble and gravel. There are numerous large logs, greater than three feet in diameter and greater in length than the wetted width of the stream channel, that create deep pools. On average, there were more logs upstream than downstream. The stream channel is currently "living off" this remnant large wood that came into the stream naturally long ago or during previous harvest. In some sections, a number of alders are also being undercut and are falling into the stream channel. While the alders provide a small amount of wood they are not large enough to create and maintain high quality fish habitat. Over the next couple of decades the large wood will continue to rot and there are few options for large trees falling into the stream channel, so it is likely that large wood will become less plentiful that it currently is in the reach.

Most riparian areas on the Reserve are dominated by young alder.

The major factors that are currently limiting the quality of the habitat in the stream reach are, in order on importance: 1) fine sediment from upstream; 2) road and culvert locations; 3) large wood inputs to the stream system.

There is evidence of considerable fine sediment in the reach. The two major sources were from upstream reaches and from lateral channel migration within the reach. As to the primary source, it was not possible to determine this during the limited survey. Clearly some of the sediment had its origin upstream of the study reach. The Ecola Creek Watershed Assessment (Parker *et al*. 2001) identified roads as a possible source of elevated sediment within the Ecola Creek watershed. Over 130 miles of roads were identified on private timberland within the basin and a prioritization of culverts and stream crossing was completed. A total of 7 miles of road were decommissioned in 2000

and a number of at risk culverts were replaced. Since that time, all the high priority culvert and road work has been completed, greatly reducing the potential for ongoing sedimentation (M. Morgans, pers. comm.).

Channel migration within the study area is also a likely source of fine sediment. Just upstream of the location where the runoff from the springs reaches the West Fork, there is an area of rapid channel migration. The cause of this higher than average channel migration is a loose jam of large wood in the channel that increases the resistance to flow. The result is that it increases the stream's ability to laterally cut into the banks. There are also few large trees on the valley floor at this location to slow the lateral migration. This stream section is a source of considerable sediment found in immediate downstream reaches.

In addition to these sources, mass erosion also occurs within the basin. A number of large events have occurred during the last 50 years. The causes are both natural and due to logging related causal mechanisms (Parker *et al*. 2001, Chapter 7).
The project area is a poor candidate for placement of large woody debris. First, the stream is large enough that it can move wood as large as can be practically placed. Second, placing wood in the channel will also speed the lateral migration of the channel, especially if the wood is cabled. Often the channel migration is accelerated downstream of log placement. There are currently few large trees, particularly conifers, that can slow the lateral migration.

Existing Man-made Features

The area contains a network of roads, water collection and conveyance structures, a water filtration plant, and a powerline. This section primarily addresses access and roads.

Access

There is no direct access to the Ecola Creek Forest Reserve. Access to the Reserve is via roads on other ownerships.

Access to the Reserve from the north, is by way of Elk Creek Road and a road across Oregon Department of Forestry land. This is the primary access to the Reserve. This road is gated at the end of Elk Creek Road at the boundary of Oregon Department of Forestry land, restricting public vehicular use of the Reserve. The distance from the gate to the Reserve is approximately ¾ of a mile. There is vehicular parking for approximately four vehicles in an informal parking area at the end of Elk Creek Road. A portion of this parking area may be located on Cannon Beach Christian Conference Center land.

Access to the Reserve from the west is from the east side of the Highway 101 right-of-way, at "East Warren Way." Access is on a private road across private property extension and then on the Warren Main Line across Weyerhaeuser Company land. Spur 90 and an unnamed spur from the Warren Main Line, enter the Reserve. The road is gated at the Weyerhaeuser ownership of the Warren Main Line, restricting public vehicular use. The

distance from the gate to the Reserve is approximately one mile on either Spur 90 or the unnamed spur.

The Weyerhaeuser Company reserves the right to restrict access to its lands at any time. Their access policy is as follows: Weyerhaeuser's timberlands are open during daylight hours to the public for non-motorized recreational use. Camping, campfires, garbage dumping, off road driving, and illegal activities are prohibited. Removal of firewood, ferns, mosses or other items found in the forest are prohibited without a permit issued by Weyerhaeuser. Public access may be discontinued without advanced notice. This may include active forestry or harvest operations areas or during periods of high fire danger. "Area Closed" signs will be posted at road access points. Some gates will be opened to hunters during the hunting season.

Roads

Within the Reserve there are operational gravel-surfaced roads, a powerline access right of way road, and abandoned historic logging roads. The main access road is an operational gravel road beginning in the northwestern portion of the Reserve and leads past the water treatment facilities to the springs. Generally, this road is in good working condition and requires periodic rocking to maintain desirable surface characteristics and stability. It is approximately 3,000 feet in length.

A plugged culvert has resulted in road failure on this abandoned logging road.

The powerline right of way access road is built on a constructed berm that created the distinct wetland area on the Reserve. Presently, some fill instability at the point the road, wetland, and the West Fork of Ecola Creek converge indicates the potential for fill failure and possibly partial draining of the wetland. Additional engineering analysis is required to fully assess the problem, the risks it poses, and possible solutions.

The old logging roads are numerous and cover many areas of the property. Their approximate locations are recorded on the Reserve map. Presently they are used for very limited recreational purposes only. There is one location where a plugged culvert has led to substantial slumping and erosion along a short segment of the road.

Stream Channel Modifications

Several modifications to the streams are present, primarily related to the City's water use. These include:

- The Sand Filtration Plant constructed in 1994
- The rip rap protecting the water intake to the Sand Filtration Plant and temperature probe
- The bridge crossing the West Fork
- The springboxes and other features at the springs themselves

Further description of these features is contained in the Ecola Creek Watershed Assessment (Table 6.9 and Figure 6.3) (Parker *et al*. 2001).

4. Resource Policies

In 2005 the City Council adopted a statement of management philosophy and a series of four planning goals. These policies have guided the development of this management plan and are repeated here.

Management statement

The Ecola Creek Forest Reserve shall be managed to preserve and enhance municipal water quality, as well as the ecological integrity of the forest ecosystem and its constituent aquatic and riparian habitats.

Planning Goals

PROTECT AND ENHANCE FOREST HEALTH
Preserve existing mature forest, and allow second- and third-growth forest areas to mature.
Reduce fragmentation of mature forest habitats through the coordinated management of forested City lands in cooperation with the Oregon Department of Forestry and adjacent private landowners.

PROTECT MUNICIPAL WATER QUALITY
Preserve the integrity of existing springs and in-stream water intakes.
Protect municipal water quality through restoration activities that might reduce suspended sediments and enhance natural wetland water filtration processes upstream from City water supply intakes.

PROTECT AND ENHANCE SALMON HABITAT
Preserve existing floodplain forests, riparian wetlands, and side-channel habitats.
Restore salmon habitat through such actions as the restoration of historically degraded riparian wetlands and side-channel habitat, and the identification and stabilization of upland sources of erosion.

FOSTER COMMUNITY INVOLVEMENT WITH THE FOREST RESERVE
Facilitate opportunities for public education, focusing on the Forest Reserve's unique ecosystem.
Facilitate opportunities for passive recreation within the Forest Reserve that are compatible with general goals 1, 2, and 3, above.

Policies, Objectives, and Guidelines

Forest Health & Native Biodiversity

<u>Policies</u>
The first priority in managing the Reserve is to protect and enhance forest health. For the Reserve, forest health is most strongly related to conservation and restoration of native

biodiversity. Because the Reserve is in a watershed primarily consisting of industrially managed forestland, the conservation of mature stands of trees takes on special significance. The goal in all areas of the Reserve will be the development of older forest conditions. Structural elements in the forest that influence biodiversity, such as vertical and horizontal stand structure and snags and down wood, will be retained and enhanced.

Species diversity contributes to resilience and long-term forest health.

Objectives

- Create more diverse and healthy forests.
- Ensure that cedar remains a vital component of the ecosystem.
- Control invasive, non-native plant species as much as possible.
- Create snags to enhance wildlife habitat in areas without such habitat.
- Create down wood through forest restoration projects.
- Survey old growth areas for sensitive species.
- Seek conservation of adjacent areas of mature forest, through acquisition if necessary

Guidelines

- No herbicides will be used to control invasive species. Instead, manual removal techniques will be used.
- No chemical animal browse repellants will be used to protect planted seedlings. Instead, physical barriers such as netting will be used.
- Logs will not generally be removed during restoration efforts in order to increase the amount of down wood on the forest floor and minimize potential soil disturbance and compaction.
- Forestry professionals will be involved in planning restoration efforts

Municipal Water Quality

Policies

The maintenance of an ecosystem that produces a consistent supply of high quality water is of critical importance to the well-being of the community of Cannon Beach. No activities will be undertaken that have any demonstrable risk to the water supply.

Objectives

- Protect the springs from any adverse effects of management or recreation activities.

- Treat the forest area surrounding the springs as a water catchment area.
- Seek conservation of mature forest and riparian areas within the Ecola Creek watershed to minimize long-term risks to water quality in the watershed.

The North Fork of Ecola Creek.

Guidelines

- Public vehicular access to the Reserve will not be allowed.
- No cutting of trees, even if only for restoration purposes, will occur in the proximity of the springs without further study to determine an appropriate buffer width.
- Continued public access for recreation purposes will be contingent on continued high water quality.
- No herbicides will be used within the Reserve.

Planting conifer seedlings is a key component of riparian restoration.

Salmon Habitat

Policies

The North and West Forks of Ecola Creek contain important salmon habitat that will be preserved and enhanced. While placement of logs has achieved some habitat goals in other coastal streams, there remains a risk that these activities will cause increased sedimentation. Long-term strategies, such as conifer reestablishment in riparian areas, will be favored over short-term solutions.

Objectives

- Reestablish conifer trees in alder-dominated riparian areas to help stabilize floodplain soils and provide future sources of durable large woody debris for streams.
- Ensure that roads that are possible sources of sediment delivery to streams have appropriate water drainage structures to minimize the risk of sediment delivery.

Guidelines

- No soil disturbing activities, including heavy equipment operation, will be conducted within 200 feet of any streams, except for maintenance of existing roads.
- Recreational uses that conflict with salmon habitat goals will be restricted.
- Fisheries professionals will be involved in planning restoration efforts.

Community involvement

Policies

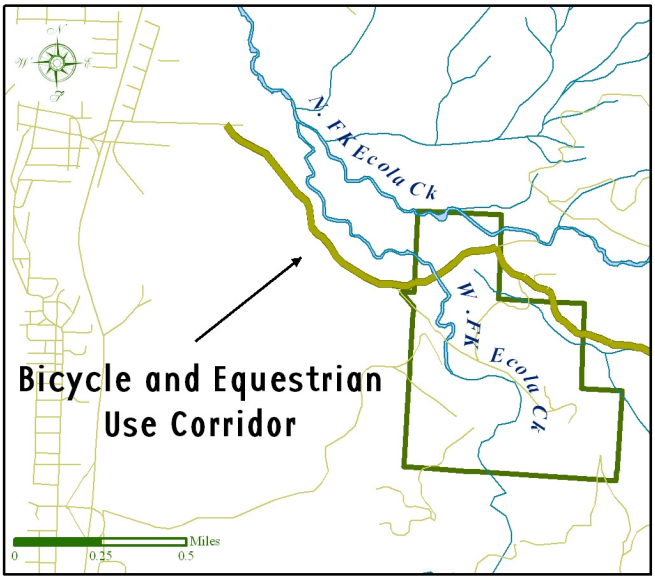
Management of the Reserve must carefully balance the need to maintain water quality and salmon habitat with the legitimate interest of the community to have access to and recreate in the Reserve. Because of the importance of this water source to the community, water quality protection necessarily takes priority; however, the City will continue to acknowledge the community's right to enter and use the Reserve for passive, non-motorized, low impact recreation subject to certain limitations. Any future improvements to the recreational infrastructure of the Reserve must be compliant with the Americans with Disabilities Act (ADA).

Recreational use of the Reserve is concentrated on the main access road.

Objectives

- Allow modes of recreation that are fully consistent with water quality, forest health, and salmon habitat objectives
- Allow educational groups to use the area for conservation education
- Foster community involvement in restoration efforts

Guidelines



- Fishing within the Reserve is permitted subject to Oregon Department of Fish and Wildlife regulations.
- Motorized off-road vehicles such as snowmobiles, dune buggies, all-terrain vehicles and motorcycles are prohibited.
- Public vehicular access is prohibited.
- Vehicular access for City workers or contractors for public works or restoration purposes is allowed.
- Off-road (mountain) bicycle trails may not be developed.
- In order to provide mountain bike access to adjacent forest land and to address the potential impacts of bicycle use on the Reserve and the West Fork of Ecola Creek in particular, bicycle use in the Reserve will be limited to the road that crosses the West Fork of Ecola Creek and the Pacific Power transmission line right-of-way (see figure, inset). Use of the road and the Pacific Power transmission line right-of-way for bicycle use shall be prohibited from October to March.
- Hunting and the use of firearms are prohibited.
- Equestrian use in the Reserve shall be limited to the bicycle access corridor described above (see figure, inset). The prohibition on use of this corridor from October to March shall also apply to equestrian use.
- Public access is restricted to daytime only (i.e. no camping).
- Dogs must be on a leash.
- Commercial harvesting of minor forest products such as moss, salal, ferns, and mushrooms is prohibited.
- Gathering such products for personal use is permitted
- Annual monitoring of recreational impacts will be conducted

5. Management recommendations

The following recommendations were developed through a series of public forums and Advisory Council meetings. They are intended to provide a blueprint for managing the Reserve in a manner that furthers the City's objectives and is fully consistent with its resource policy framework.

Costs provided are general estimates only and are not based on any actual cost estimates provided by potential service providers. They are based on a general knowledge and experience of labor costs on previous projects. Actual implementation costs may, and likely will, vary over time based on market conditions and other variables.

Forest Health

#1: SURVEY FOR MURRELETS

- Location: Stand 11
- Extent: 17 acres
- Priority: Medium
- Cost: $1,000

Discussion
The old-growth cedar stand probably meets minimum requirements for nesting Marbled Murrelets. The site should be inventoried during the breeding season. Presence of murrelets may dictate some of the management strategies as well as timing of other management activities. A murrelet inventory requires 2 or 3 visits in late-June/early-July. The surveyors enter potential habitat about 1 hour before dawn and listen for murrelets returning from the ocean to change places with mates occupying nests.

#2: INVASIVE SPECIES CONTROL

- Location: Stands 3, 5, 7, 9, and 11
- Extent: 5 acres
- Priority: Medium
- Cost: approx. $2,500

Discussion
The invasive plant species are primarily located near roads, although there are some species that have been detected in forest interior areas. The control program would seek to eradicate these aggressive invasives through manual removal methods including cutting and uprooting plants. The primary targets would be Scotch broom, Himalayan blackberry, English ivy, and English holly.

#3: THIN HEMLOCK

- Location: Stands 9
- Extent: 17 acres
- Priority: High
- Cost: approx. $4,500 per entry (two entries total)

#4: UNDERPLANT IN HEMLOCK

- Location: Stand 9
- Extent: 17 acres
- Priority: Medium
- Cost: approx. $3,000

#5: SNAG CREATION

- Location: Stand 9
- Extent: 17 acres; 2 trees per acre in groups
- Priority: Low
- Cost: approx. $2,500

Discussion

These three recommendations, taken together, are intended to begin to restore diversity to the highly artificial hemlock plantations found on the Reserve. The area selected for initial restoration is Stand 9, which lies on a ridge to the north of the old growth cedar stand. This area is relatively protected from the possible impact of windthrow due to recent or anticipated future harvesting on adjacent lands, and would also be difficult to access for any possible log removal. For these reasons, it is a good candidate for initial restoration efforts.

The thinning is intended to reduce tree density from the current level of approximately 250 trees per acre to 200 trees per acre over two entries. This represents a 20% reduction in tree density. The thinning would not be uniform, but instead would be designed to create more horizontal diversity by creating a patchy distribution. Small openings would be created to allow for cedar planting sites. The remaining hemlock will be free to grow healthier, larger crowns. This will increase their ability to grow strong root systems and develop increased windfirmness. It will also enhance their ability to grow and maintain large branch structures that could provide additional marbled murrelet habitat over the long-term. Without such intervention, development of potential habitat for this species will be delayed by at least several decades as the stand undergoes the stem exclusion stage of development (Oliver and Larson 1996).

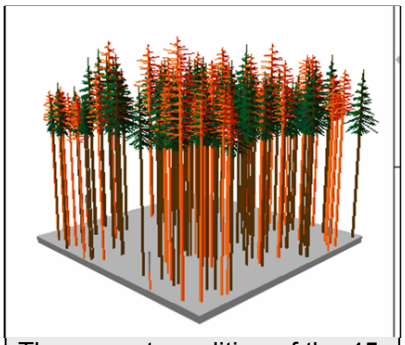
The treatment will also immediately create additional large woody debris for the forest floor. This will enhance habitat for a variety of species, including amphibians. Underplanting will follow to establish cedar and spruce in the understory, particularly where small gaps have created openings in the canopy to allow increased sunlight. This increased sunlight will help the planted trees grow more rapidly past browse height. Elk and deer browsing pressure is the primary cause of cedar planting failure in northwestern Oregon. Planting density will be approximately 100 trees per acre. Species composition will be 50% cedar and 50% spruce. The spruce will be planted as a hedge against cedar planting failure, since spruce are not subject to animal browsing pressure. Abundant natural regeneration of hemlock is expected in the treated areas. Figure x presents a visualization of the restoration work.

Snag creation will be carried out if necessary. It is possible that the thinning will result in some blowdown and snag creation, which may render this action unnecessary.

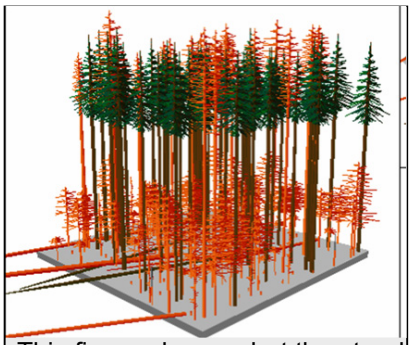
#6: PCT YOUNG PLANTATIONS

- Location: Stand 7
- Extent: 19 acres
- Priority: Low
- Cost: approx. $5,000

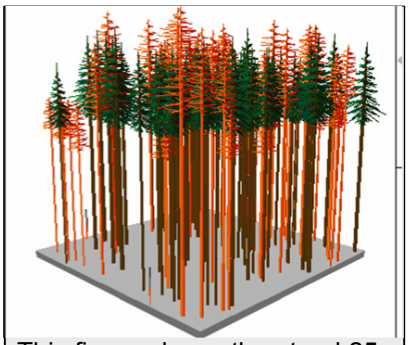
Figure 4. This sequence of schematic forest models depicts the predicted stand development trajectory under a restoration plan as compared to doing nothing



The current condition of the 45 year-old hemlock plantations. Tree density is high, and there is virtually no understory



This figure shows what the stand might look like 25 years after restoration thinning. Green is hemlock, red is cedar & spruce



This figure shows the stand 25 years from now, with no treatment.

Discussion

These areas were harvested and planted to hemlock and spruce within the last ten years. Since that time, abundant natural regeneration of alder and hemlock have contributed to very high stem densities. Without intervention, the stand will enter a prolonged period of stem exclusion, where very little understory development will take place. By actively controlling stem density and species composition, results more favorable to biodiversity objectives can be attained.

Municipal water quality

1: PROHIBIT INCOMPATIBLE ACTIVITIES

Discussion

Due to the potential for certain activities to conflict with water quality objectives, signage will be added to the main entry gate specifically prohibiting these activities. These include:

- Motorized vehicles
- Hunting and trapping
- Overnight use
- Dogs required to be on-leash

The signage will also describe the use restrictions on the following activities:

- Bike use
- Equestrian use
- Dog walking
- Fishing

Salmon habitat

#1: PLANT CONIFERS IN RIPARIAN

- Location: Stands 1, 2, and 6
- Extent: 20 acres
- Priority: High
- Cost: approx. $6,500

Discussion
As part of a long-term strategy to provide a future source for large wood inputs to streams and to increase soil stability in the floodplains, conifer planting is proposed. Plantings would be 50% cedar to reintroduce this species and 50% spruce to hedge against risk of cedar planting failure due to animal browse. The planting density would be approximately 200 trees per acre, but would be patchy and irregular in distribution. The area of focus would be within 100 feet of the streams.

The planting activity could take place gradually over a several year period to reduce financial impact on the City and to allow for an increase in site-specific knowledge regarding planting and seedling protection techniques.

#2: THIN ALDER IN RIPARIAN

- Location: Stands 1, 2, and 6
- Extent: 20 acres; fall 20 trees/acre (patchy)
- Priority: Medium
- Cost: approx. $5,000

Discussion
Some thinning of dense alder will be necessary to ensure planting success and speed growth rates. The primary cause of planted cedar mortality is animal browse. Hence rapid early growth is important and can only be achieved with increased sunlight. The alder felling will be limited to approximately 20 trees per acre in a patchy, non-uniform distribution. The timing of this treatment can also be somewhat gradual in accordance with the planting schedule.

#3: ROAD WORK

- Location: Wetland outlet at powerline road
- Priority: High
- Cost: approx. Unknown – need engineering analysis

This possible fill failure, if unchecked, could potentially partially drain a wetland area and contribute sediment to an important stretch of the West Fork. An engineering analysis, in coordination with Pacific Power, is needed to further evaluate risks and solutions.

Community involvement

#1: EDUCATION

- Educational and interpretive activities will be conducted under auspices of nonprofit, non-commercial organized groups
- Develop educational materials pertinent to Reserve in cooperation with groups with an environmental education mission
- Place a unified entry sign

#2: RECREATION

- Do not promote additional use.
- No new trails – rely on existing road network to provide access
- Minimal physical improvements – entry sign, benches
- Re-evaluate recreation policies and infrastructure in 2011

#3: ROAD WORK

- Location: Stand 4
- Priority: Low
- Rationale: Stop erosion of road base to maintain usability as a trail
- Cost: approx. $10,000

#4: ACCESSIBILITY FOR DISABLED PERSONS

- The gate at the terminus of Elk Creek Road limits the accessibility of the Reserve for persons with disabilities. A number of actions need to be taken to enhance the accessibility of the Reserve for persons with disabilities. A suitable path around the gate needs to be constructed so that disabled persons can bypass the gate. Signage at the gate needs to provide persons with disabilities information on the condition of the road, the distance to the Reserve and the Reserve's unique features. An option needs to be developed so that disabled persons wishing to have access through the gate can obtain assistance to do so.

#5: MONITORING

- Develop monitoring program to ensure plan is being implemented and goals are being met

Discussion

Taken together, these proposals allow for increased engagement of community members with the improvement of the resource and continued protection of water quality on the Reserve.

6. Implementation Timeline

Year	Activity
2006-7	• Invasive species control • Engineering analysis for powerline road repair
2007-8	• Begin conifer planting and alder thinning in riparian areas • Survey for Murrelets • Powerline road repair • Thin hemlock – Stand 9 • Install entry sign
2010	• Finish conifer planting and alder thinning in riparian areas • Underplant Stand 9
2011	• Repair road in Stand 4 • Re-evaluate recreational use and policies
2012	• Snag creation in Stand 9 (if needed)
2013	• Evaluate success of riparian planting • Evaluate success of hemlock thinning • Evaluate invasive species and control if needed
2014	• Pre-commercial thinning in Stand 7
2015	• Second thinning in Stand 9, if warranted • Continued thinning and underplanting in Stands 8 and 10, if warranted

Thinning activities will generally be conducted in the summer months, although since no log extraction or other heavy equipment uses are proposed, the work could be conducted during wet weather without any adverse impacts. Normal restrictions on operations during fire season (late summer) would be observed during thinning. Planting is generally done in late winter when seedlings are dormant and newly planted trees will not be subject to moisture stress.

Appendix A - References

Altman, B. 2003. Olive-sided Flycatcher. in *Birds of Oregon: a general reference*. D.B. Marshall, M.G. Hunter and A.L. Contreras, Eds. Oregon State University Press, Corvallis, OR.

Altman, B. 2003. Willow Flycatcher. in *Birds of Oregon: a general reference*. D.B. Marshall, M.G. Hunter and A.L. Contreras, Eds. Oregon State University Press, Corvallis, OR.

Bull, E. 2003. Pileated Woodpecker. in *Birds of Oregon: a general reference*. D.B . Marshall, M.G. Hunter and A.L. Contreras, Eds. Oregon State University Press, Corvallis, OR.

Corn, P.S. and R.B. Bury. 1991. Terrestrial Amphibian Communities of the Oregon Coast Range. *in Wildlife and Vegetation of Unmanaged Douglas-Fir Forests,* Gen Tech Rep PNW-GTR-285. L.F. Ruggiero, K.B. Aubry, A.B. Carey, and M.H. Huff, tech eds. Pacific Northwest Research Station, Forest Services, U.S. Department of Agriculture.

Giese, A.R. and E.D. Forsman. 2003. Northern Pygmy Owl. *in Birds of Oregon: a general reference.* D.B. Marshall, M.G. Hunter and A.L. Contreras, eds. Oregon State University Press, Corvallis, OR.

Hamer, T.E and S.K. Nelson. 1995. Characteristics of Marbled Murrelet Nest Trees and Nesting Stands. in *Ecology and Conservation of the Marbled Murrelet,* Gen. Tech. Rep. PSW-GTR-152. C.J. Ralph, G.L. Hunt, M.G. Raphael and J.F. Piatt, eds. Pacific Southwest Research Station, Forest Services, U.S. Department of Agriculture.

Hayes, J. and F. Burris. 2006. Wildlife and Stewardship Planning. Presentation at Oregon Forest Stewardship Planning Workshop, Jan.31, 2006, Veneta, OR.

Heyer, W.R., M.A. Donnelly, R.W. McDiarmid. L.C. Hayek and M.S. Foster.1994. *Measuring and Monitoring Biological Diversity: standard methods for amphibians.* Smithsonian Institution Press, Washington, D.C..

Oliver, C.D., and B.C. Larson. 1996. *Forest Stand Dynamics.* John Wiley and Sons, New York, NY.

Oregon Department of Environmental Quality. 2001. Source Water Assessment Summary Brochure PWS # 4100164.

Oregon Department of Forestry. 2001. Northwest Oregon State Forests Management Plan.

Oregon Forest Resources Institute. 2002. Oregon's Forest Protection Laws: An Illustrated Manual.

Oregon Watershed Enhancement Board. 2004. Ecola Creek Forest Reserve Conservation Easement (#205-001).

Parker, S. et al. 2001. Ecola Creek Watershed Assessment: A Living Document.

Welsh, H.H. and S. Droege. 2001. A Case for Using Plethodontid Salamanders for Monitoring Biodiversity and Ecosystem Integrity of North American Forests. *Conservation Biology* 15(3):558–569.

Appendix B

Ecola Creek Forest Reserve Management Plan

OPINION SURVEY SUMMARY

February 2, 2006

The City of Cannon Beach held a three week comment period for public input on the Ecola Creek Forest Reserve Management Plan in December 2005/January 2006. The comment forms were available at the City Hall and also online via a web-based survey linked to the City of Cannon Beach website. A total of 59 surveys were completed and the results are summarized below.

In addition, a public open house for the project was held on Wednesday, January 11, 2006 at the Cannon Beach City Council Chambers. Approximately 15 people attended the meeting and provided input in a question and answer session that was recorded on a flip chart. Those comments are included in a section at the end of this summary report.

1. First please tell us your zip code:

Zip Code	City, State	Number of Respondents
97110	Cannon Beach, OR	18
97201	Portland, OR	5
97145	Tolovana Park, OR	2
97102	Arch Cape, OR	2
97213	Portland, OR	2
45701	Athens, OH	1
97006	Beaverton, OR	1
97009	Boring, OR	1
97015	Clackamas, OR	1
97034	Lake Oswego, OR	1
22032	Fairfax, VA	1
97103	Astoria, OR	1
11231	Brooklyn, NY	1
97138	Seaside, OR	1
97146	Warrenton, OR	1
97212	Portland, OR	1
97214	Portland, OR	1
97215	Portland, OR	1
97217	Portland, OR	1
97218	Portland, OR	1
97229	Portland, OR	1
97255	Portland, OR	1
97221	Portland, OR	1
98632	Longview, WA	1

85255	Scottsdale, AZ	1
	Cannon Beach area	**51%**
	Portland area	**38%**
	Other areas	**11%**

2. Is Cannon Beach your (please check one):

- Primary Home: **25 (45%)**
- Secondary Home: 22 (39%)
- Place to Visit: 9 (16%)

3. How often do you visit the Ecola Creek Forest Reserve for the following uses? (Check one box per row)

	Frequently (daily/weekly)	**Occasionally (once a month)**	**Seldom (once/twice a year)**	**Never**	**# of respondents**
Hiking/Walking	3 (7%)	11 (28%)	**15 (38%)**	10 (25%)	39
Mountain Biking	1 (3%)	2 (6%)	3 (9%)	**26 (81%)**	32
Wildlife viewing/ photography	2 (4%)	10 (24%)	**19 (45%)**	11 (26%)	42
Hunting	0	0	0 (0%)	**29 (100%)**	29
Fishing	0	1 (3%)	3 (10%)	**26 (87%)**	30

Additional Comments:

- I want and plan to use it more.
- We'd like a map-is there one available?
- I have never been there. I would like to go at a time when someone familiar with the area is there.
- Never-unfortunately for me!
- I didn't know it was open for unescorted visits!

4. Are there other ways you use the ECFR? If so please list them here and tell us how often:

- We value keeping open space open and undeveloped.
- Had not realized it was open for these uses.
- While we contributed to it, we're not sure exactly where it is. If there was a map available (there might be one but we are not familiar with it), we'd use the reserve for hiking and birding (occasionally).
- I like to be able to look back at the forest from the beach and from town and not see clear cuts. I'd prefer to see old growth forest.

- Observational drawing (once a month).
- Short hikes with children.
- Reflecting on what a wonderful "saving" this was for the future of our area!
- To enjoy the plant species of a climax forest. To understand the ecology of this forest (the web of life, etc).
- I view it.
- On both 3 and 4 I believed that the lands were closed areas so both questions are meaningless to me.
- Teaching, guided walks-once or twice a year
- I would love to visit this place, but I've never been in town when a walk is planned to the site and I'm not really sure where the entrance to the site is! I would use it for hiking/walking and wildlife viewing if I knew how to get there! But none of the other uses.
- Walking to enjoy the peaceful forest.
- Showing tourists the area and view.
- Every time I visit CB I have a greater sense of peace of mind, just knowing the reserve has been protected.
- Birding- I guess this qualifies as wildlife viewing.

5. How valuable is each of the following functions of the ECFR to you? Assign a value to each, check one box per row.

	Essential	Important	Inconsequential	# of respondents
Clean water	**52 (93%)**	4 (7%)	0	56
Fish habitat	**42 (81%)**	9 (17%)	1 (2%)	52
Wildlife habitat	**40 (70%)**	17 (30%)	0	57
Open space/natural preserve	**30 (67%)**	15 (33%)	0	45
Recreation	10 (17%)	**44 (76%)**	4 (7%)	58
Education	13 (24%)	**41 (75%)**	1 (1%)	55

Additional Comments:

- I defer to Doug Deur of the advisory committee on these, as he has a far superior knowledge of restoration and protection.

6. Please rate the following priorities for protection and restoration actions. (Check one box per row)

	High	Medium	Low	Not a priority	# of respondents
Abandoning old logging roads	12 (24%)	**20 (39%)**	11 (22%)	8 (16%)	51
Surveying for Marbled Murrelets	14 (29%)	**18 (38%)**	11 (23%)	5 (10%)	48
Planting conifers along	**34**	14	5	0	53

streams to enhance fish habitat by providing for large wood inputs to the streams	**(64%)**	(26%)	(9%)		
Controlling non-native invasive species (Himalayan blackberries, English Ivy, etc)	**35 (66%)**	16 (30%)	2 (4%)	0	53
Thinning in hemlock plantations to speed the creation of large diameter trees.	20 (38%)	**24 (45%)**	8 (15%)	1 (2%)	53
Creating small openings in hemlock plantations to plant cedar and spruce for species diversity.	**25 (46%)**	20 (37%)	6 (11%)	3 (6%)	54
Creating snags for bird and small mammal habitat.	**27 (53%)**	15 (29%)	9 (18%)	0	51
Purchasing additional lands to increase the size of the reserve.	**38 (70%)**	8 (15%)	7 (13%)	1 (2%)	54

Additional Comments:

- This question isn't clear. We're in favor of keeping vehicles off logging roads but keeping them available for hiking only (abandoning old logging roads).
- There's not enough info. here but done with sensitivity to ecology it sounds reasonable (Thinning in hemlock plantations to speed the creation of large diameter trees).
- Probably a benefit (abandoning old logging roads).
- I know nothing about the area, but would like to learn. We support ECFR because we are sensitive to the ecology in general and also supportive.
- Unknown, for these roads may provide necessary access to control catastrophic fires, to move tree planting crews in/out etc. Please designate as "high" priority if roads are sliding and/or eroding or if the road isn't needed (abandoning old logging roads).
- I trust Doug Deur's ideas on theses issues as well as item's #8 and #9.

7. Are there other protection/restoration priorities for ECFR not listed in question 6? If so, please list them here.

- I think the forest needs to be managed, thinning, remove diseased trees, leave wild life trees, no motorized machines, trails for horses, trails for walkers and runners, trails for bicycles.
- Our overall goals would be to protect biodiversity for its own sake. We'd strongly oppose hunting in ECFR because it should be safe for biodiversity to flourish there and safe for humans to walk, hike, and enjoy more of creation without fear of hunters trying to destroy animals and humans.
- Field trips for children where they plant several tree species and they return yearly to observe growth and/or survival due to planting technique, location

and damage due to animals. Also teach them about non native, invasive plants and how to pull those plants out.

- Build and maintain trails for hiking (and possibly bikes and wheelchairs). As a hunter, this isn't an easy thing to say, but I encourage you to consider banning hunting in this reserve to increase populations of cougar, bear, deer, grouse and elk and to make non-hunters feel safer and welcome there.
- Preparing and maintaining walking trails with least possible impact to environment, signage (stay on trail) plus information about species.
- Controlled hiking trails
- Create primitive bridges across the creek that can be removed during winter floods.
- Provide accessible trails so Cannon Beach's retired and aging population can walk in the preserve-a trail that remains relatively safe yet unobtrusive.
- Avoid making the ECFR so known and accessible that the city has to worry about liability.
- All thinning should involve girdling or falling trees in decadal intervals in over stocked hemlock areas. NO commercial logging should be done. Below on #8 my support is predicated on only ecological forest use of all thinned trees for whether in stream alcove wood augmentation or left on the forest floor. If multiple entries are made on a 10-14 year cycle the forest would build a cumulative biomass of various stages of decayed wood and would prevent the "loading" of the forest floor with small DBH trees with short persistence time in the forest system.
- Develop various erosion control practices on disturbed area in the watershed, both within the ECFR and beyond boundaries-restrict access or redirect trails to less erosive routes, with emphasis on stream crossing which break the natural banks.
- Riparian wetland enhancement/restoration.
- When removing young hemlocks, let some remain fallen on the ground to encourage a natural process which adds to the nutrients of the soil through their decomposition.
- The biological survey may also suggest other priorities- e.g. amphibian populations.
- Foot bridge across West Fork Ecola

8. Some public land managers have adopted a strategy to thin dense young (less than 50 years old) strands of trees to speed development of old growth forests. How would you rate your level of support for adopting this strategy on portions of the ECFR, if done properly?

- High: **25 (46%)**
- Medium: 19 (35%)
- Low: 10 (18%)
- None: 1 (2%)

Total respondents: 55

Additional Comments:

- I would take the advice from scientists, not land managers.
- If done properly-the key

- Again, I would defer Doug Deur's view.

9. In the course of restoration activities, the City may have the opportunity to extract some second growth logs to help offset costs of these activities. How would you rate your level of support, if done properly?

- High: 17 (30%)
- Medium: **22 (39%)**
- Low: 9 (16%)
- None: 8 (14%)

Total respondents: 56

Additional Comments:

- Based on scientific recommendations.
- Low-even if "done properly"
- As you said earlier, re-planting thinned and or clear-cut areas with spruce, hemlock and red cedar is a necessity if this is done.
- Don't make the forest "too clean" in an effort to make money from logs.
- Only if Doug Deur really supports this idea.

10. Please consider the following recreational uses and rate them based on what you consider to be appropriate uses for the ECFR. (Check one box per row.)

	High	Medium	Low	Not a priority	# of respondents
Walking	**54 (93%)**	3 (5%)	0	1 (2%)	58
Wildlife Viewing/ Photography	**49 (85%)**	8 (14%)	0	1 (1%)	58
Mountain Biking	7 (12%)	11 (19%)	17 (29%)	**23 (40%)**	58
Hunting	3 (5%)	4 (7%)	13 (23%)	**37 (65%)**	57
Equestrian Use	4 (7%)	14 (24%)	12 (21%)	**28 (48%)**	58

Additional Comments:

- I suggest that only some trails in the reserve be designated as allowed for use by horses and bikes. I also suggest that at least one short "flattish" trail be paved so that baby strollers, wheelchairs and walkers can use the reserve too.

11. Please consider the following potential educational/recreational improvements and rate them based on your personal interest. (Check one box per row)

	High	Medium	Low	Not a Priority	# of respondents

New walking trails	**27 (47%)**	20 (35%)	8 (14%)	3 (5%)	58
Viewing benches	11 (19%)	**28 (49%)**	12 (21%)	6 (10%)	57
Interpretative signs	16 (28%)	**26 (45%)**	10 (17%)	6 (10%)	58
Off-site parking	8 (14%)	**21 (37%)**	16 (28%)	12 (21%)	57

Additional Comments:

- Limited to habitat information and appropriate behavior in the area (interpretative signs)
- Off-site parking needed at the entrance only.
- Please keep the ECFR as rustic as possible, thank you.
- On abandoned logging roads: a good idea so that people won' create their own trails through fragile territory (New walking trails).

12. Is there anything else about ECFR that has not been covered in this survey that you would like to tell us?

- Trees are renewable, God is in charge, but he needs management help.
- Are there small boat opportunities (in or near the reserve area) which could be created? For wild life observation?
- One of the reasons to establish the reserve is to protect the quality of a potable water supply. Are the plans to build water tanks, dams and reservoirs, etc. in the reserve area? If so, future survey question could address this.
- See #4. We care about this parcel as a "forest reserve" and we are pleased that there is going to be a plan for managing this as an ecological resource. We do not support activities that are detrimental to the reserve (horse back riding. Removing older trees) and its habitat.
- I've been so busy in the last few years I've barely been able to walk on the beach let alone the preserve. I know nothing about forest management but some logging to thin the preserve seems common sensible and if that helps the ECFR coffers… that's a plus. I hope to slow down in the very near future to do nature walks and maybe even some fishing in the preserve.
- Contact a university that may want to assist or do natural science studies.
- Only that direction and "control" stay closely in hands of original people working on this.
- Create a guide to plants, mammals, amphibians, birds and fish life found in ECFR.
- Let this be an experiment in "letting" nature evolve without interference. "Human improvement" often means misuse and abuse.
- I would like to use ECFR for walking, hiking, peace solitude etc., but do not know how to access it.
- I will submit written comments regarding restoration actions as well as this survey.
- Purchase additional lands to protect watershed, views and habitat.
- Is there a map to the site? I would like to have one, if there is. Thanks! Thank you for asking for input.
- I love the area!

- I hope these will be opportunities for (and interest in) involvement by local school children And thank you for doing the survey!
- I think snags will be created naturally after thinning and the clear cutting of trees on adjoining private properties. Maintain old logging roads as trails.
- Thank you all for the fine work you've done thus far.
- My husband and I come to Cannon Beach for one week in October. I have been coming here since I was a child. My husband and I honeymooned here 50 years ago. It is my favorite place in the work and I am so happy people like you are trying to preserve the naturalness and magic of it.
- I would prefer to see thinned hemlock left on the ground, and only removed if necessary to help pay for the restoration. Restoration and preservation should be priorities rather than recreation.
- I do own 42 acres of forest land in Hillsboro, OR. O I am a master woodland manager with the state forest Department of Forestry. Also an active member of Washington County small woodlands. I am willing to serve on a committee connected to CB forest.

January 11, 2006 Open House Comments

The comments provided at the January open house mirror the feedback received through the opinion survey: participants prefer to see the ECFR managed carefully to restore/enhance forest health and that any recreational uses/improvements be largely limited to passive activities such as walking and wildlife viewing.

Forest Health:

- Protect it-don't log it (for money).
- Balance open space with recreational needs.
- Does understory have to be planted or does it occur naturally?
- Would seed sources be local genotype (for re-planting)?
- Look at funding sources like OWEB for restoration. Cost share money.
- Any thinning process should be delicate.
- Do you envision cutting for commercial value?
- Girdling/thinning without extracting the wood.
- Want to trust in the process that any thinning is being done with the right intent.
- Are these studies that show selective thinning is ecologically/economically sound?
- Restoration/re-seeding needs to be done carefully. Decisions driven by restoration NOT economics.

Recreation:

- Convert some of the old logging roads into trails. Could make a loop trail.
- Include facilities for the physically handicapped
- Consider access from the school property and year round use.
- Logging roads could help people experience Parcel #1.
- People can still enjoy it without spending money on trails.

- Biking on roads is fine but creating new bike trails could be a problem.
- Keep it as rustic as possible.
- 3 out of 4 of your Goals aren't really compatible with recreation.
- Fundraising was built around preservation and that's what people are expecting to see
- It's a small parcel - can't be all things top all people.
- Recreation exists up there already-don't shut that off.
- Management plan should be revisited periodically as problems emerge.

Other:

- Further land acquisition is a good idea
- Identify funding sources for restoration.

After recording, return to:

[Melissa Leoni
Oregon Watershed Enhancement Board
775 Summer St. NE #360
Salem, Oregon 97301]

CONSERVATION EASEMENT

This Conservation Easement is entered into pursuant to ORS 271.715 to 271.795 this ____ day of _____, 2004, between the City of Cannon Beach (hereinafter "Grantor") and the State of Oregon, acting by and through its Oregon Watershed Enhancement Board, an agency of the State of Oregon, as holder (hereinafter "Grantee").

RECITALS:

A. The Grantor is a local government in Clatsop County, Oregon;

B. The Grantor is the sole owner in fee simple of certain real property described in Exhibit A ("the Property");

C. The Property possesses natural, scenic, educational, recreational, and fish and wildlife values (collectively called "Conservation Values", as further described in Section 3, below) of great importance to the Grantor and to the citizens of the State of Oregon;

D. Grantee is an agency of the State of Oregon whose statutory mission is to provide funding to support the acquisition of lands and waters, or interests therein from willing sellers, for the purpose of maintaining or restoring watersheds, habitat and native salmonids. Interests in these lands and waters may be held by local, state and federal agencies, tribes, not-for-profit land conservation organizations, state institutions of higher education, independent not-for-profit institutions of higher education or political subdivisions of this state, as long as the entity continues to use the land or water for the purposes specified under section 4b, Article XV of the Oregon Constitution;

E. The Grantor has purchased the Property with funds provided, in part, by the Grantee. In exchange for the receipt of such funds, the Grantor has agreed to grant to Grantee a conservation easement as provided in this Agreement;

F. Grantee has publicized and held public meetings in compliance with ORS 271.735 and has thereafter determined that the purchase of a conservation easement is in the public interest;

G. ORS 541.375(9) requires that real property acquired with funds from the Watershed Improvement Grant Fund be used for purposes specified under section 4b, Article XV of the Oregon Constitution, attached as Exhibit B;

H. The purpose of this Conservation Easement is to ensure that the Property will continue to be used for purposes specified under section 4b, Article XV of the Oregon Constitution, in satisfaction of the requirements of ORS 541.375(9), to protect the Conservation Values enumerated in Section 3 of this Easement, and to accomplish the goals described by Grantor in its grant application to Grantee (No. 205-001), upon which basis Grantee awarded Grantor funding to assist with acquisition of the Property.

AGREEMENT

1. Grant of Conservation Easement. In consideration of $185,000.00 (the "Funds"), and of the mutual promises, terms, conditions, restrictions and undertakings herein set forth, Grantor hereby voluntarily grants and conveys to Grantee a conservation easement in perpetuity upon the Property of the nature and character and to the extent hereinafter set forth.

2. Obligations of the Grantor. The Grantor shall:

a. Preserve and protect the Conservation Values of the Property (as described in Section 3, below), in perpetuity, preserving its predominantly natural, scenic, forested, and open space condition;

b. Take all actions necessary to insure that the Property is used and managed in a manner consistent with the Conservation Values described in Section 3, below;

c. Take all actions necessary to insure that the Property is not used in violation of the use restrictions contained in Section 4, below; and

d. Prepare a proposed management plan and implement an Approved Management Plan as provided in Section 6, below.

3. Specific Conservation Values. The uses of the Property are limited to those consistent with section 4b, Article XV of the Oregon Constitution and the restoration, preservation and protection of the Conservation Values identified below. Grantor and Grantee have identified the following specific Conservation Values that shall be preserved, protected, and enhanced under this Easement:

a. Healthy watershed function;

b. Coastal forest and forested riparian habitats, including the preservation of remnant temperate-climate rainforest;

c. Native fish and wildlife habitat, including:

   i. Habitat for native resident and anadromous salmonid species, such as populations of coho salmon, steelhead, chum salmon, searun cutthroat trout, and Pacific Lamprey,

   ii. Habitat for native terrestrial and avian species; and

d. Current or historic wetlands located on the Property.

4. Prohibited Actions. Except as expressly permitted in Section 5, any activity on the Property, or use of the Property, inconsistent with the purposes of this Conservation Easement or detrimental to the Conservation Values in Section 3 is expressly prohibited, and the Grantor agrees not to engage in or permit any such activity or use. By way of example, the following activities and uses are explicitly prohibited, except to the extent expressly permitted in the Approved Management Plan, described in Section 6, or approved in writing by Grantee, which approval shall not be unreasonably withheld:

a. Division. Any division, partition or subdivision of the Property is prohibited.

b. Commercial Activities. Commercial or industrial activity is prohibited.

c. Construction. All construction, improvements and/or other man-made modifications such as buildings, structures, fences, roads and parking lots are prohibited, except for:

   i. Temporary fences built for the protection of trees and vegetation.

   ii. Maintenance of existing roads to allow restoration, preservation, and protection of the Conservation Values identified in Section 3 of this Easement.

   iii. Construction, improvements and/or man-made modifications approved in writing by Grantee, which approval shall not be unreasonably withheld.

d. Cutting Vegetation. Any cutting of trees or vegetation is prohibited, except for the purpose of noxious weed control, removal of danger trees, or obstructions to permitted roads.

e. Land Surface Alteration. Any mining, quarry, gravel extraction, grading, excavation, or alteration of the land surface is prohibited.

f. Dumping. Waste and unsightly or offensive materials are not allowed and may not be accumulated on the Property.

g. Water Courses. Natural water courses, lake shores, wetlands or other water bodies may not be altered.

h. Off-Road Vehicles. Except for vehicles needed to facilitate implementation of the Approved Management Plan, motorized off-road vehicles such as snowmobiles, dune buggies, all-terrain vehicles and motorcycles may not be operated on the Property. Off road bicycle trails may not be developed on the Property.

i. Firearms. No shooting of firearms, guns, rifles, for professional or recreational purposes on or from the Property is allowed.

j. Hazardous Materials. The owner of the Property or land manager shall not, by any act or omission, cause, contribute to or exacerbate a release of hazardous substances on or about the Property. As used herein, the term "Hazardous Substances" includes, without limitation, any material or substance that is (i) defined as a "hazardous substance" under any federal, state or local law, including oil; (ii) asbestos; (iii) fertilizers, herbicides, pesticides, and their residues; and (iv) nuclear or radioactive materials. The Grantor shall promptly notify Grantee of the presence or release of Hazardous Substances in, on, or about the Property, whether caused or discovered by the Grantor or any other person or entity. The Grantor shall take any action required by law to contain, remove, and remediate the Hazardous Substances. In addition, the Grantor shall take all appropriate actions to contain, remove or remediate the Hazardous Substances to the extent necessary to protect the Conservation Values identified in Section 3 this Conservation Easement. The Grantor shall cooperate fully with any investigation, removal or remedial action on or about the Property and shall not hinder or delay entry to, investigation of, or removal or remedial action on the Property by EPA, DEQ or their authorized representatives.

   If Hazardous Substances are found or released on the Property, the Grantor shall keep Grantee informed on a quarterly basis about the progress of any actions to remove, remediate, or contain Hazardous Substances on the Property, or decisions that no removal, remediation or containment will be necessary.

k. Billboards. Billboards and signs are prohibited. Signs may, however, be displayed to state:

   i. the name and address of the Property.
   ii. the owner's name.
   iii. the area protected by this Conservation Easement.

iv. prohibition of any unauthorized entry or use.
v. restoration activities implemented.

Signs may also be displayed for educational purposes consistent with protection of the Conservation Values described in Section 3 of this Easement.

l. No domestic, exotic or farm animals of any type are allowed on the Property unless expressly permitted in writing by Grantee and consistent with enhancement, preservation, or protection of the Conservation Values described in Section 3 of this Easement.

5. Permitted Actions. The Property may be used for the activities described in the Grantor's grant application, including watershed restoration activities, educational activities, and passive, low-impact recreational use such as hiking and walking trails, in a manner consistent with section 4b, Article XV of the Oregon Constitution, the Conservation Values listed in Section 3 of this Easement, and the Approved Management Plan.

6. Management Plan.

a. Grantor shall prepare a proposed management plan to enhance, protect and preserve the Conservation Values on the Property.

b. Grantor shall submit its proposed management plan to Grantee for approval no later than June 30, 2006.

c. If Grantor fails to submit an acceptable management plan to Grantee by August 30, 2006, Grantee will have the right, but not the obligation, to prepare its own management plan, or contract with a third party to prepare an acceptable management plan, and Grantor will pay all Grantee costs and expenses for the preparation of such plan. Such remedy shall be in addition to any other remedies provided for in Section 9, below.

d. After a proposed management plan has received final approval by Grantee, or has been prepared by Grantee pursuant to Section 6(c) above, (the "Approved Management Plan"), Grantor will manage the Property in a manner consistent with the terms of the Approved Management Plan and this Conservation Easement.

7. Duration, Burdens, and Benefits. The covenants and restrictions of this Conservation Easement are binding on the Grantor and its successors and assigns, and shall run with the Property in perpetuity. The benefits of this Conservation Easement are in gross and are assignable, but only to an eligible holder specified in ORS 271.725(1).

8. Grantee's Right Of Entry And Inspection. Grantee shall have the right, in a reasonable manner and at reasonable times, to enter and inspect the Property to determine

compliance with this Conservation Easement. Except in the case of an emergency, Grantee shall attempt to give the Grantor prior notice, which may be by telephone.

9. Grantee's Remedies.

a. Notice of Violation; Corrective Action. If Grantee determines that a violation of the terms of this Easement or the Approved Management Plan has occurred or is threatened, Grantee shall give written notice to the Grantor of such violation and demand corrective action sufficient to cure the violation and, where the violation involves injury to the Property resulting from any use or activity inconsistent with the purpose of this Easement or the Approved Management Plan, to restore the portion of the Property so injured to its prior condition in accordance with a plan approved by Grantee.

b. Management Plan. If an Approved Management Plan is not adopted by September 30, 2006, or if the Grantor fails to properly implement the Approved Management Plan, then Grantee will have the right, but not the obligation to:

i. Prepare a management plan as provided in Section 6(c), above;

ii. Perform, or cause to be performed, the obligations under the Approved Management Plan, in which case i) the Grantor will reimburse Grantee for all costs incurred thereby and ii) grant to Grantee or its designees a license to enter the property and perform the duties under the Approved Management Plan; and/or

iii. Require the Grantor to repay to Grantee the grant amount ($185,000), which shall bear interest from the effective date of this Agreement at the rate provided for in OAR Chapter 695, as amended from time to time. Upon repayment to Grantee, Grantee will release this Conservation Easement and the Grantor's obligations hereunder.

c. Legal Action. If the Grantor fails to cure the violation within thirty (30) days after receipt of notice thereof from Grantee, or under circumstances where the violation cannot reasonably be cured within a thirty (30) day period, fails to begin curing such violation within the thirty (30) day period, or fails to continue diligently to cure such violation within the thirty (30) day period, or fails to continue diligently to cure such violation until finally cured, Grantee may alternatively:

i. Bring an action in equity in a court of competent jurisdiction to enforce the terms of this Easement or Approved Management Plan, to enjoin the violation, ex parte as necessary, by temporary or permanent injunction, and to require the restoration of the Property to the condition that existed prior to any such injury; or

ii. Bring an action to recover damages for violation of the terms of this Easement or injury to any Conservation Values protected by this Easement, including, without limitation, damages for the loss of scenic, aesthetic, or environmental values.

iii. In addition, Grantee shall be entitled to recover damages for costs or expenses incurred due to the failure of the Grantor to perform its obligations under the Approved Management Plan.

d. Emergency Enforcement. If Grantee, in its sole discretion, determines that circumstances require immediate action to prevent or mitigate significant damage to the Conservation Values of the Property, Grantee may pursue its remedies under this Section 9 without prior notice to the Grantor or without waiting for the period provided for cure to expire.

e. Scope of Relief. Grantee's rights under this Section 9 apply equally in the event of either actual or threatened violations of the terms of this Easement. The Grantor agrees that Grantee's remedies at law for any violation of the terms of this Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in Section 9(c), both prohibitive and mandatory, in addition to such other relief to which Grantee may be entitled, including specific performance of the terms of this Easement, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies.

f. Remedies Cumulative. Grantee's remedies described in this Section 9 shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity.

g. Attorney Fees. In any action or suit to enforce any right or remedy under this Agreement the prevailing party shall be entitled to recover its reasonable attorneys' fees and costs. Grantee's obligation under this Section 9 is subject to the limitations of Article XI, section 7 of the Oregon Constitution.

h. Forbearance. Forbearance by Grantee to exercise its rights under this Easement in the event of any breach of any term of this Easement by the Grantor shall not be deemed or construed to be a waiver by Grantee of such term or of any subsequent breach of the same or any other term of this Easement or of any of Grantee's rights under this Easement. No delay or omission by Grantee in the exercise of any right or remedy upon any breach by the Grantor shall impair such right or remedy or be construed as a waiver.

i. Waiver of Certain Defenses. The Grantor hereby waives any defense of laches, estoppel, or prescription.

j. Acts Beyond Grantor's Control. Nothing contained in this Easement shall be construed to entitle Grantee to bring any action against the Grantor for any injury to or change in the Property resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, natural earth movement, and trespassers (although the Grantor shall take reasonably prudent actions to prevent trespasser access to the Property). In addition, the Grantor shall not be responsible for any prudent action, taken by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to the Property resulting from such causes.

10. Rights Of Action Against Third Parties. Grantee may bring any action it deems necessary or prudent against third parties if, in its good faith judgment, it believes such third parties' actions may impair the Conservation Values identified in Section 3 above.

11. Notices. For purposes of this agreement, notices may be provided to either party, by personal delivery or by mailing by First Class Mail a written notice to that party at the address shown below, or at such other address as a party may instruct by notice given the other pursuant to this paragraph. Service will be complete upon the earlier of delivery or 2 business days after depositing the properly addressed notice with the U.S. Postal Service with sufficient postage.

GRANTOR:
City Manager
City of Cannon Beach
PO Box 368
Cannon Beach, OR 97110
(503) 436-1581

GRANTEE:
Executive Director
Oregon Watershed Enhancement Board
775 Summer Street, NE
Salem, OR 97301-1290
(503) 986-0186

12. Maintenance or Repair, Taxes or Assessments. Grantee shall have no obligation or liability for maintenance or repair of the Property, or for the payment of any real estate taxes or assessments levied on the Property.

13. Indemnification. Grantor and Grantee acknowledge that each is insured with respect to tort liability by the State of Oregon Insurance Fund, a statutory system of self-insurance established by ORS chapter 278 and subject to the Oregon Tort Claims Act (ORS 30.260 to 30.300). Each party agrees to accept that coverage as adequate insurance of the other party with respect to personal injury and property damage. Grantor and Grantee each shall be responsible for any negligent acts or omissions of its own employees or agents under this conservation easement.

14. Severability. In the event any provision of this Conservation Easement is determined by a court to be void and unenforceable, all other terms of this Conservation Easement shall remain valid and binding.

15. Assignment or Disposal. The Grantor may not assign or transfer its rights or delegate its responsibilities under this Conservation Easement or sell, lease, exchange, or otherwise dispose of the Property without prior written approval from OWEB, which

approval shall not be unreasonably withheld. Such approval will not be granted if a profit, as defined by OWEB in OAR Chapter 695, as amended from time to time, will result from conveyance of the Property. The foregoing notwithstanding, the Grantor may grant other conservation easements on the Property, without the necessity of obtaining the prior approval of OWEB, so long as such conservation easements are consistent with and advance the protections of the Conservation Values described in Section 3 of this Easement, the management goals for the Property as specified in the Grantor's grant application (#205-001), and Section 4(b), Article XV of the Oregon Constitution.

16. Dispute Resolution. If there is a dispute regarding the use restrictions contained in this Conservation Easement or assignment or transfer of the Property, prior to Grantee seeking to enforce the terms of the Easement, the parties shall meet, negotiate in good faith, and attempt to resolve amicably any controversy or any disputed claim by any party against any other party arising under or related to this Conservation Easement. If the parties are unable to resolve the matter themselves they shall confer in good faith with respect to resolving the matter through mediation with a mutually acceptable, qualified third party. Each party shall share the cost of mediation equally.

17. Modification. This Conservation Easement may not be modified, changed, amended, deleted or eliminated without the express written consent of both parties, their successors or assigns.

18. Oregon Law: This Conservation Easement will be construed in accordance with Oregon Law.

19. Liberal Construction: This Conservation Easement shall be liberally construed in favor of maintaining the Conservation Values of the Property, as described in Section 3, above.

IN WITNESS WHEREOF, the Grantor and Grantee have executed this Conservation Easement on this ____ day of _____, 2004.

Accepted by City of Cannon Beach as Grantor:

By: _____

Its: _____

STATE OF OREGON)
) ss.
County of _____)

The foregoing instrument is acknowledged before me this ___ day of _____, 2004, by _____, of _____, on its behalf.

_____
NOTARY PUBLIC FOR OREGON
My commission expires: _____

Accepted by OWEB as Grantee:

By: _____

Its: Acting Director

STATE OF OREGON)
) ss.
County of _____)

The foregoing instrument is acknowledged before me this __ day of _____, 2004, by _____, of _____, on its behalf.

_____
NOTARY PUBLIC FOR OREGON
My commission expires: _____

EXHIBIT A

IN CLATSOP COUNTY, OREGON

TOWNSHIP 5 NORTH, RANGE 10 WEST OF THE WILLAMETTE MERIDIAN:

SECTION 28: THE **SW¼SW¼** ***LESS AND EXCEPT*** THAT PORTION THEREOF LYING WITHIN PARCEL 1 OF PARTITION PLAT NO. 1994-022 RECORDED MAY 24, 1994 IN BOOK 2 AT PAGE 27, CLATSOP COUNTY PLAT RECORDS;

SECTION 32: THAT PORTION OF THE **NE¼NE¼NE¼** LYING NORTHEASTERLY OF THE NORTHEASTERLY RIGHT OF WAY LINE OF THAT 30 FOOT WIDE ACCESS, UTILITY, AND WATERLINE EASEMENT CREATED ON PARTITION PLAT 1994-022 FOR THE BENEFIT OF THE CITY OF CANNON BEACH;

SECTION 33: THAT PORTION OF THE **NE¼NW¼** DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT WHICH IS THE WEST ONE-SIXTEENTH CORNER COMMON TO SECTIONS 28 AND 33, TOWNSHIP 5 NORTH, RANGE 10 WEST, SAID POINT BEING MARKED BY A BRASS CAP;

THENCE SOUTH 89°28'08" EAST, ALONG THE NORTH LINE OF SAID SECTION 33, A DISTANCE OF 709.73 FEET;

THENCE SOUTH 22°14'49" EAST A DISTANCE OF 288.30 FEET;

THENCE SOUTH 42°34'05" WEST A DISTANCE OF 125.07 FEET;

THENCE NORTH 72°37'01" WEST A DISTANCE OF 769.39 FEET, MORE OR LESS, TO A POINT ON THE WEST LINE OF SAID NE¼NW¼;

THENCE NORTH ALONG SAID WEST LINE A DISTANCE OF 135.66 FEET TO THE **POINT OF BEGINNING**;

THE **W½NW¼** ***LESS AND EXCEPT*** THAT PORTION THEREOF LYING WITHIN PARCEL 1 OF PARTITION PLAT NO. 1994-022 RECORDED MAY 24, 1994 IN BOOK 2 AT PAGE 27, CLATSOP COUNTY PLAT RECORDS.

EXHIBIT B

Oregon Constitution Article XV

Section 4b. Use of net proceeds from state lottery for salmon restoration and watershed and wildlife habitat protection. Moneys disbursed for the public purpose of financing the restoration and protection of wild salmonid populations, watersheds, fish and wildlife habitats and water quality from the fund established under Section 4 of this Article shall be administered by one state agency. At least 65 percent of the moneys will be used for capital expenditures. These moneys, including grants, shall be used for all of the following purposes:

(1) Watershed, fish and wildlife, and riparian and other native species, habitat conservation activities, including but not limited to planning, coordination, assessment, implementation, restoration, inventory, information management and monitoring activities.

(2) Watershed and riparian education efforts.

(3) The development and implementation of watershed and water quality enhancement plans.

(4) Entering into agreements to obtain from willing owners determinate interests in lands and waters that protect watershed resources, including but not limited to fee simple interests in land, leases of land or conservation easements.

(5) Enforcement of fish and wildlife and habitat protection laws and regulations. [Created through initiative petition filed March 11, 1998, and adopted by the people Nov. 3, 1998]

Appendix D: Bird Species Table

	Open wetland	shrub/scrub (riperian edge)	shrub/ scrub understory	Alder/ maple overstory	Mixed overstory	conifer reprod (10-20yrs)	conifer overstory (20-60yrs)	Conifer overstory (>60yrs)
Great Blue Heron	x							x
Bald Eagle								x
Sharp-shinned Hawk		x	x	x	x			x
Cooper's Hawk		x	x	x	x			x
Red-tailed Hawk	x			x				
Marble Murrelet								x
Band-tailed Pigeon				x				
Great Horned Owl								x
Barred Owl				x				x
Northern Pygmy Owl		x		x	x			x
Vaux's Swift	x							
Rufous Hummingbird		x	x					
Belted Kingfisher	x	x						
Red-breasted Sapsucker				x	x		x	x
Downy Woodpecker		x	x	x	x		x	x
Hairy Woodpecker		x	x	x	x		x	x
Northern Flicker		x	x	x	x			x
Pileated Woodpecker				x	x			x
Olive-sided Flycatcher				x	x			x
Hammond's Flycatcher					x			x
Willow Flycatcher		x	x			x		
Pacific-slope Flycatcher			x	x	x		x	x
Hutton's Vireo			x	x	x			
Warbling Vireo		x	x	x	x			
Steller's Jay			x	x	x		x	x
Gray Jay				x			x	x
American Crow					x		x	x
Common Raven								x
Purple Martin	x							
Tree Swallow	x	x		x				
Violet-green Swallow	x	x						
Barn Swallow	x							
Black-capped Chickadee		x		x	x		x	x
Chestnut-backed Chickadee		x		x	x		x	x
Bushtit		x	x	x				
Red-breasted Nuthatch				x	x		x	x
Brown Creeper				x	x		x	x
Bewick's Wren		x	x					
Winter Wren			x					
Marsh Wren	x	x						
American Dipper	x	x						
Golden-crowned Kinglet				x	x		x	x
Ruby-crowned Kinglet		x	x	x	x		x	x
Swainson's Thrush		x	x					
Hermit Thrush		x	x					
Western Bluebird	x	x	x			x		
American Robin		x	x	x	x			
Varied Thrush			x					
European Starling		x		x	x			
Cedar Waxwing		x		x	x			
Orange-crowned Warbler		x	x					
Yellow-rumped Warbler		x		x	x		x	x
Black-throated Gray Warbler		x		x	x			
Townsend's Warbler				x	x		x	x
Hermit Warbler				x	x		x	x
MacGillivray's Warbler		x	x			x		
Common Yellowthroat	x	x	x					
Wilson's Warbler		x	x					
Western Tanager		x		x	x		x	x
Spotted Towhee		x	x					
Savannah Sparrow	x	x						
Fox Sparrow		x	x			x		
Song Sparrow	x	x	x			x		
Lincoln's Sparrow	x	x						
White-crowned Sparrow		x				x		
Golden-crowned Sparrow		x	x					
Dark-eyed Junco		x	x			x		
Black-headed Grosbeak		x	x	x				
Red-winged Blackbird	x							
Brown-headed Cowbird	x	x	x					
Purple Finch		x		x	x		x	x
House Finch		x		x	x		x	x
Red Crossbill				x	x		x	x
Pine Siskin				x	x		x	x
American Goldfinch	x	x		x				
Evening Grosbeak				x	x		x	x
total potential = 74	17	45	31	40	34	7	22	33
presence confirmed = 27								
potential breeders = 67								

Appendix E

Amphibian count data and observations

Taricha granulosa (Rough-skinned Newt) - Common to abundant over most of the site, particularly in wetland/riparian zones (n = 50+).

Ambystoma gracile (Northwestern Salamander) - Found near standing water side-channels of the West Fork Ecola Creek (n = 1). A second individual was found on the State Forest land about 50 m east of the entry gate.

Ambystoma macrodactylum (Long-toed Salamander) - Found in spruce wetland area near the creek that drains into the large open wetland (n = 2).

Dicamptodon tenebrosus (Pacific Giant Salamander) - Not found, but probably present in larger streams with rocky substrate.

Dicamptodon copei (Cope's Giant Salamander) - Not found, most streams that were surveyed did not appear to be appropriate habitat. There may be additional habitat along the upper ridge, but presence seems unlikely.

Rhyacotriton kezeri (Columbia Torrent Salamander) - Found in the steep, rocky creeks along the road beyond the yellow gate (n = 2). Listed as sensitive in Oregon.

Ensatina eschscholtzi (Ensatina) - Not found, but probably present in drier habitats with significant woody debris on the ground.

Plethodon dunni (Dunn's Salamander) - Found in the forested areas above the spring intakes (n = 4).

Plethodon vehiculum (Western Red-backed Salamander) - Not found, but should be present in forested areas. Scarcity of large woody debris from conifers on forest floor may explain lack of detections.

Pseudacris regilla (Pacific Tree Frog, or Pacific Chorus Frog) - Not found, but should be present in wet areas.

Rana aurora (Red-legged Frog) - Found in wet areas near wetland and stream sides (n = 3). Listed as sensitive in Oregon.

APPENDIX F

RECREATIONAL USE OF THE ECOLA CREEK FOREST RESERVE

BACKGROUND

I. POLICY LIMITATIONS

The following are policy limitations on the future recreational use of the Reserve:

1. The City Council has adopted planning goals for the Reserve. The goals state that the "Ecola Creek Forest Reserve shall be managed to preserve and enhance municipal water quality, as well as the ecological integrity of the forest ecosystem and its constituent aquatic and riparian habitats." One of the specific goals for the Reserve is defined as follows:

   FOSTER COMMUNITY INVOLVEMENT WITH THE FOREST RESERVE

   Facilitate opportunities for public education, focusing on the Forest Reserve's unique ecosystem.
   Facilitate opportunities for passive recreation within the Forest Reserve that are compatible with general goals 1, 2, and 3, above. (This reference to goal 1, 2, and 3 refers to goals to protect municipal water quality, enhance forest health, and protect salmon habitat.)

2. The adopted policy framework for the Reserve provides that while recreational use of the Reserve is an objective, recreation use has a lower priority than the goals of protecting municipal water quality, enhancing forest health and protecting salmon habitat and as such any recreational use must be compatible with these other broad management goals.

3. As a condition of a grant award to assist in the purchase of the 120-acre Parcel "B", The Oregon Watershed Enhancement Board placed a conservation easement on that tract of land. The conservation easement contains a number of restrictions that are applicable to potential recreational use of the Reserve. The following are key provisions of the conservation easement:

4. *<u>Permitted Actions</u>. The Property may be used for the activities described in the Grantor's grant application, including watershed restoration activities, educational activities, and passive, low-impact recreational use such as hiking and walking trails, in a manner consistent with section 4b, Article XV of the Oregon Constitution, the Conservation Values listed in Section 3 of this Easement, and the Approved Management Plan.*

5. *<u>Prohibited Actions</u>. Except as expressly permitted in Section 5, any activity on the Property, or use of the Property, inconsistent with the purposes of this*

Conservation Easement or detrimental to the Conservation Values in Section 3 is expressly prohibited, and the Grantor agrees not to engage in or permit any such activity or use. By way of example, the following activities and uses are explicitly prohibited, except to the extent expressly permitted in the Approved Management Plan, described in Section 6, or approved in writing by Grantee, which approval shall not be unreasonably withheld:

c. Construction. All construction, improvements and/or other man-made modifications such as buildings, structures, fences, roads and parking lots are prohibited, except for:
i. Temporary fences built for the protection of trees and vegetation.
ii. Maintenance of existing roads to allow restoration, preservation, and protection of the Conservation Values identified in Section 3 of this Easement.
iii. Construction, improvements and/or man-made modifications approved in writing by Grantee, which approval shall not be unreasonably withheld.
h. Off-Road Vehicles. Except for vehicles needed to facilitate implementation of the Approved Management Plan, motorized off-road vehicles such as snowmobiles, dune buggies, all-terrain vehicles and motorcycles may not be operated on the Property. Off road bicycle trails may not be developed on the Property.
i. Firearms. No shooting of firearms, guns, rifles, for professional or recreational purposes on or from the Property is allowed.

II. EXISTING RECREATIONAL USE

- Based on limited observations, existing recreational use of the Reserve consists of walking for pleasure and exercise, bicycle riding and nature and wildlife observation, with the majority of that use consisting of walking for pleasure. This observation is supported by the results of the opinion survey which indicated that the primary use of the area was for hiking/walking and wildlife viewing/photography, with little or no use for mountain biking, hunting, or fishing.
- Oregon Department of Fish and Wildlife regulations permit limited fishing the portions of the North and West Fork of Ecola Creek located within the Reserve.
- It is not known if hunting occurs on the Reserve. No respondent to the opinion survey indicated use of the area for hunting. It is known that hunters use the Reserve as an access point to adjacent areas. No portion of the Reserve is presently posted as "No Hunting."
- The only existing improvements within the Reserve associated with recreational use consist of roads. These roads are: 1). A road that extends from the northwest corner of the Reserve to the primary spring location, a distance of approximately 2/3 mile; 2). Two short roads that extend from the northwest corner of the Reserve to the West Fork of Ecola Creek; 3). The Pacific Power transmission line right-of-way; and 4). A road across the

northeast corner of the Reserve connecting adjacent Oregon Department of Forestry lands to the north and south.

- The Pacific Power transmission line right-of-way connects to roads located on Oregon Department of Forestry and Weyerhaeuser Company forest land.

III. ACCESS AND PARKING

- There is no direct access to the Ecola Creek Forest Reserve. There is road access to the Reserve across other ownerships.
- Access to the Reserve, from the north, is by way of Elk Creek Road and a road across Oregon Department of Forestry land. This is the primary access to the Reserve.
- The access to the Reserve, from the north, is gated at the end of Elk Creek Road at the boundary of Oregon Department of Forestry land. This gate restricts vehicular use of the Reserve. The distance from the gate to the Reserve is approximately 2/3 to ¾ of a mile.
- There is vehicular parking for approximately four vehicles in an informal parking area at the end of Elk Creek Road. A portion of this parking area may be located on Cannon Beach Christian Conference Center property.
- Access to the Reserve, from the west, is from the east side of the Highway 101 right-of-way, at "East Warren Way." Access is on a private road across private property and then onto the Warren Main Line across Weyerhaeuser Company land: Spur 90 and an unnamed spur, from the Warren Main Line, enter the Reserve.
- The access to the Reserve, from the west, is gated at the Weyerhaeuser ownership at the Warren Main Line. This gate restricts vehicular use. The distance from the gate to the Reserve is approximately one- mile on either Spur 90 or an unnamed spur.
- Oregon Department of Forestry land is public land and is open to public access.
- The Weyerhaeuser Company reserves the right to restrict access to its lands at any time. Their access policy is as follows: Weyerhaeuser's timberlands are open during daylight hours to the public for non-motorized recreational use. Camping, campfires, garbage dumping, off road driving, and illegal activities are prohibited. Removal of firewood, ferns, mosses or other items found in the forest are prohibited without a permit issued by Weyerhaeuser. Public access may be discontinued without advanced notice. This may include active forestry or harvest operations areas or during periods of high fire danger. "Area Closed" signs will be posted at road access points. Some gates will be opened to hunters during the hunting season.
- Access to the Reserve, from the north, provides the only viable access to the Reserve for recreation purposes. The combination of the gate at the south-end of Elk Creek Road and the distance of the gate from the Reserve limits the recreational use of the Reserve.

ISSUES/FINDINGS/RECOMMENDATIONS

I. Recreational Use

- The Reserve is the site of the City's water treatment facility and its water sources, springs and a water intake from Ecola Creek. Given the fairly remote location of these improvements, there is a potential for conflict between public access and recreational use and the protection of the City's water system. To date, because of the limited amount of recreational use there have been limited use conflicts. However, given the potential for additional recreational use of the area, these conflicts may increase. Therefore, the City should not promote the recreational use of the Reserve.

- Given the location of the roads within the Reserve, in relationship to the water treatment plant and the springs, it is not possible to divert recreational use of the Reserve to less sensitive areas of the site.

- The road, from the terminus of Elk Creek Road, across Oregon State Forestry land, provides the only viable access to the Reserve. The location of the gate at the end of Elk Creek Road provides an effective tool for managing and controlling access to the Reserve in several ways. It prevents motorized vehicle access and it limits the number of visitors to the site, given that it is between 2/3 and 3/4 of a mile from the gate to the Reserve.

- Existing recreational use of the area consists primarily of walking for pleasure and exercise and nature and wildlife observation and enjoyment. These activities are compatible with the broader goals for the Forest Reserve of preserving and enhancing municipal water quality, the ecological integrity of the forest ecosystem and the protection and enhancement of salmon habitat. Recreational use of the Reserve should generally continue to be limited to these low impact, passive recreation activities.

- It is assumed that bicycle use within the Reserve is very limited. This is supported by the response to the opinion survey. A number of mountain bike users spoke to the importance of permitting bicycle access across the Reserve as a means of accessing the network of logging roads that are located to the east of the Reserve. The key concern with regard to permitting bike use on the road and transmission line right-of-way, which provides access to forest land, is the crossing of the West Fork of Ecola Creek. There is a concern about the potential impact of bicycle use on salmon habitat and spawning areas at the crossing point of the West Fork of Ecola Creek. In order to provide bike access to adjacent forest land and to address potential impacts of bicycle use on the Reserve and the West Fork of Ecola Creek in particular, bicycle use should be limited to the road

that crosses the West Fork of Ecola Creek and the Pacific Power transmission line right-of-way. This use should be prohibited from October to March. The desirability of the bike use corridor across the Reserve to connect to the adjacent forest land road network should be reevaluated at the first review of the management plan. Any such evaluation should include a consideration of the installation of a bridge across the West Fork of Ecola Creek.

- Recreational activities should be limited to day use.

- Motorized vehicle use should be prohibited.

- It is assumed that there is very limited equestrian use within the Reserve. Several equestrians spoke to the importance of permitting equestrian access across the Reserve as a means of accessing the network of logging roads that are located to the east of the Reserve. To minimize the impact of equestrian use on the Reserve, while permitting access to adjacent forest land, equestrian use should be limited to the access corridor described for bicycle use above. The same seasonal restrictions should also apply.

- Based on the response to the opinion survey, a very limited amount of recreational fishing occurs within the Reserve. If fishing occurs in compliance with Oregon Fish and Wildlife regulations, this limited level of use will have no adverse impact on the Reserve and as such should continue to be permitted.

- Hunting and trapping should be prohibited because these activities are not consistent with wildlife conservation goals of the Reserve.

II. Public Improvements

- Access to the Reserve, from the north, utilizing an existing road on Oregon State Forestry land provides the only viable access to the Reserve for recreation purposes.

- An informal vehicle parking area, accommodating approximately four vehicles, has developed adjacent to the gate at the end of Elk Creek Road. It appears that portions of this parking area are on property owned by the Christian Conference Center. The Christian Conference Center has stated that for the time being they have no concerns about potential encroachments of the informal parking area on their property.

- There may be an opportunity to establish a permanent vehicle parking area, on land being acquired by the North Coast Land Conservancy, located slightly north of the existing informal parking area.. At this time,

there is no need to establish a permanent parking area at that location. The need for a permanent parking area should be revaluated at the first review of the management plan.

- There are presently no recreational improvements within the Reserve. The existing recreational use of the site is centered on the road that provides access to the springs and the two short spur roads that provide access to the West Fork of Ecola Creek, north of the water treatment facility. These roads have adequate surfaces to support the existing level of recreational use. These existing roads provide access to the Reserve's unique features, the stand of older spruce trees to the south of the bridge across the West Fork of Ecola Creek, a stand of old growth cedar located on the original City watershed parcel, and physical and visual access to the West Fork of Ecola Creek. Because of the recreational access provided by the existing roads, there is not a need to develop additional trails.

- There are several abandoned logging roads on the Reserve. These should be retained to provide additional unimproved walking access to other portions of the Reserve.

- The gate at the terminus of Elk Creek Road limits the accessibility of the Reserve for persons with disabilities. A number of actions need to be taken to enhance the accessibility of the Reserve for persons with disabilities. A suitable path around the gate needs to be constructed so that disabled persons can bypass the gate. Signage at the gate needs to provide persons with disabilities information on the condition of the road, the distance to the Reserve and the Reserve's unique features. An option needs to be developed so that disabled persons wishing to have access through the gate can obtain assistance to do so.

- Dogs. It appears a significant number of persons accessing the Reserve do so in the company of a dog. There is a potential for conflicts between dogs and wildlife. Therefore, dogs should be required to be on a leash. A dog waste collection station, of the type recently developed by the City, should be installed.

- Consideration should be given to installing a bench in an area adjacent to the West Fork of Ecola Creek, in the vicinity of the final gate to the City's springs.

III. Education

- A unified entry sign, at the property boundary, should be installed to provide basic environmental interpretive information about the Reserve and information on the use rules that apply to the Reserve. A more extensive environmental interpretive sign program is not appropriate.

- Opportunities for environmental education and interpretation at the Reserve are quite high because of the diversity of forest types, and the accessibility of stream corridors and salmon habitat. However, as with recreational use, there is a potential for conflict between the use of the Reserve for environmental education and interpretation purposes and the protection of the City's water system. This potential conflict can best be addressed by having educational and interpretive activities conducted under the auspices of organized groups such as the Seaside School District, the Ecola Creek Awareness Program, the Haystack Rock Awareness Program, and the North Coast Land Conservancy.

- There is an opportunity for the City to work with groups that have an environmental education mission, such as the Ecola Creek Awareness Program, the Haystack Rock Awareness Program, and the North Coast Land Conservancy, to develop educational materials pertinent to the Reserve that could be distributed to visiting groups and the general public.

IV. Plan Update

- The recreational component of the management plan should be reviewed periodically. It is recommended that such a review occur every five to seven years.

Timber Inventory

Property of the City of Cannon Beach

Clatsop County, Oregon

Prepared for:

Rainmar Bartl
City Planner
City of Cannon Beach

Prepared by:

Barry Sims
Sims Forestry
4730 NE Davis Street
Portland, OR 97213
(503) 233-2131

December 5, 2005
Revised January 10, 2005

SIMS FORESTRY

Introduction

This report is intended as a preliminary summary of data gathered and analyzed as part of a contract with the City of Cannon Beach to develop a comprehensive forest management plan. Future work will identify key management issues, and make recommendations for specific restoration and management activities on a stand-by-stand basis for the City's ownership.

In October and November 2005, I cruised the property of the City of Cannon Beach, located off Elk Creek Road, approximately 1 mile east of the City. The property is approximately 220 acres. The City's ownership is comprised of three parcels. The original parcel is approximately 60 acres. On this parcel, I cruised for timber volumes, regeneration, snags, and down wood. In 2003, the City purchased Parcel A and Parcel B from Weyerhaeuser Company. These parcels were both cruised for timber volume and value at that time. As part of the present analysis, these parcels, which contain approximately 40 and 120 acres, respectively, were sampled for regeneration, snags and down wood.

In conducting this analysis, I have integrated data from the 2003 timber appraisals, which were conducted by Pacific Forest Consultants, with the current cruise data. Some stands (i.e., stands in Parcels A and B) were therefore cruised for timber volumes in 2003 and for the other ecological attributes in 2005. This approach required standardization of merchantability standards. No attempt was made to model growth of the stands sampled in 2003 (i.e., to reflect an additional two years of growth). However, it is my opinion that the timber volume estimates from the 2003 cruise are reasonable estimates of current growing stock. In the case of one stand (stand 4) that represents a joining of a timber stand cruised in 2003 with additional acres that were cruised in 2005, I conducted an area-based weighting exercise to develop accurate average values for key parameters.

These concerns aside, the advantage of integrating the 2003 and 2005 cruise data is obvious: it results in a single data set that reflects the total timber situation for the City's ownership.

In some cases, stand delineations have been modified slightly to reflect true stand boundaries as opposed to parcel boundaries. Thus some stands, as now defined, cross tax lot boundaries. These stand boundaries more accurately reflect current ecological conditions of the forest.

Forest inventory methods

Forest types were delineated from an orthorectified 2005 aerial photograph, then ground-truthed. Sample transect lines were laid out in a systematic fashion, and variable radius sampling was carried out at fixed intervals along the sample transects. In addition to measuring timber volumes, snags and down logs were also measured at each sample point to better understand the distribution and abundance of these important wildlife habitat

elements. Trees smaller than five inches DBH were also measured using fixed radius plots. This provides an indication of the advance regeneration currently established in the understory. Forty three sample points were taken. The data were entered into the Forest Projection and Planning System (FPS) software, and a copy of the data files is maintained at the Sims Forestry office. This software program allows for growth and yield analysis, stand visualization, and other useful functions.

Timber inventory summary

The property is presently adequately stocked from a timber management standpoint. Total sawtimber volume is 6.18 million board feet, for an average stocking over the 209.23 acres in timber production of 29.6 MBF per acre. Volumes by species are presented in Table 1.

Table 1. *Total net timber volumes by species*

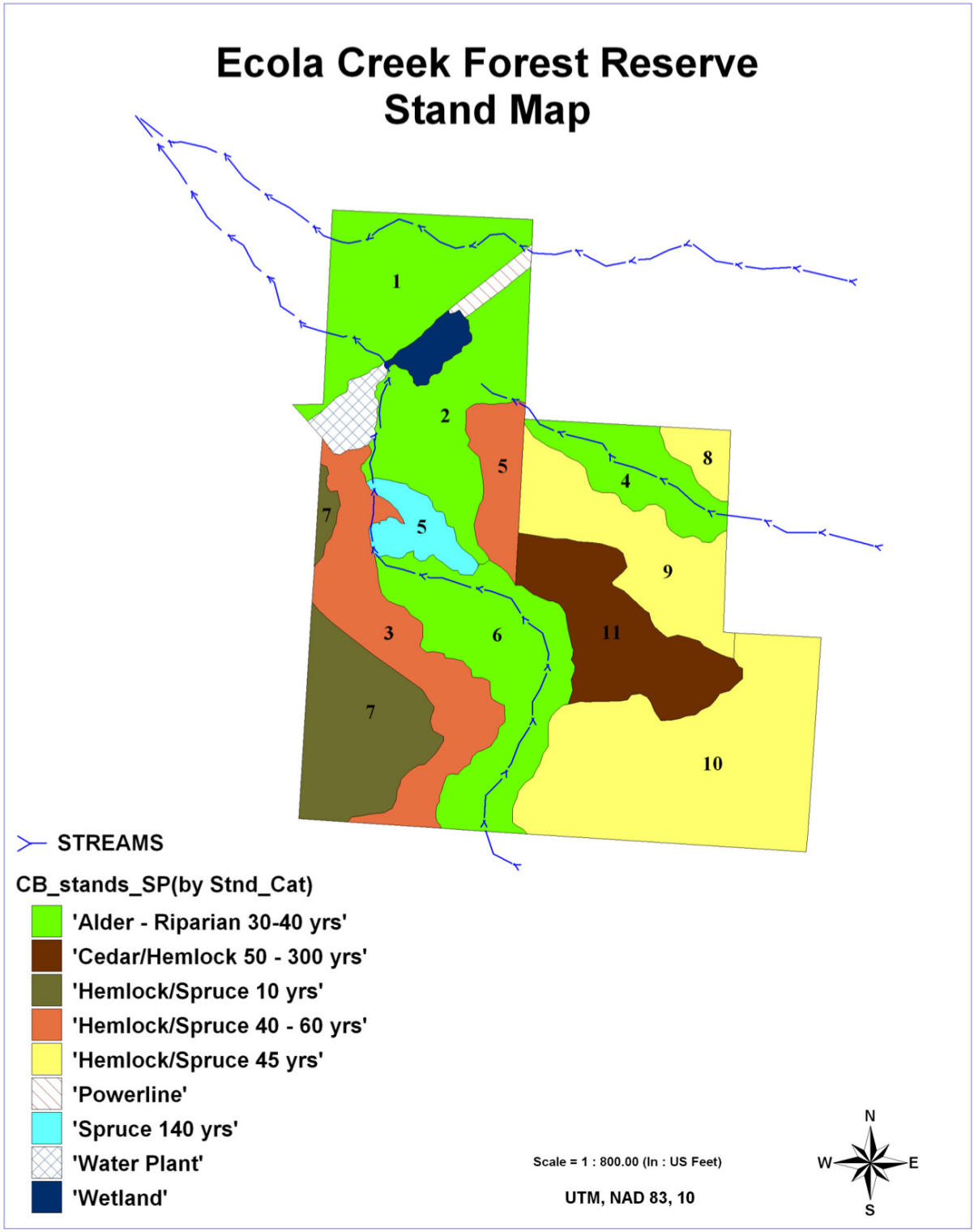
Species	**Net board feet**	**% of total**
Red alder	1,772,759	28.7%
Sitka spruce	1,476,259	23.9%
Western hemlock	2,885,206	46.7%
Western redcedar	49,493	0.8%
Total	**6,183,717**	**100.0%**

All sawtimber volumes are in west-side Scribner scale.

Stand analysis

This section contains detailed data for each of the eleven timber stands identified on the Forest Management Map. The following is a key to the data summary tables:

Area – mapped area, in acres
Soils – soil map units
Site index – site productivity class; based on height at age 100
Aspect – primary direction sloping land faces
Slope – general range of slopes found, in percentages
Access – assessment of existing or potential road access
Basal area (BA) – the cross-sectional area of all trees in a stand, measured at breast height and expressed per unit of land area
DBH – average diameter-breast-height
TPA – trees per acre
Relative density (RD) – the current timber stocking relative to the theoretical maximum stocking, expressed as a percentage.
Merch. volume – total log volumes
Net volume – total log volumes after deductions for defect and breakage, Scribner log scale


Ecola Creek Forest Reserve
Stand Map
1
2
5
8
4
7
5
9
3
6
11
7
10
STREAMS
CB_stands_SP(by Stnd_Cat)
'Alder - Riparian 30-40 yrs'
'Cedar/Hemlock 50 - 300 yrs'
'Hemlock/Spruce 10 yrs'
'Hemlock/Spruce 40 - 60 yrs'
'Hemlock/Spruce 45 yrs'
'Powerline'
'Spruce 140 yrs'
'Water Plant'
'Wetland'
Scale = 1 : 800.00 (In : US Feet)
UTM, NAD 83, 10
N
W
E
S

Stand 1	Summary data table					
Site						
Area		Soils		Site Class		
20.87 acres		Tropofluvents		NA		
Aspect		Slope		Access		
none		0-5%		Via powerline road		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	12.2	178.3	145.4	13,318	13,261	276,757
Sitka spruce	26.0	9.2	33.9	5,640	5,483	114,430
Western hemlock	13.1	11.7	10.9	1,069	1,069	22,310
Total (average)	13.2	199.2	190.2	20,027	19,813	413,497
Relative density	NA	Regeneration		RA 40 TPA, SS 20 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
1.6	30.0	52.4	10.2	5.4		

Stand 2	Summary data table					
Site						
Area		Soils		Site Class		
19.28 acres		Tropofluvents		NA		
Aspect		Slope		Access		
north		0-5%		Via main road		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	12.1	174.9	140.2	16,571	16,178	311,912
Sitka spruce	15.7	42.9	57.8	10,670	10,380	200,126
Western hemlock	14.4	45.5	51.3	6,172	5,816	112,132
Total (average)	13.2	263.3	249.3	33,414	32,374	624,170
Relative density	NA	Regeneration		WH 20 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
10.2	12.0	26.2	13.0	4.8		

Stand 3	Summary data table					
Site						
Area		Soils		Site Class		
21.31 acres		Grindbrook/Ecola		II (160 for WH)		
Aspect		Slope		Access		
northeast		5-25%		Via main road and Weyco roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	12.1	74.6	59.5	5,821	5,614	119,634
Sitka spruce	18.3	50.2	91.4	16,156	15,568	331,754
Western hemlock	14.4	56.5	115.5	17,613	16,836	358,775
Total (average)	16.4	181.3	266.5	39,590	38,018	810,163
Relative density	NA	Regeneration		WH 43 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
17.9	15.0	41.2	8.6	2.9		

Stand 4	Summary data table					
Site						
Area		Soils		Site Class		
10.31 acres		Klootchie		II- (155 for WH)		
Aspect		Slope		Access		
variable		10-40%		Via abandoned logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	14.1	91.8	93.5	12,581	11,042	113,843
Sitka spruce	15.3	24.2	29.0	4,744	4,502	46,416
Western hemlock	17.3	34.0	53.1	8,216	7,868	81,119
Total (average)	14.7	149.9	175.6	25,540	23,412	241,378
Relative density	65	Regeneration		WH 20 TPA, SS 20 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
15.1	14.0	21.0	7.0	0.9		

Stand 5	Summary data table					
Site						
Area		Soils		Site Class		
12.75 acres		Tropofluvents, Klootchie		II- (155 for WH)		
Aspect		Slope		Access		
north, west		0-25%		Via main access road		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	12.8	48.7	43.6	4,570	4,430	56,483
Sitka spruce	23.5	25.1	75.8	19,027	18,467	235,454
Western hemlock	20.2	75.0	166.6	32,472	31,080	396,270
Western redcedar	21.2	3.4	8.3	443	409	5,215
Total (average)	18.8	152.1	294.4	56,512	54,386	693,421
Relative density	NA	Regeneration		WH 20 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
7.0	20.0	55.1	16.1	15.1		

Stand 6	Summary data table					
Site						
Area		Soils		Site Class		
24.27 acres		Tropofluvents		NA		
Aspect		Slope		Access		
north		0-5%		Via abandoned logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	14.0	107.4	114.7	12,438	12,219	296,555
Sitka spruce	22.9	11.3	32.2	4,036	4,036	97,954
Western hemlock	10.5	17.6	10.6	527	527	12,790
Total (average)	14.6	136.3	157.4	17,001	16,782	407,299
Relative density	NA	Regeneration		SS 25 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
10.2	19.0	85.2	8.7	4.6		

Stand 7	Summary data table					
Site						
Area		Soils		Site Class		
22.25 acres		Grindbrook		II (165 for WH)		
Aspect		Slope		Access		
east		5-20%		Via Weyco logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	1.0	100.0	NA	0	0	0
Sitka spruce	2.0	200.0	NA	0	0	0
Western hemlock	2.0	300.0	NA	0	0	0
Total (average)	1.5	600.0	NA	0	0	0
Relative density	NA	Regeneration		NA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
0.0	NA	NA	NA	NA		

Stand 8	Summary data table					
Site						
Area		Soils		Site Class		
2.71 acres		Klootchie		II- (155 for WH)		
Aspect		Slope		Access		
variable		5-15%		Via abandoned logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Sitka spruce	15.0	65.7	80.0	14,186	12,773	34,615
Western hemlock	17.0	132.0	210.0	32,899	31,024	84,075
Total (average)	16.4	197.7	290.0	47,085	43,797	118,690
Relative density	81	Regeneration		WH 50 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
8.1	15.0	45.9	6.4	2.1		

Stand 9	Summary data table					
Site						
Area		Soils		Site Class		
17.39 acres		Klootchie		II- (155 for WH)		
Aspect		Slope		Access		
northwest		5-20%		Via abandoned logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	11.0	46.6	32.0	4,731	4,495	78,168
Sitka spruce	15.0	57.2	68.0	12,871	11,913	207,167
Western hemlock	15.0	154.8	184.0	28,054	26,326	457,809
Total (average)	14.2	258.6	284.0	45,657	42,734	743,144
Relative density	84	Regeneration		WH 10 TPA		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
19.3	14.0	36.7	7.3	2.1		

Stand 10	Summary data table					
Site						
Area		Soils		Site Class		
38.83 acres		Klootchie		II- (155 for WH)		
Aspect		Slope		Access		
northwest		10-50%		Via Weyco logging roads		
Timber volumes						
Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	11.3	38.4	26.7	2,670	2,657	103,171
Sitka spruce	16.1	29.8	42.2	5,234	4,934	191,587
Western hemlock	15.9	141.5	195.6	27,480	27,078	1,051,439
Western redcedar	84.4	0.1	3.9	1,001	731	28,384
Total (average)	15.3	209.8	268.3	36,384	35,400	1,374,582
Relative density	NA	Regeneration		None		
Wildlife habitat indicators						
Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre		
14.7	14.0	52.4	10.3	5.8		

Stand 11	**Summary data table**	
Site		
Area	Soils	Site Class
19.26 acres	Klootchie	II- (155 for WH)
Aspect	Slope	Access
southwest	10-50%	Via main access roads

Timber volumes

Species	DBH	TPA	BA	Merch/acre	Net/acre	Total
Red alder	15.0	3.3	4.0	489	464	8,937
Sitka spruce	48.0	0.3	4.0	1,089	870	16,756
Western hemlock	19.0	102.7	192.0	19,782	16,017	308,487
Western redcedar	54.0	0.7	12.0	2,004	1,096	21,109
Total (average)	19.1	106.0	212.0	23,364	18,447	355,289
Relative density	60	Regeneration		WH 110 TPA		

Wildlife habitat indicators

Snags/acre	Mean snag diameter	Down logs/acre	Mean log diameter	Dry tons/acre
24.4	25.0	57.7	17.1	18.4