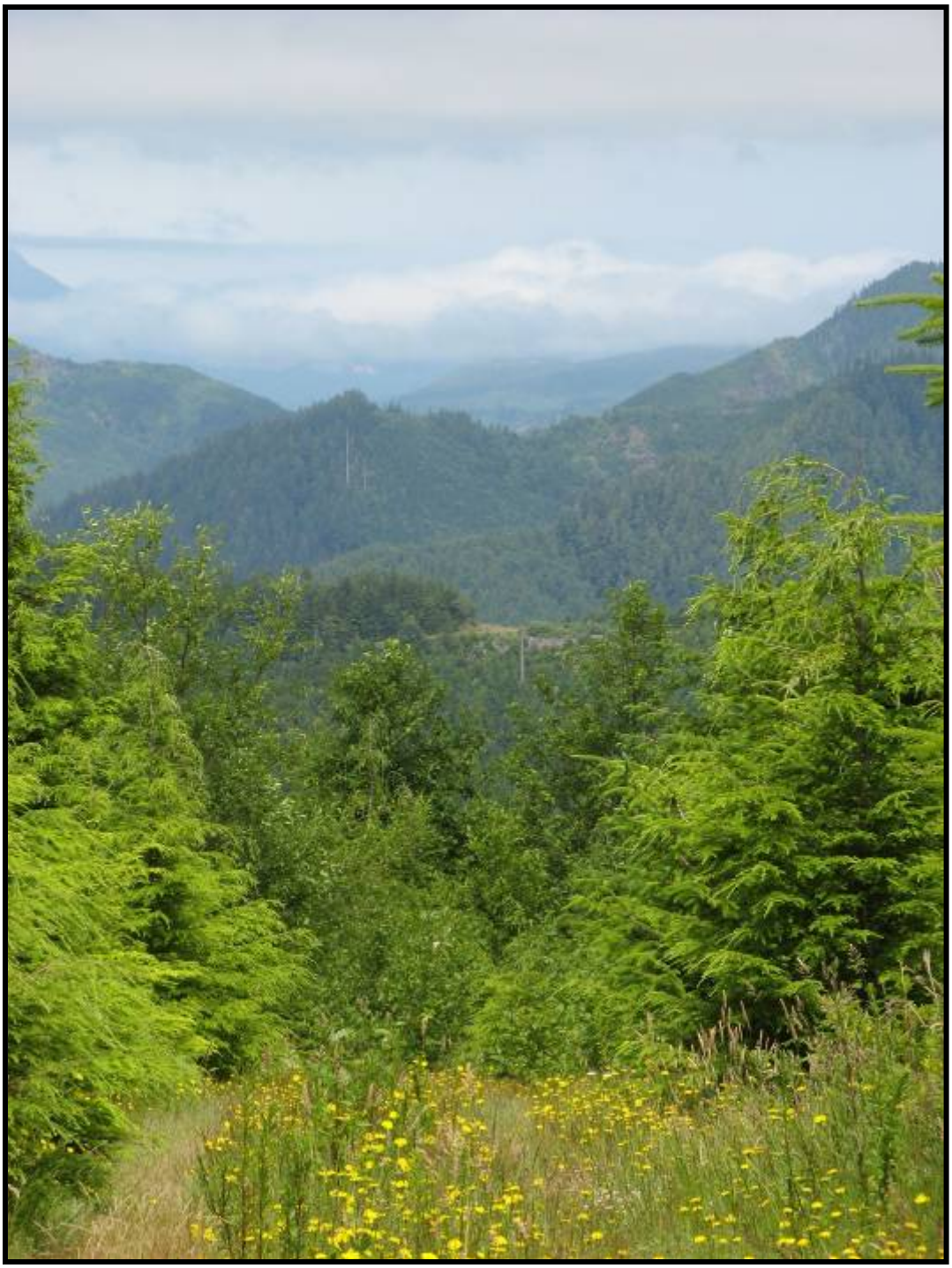
# ECOTRUST FOREST MANAGEMENT, INC.



# FOREST MANAGEMENT PLAN

FEBRUARY 2009

UPDATED AND AMENDED AUGUST 2011

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## *Tables*



## *Appendices*

## *Acronyms and Abbreviations*

| | |
|---|---|
| Atterbury | Atterbury Consultants, Inc. |
| BA | basal area per acre |
| BMPs | best management practices |
| CAL FIRE | California Department of Forestry and Fire Protection |
| CCF | crown competition factor |
| CWA | Clean Water Act |
| CWCS | Comprehensive Wildlife Conservation Strategy |
| CWD | coarse woody debris |
| Df | Douglas-fir |
| DNR | Department of Natural Resources |
| EFM | Ecotrust Forest Management, Inc |
| ESA | Endangered Species Act |
| FPS | Forest Projection and Planning System |
| FSC | Forest Stewardship Council |
| Fund | Ecotrust Forests, LLC |
| GIS | geographic information system |
| HCVF | High Conservation Value Forests |
| MBF | thousand board feet |
| NMTC | New Markets Tax Credit |
| OCS | Oregon Conservation Strategy |
| Offering Documents | Ecotrust Forest, LLC confidential offering documents |
| P&C | Principles and Criteria |
| PCT | pre-commercial thinning |
| RMZ | riparian management zone |
| RTE | rare, threatened, or endangered |
| SGCN | Species of Greatest Conservation Need |
| T/E | threatened and endangered |
| the Plan | EFM Forest Management Plan |
| THP | Timber Harvesting Plan |
| TPA | trees per acre |
| U.S. | United States |
| USFS | United States Forest Service |
| wh | western hemlock |

# Property Data Summaries

## *Dickey River Forest*

| | |
|---|---|
| Property Name: | Dickey River Forest |
| Location: | Clallam County, Washington |
| Legal Description: | T29N, R13W, in Section 7<br>T29N, R14W, in Sections 1, 12<br>T30N, R13W, in Section 31 |
| Acreage: | 1,081 acres (841 acres forested, 240 acres non-forested) |
| Acquisition Date: | December 21, 2006 |
| Prior Owner(s): | Ecotrust, Roseburg |
| Net Timber Volume at Time of Purchase: | 3.771 thousand board feet (MBF) per acre |
| Net Total Volume at Time of Purchase: | 4,077 MBF all species<br>1,688 MBF (41.1%) western hemlock<br>1,481 MBF (36.3%) Sitka spruce<br>669 MBF (16.4%) Douglas-fir<br>238 MBF (5.8%) red alder |
| Average Site Index: | 122 |
| Operability: | 100% ground-based |
| Threatened/Endangered (T/E) Species on Site: | none known |
| Nearby Conservation Lands: | Rayonier HCP, Olympic National Park |
| Easements and Other Restrictions: | Riparian Conservation Easement to State of Washington, December 14, 2006 |

## *Garibaldi Forest*

| | |
|---|---|
| Property Name: | Garibaldi Forest |
| Location: | Tillamook County, Oregon |
| Legal Description: | T1N, R9W, in Sections 6, 7, 8, 17, 18, 19, 20, 21<br>T1N, R10W, in Sections 1, 12, 13 |
| Acreage: | 4,822 acres (4,635 acres forested, 187 acres non-forested) |
| Acquisition Date: | December 29, 2006 |
| Prior Owner(s): | Forest Capital Partners, Boise Cascade |
| Net Timber Volume at Time of Purchase: | 10.053 MBF per acre |
| Net Total Volume at Time of Purchase: | 46,597 MBF all species<br>27,029 MBF (58.0%) western hemlock<br>10,142 MBF (21.8%) Douglas-fir<br>7,483 MBF (16.1%) red alder<br>939 MBF (2.2%) Sitka spruce<br>1,005 MBF (2.2%) other species |
| Average Site Index: | 113 |
| Operability: | 9% ground-based; 91% cable |
| T/E Species on Site: | none known |
| Nearby Conservation Lands: | Tillamook State Forest Reserve Area |
| Easements and Other Restrictions: | None |

## *Sixes River Forest*

| | |
|---|---|
| Property Name: | Sixes River Forest |
| Location: | Curry County, Oregon |
| Legal Description: | T32S, R14W, in Sections 7, 8, 9, 15, 16, 17, 18<br>T32S, R15W, in Sections 13, 24 |
| Acreage: | 3,190 acres (3,017 acres forested, 173 acres non-forested) |
| Acquisition Date: | June 26, 2006 |
| Prior Owner(s): | Roseburg, Westbrook |
| Net Timber Volume at Time of Purchase: | 4.984 MBF per acre |
| Net Total Volume at Time of Purchase: | 15,036 MBF all species<br>4, 905 MBF (32.6%) Douglas-fir<br>3,850 MBF (25.6%) red alder<br>5,387 MBF (35.8%) other hardwoods<br>894 MBF (5.9%) other softwoods |
| Average Site Index: | 98 |
| Operability: | 27% ground-based; 73% cable |
| T/E Species on Site: | none known |
| Nearby Conservation Lands: | Grassy Knob Wilderness Area [United States Forest Service (USFS)] |
| Easements and Other Restrictions: | Dry Creek Riparian Easement to Curry County Soil & Water Conservation District, November 26, 2002 |

## *Sooes Forest*

| | |
|---|---|
| Property Name: | Sooes Forest |
| Location: | Clallam County, Washington |
| Legal Description: | T32N, R14W, in Sections 17, 18, 19, 20<br>T32N, R15W, in Sections 13, 14, 23, 24, 25, 26 |
| Acreage: | 3,282 acres (2,763 acres forested, 519 acres non-forested) |
| Acquisition Date: | November 17, 2005 |
| Prior Owner(s): | Cascade Timber, Crown Pacific |
| Net Timber Volume at Time of Purchase: | 13,265 MBF per acre |
| Net Total Volume at Time of Purchase: | 36,646 MBF all species<br>22,300 MBF (60.9%) western hemlock<br>4,666 MBF (12.7%) Douglas-fir<br>855 MBF (2.3%) red alder<br>829 MBF (2.3%) red cedar<br>7,996 MBF (21.8%) other species |
| Average Site Index | 110 |
| Operability: | 60% ground-based; 40% cable |
| T/E Species on Site: | none known |
| Nearby Conservation Lands: | Makah Tribal Lands |
| Easements and Other Restrictions: | NRCS Wood for Wildlife, 20 acres (10-year restriction) |

# Purpose of Plan

Forests provide a wide array of products, services, and values beyond producing logs and wood fiber. These values include: (1) the ecosystem services provided by a healthy, intact forest such as carbon storage, habitat, soil formation, climate regulation, and water storage and purification; (2) community enhancement and locally based economic opportunities through job creation, raw materials for value-added production, recreation, subsistence harvesting, firewood, scenic and aesthetic values; (3) the economic contribution of timber harvest, management, and restoration activities. Ecotrust Forest Management, Inc. (EFM) manages for the long-term benefit of all three values and aims to achieve triple-bottom line–financial, ecological, and social–returns. Through demonstrating the advantages and potential for success inherent in a management approach that keeps profit creation, environmental stewardship, and community enrichment in mind, we hope to contribute to improving forest management practices throughout the region. EFM is committed to obtaining third party verification of its management activities through compliance with the Forest Stewardship Council (FSC) Principles and Criteria (P&C) and other high quality relevant third-party certification and verification systems.

The EFM Forest Management Plan (the Plan) serves the dual roles of outlining our general management objectives, while also providing more specific management directives to enable us to achieve these goals over the long term. The Plan provides a guiding document for all currently managed properties, as well as those acquired or managed in the future. Management activities described herein and employed on the ground meet or exceed all applicable state and federal regulations and comply with all applicable laws.

## *Relationship to Other Documents*

There is substantial documentation on the forestland properties managed by EFM. These documents are on file at the EFM office in Portland and are referenced in the Plan.

Timberland Appraisal Reports are prepared annually for each forest. The main purpose of these reports is to provide a yearly appraisal of the value of Fund assets to investors. The appraisal reports document land and timber value, easements, leases, and provide a detailed market value assessment. These reports also contain descriptions of deeds, legal descriptions, historic records, and background appraisal information. Reports are updated annually to account for growth, harvest, mortality, and changes in market value. Workbooks are compiled and maintained for each property; contents include detailed forest inventory, including age class and species distributions. Comprehensive geographic information system (GIS) records and other map products are maintained at the EFM office in Portland. The GIS system utilizes ESRI ArcGIS software and is managed by EFM with assistance from Ecotrust and external consultants. A five-year activity plan is maintained for each forest property to describe specific operating areas and prescribed practices. These plans provide stand-level detail and operational considerations. Harvest plans will be updated periodically, providing a rolling three- to five-year harvest schedule.

## *Framework for Growth*

EFM currently manages seven properties totaling approximately 30,000 acres. Individual aerial maps of the properties (Maps 1-8) and a property locator map of all properties under management (Map 9) are attached as Appendix B. This plan has been designed to accommodate growth without the need to create a new plan after every acquisition. Property-specific reports, maps, and other documentation will be developed for new properties as they are acquired, consistent with the principles and practices described in the Plan. Ownership wide harvest levels and harvest scheduling will be adjusted as needed.

## *Management Plan Updates and Revisions*

Within 90 days of the end of each fiscal year, the Plan will be reviewed by the staff Forester and any necessary revisions and updates will be made. Any significant changes or departures from the Plan will be approved by the CEO, and, if indicated, by the Board of Directors. In addition to the annual review, the Plan will be revised and updated every five years or upon the following events:

1. Material change in EFM's management strategies or practices (in compliance with FSC P&C).
2. Addition of new property to EFM's management.
3. Change in FSC P&C guidelines and/or requirements for certified bodies.

# Management Objectives

## *Forest Management Philosophy*

EFM believes that successful long-term management of forestlands requires the integration of economic, ecological, and social considerations. EFM's management strategy is designed to provide return on investment, while demonstrating forest management that improves the health, diversity, productivity, and ecological functions of the forests under management.

The fundamental tenets of EFM's approach to ecological forest management are:

- *Nature knows best*: Work with species that are native to the site, having evolved to be well-adapted, competitive, and disease-resistant.
- *Forest structure makes habitat*: Structural and compositional diversity provides the best habitat for the widest range of species.
- *Diversity is security*: Growing multiple species of trees greatly enhances the ability to manage forests and timber assets. Complexity and diversity provide the greatest resilience in the face of changing economic and ecological conditions.
- *Build and realize forest values beyond wood production*: Forests offer opportunities to capture value beyond the harvesting of trees. A well-managed forest has aesthetic and conservation values that the Fund believes can be captured through sales of conservation easements, carbon credits, recreational leases, and a variety of other techniques.
- *Realize the inherent value of forestlands*: Forests should be managed to maximize their inherent value and management systems should be adapted to the unique attributes of each forest.
- *Cultivate partnerships*: Seeks public input and involvement in management activities by key stakeholders, such as tribes, resource agencies, and local communities. Consult with community members, indigenous peoples, forest researchers, neighboring landowners, and wood production facilities.

## *Management Objectives*

With the above tenets in mind, EFM's core management objectives are to:

- *Provide competitive financial returns to investors/landowners, without compromising forest health:* Diversify income sources by simultaneously pursuing selective harvest strategies and alternative revenue sources, such as carbon and easement sales.
- *Retain biological legacies for future stands:* Retain clumps of trees to provide habitat and speed development of older forest characteristics.
- *Promote species diversity:* Encourage economically valuable and/or ecologically important species like western red cedar, spruce, and red alder. Promote saw log quality in native hardwoods rather than attempting to eliminate them.
- *Enhance value to local economies:* Employ local contractors and use local suppliers wherever practicable for management, research, monitoring, restoration, and other activities.
- *Involve community stakeholders when forming management plans:* Provide opportunities for public involvement and collaboration, such as periodic public tours of managed properties.

- *Manage at the landscape level:* Partner with neighboring landowners and other stakeholders to work toward landscape-scale objectives.
- *Enhance understanding of ecological forest management:* Collaborate and share information with landowner, land manager, and forest research communities, participate in workshops and conferences, and participate in research and monitoring studies.

## *Desired Future Condition*

EFMs objective is to manage forestlands in Pacific Northwest according to principles of ecological forest management. We also seek to capture a full range of values from its forestland in a manner consistent with our social and environmental purposes. Financial goals include the sale of carbon credits, conservation easements, and other financial instruments that monetize the social and ecological benefits created through EFM's management.

As such, desired conditions of managed lands include:

- Stands and forests composed of a mix of native tree species, emphasizing species that are site-adapted and of high commercial value;
- A full complement of minor tree and understory species;
- Diversity of age classes and stand structures;
- Vigorous stands, density controlled to enhance timber quality and growth rates;
- Invasive species, if present, at low and controlled levels.

# Planning Process

## *Forest Management Plan*

The Plan provides a unified guide for all EFM-managed lands, outlines the EFM management philosophy, and details management methods to be used. It consolidates information from other planning documents and sets policy direction. It is reviewed regularly and updated as needed to address changes in management structure or philosophy.

Data included in the Plan is taken from the best sources available at the time of authoring, and may contain inaccuracies and omissions. To enable management to make the best decisions possible, data will be ground-truthed whenever practicable by staff foresters and/or consultants, and the Plan will be updated periodically as detailed above.

## *Harvest Plan*

Planning will be completed annually for each forest and will be incorporated into more general activity plans. Plans will be map-based documents with associated operations schedules. Harvest plans are based on meeting annual cash targets and long-term financial return targets, improving forest health and structure, retaining unique or sensitive species, and providing stable employment opportunities for local residents. Our plans maintain flexibility to be opportunistic to changing market conditions and to have sufficient liquidity to meet cash needs. Annual plans will be incorporated into five-year harvest plans, which will be updated periodically.

## *Public Involvement*

The Fund has established stakeholder advisor groups for each property to advise EFM on operations and community relations. A list of current advisors is attached as Appendix C.

As detailed below (*Socioeconomic Context*), EFM will hold a public tour of one or more of its managed properties at least once every two years. This tour will present an opportunity for local stakeholders to review and comment on management procedures. Additionally, EFM will maintain a file of public comments and suggestions regarding managed properties. Whenever the Plan is updated and revised, this public comments summary will be reviewed and incorporated into the Plan where relevant.

# Setting

## *Historic Context*

All forestland under management was previously managed as industrial tree farms. The current forests contain second- or third-growth stands following initial harvests in the early- to mid-1900s. Prior to the period of western settlement, these forests were within the home range of Northwest Coast Native American tribes, including the Makah, Clallam, Quilleute, Coquille, and lower Rogue River tribes, as well as the Confederated Tribes of the Grand Ronde and the Confederated tribes of the Coos, Lower Umpqua, and Siuslaw Indians.

Existing stands are a legacy of previous industrial timber management practices. Many stands are single species, even-aged plantations, planted to be dominated by Douglas-fir but with a substantial component of western hemlock, Sitka spruce, and red alder. There is very little mature or old-growth timber across EFM-managed lands.

**Table 1. Acquisition History**

| Forest | Location | Acreage | Acquired | Past owners |
|---|---|---|---|---|
| Dickey River | Clallam County, WA | 1,144 acres | 12/2006 | Ecotrust, Scott Timber Co. (Roseburg) |
| Sooes | Clallam County, WA | 3,283 acres | 11/2005 | Cascade Timber, Crown Pacific |
| Sixes River | Curry County, OR | 3,189 acres | 06/2006 | Roseburg, Westbrook |
| Garibaldi | Tillamook County, OR | 4,823 acres | 12/2006 | Forest Capital Partners, Boise Cascade |
| Wasson Creek | Douglas County, OR | 2,481 acres | 07/2013 | Roseburg Forest Products |
| 3 Mile/5Mile | Coos County, OR | 150 acres/125 acres | 07/2013 | Roseburg Forest Products |
| Mt. Walker | Jefferson County, WA | 1,481 acres | 12/2013 | Rayonier, Pope Resources |
| Desolation Creek | Grant County, OR | 13,440 acres | 04/14 | Boise Cascade, Hood River County |
| **Total** | | **28,635** | | |

## *Socioeconomic Context*

Prior to the late 1900s, timber was the dominant industry in the Pacific Northwest. In numerous communities throughout the region, this industry was of key importance in providing employment, especially family-wage jobs. Shrinking and consolidation of the timber industry through the 1980s and 1990s, decline in harvesting from federal lands, and increased mechanization has resulted in significant job loss, leading to economic and social stress throughout the Pacific Northwest. The number of mills in the region has shrunk, though mill capacity has remained more or less steady due to construction of larger mills, primarily along the Interstate-5 corridor. Many logs now travel farther to market, often to Roseburg

or destinations in the Puget Sound and Willamette Valley areas. The reduction in mills capable of handling and sawing larger logs is an important management consideration as rotation ages are extended. Many mills in the region do not have the capacity to process larger diameter logs.

There is a strong need for local family-wage and professional jobs throughout the region. EFM's social goals are to create opportunities and value for local communities. By seeking to generate a steady and predictable flow of wood products from EFM-managed lands, EFM anticipates its activities will maintain a local network of forest-related contractors and enterprises. In addition to contracting locally, EFM is committed to employing underrepresented and/or disadvantaged populations whenever possible.

## Community Stakeholders

EFM strives to keep neighbors and other community stakeholders informed of management activities with potential environmental, aesthetic, and safety impacts to the surrounding community. Stakeholder contact is maintained through public property tours, property-specific stakeholder committees, and sign postings during operations. Additional steps are taken to provide the general public with opportunities to comment on EFM management activities through the public comment form, by email, and by phone.

***Stakeholder Advisors***

EFM strives to promote stakeholder involvement in its management planning. For each property under management, EFM assembles a group of stakeholder advisors made up of neighboring landowners and other interested parties. Management will contact each stakeholder advisor group at least once a year to inform stakeholders of planned management activities, including harvests, road construction and maintenance, restoration activities, research and monitoring, and other operations. A list of stakeholder advisors for all currently managed properties is available in Appendix C. The stakeholder advisors were selected to represent a sample of tribal, neighboring landowners, conservation districts and resource experts for each FMU. Additionally, all neighboring landowners and entities with tenure/use rights on EFM ownership will be contacted during the harvest planning phase.

***Sign Postings***

Permanent signs for recreational users are posted at the gate of each managed property. An example can be seen in Appendix D. During operations, additional temporary signs are posted advising recreational users and neighboring landowners of current activities and any safety issues (such as logging trucks in use). Detailed EFM safety policies are attached as Appendix E.

***Public Comments***

Management maintains a file of public comments and suggestions. A public comment form (Appendix F) is provided to those wishing to comment on management strategies or other issues concerning EFM-managed properties. EFM office staff and foresters have access to the comment form and the ability to distribute it as necessary. The EFM website contains a version of the public comment form that can be completed online. Additionally, EFM has designated a phone line for general and property-related inquiries, 503-227-6225, extension 110. The voicemail for the line is monitored by the EFM Office Manager. EFM will respond to all comments within 14 days.

***Local Contractors***

EFM strives to employ local contractors for operations on managed properties. EFM compiles annual information on the composition of contractors/consultants who work on managed properties. Please refer to Appendix G for an example of this report. The Forester will make best efforts to address the following factors, where available and when not in conflict with any employment and contract laws or regulations:

- Number of contractors working on property during the year, and days/hours worked
- Gender composition of contractors
- Ethnic and racial composition of contractors
- Address of contractors (local community or other)

### New Properties

When a new property is added to those currently under management, EFM will complete the following tasks within 12 months of acquisition:

- Research and collect all known and readily available datasets applicable for property
- Identify relevant community stakeholders and:
  - Introduce EFM and its management strategies.
  - Discuss the community significance of the property under management and obtain information on any specific sites of cultural, historical, or community significance, to be incorporated into the EFM database.
  - Invite community members to provide comments and concerns, and introduce them to EFM's procedures for doing so (detailed above).
- Form stakeholder committee for new property.

## *Landscape Context*

The landscapes surrounding these forests are typically large blocks of undeveloped forestland where industrial tree farms are the dominant land use. To further ecological program goals at the landscape level, we purposely select forestlands that are proximate to public or other conservation-oriented resource lands managed for long-term ownership. For example, the Garibaldi Forest abuts Tillamook State Forest, the Sixes River Forest abuts the Grassy Knob Wilderness Area of the Rogue River National Forest, the Sooes and Dickey River Forests are near Makah tribal lands, Department of Natural Resources (DNR) lands, and the Olympic National Park.

Forestlands typically include headwater streams and principal tributaries of larger waterways. These waters frequently contain key spawning and rearing habitats for anadromous fish. The surrounding landscape often includes endangered or sensitive species habitats, including that of eagles, northern spotted owl, marbled murrelets, and Pacific salmon.

## *Legal Context*

### Federal Rules

All lands currently under management are located in the United States and are subject to U.S. federal environmental laws and regulations. The most pertinent of these is the Endangered Species Act (ESA), which provides a framework for protection and recovery of critical wildlife species. Species protected under the ESA that may occur on EFM-managed forestlands include northern spotted owl, marbled murrelet, and various runs of coho and Chinook salmon. The bald eagle has been delisted from the Federal List of Endangered Wildlife and Plants but still has specific protections under the The Bald and Golden Eagle Protection Act.

Other federal laws that may be pertinent include the Clean Water Act (CWA), administered by the U.S. Environmental Protection Agency, particularly as it relates to non-point source pollution to streams, which can occur when logging-associated sediment is delivered to streams or when roads and culverts are not property maintained.

## State Rules

All forestlands under management are presently located in Oregon and Washington, but since new acquisitions are contemplated in California, all three west coast states shall be addressed here. The rules are complex and technical for each state; therefore, only brief overviews are presented here.

***Oregon***
Private forestland management in Oregon is subject to the Oregon Forest Practices Act, which is administered by the Oregon Department of Forestry. Particular requirements that are most relevant to EFM's management strategy are reforestation standards, stream buffers, and notification/permitting. In Oregon, a fairly simple notification of intent to harvest timber is required. Timber harvests near streams may require an additional written operations plan.

***Washington***
Private forestry is regulated by the Washington DNR, which administers the state's Forest Practices Rules and is also responsible for implementing the State Environmental Policy Act. Washington also passed the *Forests and Fish* agreement in 1999, which places additional rules on harvesting near streams to ensure compliance with the federal ESA and CWA. The notification process is similar to Oregon's, but additional written documents may be necessary to secure a permit to harvest, including documentation of stream buffer widths and road construction/abandonment plans.

***California***
The California Department of Forestry and Fire Protection (CAL FIRE) enforces the laws that regulate logging on privately owned lands in California. These laws include the Forest Practices Act and additional rules enacted by the State Board of Forestry and Fire Protection. Prior to harvesting, a Timber Harvesting Plan (THP) must be submitted to CAL FIRE for approval. The THP provides a comprehensive environmental review of the proposed harvest activities and must be prepared by a Registered Professional Forester. THPs can range from about 100 pages to more than 500 pages. These additional documentation, agency review, and professional licensing requirements make forest harvest planning more complex and time-consuming in California.

## FSC Principles & Criteria

EFM manages member properties in accordance with FSC U.S. standards and policies. If, at any time, a federal or state regulation is found to be in conflict with a requirement of either the FSC U.S. or general FSC group certification criteria, management will consult with its certifier, Scientific Certification Systems. Such consultation will occur within 30 days of the time that the conflict comes to the attention of EFM staff.

EFM will notify SCS Global Services, our third-party FSC-certifying body, of significant changes in ownership within 90 days of the closing date.

## Boundary Lines

Property boundaries of the Fund's current forestlands are occasionally marked. Boundary lines adjacent to federal or state lands are often marked, although blazed lines may be old and difficult to follow. Many boundaries are evident where recent cutting has occurred on abutting lands. When conducting

management activities in the vicinity of indistinct boundary lines, boundaries will be established and marked either by legal survey or by mutual agreement (cutting line agreement) with the adjacent property owner.

## Dispute Resolution

EFM has established procedures to address concerns raised by loggers, consulting foresters, employees, the public and other program participants regarding practices that appear inconsistent with the FSC standards and policies, tenure claims, and use rights.

EFM helps to develop and implement appropriate methods to address concerns about apparent non-conforming practices. In Oregon these methods include cooperation with Oregon Department of Forestry that has regulatory authority over forestry practices and the implementation of Best Management Practices (BMPs) on forestlands, to provide a workable system for the public to express concerns. EFM supports similar efforts with the Washington DNR.

Internally, EFM has a process for receiving and responding to public inquiries, particularly those that potentially relate to practices that appear to be inconsistent with the FSC standards and policies. If a phone call or other public inquiry comes to EFM, the message will be forwarded to the appropriate Forester. The Forester will follow up with the entity or individual(s) making the inquiry if the activity occurred on EFM lands. If the operation or activity is located on lands other than those managed by EFM, the Forester can offer other contact assistance.

If the inquirer is not satisfied with the resolution of the EFM contact, EFM will proceed according to the established FSC Dispute Resolution System (FSC-STD-01-005 (V1-0) (Appendix H). EFM is committed to handling disputes in the most effective and appropriate manner possible.

## Chain of Custody

EFM has developed and implemented a Chain of Custody policy and procedure. This policy applies to the transportation, delivery, and receipt of products sold by EFM and serves as its document control system. Please refer to Appendix I for the policy surrounding Chain of Custody.

# Resource Conditions

## *Soils*

The Pacific Coast region consists of steep, forested mountains drained by streams and rivers flowing to the Pacific Ocean. The rich and fertile soils, combined with abundant rainfall and a long growing season, create some of the most productive timber growing sites in the world.

Numerous soil types are found across the region, varying widely in texture, natural drainage, and other characteristics. Soils formed in mountainous areas are typically deep. Those formed on moderate to steep slopes have a loamy texture and are sometimes rocky. Soils formed in alluvial valleys are typically deep, somewhat poorly drained and are loamy to fine-textured. Soils formed along Pacific marine terraces are deep, excessively to poorly drained, and sandy to fine-textured.

**Table 2. Soil Properties by Forest**

| Forest | Annual precip. | Most common soil type | Texture | Depth | Site index | Parent material |
|---|---|---|---|---|---|---|
| Dickey River | 100” | Klahowya | silt loam | 60” | 87-113 (wh) | glacial till |
| Garibaldi | 80-110” | Necanicum-Ascar-Klootchie complex | gravelly loam | 20-40” | 83-116 (Df) | weathered basalt |
| Sixes River | 90-130” | Digger-Umpcoos-Dystrocrepts complex | very gravelly loam | 20-40” | 52-83 (Df) | metasedimentary |
| Sooes | 120” | Makah | gravelly loam | 60” | 96 (wh) | weathered basalt |
| Wasson Creek | 70-110” | Damewood-Bohannon-Umpcoos complex | very gravelly loam | 20-40” | 118 (Df) | sandstone |
| 3 Mile | 70-80” | Salander silt loam | Silt loam | > 80” | 127 (Df) | Colluvium and residuum derived from sandstone and siltstone |
| 5 Mile | 70-90” | Bragton muck | Muck | > 80” | N/A | Decomposed fibrous organic material over sandy or silty alluvium |
| Mt. Walker | 70” | Ahl very gravelly loam | Very gravelly loam | 24-40” | 105 (Df) | Colluvium and residuum from basalt |
| Desolation Creek | 19” | Data unavailable | Data unavailable | Data unavailable | Data unavailable | Data unavailable |
| wh = western hemlock, Df = Douglas-fir | | | | | | |

Soil properties can create a range of management limitations. Fine-textured soils are easily compacted by equipment when wet. Competition from vegetation may be severe on rich soils. Seedling mortality can be high in shallow, gravelly, and dry soils, and on southern and western exposures. Erosion can be a hazard on steep slopes and with fine-textured soils. Landslide potential and suitability for road construction are also influenced by soils. Soil properties are considered in management plans and silvicultural prescriptions. Maps of soil types (Maps 6-9) and site productivity (Maps 10-14) are included in Appendix B.

## *Timber*

The Pacific Northwest is renowned for magnificent native conifer forests. Extensive stands of old-growth forest once blanketed much of the region. Native forests are known for their natural diversity of tree species: Douglas-fir, Sitka spruce, western hemlock, western red cedar, red alder, bigleaf maple, and a host of other minor species depending on site, from black cottonwood to madrone and myrtle.

Current stands are second- or third-growth forests, both planted and naturally regenerated. Most stands are even-aged, with stumps and some downed logs as the only legacies of the original stands. Industrial tree farm management previously harvested all standing timber, including culls, and planted dense single-species stands. Natural regeneration, especially of hemlock, alder, and spruce, enriches many plantings.

Most stands under management are immature. A diversity of age classes is present in the forests, but the majority of trees are pre-merchantable from 21 to 35 years old. There is very little timber over 50 years old. A balanced age class distribution is desired for even income flow. In the process of converting these stands to a more structured forest, we will be entering commercial size stands and harvesting with a combination of variable retention harvests, patch cuts and thinning. Age class maps (Maps 15-18) can be found in Appendix B.

**Table 3. Age Class by Forest (in Net acres) (2014)**

| | Reproduction: 0-15 yrs | Pre-merch.: 16-35 yrs | Merchantable: 36-45 yrs | Mature: > 46 yrs | **Total** | **Percent** |
|---|---|---|---|---|---|---|
| **Dickey River** | | | | | | |
| **Garibaldi** | | | | | | |
| **Sixes River** | | | | | | |
| **Sooes** | | | | | | |
| **Wasson Creek** | | PENDING UPDATES | | | | |
| **3 Mile** | | | | | | |
| **5 Mile** | | | | | | |
| **Mt. Walker** | | | | | | |
| **Desolation Creek** | | | | | | |

Most stands are fully stocked with good growth rates. A mix of species is present, either within or between stands. Many management opportunities exist, often with multiple silvicultural options including Variable Density Thinning (VDT), patch cuts and Variable Retention Harvest (VRH). Multiple markets for all species on the forestlands are located near each forest, including a combination of sawmills, veneer plants, pulp mills, and export facilities. All forests have well-established, all-weather road networks.

The most recent annual appraisal reports for each property provide detailed stand data and analysis of species and age class composition, timber volumes, and quality.

## *Vegetation*

In the Pacific Northwest, native forests west of the Cascade Mountains are among the most productive in the world, characterized by large trees, substantial woody debris, luxuriant growth of mosses and lichens, and abundant understory vegetation. Native plant communities endemic to their sites dominate most forest stands. Past management has created landscapes dominated by young plantations, and there is a general lack of early successional "pre-forest" communities. In some areas, lush undergrowth provides opportunities for collection of non-timber forest products, such as floral greens, mushrooms, and medicinals. In other areas, young stands with a dense overstory create heavy shade, precluding most or all understory plants. Few invasive species are present, with the exception of small concentrations found around some roadsides and old log landings.

There are no known populations of species of concern or T/E plant species within Fund ownership, although there are some known incidences of these species on adjacent properties. Most forests are young-planted or natural stands, but there are special features on each property that may support uncommon plant communities. These include escarpments, rock faces, floodplains, and depressions. Such sites will be surveyed for uncommon plant and animal species before commencing activities in nearby stands.

## *Water Resources*

West of the Cascade Mountains, high rainfall and mountainous terrain create a dense network of streams and rivers, many of which drain directly to the Pacific Ocean. The region is renowned for pristine streams and high-quality water. The quality of water resources directly influences fish habitat quality and fish populations. There are currently no domestic surface water sources on the Fund's ownership, although the Moss Creek watershed on the Garibaldi property provides water to the City of Garibaldi through a well near the confluence of Moss Creek with the Miami River. Given the proximity of the well to Moss Creek and other factors it is likely that forest management practices in the Moss Creek watershed have potential impacts on water provision and quality to the City of Garibaldi and we are incorporating this feature into our management plans

The Federal Environmental Protection Agency identifies streams not meeting water quality standards of the Clean Water Act, known as the 303(d) List. The only listed water quality-impaired streams on or near Fund ownership are the Sixes River (adjacent to the Sixes River Forest), and the Miami and Kilchis Rivers (immediately downstream from the Garibaldi Forest).

Past road building and harvesting practices have impacted water resources in numerous locations throughout the region. Such conditions are present to a limited degree throughout Fund ownership. Poor road placement and inadequate maintenance can lead to landslides and surface erosion. Inadequate maintenance and natural aging of culverts can lead to failure and road washouts. Inadequate ditching or cross drains can lead to surface erosion and altered stream flow dynamics.

A road and stream crossing assessment is performed initially upon property acquisition. Locations where roads negatively impact water resources are targeted for immediate maintenance, reconstruction, or retirement. EFM actively pursues partnerships with watershed councils, both for technical expertise during assessment and project planning, and as a source of cost-share grants. In Washington, sale of riparian easements to protect water resources will be executed wherever advantageous.

## *Fish Habitat*

Forests are chosen for their fisheries values and high-quality salmonid production and rearing areas. The Sixes, Miami, and Kilchis Rivers have been identified as being in critical fish-rearing watersheds by a multitude of watershed assessments. There are also numerous fish-bearing streams located on EFM-managed lands that support Oregon Coastal Coho salmon, listed by the ESA as a Threatened Species in 2008. Some tributary streams have not been surveyed for fish presence. Survey records are being expanded as surveys are completed during planning for nearby operations. Fish habitat improvement is a key management priority. Fish passage barriers are being removed and roads maintained or retired. Partnerships and cost sharing are actively pursued. In Washington, conservation easements are being sold on suitable riparian areas.

States use different stream classification conventions for forest regulations. Oregon classifies streams as either fish-bearing (Type-F) or non-fish-bearing (Type-N). Recent changes in these regulations have reclassified numerous small Type-N streams as Type-F, although few of these have been ground-truthed. Washington classifies streams as either fish-bearing (Type-S or Type-F) or non-fish-bearing (Type-Np [perennial] or Type-Ns [seasonal]). The California Forest Practices Act classifies waters into four groups (Class I, II, III and IV) based on key beneficial uses, aquatic habitats, and potential for resource impacts.

**Table 4. Fish-Bearing Streams, Oregon**

| Forest | Large Type-F | Medium Type-F | Small Type-F | Species present |
|---|---|---|---|---|
| Garibaldi | Moss Creek | Waldron Creek, Kiger Creek, Stuart Creek | Several unnamed tributaries incl. off Kilchis River | winter steelhead, coho (lower reaches); cutthroat (upper) |
| Sixes River | Sixes River, Dry Creek | Little Dry Creek, unnamed Dry Creek trib. (section 18) | Several unnamed tributaries | winter steelhead, coho, Fall Chinook |
| Wasson Creek | Smith River, Wasson Creek | Perkins Creek | Several unnamed tributaries | winter steelhead, coho, Fall Chinook |
| 5 Mile | 5 Mile Creek | None | Several unnamed tributaries | winter steelhead, coho |
| 3 Mile | None | Three Mile Creek | Several unnamed tributaries | winter steelhead, coho |
| Desolation Creek | Desolation Creek | Kelsay Creek | Park Creek, Starveout Creek, several unnamed tributaries | winter steelhead, bull trout |

**Table 5. Fish-Bearing Streams, Washington**

| Forest | Type-S | Type-F | Type- Np, Ns | Species Present |
|---|---|---|---|---|
| Dickey River | East Fork Dickey River | Unnamed tributaries | Unnamed tribs. | Fall Chinook, coho, winter steelhead, chum |
| Sooes | Sooes River<br>North Fork Sekiu River | Unnamed Sekiu & Sooes tributaries | Unnamed tributaries | Fall Chinook, coho, winter steelhead, chum |
| Mt. Walker | None | Spencer Creek | Unnamed tributaries | winter steelhead, coho |

**Table 6. Stream Classification, California**

| Class I | Class II | Class III | Class IV |
|---|---|---|---|
| Fish present; includes migrating and spawning habitat | Fish present within 1000 feet downstream; aquatic habitat present | Natural watercourses lacking aquatic life | Manmade watercourses |

EFM is has developed stream classification conventions for all managed properties, based on the state-specific classifications listed above. These classifications are described in more detail in *Forest Protection, Stream and Water Quality Protection* (page 37). EFM has mapped riparian reserves on all properties. The attached maps (Appendix B) display EFM-designated riparian buffers as compared with Oregon and Washington Forest Practice Regulations. Under EFM management, an additional 9% of riparian area is protected.

## *Wildlife Habitat*

A wide variety of animal species exists, from elk, deer, black bear, and cougar, to amphibians and invertebrates. The Plan is designed to foster biodiversity and enhance wildlife populations. Wildlife habitats are being enhanced by small gap creation and retention of snags, character trees, den/nest trees, mast producers, and woody debris.

## Oregon

The Oregon Department of Fish and Wildlife has developed the Oregon Conservation Strategy (OCS) as a framework for identifying, conserving, and restoring a broad range of wildlife habitats. It seeks to enhance wildlife by protecting broad ecosystems and ecological processes, and prioritizing protection and restoration efforts. Voluntary coordination between private landowners and federal and state agencies is encouraged.

Of the eight habitats defined by OCS in the Coast Range ecosystem, four are present on EFM-managed lands: Late Successional Conifer Forest, Riparian, Wetland, and Freshwater Aquatic. Over 378 vertebrate species are found in this ecosystem, with approximately 30 Strategy Species likely found in forested habitats.

Based on existing plans and spatial analysis, the OCS identifies Conservation Opportunity Areas. The Garibaldi and Sixes River Forests both fall within identified high-priority locations. Recommended actions include:

- Restore aquatic complexity (add woody debris, improve fish passage)
- Maintain water quality (prevent erosion)
- Prevent invasive species (prevention, monitoring, early detection/quick control)

## Washington

Washington's Comprehensive Wildlife Conservation Strategy (CWCS) has a similar ecosystem-based framework and emphasis on biodiversity conservation. Its assessment lists 193 Species of Greatest Conservation Need (SGCN), identifies 20 Priority Habitats, and identifies conservation challenges and opportunities. EFM-managed lands contain two Priority One Habitats: Westside Lowland Conifer-Hardwood (Mature) Forest and Westside Riparian-Wetlands. At least 10 SGCN species could be found and/or with restoration could be supported on lands managed by EFM, including northern spotted owl, marbled murrelet, bald eagle, fisher, Keen's myotis, Van Dyke's salamander, and others.

Within the Pacific Coast ecoregion, clear-cut logging, road building, invasive species, and the fragmentation of natural habitats by commercial plantations are considered the most pressing conservation problems. EFM's management approach is consistent with minimizing these impacts and restoring ecosystem function. The CWCS assigns Conservation Utility Scores to reflect biodiversity values of a particular watershed and its utility for conservation. The watersheds containing the Dickey River Forest scored in the 70$^{th}$ percentile (high suitability for conservation), while those containing the Sooes Forest scored in the 30$^{th}$ percentile (lower suitability).

Washington CWCS recommended conservation actions include:

- Conserve and recover SGCN species
- Protect, restore, and connect habitats
- Improve forest management practices (extend rotations, create late-successional structure, retain snags and down wood, increase stream buffers)
- Control invasive species

## *Threatened and Endangered Species*

Several uncommon species protected under the ESA occur across the region. Most notable are the northern spotted owl, marbled murrelet, various runs of coho and Chinook salmon (all listed as federal and state-threatened), and bald eagles (listed as species of special concern in Oregon and Washington and as endangered in California). On the Sixes River and Garibaldi Forests, riparian forests associated with known fish-bearing streams have been designated as High Conservation Value Forest in order to protect critical habitat for threatened Oregon Coast Coho Salmon populations.

No known spotted owl, murrelet, or eagle nest sites are located on Fund ownership. Young plantations and naturally reseeded stands dominate most properties. As such, potential upland T/E habitat is limited to scattered occurrences of generally unexceptional quality. Screenings conducted by Washington DNR found no suitable murrelet or owl habitat in previous harvest areas.

Several T/E species sites are located nearby on adjacent lands. Some of these occurrences are close enough to impact management activities on EFM-managed lands, although most are several miles away.

While such occurrences are often beyond the distance that legally impacts EFM operations, they nevertheless present opportunities to participate in recovery of these species through complementary management. When practical, management will actively pursue such opportunities.

State wildlife biologists will be consulted during the planning of operations to ensure up-to-date inventories of rare species locations, and to ensure that management activities are consistent with habitat protection and restoration at the landscape level.

**Table 7. Threatened and Endangered Species**

| Forest | Located on site | On abutting property | In nearby landscape |
|---|---|---|---|
| Dickey River | none | Marbled murrelet habitat on adjacent state land. | Marbled murrelet habitat on various state lands in area. |
| Garibaldi | Oregon Coast Coho Salmon | Marbled murrelet habitat on adjacent state land. | Previous spotted owl 2 miles West. |
| Sixes River | Oregon Coast Coho Salmon | Bald eagle on USFS ownership, section 24, use of "jake" brakes forbidden within 0.5 mile; Spotted owl in section 17 (Bureau of Land Management), 0.25 mile circle impacts a portion of section 8 . | Murrelet activity centers 3 miles East, 3 miles Southeast. |
| Sooes | none | Eagle nest within 0.5 mile in section 26 . | Murrelet habitat on various state lands in area. |
| Wasson Creek | Oregon Coast Coho Salmon | Marbled murrelet/northern spotted owl habitat on adjacent federal land. | Marbled murrelet/northern spotted owl habitat on adjacent federal land. |
| Mt. Walker | none | Marbled murrelet/northern spotted owl habitat on adjacent state/federal land. | Marbled murrelet/northern spotted owl habitat on adjacent state/federal land. |
| Desolation Creek | Bull Trout | Bull trout habitat on adjacent private and federal lands. | Bull trout habitat on adjacent private and federal lands. |

## *Archeological/Cultural Resources*

For the purposes of this plan, cultural resources are broadly defined as historic sites, traditional places, traditional materials and archaeological resources of cultural value. Cultural resources may be of Native American origin (prehistoric) or post-European settlement (historic). Generally speaking, if a site or artifact is more than 50 years old, it is to be considered a cultural resource.

Prior to the period of western settlement, Fund forests comprised a portion of the home range of various Northwest Coast Native American tribes, including the Makah, Clallam, Quilleute, Tillamook, Coos, and Lower Rogue River tribes. No tribal settlement areas are known to exist within the ownership.

Some historic evidence remains from the early logging period (early- to mid-twentieth century). The primary evidence is of early logging access infrastructure, including railroad beds, steam donkey landings, cat logging trails, and early log puncheons and culverts. No evidence of early logging camps or mill sites is known to exist within the ownership.

Screening for archeological and cultural resources will be conducted as part of the timber sale planning process. During the planning process, historic topographic maps and historic GLO maps are consulted to determine if there may be any known sites of interest previously recorded. Once the harvest area is defined, the appropriate Cultural Resources contact from all interested tribes will be contacted and given the opportunity to provide historical context or local knowledge that may affect operational design. Field foresters conducting unit layout are trained to recognize culturally significant sites and will document the location of cultural resources with GPS. If cultural resources are identified on the ground, the site may be recorded with the state's Department of Archaeology and Historic Places (WA) or State Historic Preservation Office (OR), and a site protection plan will be developed in cooperation with State Archaeologists and with input from affected tribes. Concurrence with site protection plans will be sought from affected tribes and the appropriate state departments. If concurrence is not received within 30 days, EFM will assume implied concurrence. All historic and prehistoric cultural resources will be protected during forest management operations. Historic protection agency partners will be actively engaged when indicated. EFM may invite affected tribes to harvest traditional materials from within a scheduled harvest area prior to the activity.

## *Aesthetics*

The conservative forest management practices EFM employs tend to create aesthetically pleasing stands. Thinning harvests maintain continuous tree canopy cover, and final harvests utilize retention strategies designed to blend with topography and landforms. Promoting aesthetics is important to provide a suitable "public face" to EFM's management program. Investors, members of the general public, and interest groups frequently tour the properties. Where feasible, roads are gated to prevent unwanted motorized access and dumping.

The following aesthetic considerations are applied in the design silvicultural prescriptions:

- Design harvest units that fit into the surrounding landscape.
- Keep log landings to the minimum practical size and utilize road sides and natural stand openings where possible.
- Keep roads to the minimum size and density to adequately operate and protect the property.
- Leave most logging slash scattered in the woods to naturally decompose (rather than piling and burning).
- Clear log landings of all logging slash and litter after operations.
- Post-operations, grade landings and roads and establish water bars as needed. Replant abandoned landings and road grades, and if slash cannot be redistributed effectively in the forest, burn existing slash within one year.

## *Recreation*

EFM-managed lands are generally open to non-motorized forms of recreation including hunting, fishing, camping (without campfire use), horseback riding, hiking, etc. They are not open to access by unauthorized motorized vehicles. During periods of extreme fire danger or active operations, recreational access may be temporarily shut down. Recreational closures will be posted at access points and on our

website at www.ecotrustforests.com. Due to the remote location, industrial forest landscape setting, and gated access, recreation use of most forests is light. See Appendix D for an example of the signs posted on each forest.

Recreational use statues that apply are:

- Oregon: ORS 105.672 to 105.696
- Washington: RCW 4.24.200 to 4.24.210

# Forest Management

## *Silviculture*

Forests west of the Cascade Mountains have the capacity to grow large volumes of high-quality timber. These highly productive sites are noted for their ability to sustain high growth rates to ages approaching 100 years before stands begin to deteriorate. Recognizing these unique traits, the goal of management is to grow stands to somewhat more mature age than industrial management regimes of the region, targeting rotations of 50-75 years rather than 35-40 year rotations commonly employed by industrial timber managers. Silvicultural design is intended to improve species diversity and structural complexity while providing improved wildlife habitat and a seed source for future rotations.

## Systems to Be Used

EFM will use silvicultural systems designed to maintain or improve species diversity, enhance structural complexity and support natural forest succession. The silvicultural systems and retention patterns are chosen based on site specific characteristics and may mimic natural disturbance patterns such as:

- Small, irregular gaps, typically created by wind throw
- Infrequent, large-scale, stand-replacing fires
- Largely even-aged stands, naturally reseeded after wind or fire
- Legacies of the prior forest: large numbers of older trees surviving the disturbance, including single trees, clumps of trees, snags, and large fallen logs
- Thinning from competition-induced mortality of smaller trees as stands age

In coastal forests dominated by western hemlock, stands will be managed differently than inland stands dominated by Douglas-fir. In coastal forests, the primary disturbance mechanism is wind throw. Our experience managing coastal hemlock forests has shown that partial cuts, including thinning from below, variable density thinning, and variable retention harvest are challenging systems to employ on the coast as the trees retained have a tendency to blow down during winter storms. Stands in coastal forests will frequently be managed using variable retention harvest systems with aggregated (clumped) retention on a 50-75 year rotation. Thinning from below and variable density thinning may be utilized in some stands that are not wind exposed. Inland, Douglas-fir dominated forests may be managed using multiple entry thinning regimes in combination with variable retention harvests, as this forest type is less prone to wind throw. Silvicultural systems that EFM may employ to mimic natural processes include group selection, patch cuts, variable retention harvest (VRH), and variable density thinning (VDT). Retention patterns in VRH harvest units will typically be designed to aggregate retention around ecologically significant features such as streams, seeps, and wetlands (aquatic features), or upland habitat components such as snags, large concentrations of coarse woody debris, or areas with significant biodiversity characteristics and complex vertical structure. Operational and safety limitations are considered when designing retention patterns in harvest units, as is adjacency and landscape-level distribution patterns.

**Table 8. Silvicultural Systems**

| System | Application | Stand structure | Gap size | Mimic |
|---|---|---|---|---|
| Thinning from below | thinning | even-aged | Not applicable | insects, competition-induced mortality |
| Variable Density Thinning (VDT) | Thinning with skips and gaps | uneven-aged | 0.25-2.0 acres | insects, wind |
| Patch cut | final harvest | even-aged | 2.0-6.0 acres | wind |
| Variable Retention Harvest (VRH) | final harvest | uneven-aged | 6.0-60 acres | insects, wind |

## Constraints and Considerations

### Steep Slopes

Steep slopes are common throughout the Pacific Coast region. Cable logging is typically required where slopes average greater than 40 percent. Slope, landslide risk, stream crossings, and fish habitat are associated considerations and often dictate road locations. Pre-existing road systems on most forests are generally located to support large harvest-block layouts. Group selection and smaller size harvest units may require new road construction to facilitate logging operations. New road construction will be located on stable, ridge top locations whenever possible. The higher cost of cable thinning (compared to VDT, patch cuts or VRH) may be uneconomical for even the highest-value species.

### Wind and Weather

Pacific storm systems often produce strong winter winds that can frequently exceed 70 miles per hour. The risk of blowdown increases on ridge-top locations, in stands with western exposure, on high water table sites, at first stand entry, and with increased thinning intensity. Thinning prescriptions assess these considerations and avoid high-risk sites. Residual trees are left in clumps and in sheltered locations, and in many cases may be located adjacent to unharvested areas such as riparian management zones. Initial thinning entries target 20-30% of the standing volume for removal as lighter thinning treatments are less likely to experience significant blowdown. Salvage harvests may be conducted in some cases, but will be designed to leave sub merchantable and lower value stems in the woods, allowing stands to naturally accumulate desirable concentrations of downed woody debris.

### Markets and Timber Value

Forests of the region support a diversity of species. Low timber values for certain species or log grades may constrain silvicultural options. Thinning in low-value stands may not be economically feasible during low market periods. Alternatively, thinning treatments may be accelerated during high market periods.

## Hardwood Management

EFM values hardwoods both ecologically and economically and seeks to promote saw log quality in native hardwoods. High-quality red alder logs are frequently more valuable than some Douglas-fir logs. Bigleaf maple is a potential substitute for eastern maple, which is highly valued in the marketplace.

Madrone, Oregon oak, myrtle, willow, and other "minor" species have modest timber value, but high ecological significance for wildlife and general ecosystem health.

## Harvesting Policies

Logging and road construction operations have the greatest potential for adverse environmental impact of any property management activity which might occur. As such, particular care will be given to all phases of planning and operations for timber harvest activities. Timber harvest activities will strive to use methods and equipment that result in the lightest possible impact. Road construction and reconstruction policies are addressed in *Forest Protection, Environmental Safeguards* (page 37).

EFM's primary harvesting policies are as follows:

- Commercial Thinning
    - Ground-based harvest methods are the preferred logging systems and, to the extent feasible, shall be utilized on all slopes of 40 percent grade or less.
    - Trees to be harvested (or retained) will be marked or designated prior to commencement of logging operations, unless the logging contractor has worked with EFM previously and has evidenced that he or she fully understands and can implement the designated thinning prescription. Logging operations will be monitored on a regular basis to assure that thinning and/or retention targets are being met.
    - To the extent feasible, trees will be felled, limbed and bucked in place to facilitate scattering of slash within the harvest unit.
    - Thinning operations will be conducted in a manner so as to minimize soil compaction and mechanical damage to the residual stand.
    - Initial thinning prescriptions should target no more than 30% of the pre-harvest basal area for removal.
- Patch Cut
    - A minimum of 8 trees per acre (TPA) will be marked or designated for retention prior to commencement of logging operations (in addition to those trees retained in riparian and wetland management zones).
        - Individual tree retention will depend on harvest unit size, retention trees in excess of Riparian Management Zone (RMZ) requirements, and slope stability.
        - Retained trees will generally comprise a diversity of species and size classes.
    - A patch cut cannot be adjacent to another patch cut unless:
        - Regeneration in the existing patch cut(s) is considered "free-to-grow" (at least 5 years old or, on average, 5 feet tall); or
        - If the shared perimeter of the two harvest units is less than 10% of the total perimeter of the 2 units together.
- Variable Retention Harvest
    - 10 to 30 percent of the pre-harvest basal area will be retained.
        - Retention is to be distributed as individual trees or in clumps throughout the unit.
        - Forest stand conditions on ownerships abutting Fund forestland are to be considered when designing harvest units.

- Salvage Harvests
  - Windthrown timber will be given priority for harvest and salvage harvest should be accomplished within one year from the date the windthrow occurred.
- Retention
  - Legacy trees, old and large trees, snags, and woody debris are retained across each harvest unit and across the ownership, or are recruited if absent or lacking.
  - Within harvest openings larger than six acres, 10 to 30 percent of pre-harvest basal area is retained.
  - Goal of 8 legacy trees, snags, wildlife TPA across each harvest unit is observed. Young plantations generally lack legacy and wildlife trees, so it may take several entries for this goal to be fully attained.
  - Trees that display old growth characteristics are marked, permanently retained, and recorded in GIS.
  - Composition of retained trees is representative of the stand, landscape, and desired future condition. This includes at least 50 percent conifers, with minor species at equal or greater proportion of current stocking to augment diversity.
  - Legacy trees and snag numbers are monitored through periodic forest inventory.
  - Retained trees are distributed to enhance diversity values and minimize risk of blowdown as follows:
    - Include hardwoods and minor conifer species.
    - Use clumped distribution to protect microclimates of large snags, coarse woody debris (CWD), and structural complexity.
    - Use clumped distribution in areas of blowdown risk.
  - Retained trees are generally kept until the next rotation. Exception is allowed for thinning within retention clumps at retention levels greater than 20 percent or if required to create desired future conditions. Such thinning will not be conducted sooner than the first commercial thinning of the regenerated stand.
  - Aggregated retention should be centered on features that have some ecological significance such as streams, seeps, or wetlands (aquatic features), or wildlife trees, snags, large concentrations of downed woody debris, or areas with significant structural complexity (upland features).
- Woody Debris
  - An average of 20 tons of woody debris per acre is present and well-distributed by diameter and decay class. Young plantations generally lack woody debris, so it may take several entries for this goal to be fully attained.
  - For ground-based logging, limbs, tops, and cull log sections are left in the woods. For cable logging, cull trees and log segments are left in the woods to meet woody debris goals. Slash accumulated at landings is distributed back into the woods when practical.
  - Variable Retention Harvests will leave at least two logs per acre measuring at least 14 inches in diameter and six feet long at each harvest entry. Periodic forest inventory monitors woody debris by size and decay class at the stand level.

# *Growth and Yield*

## Forest Inventory

Inventory is managed by EFM using Forest Biometrics Research Institute's (FBRI) inventory management program Forest Projection System (FPS). The FPS management software has become the reference basis for many forest management organizations in the Western United States, and provides a full range of tools for managing a working forest at the stand-level using a stand-based relational database linked to a forest-wide GIS mapping system. All parameters for tree volume, weight, biomass and carbon content are based on a Regional Library database, which is based on over 17,800 felled-tree measurements and growth and yield dynamics based on over 3,610,500 permanent plot tree measurements. Depletion is calculated annually from actual volumes harvested and sold, and growth is calculated and added to year-end inventories. On an annual basis, cruising is performed at a level necessary to support annual market appraisals with the intent that no inventory data is older than 10 years across the ownership.

## Allowable Harvest Level

Annual allowable harvest level for the ownership is established every 10 years by 5-year schedule periods, and is a function of desired future condition, conservation and carbon financing, and financial objectives. Growth rates are calibrated for each forest using FBRI's FPS Regional Library and are estimated for each forest based on modeling of forest inventory data. Harvest levels are intentionally conservative to meet the management objective of growing older forests and increasing inventory over time. Allowable harvest level is determined at the forest level. Harvesting on an individual property may exceed the target level in a single year in response to favorable log markets, operational considerations, or other opportunities, but will be within five-year averages on a rolling basis. Harvests are generally designed to improve the health, restore the productive potential and achieve desired stocking levels.

**Table 9. Annual Allowable Harvest, 2014-2018**

| Forest | 2014 Standing Inventory (MBF) | Est. Annual Growth | Allowable Harvest as % of Growth | Annual Harvest (MBF) |
|---|---|---|---|---|
| Dickey River | 10,111 | 7% | 7% | 48 |
| Garibaldi | 61,270 | 5% | 52% | 1,605 |
| Sixes River | 25,407 | 5% | 59% | 750 |
| Sooes | 39,171 | 5% | 61% | 1,200 |
| Wasson Creek | 16,826 | 6% | 0% | 0 |
| 5 Mile | 448 | 6% | 0% | 0 |
| 3 Mile | 229 | 6% | 0% | 0 |
| Mt. Walker | 8,592 | 6% | 0% | 0 |
| Desolation Creek | 35,663 | 3.5% | 95% | 1,200 |

## Rotation Age

Standard industrial practice in the region is even-aged management without thinning and with final harvest by clear cutting at ages 35 to 45 years. Harvest blocks of up to 120 acres are allowed. To meet

management objectives, EFM final harvests will differ significantly from the industrial model. In coastal western hemlock forests, stands will be grown on a 50-75 year rotation, depending on current conditions, site index, growth rates, and opportunity for ecological uplift. Most stands will be harvested using variable retention silviculture, which will lead to an uneven age stand structure for the second rotation under EFM management. In most cases, residual trees will not be harvested in the second rotation, although in some cases thinning of residual clumps will be allowed. Considerations in selecting stands for harvest include access, stand arrangement, and habitat connectivity.

## Species Selection

The standard practice in the region is to promote single-species stands with an emphasis on Douglas-fir. To achieve ecological as well as economic goals, mixed-species stands will be emphasized. Commercially and ecologically valuable species like red alder and cedar will be encouraged during thinning and reforestation. Spruce and hemlock are often more suited to coastal sites than Douglas-fir; these species will thus be encouraged. Maintaining a mix of species will provide insurance against market fluctuations and insect/disease occurrences. In planting mixed species, the growth rates and site requirements will be carefully evaluated.

## Modeling Growth Dynamics

Growth is measured and estimated through physical cruising and using accepted growth models adjusted for location, site, and species. It is applied at the end of each calendar year as part of the annual appraisal process.

## Modeling Assumptions and Rationale for FPS

The silvicultural process that will be employed on EFM-managed properties is designed to evaluate stand conditions on an individual stand basis and determine their readiness to move toward the next silvicultural treatment. This is accomplished by utilizing an individual stand-based inventory system, which models treatments using dynamic triggers that respond to the species, site class, growing conditions and density of the stand. The EFM model uses a combination of basal area per acre (BA) and crown competition factor (CCF) to act as the triggers. Post-treatment or residual stand conditions are usually measured in basal area and trees per acre.

Since the properties that EFM manages are diverse in topography and location, we have chosen to also stratify stands by slope, exposure and starting condition. The stands are grouped for similar traits and then categorized, and a regime is applied to the group. As our GIS capabilities increase and we are able to refine the groupings, different regimes will be added.

With the inventory and GIS system that we currently have, we are able to separate the stands by their operability and their starting condition. The starting condition that we filtered for was highly overstocked stands that were stagnant in their volumetric growth. Different prescriptions are being applied to these stands relative to stands that were within normal stocking levels. Operability is classified by ground-based harvest systems and cable-based harvest systems.

## General Assumptions

- **Planting**
  Plant a diverse mixture of commercially viable tree species at a density that is consistent with future operations and expectations. For example, on difficult to access, cable-based stands where commercial thinning is not anticipated, it may be preferable to plant at a lower density than on a ground based stand with mainline accessibility where early commercial thinning can be reasonably

expected. In all cases, planting will meet or exceed the reforestation requirements dictated by State Forest Practices requirements.

- **Pre-commercial Thinning**
  When stocking levels exceed 450 conifer TPA, we anticipate pre-commercial thinning between ages 12 and 16, with PCT occurring relatively earlier on higher-site ground and later on lower site ground. Timing pre-commercial thinning is important to influence the form of the young trees and help establish their wind-firmness. Residual stocking levels will be range from 300-350 TPA. Selection will be based on maintaining a representative mix of species, removing the suppressed stems, and consideration for spacing. Pre-commercial thinning provides an opportunity to augment species diversity and habitat characteristics in young stands as they approach crown closure. Under normal stand conditions, this activity is triggered when the BA reaches 20.
- **Brush Control**
  On high-site ground, brush control will be done by hand-releasing the seedlings to allow the trees to establish themselves and begin their growth trajectory. If competing vegetation is capable of vegetative reproduction, chemical control will be considered.

# Commercial Harvest

## Ground-based Assumptions

- Because of the increased operability of flatter ground, such areas may be targeted for multiple-entry thinning, if wind exposure is not a concern. Thinning entries will be conducted when a stand's growth rate has slowed and the average live crown ratio approaches 30%. Units will be selected based on operational boundaries such as roads, stream buffers, or stand boundaries.
- Individual stem selection will be made at the time of harvest, and will remove no more than 30% of the stands pre-harvest basal area. Under represented species such as western red cedar will not be harvested during thinning operations in order to promote species diversity. As a general rule, the best representatives of a given species are always left.
- The first thinning entry will be earlier in higher site ground and later in lower site ground and will typically occur around age 30. Depending on the site, a second thinning may be scheduled, typically around age 50.
- Final harvest will be a Variable Retention Harvest targeting 70-80% of the pre-harvest basal area for removal.

## Cable-based Assumptions

Since the operational costs of cable-based harvest are much higher than ground-based, fewer entries are anticipated. Stands will be assessed based on their capacity to withstand environmental factors such as major wind events.

- Harvest units will be delineated by operational boundaries (streams, roads, etc.). 60
- Stands that are not windfirm or are overstocked will be prescribed as single entry variable retention harvest units. Approximately 10-30% of the pre-harvest basal area will be retained. Aggregated retention is centered around significant ecological features with consideration for operational efficiencies.

### Salvage

Blowdown, insect infestation, and tree mortality are viewed as natural forest dynamics that serve useful functions in creating snags, woody debris, and canopy gaps. Salvage of natural mortality events is considered on a case-by-case basis. The economic consequences of large-scale tree loss are balanced against ecological values and the net economic gain and disturbance costs of salvage. Typically, salvage is only considered where losses exceed one truckload per acre across numerous contiguous or nearby acres.

## *Stand Management*

### Establishment

New stands will be established using a combination of natural regeneration and supplemental planting. Site adapted, non-genetically altered, native species will be used. Natural regeneration is preferred over manual reforestation, as naturally regenerating trees are proven to be site-adapted. Western hemlock is a prolific seeder on most coastal sites, as is red alder on disturbed, moist sites. Douglas-fir naturally regenerates well on certain drier sites on the southern Oregon coast (where the Sixes River Forest is located).

Planting of nursery-grown seedlings will supplement native stock where natural regeneration is unlikely to be successful. Large seedlings from appropriate seed zones will be selected for best growth. Replanting will follow immediately after harvesting, using the earliest safe planting date possible. Tree planting densities shall be specified to allow for anticipated natural regeneration. Typically, site preparation should not be needed, especially when regenerating fully stocked stands in which the dense overstory (especially of hemlock and spruce) has excluded most understory vegetation. When needed, mechanical site preparation is the preferred method, with material left on-site in small piles to recycle nutrients and provide wildlife habitat.

### Stocking Control

Intensive management for stocking control is desired to increase tree size, shift stand composition to more valuable species, speed stand differentiation, and nurture trees with old-growth characteristics. Thinning prescriptions will be tailored to the particular conditions of each stand.

Management will evaluate all pre-merchantable stands for pre-commercial thinning needs, and will schedule and prioritize treatments. Pre-commercial thinning is anticipated at age 10 to 15 years for most hemlock and is not anticipated for alder-dominated stands. Timing and site quality of alder thinning will be carefully evaluated to ensure good growth response. Rather than using a rigid spacing or single-species approach, EFM will use a variable-density thinning approach to accentuate the natural diversity present within each stand. Pre-commercial thinning density will be reduced on stands located on steep slopes where no commercial thinning is anticipated.

Commercial thinning is desirable for all suitable stands, with multiple thinning entries at regular intervals anticipated. Thinning return intervals are based on stand growth and condition, and vary from 8 to 15 years for younger stands on good growing sites to 15 to 20 years for older stands and lower-quality sites. Commercial thinning will be evaluated on a stand-by-stand basis and may not be feasible in certain situations, such as:

- Steep slopes, when more costly cable thinning is required (except possibly for high-value species like Douglas-fir or cedar).

- Locations with high wind exposure (ridgetop sites, Southeast or Southwest aspects).
- Red alder (does not respond well to late thinning).
- During periods of low market prices.
- For low-value species (spruce, hemlock).

Target post-harvest stand density is specified on a stand-by-stand basis and varies based on species, age, and site considerations. Thinning typically removes 25 to 30 percent of total stand volume.

## Use of Chemicals

Standard industrial practices of broadcast chemical site preparation, fertilization and seedling release treatments will generally be avoided whenever possible, as will chemical insecticides or fungicides. While herbicide provides a valuable tool for hard-to-control invasive species and persistent, aggressive native vegetation, EFM's silvicultural systems are designed to consider chemicals a method of last resort. Careful harvest planning and site-specific evaluation of the applicability of chemical use will be conducted on each harvest unit. When high levels of competition from non-crop species is not anticipated, prompt reforestation with large, two to three year-old seedlings and mechanical vegetation management practices during the stand reestablishment period should eliminate the need for broadcast chemical application. In some instances where mechanical site preparation is not feasible due to species composition (particularly where competing vegetation includes species capable of vegetative reproduction) or operability, and significant competition likely to prohibit prompt reforestation is anticipated, targeted ground-based application of FSC-approved chemical herbicides may be utilized. A list of FSC-prohibited pesticides can be found in Appendix Q.

Currently, all chemical application on EFM-managed lands is conducted by trained, licensed subcontractors in accordance with all applicable state and federal regulations and in compliance with the information provided in the Material Safety Data Sheets for products used. Contractual obligations require subcontractors to report worker exposures and accidents to EFM. EFM will document the amount and type of herbicide applied, where it was applied, and application date. Effectiveness monitoring is conducted via initial survival surveys conducted the first year after planting, vegetation management surveys conducted in years 2 and 3, and stocking surveys conducted in year 5. A comparison of seedling survival, growth and the extent of competing vegetation on treated and untreated sites should provide a reasonable performance metric for assessing the effectiveness of chemical site preparation.

It is our intent to transition our ownership from the industrial forest management model of short rotations and even-age management to a selective harvest system utilizing multiple entries and uneven-age management systems. While the current age class structure of our ownership doesn't allow for this type of harvest system at this time, as the forest ages and we are more able to operate an uneven-age management system, the need for chemical site preparation will diminish significantly.

EFM also anticipates the use of chemical herbicides to control persistent invasive species typically found along forest roads. While many invasive plant species can be controlled using mechanical or biological control agents, some invasive species such as scotch broom and gorse are so persistent and aggressive that the only effective control measure is chemical herbicide. Although not utilized to-date, EFM anticipates using chemical control measures to manage some invasive species populations across our ownership. As invasive species populations are brought under control, the use of chemical control measures should diminish over time.

## *Harvest Systems*

Many of the properties under management are situated in mountainous terrain, with steep slopes that may require some kind of suspension or cable logging system for log removal. Areas where slopes average greater than 40 percent grade typically require cable logging, while more gentle slopes may be logged by ground-based tractor or "shovel" systems. Areas lacking road access can only be logged by helicopter, which the Fund does not currently plan to do. Soil type, road network, and stream location may also influence logging operability.

**Table 10. Estimated Percent Area by Logging System**

| Forest | Tractor/Shovel | Cable | Helicopter |
|---|---|---|---|
| Dickey River | 100% | 0% | 0% |
| Garibaldi | 9% | 91% | 0% |
| Sixes River | 27% | 73% | 0% |
| Sooes | 60% | 40% | 0% |

## Thinning

Commercial thinning with regular entries beginning at an early age is EFM's preferred management technique. This provides steady income, fosters the creation of complex stand structures, and speeds the creation of older forest characteristics. Thinning levels will be varied and conservative to create diverse habitats, allow a frequent return interval, maintain high growth rates, and minimize site disturbance. Re-entry intervals are determined by stand growth response.

Ground-based logging systems are preferred for thinning due to their maneuverability, selectivity, and low operating costs. The cut-to-length processor/forwarder system is ideal for its low ground disturbance, ability to protect residual trees, and high production rates. Harvester/skidder or manual/tractor systems may also be suitable, though these are limited to dry soil conditions. Skilled equipment operators are critical to reducing residual stand damage in all thinning systems. The greater operating costs of cable thinning systems restrict their use to harvests of high-value species or periods of high market prices. Cable thinning also requires higher thinning removal levels and associated longer return intervals.

Ground-based systems are utilized on slopes up to 40 percent grade or at somewhat greater slopes in irregular terrain. Due to increased site disturbance and lower efficiency, uphill yarding on steep slopes is avoided. Care is taken to limit damage to residual hemlock, true fir, and spruce, since wounds in these species are prone to rot. Due to poor growth response in older stands, alder stands are not typically commercially thinned.

On most forestlands, roads and landings were designed to accommodate clear cut logging. Compact temporary roadside log landings can be used to minimize yarding distance and thinning cost. Mixed stands in large harvest units further complicate the selection of logging systems for thinning.

## Final Harvest

Final harvest methods mimic natural disturbances, such as wind events that create small gaps, irregular patches, or swaths, with surviving residual trees and snags in openings. Harvest openings will vary in size and will be designed to blend with the terrain and surrounding landscape. Within larger (greater than 6 acres) harvest units, 10 to 30 percent of the prior stand will be left as biological legacies and for wildlife habitat.

For final harvests, ground-based logging systems are used wherever terrain allows. Shovel logging is the preferred method due to low ground disturbance, high production, low cost, and multiple capabilities (site preparation, brush piling, log loading).. Harvester/skidder or manual/tractor systems may also be suitable, though they are limited to dry soil conditions. Cable systems will be used for steep slopes or long yarding distances. Hybrid systems (harvester/shovel or shovel/cable) allow flexibility in implementing complex prescriptions or protecting sensitive resources.

### Special Situations

Steep slopes and areas lacking road access may require long cable settings. In many cases these areas will be considered for reserve areas. Helicopter logging will generally be avoided.

Riparian forests and unique ecosystems may be candidates for active restoration. Site-specific prescriptions will be prepared in consultation with resource specialists. Cost sharing or grant resources will be sought to leverage capital resources and expand restoration opportunities.

## *Access and Roads*

### Legal Access

All forests have legal access for all necessary forest management functions, Access might be in the form of easements or in negotiated Road Use Permits. Internal access is typically from private road networks situated entirely on the property. In some cases, these roads connect directly to public roads; in others, rights of way cross abutting lands. In all cases, legal access is described in property deeds. On some properties, abutting owners have a deeded right of access to cross Fund lands. For more details, please refer to Appendix L, *Transportation System Management Program.*

Road construction, reconstruction, and maintenance policies are described in more detail under *Forest Protection, Environmental Safeguards* (page 37)

## *Non-timber Forest Products*

Non-timber forest products, including floral greens, mushrooms, and medicinal plants, may be harvested where local markets and a local workforce exist. Our primary goal in harvesting such resources is to provide local jobs to stimulate the local economy. To date, floral green harvesting has occurred at the Sooes and Dickey River forests, but not at other sites.

In addition, one of the objectives of EFM's management philosophy is to monetize non-timber assets which exist today or which might exist in the future. Monetization strategies include easements for riparian protection, protection against various types of development, or promotion of activities consistent with the mission of EFM and the Fund. They might also include the sale of carbon credits, the use of waste wood as a source of biofuels, and other activities not yet contemplated.

# Forest Protection

## *Forest Health*

### Insects and Disease

There are several notable insect and disease issues that will likely influence management decisions on the Fund's forestlands. As part of a balanced management approach, EFM recognizes that insects and diseases are a natural and necessary part of the forest ecosystem. Presence of invasive non-native pathogens or unusual climatic stressors such as prolonged drought are all factors that can contribute to unacceptably high levels of tree mortality or reduction in tree growth. An integrated pest management approach will seek to create conditions unfavorable for large-scale insect and disease problems by fostering native species diversity and vigorous stands that are relatively resilient to disease. However, aspects of EFM's management philosophy, such as longer rotations and retention of legacy trees, will likely require increased tolerance for insect and disease activity.

Despite all of the potential insect and disease problems, the most likely agent of damage and mortality in coastal forests is wind. High winds coming in off the coast, particularly during winter storms, can be very destructive in coastal conifer forests. Heavy precipitation associated with these storms saturates soils and contributes to uprooting during high winds. Damage can be more severe along ridgetops, but due to the erratic nature of wind patterns, somewhat random effects are often seen. As clear cutting in large blocks is the predominant forest management technique in the coastal region, adjacent lands will likely be clear cut, which dramatically increases the likelihood of wind throw in otherwise stable stands on the Fund's properties.

Below are the major categories of pathogens and the primary examples of each:

***Root Diseases***
Root disease fungi are a serious concern, primarily because they kill trees and spread by root-to-root contact among susceptible conifers. Maintaining species diversity, particularly with hardwoods and shrubs, can help slow the spread of disease. On heavily infected sites, planting with hardwoods or western red cedar (where protected from browse damage) for one rotation is usually recommended as the fungus can remain viable in the soil for several decades.

- Laminated root rot (primarily Douglas-fir, but also hemlock)
- Armillaria root rot (Douglas-fir, hemlock, spruce)
- Annosum root disease (hemlock, spruce)

***Wood Decay Diseases***
These are of less concern than the root diseases, but can cause mortality and cull particularly in older stands. Trees killed by heart decay often die very slowly and eventually produce cavities in the decayed wood area, which makes them very important for wildlife habitat as snags.

- Phellinus pini (mature Douglas-fir)

***Foliage Diseases***
The most significant foliage disease is Swiss needle cast, which has caused large areas of mortality and reduced growth in Douglas-fir in somewhat well-defined areas along the coast. Resistance to the disease is widespread, and many managers focus on removing heavily affected trees during thinnings. Avoiding pure plantings of Douglas-fir in the Swiss needle cast zone is essential.

- Swiss needle cast (Douglas-fir)

***Mistletoes***
Mistletoes mainly cause reduced growth in older stands and are not a major factor in young stand management. Uneven-aged stand structure increases the spread of mistletoe within a stand to understory trees.

- Dwarf mistletoe (primarily mature hemlock, but also mature Douglas-fir)

***Insects***
Insect outbreaks are much less common in coastal forests than in drier interior forests, but various insects can cause mortality and reduced growth in coastal conifer forests. Bark beetles are primarily a concern where large areas of old growth or downed timber can allow populations to build to epidemic levels. As populations exceed the carrying capacity of decadent trees and down logs, healthy trees can be attacked.

- White pine weevil (causes stem deformities in spruce seedlings and saplings)
- Western hemlock looper (defoliates mature hemlock)
- Bark beetles (mine inner bark in Douglas-fir, spruce, and hemlock)
- Spruce budworm (defoliates spruce)

***Microbes***
This oomycete, a somewhat mysterious pathogen, has caused extensive and rapid mortality in tanoak and other oak species in California and the southern Oregon coast. No treatment is known other than cutting down and burning infected trees.

- Sudden oak death (tanoak)

***Animal Damage***
In established coastal forests, the primary culprit of animal damage is the black bear. Bears scrape away the bark of young plantation conifers to eat the cambium, an action that can completely girdle and kill trees. Although trapping and killing bears has been practiced on industrial forestlands, a more integrated approach to forest management is to maintain species diversity, including fruiting shrubs and other possible food sources for bears.

- Bears (primarily young plantations of Douglas-fir, hemlock, and spruce)
- Porcupines (primarily Douglas-fir)
- Deer and elk (browse on planted seedlings, rub on saplings)
- Mountain beaver (clipping of planted seedlings)

## Invasive Species

Forest health is seriously compromised when non-native species become established and aggressively expand into native forests. Invasive species can persist for decades and may drive out native species, reduce wildlife habitat, and alter soil moisture regimes.

Within the management area, the invasive species of greatest concern include exotic blackberries, Scotch broom, tansy, gorse, and knotweed. Property-level plans contain a list of the agency-identified noxious weeds for each county that properties are located in. Population levels vary by forest and stand, but are generally modest. Heavy infestations typically cover less than an acre, are generally centered on roadsides and log landings, and as such are easily visible. Practices used to defend against invasive species include:

- Require that all equipment be washed prior to being moved on site.

- Minimize disturbance from skid trails, log landings, and road construction.
- Reseed disturbed sites promptly and with certified weed-free native species.
- Maintain roadsides by periodic mowing or brushing.

## Assessment

- Annual assessment on all open-access roads, mapped using GPS and extent quantified.
- Biennial assessment on all closed-access roads, mapped using GPS and extent quantified.
- Periodic forest inventories will include an invasive species assessment to determine the extent of invasive species across EFMs ownership.
- Maintain records of population centers, extent, and effectiveness of treatments as part of monitoring programs.
- Degree of threat from invasive species will be determined by the straight-line distance from a given invasive population to a receptive environment. Populations immediately adjacent to recent disturbances will be given the highest priority for control efforts.

## Invasive Species Policies

- Maintain invasive species populations at a controllable level across EFMs ownership.
- Focus control efforts as soon as new populations are detected. Attempt control before populations become well established.
- Leave an undisturbed soil buffer around populations of exotics to slow their rate of spread.
- Primary control methods used will be mechanical. Persistent populations of hard-to-control invasive species may require the limited use of herbicides.
- Biocontrol agents are typically not employed by EFM. However, in 1959 the cinnabar moth was released in California to control tansy ragwort, an invasive weed that is poisonous to livestock. This agent is now well-established in California, Oregon, Washington and northwestern Montana. The cinnabar moth is found in varying degrees on all EFM-managed properties, but is considered by EFM to be a naturally-occurring biocontrol agent. EFM does not actively manage cinnabar moth populations or directly monitor their effect on tansy ragwort populations.

## Fire

Fire has historically played a significant role in shaping forest ecosystems in western North America. However, coastal regions receive enough moisture to prevent large-scale fires from occurring very often. In west-side forests, the natural fire regime can be generally characterized as having long return intervals (two to three hundred years or more). When fires do occur, fuel and climatic conditions are usually so extreme that very hot, stand-replacing conflagrations have historically been the norm. Unlike east-side forests, where lightning strikes are a major factor in wildfire ignition, west-side fires are mainly caused by human activity.

In the Pacific Northwest's managed forests, young plantations occasionally burn under extreme drought conditions, usually between July and September. The continuity of fuels (i.e., fully stocked conifer plantations) is a factor in the rapid spread of these fires. Due to the well-roaded nature of many of these planted forests, fire suppression efforts are usually able to limit the scale of these fires to a few hundred acres. Factors that limit the intensity of these fires include the generally low levels of available fuels as a result of modern clear cutting techniques that remove virtually all trees. Slash burning after clear cutting,

which is commonly practiced throughout the region to prepare the site for the next rotation, further reduces residual fuel loading.

EFM's management approach can help reduce the risk of large-scale fire by adhering to the following principles:

- *Promote diversity in stand conditions:* Hardwoods retain more moisture in their leaves and stems during fire season, and do not contain many of the volatile compounds (resins and terpenes) that make conifers very flammable. Retaining pockets of alder and maple in conifer stands breaks up the continuity of available fuels in the forest and helps limit the spread of fires.
- *Ensure vigorous growth rates through thinning:* Periodic thinning, even in pre-commercial sizes, results in optimal stand density for tree growth and vigor. Reducing competition-induced stress and mortality prevents the buildup of forest fuels that can lead to high-intensity fires.

The Fund's forestlands are located in remote areas and there are no significant wildland urban interface issues. In addition, forests are access-controlled (gated) and posted against campfires and motor vehicles. For forests in dry climates, such as southern or eastern Oregon, a site-specific fire response plan will be developed and included as an addendum to the property management plan. The fire response plan will address fuels, topography, access, and firefighting resources and contacts.

## Fire Policies

- It is EFM's policy to protect the properties it manages from wildfire and to manage forest stands to reduce fire risk.
- All wildfires occurring on the forest shall be controlled as quickly as possible. There will be no "let-burn" areas on the forest.

## Weather and Climate Change

The Pacific Coast region is known for its mild and productive maritime climate, with frequent rainfall (totaling 100 to 200 inches per year or more), mild temperatures, a long growing season, and extreme winter storms, with winds in excess of 70 miles per hour not uncommon. These high wind events, often in combination with water-saturated soil conditions, can topple trees singly and in small gaps, although local disturbances can be extensive and significant. This natural disturbance regime adds woody debris, snags, and canopy gaps that characterize the region's native forests.

Management will help mitigate the risk of widespread weather damage by thinning early (including pre-commercial thinning) to promote wind-firmness, developing multi-story canopies, and considering wind and topography in harvest block layout and design. This includes maintaining conservative thinning levels and not thinning in high-risk locations (ridge tops, moist soils).

It is widely acknowledged that climate change is underway and that significant impacts on our natural and human communities are likely impending. While the exact implications for climate change on forests is uncertain, predictions for the Pacific Coast region include stronger storms, higher rainfall, and warmer, drier summers. Changes may include increased fire risk, although this will mainly be a risk in drier ecosystems. The only certainty is that future climate and weather patterns are unknown.

The risks of widespread losses from climate change can be minimized by employing the following principles:

- *Maintain species diversity:* "Keeping all the pieces" minimizes the risk of financial loss should stands be affected by drought or other stresses. It allows stands to naturally adapt to changing conditions. Diversity both within and between stands is valuable.
- *Thin to maintain stand vigor:* Vigorously growing stands are more wind-firm and able to resist stress. Lower tree densities make stands better able to weather periods of drought.
- *Consider site suitability:* When harvesting or planting on dry sites, EFM should discriminate against drought-sensitive species (like grand fir) and encourage drought-hardy species (like incense cedar and madrone).

## *Environmental Safeguards*

### Policies

### Stream and Water Quality Protection

The management of rivers, streams, vernal ponds, lakes, wetlands, seeps, springs, and their associated riparian areas shall give priority to fish and wildlife habitat, and water quality. Management activities within riparian areas will limit timber harvest to practices which promote habitat diversity and/or development of old-growth characteristics. Where feasible, existing skid trails and roads within riparian zones will be retired or relocated. EFM categorizes streams as follows:

- Category A Stream: A stream that supports or can support populations of native fish and/or provides a domestic water supply.
- Category B Stream: A perennial stream that does not support native fish populations and is not used for domestic water supply.
- Category C Stream: An intermittent stream that has sufficient water to host populations of non-fish aquatic species.
- Category D Stream: A stream that flows only after rainstorms or melting snow and does not support populations of non-fish aquatic species.

### Riparian Management Zone

RMZs are identified as follows:

- Category A streams and lakes and wetlands larger than one acre in size shall have a minimum RMZ of 150 feet (slope distance) maintained on both sides of the stream consisting of a 50-foot "no harvest" inner zone and 100-foot outer zone.
- Category B Streams shall have a minimum RMZ of 100 feet (slope distance) maintained on both sides of the stream consisting of a 25-foot "no harvest" inner zone and 75-foot outer zone.
- Category C Streams shall have a minimum RMZ of 75 feet (slope distance) maintained on both sides of the stream consisting of a 75-foot outer zone.
  Note: Wider zones shall be established if site-specific characteristics such as forest type, slope stability, steepness, and/or terrain recommend it. Additionally, if the state forest practices rules dictate a greater level of protection, those rules will be assumed.
  - Zone Management Issues:
    - Inner Zone: The management objective within this zone is to avoid disturbance of mineral soil and maintain or restore the native vegetation, while retaining and allowing for

recruitment of large live and dead trees for shade, stream structure, and aquatic and terrestrial habitat. No harvest is authorized, with the exception that timber may be cut to provide for yarding corridors and/or road construction. Equipment operation is prohibited, except at designated crossings, or as may be necessary for road construction and/or stream restoration activities. To the extent feasible, new road construction is to be avoided and generally limited to stream crossing sites. Road reconstruction shall be designed and built to enhance riparian functions and reduce sedimentation concerns. Timber cut to facilitate yarding corridors must be left on site.

        - Outer Zone: The management objective within this zone is to minimize disturbance of mineral soil and provide sufficient post-harvest canopy to maintain shading, which will moderate water temperature and provide aquatic and terrestrial habitats. Harvest within this zone shall be limited to single trees or group selection, removing the smallest diameter trees first then progressively selecting larger trees. To the extent feasible, new road construction is to be avoided and road reconstruction shall be designed and built to enhance riparian functions and reduce sedimentation concerns.

- Category D Streams: Management activities adjacent to these streams focus on maintaining stream bank and channel stability while minimizing sediment transportation. To the extent feasible, trees will be felled and yarded away from the existing stream channel.
    - Fish Habitat and Stream Structure Restoration
        - Target degraded or at-risk habitats for improvement and/or restoration.
        - Conduct in-stream work during periods of lowest flow and in accordance with state law and regulations.
        - Restoration activities within riparian zones will incorporate all necessary precautions to ensure minimum impacts and to protect water quality.

## Wildlife Habitat Enhancement

The identification, protection, and enhancement of wildlife habitats are implicit in all phases of harvest planning and operations.

- Prescription design strives to enhance wildlife habitats by applying the following actions, as appropriate:
    - Manage for site-adapted species.
    - Manage for multi-species stands, either within or between stands; retain alder, bigleaf maple, and minor tree species in conifer-dominated stands to increase diversity.
    - Use variable density thinning where appropriate; manage some areas at less-than-full stocking to grow larger trees, protect against root-rotting pathogens, and to develop diverse understory vegetation.
    - Emphasize extended rotations on poor sites or those with steep slopes or poor access; designate shorter rotation management on high-fertility sites, those stocked with high value species, and those with easy access for ground logging or cable thinning.
    - When lacking, cultivate wildlife trees to provide critical habitat (den cavities, nests, perch sites) or mast (acorns, seeds, fruit).
    - Identify areas of high wildlife habitat value (late-successional forest, riparian and wetland areas, grasslands, oak savanna, talus), and tailor management to protect or restore habitats.

  - Solicit input from wildlife professionals when managing areas adjacent to high-value wildlife habitats or travel corridors, or for restoration of rare, threatened, or endangered (RTE) species.
- Prescription execution strives to enhance wildlife habitats by the following actions, as appropriate:
  - During project planning, consult with agencies or wildlife professionals to identify high-value wildlife habitats, wildlife travel corridors, and RTE species locations.
  - Prior to harvest, mark trees of special value to wildlife for permanent protection. Allow wildlife trees to naturally die in order to provide future snags and large woody debris for soil fertility.
  - Mark riparian buffers and wildlife habitat protection areas prior to timber harvest.
  - Where not a safety hazard, permanently retain standing dead trees (snags) and allow them to deteriorate naturally.
  - Identify and retain trees greater than 36 inches DBH as legacies.
  - During logging, give the highest priority for protection to all legacies of the older forest (e.g. residual trees, snags, large cull logs, wildlife trees).
  - Leave non-merchantable log sections in the woods.

## Snags and Woody Debris

Snags and downed logs provide critical habitat for numerous wildlife species, conserve soil moisture, recycle nutrients, build organic matter and site fertility, and greatly add to overall site biodiversity. However, given the history of industrial forest management on most sites, snag and woody debris levels are low. Very large snags (greater than four feet in diameter) are generally very limited, with snags two to three feet in diameter somewhat more common. Small snags are more abundant across EFMs ownership. Snag target levels are two snags per acre (property-wide average), preferably greater than 24 inches in diameter. A minimum target of 20 tons CWD per acre is maintained (property-wide average); additional recruitment is encouraged. Snag and woody debris levels are assessed during harvest planning, with recruitment specified in harvest prescriptions where levels are deficient. For economy, low-value species and low-grade trees are preferred for snags and woody debris. Snags should be clumped and located near water or reserve areas for greatest ecological value.

### *Snag and Woody Debris Policies*

(Harvest specific policies are described in *Forest Management, Harvesting Policies*, beginning on page 23 of the Plan)

- Retain snags where operationally feasible, and in accordance with federal or state safety standards.
- Allow salvage of dead trees only in select circumstances (see *Harvesting Policies*, page 23).
- Trees shall be limbed, and bucked at the stump rather than on the landing, where operationally feasible.
- Pulp and firewood removals are restricted to encourage CWD recruitment until the desired CWD target has been met.

## Logging Operations

Harvest policies are described in detail in *Harvesting Policies*, page 23 of the Plan. More general considerations include:

- Western red cedar, Port Orford cedar, Redwood and snags of all species shall be retained unless other treatment is necessary for safety reasons.
- All legacies of the older forest (e.g. residual trees, snags, large cull logs) will receive high levels of protection.
- Logging methods and equipment selected for use will minimize site disturbance and construction of new roads while maintaining production efficiency at a reasonable cost.
- All timber will be felled and processed to minimize waste and maximize yield and value.
- All trash is to be removed from within harvest units, landings, roads, and other work areas on a daily basis.
- Property boundary lines will be marked prior to harvest activities on units located immediately adjacent to neighboring property ownerships.
- Adjoining property owners and entities with tenure/use rights on EFM ownership will be contacted during the harvest planning phase.

## Monitoring

Implementation of environmental protection policies will be monitored as part of routine operations, including timber inventories, wildlife habitat and populations, harvest unit layout, and operations supervision. EFM cooperates with various agencies including Oregon Department of Fish and Wildlife, USFS, Washington Department of Fish and Wildlife and tribal entities to conduct some monitoring activities, while other monitoring is conducted internally. The following key elements are monitored on a regular basis to ensure that we are on track to meeting targets and to understand trends in key aspects of forestland management. **A summary of our monitoring activities is available upon request.**

1) Inventory: We monitor harvest depletions, timber inventory and carbon sequestration annually. Tree species composition, snags, and coarse woody debris are tracked across the ownership as is seedling growth and survival in recently planted stands.

2) Wildlife Species and Habitat: In cooperation with state Fish and Wildlife agencies, USFS and tribal organizations, we monitor fish and terrestrial wildlife populations. Terrestrial monitoring is focused primarily on northern spotted owl, marbled murrelet and ungulate species.

3) Contractors and Consultants: We track the number of full-time-equivalent employees (FTEs) supported through hiring of contractors and consultants, whether those FTEs are members of low-income communities, and whether they are considered local. This provides a basic understanding of how our management affects the local community.

4) Conservation: EFM monitors the number of acres protected as High Conservation Value Forests (HCVF) or permanently protected through conservation easements. We monitor the effectiveness of habitat restoration projects implemented across our ownership and the number of Rare, Threatened or Endangered Species known to exist on land under our management.

5) Community: For each property we establish a group of stakeholders composed of individuals from local tribes, agencies and communities. These stakeholders are contacted annually to discuss upcoming management activities and overall management. Discussions are documented and management activities are coordinated with external

stakeholders. Additionally, public comments received via email or phone are documented and responded to in a timely manner.

## *Protecting Uncommon and Sensitive Resources*

### Identification

One of EFM's management objectives is to retain biological legacies and promote species diversity. Protecting uncommon and sensitive species is imperative to this objective, and identification is the first step of protection. It is a goal of management to identify uncommon and sensitive species during all phases of operations. To increase effectiveness of identification and protection plans, agency personnel and resource experts are consulted during mapping and prescription development. Records of known occurrences are noted in management documents and monitored during routine operations.

### Protection Plans

### Threatened and Endangered Species Habitats

Protecting habitats for T/E species is critical, not only to meet legal requirements, but as a key component of EFM's management philosophy and objectives. As part of routine operations, the following policies will apply:

- Maintain detailed records on T/E occurrence, historic occupancy, and potential habitat condition.
- Conduct pre-harvest screening of potential T/E habitats to meet or exceed legal requirements.
- Obtain expert input during project design and layout if T/E species may be present.
- Engage outside partners in studies and monitoring.

### High Conservation Value Forests (HCVF)

High Conservation Value Forests are managed to protect and maintain their identified high conservation value attributes, including:

- Forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia), including RTE species and their habitats
- Forest areas containing globally, regionally, or nationally significant large landscape level forests contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance.
- Forest areas that are in or contain rare, T/E ecosystems, and/or property site specific unique habitats.
- Forest areas that provide basic services of nature in critical situations (e.g. water quality protection, watershed protection, erosion control).
- Forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health)
- Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

During 2010 and 2011 EFM conducted an extensive analysis including the review of Oregon and Washington Conservation Strategies, TNC Ecoregional plans, and other prioritization schemes and meta-analyses that drew on multiple agencies and assessments. We also conducted an internal expert review and consulted with a number of external experts from watershed councils, federal and state agencies,

tribes, and conservation organizations. At the time of review, none of EFMs four properties contained any HCVFs. Since our initial assessment, the Oregon Coast populations of Coho salmon have been listed as threatened (June 20, 2011). Consequently, EFM has established 258 acres of HCVF along 10 fish-bearing streams that support Oregon Coast coho populations in the Garibaldi and Sixes River properties. Washington Coast populations of Coho salmon have not yet been designated as threatened. The results of our review and analysis are contained in Appendix M.

**Table 11. Voluntary Stream Management Zones**

| | **Reserve** | **Total** | **%** |
|---|---|---|---|
| Garibaldi | 723 | 4,834 | **15%** |
| Sooes | 238 | 3,275 | **7%** |
| Dickey | 120 | 1,146 | **10%** |
| Sixes | 59 | 3,185 | **2%** |
| **TOTAL** | **1,141** | **12,440** | **9%** |

**Table 12. Stream Management Zone Analysis: Oregon**

| OREGON | | | | |
|---|---|---|---|---|
| State Type | FSC Type | Core (Regulatory) | Outer Thinnable (Voluntary) | Total |
| S | A | 200 | 0 | 200 |
| F (Large) | A | 100 | 100 | 200 |
| F (Medium) | A | 70 | 130 | 200 |
| F (Small) | A | 50 | 150 | 200 |
| D (Large) | A | 70 | 130 | 200 |
| D (Medium) | A | 50 | 150 | 200 |
| D (Small) | A | 20 | 180 | 200 |
| N (Perennial) Large | B | 70 | 30 | 100 |
| N (Perennial) Medium | B | 50 | 50 | 100 |
| N (Perennial) Small | B | 0 | 100 | 100 |
| N (Seasonal) Small | C | 0 | 75 | 75 |

**Table 13. Stream Management Zone Analysis: Washington**

| WASHINGTON | | | | |
|---|---|---|---|---|
| State Type | FSC Type | Core (Regulatory) | Outer Thinnable (Voluntary) | Total |
| S | A | 200 | 0 | 200 |
| F - Site I | A | 160 | 40 | 200 |
| F - Site II | A | 138 | 62 | 200 |
| F - Site III | A | 115 | 85 | 200 |
| F - Site IV | A | 93 | 107 | 200 |
| F - Site V | A | 78 | 122 | 200 |
| N (Perennial) | B | 50 | 50 | 100 |
| N (Seasonal) | C | 0 | 75 | 75 |

## Reserves

EFM is in the process of establishing reserve areas on all currently managed properties. We classify reserves as areas that receive special protection and management, be it permanent or temporary. It includes HCVFs, if present (permanent); Streamside Management Zones (permanent); and Representative Sample Areas (permanent and temporary, depending on the reason for qualification). Our overall goal on a portfolio level is to have approximately 5 to 15 percent of the ownership in reserve areas, including the voluntary riparian reserves established in stream management zones. The amount of reserve area may vary beyond that range on individual properties. Causes of variation include both differing regulatory environments and variations in conservation attributes of properties. For example, Washington forest regulations provide significantly more protection for riparian zones than do Oregon forest regulations, and therefore generally require a lower level of voluntary riparian reserves to accomplish our riparian habitat goals. As an example of the second point, some of our properties – such as the Sixes property – have a high number of acres in hardwoods, which are theorized to benefit migratory songbirds. Given the focus on conversion of these hardwoods to conifer at a landscape scale, we are placing a portion of this forest type in a hardwood reserve.

The following summarized our reserves which currently include no HCVFs but do include SMZs and Representative Sample Areas. Of the 12,440 acres currently under management, 8% falls into regulatory reserves; 9% into additional riparian and wetland reserves; and 5% into Representative Sample Areas. This leaves 79% of the property in what we designate as "Working Stands" available for general harvesting and management prescriptions as the stands meet our criteria for various treatments.

**Table 14. Land Use Designation**

| | Total | Stream & Wetland Reserves | | | | Representative Sample Areas | | Working Stands | |
|---|---|---|---|---|---|---|---|---|---|
| | | Regulatory (State) | | FSC + Additional | | | | | |
| **Garibaldi** | 4,834 | 195 | 4% | 663 | 14% | 49 | 1% | 3,927 | 81% |
| **Sooes** | 3,275 | 432 | 13% | 231 | 7% | 86 | 3% | 2,526 | 77% |
| **Dickey** | 1,146 | 194 | 17% | 120 | 10% | 41 | 4% | 791 | 69% |
| **Sixes** | 3,185 | 118 | 4% | 59 | 2% | 385 | 12% | 2,623 | 82% |
| **TOTAL** | **12,440** | **939** | **8%** | **1,074** | **9%** | **561** | **5%** | **9,866** | **79%** |

From a conservation perspective, EFM's properties were selected due primarily to their importance for salmonids. In addition, EFM's current portfolio features properties that have been managed industrially for decades and have no or very minimal older trees or older forest structure. Therefore, our reserve strategy is initially largely focused on riparian habitat and our restoration activities focus on large woody debris placement, riparian plantings, snag creation, and other strategies to improve spawning and rearing habitat for salmonids.

In establishing current and future networks of reserves, EFM's objectives include HCVFs, SMZs, and Representative Sample Areas (RSAs). The analysis of RSAs takes into account (1) the establishment of ecological reference conditions, (2) creation or maintenance of under-represented ecological conditions; and (3) the establishment of protected areas or refugia for species, communities and community types that may not have been captured elsewhere. The evaluation of RSAs takes into account the surrounding landscape and the extent to which representative sample areas are present and protected in the surrounding area.

The process of evaluating and establishing HCVFs and SMZs will take place within two years of acquiring a new property or bringing a new property into the group, or before any significant management actions take place, whichever is later. The process of establishing RSAs is continuous, and shall be evaluated at least every 10 years. Generally sites that serve as ecological reference conditions or sites that have unusual features will be permanent. Sites that are selected as good examples of under-represented ecological conditions may be temporary as the forest and its surrounding landscape changes. Initial RSAs shall be designated within two years of property acquisition.

In the Olympic Peninsula, much of the focus is on early successional stages because of the high level of old-growth forest on the landscape with the proximity of the Olympic National Park, the Olympic National Forest (which is primarily managed for late successional forest), the Department of Natural Resources lands, and the Rayonier HCP lands. On the Sixes property, which is adjacent to the Grassy Knob Wilderness Area and the Siskiyou National Forest, older forest is also well-represented. In the case of Garibaldi, it is surrounded by Oregon Department of Forestry, but older forest is limited because of the Tillamook burn. We are currently assessing strategies to increase older forest representation and watershed health with ODF and the Tillamook Bay Watershed Council and may designate additional areas to manage towards older forest structure at the conclusion of our analysis and planning.

Old-growth forests are classified in two types: stands greater than 3 acres that have never been logged and that display late successional old-growth characteristics (Type 1), and stands greater than 20 acres that have been logged, but which retain significant late-successional old-growth structure and functions (Type 2). As most of the ownership was previously managed as industrial tree farms, no Type 1 or Type 2 old-growth stands remain. Some individual old-growth remnants may remain, primarily in riparian buffers or inaccessible locations. Each FMU will be screened for old-growth forest stands initially during the acquisitions due diligence process. As the inventory for each forest is updated stands will be reassessed for old-growth characteristics and classified according to FSC definitions. As forest management operations are planned, field foresters will ground-truth the presence or absence of Type 1 or 2 old-growth forest in stands adjacent to and within the planning unit.

Reserve areas will be incorporated into EFM's forest inventory database and all field operations will be in compliance with designated reserve areas. Additionally, EFM is in the process of developing a database that will aid forest management around designated reserve areas. As with other designated non-operational areas, EFM will investigate opportunities to make reserve areas permanent (i.e. sales of easements or carbon sequestration credits), and will pursue these when available.

## Restoration

Uncommon and sensitive species and their habitats will be candidates for active restoration where good opportunities for success exist, where compatible with existing regional restoration plans and priorities (if suitable partners can be engaged) and where cost-sharing or incentive funding is available. Several forests currently under management are situated within areas designated by state fish and wildlife departments as high-priority conservation opportunity areas.

EFM has conducted several restoration projects to date, many in conjunction with state and local conservation partners, including:

- Culvert and bridge replacement for fish passage (Dickey River, Sixes River)
- Sale of riparian easements [Sooes (pending)]. The Sixes and Dickey Rivers had existing riparian easements at the time of purchase
- Road maintenance to correct erosion near fish streams (Dickey River, Sixes River)
- Variable density thinning to create multi-age forest structure (all forests)
- Bridge replacement and placement of logs and restoration planting (Garibaldi and Sooes)
- Snag creation (Sooes)

The following restoration projects are in progress or under consideration:

- Variable density thinning to create multi-age forest structure (all forests)
- Sale of riparian easements (Sooes, Dickey River, Garibaldi and Sixes River)

# Monitoring and Adaptive Management

## *Monitoring and Adaptive Management Plan*

Our monitoring plan is focused on monitoring our progress towards our key objectives stated in the management plan.

- Provide competitive returns: We provide quarterly financial reports and a more detailed annual report to our investors analyzing returns relative to performance benchmarks. Our revenues might include timber revenue, carbon credit sales, easement and conservation land sales, New Market Tax Credit financing, and other sources. We also appraise our forestlands annually using an external appraisal company to assess the capital appreciation which reflects tree growth, changes in the log value category, and current and future prices for logs. Among other things, we analyze the net realized value of our timber harvests, and review costs, productivity and efficiency of forest management. Our financial statements are audited and our audit results and management letter are reviewed annually by our Board of Directors. As a privately held Fund, these results are not available to the public, but are available as required for auditing purposes.
- Creation of older forest characteristics, biological legacies, and species diversity: We monitor these trends annually through our inventory updates, through periodic cruising, and through observation as described below. Our inventory contains information on volume, stocking, regeneration, timber quality, age class, species composition, snags, and other key information. Through this process we review growth rates, regeneration, and condition of the forest, along with the composition and changes in plant communities. We review this information annually and set management activities to move towards desired conditions which are described elsewhere in this Management Plan and in our Performance Metrics table.
- Enhance value to communities: We encourage local hiring by our contractors and request information on the home zip code of contractor employees, among other information. We summarize employment information annually. In addition, on our Garibaldi property we directly employ low-income people and monitor employment on a quarterly basis. We also seek specific ways to enhance our contribution to special populations, especially economically disadvantaged populations and low-income people. These activities range from providing the Makah tribe with rock free of charge to developing a firewood program for low-income people from our Garibaldi property.
- Involve community stakeholders: In addition to periodic tours, we have created stakeholder committees for each of our properties. These are composed of representatives from agencies, watershed councils, conservation organizations, neighboring landowners, and tribes, are advisory in nature and are consulted at least annually to seek feedback on proposed management activities and to seek information on conservation or community issues of which we should be aware. We have also created partnerships for each of our properties with the relevant watershed council or salmon restoration group with which we plan restoration activities and research. These include the Curry County Soil and Water District for Sixes; the Tillamook Bay Watershed Council for Garibaldi; and the Pacific Coast Salmon Coalition for Dickey and Sooes. We also seek special relationships with tribes, including the Makah, Quileute, Grand Ronde, and Coquille. Given our adjoining ownership, our relationship is particularly rich with the Makah. This process allows us to monitor and improve the environmental and social impacts of harvesting and other operations.
- Manage at the landscape level: This involves collaboration from adjoining landowners and can involve considerable time and resources. We have analyzed ownership in each of our watersheds and conservation priorities and are initially focusing our attention on the Garibaldi property and the Miami watershed. Working with the Oregon Department of Forestry and in collaboration with the

Tillamook Bay Watershed Council and other community organizations, we are in the process of developing an action plan for the Miami with an initial focus on Moss Creek, an important salmon stream that runs through our land, ODF land, and private dairy farmers before reaching the Miami River.

- Enhance understanding of ecological management: Increasing our understanding and the practice of ecological management is a key priority. We are interested in the financial, ecological, and social aspects of ecological forest management, how these compare to conventional management, and how we might address barriers to the adoption of ecological forestry – be they lack of information or financial disincentives. We are particularly interested in the relationship between forest management and fish production. Towards this end, we have conducted baseline snorkel surveys on all of our properties and participate actively with agencies, conservation organizations, and tribes on an array of studies including fawn survival studies (Sooes), salmon spawning surveys (Sixes, Garibaldi), and northern spotted owl surveys (Garibaldi). We are also working with our affiliate Ecotrust on a proprietary financial optimization tool that will help us analyze tradeoffs between timber harvests, carbon credit sales, and conservation reserves, among other uses.

The results of our monitoring are incorporated into our harvest and management planning and into the implementation and revision of this management plan.

A summary of our monitoring plan is available to the public upon request.

## Treatment Effectiveness Monitoring

This component of the monitoring program seeks to ensure the silvicultural treatments are implemented according to the stated prescriptions and that management practices are followed. The monitoring activities described are conducted to ensure that site specific plans and operations are properly implemented, environmental impacts of site disturbing operations are minimized, and that harvest prescriptions and guidelines are effective.

Treatment monitoring is generally done during operations and at set intervals after completion by the project supervisor. EFM's Pre-Operation and Active Unit Checklists, used during operations activities, are attached as Appendix P. Initial and ongoing assessment of activities is crucial so changes can be made early in the treatment implementation. An outline of this monitoring plan is provided in Table 11. A harvest prescription data sheet (Appendix Q) will be used to note the pre-operation conditions of an area, the prescription that was applied, and the intent of the operation. This will be used to help monitor and evaluate the effectiveness of harvest prescription. One of our goals prior to starting harvest operations is to further define the desired range or objective for each parameter and to develop the necessary checklists.

**Table 15. Silviculture Monitoring / Treatment Matrix**

| Silvicultural Prescription | Treatment Parameter | Monitoring Question | Method of Assessment | Timeline |
|---|---|---|---|---|
| Harvesting - Thinning / Patch cut / PCT | Residual tree spacing, density, and distribution | Did the thinning treatment achieve target residual spacing and density? | Walk-through, Quick Plots | During Treatment |
| | Tree selection | Did the operation retain the most vigorous and largest trees of the desired species? | Walk-through | During Treatment |
| | Residual stand damage | Did the operation cause unacceptable levels of residual tree damage? Rubs / Roots | Walk-through | During Treatment |

| Silvicultural Prescription | Treatment Parameter | Monitoring Question | Method of Assessment | Timeline |
|---|---|---|---|---|
| | Slash treatment | Was the Slash treated to acceptable levels and distribution? | Walk-through | During Treatment |
| | Roads and trail conditions | Were the roads and landing in comparable shape after operations were completed? | Walk-through | Within 1 month following treatment |
| | Downed wood | Were Downed wood retention levels achieved? | Walk-through | During Treatment |
| | Soils (compaction, displacement, erosion) | Was soil compaction increased significantly off the yarding trails? | Walk-through | During Treatment |
| Reforestation | Tree survival and vigor | Were trees planted properly and according to prescription, are trees adequately protected and free of vegetation competition? | Post-Planting Inspection, Walk-through | During Treatment, annual |
| Regeneration release | Tree survival and vigor | Did treatments protect trees and increase vigor moving tree towards free to grow stage? | Walk-through | During Treatment, annual |

## Long-term Management Monitoring

The purpose of long-term management monitoring is to gauge whether the designated vegetation prescriptions are moving plant communities towards desired future conditions. This ongoing assessment will compare initial and follow-up estimates of relative vegetation composition and structure using repeat photography, silvicultural walk-throughs, and forest inventory. An outline of this monitoring plan is provided in Table 12.

**Table 16. Long-term Management Monitoring Matrix**

| Resource Parameter | Method of Assessment | Timeline |
|---|---|---|
| **TREE COMPONENT (OVERSTORY & UNDERSTORY)** | | |
| Size class distribution | Silvicultural walk-through<br>Forest inventory | Annual or periodic<br>Every 5 years |
| Age class distribution (vertical distribution) | Silvicultural walk-through<br>Forest inventory | Annual or periodic<br>Every 5 years |
| Harvest unit & patch cut size (horizontal distribution) | Silvicultural walk-through<br>Forest inventory | Annual or periodic<br>Every 5 years |
| Species composition | Silvicultural walk-through<br>Forest inventory | Annual or periodic<br>Every 5 years |
| Stocking levels | Silvicultural walk-through<br>Forest inventory | Annual or periodic<br>Every 5 years |
| **UNDERSTORY VEGETATION** | | |

| Resource Parameter | Method of Assessment | Timeline |
|---|---|---|
| Composition / percent cover | Silvicultural walk-through<br>Forest inventory<br>Repeat photography | Annual or periodic<br>Every 15-20 years<br>Year 1, 5, 10 |
| Noxious weeds | Silvicultural walk-through | Annual or periodic |
| Downed wood | Forest inventory<br>Repeat photography | Every 15-20 years<br>Year 1, 5, 10 |
| Snags | Forest inventory | Annual |
| **SOCIAL IMPACTS** | | |
| Community concerns | Feedback from stakeholder group, neighbors, comments | Annual |
| Improve carbon storage of forests | Forest inventory | Annual or periodic |
| Create stable jobs and economic opportunity for the local community and residents | Contractor and vendor records | Annual or periodic |

# Human Resources

## *Management Structure*

The Fund and Fund lands are managed by EFM under an operating agreement that has been in place since the Fund was created. EFM has an independent board of directors with three outside board members not affiliated with Ecotrust; EFM Board policy is to maintain a majority of non-Ecotrust members. The EFM management team relies on its board of directors and the expertise of its major contractors. Atterbury, located in Beaverton, Oregon, performs annual forestland valuations and provides assistance in acquisition due diligence.

## *Contractor Selection*

EFM seeks contractors local to the communities surrounding managed forestlands. All contractors are licensed in the state in which they operate. Contractors are required to show evidence of insurance in amounts not less than $1 million per occurrence and $2 million in aggregate for liability claims.

## *Training and Safety*

Foresters receive safety training as well as training in first aid as part of their accreditation process. The EFM Forester is the designated Safety Officer for the company and will be responsible for all safety trainings of employees, as well as safety procedures and policies for contractors and visitors.

### Employee Safety

All field staff receive general field safety training and task-specific training as outlined in the attached EFM Safety Manual, Appendix E. Staff must follow all safety procedures as outlined in this manual.

### Contractor Safety

All company contracts require that contractors have applicable training/credentials (i.e. professional logger training, pesticide licenses, etc.). A sample contract is attached as Appendix R.

### Visitor Safety

All company-organized forest tours will be led by a designated leader. When entering areas undergoing harvest or construction operations, visitors will be required to wear hard hats.

### FSC Training

The Forester is responsible for all FSC training for field employees and contractors. All EFM staff members receive training on FSC P&C and how these are being applied in EFM-managed forests. EFM conservation and field staff received FSC training in January 2010, administered by Forester Mark Miller of Trout Mountain Forestry. A summary of this training is attached as Appendix S. Garibaldi Forest Management staff received training on FSC P&C by the EFM Forester in January 2010. All company contracts require that contractors comply with FSC P&C when performing operations on EFM-managed lands (Appendix R). Contractors will be given a field summary of FSC P&C (Appendix T) and will sign a form attesting they have read and understand the document and will adhere to the principles prior to commencing work on EFM-managed properties.

# Works Cited

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# Appendix A:
# Forest Management Schedule and Harvest Plan summary

| **Forest Management Schedule**<br>**Ecotrust Forest Management**<br>**2008 - 2012** | | | |
|---|---|---|---|
| **Year** | **Forest** | **Task** | **Specifications** |
| 2008-11 | all | Conduct fish surveys | For operations planned within five years |
| 2008-10 | all | Establish GIS databases for uncommon species & sensitive resources | For all managed properties |
| 2008-10 | all | Map & classify streams for fish use by species | Using existing state data. |
| 2008-11 | all | Identify & classify HCVF/OG forests | Follow FSC definitions, and EFM modifications |
| 2009-10 | all | Survey special sites for rare plants | Talus, cliffs, balds, riparian |
| ongoing | all | Pre-commercial thinning | |
| ongoing | all | Sell Riparian Easements | |

## *Dickey River Forest*

Currently, no commercial harvests are planned for the Dickey River Forest in the years 2008-2014. The property was acquired from Ecotrust in December of 2006. During Ecotrust's ownership the property was harvested, thinned and otherwise prepared for healthy growth. The Fund completed commercial thinning on a portion of the property in 2007 and we consider the property to have very little commercial harvesting possibilities for at least five years.

A small pre-commercial thinning operation is possible in the southeast area of the southern section of the property on a stand primarily made up of red alder with an age class of around 20 years.

While Ecotrust owned the Dickey River Forest, they sold riparian easements covering three separate areas to the State of Washington, Department of Natural Resources. The easements cover 150 feet of each side of watersheds where commercial forestry operations were previously undertaken. When additional forestry operations are commenced, we will, if still possible, enter into further riparian easement transactions with Washington State.

## *Garibaldi Forest*

Timber harvesting will occur on the Garibaldi Forest in each of the next five years, excepting 2010 during which no harvests are currently planned. The property needs commercial as well as pre-commercial thinning and lends itself well to small patch cuts. The concentration of 35- to 45-year-old trees supports harvesting in order to smooth out the age class distribution and to increase growth on overstocked stands. Ground-based logging will be used as much as possible, though on the steeper stands cable logging will be utilized. We aim to keep species distribution similar to current stocking, with a bias toward increasing spruce, cedar and alder. The dominant species is western hemlock and we do not expect this to change.

The most significant damaging agent is windthrow. The property had evidence of past wind damage and incurred moderate damage in the December 2007 storm. Due to road and bridge damage incurred prior to

our ownership, the southern part of the forest is inaccessible. Planning is under way to determine the best and most economical solution to gain access to this portion of the property. Any construction is not expected to occur until 2010 at the earliest. The five-year harvest plan is being developed and should be completed by the end of 2009.

The attached Map 21 in Appendix B shows planned riparian and HCVF reserves.

Based on current ownerships, the Garibaldi Forest likely will bear the largest burden of cash generation in the near term.

## *Sixes River Forest*

The overall objective for the Sixes River Forest is to gradually reduce the volume of low-value trees, such as tan oak and myrtle. Currently, tan oak makes up over 20 percent of inventory; these trees will be reduced to less than 10 percent of the inventory, which will lower the risk of sudden oak death. This will occur naturally as Douglas-fir and spruce grow in stands currently dominated by hardwoods. Conifer stands will be pre-commercially or commercially thinned in order to increase growth rates and improve the health of the remaining forest. Overall we expect to increase average age from 35 years to over 50 years. During this period, inventory will be managed to increase the overall volume from17 million board feet (MMBF) to closer to 30 MMBF.

2008 marked the initiation of forest operations on the property. The areas planned for harvesting in the nearest future, consisting mostly of commercial thinning with interspersed patch cuts, are on the east side of Dry Creek and along the 2000 road. No harvests are planned for 2010.

When planning harvests, we will always prioritize the water quality of Dry Creek and other fish-bearing streams. We are contemplating designating those areas containing steep slopes draining into the Sixes River as non-operational.

## *Sooes Forest*

The Sooes Forest was acquired in November of 2005 and has had some operations in the past three years. From 2007 to the present, harvests have focused on spruce, primarily for its export value. Patch cuts were completed during 2008, totaling approximately 21.4 acres. Currently, no harvests are planned for 2010.

In the next five years, any harvest will be based on market conditions. Many of the merchantable stands require cable logging, which we will not do until there is a strong demand for softwood lumber. The property contains primarily conifer, so very little hardwood harvesting is currently or will be available.

In 2007 and again in early 2008, we harvested according to the State of Washington, Department of Natural Resources criteria for riparian easement sales. A riparian easement application has been submitted and is currently pending. No significant commercial or pre-commercial thinning is expected during the five-year period from 2008 to 2012. As stands that were clear cut by the former owner age, pre-commercial thinning will become a more frequent occurrence.

As on other properties, we will continue to favor spruce and cedar where they can be grown in a healthy manner, but are also realistic that this will be a forest dominated by western hemlock.

# Appendix B: MAPS

## Aerial Maps

Map 1. Dickey Property – NAIP Aerial Imagery 2006
Map 2. Garibaldi – NAIP Aerial Imagery 2005
Map 3. Sixes River – NAIP Aerial Imagery 2005
Map 4. Sooes – NAIP Aerial Imagery 2006

## Property Locations Map

Map 5. Ecotrust Forests, LLC Property Locations

## Soil Maps

Map 6. Soil Map – Clallam County Area, Washington (Dickey Tract)
Map 7. Soil Map – Tillamook County, Oregon (Garibaldi Tract)
Map 8. Soil Map – Curry County, Oregon (Sixes Tract)
Map 9. Soil Map – Clallam County Area, Washington (Sooes Tract)

## Site Index Maps

Map 10. Forest Productivity: western hemlock (Dickey Tract)
Map 11. Forest Productivity: Douglas-fir (Garibaldi Tract)
Map 12. Forest Productivity: Douglas-fir (Sixes Tract)
Map 13. Forest Productivity: red alder (Sooes Tract)
Map 14. Forest Productivity: western hemlock (Sooes Tract)

## Age Class Maps

Map 15. Dickey River Age Class
Map 16. Garibaldi Age Class
Map 17. Sixes River Age Class
Map 18. Sooes Age Class

## Reserve Maps

Map 19. Dickey Reserve Map
Map 20. Garibaldi Reserve Map
Map 21. Sixes Reserve Map
Map 22. Sooes Reserve Map

## Representative Sample Area Maps

Map 23. Dickey Representative Sample Area Map
Map 24. Garibaldi Representative Sample Area Map
Map 25. Sixes Representative Sample Area Map
Map 26. Sooes Representative Sample Area Map

## Existing Easement Maps

Map 27-28. Dickey River Existing Easements
Map 28. Sixes River Existing Easement

# Appendix C:
# Property Stakeholder Advisors

## *Dickey Property*

Frank Geyer, Fish Biologist
*Quileute Tribe*
frank.geyer@quileutenation.org

Mike Leavitt
*Rayonier Timberlands*
mike.leavitt@rayonier.com

Theresa Powell, Fish Biologist
*Washington Department of Fish and Wildlife*
teresa.powell@dfw.wa.gov

## *Garibaldi Property*

Lisa Phipps, Executive Director
Tillamook Estuaries Program
lphipps@tbnep.org

Kate Skinner, Assistant District Forester
*Oregon Department of Forestry*
kate.j.skinner@state.or.us

John O'Leary, City Manager
*City of Garibaldi, Oregon*
john@ci.garibaldi.or.us

## *Sixes Property*

Harry Hoogesteger, South Coast Watershed Coordinator
*Curry Soil and Water Conservation District*
harry@currywatersheds.org

Jessie Berner, Powers District Ranger
*USDA Forest Service*
jberner@fs.fed.us

Edward Vaughn, Forest Programs Coordinator
*Coquille Indian Tribe*
edvaughn@coquilletribe.org

## *Sooes Property*

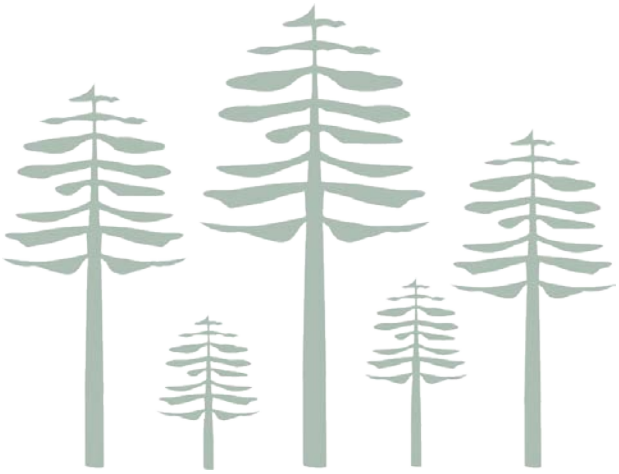
Rob McCoy, Wildlife Division Manager
*Makah Tribe Forestry*
makahwildlife@centurytel.net

Wes Romberg
*Campbell Group*
wromberg@campbellgroup.com

Theresa Powell, Fish Biologist
*Washington Department of Fish and Wildlife*
theresa.powell@dfw.wa.gov

# Appendix D: aCCESS pOLICY

# Appendix E: Safety Manual



## ECOTRUST FOREST MANAGEMENT

# SAFETY MANUAL

***Effective November 16, 2017***

Ecotrust Forest Management holds the safety of its employees as a top priority. The prevention of injuries and illnesses is a cooperative effort between both employees and management.

This safety manual will outline proper workplace procedures, equipment handling and maintenance, and other safety-related policies.

### GENERAL SAFETY RULES

1. Personal protective equipment suitable for each job will be worn (hard hats, safety glasses, gloves, hearing protection, leg protection, proper footwear etc.) as assigned by their supervisor.
2. Removal of guards, shields or disabling of safety devices from equipment will not be permitted.
3. Alcoholic beverages and/or narcotics are strictly forbidden for use on Company property or vehicles as stated in the Employee Manual and Vehicle Use Policy.
4. Employees must report all occupational injuries and/or illnesses to their supervisor using the company approved Safety Incident Reporting Form before leaving the shift in which they

occur. Should an employee seek medical attention for that occupational injury and/or illness, it is the employee's responsibility to immediately notify their supervisor.

5. All safety incidents will be thoroughly investigated by management. Employees are strongly encouraged to proactively suggest corrective and preventative measures that can be instituted company-wide.
6. All employees involved in field operations will be required to attend first aid training as scheduled by management.
7. Any employee has the authority to stop any workplace act that may result in an unsafe or dangerous condition. It is the employee's responsibility to immediately notify their supervisor of that action if the supervisor is not already present.
8. Safety meetings will be held as needed, and all employee attendance is mandatory. Any employee that is unable to attend a safety meeting must meet with their supervisor separately to receive the contents of that meeting.
9. Any violation of this policy or the applicable safety standard, or the failure of an employee to cooperate or attend safety and first aid meetings will result in disciplinary action and/or termination as outlined in the Employee Manual.

## RESPONSIBILITY

**Supervisors:**

1. Will assure that all safety and health rules, policies and procedures are understood and observed.
2. Require the proper care and use of all needed personal protective equipment.
3. Identify and eliminate job hazards as much as possible.
4. Receive and take initial action on employee suggestions.
5. Report all safety incidents to management in a detailed manner for completion of the Safety Incident Reporting Form.
6. Train employees in the approved methods of performing each job or task as necessary.
7. Participate in investigations and inspections.
8. Account for each employee at the end of the shift and ensure that no safety incidents go unreported.

**Employees:**

1. Shall cooperate with management and other employees in an attempt to eliminate injuries.
2. Report any injury, illness or property damage to the immediate supervisor as soon as possible.
3. Report hazardous conditions or unsafe work practices to the supervisor.
4. Know the location of all first aid equipment on the job.

5. Operate only the equipment for which you are trained and authorized.
6. Follow proper lifting procedures. (Back straight, knees bent, load close to body.)
7. Ride as a passenger on equipment or vehicles only if it is equipped with a rider's seat.
8. Attend safety meetings when required.

## HAZARDOUS PRODUCTS POLICY

**Purpose:**

The Hazard Communication Policy ensures that all hazardous products used in the workplace are properly evaluated and approved prior to use. The Company will collect required information concerning each product and devise a plan of use for that product in accordance with Company-approved and regulated safety standards.

**Procedures:**

1. All hazardous products will have an accompanying material safety data sheet (MSDS) that is maintained annually and accessible to employees.
2. All hazardous products must be kept in their original container. No hazardous products can be transferred to other containers. Container labels should be kept intact as practical. Labeling that has been damaged or made unreadable should be replaced immediately.
3. Containers should be disposed of according to procedures on label.
4. All employees will be made aware of the location of hazardous products.
5. No employee should handle a hazardous product that they have not received training for.
6. Hazard communication training will be integrated into safety meetings.
7. Spills of hazardous chemicals should be reported immediately to a supervisor. The supervisor should assess the nature of the spill and respond appropriately per U.S. Environmental Protection Agency and DEQ regulations.

## SAFETY TRAINING POLICY

**All employees must be trained**:

1. Prior to initial assignment for each new employee
2. Whenever an employee is assigned new work tasks or new equipment
3. Whenever an employee demonstrates unsafe job performance.

*New employees who can document prior training in their assigned task or equipment may not require Company training as determined by their supervisor.*

**Required training must include:**

1. General recognition and prevention of safety hazards in forest management.

2. Recognition of hazards, and protective measures which apply to their individual jobs.
3. Safe performance of assigned tasks – including, but not limited to, personal protective equipment, safe navigation of Company property, and education on general forest hazards.
4. Safe use and maintenance of the tools or equipment they may be required to use. They must also be trained to understand and follow manufacturer's instructions.

*Documentation of this training will be kept by the Company and will include the employee's name, date(s) the training was performed, and the signature of the employee, supervisor and/or trainer.*

# EQUIPMENT: CHAINSAW

**Approved Uses (including, but not limited to the following as approved by supervisor or management):**

- Clearing road debris
- Cutting firewood
- Clearing slash
- Removal of competing brush
- Pre-commerical Thinning

**Safety Tips:**

- Check controls, chain tension, and all bolts and handles to ensure that they are functioning properly and that they are adjusted according to the manufacturer's instructions.
- Make sure that the chain is always sharp and the lubrication reservoir is full.
- Start the saw on the ground or on another firm support. Drop starting is never allowed.
- Start the saw at least 10 feet from the fueling area, with the chain brake engaged.
- Use approved containers for transporting fuel to the saw.
- Dispense fuel at least 10 feet away from any sources of ignition when performing construction activities. No smoking during fueling.
- Use a funnel or a flexible hose when pouring fuel into the saw.
- Never attempt to fuel a running or HOT saw.
- Clear away dirt, debris, small tree limbs and rocks from the saw's chain path. Look for nails, spikes or other metal in the tree before cutting.
- Shut off the saw or engage its chain brake when carrying the saw on rough or uneven terrain.
- Keep your hands on the saw's handles, and maintain secure footing while operating the saw.
- Proper personal protective equipment must be worn when operating the saw, which includes hand, foot, leg, eye, face, hearing and head protection.
- Do not wear loose-fitting clothing.
- Be careful that the trunk or tree limbs will not bind against the saw.
- Watch for branches under tension, they may spring out when cut.
- Gasoline-powered chain saws must be equipped with a chain brake, to be used.
- Be cautious of saw kick-back. To avoid kick-back, do not saw with the tip. If equipped, keep tip guard in place.
- Always carry saw below your waist.
- Avoid situations where operating the saw overhead.

## EQUIPMENT: HAND TOOLS (AXES, SHOVELS, PICK, FIRE TOOLS, ETC.)

**Approved Uses (including, but not limited to the following as approved by supervisor or management):**

- Fire protection
- Land clearing
- Road maintenance

**Safety Tips:**

- Wooden handles kept free of splinters and cracks and fastened tightly to tool.
- Cutting tools should be used away from body.
- Tools should be stored in secured, Company-approved location, with appropriate guards.
- Worn tools should be replaced as necessary.

## SAFE VEHICLE USE ON FORESTLAND PROPERTY

**This policy serves as an addendum to the Company Vehicle Use Policy and governs vehicle use on Company forestland property by Company vehicles and non-Company vehicles.**

- Utilize radio properly in communicating with other vehicles and equipment to prevent accidents.
- All traffic must drive on right-side of road.
- Loaded trucks have right-of-way, and empty vehicles should move to designated pull-out areas.
- Use headlights at all times.
- Be aware of weather and road conditions when driving on Company forestland property. Take proper precautions for wet, muddy, or snow-covered conditions.
- Drivers must obey all posted signs by Company or contractor.
- Maintain safe driving speed at all times.

# HEAT STRESS

**Definition:** When the body is unable to cool itself by sweating, several heat-induced illnesses such as heat stress or heat exhaustion and the more severe heat stroke can occur, and can result in death.

**Factors Leading to Heat Stress:** High temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; some medicines; and inadequate tolerance for hot workplaces.

**Symptoms:**

- Headaches, dizziness, lightheadedness or fainting.
- Weakness and moist skin.
- Mood changes such as irritability or confusion.
- Upset stomach or vomiting.
- Severe symptoms of heat stroke include hot skin with no sweating, mental confusion, losing consciousness, seizures, or convulsions.

**Preventing Heat Stress**

- Know signs/symptoms of heat-related illnesses; monitor yourself and coworkers.
- Block out direct sun or other heat sources.
- Use cooling fans/air-conditioning; rest regularly.
- Drink lots of water; about 1 cup every 15 minutes.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid alcohol, caffeinated drinks, or heavy meals.

**What to Do for Heat-Related Illness**

- Call 911 (or local emergency number) at once.

**While waiting for help to arrive:**

- Move the worker to a cool, shaded area.
- Loosen or remove heavy clothing.
- Provide cool drinking water.
- Fan and mist the person with water.

# SAFETY INCIDENT REPORTING FORM

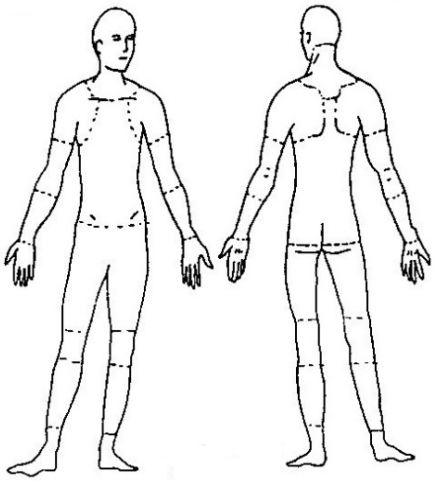
**Instructions**: Complete this form as soon as possible after an incident that results in serious injury or illness. (Optional: Use to investigate a minor injury or near miss that *could have resulted in a serious injury or illness*.)

| This is a report of a: ❑ Death ❑ Lost Time ❑ Dr. Visit Only ❑ First Aid Only ❑ Near Miss | |
|---|---|
| Date of incident: | This report is made by: ❑ Employee ❑ Supervisor ❑ Team ❑ Final Report |

**Step 1: Injured employee (complete this part for each injured employee)**

| Name: | Sex: ❑ Male ❑ Female | Age: |
|---|---|---|
| Department: | Job title at time of incident: | |

Part of body affected: (shade all that apply)



Nature of injury:
(most serious one)
- ❑ Abrasion, scrapes
- ❑ Amputation
- ❑ Broken bone
- ❑ Bruise
- ❑ Burn (heat)
- ❑ Burn (chemical)
- ❑ Concussion (to the head)
- ❑ Crushing Injury
- ❑ Cut, laceration, puncture
- ❑ Hernia
- ❑ Illness
- ❑ Sprain, strain
- ❑ Damage to a body system:
- ❑ Other _____

This employee works:
- ❑ Regular full time
- ❑ Regular part time
- ❑ Seasonal
- ❑ Temporary

Months with this employer

Months doing this job:

(EG: nervous, respiratory, or circulatory systems)

**Step 2: Describe the incident**

| Exact location of the incident: | Exact time: |
|---|---|

What part of employee's workday? ❑ Entering or leaving work ❑ Doing normal work activities ❑ During meal period ❑ During break ❑ Working overtime ❑ Other

Names of witnesses (if any):

| Number of attachments: | Written witness statements: | Photographs: | Maps / drawings: |
|---|---|---|---|

What personal protective equipment was being used (if any)?

Describe, step-by-step the events that led up to the injury. Include names of any machines, parts, objects, tools, materials and other important details.

Description continued on attached sheets: ❑

**Step 3: Why did the incident happen?**

| Unsafe workplace conditions: (Check all that apply) | Unsafe acts by people: (Check all that apply) |
|---|---|
| ❑ Inadequate guard | ❑ Operating without permission |
| ❑ Unguarded hazard | ❑ Operating at unsafe speed |
| ❑ Safety device is defective | ❑ Servicing equipment that has power to it. |
| ❑ Tool or equipment defective | ❑ Making a safety device inoperative |
| ❑ Workstation layout is hazardous | ❑ Using defective equipment |
| ❑ Unsafe lighting | ❑ Using equipment in an unapproved way |
| ❑ Unsafe ventilation | ❑ Unsafe lifting by hand |
| ❑ Lack of needed personal protective equipment | ❑ Taking an unsafe position or posture |
| ❑ Lack of appropriate equipment / tools | ❑ Distraction, teasing, horseplay |
| ❑ Unsafe clothing | ❑ Failure to wear personal protective equipment |
| ❑ No training or insufficient training | ❑ Failure to use the available equipment / tools |
| ❑ Other: _____ | ❑ Other: _____ |

Why did the unsafe conditions exist?

Why did the unsafe acts occur?

Is there a reward (such as "the job can be done more quickly" or "the product is less likely to be damaged" that may have encouraged the unsafe conditions or acts? ❑ Yes ❑ No

If yes, describe:

| | |
|---|---|
| Were the unsafe acts or conditions reported prior to the incident? | ❑ Yes ❑ No |
| Have there been similar incidents or near misses prior to this one? | ❑ Yes ❑ No |

**Step 4: How can future incidents be prevented?**

**What changes do you suggest to prevent this incident/near miss from happening again?**

❑ Stop this activity ❑ Guard the hazard ❑ Train the employee(s) ❑ Train the supervisor(s)
❑ Redesign task steps ❑ Redesign work station ❑ Write a new policy/rule ❑ Enforce existing policy
❑ Routinely inspect for the hazard ❑ Personal Protective Equipment ❑ Other: _____

What should be (or has been) done to carry out the suggestion(s) checked above?

Description continued on attached sheets: ❑

**Step 5: Who completed and reviewed this form? (Please Print)**

| | |
|---|---|
| Written by: | Title: |
| Department: | Date: |
| Names of investigation team members: | |
| Reviewed by: | Title: |
| | Date: |

# RECEIPT OF SAFETY MANUAL

By signing, I acknowledge receipt of the **Safety Manual** and agree to comply with all of the policies and procedures as stated. I further agree to notify my supervisor if I do not understand any of its contents.

Employee Name (printed):_____

Employee Signature:_____ Date:_____

# Appendix F:
# Sample public comment form

**Ecotrust Forest Management**

## Public Comment Form

**Individual or Organization**

Name: _____ Tel: _____

Address: _____ Fax: _____

_____ Cell: _____

_____ email: _____

**Property Reference**

General _____ Dickey _____ Garibaldi _____ Sixes _____ Sooes _____

Date: _____ Time: _____

**Comments**

# Appendix G:
# CONTRACTOR REPORT

# Appendix H:
# FSC Dispute Resolution System
# (FSC-STD-01-005 (V1-0)

# Appendix I:
# Chain-of-Custody Procedures

30 June, 2010

**5.1 Principle 1: Documented Control System**

5.1.1 ECOTRUST FOREST MANAGEMENT has a documented control system to address the Principles of Chain of Custody control as set forth by the Forest Stewardship Council (FSC).

5.1.2 The general procedure for ECOTRUST FOREST MANAGEMENT maintenance of its documented control system is:

5.1.2.1 ECOTRUST FOREST MANAGEMENT designated Chain of Custody Control Administrator (CCA), Bettina von Hagen, has the overall responsibility for education of employees, contractors, and landowner clients, as well as for implementation and supervision of the documented control system for Chain of Custody of FSC-certified wood products sold by ECOTRUST FOREST MANAGEMENT, its subsidiaries, or its client landowners.

5.1.2.2 Example of forms, records and documents appear in the Appendix.

5.1.2.3 Instructions for accurate completion of all forms, records and documents appear in the Appendix.

**5.2 Principle 2: Conformation of Inputs**

5.2.1 ECOTRUST FOREST MANAGEMENT is engaged in the business of selling logs, and does not purchase any FSC wood products. Therefore, confirmation of inputs is not applicable, except in the sense the ECOTRUST FOREST MANAGEMENT will be responsible for ensuring that log decks in the forest will contain only logs originating in that forest.

**5.3 Principle 3: Separation and/or Demarcation of Certified and Non-Certified Inputs.**

5.3.1 ECOTRUST FOREST MANAGEMENT has a system for ensuring the FSC-certified products are clearly identified as certified. ECOTRUST FOREST MANAGEMENT conducts timber sales activity only on land within its Certified Management Group. Hence, there are no non-FSC logs involved.

5.3.2 Certified products will always be clearly labeled and segregated from non-certified products. This is achieved by:

5.3.2.1 Physical separation of certified and non-certified products. Only ECOTRUST FOREST MANAGEMENT FSC-certified logs are involved. No non-certified logs will ever be brought in and mixed with certified logs.

5.3.3 Certified and non-certified inputs are not to be mixed over a specific time period.

5.3.4 Logs will be identified as certified through paperwork supplied to the purchaser by ECOTRUST FOREST MANAGEMENT and/or the seller.

5.3.5 Logs will also be identified as certified by designating one of EFMs registered log brands to be used to brand FSC-certified logs, and a second brand to be used on non-FSC certified logs.

**5.4 Principle 4: Secure Product Labeling**

5.4.1 ECOTRUST FOREST MANAGEMENT does not use on-product labels during the sale of logs.

5.4.2 ECOTRUST FOREST MANAGEMENT accepts the responsibility to ensure that the FSC Logo Pack is not used by unauthorized users and for any unauthorized use.

**5.5 Principle 5: Identification of Certified Outputs**

5.5.1 Certified products are identifiable by hammer brands and log load tickets that clearly identifies the purchaser and the seller of logs. The certified status of the logs will be directly communicated, orally and in writing, by ECOTRUST FOREST MANAGEMENT and/or the seller to the purchaser.

5.5.2 ECOTRUST FOREST MANAGEMENT operates a system that records the log species, volume, and grade information for all certified loads sold by its certified landowners. Invoices are not issued during the sale of logs; rather, mills issue payment after logs are received at the mill based on either a timber sale purchase order/cutting contract or verbal agreement.

5.5.3 Because no invoices are issued, it is incumbent on ECOTRUST FOREST MANAGEMENT to clearly communicate the certified status of logs to the purchaser. This is accomplished by affixing log load tickets with ECOTRUST FOREST MANAGEMENT's FSC certificate code and product claim prominently displayed to each load of logs delivered to the purchaser. Additionally, a copy of ECOTRUST FOREST MANAGEMENT's FSC certificate will be provided to each mill representative/purchaser upon entering into an agreement to purchase FSC certified logs from ECOTRUST FOREST MANAGEMENT.

**5.6 Principle 6: Record Keeping**

5.6.1 ECOTRUST FOREST MANAGEMENT maintains appropriate records of all log sales and outputs of certified products in accordance with GAAP.

5.6.2 ECOTRUST FOREST MANAGEMENT records are sufficient to allow any independent assessor to trace back from any given certified output to the specific certified forest of origin.

5.6.3 ECOTRUST FOREST MANAGEMENT records are sufficient to allow an independent assessor to determine the conversion rates for the manufacture of certified outputs from given certified inputs, if applicable.

5.6.4 All records related to certified forest products sold by ECOTRUST FOREST MANAGEMENT and its client landowners will be kept for a minimum of five years.

# Appendix J:
# Transportation System Management Program

## Contents



### Introduction and Purpose

This document describes the Road Management Objectives and Standard Operating Procedures (SOPs) for Ecotrust Forest Management's transportation system and provides guidance for the management of the company's forestlands road system. These objectives and SOPs are used by company land managers to construct, reconstruct and maintain Ecotrust Forest Management's road system, assuring investors and the public that company roads are being managed in an efficient and environmentally sound manner. This road management program will be reviewed and updated as needed to incorporate advancements in technology and management techniques and new information regarding environmental conditions and regulations.

### Background

The main purpose of the Ecotrust Forest Management transportation system is to provide for cost effective access for conducting forest management activities. There are dozens of miles of private road on the company's 12,436 acres of forestland. The existing road system ranges from high quality mainline haul roads that have gentle grades, rock surfacing and drainage systems to primitive roads with steep grades and little or no surfacing.

Approximately 1 – 2 miles of roads are constructed and/or reconstructed annually to facilitate forest management activities including timber harvesting on company lands. New construction falls into two general categories. The first category is an "expense" road which serves a single harvest unit and/or forest operation. These are generally temporary roads with native surfacing or spur roads with pit-run rock surfacing. These roads have low use and are sometimes closed after the forest operation has been completed. The second category is a "capital" road that provides access to multiple harvest units and/or multiple forest operations. Capital roads generally have gentle grades and are usually surfaced for year-round use.

## Transportation Planning

Transportation planning is an essential part of managing forestlands. When considering reconstruction and/or new construction, a number of factors should be evaluated.

Reconstruction

- Will the existing transportation system support accomplishing current management goals?
- Are there existing environmental problems that can be addressed through reconstruction and/or relocation?
- If the existing road no longer supports management goals, is decommissioning or other action appropriate?
- What are the anticipated costs and expected benefits?

New Construction

- Will the planned road support current management objectives including planned harvest units?
- How will identified environmental concerns be addressed in the design and construction?
- Does the current soils and geology information support the proposed construction activities?
- What are the anticipated costs and expected benefits?

## Road Design

Forest roads can be a major source of sediment generated from forestlands. Therefore, road design is an important element when constructing and maintaining forest roads. Back slopes and fill slopes are potential sources of sediment. Road grades, alignment, sub-grade shape, and surfacing affect the sediment generated from the road surface, delivery point of sediment, traffic speed and safety. Road width affects the type and number of vehicles and drainage structures may affect the passage of fish, delivery of sediment and stability of the road.

Ecotrust Forest Management has developed the following Road Management Objectives and their associated Standard Operating Procedures. These policies support the company's environmental policies and support compliance with the Forest Stewardship Council Principles and Criteria along with state and federal laws and regulations.

## Road Management Objectives

Manage the Ecotrust Forest Management road system, both existing roads and new construction, in accordance with the following objectives:

- Minimize the amount of road construction needed, while meeting other Company management objectives.
- Reduce the sediment delivered to streams from forest roads.
- Minimize impacts from roads that adversely affect native species of fish and wildlife such as barriers to fish passage, seasonal animal disturbance and spread of invasive plant species.
- Consider aesthetics of road construction and maintenance projects and their associated management activities in areas where visual impacts are a concern.

## Maintenance & Inventory

Ecotrust Forest Management has developed an inventory of road segments, watercourse crossings and drainage structures with condition classes that will assist in the prioritization of work and treatments. This inventory will start with the properties that have highest resource risk and proceed to the low risk properties.

High-priority road maintenance projects will be budgeted in the annual operations budget process and general maintenance will be budgeted by operating block.

A strategic review of road access will be done to assess where maintenance will be focused and determine whether road segments will remain open or be closed.

## Standard Operating Procedures

These Standard Operating Procedures (SOPs) have been established to assure proper construction of new roads and provide standards for reconstructing and maintaining existing roads that do not currently meet management objectives. The SOPs can be amended if other site-specific designs better meet the Road Management Objectives. Generally, site-specific review of road plans and contractor work is required. To further support compliance with Road Management Objectives and Standard Operating Procedures, contracts involving road construction and road maintenance will include typical cross sections and road specifications.

*Standard Operating Procedures (SOPs) for specific road components are as follows:*

**Road Location**

- New road construction must support the company's land management goals.
- When consistent with other environmental objectives, the length of new road construction should be minimized.
- The number of stream crossings should be minimized.
- Steep and/or unstable ground should be avoided, whenever possible. Consult with applicable geologic and soils maps.
- Road grades should be rolled to facilitate road drainage.

- Non-strategic and high-risk roads will be considered for retirement. These include roads within reserve areas, roads at risk of landslide above fish streams, roads with persistent maintenance problems and duplicate segments of road. Roads may be retained for fire protection and security even if they do not access timber management areas.

**Road Design**

- Cut and fill slopes angles should be no steeper than the angle of repose.
- Road should be wide enough to accommodate the anticipated traffic.
- Turnouts should be designed to add an additional 10 feet of width to the specified single lane road width.
- For single lane roads, the spacing of turnouts should be specified. Spur roads should be considered as a turnout when specifying the turnout spacing.
  Examples of spacing:
    - Inter-visible
    - Every 1,000 feet
    - Where they fit the terrain
- Roads should be in-sloped, out-sloped or crowned to provide adequate road drainage.
- Horizontal curves should be 50 feet or greater.
- Grades should fit the terrain within these standards as possible:
    - Adverse – Optimum: 0% to 8%; Sustained Max: 12%; Pitch Max: 15%
    - Favorable – Optimum: 0% to 10%; Sustained Max: 15%; Pitch Max: 20%
- For site-specific conditions where excavated material is unsuitable for incorporation into the road, the material should be end-hauled and deposited at a stable location.

**Road Surface**

- In slope, out slope or crown the road surface to facilitate surface drainage.
- Surfacing material should vary depending on the intended use of the road, the timing of anticipated road use and the potential impact on water quality and other resources.
    - Dirt roads should be used for dry-season roads.
    - Pit-run rock can be used on low traffic volume mainlines and wet-season roads.
    - Pit-run or crushed rock should be used on main year-round haul roads and especially winter haul-roads.
- Road surfaces, turnouts and shoulders should be graded and shaped to provide a suitable travel surface and control water runoff.
- Roadside berms should be used for specific design purposes such as keeping the surface water off of an unstable slope.

**Drainage Structures**

- Staff forester shall approve all proposed stream crossing designs prior to

installation. If a contractor wishes to modify the proposed design, a detailed plan shall be submitted to the staff forester for approval prior to commencing work.

- On fish bearing streams, permanent crossing structures should be sized to allow fish passage at all life stages.
- On non-fish bearing streams, crossing structures should be sized for the maximum design flow.
- Drainage structures designed to intercept road surface and ditch water should be installed uphill from stream crossings. When stream crossings are constructed or replaced the stream crossing design shall incorporate Best Management Practices (BMPs) to disconnect ditch water from live water. Possible BMPs to provide ditch water disconnect include the installation of cross drains or ditch-outs upslope from live water or in-ditch sediment traps. In no case shall a new or replaced stream crossing allow for connectivity between ditch water and the live stream.
- Drainage structures should be spaced to prevent ditch and/or road surface scour.
- Ditch relief culverts installed on roads with 3% or greater road grade should be installed with the appropriate skew.
- Catch basins for the inlet should be a minimum of 1.5 times the diameter of the culvert up to four feet.
- Outlets for culverts should discharge onto natural ground where possible with little to no drop in elevation from the culvert to the ground to avoid a "shotgun" outlet.
- When it is not possible to discharge a culvert onto native ground, dissipate the energy and mitigate erosion potential. The discharge should fall onto a stable surface such as riprap, woody debris, a culvert downspout or an erosion control mat.
- Cross drains should have adequate forest floor below the outlet to filter road- generated sediment.
- When installing a culvert or other appropriate drainage structure on seeps, springs or streams, the natural drainage channel should be maintained.
- Water bars, dips, grade breaks and other surface water intercepting structures should be designed and maintained to drain onto stable slopes and not deliver runoff into streams.

**Bridges**

- Bridges should be inspected at least every two years.
- Rub rails and guardrails should be designed and maintained to withstand the impact of a vehicle and deflect it back on to the running surface.
- The running surface should be maintained to support the anticipated uses and vehicles.
- Support structures such as stringers, girders, and abutments should be inspected at regular intervals to assure the bridge is able to support the design load.
- Bridges should have adequate height and stream clearance to pass

anticipated debris during flood events.
- Stream channels should not be constricted to cause scour.
- Stream channels should be free of stream blocking debris that would threaten the bridge structure.

**Ditches**

- Drainage ditches should be a minimum of one foot below the road surface elevation.
- Ditches should be designed to drain water from the road to prevent standing water from saturating the subgrade.
- Vegetation growth in the ditch line to control erosion, as long as the drainage is maintained, should be encouraged.
- Ditch maintenance should occur early in the growing season to allow grasses and forbs to become re-established.
- When necessary, erosion controls structures should be installed in the ditch line to catch sediment. It is especially important to install erosion control structures where the ditch discharges directly into a stream. Some types of erosion control structures are:
    - Rock armoring
    - Sediment catch ponds
    - Rock weirs
    - Straw Bales
    - Silt fencing

**Other Road Related Issues**

- Roadside vegetation should be managed to maintain a safe sight distance
- Critical road segments should be inspected during or shortly after a storm event.
- Slide materials from road failures should be removed and disposed of in a safe stable location away from water.
- Unstable cut or fill slopes should be repaired as soon as possible after their discovery.

# Appendix K: FSC DEFINITIONS

## *FSC Definitions: Old Growth and High Conservation Value Forests*

Excerpts from: Revised Final Pacific Coast Regional FSC Standard, Version 9.0, December 2, 2004.

### 6.3.d. Old-growth stands and forests

*This section uses the following definitions:*

*Type 1 Old Growth* - stands of at least 3 acres that have never been logged and that display late-successional/old-growth characteristics.

*Type 2 Old Growth* stands of at least 20 acres that have been logged, but which retain significant late-successional/old-growth structure and functions.

### Principle 9. Maintenance of High Conservation Value (HCV) Forests

High Conservation Value Forests are those that possess one or more of the following attributes:

1. HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia);
2. HCV forest areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance;
3. HCV forest areas that are in or contain rare, threatened or endangered ecosystems;
4. HCV forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control);
5. HCV forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health);
6. HCV forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

HCV forests are managed to protect and maintain their high conservation value attributes. Classification of a forest stand as HCVF does not automatically preclude active management, however all management activities in designated HCVF shall be conducted so as to maintain or enhance the high conservation values and the extent of the HCVF.

*Applicability note: Classification of a forest as a "high conservation value forest" (HCVF) does not automatically preclude active management.*

# Appendix L:

## Ecotrust Forest Management
## FSC HCVF and RSA Criteria

To determine the HCVF and RSA designation on Ecotrust Forest Management (EFM) properties, staff consulted with the following stakeholders:

- US Fish and Wildlife Service
- WA Department of the Fish and Wildlife
- WA Natural Heritage Program
- Oregon Biodiversity Information Center
- Oregon Department of Forestry
- The Nature Conservancy – Ecoregions
- North Olympic Land Trust

After extensive consultation with local stakeholders, our analysis concluded that landscape level significance on currently managed land lay primarily within riparian areas adjacent to fish bearing streams providing high conservation value toward the protection of rare, threatened or endangered fish habitat. According the US Fish and Wildlife Service, these areas are considered as critical habitat for populations of fish species including Chinook, Coho, Chum and Steelhead. Additionally, according to the Washington Department of Fish and Wildlife riparian areas within Washington State showed the as priority habitat for Coastal Cutthroat trout.

HCVF designation was applied to areas within 150 feet on either side all fish bearing streams. The HCVF areas illustrated on the following maps are to be management as "No Harvest Zones", with the exception that minor harvest adjacent to existing roads for structural maintenance and improvement is allowed.

Following our HCVF designations, EFM utilizes Representative Sample Areas (RSAs) to protect other ecosystem types that are deemed important through our stakeholder consultation process, but are not protected under the HCVF designation. EFM has designated areas of ecological significance on Desolation Creek and Chimacum.

# Appendix M:
# Pre-Operation and Active unit Checklists

# Appendix N:
# HARVEST PRESCRIPTION DATA SHEET

# Appendix O:
# Sample contractor contract

# Appendix P:
# FSC principles and criteria field guide

# Appendix R:
# Tribal Contact Information

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**Makah Indian Tribe: Sooes Forest, Dickey Forest**

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# Appendix T:
# Product Types Sold: 2008-2013

***Timber***

Douglas-fir sawlogs (domestic)
Douglas-fir sawlogs (export)
Douglas-fir pulp

Western hemlock sawlogs (domestic)
Western hemlock sawlogs (export)
Western hemlock pulp

Sitka spruce sawlogs (domestic)
Sitka spruce pulp

Red alder sawlogs (domestic)
Red alder pulp

***Non-Timber Forest Products***

***Floral Greens:***
Salal

***Firewood:***
Community Firewood Program (donated)
Direct Sale (to commercial firewood cutters)

***Ecosystem Services***
Carbon Credits

***Conservation***
Riparian Easements