



LOWER NEHALEM COMMUNITY TRUST

Conservation Plan

2013



forest



freshwater



estuary



LOWER NEHALEM COMMUNITY TRUST

Our Mission

*To preserve land and nurture conservation values
in partnership with an engaged community
in the Nehalem region of the Oregon Coast*

Founded 2002

Acknowledgments

The approach used to develop this plan reflects Lower Nehalem Community Trust's commitment to engaging our community in fostering conservation values. The process involved a wide variety of people to ensure we understood our community's values and priorities. Gareth Ferdun, chair of the Trust's Lands Committee, assumed the lead role for the process that began with interviews of forty-four representatives of the community and other environmental organizations serving this area. The other members of the Trust's Lands Committee, Nancy Chase, Erich Miller, Doug Firstbrook, Mike Manzulli and Ted Chu, along with Gary Seelig and Georgenne Ferdun, provided critical feedback on an early draft of the document. After revisions the Trust Board reviewed the draft document and additional revisions were incorporated.

Credits

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North Fork of Nehalem River. Photo by Gary Seelig



Restoration at Alder Creek. Photo by Gary Seelig

Introduction

The Lower Nehalem Community Trust (LNCT) was formed in 2002. Our mission is to preserve land and foster conservation values in partnership with an engaged community in the Nehalem region of the Oregon Coast. In the eleven years since our founding we have acquired seven properties totaling 106 acres. We have grown from a small group of volunteers into a staffed organization with over 150 volunteers and a membership of over 250 individuals, families and businesses.

In 2013 the Trust Board began a series of planning processes, reviewing and revising our mission, goals and strategies. We developed a new Strategic Plan, a Resource Development Plan, and this, our first comprehensive Conservation Plan.

The Lower Nehalem Community Trust Conservation Plan is designed to guide the conservation work of the Trust. The development of this plan was motivated by:

- our need to think about what we want to accomplish in the next 10 years;
- a recent Nehalem Conservation Action Plan that set a new context for such work;
- the development of conservation plans by other Oregon land trusts; and
- a recommendation that we develop such a plan in a recent Land Trust Alliance assessment of LNCT.

This plan describes the:

- conservation strategies that LNCT utilizes, as well as opportunities for future conservation activities;
- history, species of concern, key ecological systems, threats and proposed conservation strategies for Nehalem environmental targets:
 - *Estuary and Surrounding Areas,*
 - *Freshwater and Riparian Areas, and*
 - *Forest Lands and Meadows.*

The Plan draws heavily on our experience in our first ten years of community conservation work and a Conservation Priorities Survey and interview process we engaged in with our Board, our supporters, and our conservation partners. It also draws on the Nehalem Watershed Assessment (1999), the Oregon Conservation Plan, and the multi-agency Nehalem Conservation Action Plan (CAP) completed in 2012. The Nehalem CAP was particularly important in gathering information about habitat types and conservation needs relevant to our service area.

The online version of the LNCT Conservation Plan can be found on the LNCT website at: Nehalemtrust.org/Reports/CPlan.pdf. In that document, text shown in blue provides hyperlinks to reference information. We will update the electronic version of this document as new information becomes available. We will think of this as a “living document”. We anticipate that we will prepare a new printed version of the LNCT Conservation Plan on a four-year cycle, with the next printed version available in 2017.

Trust Values and Preservation Priorities

The Lower Nehalem Community Trust's work builds on the following set of LNCT Conservation values:

- Respect for all species
- Species diversity
- Clean water
- Responsibility for human impact on nature
- Living in harmony/balance with nature
- Recognition that nature and natural systems sustain all life
- Healthy habitats
- Resilient ecosystems
- Understanding the place in which we live
- Learning as a process

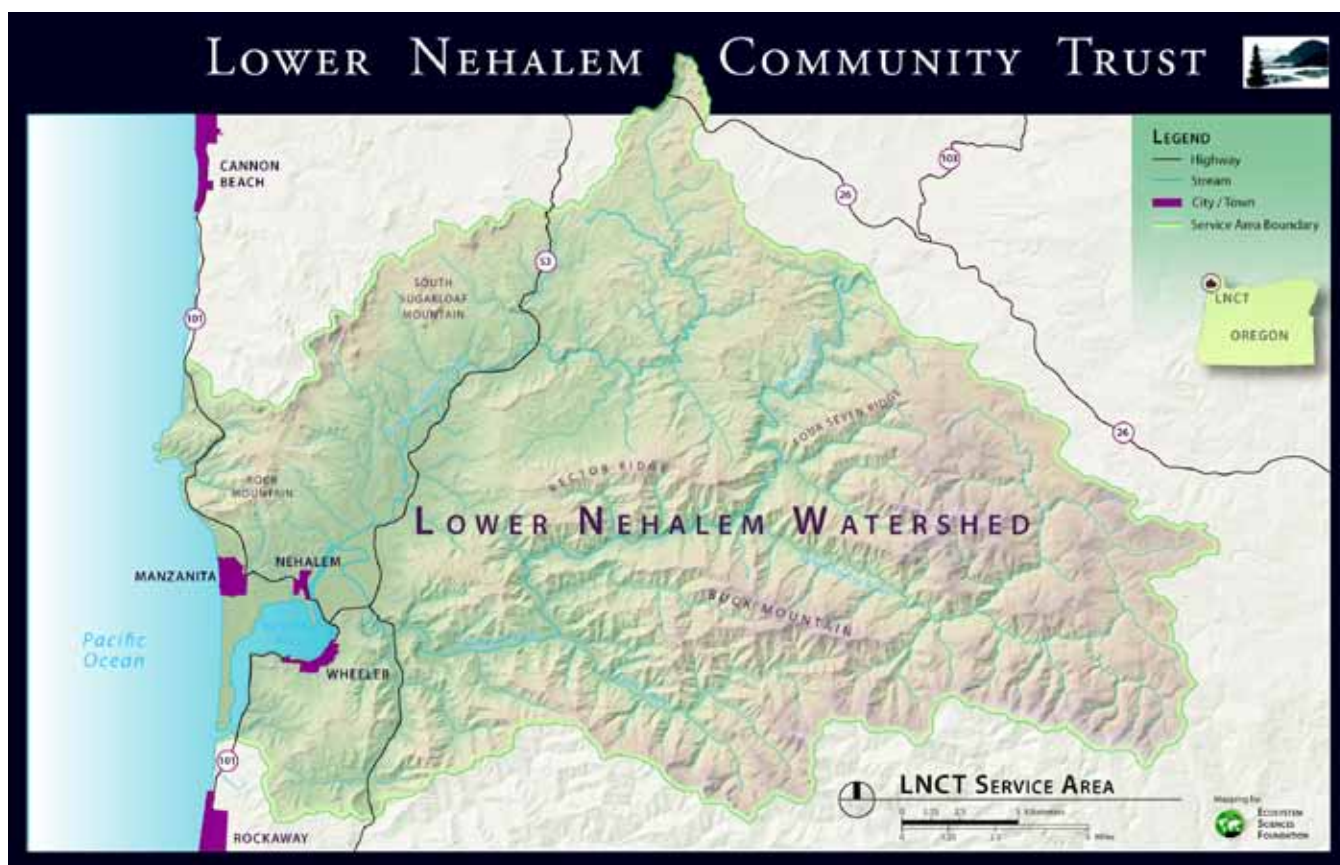
The Trust Board members, partners and supporters have identified these preservation priorities:

- Wetlands areas
- Clean water
- Riparian (stream side) areas
- Areas where there is a threat to habitat
- Fish habitat
- Availability of funding partners
- Areas that support an abundance of wildlife
- Lands adjacent to currently protected lands
- Areas that connect people to place
- Wildlife corridors
- Larger parcels

Service Area

Our service area, located in northwest Oregon, stretches from the ocean shoreline on the west in a northeasterly direction nearly to Highway 26 on the east. It includes the Nehalem Bay and estuary, all of the area drained by the North Fork of the Nehalem River and its tributaries, the area drained by the main stem of the Nehalem River from the ridgeline just south of where Highway 26 crosses the Coast Range, and the area north along the coast up to the northern edge of Oswald West State Park. On the north edge is a basaltic ridge with several distinct peaks, Neahkahnie Mt., Angora Peak, and Onion Peak. To the east are the Salmonberry River and Cook Creek, the major tributaries of the lower main stem Nehalem. To the south is the Foley Creek drainage and Foley Peak.

The service area is approximately 220 square miles of land including much of north Tillamook County and part of Clatsop County. This area constituted the area of interest of the founding board and was reaffirmed by the current board in 2013.

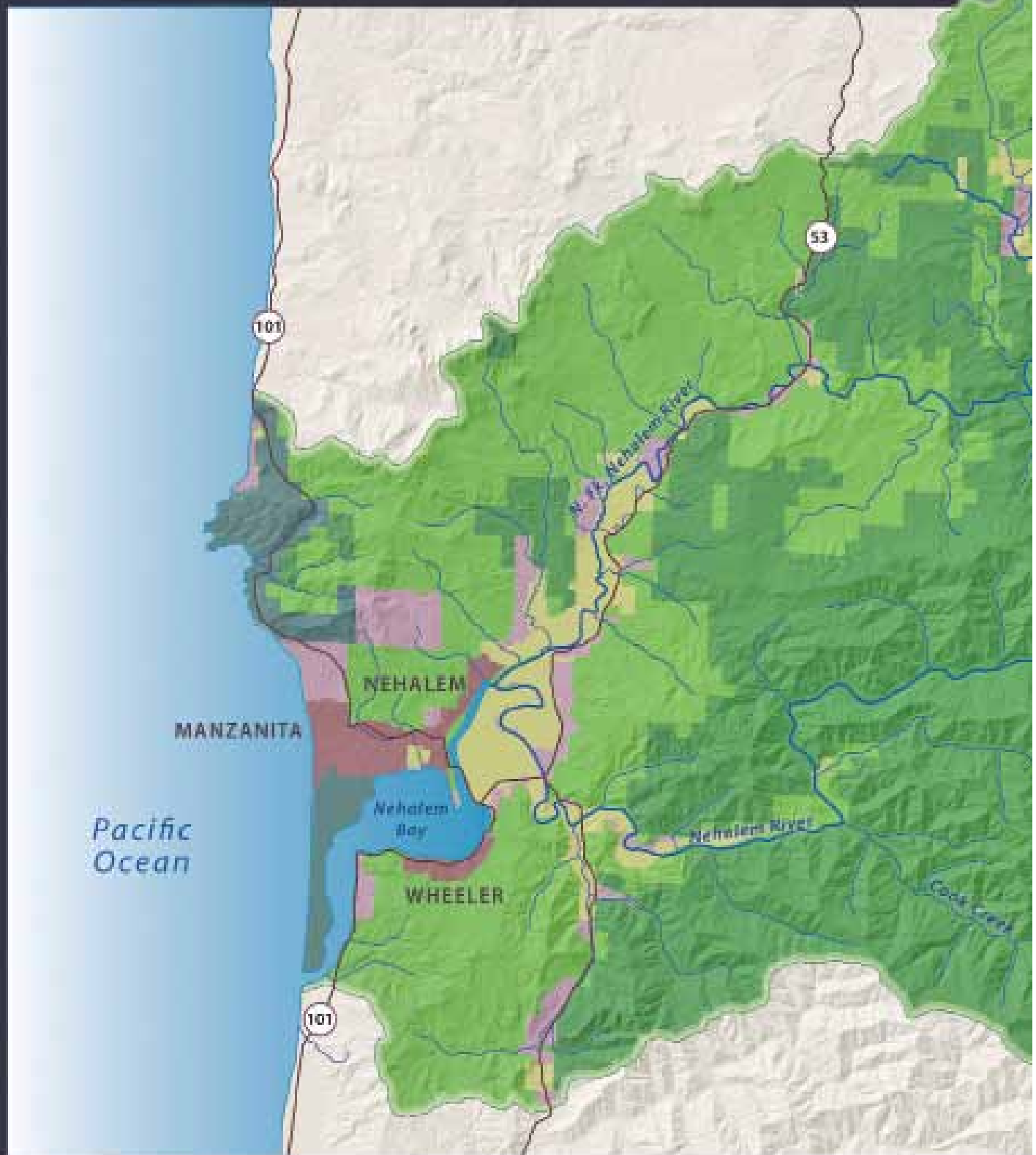


With a rise from sea level to peaks up to 3,000 feet, this terrain varies from dunes, salt marsh, Sitka spruce swamps, and scrub shrub wetlands in the lowlands to a wet temperate rain forest of Sitka spruce, hemlock and Douglas fir. A few mountain bald grassland communities exist at the highest points.

Most of the LNCT service area is timberland either owned by the State of Oregon or private industrial timber companies. A population of approximately 1,800 is clustered in three small towns, Manzanita, Nehalem and Wheeler, with the rest in unincorporated areas along the coast, the bay, the main stem of the Nehalem, and along Foley Creek. Farms are also concentrated around the estuary, the main stem and North Fork of the Nehalem and Foley Creek.

Land Use	Percent of land
The Oregon Department of Forestry	53%
Private industrial timber	40%
Agriculture	3%
Rural Residential	1.7%
Parks	1.7%
Urban	1.2%

LAND USE AND ZONING

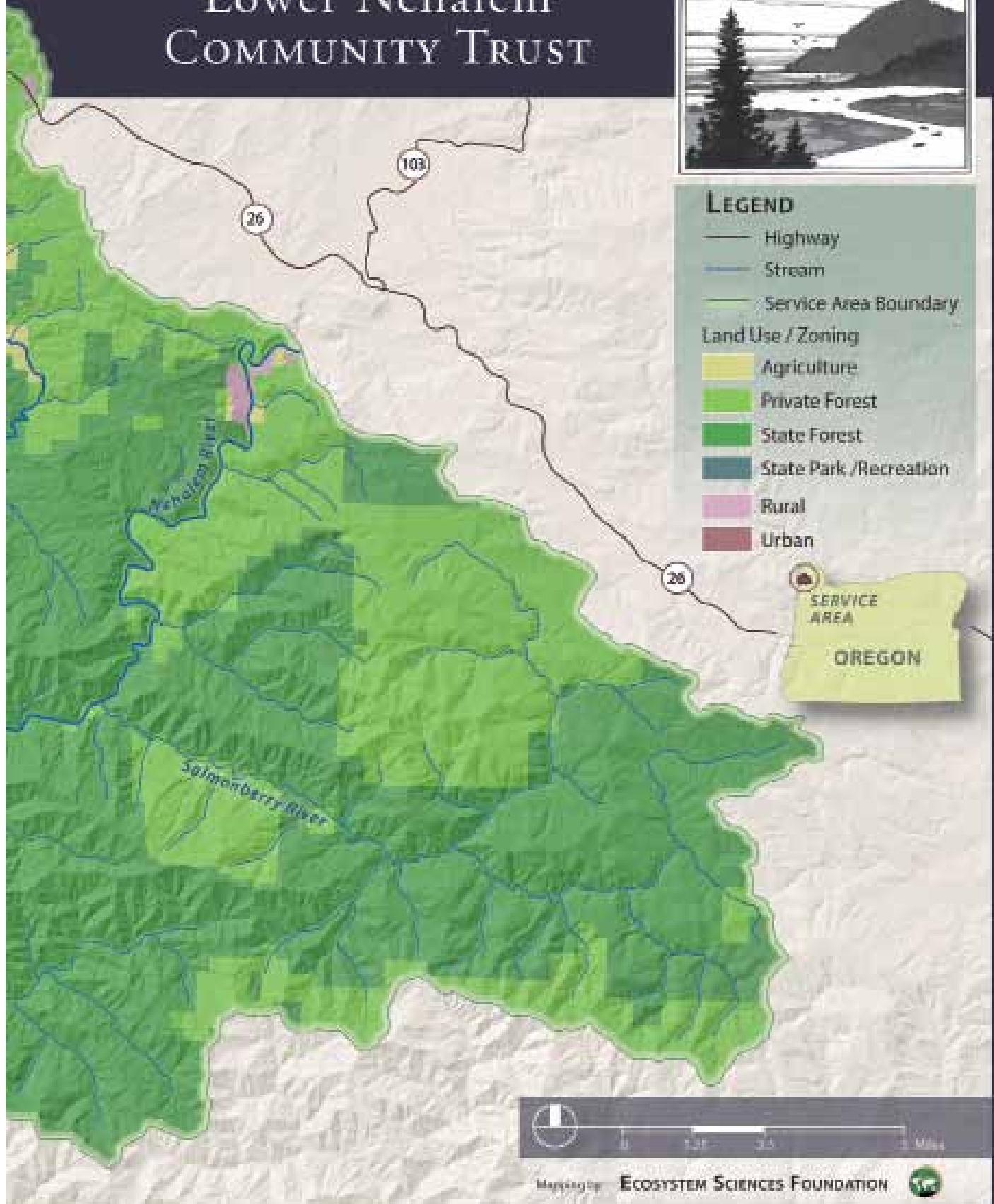


Lower Nehalem COMMUNITY TRUST



LEGEND

- Highway
- Stream
- Service Area Boundary
- Land Use / Zoning
 - Agriculture
 - Private Forest
 - State Forest
 - State Park / Recreation
 - Rural
 - Urban



Mapping by ECOSYSTEM SCIENCES FOUNDATION





Emergent wetlands at Alder Creek Farm. Photo by Gary Seelig

Conservation Strategies

Conservation strategies utilized by the Lower Nehalem Community Trust include:

- land acquisition
- conservation easements
- land restoration and stewardship
- education and community involvement
- working with government and governmental agencies

Land Acquisition

History

During the last ten years the Lower Nehalem Community Trust (LNCT) has acquired over 106 acres of land, most of which is located around the estuary (See Appendix C). Funding partners for land acquisition have included the Oregon Watershed Enhancement Board, the U.S. Fish & Wildlife Service, the U.S. Department of Agriculture, The Collins Foundation, the Wheeler Foundation, and local residents. This land has a current value of over two million dollars. The Trust is committed to preservation of this land “in perpetuity”. The Trust has chosen the estuary and adjacent areas as a focus for acquisitions.

The [North Coast Land Conservancy](#), our sister organization to the north, protects land in our service area. Its service area covers Clatsop, Tillamook and Lincoln Counties. [The Nature Conservancy](#) (an international organization) and [The Wetlands Conservancy](#) (a statewide organization) also protect lands within the LNCT service area. [The Central Coast Land Conservancy](#) service area also overlaps with the LNCT service area. That Conservancy does not currently have any land holdings in our service area.

Opportunities

The Trust anticipates continuing opportunities to acquire high-value habitat around the estuary from willing landowners. Such land comes on the market from time to time, sometimes with high asking prices. Trust acquisition of such land is dependent upon finding funding partners and acquiring the land at its appraised value. Choice of lands for acquisition will be guided by the priorities of the Trust Board and our supporters ([see Appendix A for priorities](#)). This currently includes lands around the estuary, wetlands, fish habitat, stream riparian areas, areas that support an abundance of wildlife, and areas that preserve our natural heritage.

The Trust will develop a rating system to provide for more objectivity in decisions concerning which lands provide the greatest habitat value.

Funding Partnerships

Potential funding partners for future acquisitions include: [The Oregon Watershed Enhancement Board](#), the U.S. Fish & Wildlife Service through the [North American Wetlands Conservation Act](#), the [National Coastal Wetlands Conservation Grant Program](#) and [The Wetlands Reserve Program](#).

Conservation Easements

History

A conservation easement enables a trust to achieve specific conservation objectives on the land while keeping the land in the ownership and control of landowners for uses consistent with the conservation objectives. Objectives might include maintaining and improving water quality, maintaining and improving wildlife habitat and migration corridors, or protecting scenic vistas visible from roads.

The permanent conservation easement “runs with the land”, meaning it is applicable to both present and future owners of the land. When the land is sold, the new landowner may not fully approve of the limitations placed on land usage and decide to contest the provisions of the easement. Because of the [possible costs](#) of such legal proceedings, LNCT decided not to seek conservation easements during the early years of our operation.

The Nature Conservancy, the North Coast Land Conservancy and the Wetlands Conservancy do hold conservation easements on land in the LNCT service area.

Opportunities

During the last year Terrafirma Risk Retention Group LLC, a charitable risk pool owned by participating land trusts, was established by the Land Trust Alliance to provide insurance for legal costs of defending conservation easements. This insurance against the costs of conservation easement litigation is available at a relatively low cost (basic initial annual premium is \$60 per conservation property). LNCT may now consider developing the capacity to hold conservation easements. LNCT recognizes that Terrafirma insurance is not a replacement for individual land trust legal defense funds and stewardship endowments that LNCT would have to develop.

In addition to the costs associated with defending an easement there are other costs associated with maintaining and supporting an easement. These include:

- Development of a baseline documentation report that identifies the important conservation values of the land
- Easement monitoring (at least annually)
- Regular contact with the landowner
- Ensuring that the landowner complies with the provisions of the easement.

The Lower Nehalem Community Trust will develop policies and procedures that would support holding conservation easements with the understanding that the Trust is not currently committed to holding such easements.

Funding Partnerships

Potential funding partners for conservation easements include the same organizations that fund acquisitions: [The Oregon Watershed Enhancement Board](#), the U.S. Fish & Wildlife Service through the [North American Wetlands Conservation Act](#), the [National Coastal Wetlands Conservation Grant Program](#) and [The Wetlands Reserve Program](#).

Restoration and Stewardship

History

The Lower Nehalem Community Trust from its founding has supported stewardship and restoration in our area. As we acquired land our stewardship and restoration work focused on our own properties. Our work has included:

- removing old buildings from Alder Creek Farm and Cedar Creek properties;
- restoring salt marsh and enhancing the wetlands on Alder Creek Farm;
- planting trees and shrubs in riparian areas and on hillsides at Alder Creek Farm and Vosberg Creek and in the wetlands at Cedar Creek;
- placing large wood in Vosberg Creek;
- removal of invasive plants at Alder Creek Farm, Cedar Creek, Vosberg Creek, Sitka Wetlands, Blacktail Ridge and Zimmerman Marsh;
- repairs to the barn at Alder Creek Farm and buildings at Vosberg Creek; and
- co-sponsoring the biennial estuary cleanup.

The local community has been very responsive to opportunities to participate in stewardship and restoration. Local volunteers have completed much of our work during Trust-sponsored workdays. The Oregon Watershed Enhancement Board provided financial assistance for riparian planting and planning for wetlands enhancement on Alder Creek Farm and for cleanup and habitat enhancement at Vosberg Creek. The Wetlands Reserve Program provides financial assistance for wetlands restoration and tree planting on Alder Creek Farm. Other partners include the Lower Nehalem Watershed Council, CARTM, and the Oregon Department of Fish and Wildlife.

All Trust restoration projects are on Trust owned property. The Lower Nehalem Watershed Council supports restoration projects throughout the Lower Nehalem watershed.

Opportunities

The Trust continues to respond to tree planting and invasive control opportunities on our current land. Restoration work for newly acquired land is determined at the time of acquisition and is included in the management plan created for each property.

The [Tillamook Estuaries Partnership](#) and [The Nature Conservancy](#) may be available to assist us in the development of land management plans and the design of restoration projects for our land.

Funding Partnerships

Restoration funding partners for future projects include: [Oregon Watershed Enhancement Board](#) and [National Fish and Wildlife Foundation](#).

Education and Community Involvement

History

The Trust is engaged in a number of activities that are designed to help our community understand our environment and take action using available strategies to conserve land and natural resources. We believe that this community support is essential to promote conservation values.

Trust programs have included:

- children's watershed education;
- adult educational presentations and workshops;
- restoration and stewardship projects;
- the Trust's community garden;
- conservation planning projects; and
- the Trust e-bulletins, newsletters and website.

It should be noted that the Lower Nehalem Watershed Council also provides adult environmental education opportunities in this area.

Opportunities

Our community includes full-time and part-time residents of our small towns, those living in our rural areas, and visitors to our area. There are a variety of ways the Trust can strengthen our education programs and outreach to more deeply engage our community and promote conservation and our conservation values.

- Develop an integrated scope and sequence for our education efforts for pre-school through seniors;
- Expand the presentation of our conservation values in our current outreach events and our printed and digital communications;
- Partner with other conservation organizations and state agencies to deliver adult conservation science education in our community;
- Take advantage of the newest electronic information dissemination techniques to keep our Trust members and other interested community members current on conservation issues and conservation legislation that affect our area;
- Provide opportunities for our community to have personal outdoor experiences that connect them with the variety of key ecosystems and special habitats in our service area;
- Assist community members who wish to form study groups to focus more deeply on particular conservation topics.

Funding Partnerships

Funding partners for our children's education programs include the Eugene Schmuck Foundation and the Tillamook Estuaries Partnership. The Eugene Schmuck Foundation has also provided financial support for the community garden. Other potential funding partners include: [The Brainerd Foundation](#), [Oregon Department of Land Conservation and Development](#) and [5 Star Wetland Restoration & Grants](#). The Lower Nehalem Watershed Council, the Tillamook Estuaries Partnership and the North Coast Land Conservancy are potential co-sponsors for adult presentations and field trips.

Working with Governments and Governmental Agencies

History

Our work with governmental agencies in the past has focused on specific acquisition and restoration projects and a joint planning project as part of the development of the Nehalem Conservation Action Plan ([see Nehalem CAP planning teams](#)).

Opportunities

Governmental agencies routinely seek public comment on proposed plans affecting the environment:

- The Division of State Lands seeks comments on [proposals affecting wetlands](#).
- The Oregon Department of Forestry seeks [public comment](#) on a variety of planning documents.
- The Oregon Watershed Enhancement Board provides opportunities for [public comment on its plans](#).
- The Oregon Department of Fish and Wildlife provides [opportunities to comment on its Wildlife Conservation Strategies](#).

LNCT involvement could range from using these as opportunities for education to using them as tools for influencing public policy.

Funding Partnerships

The [Department of Land Conservation and Development](#) offers grants to local governments to complete projects that update and modernize comprehensive plans, land use ordinances, development codes and other planning regulations.



Foley Creek drainage. Photo by Gary Seelig

ESTUARY AND ASSOCIATED ECOSYSTEMS



Estuary and Associated Ecosystems

Overview

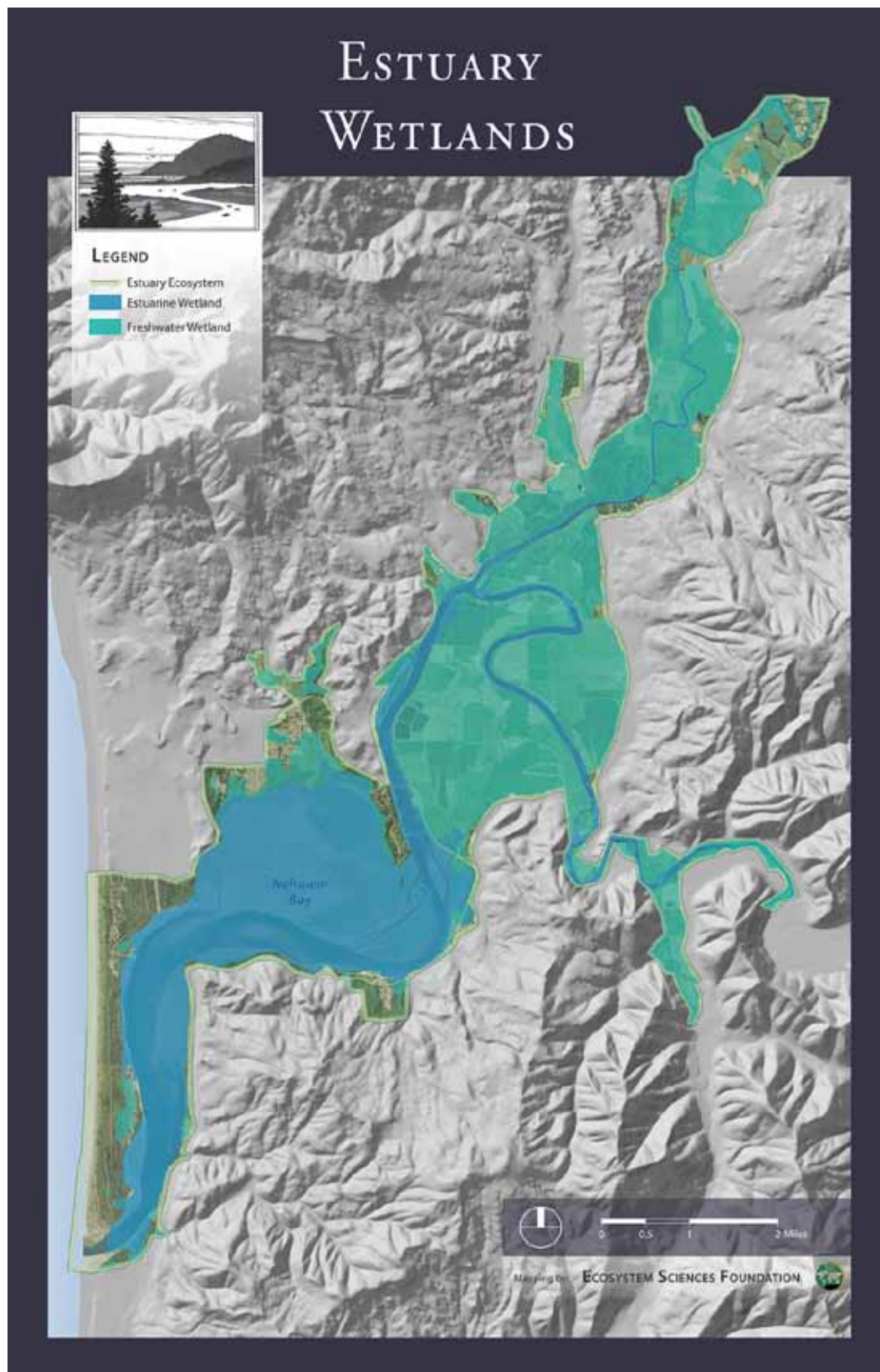
Oregon estuaries received considerable attention with the establishment of the State of Oregon's Planning Goal 16 on the management of estuarine resources in 1973. As part of the implementation of the goal, the State of Oregon published the Estuary Plan Book that identified the level of protection provided to areas in the estuary. Since that time increased attention has been placed on how the areas surrounding the estuary affect the overall health of the estuary ecosystem.

Federal and state funding for land preservation supports acquisition of this land since it nourishes and protects the estuary. It seems logical then for us to focus not only on the estuary proper but also these surrounding areas. The location of the boundaries for this larger ecosystem is arguable but the area highlighted in the map to the left will work for most practical purposes. It includes 12.2 square miles.

This area has seen significant alterations in the last 150 years. Diking has reduced the size of the estuary. Housing development has occurred along its shores. Logging has significantly altered the surrounding forests. Planting on the spit has significantly altered that area. The mouth of the estuary has been moved and armored with rock. Everywhere one looks one sees evidence of alteration.



Estuary at sunrise. Photo by Gary Seelig



The National Wetland Inventory shows 9.97 square miles, or 82%, of this area as wetlands. Approximately 4.35 square miles of this area are part of the estuary and the remaining 5.62 square miles are freshwater wetlands. Estuaries have four main subsystems: marine, bay, slough and riverine. Freshwater wetlands include grasslands, forested, emergent and shrub areas.



Eighty-four percent of the freshwater wetlands surrounding the estuary are zoned for farm use¹. Some of these areas are highly productive. Other areas can only be farmed on a seasonal basis and some areas are so wet that they are not currently used for farming.

¹ The Tillamook County Creamery Association and local farmers oppose any net loss of farmlands.

“Wetlands are threatened by both direct and indirect impacts related to land use. Direct impacts include conversion of wetlands to other uses, primarily urban and agricultural. Indirect impacts originate from surrounding land uses, based on the fact that what occurs on surrounding uplands usually ends up in wetlands.” ([Oregon Explorer](#))

Protection From Direct Impacts

Wetlands management is regulated through a handful of city and county ordinances and federal and state laws.

City and County Zoning

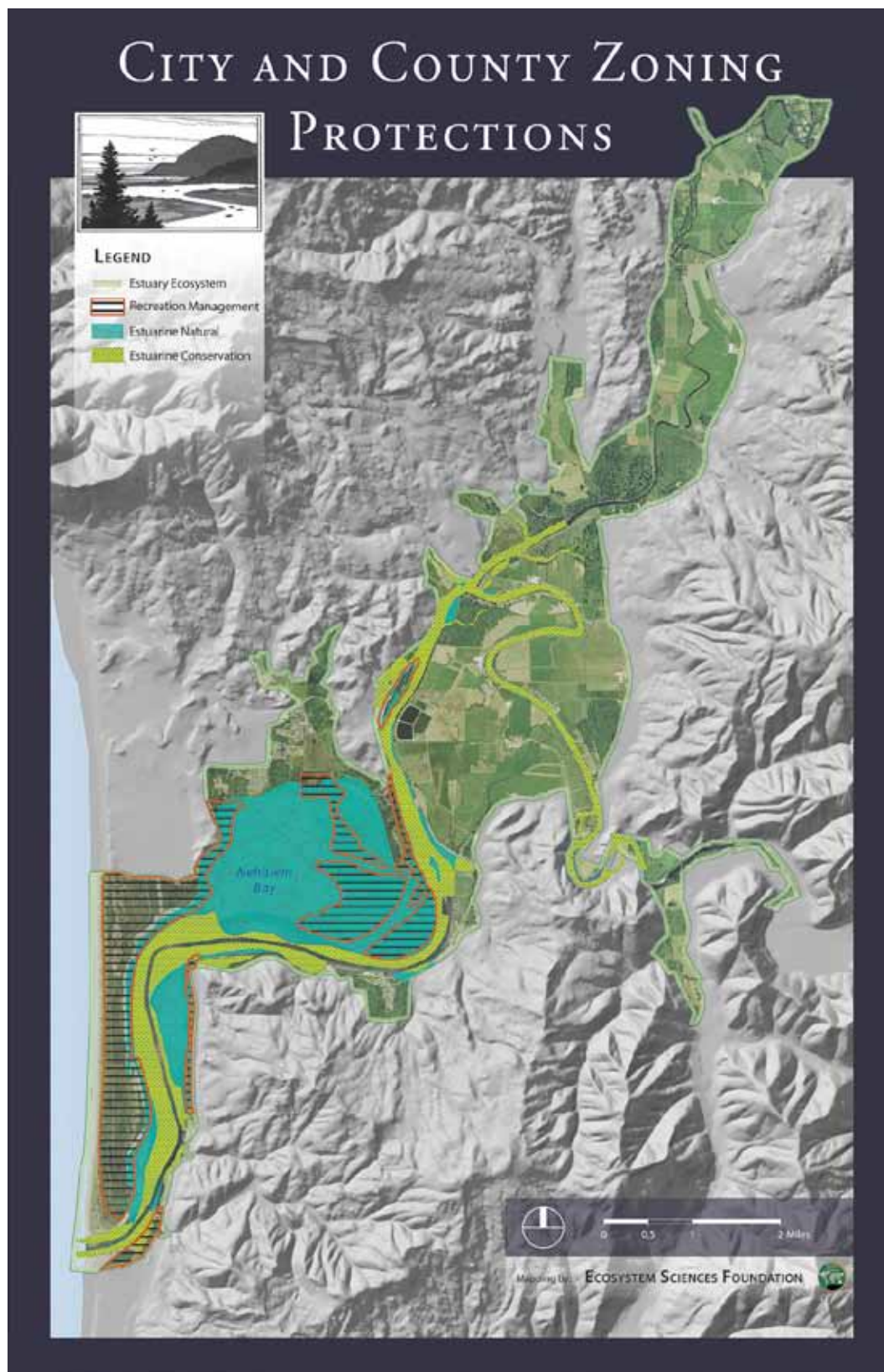
Zoning Type	Management
Estuarine Natural (EN)	Managed to assure the protection of significant fish and wildlife habitats, continued biological productivity of the estuary, and for scientific, research, and educational needs. These areas include all major tracts of salt marsh, tide flats, and sea grass and algae beds.
Estuarine Conservation (EC)	Managed for conservation for long-term use of renewable resources. This includes recreational or commercial oyster and clam beds and tracts of significant habitat of less biological importance than those included in natural management units.
Recreation Management (RM)	Managed for public and private parks and day-use facilities, including such areas that contain significant natural or scenic values. The RM zone is intended to accommodate the type of recreational developments that preserve an area's natural values.

Federal and State Regulations

Governmental Jurisdiction	Activities Covered
U.S. Army Corps of Engineers	Wetlands dredge and fill activity Dam, dike or bridge building activities
Oregon Department of State Lands (DSL)	Filling or removal of soil from wetlands

Protections from indirect (waterborne) impacts

Governmental Jurisdiction	Activities Covered
Oregon Department of Agriculture	Land application of waste, dead animal disposal, and application and use of pesticides. The North Coast Basin Agricultural Water Quality Management Plan provides guidance for management of agricultural land around the Nehalem estuary.
Department of Environmental Quality	Storage, treatment, or disposal of hazardous or solid waste. Storage of animal waste.



The Oregon Department of Fish and Wildlife, the U.S. Fish & Wildlife Service, and the National Marine Fisheries Service provide advisory services to these regulatory agencies (see Appendix B). Protection from indirect impacts requires effective management of the source of the contamination.

History of the Area

Current conditions within our service area have been dramatically affected by the history of land use. Some key events in the history of the estuary and surrounding ecosystems include:

- 1806 Lewis and Clark report approximately 1,000 Tillamook Indians living in the region and confirm that the largest Nehalem Indian site is at Cronin Point along the edge of the Nehalem estuary.
- 1830 Most of the Nehalem Indians had died from diseases contracted from early white settlers.
- 1868 Pioneers settled the towns of Nehalem and Wheeler.
- 1878 Pittsburg lumber mill built, powered by a 20 foot dam across the East Fork of the Nehalem River.

- 1889-1890 Salmon and dairy products become Nehalem's first exports to the outside.

*Wheeler Cannery, 1915.
Photo supplied by
United Methodist Church*



- 1895-1897 A lumber mill and cannery are built near Wheeler. The City of Nehalem still enjoys prominence as an exporter of cheese, milk and salmon.
- 1911 Railroad connecting Portland with Tillamook County completed.
- 1916 Jetty at mouth of Nehalem River completed.
- 1920s Logging activity exploded. A dike wall was constructed to direct river flow (and logs) towards the Wheeler sawmill.
- 1924 Construction of the Nehalem Wheeler dike road - effectively removed the marsh and slough area of the east bank of the river (Gallagher Slough and vicinity) from the influence of tidal waters.
- 1950-60 European beach grass, Scotch broom and coast pine species were planted on the Nehalem spit to stabilize the dunes.

*Planting beach grass.
Photo courtesy Neahkahnie
Visions/ Mark Beach*



Endangered Species and Species of Concern

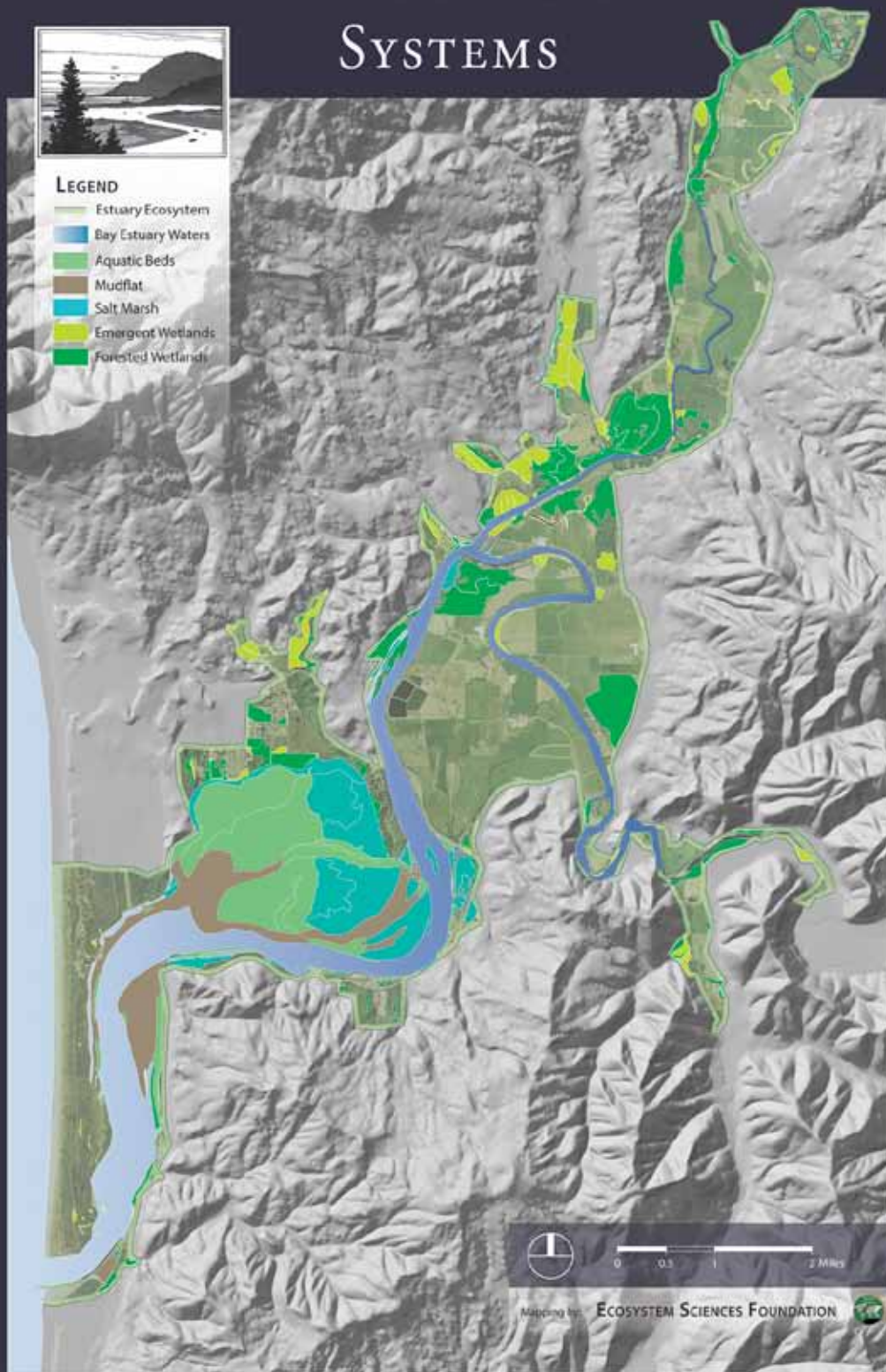
Endangered Species

Species	Habitat
Coho salmon	Found throughout the estuary and in the surrounding streams
Western snowy plover	Sandy or salty areas that generally do not have much vegetation
Oregon silverspot butterfly	Coastal terrace and headland “salt spray” meadows and coastal dune systems

Species of Concern

Species	Habitat
Pacific lamprey	In the estuary and nearby streams
River lamprey	In the estuary and nearby streams
Coastal cutthroat trout	Coastal cutthroat trout use a large variety of habitat types including lower and upper reaches of both large and small river systems, estuaries, sloughs, ponds, lakes and nearshore ocean waters. They spend more time in the freshwater environment than do most other anadromous Pacific salmonids. In freshwater habitat these fish prefer deeper pool habitat and cover, such as that formed by woody debris.
Purple Martin	Open land near water is the main Purple Martin nesting and foraging habitat. Purple Martins can be found in developed areas, along waterfronts, and in fields, wetlands and clearings.
Northern Pacific pond turtle	Found in marshes and irrigation ditches with abundant vegetation. May enter brackish water and even seawater.
Pink sand verbena	On beaches and sand dunes.
Pt. Reyes bird's-beak	Coastal beaches and salt marshes.
Frye's Limbella	Dense coastal shrub swamps or in open, weedy herbaceous vegetation along dune lakeshores.

KEY ECOLOGICAL SYSTEMS



Key Ecological Systems

Five ecological systems are of high priority for preservation and restoration. Each contributes in a unique way to the health of this area. They are:

- Mudflats
- Aquatic Beds
- Salt Marshes
- Emergent Wetlands
- Spruce Swamps (Forested Wetlands)

Mudflats

“Mudflats are usually found around estuaries and other sheltered coastal areas where wave action is low and sediments are deposited. The sediments consist mostly of silts and clays with a high organic content... In large estuaries they may be several miles wide and commonly form the largest part of the intertidal area of estuaries. . . .

“Mudflats are characterized by high biological productivity and abundance of organisms, but low diversity with few rare species. The surface of the sediment is often apparently devoid of vegetation, although mats of benthic microalgae are common.

“Mudflats, together with other intertidal habitats, support large numbers of predatory birds and fish. They provide feeding and resting areas for internationally important populations of migrant and wintering waterfowl, and are also important nursery areas for flatfish.” ([Oregon Explorer](#))



Mudflats. Photo by Gareth Ferdun

Zoning provides a relatively high level of protection from direct impacts. Indirect impacts can be considerable. Threats come from surrounding areas and drift downstream onto the mudflats. E-coli bacteria from farm and human waste can contaminate shellfish. Excessive E-coli concentrations have been found at Gallagher Slough at Hwy 101 and Coal Creek at North Fork Road. Heavy metals can also be a health threat since they can accumulate in shellfish. We do not currently have information on the concentrations of metals and synthetic organic substances in the estuary. However, we do see a large accumulation of metals, plastics and tires during our biennial estuary cleanup.

Over time the Nehalem estuary mudflats are slowly being filled in with sediment brought down from forested areas.

Aquatic Beds

“The aquatic bed category includes both subtidal and intertidal algal and eelgrass beds that frequently occur in bay and slough subsystems. These communities probably represent a significant portion of the primary production in Oregon estuaries. Eelgrass is the most common species of seagrass. It grows in both sand and mud substrates. It is a rapid growing plant that provides habitat for a diverse community of estuarine plants and animals. Its leaves support large numbers of algal and invertebrate epiphytes that are consumed by fish and larger invertebrates and are the primary food of black brant during their migration along the Oregon coast. Clam beds are often associated with eelgrass. In some estuaries, eelgrass leaves provide a spawning surface for herring. Thick beds of eelgrass reduce currents near the bottom and promote deposition of sediment, while roots and rhizomes bind sediments and prevent erosion. Finally, eelgrass decomposition contributes nutrients to the detrital food chain.” ([Inforain](#))

Again, zoning provides a relatively high level of protection from direct impacts. Indirect impacts are similar to those found for mudflats. In addition, aquatic beds can be smothered by fine sediment generated by erosion from forestry, roads, mining, and construction sites and from dredging in the estuary. ([ODFW Conservation Strategy](#)).



Aquatic bed. Photo by Gary Seelig

Salt Marshes



Salt marsh. Photo by Gareth Ferdun

[Salt marshes](#) are among the most productive ecosystems in the world. Flood tides sweep sediments and nutrients into the marsh, which drop out and settle during slack-water periods. Ebb tides flush dead plants and other organic material out of the marsh and into the estuary, where they enter the detrital food chain and contribute significantly to estuarine food webs. Seaward portions of salt marshes emerge from sand flats and mudflats as they accumulate silt flowing down the rivers. They become a transition zone between estuarine and upland ecosystems.

Currently the Nehalem estuary has about 536 acres of salt marsh. Since the late 1800s about 555 acres of salt marsh have been lost due to diking in the estuary. On the other hand new sediment has added about 148 acres of salt marsh. Given the ecological importance of salt marshes the remaining areas of salt marsh are a high priority for preservation.

Most salt marsh is zoned estuarine natural with a high level of habitat protection. Some marshes, however, are in areas zoned for agricultural use. The level of habitat protection provided by this type of zoning is limited. Invasive plants can become a threat to marsh habitat.

Emergent Wetlands

Emergent wetlands contain erect, rooted, herbaceous hydrophytes (plants that grow best in water). Perennial plants usually dominate these freshwater wetlands. In general these areas are so wet that they have not been converted to grasslands for farm use and mostly contain native freshwater vegetation.

The area adjacent to Gallagher Slough was at one time a large salt marsh. Diking, the construction of Highway 101 and the placement of tide gates under 101 removed the saltwater influence in this region. The lower end of this area is an emergent wetland, while the higher parts have been converted to farm use. Other important emergent wetlands are along the North Fork of the Nehalem near McDonald Road.

These areas are zoned for farm use and hence do not have the level of zoning protection provided for the ecological systems described above. Standard farming practices such as ditching can have a significant impact on this type of wetland.



Emergent wetland. Photo by Gary Seelig

Spruce Swamps (Forested Wetlands)

Spruce trees dominate forested wetlands around the Nehalem estuary. Spruce is very tolerant of standing water, which allows it to survive in the areas where water accumulates during the rainy season. Spruce in swampy areas do not grow as large as they do in the uplands. We find these spruce swamps adjacent to both salt marshes and freshwater sloughs. They are very productive, and winter rains carry a substantial amount of their vegetation into the estuary where it enters the estuarine food chain. Spruce swamps were once common in Pacific Northwest estuaries. Most of them have been cut down and the land has been converted to urban and farm use. The Nehalem estuary retains a large spruce swamp at the foot of Coal Creek and other smaller swamps around the estuary. Sixty-eight percent of the spruce swamp area that was once around the estuary has been lost. ([Nehalem Conservation Action Plan](#), p. 85)



Spruce swamp. Photo by Gareth Ferdun

LNCT Conservation Strategies for the Estuary and Associated Ecosystems

The Lower Nehalem Community Trust will employ the full range of conservation strategies in the estuary and associated ecosystems:

- Land acquisitions,
- Conservation easements,
- Restoration and stewardship projects on trust lands,
- Education and community involvement strategies, and
- Working with government and governmental agencies.

Nearshore Ocean Areas

The area just off the coast along the ocean shoreline is not specifically included within the Trust service area although that area forms one border of our service area. The State of Oregon has defined this nearshore ocean area as the area from the coastal high tide line offshore to the 30 fathom (180 feet or 55 meter) depth contour or out to three nautical miles. This area includes a “variety of habitats ranging from submerged high-relief rocky reefs to broad expanses of intertidal sandy beaches... (It is) home to a diversity of marine organisms, including species of bony fishes, cartilaginous fishes, invertebrates, mammals, and algae.” ([The Oregon Nearshore Strategy](#)) The state has deemed it worthy of management and conservation. LNCT anticipates supporting education, community involvement and interacting with government agencies in support of conservation in these areas. (See [Nearshore Ocean Areas](#) and Appendix D, Cape Falcon Marine Reserve)



LNCT's Peregrine Point. Photo by Linda Cook

Freshwater and Riparian Ecosystems



Coal Creek. Photo by Gary Seelig

Overview

The habitats created by rivers/streams and riparian areas are highly interdependent. The water supports the riparian vegetation and wildlife, and the riparian vegetation and wildlife in turn support the river and stream habitat functions. From the early 1900s through the 1960s this system was severely degraded by timber practices that removed large wood from streams, clear-cut to the stream edges, and built roads that blocked fish passage. As one of the consequences coho salmon runs fell to dangerously low levels. With the development of the Oregon Forest Practices Act and the [Oregon Plan for Salmon and Watersheds](#) the long, slow process of recovery of this system began.

MAJOR RIVERS AND STREAMS



Lower Nehalem COMMUNITY TRUST



LEGEND

- Stream
- Service Area Boundary



0 1.25 2.5 5 Miles

Mapping by

ECOSYSTEM SCIENCES FOUNDATION



History of Freshwater and Riparian Systems

1850–1978	Little or no restriction on timber harvest or road building practices in riparian areas.
1850–1920	Clearing of streams to move logs downstream and also in the mistaken belief that this would be of benefit to fish.
1978	Comprehensive revision of Forest Practices Act in response to provisions of the Federal Clean Waters Act. Revision to harvesting and road construction rules dealing with riparian protection.
1988	Mandatory written operations plans for timber harvests within 100 feet of perennial streams. Mandatory written operations plans for timber harvests within 300 feet of sites of threatened or endangered species; sensitive bird nesting, roosting or watering; significant wetlands; or biological sites.
1995–1998	Development of the Oregon Plan for Salmon and Watersheds .
1999	Formation of the Lower Nehalem Watershed Council .
1999	Completion of an Assessment of the Nehalem Watershed by Portland State University.
2002	Completion of a Lower Nehalem Stream Habitat Assessment by Todd Boswell.
2000–2013	Large wood, riparian planting and culvert replacement projects on private land in the Lower Nehalem Watershed by the Lower Nehalem Watershed Council. Replacement of culverts under state highways by the Oregon Department of Transportation (ODOT).



Coho salmon, endangered species. Photo by Gary Braasch

Endangered Species and Species of Concern

Endangered Species

Species	Habitat
Coho salmon	Coho salmon prefer low stream velocity, shallow water and small gravel for spawning. Most coho fry stay in the stream for over a year feeding on aquatic insects, zooplankton and small fish.

Species of Concern

Species	Habitat
Pacific lamprey	Suitable hiding places and clean spawning gravels.
River lamprey	Suitable hiding places and clean spawning gravels.
Coastal cutthroat trout	In freshwater habitat these fish prefer deeper pool habitat and cover, such as that formed by woody debris.
Harlequin duck	Turbulent water, along fast-moving mountain streams. The streams are usually at low to subalpine elevations within a closed forest canopy, and have midstream gravel bars or rocks for roosting.
Northern Pacific pond turtle	Found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater.
Coastal tailed frog	Inhabits cold, clear, rocky streams in wet forests.
Southern torrent salamander	Found in shallow, cold, clear, well-shaded streams, waterfalls and seepages, particularly those running through talus and under rocks all year, in mature to old-growth forests.
Bog anemone	Bogs and fens.

*Bog anemone,
species of concern.
Photo source: bob araska.org*



Key Ecological Systems

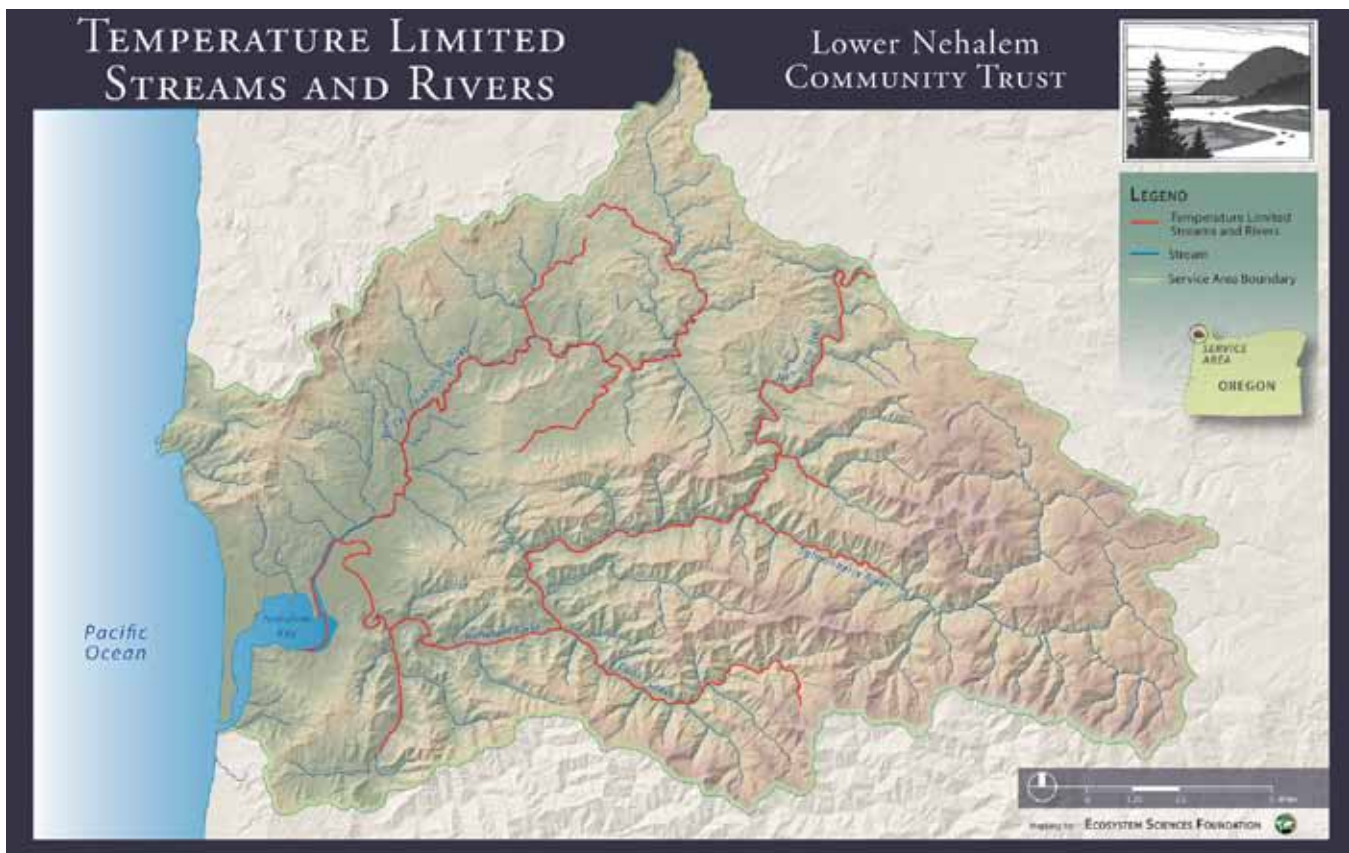
Rivers and Streams

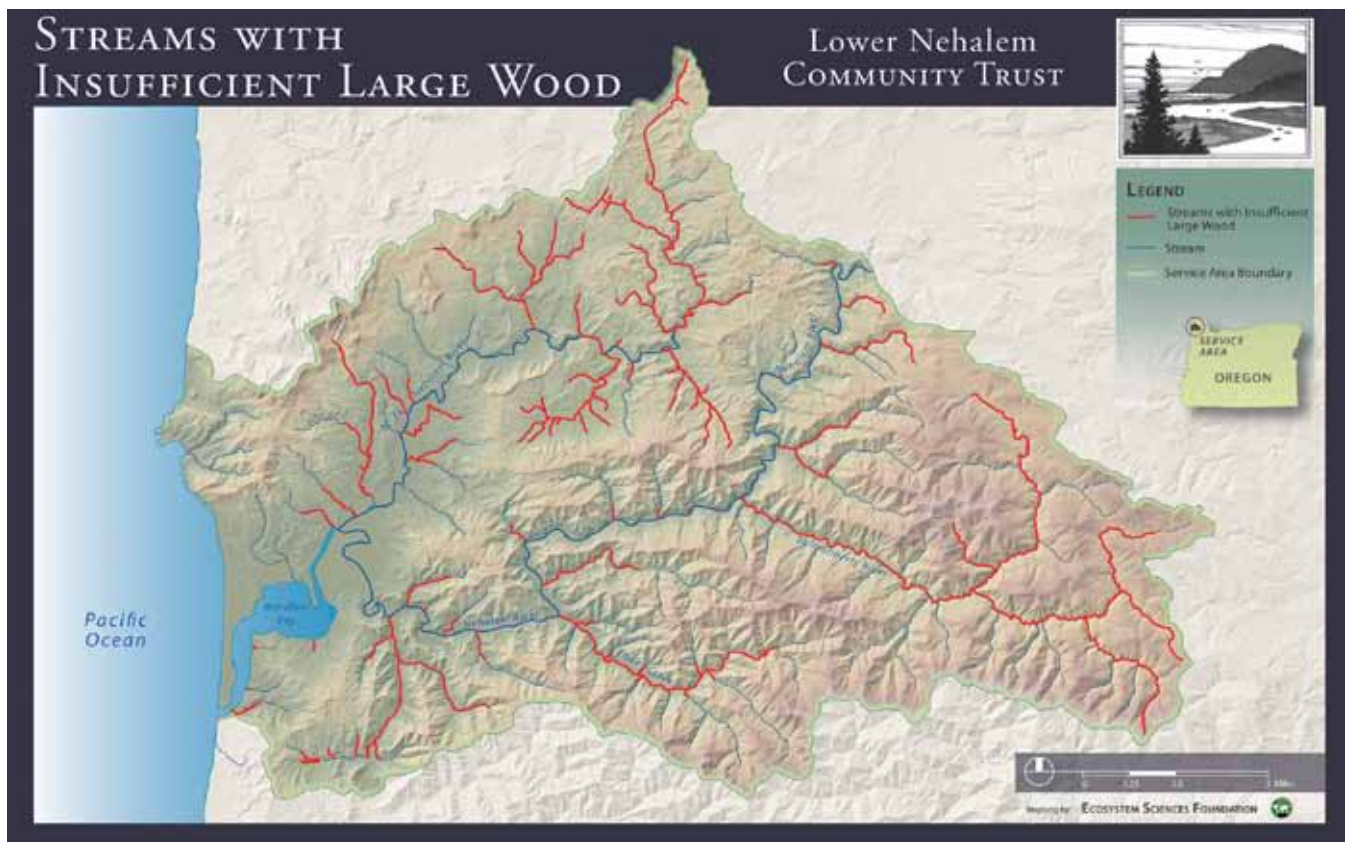
“Water is crucial for all fish and wildlife, and high quality freshwater aquatic systems provide essential habitat to many at-risk species, including important spawning and rearing habitat for salmonids, breeding habitat for amphibians, and habitat for freshwater mussels and other invertebrates.” ([Oregon Conservation Plan, freshwater aquatic habitat](#))

Warm waters in many of the Nehalem rivers and streams have a direct impact on the quality of fish habitat. Most of the main stem of the Nehalem River and the Nehalem North Fork are too warm for fish during the summer months and are therefore unavailable for fish rearing during this period of time. Sections of the Salmonberry River, Soapstone Creek and Foley Creek are also too warm for fish habitat during the summer months. Other areas in the service area are too warm for fish spawning during the fall months. These include God’s Valley Creek, sections of the Salmonberry River, the upper reaches of the Nehalem North Fork, and parts of Cronin Creek.

The accumulation of heat in the upper reaches of streams affects temperatures in all downstream reaches. It follows therefore that protection and restoration of the higher stream reaches can have a benefit to a larger amount of habitat than providing shading for a similar sized area downstream (all other things being equal).

“In many locations, flow and hydrology have been impacted by barriers (e.g., roads, dams and culverts) ...”. ([Oregon Conservation Plan, freshwater aquatic habitat](#)). Most of the culverts





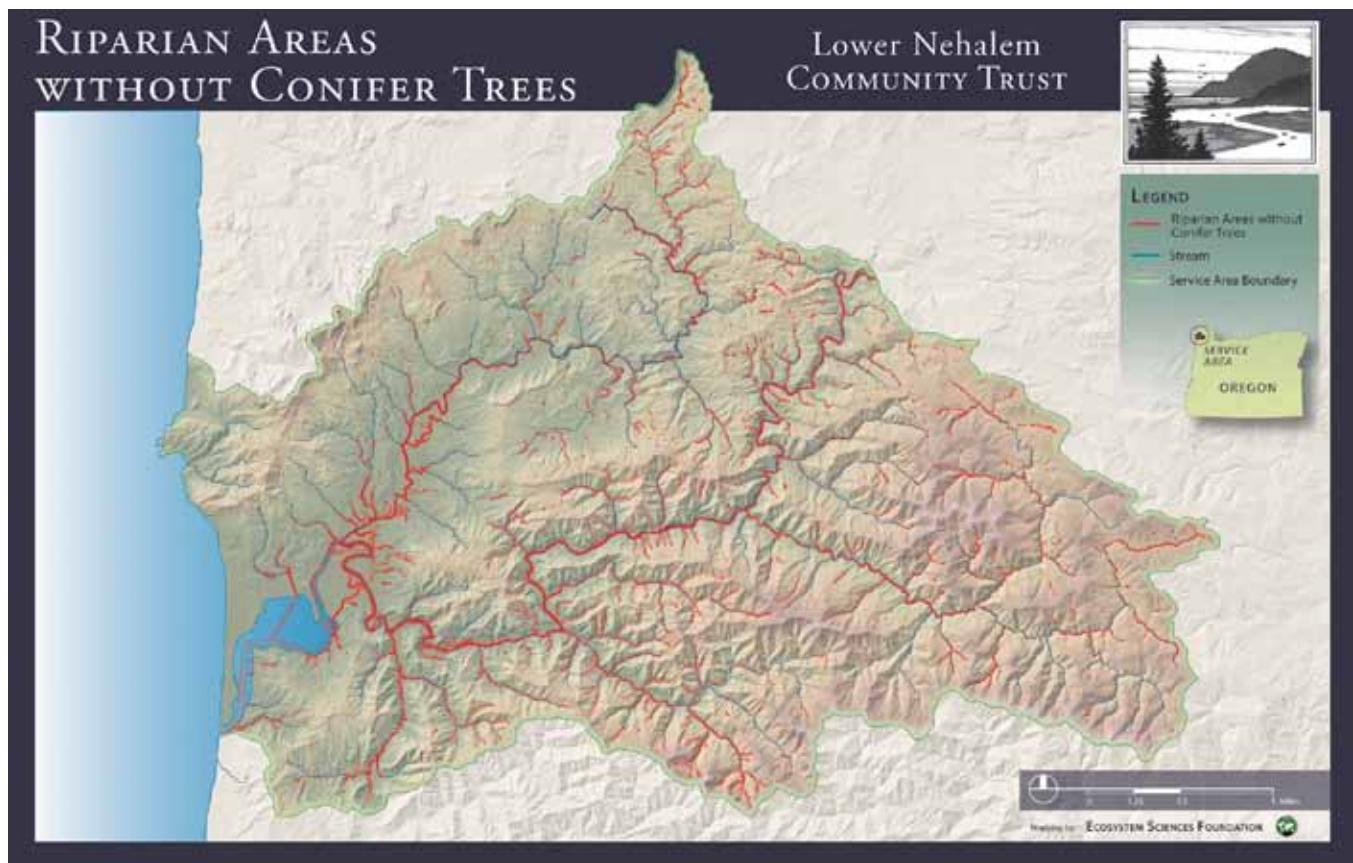
in the lower Nehalem that blocked coho fish passage have been replaced during the last twelve years. However, there are still over 250 unevaluated fish stream crossings in our service area that may block fish passage for trout.

Large wood in streams creates a complex habitat of pools and spawning grounds for fish. Pools provide fish with a low energy rearing environment, maximum exposure to drifting food organisms and cover from predators. Changes in water velocity associated with large wood structures produce nearby sand and gravel banks suitable for fish eggs. There are over 100 miles of coho fish stream that do not have sufficient large wood to provide quality habitat for this and other species of salmon.

Riparian Areas

Healthy riparian vegetation protects banks from erosion, influences in-channel aquatic habitats, maintains favorable water temperature for fish through shading, filters runoff, and provides nutrients. Riparian vegetation creates meanders and increases habitat complexity in valley bottoms. These areas also provide habitat for birds and other wildlife. ([Oregon Conservation Plan, Riparian Habitats](#))

Streamside vegetation is critical for keeping stream water cool for salmon and provides a source of large wood that in time falls into the streams, creating the complex habitat needed for fish spawning and rearing. The riparian areas of Nehalem forest streams are mostly alder trees. These trees provide shade but are not a good source of large wood since this type of wood decomposes rapidly after it falls into streams. It appears that planting conifers in these areas will be the most cost-effective method, long term, for providing adequate large wood and stream complexity.



A wide variety of standards has been developed to provide guidance to landowners concerning the amount of vegetation needed to prevent heat buildup in stream. These include:

Source	Tree buffer requirement for fish-bearing streams
Northwest Forest Plan	Buffers are typically 340 feet for fish-bearing streams, and 170 feet for non-fish-bearing streams.
Forest Management Plan (Oregon Department of Forestry land)	Stream bank zone (0-25 feet) - No Harvest. Inner RMA zone (25-100 feet) - Manage for mature forest conditions – allows some partial cutting.
Forest Practices Act (Private Industrial Timber)	Retain all trees within 20 feet - No Harvest. Retain at least 30-40 live conifers of 8-11" DBH (medium and large streams respectively)/1000 feet of stream (within 50 feet on small streams, 100 feet on large streams).
North Coast Basin Agricultural Water Quality Management Area Plan	Riparian vegetation should shade 75 percent of a natural waterway where the water body is not too wide and when achievable in the summer. Fence riparian areas to limit or exclude livestock access.

Recent research by the Oregon Department of Forestry has established that the current riparian buffer requirements of the Forest Practices Act are not sufficient to prevent heat buildup in streams. The lower standards for agricultural land also seem to be inadequate to prevent heat buildup.

An analysis of riparian areas around the Nehalem estuary, based on satellite photos, shows a need for planting for shade along over nine miles of these estuary streams. Fourteen different landowners own these streamside areas.



Typical alder dominated riparian area. Photo by Gareth Ferdun

ESTUARY STREAMS NEEDING RIPARIAN PLANTING



LNCT Conservation Strategies for Freshwater and Riparian Ecosystems

The Lower Nehalem Community Trust will focus on the following conservation strategies in freshwater and riparian ecosystems:

- Conservation easements along the headwaters of streams on private timber lands,
- Education and community involvement strategies, and
- Working with government and governmental agencies to improve riparian habitat and protection.

The Trust will support restoration projects undertaken by the Upper and Lower Nehalem Watershed Councils and the Nehalem Conservation Action Plan implementation teams, and efforts by other land trusts to conserve freshwater and riparian areas. The Trust anticipates that large wood placement and riparian planting projects in these areas will be developed and managed by the Lower Nehalem Watershed Council.



North Fork of Nehalem River. Photo by Gary Seelig



Forest habitat. Photo by Gary Seelig

Forests and Associated Ecosystems

Overview

Sitka Spruce/Western Hemlock forests generally occupy lands near the coast, where ocean fog and winds influence local conditions. Soils tend to be deep, acidic and well drained. Sitka spruce dominates the overstory, but western hemlock, western red cedar, Douglas fir, big leaf maple and red alder may be present. The lush understory has salmonberry, vine maple, salal, evergreen huckleberry, sword fern, deer fern and a high diversity of mosses and lichens. Due to high precipitation, fires are rare and the primary disturbances are due to wind throw.

At higher elevations and further inland, the influence of the Pacific Ocean on local climate conditions is dampened sufficiently to allow Douglas Fir/Western Hemlock forests to prevail. Historically Douglas fir has been the preferred source of timber. It provides a dense, stiff and durable wood. It grows straight and tall, sometimes growing larger than 10 feet in diameter. Unfortunately it has been planted in wetter areas where it has been susceptible to fungus infection (Swiss needle cast).

Almost all of the forested areas in the Lower Nehalem are managed for timber production. Areas owned by private timber firms are actively managed with clear cuts scheduled every 30-50 years. State owned lands, which are still recovering from old clear cuts and the effects of fires, are managed for a more complex forest structure.



The Oregon Forest Practices Act and the State Northwest Forest Management Plan place limits on timber harvest practices. Both of these governing documents are subject to continuing changes that are initiated by the State Legislature, the Department of Forestry or the Board of Forestry.

The actions of these governing bodies are influenced by:

- The federal government through the Endangered Species Act,
- Timber industry lobbyists seeking higher harvest levels,
- County governments seeking to increase tax income, and
- Environmental groups seeking to protect the natural environment.

The resulting documents are a complex compromise between these competing interests.

Threats	Causes
Disease	Planting of Douglas Fir in spruce hemlock zones Single aged dense tree stands Poor management of diseased areas
Invasive Plants	Roads that allow easy access Poor control of invasives
Excessive Harvest	Economic pressures in private timber firms and from county commissioners

History of Forest Ecosystems

1800-1972	Almost no restrictions on logging practices.	
	<i>Tillamook County old growth logging. Photo courtesy of Neahkahnie Visions/Mark Beach</i>	
1913	Oswald West sponsored a bill to make Oregon beaches public highways.	
1933-1951	The Tillamook Burn was a series of catastrophic fires in 1933, 1939, 1945 and 1951 that burned over 350,000 acres.	
1933-1951	Ownership of significant land holdings was transferred to the county for delinquent property tax payments.	
1940-1960	The counties deeded the lands to the State of Oregon for management. Clatsop County lands were largely cutover, sparsely roaded if at all, and were covered with brush and grass. Tillamook County lands were mostly Tillamook Burn areas.	
1950–1974	Intensive reforestation work occurred in Tillamook Burn area.	
1940-1960	Decline of logging and fishing.	
1945	Old growth timber gone.	
1972	Adoption of the first voluntary forest practices rules.	
1973	Endangered Species Act passed.	
1978	Comprehensive revision of Forest Practices Act in response to provisions of the Federal Clean Waters Act. Revision to harvesting and road construction rules dealing with riparian protection.	
1991	Protection rules for Northern Spotted Owl nesting sites.	
1970-2002	Partial cutting is the primary focus for harvesting on state lands.	
1999	Seven salmon species are listed under the Endangered Species Act.	
2001	Completion of the first Northwest Forest Management Plan for State Forests.	
2002	Young trees, 35 - 55 years old, dominate the State Forest.	
2003	Management emphasis changes to focus on regeneration harvests of Douglas fir stands severely impacted by Swiss needle cast (SNC).	
2001–2010	Revisions to the Northwest Forest Management Plan to provide for larger timber harvests. (see Northwest Oregon Forest Management Plan - Revised April 2010)	

Endangered Species and Species of Concern

Endangered Species

Species	Habitat
Marbled murrelet	Larger, unfragmented stands of old growth appear to be the highest quality habitat for marbled murrelet nesting.
Northern spotted owl	Forests characterized by dense canopy closure of mature and old growth trees, abundant logs, standing snags and live trees with broken tops.

Species of Concern

Species	Habitat
White-footed vole	Various Oregon specimens have been found among mossy stones along a small stream that flows through a heavy forest of Douglas fir with an understory of sword fern, moss and a tangle of vine maple, in or around a salmonberry thicket.
Townsend's western big-eared bat	Habitat associations include: coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types.
Silver-haired bat	Coniferous forests.
Long-eared myotis bat	Coniferous forests.
Fringed myotis bat	Roosts in trees, snags, buildings, caves, rocks, and cliffs and under bridges.
Long-legged myotis bat	Montane coniferous forests.
Yuma myotis bat	Associated more closely with water than any other North American species of bat.
Olive-sided flycatcher	Breeds in montane and northern coniferous forests, at forest edges and openings, such as meadows and ponds.
Mountain quail	Dense cover with scattered open areas on slopes in foothills and mountains. Use the dense thickets resulting from fires or clear cuts, and are seldom found far from this cover. Scotch broom thickets provide ideal cover for Mountain Quail, as do alder thickets along streams.
Band-tailed pigeon	Conifer rain forest.

Species	Habitat
Northern red-legged frog	Lowland moist forested areas.
Frigid shootingstar	Alpine meadows and slopes. Moist basalt cliffs and steep slopes on thin soils near streams and waterfalls in open or shaded conditions.
Coast Range fawn lily	This species is found in a variety of Coast Range habitats, including meadows, rocky cliffs, brush land, open and closed coniferous forest and the edges of sphagnum bogs at elevations above 790 m (2600 ft).
Queen-of-the-forest	Bedrock crevices that have water seeping over the rock surface throughout much of the year. Occurrences are usually located near the high water mark of rivers or their tributaries.
Saddle Mountain saxifrage	Western saxifrage may be found on seasonally moist (spring) slopes, cliffs, and stream banks from sea level to alpine habitats.
Cascade Head catchfly	Cascade Head catchfly is a grassland species found on steep coastal bluffs, ledges, and slopes facing the ocean at elevations ranging from 46-460 m (150-1500 ft). Plants occur among rocky outcrops in areas characterized by shallow soils, exposed bedrock, and low vegetation, as well as in grassy meadows characterized by deeper soils and denser vegetation cover.

*Marbled murrelet,
an endangered species.
Photo source: sfbaywildlife.info*



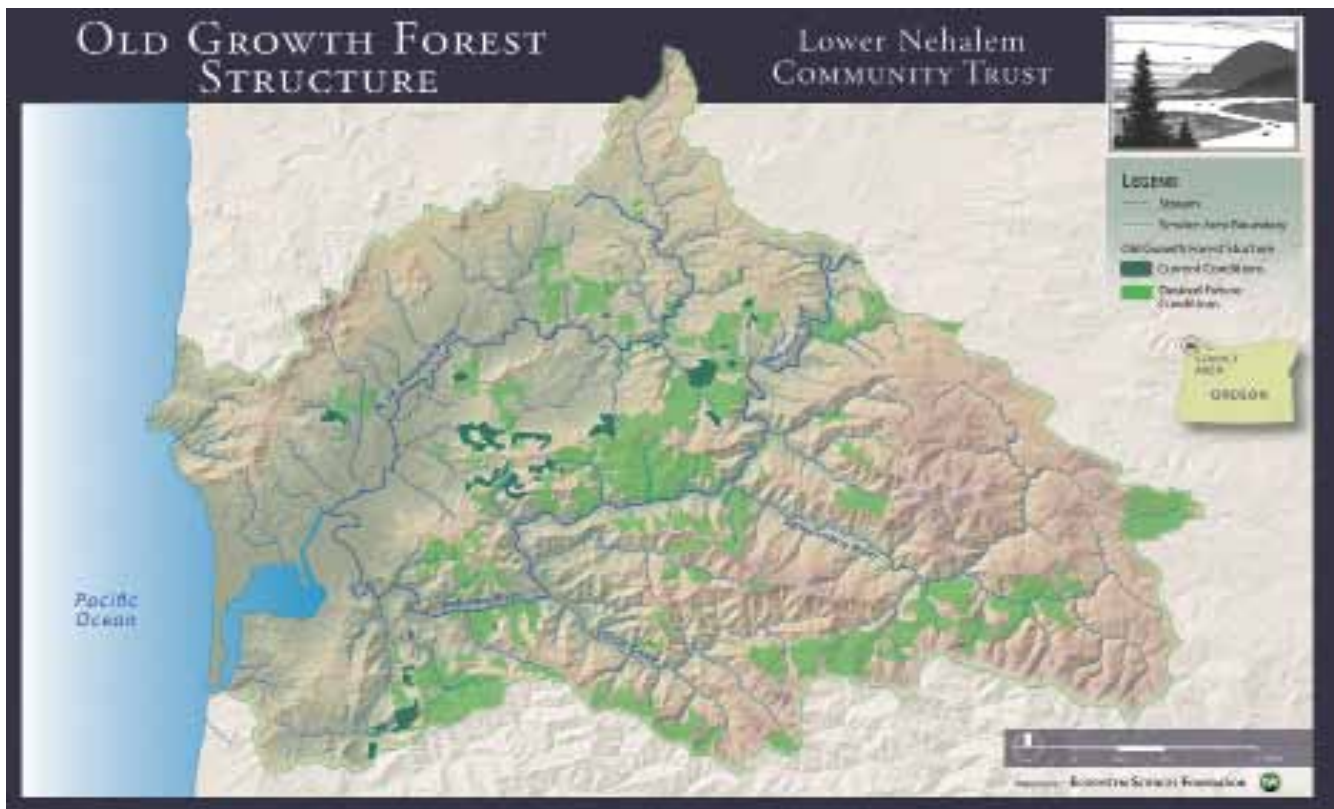
Key Ecological Systems

Late Succession Conifer Forests

[Late Succession Conifer Forests](#) are defined by the plant species composition, overstory tree age and size, and the forest structure. They include characteristics such as a multi-layered tree canopy, shade-tolerant tree species growing in the understory, large-diameter trees and a high volume of dead wood such as snags and logs.

Based on a comparison between historic (1850) and current vegetation maps, an estimated eight percent of late-succession forest remains in the Coast Range. ([Oregon Conservation Plan, Late Succession Conifer Forests](#)) Oswald West State Park contains one of the few groves of true old growth Sitka spruce remaining on the northern Oregon coast.

*Oswald West State Park old growth.
Photo by Gary Seelig*





Department of Forestry old growth structure. Photo by Gareth Ferdun



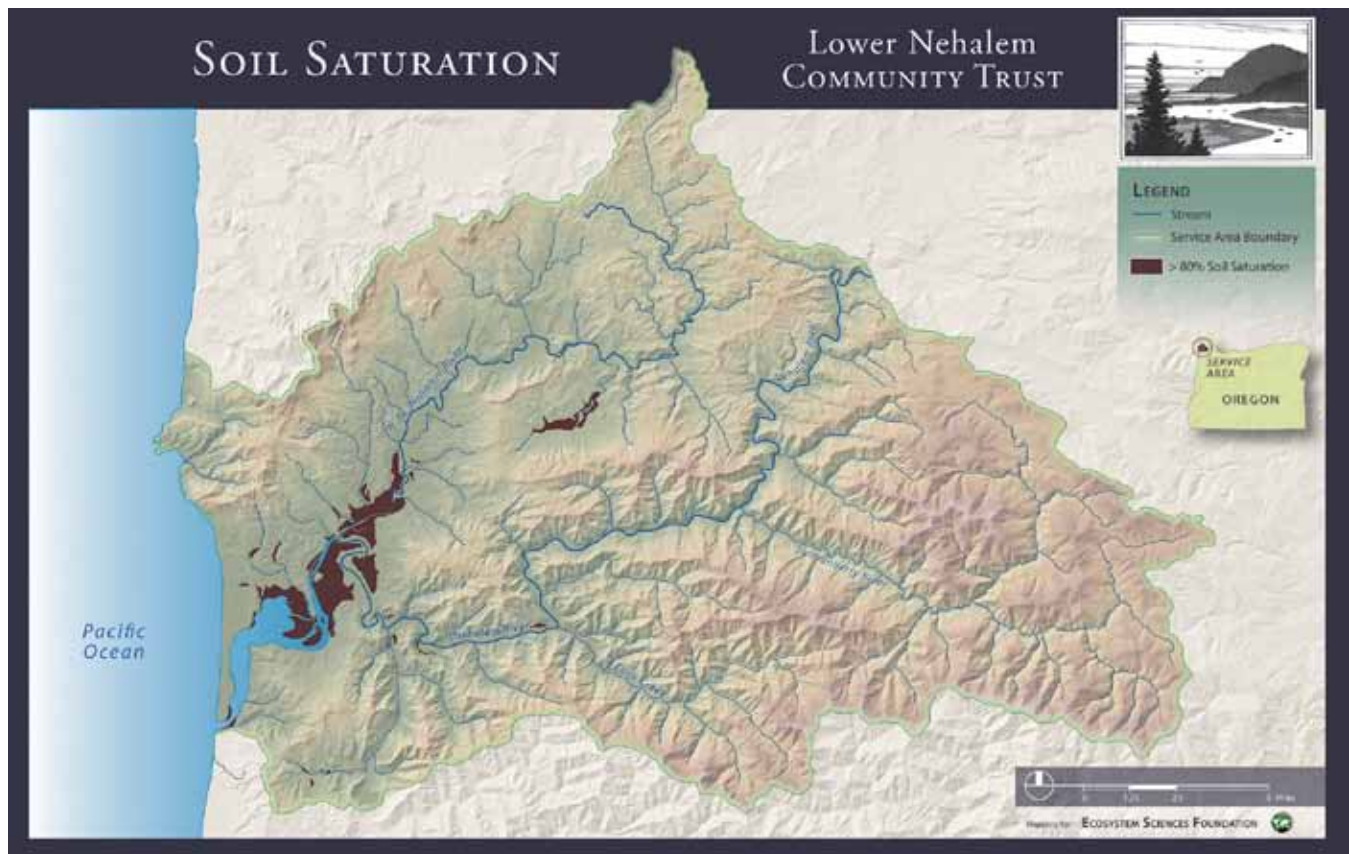
Central Coast old growth. Photo supplied by Oregon Wild.

Wetlands

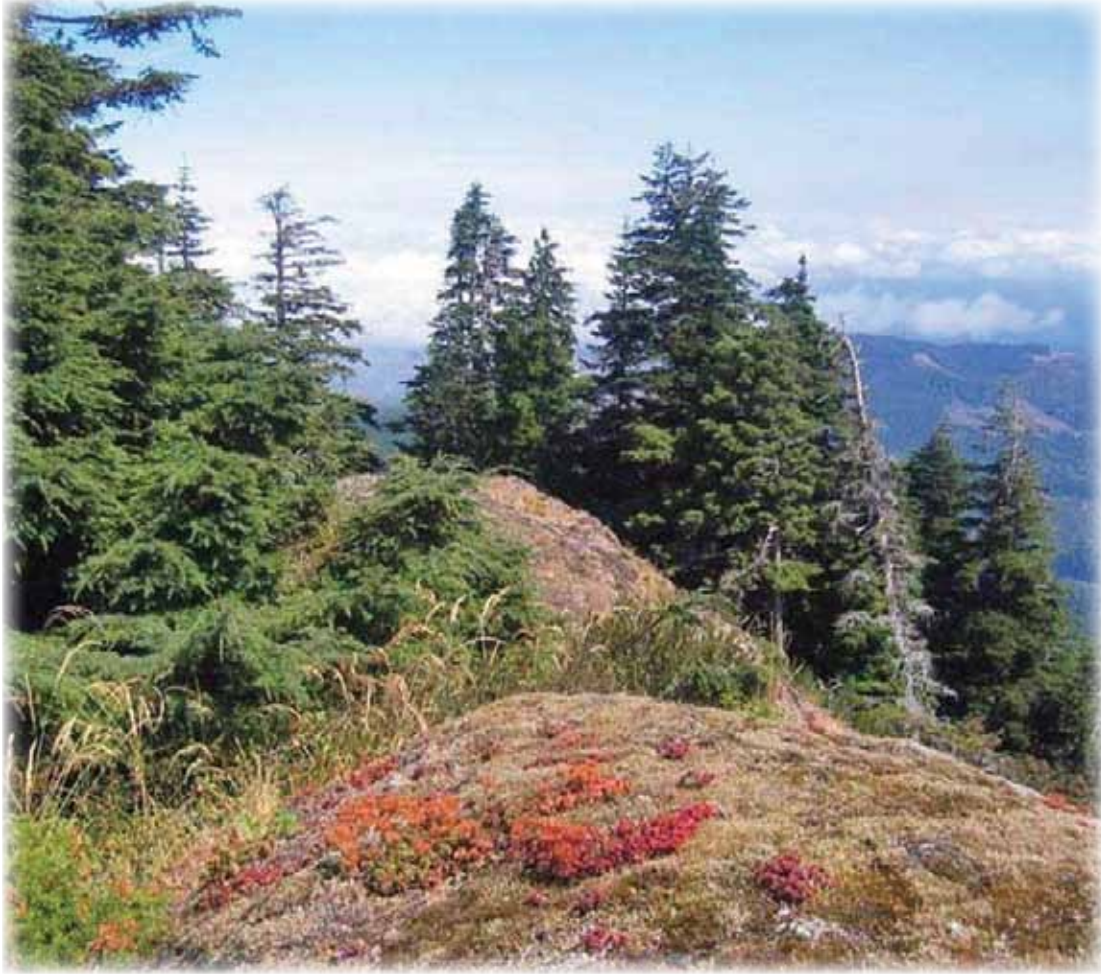


Wetland habitat. Photo by Gary Seelig

Almost all of the wetlands in the Nehalem watershed are in and around the Nehalem estuary. There are significant inland forested wetlands in God's Valley. Smaller areas of forested wetlands can be found scattered around the service area. Limited timber harvesting is allowed in these areas.



Meadows



Basaltic Ridge Meadow. Photo supplied by The Nature Conservancy

Only a few meadows can be found in the LNCT service area. These are either associated with ancient lava flows or wetlands.

The basaltic ridge meadow areas provide some rare and unique plant species¹. This system has not been well studied. Overall these areas are impacted primarily from invasive plants, herbicides from adjacent forest management, forest roads and recreational activities. Locally, Onion Peak is probably the best known of these ridge formations. ([Nehalem Conservation Action Plan](#), [Columbia Basaltic Ridge](#))

A significant meadow can be found associated with the God's Valley wetlands. This meadow is managed by the Oregon Department of Fish and Wildlife.

¹ Includes the following [Gap vegetation](#) types: Coastal Cliff and Bluff, Bald and Bluff, Hypermaritime and Massive Bedrock

LNCT Conservation Strategies for the Forests and Associated Ecosystems

The Lower Nehalem Community Trust will focus on the following conservation strategies in forests and associated ecosystems:

- Education, community involvement and
- Working with government and governmental agencies to improve legal protection of habitat.

Land acquisitions, conservation easements or restoration and stewardship projects related to forest areas will be limited to exceptional opportunities. The Trust will support restoration projects undertaken by the Upper and Lower Nehalem Watershed Councils and the Nehalem Conservation Action Plan implementation teams and efforts by other land trusts to acquire land or conservation easements in forested areas.



Old growth on Neahkahnie Mountain, Oswald West State Park. Photo by Candace Wyatt

Appendix A

Conservation Priority Survey Findings *(based on five point rating scale)*

Indicators of Wildlife Habitat Value	% rated very high (5) priority	% rated very high (5) and high (4) priority
Wetlands	77%	100%
Riparian (stream side) areas	72%	95%
Threat to habitat	67%	89%
Fish habitat	59%	93%
Intact/pristine conditions	54%	83%
Size of project parcel	53%	83%
Land adjacent to currently protected lands	52%	86%
Wildlife corridors	52%	91%
Forested areas	33%	62%
Grasslands	19%	50%
Historic flood plain	19%	48%

Direct Public Benefits		
Clean water	58%	90%
Connecting people to place	49%	73%
Carbon sequestration	29%	66%
Environmental education potential	25%	68%
Flood management	25%	50%
Public access	18%	41%
Scenic value	9%	37%
Wildlife viewing	8%	41%
Use as community park	5%	11%

Financial Considerations		
Availability of funding partners	79%	94%
Total cost of the project	57%	77%
Long-term stewardship costs	56%	92%
Cost to LNCT donors and supporters	50%	84%
Short-term restoration costs	14%	49%

Project Location		
Adjacent to (contiguous with) the estuary	79%	100%
Near the estuary	45%	98%
Forested wetlands in God's Valley and upper Foley Creek areas	25%	61%
Farm land	11%	25%
Within urban growth boundary	6%	31%

Appendix B

Governmental Agencies with Advisory Functions

Governmental Jurisdiction	Responsibility
Oregon Department of Fish and Wildlife	Advises other agencies and local governments on proper measures to protect and enhance habitat. ODFW biologists and researchers play a critical role in advising DSL and other agencies considering actions that would affect an estuary.
The U.S. Fish & Wildlife Service	Responsible for advising the U.S. Army Corps of Engineers about the effects of proposed permits on fish and wildlife. USFWS also advises the Corps on ways that harmful effects of proposed development projects can be avoided or mitigated.
The National Marine Fisheries Service	Responsible for management of ocean fisheries of anadromous fish, such as salmon and steelhead. Since many marine fish are dependent on estuaries at some point in their life cycle, NMFS also advises the Corps about potential impacts of estuarine alterations.

Appendix C

LNCT Properties

Currently LNCT holds title to 100+ acres of priority habitat in the Lower Nehalem River Watershed/Neahkahnie Mountain Region. The Trust protects and manages these properties—each with its own unique management plan.



**Alder Creek Farm
& Natural Area**
Bayside Gardens
54 acres
Purchased in 2005
uplands, estuarine
wetlands, creek,
freshwater wetlands



Sitka Wetlands
Bayside Gardens
19 acres
Purchased in 2011
Sitka spruce forested
wetlands, estuary
frontage, uplands



Vosberg Creek
Wheeler
8 acres
Donated in 2005
fish bearing creek,
riparian area



Zimmerman Marsh
Wheeler
3 acres
Purchased in 2012
estuarine wetlands,
creek, uplands



Peregrine Point
Neahkahnie
3 acres
Donated in 2006
cliffside forested,
oceanfront



Blacktail Ridge
Bayside Gardens
4.6 acres
Donated in 2012
forested uplands

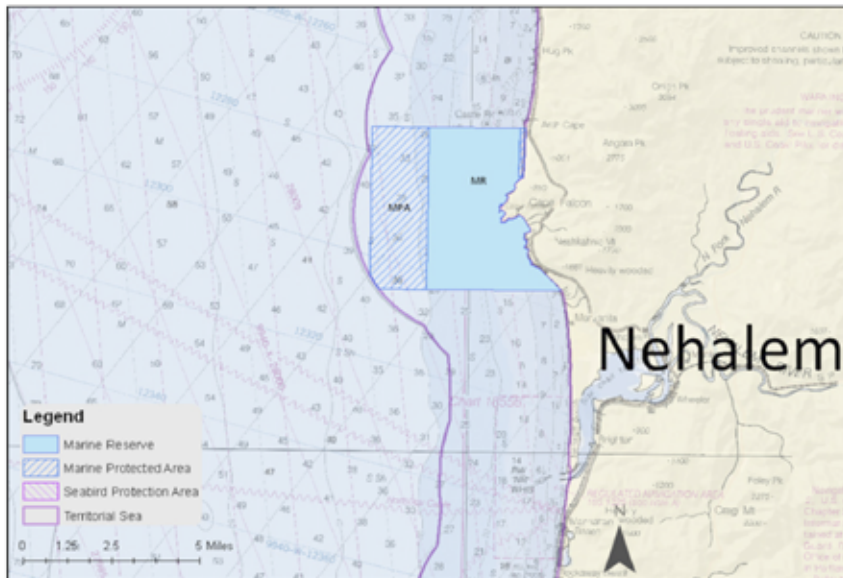


Cedar Creek
Bayside Gardens
14 acres
Purchased in 2010
wetlands, creek,
estuary frontage, uplands



Cape Falcon Marine Reserve

The Cape Falcon site is located on the northern Oregon coast south of Cannon Beach, adjacent to Oswald West State Park. The site was developed through a community team process, followed by recommendation by OPAC in 2010. ODFW will begin human dimensions baseline data collection in 2012 and ecological baseline data collection in 2014.



Prohibitions are not in effect, baseline data collection still needs to be completed

The following activities are unlawful to undertake in a marine reserve:

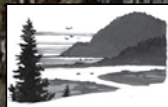
- Take of any fish, invertebrate, or wildlife species
- Take of kelp or other seaweeds
- Deployment of fishing gear

Human Use Characteristics

	Marine Reserve	MPA
Commercial Fishing Uses	Crab, flatfish trawl, salmon, lingcod, nearshore limited entry	Crab, salmon, fixed gear
Recreational Fishing Uses	Crab, groundfish, salmon	No or minimal use
Charter Uses (Gold Beach)	Crab, groundfish, salmon	No or minimal use
Shoreside Consumptive Uses	Crab, groundfish, surfperch, intertidal harvest	N/A
Non-consumptive Uses	Wildlife viewing, kayaking, surfing, beach going	
Communities of Place	Falcon Cove, Cove beach, Arch cape, Manzanita, Nehalem, Wheeler, Garibaldi	

Biological Characteristics

	Marine Reserve	MPA
Marine Reserve Area	32.8 km ²	22.4 km ²
Alongshore Length	7.4 km	7.4 km
Offshore Length	5.2 km	2.6 km
Rock Area	7.0 km ²	0.0 km ²
Mixed Rock/Sand Area	1.1 km ²	3.7 km ²
Sand Area	30.9 km ²	18.7 km ²



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