

Coastal Response to OWEB RFP for Focused Investment Priorities

Proposed Priority: *Upland/Riparian Restoration in the Coastal Ecoregion of Oregon*

1. Proposed Priority Description

a) What is the native fish or wildlife habitat to be conserved or other natural resource issue to be addressed?

Proposed Priority: restoration of upland forests and riparian habitats

Oregon's upland forests and riparian areas are often homogenized and compromised systems, due to a long land use legacy of resource extraction. Historical land use has disrupted the availability of large wood inputs to streams, simplified channel complexity in drainages, and disturbed vegetative communities. Addressing an upland/riparian priority will reestablish habitats for a variety of upland and aquatic species. Expected benefits of addressing this priority include:

- Enhanced anadromous fish spawning grounds, overwintering, and rearing habitats.
- Creation of habitat for endangered species (marbled murrelet, spotted owl, w. bog lily).
- Restoration of diminished plant communities (Sitka spruce, w. hemlock, cedar).
- Improved water quality and quantity downstream of restoration areas.
- Increased stream complexity, stream habitat, and fish passage by promoting sources of large woody debris.
- Restoration of aquatic/terrestrial food web interface.
- Improved floodplain connectivity.

b) What are the specific expected ecological outcome(s) to be achieved after this priority is addressed?

Restored upland and riparian habitats will increase connectivity and habitat complexity within a watershed, resulting in improved watershed function and water quality in rivers and estuaries downstream of the restored upland areas. Restored upland forest habitat will support a greater diversity of plant and animal communities. Because adjacent forest structure directly impacts the quality of streams, restoring riparian areas within upland forest is an important part of improving essential spawning, rearing, and overwintering habitat for protected salmonid species. The priority will also improve forest stand heterogeneity, stand and stream resiliency, and wildland fire fuel reduction. Specific outcomes include:

- Increased surface water quality and summer water quantity from ridge tops through estuaries (e.g. reduced water temperatures, higher dissolved oxygen, reduced sedimentation, and pollutant runoff in 303(d) listed streams).
- Improved stream complexity and connectivity (increased coarse woody debris in streams, de-channelization, increased anadromous fish spawning and rearing habitat).
- Forest stand heterogeneity (larger tree creation, brush layer development, promotion of depreciated species (Sitka spruce, cedar, hemlock), removal of invasive species).
- Improved forest stand and riparian resiliency (ability to resist and/or recover from disturbance) as a result of increased forest heterogeneity.
- A benefit to fish and wildlife species via improved habitat connectivity, complexity, and

resiliency of landscapes.

- Wildland fire fuel reduction (reduced chance of fuel ladders/canopy fires, removal of small tinder timber).
- Improved fish passage to upstream and off-channel habitat.
- Direct improvements in downstream and estuarine water quality and habitat.
- Input of nutrients from forest canopy and detritus.

c) What is the defined geographic location within which this proposed priority can be successfully addressed?

Since about half of Oregon is forested, this priority makes sense for application on a statewide level. However, the defined geographic location within which this proposal can be successfully addressed includes upland forests and riparian habitats within the Sitka spruce range of the Coastal Oregon ecoregion. A further geographic division for priority success may fall to watersheds within the North Coast (Spruce-hemlock-w. red cedar) and South Coast (Spruce-hemlock-Port Orford cedar) regions.

2. Significance to the State

a) Why is this proposed priority of ecological significance to the state, even though it may not be present everywhere in the state?

Nearly half of Oregon is forested, which means the quality of upland forests influences a substantial portion of Oregon's watersheds. In particular, the upland forests and riparian areas of the coastal ecoregion have direct implications for the water quality of rivers in the lower reaches of watersheds, as well as estuarine and coastal waters. Riparian areas and uplands are recognized in Oregon's Conservation Strategy as critical habitat for overwintering birds and essential corridors for migratory songbirds. They support an abundance of plant and insect species, and are essential for providing stream habitat required by migratory salmonids, such as cutthroat trout, steelhead, and chinook, chum, and protected coho salmon.

The ecological integrity of uplands is also important for the perpetuity of Oregon's forest resources industry. Oregon's land use history, particularly logging, has changed the morphology and hydrology of many waterways. Historic upland manipulation has reduced anadromous fish spawning grounds, changed runoff loads, and increased fire potential, which negatively impacts water and habitat quality throughout the state. A priority focus on the restoration of these highly manipulated systems would address a plethora of issues significant to Oregon.

b) Are there any social and/or economic considerations that the Board should understand regarding this proposed priority?

- 90.7% of land use in the coastal Oregon ecoregion is forest and woodland¹.
- 60% of the land in the coastal Oregon ecoregion is privately owned; close to 40% is publically owned by either the state, federal, or local governments¹.
- Regionally, important industries include timber, agriculture, commercial fishing, fish processing, tourism and recreation.
- There are 40 watershed councils in the Coastal Range Ecoregion.
- Resources resultant from thinning crowded uplands could mean revenue from and for projects, which could pay for themselves once planning and methods are developed.

- Practices explored in managing uplands for tree retention (e.g. thinning, instead of regeneration) could inform public, private, and industrial timber harvest methods and improve sustainability in natural resource extraction in Oregon.
- Water quality and quantity has many social and economic considerations. Protecting upland areas of watersheds reduces the need for expensive water treatment infrastructure and may be linked to health care costs.
- Water quality and salmonid habitat improvements for salmonid species enhance Oregon's fishery and tourism industries.
- Uplands forests and fisheries are highly central to Oregon's cultural identity.

¹Information from Oregon Conservation Strategy, January 2006:

http://www.dfw.state.or.us/conservationstrategy/docs/document_pdf/b-eco_cr.pdf

c) In addition to its significance to the state, identify how the proposed priority fits within regional & local ecological priorities.

An upland/riparian restoration priority fits with the ODFW Oregon Conservation Strategy (2006) in the following ways:

i. Late Successional Conifer Forests component:

- Would help achieve the desired *10-30% of forests in older structure* throughout the state.
- Would address *loss of upland structural habitat* (encourages longer rotations and strategically located large-diameter tree tracts, maintains structural elements).
- Addresses *loss of late-successional stand size and connectivity* (could "accelerate development of late successional structural characteristics...to provide greater blocks of habitat for species").
- Would create *opportunities to coordinate management of public and private lands*.
- Would *address altered fire regimes*.

ii. Riparian Habitats component:

- Would reduce erosion and improve bank stability, water temperatures for fish, filtration of runoff, and habitat complexity.
- Restoration would address *loss of riparian habitats and riparian degradation* (would promote habitat for beaver and fish, decrease downstream soil movement, increase water quality, feed downstream wetlands).
- Addresses *loss of habitat connectivity* (would promote wildlife corridors, relationship between the forest and aquatic habitat and inputs of course woody debris).
- Would involve *invasive plant removal* (upland/riparian restoration would include removing invasive plants and sources of invasive plants in lower reaches of the watershed).

iii. Estuaries component:

- Would improve *degraded water quality* while considering wildlife and recreation.
- Addresses *loss of habitat complexity* (increases the potential for inputs of large-diameter logs (i.e. large woody debris) into streams, wind protection, and shade cover).

An upland/riparian restoration priority fits with Oregon's Plan for Salmon and Watersheds in the following ways:

- Restores salmon habitat (breeding and rearing grounds for anadromous fish).
- Improves water quality.
- Could promote and fund voluntary upland watershed restoration actions by private and non-profit landowners.
- Coordinates state, federal, and tribal agencies.
- Would promote public education and awareness about watersheds (*ridgeline* to estuary) and salmon *Promotes education on salmon habitat extending into upper reaches of watersheds.
- Monitoring would be included (could be mandatory for funding) to track salmon response to upland restoration.

An upland/riparian restoration priority fits with Governor's Priorities in the following ways:

JOBS: Forestry products are listed as a global competitive advantage for Oregon – upland management and restoration promotes forest industry sustainability.

HEALTH: “Improve health by shifting focus to prevention and wellness...prevent chronic conditions from becoming emergencies” – improve fisheries and water quality address wellness and prevention of health issues at the resource level (prior to consumption).

West Coast Governors Alliance (WCGA):

- Protects and restores coastal habitats – upland restoration improves water quality of coastal habitats.
- Promotes the effective implementation of ecosystem-based management.
- Expands coastal scientific information, research, and monitoring.
- Fosters sustainable economic development in our communities.

3. Limiting Factors

a) What ecological limiting factors exist that relate to the proposed priority identified?

Limiting factors are the physical, biological, or chemical conditions and associated ecological processes and interactions (e.g., population size, habitat connectivity, water quality, water quantity, etc.) experienced by the habitat that may influence viable population parameters (i.e. abundance, productivity, spatial structure, and diversity).

- Fragmentation and loss of habitat connectivity across public and private lands with different land use priorities (e.g. timber, agriculture, development, conservation/preservation, etc.).
- Loss of riparian habitat and/or complexity of riparian habitat. *This limitation can be directly addressed by projects that meet the proposed priority (e.g. riparian habitat can be restored and complexity of riparian habitats increased by planting native plants along streams, and by conserving them once they are established).
- Upland species and stand status (species composition, response to active management, merchantable timber).
- Invasive plants (reed canary grass, Himalayan blackberries, English ivy). * This limitation can be directly addressed by projects that remove invasive species, but

complete removal is extremely difficult for some species. Monitoring invasive species and continued removal of invasives at restoration sites is critical for increasing the success of restoration projects, but invasive species in non-project areas cannot be controlled.

- Slope and terrain of project areas.
- Seasonal fluctuations and limitations (i.e. for road construction, thinning, plantings, etc.).
- Legacy land use impacts and disturbance regimes affecting forest and riparian processes (harvest, silviculture, roads, fire, development).

b) Reference any framework(s) that exist (Recovery Plans, Implementation plans, etc.).

- Northwest Forest Plan
- Oregon Forest Practices Act
- Oregon's Plan for Salmon and Watersheds
- South Slough NERR Upland Watershed Restoration Action Plan
- South Willapa Bay Conservation Area plan (The Nature Conservancy and USFW).
- The Nature Conservancy's Restoring America's Forests:
<http://www.nature.org/ourinitiatives/habitats/forests/restoring-americas-forests.xml>
*This program has 13 demonstration sites across N. America
- ODFW Conservation Strategy
- Multiple watershed assessments (Tillamook, Coos, etc.)
- Tillamook Bay Comprehensive Conservation and Management Plan
- BLM upper watershed strategies
- Siuslaw Stewardship Group strategies

4. Threats and Benefits

a) What overall threats exist to the proposed priority identified? Threats are the human actions (e.g., fishing, development, road building, etc.) or natural (e.g., flood, drought, volcano, tsunami, etc.) events that cause or contribute to limiting factors. Threats may be associated with one or more specific life cycle stages and may occur in the past, present, or future.

- Public perception of restrictions/setbacks on removing trees/planting trees
- Harvest management (e.g. over thinning of crowded uplands) can be addressed in contracting
- Disturbance of sensitive ecosystems via increased access (e.g. road construction, etc.)
- Loss of natural fire regimes and increased capacity for intense fires, either natural or human caused
- Transfer of ownership of lands out of conservation or restoration purpose, patchiness of land ownership
- Sedimentation that may affect fish habitat, resulting from heavy equipment use in restoration operations
- Temporary loss/disruption of healthy riparian areas due to restoration operations
- Introduction of pathogens or invasive species during project work
- Landslides, earthquakes, flooding, extreme wind
- Loss of riparian vegetation due to development or other land uses
- Climate change

b) What will happen if the threats aren't addressed?

- Continued disruption of ecological processes in uplands and riparian areas (erosion, landslides)
- Direct downstream impacts from ecological damage to uplands (sedimentation, hydrological disruption, water quality impacts)
- Public safety issues, dumping, long-term camping
- Intense fires may cause loss of ecological integrity (see ecological damage above)
- Reduced water quality
- Loss of critical fish and wildlife habitat
- Habitat simplification
- Loss of species diversity and productivity

c) Describe the economic, social, iconic and cultural benefits of addressing the outcome and impacts of not addressing it.

Economic benefits:

- Fishery improvement (increased anadromous fish populations/survivability) = revenue, jobs (fish product processing, biologists, fisherman, boat mechanics, harbor maintenance, recreation, tourism)
- Improved water quality (less investment in water treatment)
- Increased forest health on neglected lands, improved resource harvest practices = revenue, jobs
- Improved wildlife habitat = hunting opportunities, recreation and tourism revenue

If economic impacts are not addressed:

- Wildland fire impacts on communities/resources/homes (net loss to state and federal budgets)
- More immediately maxing out forest resources due to unsustainable rotations.
- Continually degraded fisheries.

Social benefits:

- Human health benefits via water quality and fishery quality (reduced pollutants/bioaccumulation)
- Recreational opportunities, like water trails and camping.
- Educational opportunities (forests, watersheds, salmon; ridge top to estuary concept)
- Improved relationships between resource management objectives (tribal, agriculture, forestry, water boards).

If social impacts are not addressed:

- Human health issues from reduced water quality.
- Reduced educational opportunities.
- Continued compartmentalizing of resource management (e.g. estuaries vs forests) and the consequential conflicts (e.g. industrial forestry vs. conservation).

Iconic/cultural benefits:

- Improve Douglas fir (state tree) health
- Protect Salmon Nation identity

If iconic/cultural impacts are not addressed:

- Loss of cultural identities.

d) Briefly summarize how much has been done already, how much is remaining.

- There are proven methods/techniques and substantial research for restoring riparian and upland habitats. Additionally, some agencies have already developed implementation plans for upland and riparian restoration – *see frameworks and implementation plans in 3b. In many cases funding and implementation is remaining.

e) What is your best estimate of cost to address the priority, and as a result, how economically feasible do you believe it is to address this priority over time?

- Initial costs may be substantial (tens or hundreds of thousands to millions – planning, road construction, contracting), but eventually many projects may be able to pay for themselves through the revenue generated by forest thinning. Therefore, upland and riparian restoration, as a priority, is very economically feasible.

5. Opportunities

a) Ecological:

1. What are the measures of ecological success? What's the likelihood of ecological success in the short (6-year); medium and long-term (define the term lengths)?

- Biodiversity and native plantings increased (short, medium, and long term success)
- Anadromous fish habitat improvement (short term success: accessibility, medium term success: improvement of quality and quantity of spawning and rearing habitat through restoration of stream processes, long term success: improved population viability)
- Fire fuel reduction (short term success: immediate removal of fuel, medium and long term success: resistance and resiliency with fire)
- Increased tree size, mature forest stands (medium and long term success)
- Increased forest stand heterogeneity; diversified species, brush layer development (medium and long term success)
- Improved water quality and quantity (short, medium and long term success)
- Fish and wildlife benefits; habitat connectivity, habitat creation, habitat resiliency (short, medium, and long term success)
- Downstream benefits; water quality improvement, shading, complexity of channels (short, medium, and long term success)

2. What types of voluntary conservation actions could be undertaken to address the proposed priority?

- Land exchanges
- Incentives (time, resources, or dollars) for forest certification to achieve conservation goals on private lands
- Riparian plantings
- Removal of non-native and invasive species

3. Should the proposed priority be divided into geographic areas that are appropriate for partners to address?

- Yes, the proposed priority should be divided into geographic areas based on upland (tree) species and associated plant communities. For example, a north coast hemlock/w.

red cedar and south coast Port Orford cedar division might make sense. Statewide, there would need to be divisions for other upland types (pine, high elevation, etc.).

b) Social:

1. Do partnerships exist to address the proposed priority? If so, briefly describe. If not, note why this proposed priority is important enough that partnerships may form to address it.

Across the entire Oregon coastal ecoregion, partnerships are in early stages of formation, but strong partnerships exist in localized regions. Watershed councils along the coast have been working with landowners to restore riparian areas throughout their watersheds for the past 15 years. In the south coast, the South Slough NERR developed an upland advisory board many years ago, which is a source of partnerships. The SSNERR is also partnered with the USFS concerning Port Orford cedar resilience and restoration. In Washington's Willapa Bay there is a strong partnership between The Nature Conservancy and USFW, which serves as an excellent model for a partnership centered on this priority.

The Tillamook Estuaries Partnership's Backyard Planting Program has been working with willing landowners to restore riparian areas on forest, agriculture, and residential lands. In addition, the Northwest Oregon Restoration Partnership is a collaborative of over 30 partners with the intent to promote healthy forest and riparian ecosystem conditions by collecting and growing native plant seeds and cuttings. This effort is intended to encourage the application of innovative solutions to forest and riparian health conditions on an on-going basis across the landscape.

Upland/riparian restoration is highly dependent on partnerships because it involves multiple economic and ecological facets. Uplands and riparian zones cross ownerships so to be impactful; partners need to be in conjunction across landscapes. Finally, this priority involves multiple types of landscape influence (ridge tops through freshwater/estuaries) and demands cooperation and collaboration for successful project outcomes.

2. What social opportunities exist to address the proposed priority? Is there momentum built?

There is a high interest in forest fire fuel reduction in regards to Oregon forests and residential areas that lie in forested uplands. There is also social interest in improving forest management and a growing interest in managing landscapes instead of resource sectors.

3. Describe educational benefits, if any.

- Educational benefits for coastal land managers (upland foresters, estuarine managers, etc.).
- Opportunities for field trips to restoration sites
- Educational opportunities for various programs/centers (ridge top to estuary programs): NERR Coastal Training Program, SSNERR interpretive center (Coos County schools), ODF Tillamook Forest Center, Tillamook Estuary Partnership's Environmental Education Program
- University research opportunities (OSU, Colorado State Restoration Institute, etc.)
- Opportunities for experiential learning promoting STEM and the Environmental Literacy Plan
- Opportunities for school districts to promote outdoor learning along the coast

4. Summarize the social, community, political, regulatory or other factors that will help lead to the success of this proposed priority.

- Regulatory frameworks are in place for forest resource harvesting and riparian buffers. These frameworks have an industrial focus, but could provide some basis to inform more robust restoration practices.
- There is political push for forest management and fuel reduction in non-thinned upland areas, as well as for fishery health, water quality and water availability.
- Economic and social interest in Oregon forest resources (on the Oregon coast especially, i.e. in Coos County/Tillamook County uplands provide for substantial jobs).
- Nonprofit and grassroots organizations already foster community support, involvement, and outreach (Cascadia Wildlands, Audubon, etc.).
- Other factors include watershed council regulations and goals, soil and water conservation districts, fishery commission groups.

5. What can be leveraged to address the proposed priority (funding, acreage impacts, other resources)?

- Land owners can leverage land (SSNERR has about 5,000 acres, ODF, DSL, BLM, USFS, non-profits may be interested in contributing upland tracts for restoration experiments).
- Agencies can leverage financial incentives for certifications (i.e. sustainability).
- Some agencies may be able to leverage time/facilities for technical trainings, workshops, and field trips.
- OWEB dollars can be leveraged with other funding sources, like USFWS, NFWF, that have already shown a commitment to riparian/upland health.

c) Economic Benefits:

1. Describe the economic benefits of addressing the ecological proposed priority, including ecosystem services.

- Increased habitat for salmon, other fisheries, shellfish, and wildlife = secondary benefits to communities, like tourism/recreation, industry jobs, infrastructure to support tourism and industry *There is a multiplier effect if people are drawn into an area from outside the state (which is common for fish and wildlife recreation in Oregon).
- Other recreation/industry growth = mushroom gathering, hunting, hiking, camping, wildlife viewing
- The priority would create jobs for land managers, contractors who do thinning/restoration, researchers who monitor follow-up.

Non-market values:

- Existence values: the idea that Oregon is home to healthy uplands (people value the idea of “Keeping Oregon Green,” social identity)
- Bequest values – a socially perceived value in knowing that future generations of Oregonians will have healthy uplands, water, and salmon to enjoy and employ them.
- Option values: Oregonians living outside the coastal ecoregion want to reserve the right to visit, recreate, hunt, fish, or see coastal forests with intact watersheds sometime in the future, and/or move to the coast when they retire.

6. Assess the proposed priority by locating the proposed priority in one of the quadrants. Explain why.

Fairly well understood, but moderately complex – There is a great deal of science supporting upland and riparian restoration methods and management. However, implementation, across diverse landscapes and land ownership, is complex. Upland restoration is also somewhat invasive at first, and can be expensive. Public perception of tree removal or forest health enhancement, even for the purpose of restoration, may be complex as well (undesired by some). However, there are strategies developed and social supports for an upland/riparian restoration priority, so implementation is the ultimate hurdle.

7. Is there other information the Board should know regarding this priority?

8. In lieu of attaching letters of support for this proposal, please submit a list of other supporting individuals or organizations.

Oregon Department of Forestry
Oregon Department of State Lands
Oregon Department of Fish & Wildlife
Oregon Forest Resources Institute
Tribes (Coquille Tribe, Siletz Tribe)
US Fish and Wildlife
Bureau of Land Management
City & County Fire Protection Districts
Coos Watershed Association
Coos County Forestry
Siuslaw Watershed Council
Siuslaw Stewardship Group
Lower Nehalem Watershed Council
Upper Nehalem Watershed Council
Tillamook Bay Watershed Council
Nestucca-Neskowin Watershed Council
Tillamook Estuaries Partnership
Salmon-Drift Creek Watersheds Council
Mid-Coast Watersheds Council
Oregon Department of Environmental Quality