

Washington Coast Restoration Initiative Project Summary

Project Number	15-1599
Project Name	Pulling Together Initiative – Jobs in Restoration
Sponsor	10,000 Years Institute

Project Location.

The project is located in six coastal Olympic Peninsula watersheds in WRIAs 20 and 21. The four largest have their headwaters in Olympic National Park. From north to south, these watersheds are: The Quillayute watershed (including the Sol Duc, Bogachiel, Calawah, and Quillayute Rivers and major tributaries), the independent Goodman Creek watershed (flowing into the Pacific Ocean), and the Hoh River watershed (including major tributaries Owl Creek, Elk Creek, Winfield Creek) in WRIA 20; the Queets watershed (including tributary rivers Clearwater and Snahapish); the independent Raft River, and the Quinault watershed (including major tributaries Big Creek, Joe Creek, Willaby Creek, Falls Creek, Gatton Creek, Prairie Creek, and Lunch Creek). Project sites within the watersheds include roads, gravel mines, parks, recreational sites, recreational access points, and restoration project sites, and will expand upon and support existing invasive control projects in these rivers, streams, wetlands, and floodplains.

Project Summary.

The Pulling Together Initiative is an innovative invasive species program to be applied across all six coastal watersheds that will eliminate new threats and establish a process for ongoing containment; addressing a suite of invasives that affect riparian forest growth and habitats, and are introduced by activities including construction of restoration projects. The solution lies in combining Early Detection and Rapid Response (ED/RR) and on-the-ground control utilizing specialized and local mobile strike teams. We will work with partners like coastal tribes, resource agencies, county weed boards, local fishing guides, and land trusts to conduct cross-jurisdictional coordination, ongoing education and public awareness – creating an invasive species response infrastructure to incorporate their prevention and control into every aspect of landscape management. The scale and comprehensive nature of this program will provide a model for invasive species control in the region that can be exported widely.

Site, Reach, and Watershed Condition.

The coastal watersheds in which this project will take place are forested with second and third growth moist temperate coniferous forests on the north and west slopes of the Olympic Mountains, and mixed coniferous and deciduous forests along the six rivers flowing to the Pacific Ocean. The headwaters of the four large watersheds (Quillayute, Hoh, Queets, and Quinault) lie in older forest in Olympic National Park, and in Olympic National Forest, and the two smaller watersheds in lower elevation forestland managed by the State Department of Natural Resources (Goodman Creek) and Olympic National Forest (Raft River).

The Quillayute, Hoh, Queets, and Quinault rivers are unconfined alluvially-bedded, with wide dynamic channel migration zones, while the Sol Duc is largely confined in bed-rock. The rivers flow off the steep Olympic mountains, bringing tons of glacial sediments to the valleys below; a process which is accelerated as alpine glaciers retreat, and destabilizing channels, forcing more frequent aggradation and avulsion (as reported in Mt. Rainier Nat'l Park¹), and constantly re-setting riparian succession, while favoring invasive species.

The Quileute, Hoh, Queets, and Quinault tribes have fished, hunted, and gathered native foods in these watersheds for thousands of years. Homesteading began in the mid-1800's, with clearing for pasture in the river floodplains, followed by timber harvest in the uplands.

Primary land use activities are forestry and gravel mining with low to moderate levels of residential and agricultural development in the valleys. Private industrial timber ownership lies in the low elevations. Current riverine habitat condition is affected by the historic loss of mature forests that provide critical habitats and ecosystem services required by salmon and the entire ecosystem. All native salmon stocks are declining (2013 WCSSP Sustainable Salmon Plan²).

Human activities have introduced invasive plants into coastal watersheds. The scales at which invasive plants are impacting habitats and wildlife differs in these six watersheds and is strongly influenced by the degree to which development or land clearing has occurred, roads are present, and whether prevention and control has been conducted.

Non-native invasive plants are generalists adapted to thrive in a wide range of conditions and can successfully out-compete many native plant species in the openings provided by timber harvest, gravel mining, road construction, river migration, and clearing for agriculture and development. Invasive plants outcompete and undermine the natural succession processes of native plant communities, impacting ecosystem services to salmon habitat that are provided by native plant communities including temperature modulation, nutrient supply, food web support, provision of woody debris, sediment storage, and erosion control.

Invasive species can degrade investments in protection and restoration of habitat, at first incrementally and, once established, significantly. In all watersheds addressed by this project, invasive species cause harm to aquatic habitats required by native fish.

Effective Invasive Species Management - The Problem(s).

The impacts of invasive species are poorly quantified at the local level, and especially with regard to impacts to fish habitat. Crossing watersheds, roads bring traffic, mowers, and materials with propagules of non-native invasive plants. These invaders move off roads into forests and stream channels via wind, water, wildlife (especially beaver), and in materials and heavy equipment and vehicles used in resource management, road construction and repair, fishing, recreation, and restoration. Restoration and resource management practices lack effective coordination to prevent or control invasive species. Landowners and managers who

¹ <http://www.nps.gov/mora/learn/nature/upload/Landscape-response-to-climate-change-and-its-role-in-infrastructure.pdf>

² <http://www.wcssp.org/index.php/salmon/plan>

attempt to control invasive species are often discouraged or challenged by continuous re-invasion of species across ownership boundaries.

An Early Detection/Rapid Response or ED/RR response infrastructure is needed to prevent and act effectively against invasive plant species. ED/RR requires focused and well-timed coordination, especially along roadways, which are managed separately by state, local, timber, tribal, and residential owners. With the exception of weed-free hay and equipment requirements on the Olympic National Forest and some Olympic National Park trail systems, ED/RR is not implemented in most aspects of landscape management for a variety of reasons, but often because of a lack of recognition of the costs of allowing invasions coupled with a lack of funding.

A useful state-sponsored economic impact analyses exists in Oregon titled [Economic Impact From Selected Noxious Weeds in Oregon](#)³, and a pilot modeled on this analysis is underway here in Washington. Once the true costs to managers and ecosystems caused by invasive species are understood, it is widely accepted that early action is extremely cost-effective, and worth the investment.

This project will build on a model developed by 10,000 Years Institute and applied in the Hoh River for the past decade, and in the Queets and Clearwater Rivers over the past four years. The model is '**don't walk by anything**!' The practice moves away from single-species management (such as knotweed control) to address small infestations of known invasive species upon discovery as early as possible. The investment is up-front, and highly effective. We propose to transfer this successful model across the watersheds to protect the best habitats in western Washington.

This program's focal invasive species include Scotch broom, knotweed, gorse, reed canarygrass, butterfly bush, everlasting peavine, herb Robert, tansy ragwort, Himalayan and evergreen blackberry, and English laurel, holly, and ivy. Each of these species spreads along roads and rivers, impairs natural forest succession, and is expensive and challenging to control, especially if allowed to spread. (Multi-year knotweed control projects are underway in the Quillayute and Quinault Rivers along specific river reaches, and over the entire river length in the Hoh, Clearwater, and Queets Rivers.)

Below are descriptions of four of the most aggressive species introduced as ornamentals, for slope stability, or to 'reclaim' (fill) wetlands while providing forage. All cause significant and long-term impacts to salmon and habitat:

- **Scotch broom** is long-lived woody shrub, producing up to 12,000 seeds per bush per year, which reportedly last up to 80 years – 40-50 years longer than current timber harvest rotations. Although a nitrogen-fixer, Scotch broom doesn't provide nutrients to other plants, and establishes expanding monocultures that do not provide food or shelter to native species. Of particular concern for salmon recovery, Scotch broom significantly impacts the growth of early successional species such as willow and red alder on bars and in

³ <http://www.oregon.gov/oda/shared/documents/publications/weeds/ornoxiousweedeeconomicimpact.pdf>

floodplains, and conifers on terraces and timberlands. It also degrades grazing and foraging opportunities in meadows, pastures, and prairies. It is prevalent along roadsides, from where it spreads into forest stands, and in gravel mines, from which it is distributed on new or reconstructed forest roads. While elk are occasionally reported to browse it, the plant is toxic to mammals, and highly flammable.

- **Knotweeds** grow 10–18 feet in a yearly spring/summer season, create dense stands. These characteristics eliminate the germination of forbs, grasses, shrubs and trees through dense shade and alterations of soil nutrients and mycorrhizae (Urgenson, 2011, 2013). Knotweed stems are structurally weak; the entire plant dies back to the ground in the winter, lacking the important services of woody debris, root stability, and substrates for invertebrates. The roots and stems break into small fragment and float in water to new locations where they sprout. Fragments are long-lived; rhizomes buried for years have been observed to re-sprout with as much as 6 feet of substrate above them.
- **Reed canarygrass** fills off-channel and wetland habitats, eliminating high and low flow refugia for juvenile fish (Antieau, 2011). According to recent research in the Columbia River estuary comparing native sedge meadows to RCG, the latter produces fewer prey species eaten by salmon fry (SWS workshop, October 2015). It is also implicated in the recent ESA listing of the Oregon spotted frog due to eliminating breeding habitat (USFWS, 2014)
- **Butterfly bush** is a popular ornamental from China, with attractive flower spikes which produce a reported 40,000 wind and waterborne seeds per spike. The species establishes rapidly in disturbed soils like river gravel bars, riprap, and eroded shorelines, and does not feed anything except a few nectar-feeding insects, while reducing the diversity of native plant species which do feed many species and provide structural habitats. Other than a few ornamental plantings, it is not yet established in any coastal watershed, unlike WRIAs 17, 18, and 19 where it is costing more than knotweed to control. There have been two unconfirmed sightings of butterfly bush in the wild – one in the Quinault, and one in the Hoh. That will soon change on the coast if it is not eliminated from landscape plantings.

Project Goals and Objectives.

Our goal is increased effectiveness of invasive species prevention and management across these coastal watersheds, addressing root causes of invasions, and establishing a process for ongoing education and containment of a suite of invasives that affect riparian and forest growth. This program will protect and enhance habitats for all fish species at all life stages.

Our vision for the future is a model cross-jurisdictional infrastructure with improved invasive species prevention and control effectiveness, which can be exported to other counties, and is incorporated into the WRIA LE's.

What is so compelling about the opportunity on the Washington coast is that we can actually demonstrate the eradication of problematic invasive species, combined with restoration plantings, public outreach, and research and monitoring, and do so at a scale that is meaningful. As part of this program we will change the way people think about and conduct invasive species control, informing how investments into river and riparian restoration can be protected along the Washington Coast and beyond.

Project objectives are to reduce and address invasive plants before spread by the following specific tasks:

- A. **Improve the prevention of new weed populations** along roads, in streams, wetlands, and river floodplains, and at recreation sites, reducing new focal weed distributions at the targeted sites by 30% or greater in the first year, and again in the second year.
- B. **Conduct and collate a comprehensive inventory** that incorporates all other known ongoing control activities in the six watersheds.
- C. **Conduct regular surveys:** Deploy local teams to conduct and to regularly survey state, county, and accessible timber roads, recreational access sites, and review all riverine restoration project sites for the suite of invasive weeds which harm habitat, fish, and wildlife by stopping the growth of native plants or which are toxic. Each road, river, recreational site, and restoration project where invasive species are identified, and/or controlled will be tracked in a database and in GIS by species, ownership, action, recommendation, and status/outcome.
- D. **Provide review services and recommendations** to restoration project sponsors in the project area, based on the Habitat Work Schedule: <http://hws.ekosystem.us/home/>
- E. **Develop and give presentations and workshops** (4 in each watershed).
 - a. Disseminate educational materials to resource agencies, road managers, gravel mine managers, tribes, community groups, gardening clubs, guides associations, landscapers and heavy equipment operators, and local granges. Track who, what, and when – and track their responses.
 - b. Develop and install 8 educational signs encouraging ED/RR for boots, boats, and vehicles in each watershed at recreational access points.
 - c. Develop guidance protocols on the focal species identified in the inventories and surveys, and provide at workshops and outreach events for managers, local community groups, recreational users and guides, and restoration project sponsors for prevention, monitoring, and control options.
- F. **Develop a draft coordinated weed management plan** in collaboration with the county weed boards.
 - a. Present the plan to lead entities, resource management agencies, tribes, and other partners and stakeholders for comment.
 - b. We envision this plan being reviewed, and proposed for incorporation into the WRIA 20 and 21 lead entity plans - NPCLE⁴ and the Quinault LE⁵.

⁴ North Pacific Coast Lead Entity. 2013. North Pacific Coast (WRIA 20) Restoration Strategy, (2013 Edition). <http://www.wcssp.org/Documents/NPCLEStrategyFinal2013Editionsmallsize.pdf>

⁵ 2011. WRIA 21 Queets/Quinault Salmon Habitat Recovery Strategy. <http://www.wcssp.org/Documents/WRIA21WorkingDraftHabitatStrategy.pdf>

- G. Develop a GIS reporting platform, populated with baseline surveys of collated information from other entities, and maintained with observations, treatment, and recommendations from this project's inventory. Estimate and report the degree of prevention by landowner, species, and numbers of plants.
- H. Identify needed projects and assist in developing plans and proposals.

Project Partners.

Olympic National Park (ONP) – Upper Queets Invasive Plant Control Project, others TBD

Olympic National Forest (ONF) – ONF Invasive Plant Control Projects – Queets, Sol Duc

Tribes: Quileute, Hoh, Queets, and Quinault – Knotweed and other weed projects

Washington Department of Transportation – SR 101 Weed Control Program

Washington Department of Natural Resources – Forest road and gravel mine Scotch broom, blackberry, and reed canarygrass control

Washington State Parks - Partner on control at Recreation Site Access Points, sites for signage

Counties: Clallam, Jefferson, Grays Harbor – Weed Boards – contribution to protocol development, partner on roadside control

City of Forks – Roadside weed control collaboration

Nonprofits:

Pacific Coast Salmon Coalition – Partner and crew for Hoh, Queets, Clearwater projects

Hoh River Trust – Partner in Hoh River invasives control

The Nature Conservancy – Partner in Hoh, Queets, and Clearwater invasives control

Recreational groups: Guides Association – Partner in education/outreach to river guides

Olympic Correction Camp – Partner in developing Scotch broom control crew (DESIRED)

Private residential landowners – Partners in removing butterfly bush and preventing and controlling other ornamental and weedy invasive species.

Scope of Work and Deliverables:

Please see next page.

Task	Description	Done By	Schedule
Partner Outreach	Meetings and presentations with agencies, landowners, managers. Develop list of priorities, identify areas of collaboration, establish schedules, and obtain agreements.	10,000 Years Institute	January – March 2016 Continue through project as needed.
Hiring and Training	Team hiring and training in weed identification, data collection, reporting, control methods, and outreach formats. Conduct training surveys.	10,000 Years Institute	February – March 2016
Protocols	Create protocols for each species, type of invasion, methods of prevention and control, and provide rationale.	10,000 Years Institute	January - March 2016
GIS	Create a platform to track existing inventories, species, ownership, contacts, treatment, hydrology, roads, and other information as needed.	GIS staff or Contractor	February – March 2016 Update regularly.
Inventory	Collate existing inventories from partners. Conduct inventory and enter into GIS. Identify treatment. Identify who will respond. Identify mowing schedules, and known vectors. Update annually.	10,000 Years Institute Partners w/ weed projects: Tribes, ONP, ONF, TNC, industry, state/county road managers, weed boards	January – April 2016 November - December 2016 January – December 2017
Restoration Project Review and Outreach	Create database and GIS layer of habitat work schedules in WRAs 20/21. Conduct site surveys for invasives. Conduct outreach, provide written recommendations and protocols. Meet with project sponsors as invited.	10,000 Years Institute Partners w/ projects	January – March 2016 Update annually.
Prevention and Control	Schedule teams in each watershed – roads, access points. OCC Scotch Broom Crew development, training, schedule, deployment. Queets Tribal Tansy Crew – development, training, schedule, deployment.	10,000 Years Institute Weed Board staff Tribal and Agency partners	March – November 2016 March – November 2017
Develop Preliminary Plan	Incorporate inventory and species information into an iterative Cooperative Weed Management Area Plan.	10,000 Years Institute Weed Board staff Tribal and Agency partners	April – November 2016
Outreach and Education	Develop & give presentations/workshops by watershed and target audience; conduct outreach to individuals and industries. Collect flyers & booklets and develop mailers. Write articles. Develop messaging for signs, build & install.	10,000 Years Institute Weed Board staff	April – December 2016 February – June 2017
Reporting	Document progress/challenges, disseminate.	10,000 Years Institute	Ongoing, as required.