Northwest Oregon Restoration Partnership: A Model for Successful Watershed Restoration

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Abstract

In Tillamook, OR, a partnership for watershed restoration began in 2002 with several partners. By 2011, the project had grown to become the Northwest Oregon Restoration Partnership and now includes nearly 35 partners. The primary objective of this cooperative effort is to promote healthy forest and riparian ecosystem conditions by collecting and growing native plant seeds and cuttings to develop genetically adapted, large planting stock that is able to withstand vegetative competition and thrive after planting. Providing this type of plant stock is useful for meeting management plan goals and implementing restoration activities on lands administered by the U.S. Department of the Interior, Bureau of Land Management (BLM) and on lands of interest to the various watershed organizations. The effort was designed to encourage the application of innovative solutions to forest and riparian health conditions on an ongoing basis across the landscape. These actions support the Oregon Plan for Salmon and Watersheds and meet multiple BLM strategic goals and planning objectives, including but not limited to community support, partnerships, education, youth, fish and wildlife habitat, water quality, and biological system integrity.

History

In the mid-1990s, Tillamook Bay on the Oregon Coast was included as a National Estuary Project. Input from teams of researchers and numerous local community public outreach efforts resulted in the creation of a Comprehensive Conservation and Management Plan for the Tillamook Bay area and associated watersheds (Trask, Wilson, Tillamook, Kilchis, and Miami watersheds) (Tillamook County Performance Partnership 1999). The plan identified more than 400 mi (644 km) of riparian habitat degraded because of lack of vegetation. The degradation raised concerns for fish and wildlife habitat and water quality. At the same time efforts to analyze stream conditions for many of the other northwest Oregon coast range watersheds identified similar issues, such as fish passage, stream temperatures, bank stability, invasive species, and lack of appropriate native vegetation.

The restoration and protection of natural watershed processes are the foundation for achieving watershed health. Since natural watershed processes have been eliminated, altered, or reduced in many areas, habitat restoration activities are the primary method for reintroducing critical ecosystem functions to watersheds important to threatened and endangered fish and wildlife that have been negatively impacted by past management practices or disturbance events. Restoration activities are intended to address the watershed functions necessary to support natural processes that are indicative of healthy watersheds. This effort includes, but is not limited to, improving water quality, habitat complexity, floodplain interaction, vegetation structure, and species diversity. The Oregon Department of Environmental Quality's total maximum daily load studies, the North Coast Basin Water Quality Management Plans, the Watershed Council Action Plans, the Tillamook Bay Comprehensive Management Plan, and the 35 BLM watershed analyses have all concluded that native vegetation is needed in riparian zones to reduce pollutants, stabilize stream banks, and lower stream temperatures.

As implementation for restoration efforts began in the late 1990s, it soon became recognized that locally adapted native plant material was not readily available on the open market. Desired plant species could be purchased, but not with the appropriate local genetics. Most reproductive materials used by nurseries to propagate native plants were collected from the Willamette Valley east of the Oregon coast range and the associated foothills. Before watershed coordinators became educated on the importance of genetic variation and local adaptation, they purchased and planted off-site plant stock. Because of their intolerance to coastal environments, however, plants genetically adapted to the Willamette Valley did not always do well, showing low vigor and high mortality. In addition, most of the native plant material available was small bareroot stock types that were not very competitive and hard to maintain because of their relative size to the competing vegetation already dominating the site. Common competing issues were browse, overtopping, moisture competition, and matting.

Most organizations involved with restoration efforts on the Oregon coast did not have adequate funding to purchase plants. The main source of plant material came from donations of surplus upland reforestation conifer stock that were acquired through a variety of sources, including; the U.S. Department of the Interior (USDI), Bureau of Land Management (BLM); U.S. Department of Agriculture (USDA), Forest Service; Oregon Department of Forestry and several private timber companies. A typical bareroot upland reforestation conifer, such as western hemlock, Douglas-fir, western redcedar, and Sitka spruce grown for the Oregon coast has a height range of 14 to 20 in (35 to 50 cm), a 0.2- to 0.3-in (5- to 7-mm) stem diameter, and a fibrous root mass 10 to 11 in (25 to 28 cm) in length. These stock type dimensions are not ideal for planting in riparian habitat as most sites are dominated by aggressive, nonnative species or overtopped by an existing stand of hardwoods or shrubs. In these habitats, underground competition is extremely important; for example, planting a 10-in (25-cm) rooted bareroot tree seedling into reed canarygrass (*Phalaris arundinacea* L.) with root systems 14 in (35 cm) deep is not practical for survival. In these conditions, site preparation and maintenance is extremely costly to assure survival, an expense for which most watershed restoration efforts did not have adequate funding.

Donated bareroot conifer species were available only late in the planting window; sometimes well into the spring root development stage for conifers. Planning efforts were difficult because no indication existed of what stock would be available or when. These donated surplus conifers usually had problems because of moisture stress after long-term cooler storage that led to higher mortality rates. Considering most planting efforts occur on private lands, high mortality rates did not appeal to these private landowners, thereby making it difficult to recruit neighboring landowners for participation in the watershed restoration program. Landowner participation is the key to treating watersheds as a whole; thus, plant survival and vigor is crucial for successful restoration efforts

Tillamook Native Plant Cooperative

Recognizing the need to use locally adapted native plant material and create a larger more competitive stock type, a small group of restoration coordinators in the Tillamook area created a plan. In 2001, they took the entire donated seedling surplus they could get and, instead of outplanting them, they transplanted the trees back into the soil at the Oregon Youth Authority (OYA) Camp Tillamook Work Study Center, for 1 additional year, thereby creating a 3-year-old bareroot stock type (figure 1). In theory, this approach would reduce

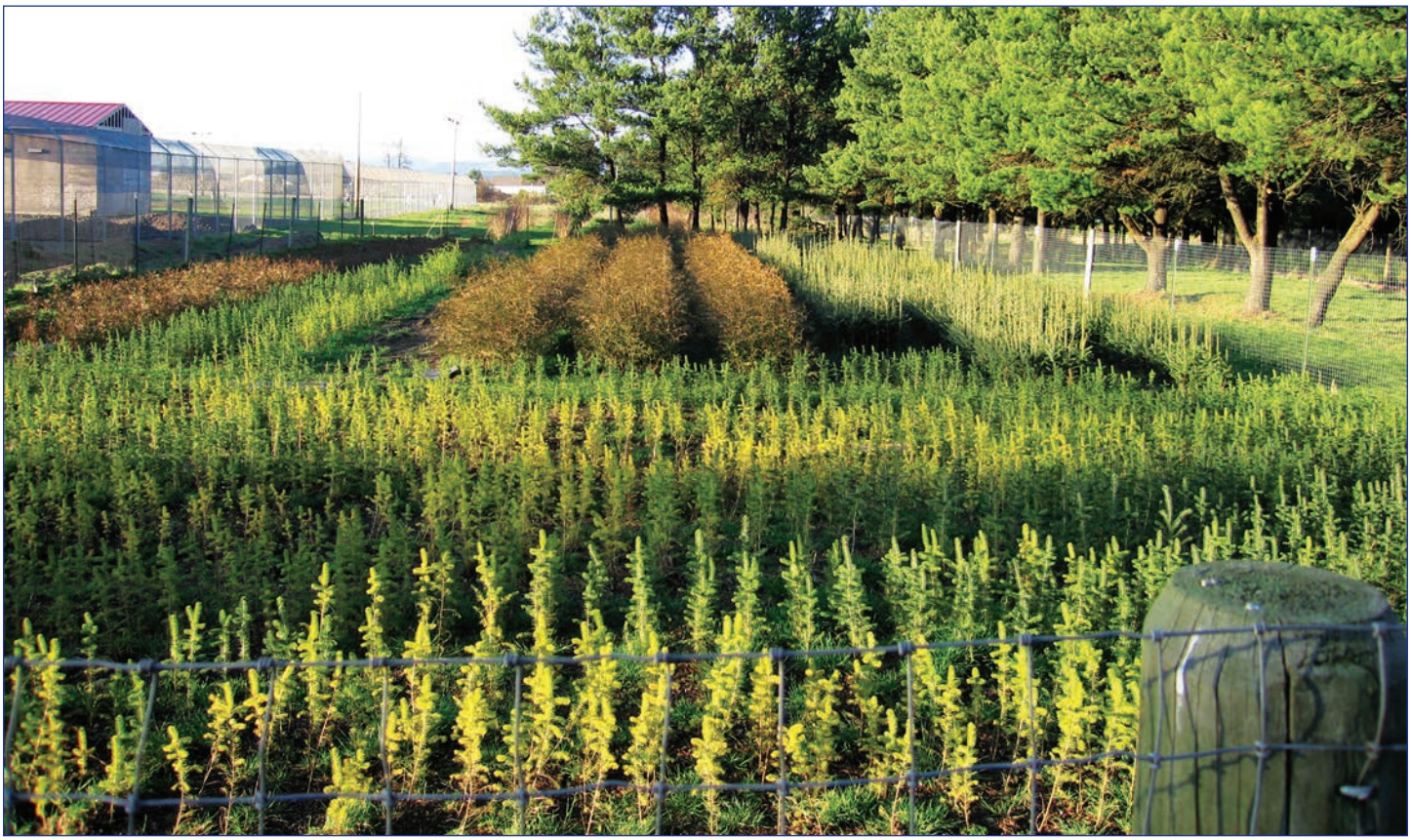

Figure 1. Initial bareroot nursery established at the Oregon Youth Authority Camp Tillamook Work Study Center. (Photo by Kurt Heckeroth 2002)

mortality issues, create a larger, more competitive plant, and provide an inventory for planning purposes. A collaborative effort began and was called the Tillamook Native Plant Cooperative. No funding initially was available to support this effort. An agreement was established between the Tillamook Soil and Water Conservation District and the OYA Camp Tillamook Work Study Center, a State Agency that allowed the partners to use State land for their project. A local farm digester cooperative donated compost to amend the soil, a local farmer donated time and equipment to till the land, the youth from Camp Tillamook donated the labor to transplant the donated seedlings, and the BLM-donated cooler space for bareroot tree storage.

Establishing the transplant nursery created an inventory of available plants and enabled the partners to control their lifting window. Limitations still existed, however. The effort to manage the nursery without chemicals led to weed control issues because the OYA labor force was not always available for manual weed removal. The OYA inmates manually did all the nursery work, and wet weather on the coast provided only small windows of opportunity to lift seedlings for outplanting. It was difficult to remove the wet soil from the roots, and, because of the lack of weed control, roots were damaged when the workers separated the target plant from the weeds. The lifted plants had to be bagged or boxed and stored in a cooler, but the 3-year-old plants were quite large and difficult to package properly. Also, because the ideal planting window for dormant bareroot plants coincides with high streamflow events, seedling storage was needed late into the spring. This storage duration meant that the cooperative was still dealing with long-term storage issues and possibly missing spring root development.

Given the difficulties in handling and storage of bareroot plant material, the partnership decided to pursue container plant production. In 2003, all 2-year-old bareroot tree seedlings were transplanted into 1-gal (3.8-L) Tall One Treepots™ (Stuewe and Sons, Inc., 4 in [10.2 cm] wide and 14 in [35.6 cm] deep) and grown for 1 additional year. A small test area was developed and was so successful that holding racks for containers were built (figure 2), and the entire nursery area was converted to containers in 2004. Transplanting into containers resulted in larger, more competitive stock, less weeding needed, longer planting windows, and less root disturbance (figure 3) while still benefitting from the OYA labor force (figure 4).

The next issue to be addressed was species diversity. Planting solely conifers did not meet all the streamside restoration objectives (such as shade to reduce stream temperature, bank stabilization, nutrient input, etc.). Some of these objectives could be met sooner by incorporating deciduous tree and shrub species that were not available through donations. In 2002, BLM's Horning Seed Orchard (Colton, OR) had three commercial-sized greenhouses that were being used at only one-third capacity for upland conifer plug production. The BLM received a grant from the National Fish and Wildlife Foundation that was used to improve the middle greenhouse span to accommodate an area for the restoration partnership to start containerized seedling production (figure 5). To formalize this relationship, a memorandum of understanding (MOU) was constructed among BLM, 7 Watershed Councils, Tillamook County Soil and Water Conservation District, OYA, and Tillamook Estuaries Partnership, all of which were within the geographic boundaries of the Tillamook Resource Area of the BLM's Salem District. Watershed councils from the

Figure 2. Holding racks were built (left) to convert the Camp Tillamook Nursery from bareroot to container seedling production (right). Each rack holds 90 plants and will last up to 15 years. (Photos by Kurt Heckeroth 2003)

Figure 3. Western redcedar (left) and sedge (right) growing in containers at Camp Tillamook Nursery (Photos by Kurt Heckeroth 2012)

Figure 4. Oregon Youth Authority Camp Tillamook Work Study Center workers applying fertilizer to newly potted western redcedar seedlings. (Photo by Kurt Heckeroth 2012)

Figure 5. A greenhouse at the Bureau of Land Management's Horning Seed Orchard was placed into production for the Restoration Partnership. (Photo by Kurt Heckeroth 2003)

Willamette Valley were also invited to partner, which created the need to separate seed collections from coastal and valley watersheds. Because Federal dollars were now being used to fund restoration on private lands, the Wyden Amendment was used as the authority, which limited partnered projects to only watersheds that could show benefit to public lands. The Horning Seed Orchard started approximately 40,000 seedlings and grew 12,000 plants in 1.0-gal (3.8-L) Tall One Treepots™ for outplanting on a yearly basis. Trees to be outplanted were shipped to 4 drop points along the Oregon coast (figure 6).

In 2010, the BLM began a process to reorganize their tree improvement program, which would eventually reduce and eliminate the partner's ability to use the greenhouses at the Horning Seed Orchard. To adapt to this change, the partnership secured funds to build a commercial-sized greenhouse in Tillamook (figure 7) located at the OYA Camp Tillamook Work Study Center. The partnership also worked with school districts and partners throughout the northwest corner of Oregon to revitalize greenhouses in disuse from underused or unfunded

Figure 6. Trees being delivered to the U.S. Fish and Wildlife Service wildlife bird refuge just south of Pacific City, OR, one of four drop points along the Oregon coast. (Photo by Kurt Heckeroth 2005)

Figure 7. A new greenhouse was constructed at the Oregon Youth Authority Camp Tillamook Work Study Center in 2012 for seedling production after the Horning Seed Orchard greenhouse was no longer available. (Photo by Kurt Heckeroth 2012)

agriculture programs and created 13 additional satellite nurseries (table 1). These geographically dispersed nurseries significantly reduced the cost for plant distribution.

Restoration Through Education

To efficiently collect reproductive material and develop community involvement, the partnership established a workshop program in 2004 that focused on 20 different native riparian plant species including conifers, hardwoods, and shrub species. The workshops are provided to coordinators, teachers, youth corps, and volunteers (figure 8). Workshops have been offered through Oregon State University Extension offices, the BLM office in Tillamook, Lewis and Clark National Park in Astoria, or one of the partner's facilities. An additional workshop was developed for grade school and high school classes in which the students learn about plant propagation in a classroom setting (figure 9) and during hands-on sessions (figure 10). In some schools, students grow plants in a native plant nursery at the school (figure 11) and plant them 2 years later on restoration sites with the local watershed councils. All of the education sessions emphasize nonprofit, community-based restoration efforts for riparian and wetland habitats. Information provided through the workshops includes plant identification, seed collection, seed extraction (if needed),

Table 1. List of satellite nurseries in Oregon built to help educate local communities and create a sustainable supply of genetically adapted plant material; any surplus plant material is made available to all partners if the genetics are appropriate.

Site in Oregon	Infrastructure	Production capacity		Primary beneficiaries (county)
		1.0-gal (3.8-L) Tall One Treepots™	16-in^3 (262-cm^3) Ray Leach Cone-tainers™	
Camp Tillamook (Tillamook)	1 greenhouse		50,000	All partners
	Outdoor growing area	25,000		Lincoln, Tillamook, Clatsop
Ecotopia (Cloverdale)	Outdoor growing area	4,000		Lincoln, Tillamook
Lewis and Clark National Park (Astoria)	Emergent shade house		20,000 wetland species	Clatsop
	Outdoor growing area	2,000		
Rainier High School (Rainier)	1 greenhouse		5,000	Columbia
	Outdoor growing area	2,000		Clatsop
St. Helens High School (St. Helens)	1 greenhouse		To be determined	Columbia
	Outdoor growing area		To be determined	
Columbia River Youth Corps Campus (Warren)	Outdoor growing area	4,000		Columbia
Scappoose High School (Scappoose)	Outdoor growing area	2,000		Columbia
Vernonia High School (Vernonia)	1 greenhouse		30,000	Columbia, Tillamook, Washington
	Outdoor growing area	2,000		
Trillium Forest Nursery (Vernonia)	Outdoor growing area	2,000		Columbia, Tillamook, Washington
Newberg High School (Newberg)	3 greenhouses		5,000	Washington, Yamhill
	Outdoor growing area	2,000		
Miller Woods (McMinnville)	1 greenhouse		1,000 or more	Yamhill
Eddyville Charter School (Eddyville)	1 greenhouse		5,000	Lincoln
	Outdoor growing area	1,000		
Westwind (Lincoln City)	Outdoor growing area	2,000		Lincoln
Taft High School (Taft)	Outdoor growing area	2,000		Lincoln

Figure 8. Workshops provide partners training on seed collection, seed extraction, seed storage, and propagation techniques. (Photo by Alex Sifford, Nestucca/Neskowin/Woods Watershed Council 2010)

Figure 9. Educational programs include classroom learning and demonstrations about plant propagation. (Photo by Alex Sifford, Nestucca/Neskowin/Woods Watershed Council 2010)

Figure 10. Hands-on plant propagation is part of the educational workshop program. (Photo by Alex Sifford, Nestucca/Neskowin/Woods Watershed Council 2010)

Figure 11. At some schools, students propagate and grow plants at a native plant nursery at the school. (Photo by Alex Sifford, Nestucca/Neskowin/Woods Watershed Council 2010)

seed storage, sowing techniques, and vegetative propagation methods under controlled greenhouse environments and outdoors at the project site. The importance of genetic diversity is emphasized throughout each workshop. After a full day in a classroom setting, a field day is offered to gain hands-on experience and follow-up to the information presented in the classroom. These workshops are provided upon request by the partners and usually held in the fall when many of the native tree and shrub species are readily available to collect.

The partnership has also established relationships with several youth corps and provides them with the opportunity for natural resource conservation training. The youth help collect seed, propagate and transplant seedlings, perform site preparation and planting techniques, and provide maintenance at the project site. Their participation has been crucial to the success of this cooperative effort. Educating youth is important as they are the next land stewards and, through education and hands-on experience, will be able to make wiser choices by understanding how their activities on the landscape affect fish and wildlife habitat and impact water quality.

In addition to workshops, each partner has incorporated volunteer activities that provide opportunities for hands-on education (figure 12). These activities promote local community interest and landowner participation.

Figure 12. Partner volunteers potting tree seedlings for restoration plantings. (Photo by Kurt Heckeroth 2005)

Collection And Propagation

The partnership model initially was to provide education and to have each partner be in control of his or her community-based collection of reproductive plant material. The material was batched with other partners' collections according to seed zone and elevation or by watershed, and then propagated and returned to the appropriate location for planned restoration projects. It was soon recognized, however, that without tight control of the collection process, plant viability could be compromised because of poor collection timing and seed handling before sowing. Since 2012, all the seed that is collected for the coop is overseen by the partnership coordinator and direct sown. The seed collection protocol for a particular species batch calls for a minimum of 15 parent plants from 15 separate locations spaced at least 0.5 mi (0.8 km) apart, with each parent contributing no more than 15 percent to the batch. This protocol is also recommended for vegetative collections. Elevation bands of 500 ft (152 m) are also observed although most of the project sites are below 500-ft (152-m) elevation.

The partners produce approximately 40,000 shrub and hardwood plants annually. All seed are direct sown immediately after collection into 16-in^3 (262-cm^3) Ray Leach Cone-tainers™ and left outdoors through the winter to go through a natural stratification (figure 13). The trays and tubes are covered tightly with shade cloth to prevent predation from birds and rodents. The next spring, they are moved into the greenhouse to encourage germination. Plants are grown in the greenhouse for 4 to 6 months (figure 14) and then transplanted into 1.0-gal (3.8-L) Tall One Treepots™ in July or August, just in time to take advantage of the fall root development period and set up the plant for vigorous growth the next spring. Initially, the partnership used smaller containers to conserve greenhouse space but found transplanting was required earlier than desired, resulting in capacity issues with the outdoor nursery. For educational purposes or when the seed collection window is missed or not available based on environmental conditions, vegetative propagation is used. For some species, it is quicker to create a larger, more robust plant from cuttings than from seed. Both hard and soft tissue cuttings are used (figure 15). Cuttings are struck into Ray Leach Cone-tainers™ and transplanted to Tall One Treepots™ after adequate root growth occurs. Most shrubs and hardwoods are grown at the nursery for 2 years before outplanting.

Figure 13. Shade house being constructed at the Oregon Youth Authority Camp Tillamook Work Study Center to use for direct sowing and outdoor natural stratification over the winter. The shade cloth protects seed from bird and rodent predation yet allows for ambient temperatures and rain. (Photo by Kurt Heckeroth 2012)

Figure 14. Black twinberry seedlings being grown for restoration plantings. (Photo by Kurt Heckeroth 2013)

Figure 15. Several native plant species, including stink currant, are grown from cuttings. (Photo by Kurt Heckeroth 2013)

In addition to the shrub and hardwood plants, more than 30,000 conifer seedlings are grown as plug+1 stock at private nurseries in the Willamette Valley and then transplanted into containers at one of the established partnership nursery sites on the coast (table 1). The bareroot seedlings are lifted in mid-January and held in the BLM cooler at Tillamook until they can be transplanted in mid-to late February. The main conifer species used are Sitka spruce (*Picea sitchensis* [Bong.] Carrière), western hemlock (*Tsuga heterophylla* [Raf.] Sarg.), grand fir (*Abies grandis* [Douglas ex D. Don] Lindl.), western redcedar (*Thuja plicata* Donn ex D. Don) and Douglas-fir (*Pseudotsuga menziesii* [Mirb.] Franco). All conifers are transplanted into 1.0-gal (3.8-L) Tall One Treepots™. These container dimensions force the root mass to develop to a depth that makes it more competitive underground when outplanted and provides the plant with more stability. Outside growing areas have been constructed throughout the northwest corner of Oregon to grow 45,000 of these containerized conifer and hardwood seedlings per year.

Northwest Oregon Restoration Partnership

A new partnership, the Northwest Oregon Restoration Partnership (NORP), has recently been created through a new MOU that builds upon the success of the Tillamook Native Plant Cooperative. The NORP includes the original partners plus approximately 20 additional agencies, organizations, and schools that want to share resources to restore not only riparian and wetland habitats but also prairie, Oregon white oak, high-elevation meadows, and other important habitats in and around Oregon's north coast range.

Because of the growth in the partnership, the Tillamook Bay Watershed Council (TBWC) agreed to apply and become the recipient of an Oregon Watershed Enhancement Board grant to fund a NORP coordinator and also manage Federal funds through a 5-year Cooperative Assistance Agreement with the BLM. All BLM funds that support the NORP are used to purchase supplies required to operate the partnership nurseries (such as soil, pots, fertilizers, and additional infrastructure costs such as propane, water, and electricity). The TBWC has hired the NORP coordinator as an employee with the objective to act as the central point of contact, to research funding opportunities, coordinate educational workshops, identify and coordinate seed collection windows for each plant species, and manage the plant production and dispersal for the entire partnership on an annual basis. Each fall, the partners provide the NORP coordinator with a plant request based on project needs. Plant material that is not readily available through the cooperatives, current plant inventory will be purchased from private nurseries if the appropriate genetics can be found.

This partnership has been successful for several reasons:

1. The BLM has provided essential funding and technical support for the plant propagation that has contributed to low mortality rates.
2. The partners are able to use the cost of plant material to secure grant funding for planned projects.
3. The partners are key to project implementation. They outplant the nursery plants onto the landscape, mostly on private lands, and restore approximately 20 to 25 mi (32 to 40 km) of degraded riparian areas each year.
4. The partners make the necessary landowner contacts, educate landowners why streamside restoration is important for fish, wildlife and water quality, and write grants to support the project work (site prep, planting, fencing, caging, and maintenance).
5. The process of providing plants is based on, and adjusted for, meeting partners' needs; this will continue into the future.

Using BLM funding sources that are targeted for native plant restoration through this partnership has shown recognizable benefit to whole watersheds that benefit from restoration efforts completed on public lands. In addition to using BLM funds, NORP partners are pursuing grant opportunities with the U.S. Fish and Wildlife Service, National Fish and Wildlife Foundation, Oregon Watershed Enhancement Board, Oregon's Department of Environmental Quality, and other sources to integrate funds for plant propagation so that the BLM is not the sole funding source for the propagation part of the project.

Everyone understands the importance of having a diverse funding stream that reduces the risk of failure if the BLM does not have the budget to continue funding the partnership. The contributions of BLM, however, allow the partners to use Federal contributions as match for grants, a concept that has built and maintained this partnership for more than 10 years. Partners use the initial investment by BLM to raise large amounts of additional funds for the project, bringing in more than $3 for every $1 spent by BLM. This project has made significant improvements to watershed health, and the partnership looks forward to continuing to work together to improve degraded habitats and water quality throughout the northwest corner of Oregon.

Accomplishments

From 2002 to 2011, significant landowner participation, education events, and miles of planting along streams occupied by federally listed endangered fish has occurred (table 2). Because of this level of local involvement established through the partnership, entire communities have raised their awareness concerning the benefits of healthy riparian conditions affecting fish and wildlife habitat and water quality. These efforts encourage and generate respect for good stewardship on both private and public lands. The emphasis for BLM's participation in this partnership is to support restoration projects that address problems and implement recommendations identified in 32 watershed analyses covering the north coast range completed as part of Salem District's land use planning. All these watershed analyses recognize that continuity of watershed health is needed to sustain and stabilize the resources that use or are part of BLM lands and the communities that BLM serves.

It does no good to fix just a portion of a problem that may exist only on BLM-administered lands when other parts of a watershed are unraveling or are not properly functioning. NORP is instrumental in restoring the whole watershed through all the partners working on all land ownership types. This partnership has been recognized as a successful working model to restore ecosystem function and has garnered awards in recognition of its achievements from the American Fisheries Society, the Public Lands Foundation, and from former BLM Director Robert Abbey for excellence through stewardship in BLM. NORP continues to draw interest and grow because of its success in addressing on-the-ground needs, providing community-based education, and encouraging public participation. The actions undertaken by NORP support the Oregon Plan for Salmon and Watersheds, the Oregon Conservation Strategy, Oregon Coast and the Coho Conservation Plan, and meets multiple BLM strategic goals and planning objectives, including, but not limited to, threatened and endangered species recovery, community support, partnerships, youth, fish and wildlife habitat, water quality, and biological system integrity. In addition to providing shade and water filtering to improve salmon habitat and water quality, much of the riparian planting also helps to control invasive species such as reed canarygrass, Scotch broom (*Cytisus scoparius* [L.] Link), English ivy (*Hedera helix* L.), Himalayan blackberry (*Rubus armeniacus* Focke), and knotweed (*Polygonum* L.) that occupy many project sites.

Table 2. Summary of Tillamook Resource Area riparian restoration accomplishments.

Activity	FY 2011	Total FYs 2002–2011
Streams planted (mi)	27	256.27
Wetlands planted (ac)	22	114.03
Riparian fences constructed (mi)	4.26	51.47
Project maintenance (mi)	42.14	353.27
Number of landowners involved	411	1,937
Number of future landowners contacted	354	1,903
Number of plants propagated (other than at Horning or Camp Tillamook)	6,750	58,680
Number of education sessions or tours	43	291
Number of people attending education sessions or tours	879	7,813
Monitoring (mi)	76.6	467.93
BLM/NFWF funds expended	$115,000	$799,671
Partner donation value (includes OWEB funding)	$187,262*	$1,840,937*

BLM = Bureau of Land Management. FY = fiscal year. NFWF = National Fish and Wildlife Foundation. OWEB = Oregon Watershed Enhancement Board
*These numbers reflect only the amount reported by partners as a match for the project. When we surveyed the partners regarding total contributions, we found that they bring approximately $350,000 per year to the project. Throughout the 9 years of implementation, the Tillamook Resource Area Riparian Restoration Effort watershed organizations have contributed more than $3 million to the project.

Summary

NORP's work will make it possible to restore thousands of acres of native plant communities in riparian, wetland, and rare upland habitats at priority sites throughout watersheds in northwest Oregon. NORP supports partners' resource management plans, watershed analyses, and restoration activities by providing locally adapted native plant materials. NORP's efforts play a central role in the restoration of threatened and endangered salmonid streams and rivers and improvement of water quality throughout northwest Oregon.

NORP has transformed the geographic region in the northwest corner of Oregon from an area where a wide variety of efforts were competing to achieve the same goals into a more cohesive, cooperative effort for riparian restoration. The program

has created a transition from plant material being sought out by individual entities to a collaborative effort that has created a sustainable supply of locally adapted native plant materials. In addition to sharing plant materials, technical advice is shared regarding seed collection, vegetative propagation, site preparation, planting techniques, animal damage protection, and maintenance. In some cases, proposals for grants are collaboratively written to support these cooperative efforts. Previously abandoned agriculture program greenhouses at schools are being rejuvenated to support restoration. Partners have greater opportunities to receive and give education to their local communities. This program is a working model of successful cooperative watershed management where boundaries can be crossed and restoration can be identified on an entire watershed scale.

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