



watersheds program

treeline

partnering for climate adapted forests

April 2021

Missed the February Treeline Newsletter? [Click here](#) to learn about what our Extension Partners are working on.

Interested in submitting an article? The June issue will focus on floodplains. [Contact Kira](#).

Lomakatsi crew members install erosion control wattles in the Almeda Fire footprint.

Fire Issue

Treeline aims to: Engage PNW restoration practitioners, nursery partners and researchers who work for or represent tribes, indigenous groups, non-profits, agencies, businesses and more. Gather, disseminate, and discuss information and knowledge across a broad region.

What we are hearing so far:

We shared a [survey](#) link in our last newsletter and while it is still open for your submissions, we are pleased to share this early snapshot of what we are learning. We invite you to please complete [this survey](#) between now and May 15 so we can include your reflections and priorities.

What partners are thinking about relating to trees, climate and assisted migration:

Trees and shrubs considered native that partners are concerned may be suffering from increased mortality, morbidity, diminished growth or poor regeneration as a result of climate change:



Trees and shrubs considered native for which partners have intentionally sourced seed or plant materials from an area outside your customary seed zone for the purpose of climate adaptation:





Lomakatsi Restoration Project Responds to the Almeda Fire

Lomakatsi Restoration Project is a non-profit, grassroots organization that develops and implements forest and watershed restoration projects in Oregon and Northern California.

An interview with:

Marko Bey
Executive Director

Belinda Brown
Tribal Partnerships Director

Niki Del Pizzo
Riparian Restoration Manager

Rob Strahan
PhD, Restoration Ecologist

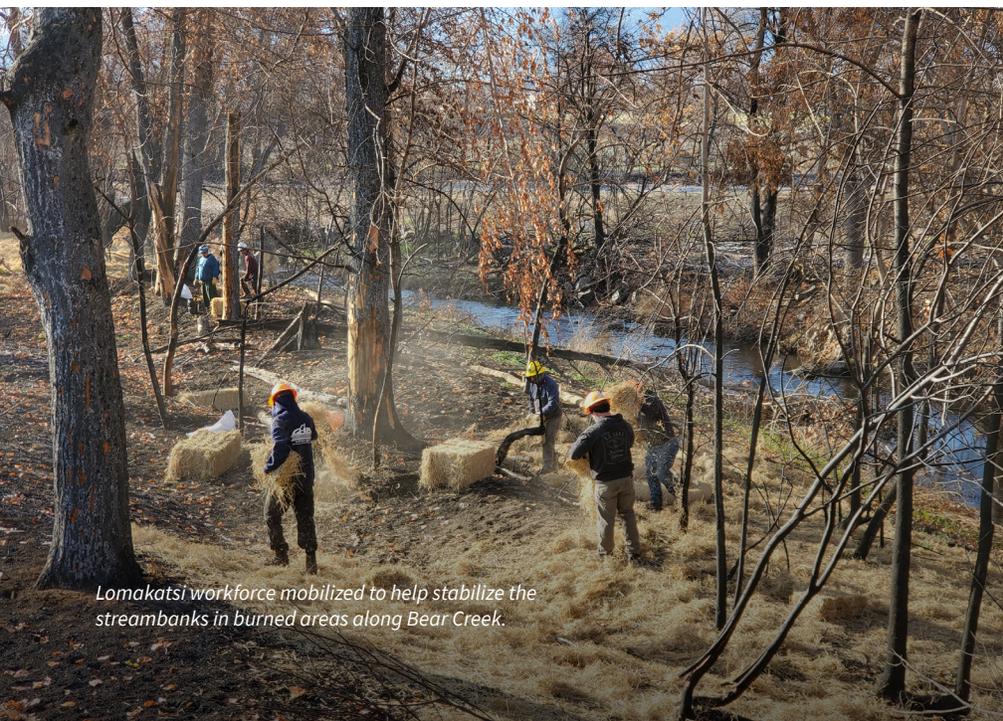
What was the impact of the Almeda Fire on the local community and ecosystem?

The Almeda Fire began on September 8, 2020, starting in Ashland, Oregon and quickly spreading through the riparian corridor of Bear Creek and devastating the towns of Phoenix and Talent, before it was stopped in south Medford. The fire burned 3,200 acres, claimed four lives, and destroyed over 2,400 homes. It hit close to home—three Lomakatsi staff members lost their homes. This was a high intensity fire, not just to the homes that were lost, but also to the riparian corridor and the trees and vegetation. Bear Creek is a fish-bearing stream and key tributary to the Rogue River. It's located largely in an urban watershed and supports anadromous fish including

Coho and Chinook salmon, Steelhead, and Pacific lamprey. The fire destroyed much of the important streamside vegetation across nearly 400 acres of riparian habitat, threatening water quality and the health of riparian and aquatic wildlife. Lomakatsi has been working for a couple of decades in Bear Creek doing riparian restoration with partners, and we know the ground very well. This fire made deep, devastating cuts to both human and ecological communities.

What made the fire so intense?

We live in a dry forest ecosystem here, with a frequent fire system influenced by lightning and thousands and thousands of years of frequent, low to moderate intensity fires used by indigenous communities to steward the landscape.



Lomakatsi workforce mobilized to help stabilize the streambanks in burned areas along Bear Creek.

To secure funding for your own restoration projects visit **Promise the Pod**.

With the generous support of One Tree Planted, the Arbor Day Foundation, and other donors, we are on track to support the planting of close to 2,000,000 native plants in the PNW in 2021. This includes over 200,000 plants directed to fire recovery areas.

Do you need additional resources for your plantings?

Reach out to hbuehler@b-e-f.org for more information.



The Almeda Fire burned at high intensity along the Bear Creek Greenway.

Over the past century, as most fires have been suppressed, vegetation densities have largely increased across the landscape and we're seeing the impacts in large, more destructive wildfires.

The Almeda Fire was driven by an uncharacteristically strong wind event late in the Rogue Valley's dry season. This region has a hot summer Mediterranean climate, meaning there is often little to no precipitation in the summer months—in 2020, zero precipitation was recorded in Medford for 99 consecutive days between June 24 and September 23. Extreme winds, very little moisture, and dry vegetation created the perfect storm for a high intensity fire.

Another primary factor in fire intensity was the high density of non-native plant species along the Bear Creek riparian corridor, including large, continuous stretches of invasive Himalayan blackberry brambles that can reach 10-15 feet high. There was also a large fuel bed of dead blackberry canes among the brambles. After a long, hot summer, these plants retained very little moisture, and were easily ignited. The native trees and plant species here have evolved alongside fire for millennia, and native species are generally more resistant to fire than invasive ones.

Following the removal of indigenous peoples as the primary caretakers of the land, settlers began removing healthy streamside forests to support grazing and urban development. Over time, riparian corridors have been heavily degraded and inundated with invasive species—including some highly flammable varieties such as non-native blackberry.

The fire highlighted the vulnerability of these urban riparian systems to this type of situation. Our thinking is evolving with riparian restoration and how we can create more resilient, resistant, climate adapted systems that take into account this new reality we're living in, of increasing frequency and severity of wildfire.

How is Lomakatsi involved in post-fire actions on the ground?

When the Almeda Fire hit, our crews were just coming off a long season of wildland firefighting, and we were commissioned by Jackson County Emergency Management to act immediately. Lomakatsi was dispatched to do emergency erosion mitigation work before the rainy season started, and in preparation for the spawning season of salmon coming up from the Rogue River to Bear Creek. We installed straw wattles and spread straw to shore up the streambanks and mitigate sediment influx into Bear Creek, to preserve spawning habitats. Lomakatsi's multi-cultural crews were assisted in these efforts by an inter-tribal workforce we employed including members of the Northern Paiute, The Klamath Tribes, Shasta Nation and Ajumawi-Atsuge Nation (Pit River Tribe).

Over the coming weeks, months and years, we will be working with our partners to plant a diversity of native trees and shrubs to prevent erosion and revegetate the streamside corridor, in a way that is much more resistant to fire than the vegetation that was there before. Jackson County did aerial seeding across the whole fire footprint, and Lomakatsi followed up with seeding on the ground and deploying straw to

areas closer to the stream banks. We gratefully received funds through the Promise the Prod program to plant six thousand trees in the fire footprint over the coming weeks.

How is Lomakatsi involved in post-fire planning and response?

Lomakatsi is working closely with Jackson County and our many partners on long-term ecological recovery efforts—including a riparian restoration strategy and developing prescriptions that include a fire-wise approach. We're working with municipalities and watershed councils to secure funding through the Federal Emergency Management Agency (FEMA), the Oregon Watershed Enhancement Board (OWEB) and other sources. We're in discussions with elected officials, tribal partners, state agencies, and foundations on how we're going to address not only the ecological but the socioeconomic impacts of these fires. Vulnerable communities were hit hard by the Almeda Fire.

Lomakatsi takes a holistic approach to ecological restoration, community engagement and collaboration with partners. As a multi-cultural organization with over 70% of our in-house staff representing Latinx and tribal communities, including in leadership positions, we've been working with diverse partners since our inception. Before working in a new area, we first engage with tribal governments and communities about work being implemented on their ancestral lands. In this case, we've been working closely with Shasta tribal leaders to guide ecological restoration and cultural resource protection efforts in the Almeda Fire area.



Lomakatsi crew members install erosion control wattles in the Almeda Fire footprint.

We're also building on Lomakatsi's established Workforce Training and Employment Program to increase regional capacity for restoration, in collaboration with economic development and community workforce organizations.

How did previous restoration efforts, including prescribed burning, impact the Almeda Fire?

We've been working on a long-term riparian restoration stewardship initiative over the past 14 years, near where the ignition started, at the confluence of Ashland Creek and Bear Creek. This has been in partnership with the City of Ashland, Rogue River Watershed Council, the local Helman Elementary School and US Fish & Wildlife Service. We've removed a lot of invasive blackberry and used controlled burning to reduce vegetation, coupled with non-chemical maintenance through digging, mulching and planting a diversity of site-specific native species in place of invasive ones.

Our treatment area did not burn as severely as adjacent untreated areas—noticeably, the fire stayed on the ground and burned at lower intensity. In untreated areas of dense blackberry, that's where the fire burned with very high intensity. In general, under most conditions, science and practice have shown that fire behavior will change if you maintain historic levels of trees and vegetation in fire-adapted ecosystems. Long-term stewardship is essential to the health of forests and streamside areas, and to building community resilience.

What would it take to scale the work you are doing to create more fire resilient forests?

In the Rogue River Basin, and throughout Lomakatsi's work across Oregon and Northern California, we have been incrementally scaling our projects over the last two decades. Many of our initiatives operate under large-scale, long-term collaboratives. Lomakatsi is involved in what are called master stewardship agreements with federal agencies including the US Forest Service and Bureau of Land Management, and with our tribal, municipal and non-profit partners, where we act as business partners and co-invest in the work.

In the dry forest, fire-adapted landscape of the Rogue Basin, we know that fires are going to come. There are over a million acres here in need of treatment—they are departed from historic conditions and are now overly dense. Also, industrial logging has had an influence on the exclusion of fire. To scale this work, we have to work together with a big collaborative team of many partners across a lot of land. Realistically, we need to be treating over 100,000 acres a year in the Rogue Basin over the next 30 years.

Restoration is expensive, but far more cost effective than dealing with the devastating impacts of wildfires on communities, ecosystem services, and biological diversity. We need more funding for accomplishing restoration on the ground, and more capacity funding to support community-based non-profit organizations like Lomakatsi that can play a key role in building partnerships and regional capacity.

What are the biggest barriers to increasing the scale and impact of prescribed burning?

Controlled burning within the Wildland Urban Interface is complex and presents a number of challenges. These include the need for specific weather conditions, compliance with various laws and regulations including around air quality, funding for operations that require careful planning and qualified crews, and public support. Lomakatsi is diligently working with many partners, elected officials, tribal communities, and prescribed fire councils across Oregon and Northern California to address the impediments to prescribed fire.

Are you noticing climate change impacts where you work and are you doing anything differently as a result?

In upland environments, we are seeing increases in drought related impacts. Directly through reduced tree growth, and indirectly through increased susceptibility to wildfire, insects and disease. Forests with higher tree densities are more susceptible to these impacts than forests that are less dense. These drought environments also relate to soil temperature and soil moisture availability in addition to air temperature and precipitation. Our restoration work is ecological forestry, and we promote those resilient forests by reducing tree densities in favor of species that are more adapted to hotter, drier conditions like oaks and Ponderosa pines. And on top of that, we also focus on retention of live and dead legacy components that provide important ecological habitat viability and also increase on site carbon storage.

In riparian zones, we can see a decline in vitality of native tree and shrub species that need moisture. They are struggling more now than they were 20 years ago. There's definitely a need for more watering in the first several years when we plant because of the drier soil conditions. Also, invasive blackberries taking over spaces where the native trees would be growing, and now the native seeds will never germinate. We are losing tree canopies in riparian systems, which are really important for ecological health and future large wood recruitment into streams that benefit fish habitat.

Native ecosystems are very drought tolerant. They are adapted to hot, dry conditions, and so in our work we promote those native species assemblages that are already ecologically appropriate and would be most adaptable moving forward. The shift from native perennial understory communities to invasive annuals (Himalayan blackberry) is a major concern. Additionally, we're already experiencing a significant loss of oak habitat, which provides important ecocultural and subsistence lifestyle resources for tribal communities.

What ideas and practices can partner organizations learn from tribal and indigenous organizations?

Response from Belinda Brown, Lomakatsi Tribal Partnerships Director and member of the Kosealekte Band of the Ajumawi-Atsuge Nation (Pit River Tribe).

Reach out to tribes. Ask about the fire affected land. Involve tribal communities in restoration work.

It is a best practice to involve tribes and tribal communities in decision-making that impacts their ancestral lands. Fires expose cultural sacred sites, gravesites and resources, so it's important to reach out to the tribes of the area to understand what happened on that land in the past that could now be uncovered. It is best to hire tribal cultural monitors from the local area, as Lomakatsi does when working in the Alameda Fire area. We also strive to hire tribal community members to help support work on the ground. Hiring cultural monitors and inter-tribal crews helps not only in healing the land, but also in supporting the socioeconomic connection by providing jobs, having different tribal members working together, and providing opportunities for youth and young adults to build their skillsets. We communicate with our partners in a good way and work together as a team as we continue to plan, respond,

recover and mitigate any further damages to the land or the people. As restoration practitioners, having input and involvement from tribes is vital, and indigenous knowledge layered into restoration plans and strategies makes for more successful projects.

Unfortunately, right now at the broader level, tribal engagement is an afterthought because the lands are usually county and state managed. If it's not federal funding going onto the ground, the revegetation and restoration requirements are quite distinct. Our goal is to elevate our Tribal Partnerships Program and the tribal leadership within the organization and throughout Southern Oregon. Lomakatsi has representatives of seven tribes within our organization, from our board to our technical team to our program leadership, to our prescribed fire team and our forestry team. We are happy to make connections throughout the region.

We must always recognize that we're on indigenous Aboriginal lands. We want to normalize the process of meaningfully engaging with the tribes—not just checking the box, but actually collaboratively engaging and taking the time to do that. It's not often in trainings or at meetings we see tribal representation. Whether working to restore forests or riparian areas, we must promote ecocultural restoration and tribal involvement in all we do.



Lomakatsi crew members install erosion control wattles in the Alameda Fire footprint.



In 2020, **Solectrac**, manufacturer and distributor of zero emission electric tractors and an innovative B Corp with a mission to disrupt climate change through sustainable farming solutions, saw an opportunity to support tree planting with BEF partners as part of a community engagement strategy. Six months later, Solectrac's funds are at work supporting Lomakatsi post-fire replanting for Alameda fire recovery. Coincidentally, a close family member of Solectrac leadership lost their home in the Alameda fire, making this work that much more poignant and meaningful. "We reached out initially wanting to amplify our climate goals and were deeply touched by the work underway in support of rivers, communities, and critically endangered species. We were touched that plantings will impact people who we know personally and love dearly" says Christiane Heckerth, CCO Solectrac.



U.S. Forest Service Climate Change Vulnerability Assessments

Science Management Partnerships Focused on Climate Change Adaptation in the Western United States

To access all of the climate change vulnerability assessments, along with a “Library” of climate change adaptation options, go to <http://www.adaptationpartners.org/>

The Project

The U.S. Forest Service (Pacific Northwest Region, Pacific Northwest Research Station) and the Northwest Climate Hub have developed science-management partnerships to conduct climate change vulnerability assessments and adaptation planning across all of the national forests (and adjacent national parks) in the Pacific Northwest. These vulnerability assessments cover hydrology, fish, vegetation, disturbance, wildlife, recreation, and other ecosystem services. The vulnerability assessments were used as the basis for developing adaptation options for the forests and partners. All of this information was incorporated into peer-reviewed and published general technical reports. The Mount Hood and Willamette National Forests plan to use the recently released assessment for their forests in planning and implementing post-fire restoration.



Jessica Halofsky
Director, USDA Northwest Climate Hub and the Forest Service Western Wildland Environmental Threat Assessment Center (WWETAC)

Lead Scientist

Jessica Halofsky is the director of the USDA Northwest Climate Hub and the Forest Service Western Wildland Environmental Threat Assessment Center (WWETAC). In her role, Jessica promotes applied climate change science and adaptation in natural resources in the Northwest and across the West. Jessica has a background in forest ecology and fire but has been doing climate change adaptation work in the Northwest for over a decade. In her previous position, she pioneered one of the first climate change vulnerability assessment and adaptation projects with Olympic National Forest and Park. Since that initial project, Jessica has co-lead eight other sub-regional to regional-scale climate change vulnerability assessment and adaptation partnerships around the western U.S.

The report (in press) **“Climate Change Vulnerability and Adaptation in the Columbia River Gorge, Mount Hood National Forest, and Willamette National Forest”** finds that:

“The vulnerability assessment shows that the effects of climate change on hydrology in the CMWAP [Columbia River Gorge National Scenic Area, Mount Hood National Forest, and Willamette National Forest] assessment area will be significant, primarily because decreased snowpack and earlier snowmelt will shift the timing and magnitude of streamflow; peak flows will be higher, and summer low flows will be lower. Projected changes in climate and hydrology will affect aquatic and terrestrial ecosystems, especially as frequency of extreme climate events (drought, low snowpack) and ecological disturbances (flooding, wildfire) increase.”



**NORTHWEST
NATURAL
RESOURCE
GROUP**

Ecological Forestry Techniques for Hotter, Drier Times

Rowan Braybrook, Northwest Natural
Resource Group

How do we address past mismanagement while also preparing for the future climate? Northwest Natural Resource Group and partners are launching a new demonstration project to test techniques that can help forests better endure the kinds of climatic change that we expect in the Pacific Northwest.

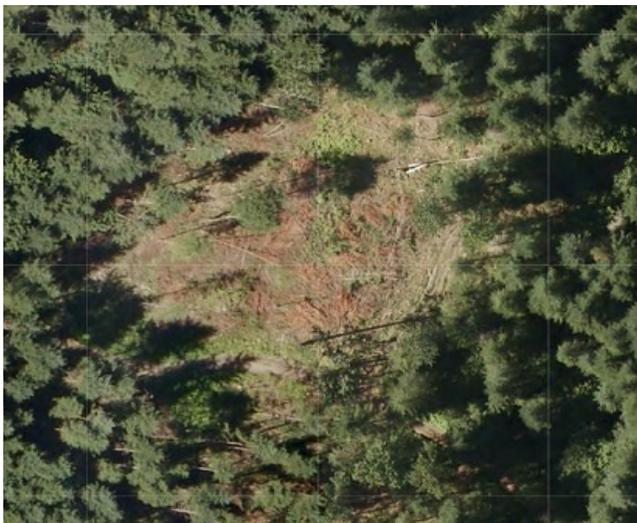
The restoration of several former monoculture plantations to older forest conditions will create more complex and diverse habitat, as well as higher rates of carbon sequestration. These demonstration sites, managed by partners King County DNRP and Nisqually Community Forest, will provide a portfolio of examples for several ecological forestry techniques that aim to speed tree growth and increase forest resilience to diverse stressors.

In the Pacific Northwest, 150 years of logging has disrupted the natural balance of seral stages (phases of ecological development). This has shifted much of the landscape in the region to younger, structurally simpler forests with a narrower spectrum of species. Monoculture forests are more susceptible to drought, insect infestations, and wildfire. These stressors will be exacerbated by climate change, making it harder for forests to attain older seral stages, thereby diminishing their contribution to biodiversity and degrading their exceptional ability to sequester carbon.

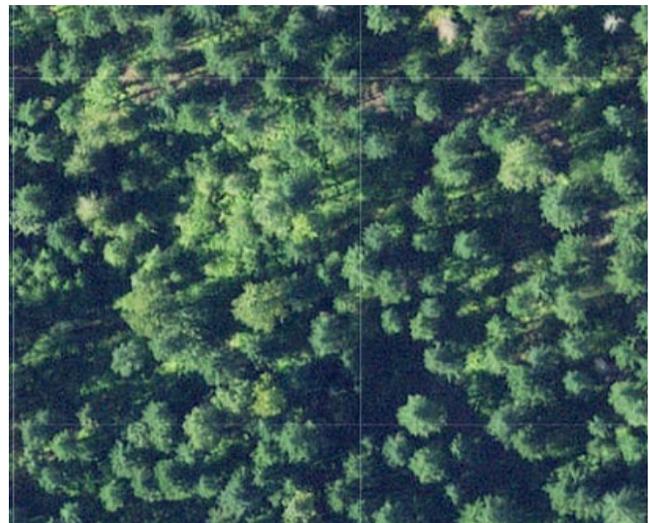
Older and more complex forests are critical to climate resilience. As forests age, they contribute more to ecosystem services, including carbon storage and watershed protection for downstream

creeks and rivers. If climate stressors cut short the seral development of these younger and middle-aged forests, the recovery of the forested landscape to greater age and complexity will be interrupted and reversed. While ecosystems have an astonishing ability to heal themselves, they work on the timeline of nature rather than the timeline of human climate impacts, and ecological forestry techniques can decrease the time it takes for forests to attain older seral stages.

The first technique is an approach to thinning that leaves 15 to 40 percent fewer trees than conventional forestry practice has traditionally recommended. Commercial and precommercial thinning are practices commonly used by forest managers to reduce competition within a stand; we are demonstrating



.7-Acre Clearing: Aerial Photo 2008: The larger of the two clearings, in 2008 - just one year after the cut was made.



.7-Acre Clearing: Aerial Photo 2019: The larger of the two clearings, in 2019. Much of the clearing has filled in with trees.

a modification of that familiar strategy. Thinning to lower densities will spread available soil moisture among fewer trees, increasing the likelihood that each will have enough water to thrive, and enabling the forest to continue maturing and providing habitat for species dependent on older forests.

Mid-elevation forests are being impacted by an upward shift in snow levels, leading to lower summer stream flows as less snowpack remains to feed creeks with snow melt. At our demonstration sites above 3,000 feet, we are installing snow gaps — 0.5- to 2-acre patch cuts in the forest canopy. This will allow snow to accumulate on the ground instead of being intercepted by tree crowns where it will evaporate or melt more quickly. The shade and shelter from the wind in these gaps also extends the spring snow-melt season, providing a time-release of snow melt that can infuse the soil with moisture and feed headwater streams later into the year.

Finally, we are taking advantage of the snow gaps to introduce seed stock from warmer seed zones, either from more southerly latitudes or from lower elevations. The significance of this introduction will extend well beyond the few thousand plants we will install: if successful, these individuals will mature to provide a local source of seed stock carrying genetic traits that will be better adapted to the warmer climate that will prevail decades hence.

By helping these developing forests recover from narrowly focused management practices and to adapt to the hotter, drier summer conditions that are predicted for the area, we're seeking to reduce the risk that they will succumb to drought or fire. Using some of these novel management techniques will hopefully address both past mismanagement and future threats for more diverse and resilient forests.

You can find more details about these tips at <https://www.nnrg.org/climateadaptation/>

To learn more as this project develops, and be invited to next year's workshops for these demonstration sites, please join our newsletter at <https://www.nnrg.org/nnrg-newsletter/>

A glimpse into the Climate Adaptation Field Guide, NNRG's illustrated overview of the major climate impacts in the Pacific Northwest.

Artwork by: Jon Wagner, jonstreehouse.tumblr.com



A Moving Target: Northwest Forests in a Changing Climate

Adaptation Tips for Forest Managers

November 2020



NORTHWEST
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Seven Steps to a More Resilient Forest

Many of the actions forest managers can take to make their forest more climate resilient are already familiar techniques.

1. Monitor the forest... and be ready to respond

Climate change scenarios cover a wide spectrum of possibilities. Your response will be more effective if you're tracking the signs that your forest is likely to be impacted.

3. Adapt planting strategies

Planting a forest is a multi-decadal bet on the seedlings' ability to thrive where you put them. Given today's range of climate predictions for the 21st century, it makes sense to hedge one's bets toward seedlings that can withstand a warmer climate.

- Select a planting palette that leans toward drought-tolerant native species, including broadleaf trees.
- Consider assisted migration of native species' seedstock from other parts of their range. Use species currently native to region, not species from beyond it. The harsher the site, the hotter and drier the zone should be where the seed originated.

Five Symptoms of Climate Change in our Forests

Climate impacts in the Pacific Northwest could follow any of several scenarios, depending on emissions over the coming years. Forest managers need to be aware of a range of potential symptoms and calibrate their responses accordingly.

1. Summer drought

Climate models forecast a longer dry season, and more precipitation arriving during intense "atmospheric river" events, which are less effective at recharging soil moisture.

2. Less snow

Climate models consistently predict less snow for the region. What snow does accumulate will melt earlier in the summer, leaving a longer season when mid- to high-elevation soils are not moistened by snowmelt. The effect will be particularly profound below 4,000 feet.

3. More intense wildfires

The major stand-replacing fires of westside forests are driven by dry winds in the summertime, which desiccate vegetation and push the fire ahead of them. Short of that, however, dry conditions and standing dead trees predispose the forest to fire, and are apt to lead to more frequent fires, as well as a greater chance that a synoptic wind event will coincide with a fire that is already burning, blowing it up into a conflagration.

4. Heat waves

Temperature spikes that last for several days will become more common, with 2 to 7 times as many days topping 86°F. Such conditions in the midst of the dry season will stress vulnerable edge of their range.

5. Insect outbreaks

Warmer, drier summers and winters with fewer freezes are expected to increase the frequency and extent of insect outbreaks in forests. Summer conditions may exacerbate moisture stress, making more trees more susceptible to insects. Warmer winter temperatures may further assist many insect species, such as pine beetles and spruce budworm, to overwinter and increase overall reproduction that can lead to larger outbreaks.

4. Manage for lower tree densities

Increasing fires and summer drought mean that soil moisture won't support the same densities of trees as in the past.

- Plant at lower densities, or plant densely but save time and budget for your stand thinning.
- Use thinning and variable retention to create space where you can establish more drought-tolerant native species and maintain soil functions even as moisture becomes scarcer.

6. Control invasive species

A warmer climate can support more invasive species, such as insects and pathogens.

- Use early detection and rapid response.
- Be aware of new invasive species.
- Report new sightings to your local agency.

7. Watch your water

Predicted climate changes mean more frequent and intense rain events, but also more frequent peak flow events and drought as summer dry seasons become longer.

- Invest in maintaining roads and riparian habitat.
- Future culvert and bridge installations should be designed for higher peak flows.
- Maintain riparian buffers to protect edge of stream.
- Use forest systems that sustain or increase soil moisture.
- Use forest systems that promote snow accumulation as small fires that promote snow accumulation.

Overall focus on multiple species, and consider both future and present climates



**NORTH SANTIAM
WATERSHED COUNCIL**

Landowners replant following the Beachie Creek and Lionshead Fires

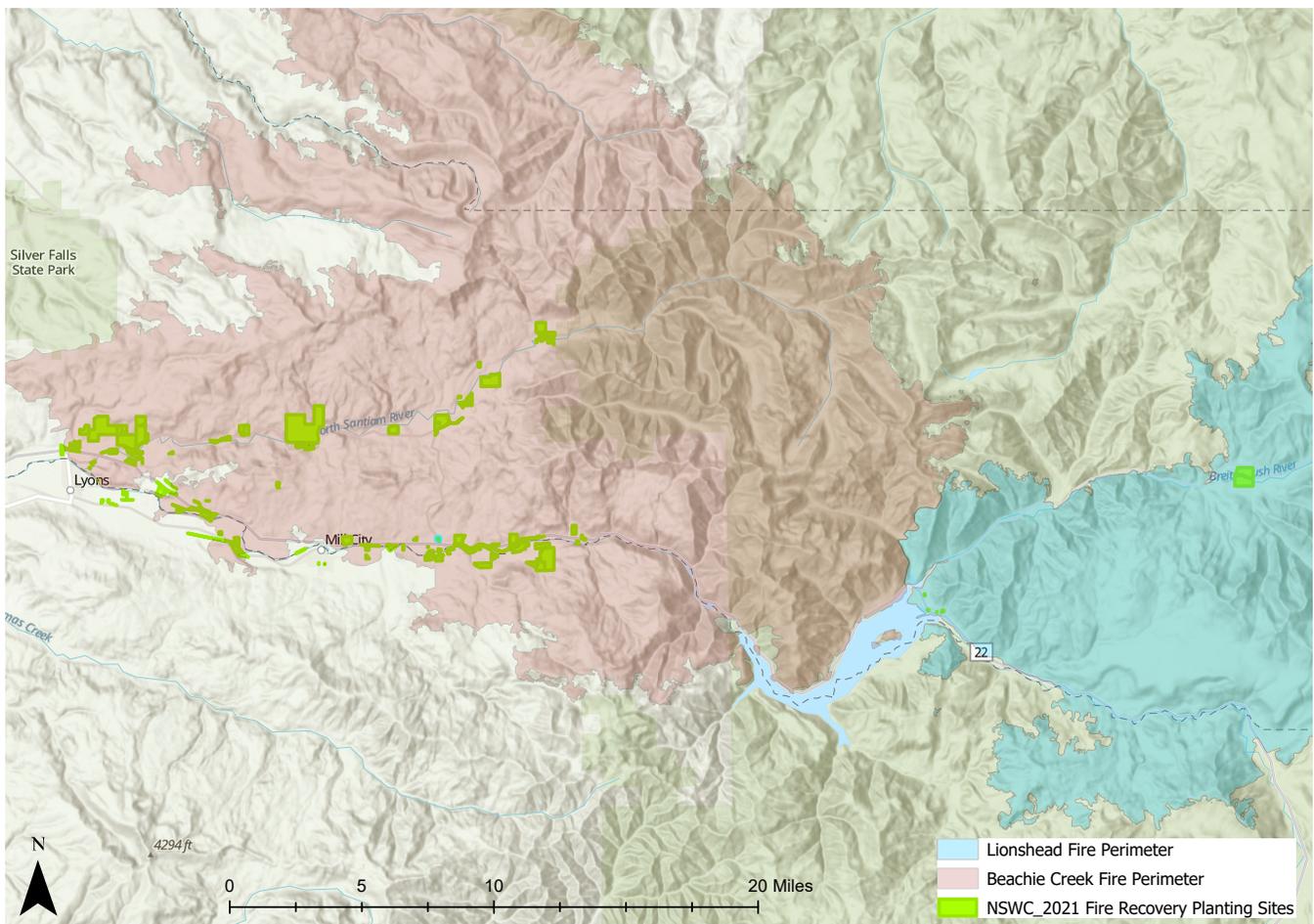
North Santiam Watershed Council Partners with BEF, Arbor Day Foundation and One Tree Planted to Distribute Native Plants to Community Members Impacted by the Fires in 2020

2021 North Santiam Watershed Council Fire Recovery Planting Sites

This map shows the aerial extent of the Beachie Creek Fire (pink) and the Lionshead Fire (blue). The North Santiam Watershed Council with support from the Arbor Day Foundation and One Tree Planted has provided plants to over 128 landowners in the Santiam Canyon, shown in green.

Nearly half of the 500,000 acre North Santiam Watershed was affected by the 2020 Beachie Creek and Lionshead fires, destroying over 1500 structures and generating hazardous materials, hazard trees, erosion of sediment and toxic runoff into sensitive waterways.

The **North Santiam Watershed Council**, with the support of numerous groups including Willamette Partnership, Oregon Watershed Enhancement Board, and city and county agencies, has distributed straw, seed, and native plants to over 128 landowners.



Rebecca McCoun, Executive Director of the North Santiam Watershed Council, reflects upon how climate change is impacting recovery efforts:

1 Are you approaching planting any differently post-fire and in light of climate change?

We are informing landowners of our concerns about the viability of Western red cedar and Douglas fir in some areas, and are encouraging people to consider planting ponderosa pine and incense cedar, especially for landowners who are replanting properties where timber harvest is not the long term focus.

2 What does fire recovery look like in the North Santiam basin?

We have been working hard with our partners to address immediate post fire needs, straw, seed, plantings. Removing hazard trees and salvage logging is taking place before bug infestations can take hold. The local entities are working hard to identify the short term, mid term and long term needs. Given the scope and scale it will take time.

In addition to post fire recovery we are working with ODF funds to address fuels reduction on areas just outside of the Beachie Creek fire parameter. We are working with partners to educate the communities on creating defensible space and how to improve forest health through thinning excess fuels and creating fuel breaks.

(Top) Brandon and Rechelle Kirk look at saplings donated by the NSWC that will be planted in areas impacted by wildfires.

(Middle) A boy poses with a freshly planted Ponderosa pine. Multiple generations of his family lost their homes during the fires.

(Bottom) Michele Beal Evans picks up some free plants distributed by the NSWC and Arbor Day Foundation to plant in her land impacted by the fire.

3 What are some of the bottlenecks you are facing?

With COVID getting the various partners in one room to discuss the vast issues that need to be identified and addressed has been challenging. With regards to on the ground work bottlenecks have been log trucks, self loaders, trained man power to get the salvage logging implemented quickly before the burned timber is no longer salvageable. Availability of seedlings and folks to plant has also been a bottleneck.

4 As we mourn the transformation of so many beloved places are there any small reasons for hope? Are there ways to approach recovery that can position the basin for healthier forests and waterways? Anything else we can learn?

Having the community working together to recover has been a huge blessing. We really want to come together and address restoration using a holistic approach. We are working on this now. How can we replant and restore the landscape so that it is more resilient. We are trying to bring as many voices to the table so that we can make informed decisions. Where did we fail in the past and what can we do now to avoid making the same mistakes?





Bare-Root Forbs: What, Why, How

Q&A with Wendy Kral, Ecologist at Scholls Valley Native Nursery in Forest Grove, OR

What is bare-root planting and why forbs?

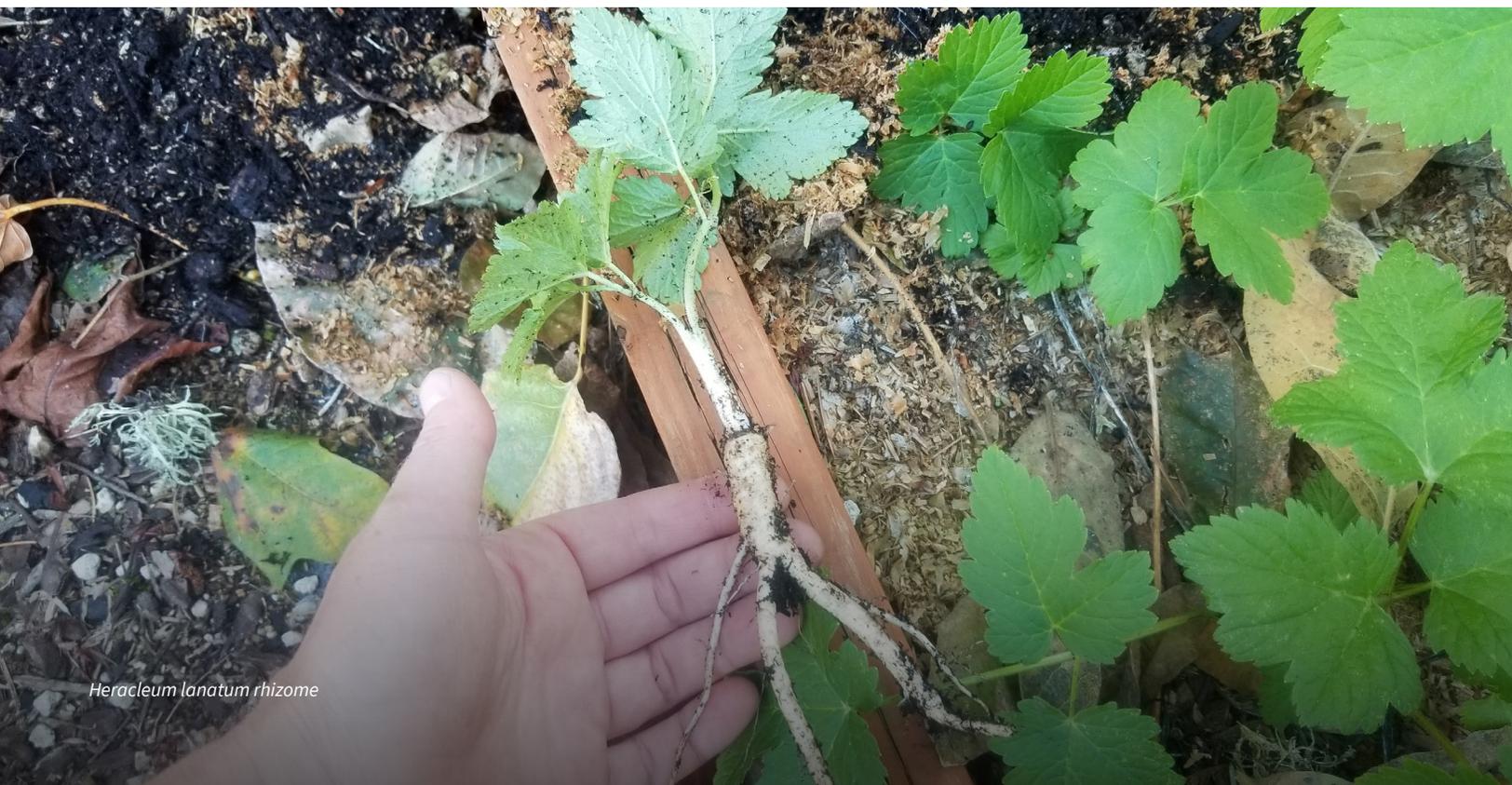
Bare-root planting is the installation of plant material that is not packaged with a rooting medium. Unlike a containerized plant that is grown and distributed in a pot with soil, a bare-root plant is grown in a nursery bed or field, harvested, and freed of excess soil prior to distribution. While containerized plants are available year-round, bare-root material is seasonally available during its most dormant time of year. Advantages of bare-root planting over container planting include:

- lower product cost,
- reduced labor for transportation and installation
- reduced plastic-input during growing and distribution
- Reduced risk of weed, pest and pathogen dispersal via soil

Who should be thinking about incorporating bare root forb planting into their plans?

The herb layer is an important component of any site because it adds a habitat layer at ground-level,

supports pollinators, and promotes soil health by limiting erosion, among other benefits. Often, the initial planting on a restoration site focuses on establishing woody trees and shrubs to provide shade, habitat, and weed exclusion. One emerging opportunity to employ bare-root herbs is on older restoration projects that have had their tree and shrub layers restored. These sites, typically within 5-10 years of initial planting, have closed canopy and shaded out many of the weedy understory herbs that tend to persist in the early years of establishment. These projects are often in riparian



Heracleum lanatum rhizome

zones where agencies, watershed councils and soil and water conservation districts have focused restoration work to improve water quality and fish and wildlife habitat.

In addition to agencies and landowners, restoration field crews interested in year-round work should get excited about planting bare-root upland herbs, many of which become dormant during the late summer and early fall when weed control and tree and shrub planting activities are limited by dry conditions. This is the perfect time of year to plant many species of bare-root bulbs and rhizomes because dormant upland rootstocks are naturally prepared to sit inactive in dry soil until the fall rains return. These species can be employed to fill critical habitat niches, and at the same time fill gaps in the schedules of our hard-working crews on the ground.

Where has it or will it be successful?

Scholls Valley Native Nursery is currently working with grant funds from Tualatin Soil and Water Conservation

District to explore the benefits of introducing an herbaceous layer in non-crop areas of our production fields such as irrigation lines, furrows, and headland roads. We have had the opportunity to utilize several stock types, including seed, plugs, bulbs and bare-root material, and the bare-root plants have performed at least as well as any of the containerized stock types.

Which plant species are most successful with this approach?

We have been successful growing and transplanting many species of perennial herbs as bare-root stock. Our current crops include over 80 species from several Willamette Valley plant communities including oak savanna, wet prairie, upland prairie, forested wetland, riparian forest, and mixed oak/conifer forests. Our goal is to increase the traction and availability of bare-root herbs within the restoration community and make herb-layer restoration and enhancement feasible on a landscape scale. Just a few of the genera that are suited to bare-root production include:

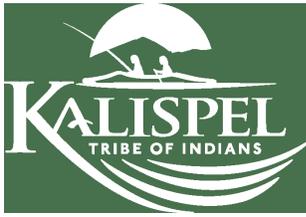
- Allium
- Trillium
- Prosartes
- Camassia
- Lilium
- Erythronium
- Iris (winter)
- Maianthemum
- Hydrophyllum
- Viola
- Delphinium
- Achlys
- Wyethia
- Chamaenerion (winter)
- Symphitrichum (winter)
- Heracleum
- Asclepias



Bare-root herb beds at Scholls Valley Native Nursery



Seed source population for 2021 *Asclepias speciosa* crop



The Kalispel Tribe and Native Plant Nursery

Preserving Wildlife and Supplying Large Native Tree and Shrub Stock for Restoration

The Kalispel Tribe

The Kalispel Indians were semi-nomadic hunters, diggers and fishermen and were often called the “River/Lake paddlers.” During the mid to late 19th century, the Kalispel Tribe of Indians worked to preserve its culture and life in the midst of increasing white settlement in the area.

In 1855, the Upper Kalispel Tribe ceded its lands and moved to the Jocko Reservation in Montana at the request of the U.S. Government. The Lower Kalispel Tribe, ancestors of today’s Kalispel members, refused to give up ancestral lands and continued to work toward an agreement that would allow the Tribe to remain on its homeland.

By 1874, Congress had stopped establishing treaties with tribes altogether, leaving the Kalispel Tribe with no legal protection. By 1875, the Tribal population had shrunk to only 395 people. From 1880 to 1910, as more white settlers moved into Kalispel territory, the tribe witnessed its land disappearing, but could do nothing to prevent it.

With most of the land on the reservation unsuitable for development, the tribe has had to develop innovative ways to create opportunity for tribal members. The tribe’s pioneering spirit, combined with sheer determination, resiliency, and community cohesiveness, has allowed the tribe to overcome many difficult circumstances.

The Kalispel Tribe of Indians is rich in heritage. It is the tribe’s mission to continue strengthening and building its community while preserving its cultural and natural heritage. The tribe’s traditions have taught its members cultural pride and to work together to continue the advancement of their people. The tribe is committed to promoting a bright future that respects traditions, education, nurturing environments for their children, and successful enterprise.

The Kalispel Tribe lives in harmony with nature and is a national leader in preserving wildlife habitat and fish hatcheries. The Kalispel Natural Resource Department (KNRD) seeks



The native plant nursery currently uses 10-15 gallon pots to grow their native stock before planting.

to protect and enhance all natural resources and the health of the entire ecosystem. KNRD is responsible for managing the historic properties, fisheries, wildlife, water, and other natural resources of the Kalispel Tribe of Indian's reservation in Usk, Washington, and other ceded lands in the lower Clark Fork and Pend Oreille.

The Kalispel Native Plant Nursery

The Kalispel native plant nursery was established in 2012 to grow larger native tree and shrub stock for planting in Kalispel restoration sites. The nursery grows mainly riparian and wetland species with the goal of planting them in the native soils, which are poor glacial lakebed sediment. This growing practice is a way of reducing transplant shock.

As a unique approach, we use a 'bathtub' watering design to avoid leaf rot from surface watering and to help roots train downward as opposed to surface. It is cheaper and easier to operate than a drip system. We are open to any information or advice that could help us succeed, but so far our methods seem to be working as is.

The native plant nursery currently has space for about 10,000 trees in 10-15 gallon pots. Welcomed advice and technical outreach for information on the nursery stock was done in connection with the local WSU extension office foresters and professors. As we expand the nursery's capacity, we will continue to engage with our community partners.

Climate change is an important consideration in all restoration projects. Functional riparian areas and wetland ecosystems help to make the landscape more resilient to climate change. This nursery gives the KNRD team access to good quality stock that will survive in the extreme conditions we face in the Pend Oreille basin. We are fortunate to have this resource and we plan to continue improving our operational efficiencies and stock quality.

Do you have questions or want more information on the Kalispel Tribe's Native Plant Nursery?

Contact Mike Lithgow:
mlithgow@kalispeltribe.com
509-370-8794

What Will Nature Do? Call to Artists

Exhibition Dates:
September 30-
November 13, 2021

Deadline for Submissions:
July 1, 2021

This call is to artists of all media and levels of experience, who are interested in the communication of the science of climate change through the arts. Submissions will be accepted online only. If you have any difficulty with the submission process, please contact hester@theartscenter.net, or 541-754-1551, Ext 658.

Background:

In the fall of 2021, The Arts Center will host the exhibit What Will Nature Do? a collaboration with guest curator Dr. Dominique Bachelet. Dr. Bachelet is a senior climate change scientist and associate professor in Oregon State University, as well as an artist and a member of The Arts Center's Exhibition Committee.

Dr. Bachelet has curated a roster of climate change scientists from all over the country. Prior to the deadline for submissions, artists will participate in the scientists' presentations and discussions on the positive and hopeful aspects of their research to inspire their artwork created for the exhibit. It is an exciting opportunity to distance ourselves from the standard doom and gloom messages and gather a deeper insight into the complexities and opportunities of climate change.

For more information and to register, please visit <https://theartscenter.net/call-to-artists-what-will-nature-do-deadline-july-1-2021/>



Aerial photo of the Kalispel native plant nursery, which has space for about 10,000 trees.

Treeline Webinar Series Presents

Western Redcedar: Cultural and Ecological Reflections, Dieback Concerns and Community Science

When: Tue, April 20, 2021, 12:30 PM – 1:30 PM PDT

What: Panelists will discuss cultural and ecological dimensions of Western redcedar and how community science can help document dieback.

Western redcedar (*Thuja plicata*) is an iconic PNW tree species with tremendous importance. Observations of widespread dieback in recent years has elevated community concern over this cultural keystone species. This talk provides information about cultural and ecological dimensions and how community science is being leveraged to better document and understand dieback.

- Historical context of Western redcedar (10 minutes) - Gary Morishima, Technical Advisor for Natural Resources to the President of the Quinault Indian Nation
- Cultural significance of western redcedar (15 minutes) - Will Bill Jr., Muckleshoot Indian Tribe
- Western redcedar ecology (15 minutes) - Connie Harrington, USFS Olympia
- Western redcedar dieback and community science (15 minutes) - Joey Hulbert, Washington State University
- Questions and Discussion (15 minutes)

Register for event for free on eventbrite:
<https://www.eventbrite.com/e/western-redcedar-cultural-and-ecological-reflections-and-dieback-concerns-tickets-148359267563>

Historical Western Redcedar Decline

An excerpt from *skwadi'lic, Board Feet, and the Cedar Tree*

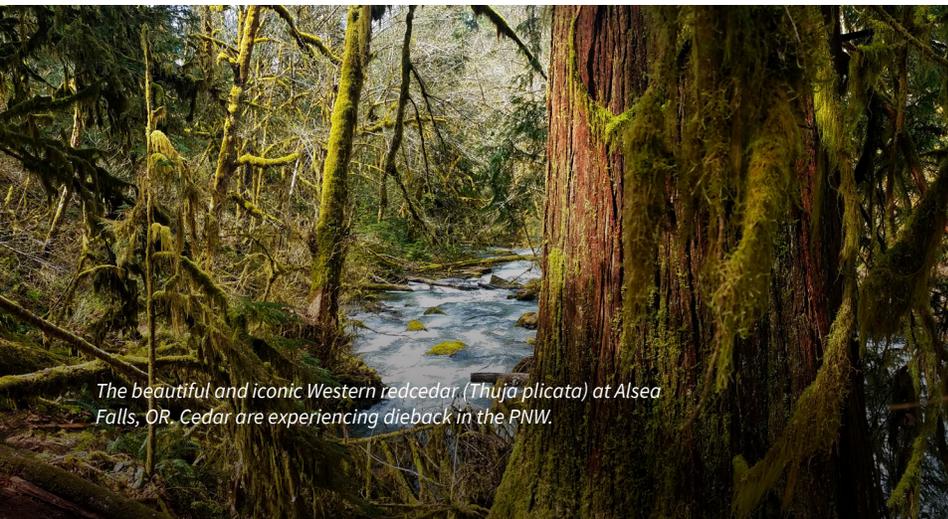
by Kurt W. Russo, PhD, Se'Si'Le

[In the late 1700's] forested lands in Oregon and Washington included over 23 million acres of trees that were at least 125 years old, including vast stands of Douglas fir, western hemlock, mountain hemlock, western red cedar, and sitka spruce (Booth, 1994). The bioregion of western Oregon and western Washington was a montage of spruce, cedar, hemlock, and fir. This temperate rainforest supported one of the most densely populated nonagricultural populations of American Indians in the pre-contact world of North America. It remained the world's largest temperate rainforest through the dawn of the twentieth century...

Despite the arrival of increasing numbers of settlers and the rapid growth of the timber industry, at the dawn of the twentieth century only a relatively small portion of the forested lands west of the Cascades in Washington State had been cut or settled for agriculture. In 1852 the first timber mill was established on Puget Sound. Within ten years, the mill was shipping 9 million board feet annually to foreign and domestic markets. In 1855, Lummi Indians were among the signatories to the Treaty of Point Elliott, and the present-day reservation was established in 1857. Fifteen years later, in 1872, a German arbitrator (Kaiser Wilhelm) awarded the remainder of the aboriginal territory in the San Juan Islands to the United States. By that time the Pacific Northwest land rush was in full bloom. As recently as 1936, when the Pacific Northwest was the Nation's leading lumber-producing region, old-growth forests of all types still made up 73% of all commercial forests in eastern Oregon and Washington (Committee on Environmental Issues in Pacific Northwest Forest Management, 2000).

By 1980, 838 billion board feet of timber had been removed from the forests of western Oregon and Washington, by which time old-growth forests accounted for 13 percent of forest land cover on

public and private forest land in this bioregion (Booth, 1994). By the year 2000 only 6 percent of western Oregon and western Washington's old-growth forests remained, primarily in fragmented islands of habitat on public lands (Booth, 1994). The rapid and radical transformation of this bioregion has severely disrupted the ecology for 1,500 species of invertebrates associated with old-growth forests and 118 vertebrate species whose primary habitat is in mature and old-growth forest systems. (Booth, 1994) It also had a direct and deleterious impact on the traditional practices of the Lummi Indians.



The beautiful and iconic Western redcedar (*Thuja plicata*) at Alsea Falls, OR. Cedar are experiencing dieback in the PNW.



Nesika Wilamut
WHERE PEOPLE AND RIVERS MEET

Welcome to Our Newest Regional Lead Partner

Nesika Wilmut/Willamette River Network

Nesika means “us,” “our” in Chinuk Wawa, the trade language spoken by Native peoples and traders around the Pacific Northwest and along the Willamette River.

Wilamut is the original name of the river and speaks to place, rooted in history and culture. The name represents how language and place, people and river, are one. We are grateful for you and your work Nesika Wilamut!



Register now!

May 20, 12:30-1:30

**Join us to learn more about
Phytophthora and what
small-scale restoration
nurseries can do to minimize
risk of spread.**

<https://www.eventbrite.com/e/phytophthora-you-probably-cant-spell-it-and-you-definitely-dont-want-it-tickets-151389013615>



watersheds
program

Do you have an idea for a future newsletter article or interview, or a suggestion for how we might improve? Please reach out to kira@b-e-f.org.

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