



watersheds
program

treeline

partnering for climate adapted forests

April 2022

Missed the February Treeline Newsletter?

Click [here](#) to learn about some of the collaborative networks that sustain Pacific Northwest ecosystem restoration.

Interested in submitting an article?

Reach out to Kayla Seaforth at kseaforth@b-e-f.org

Photo Credit: Vesper Meadow Education Program

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. We gather, disseminate, and discuss information and knowledge across a broad region.

Upland Forest Health Issue

This edition of Treeline focuses on upland forests and how agencies, tribes, NGOs and other land stewards are adapting to and planning for climate related changes.

Treeline network partners answer questions relating to adaptation to climate change: Read the full survey results [here](#).

The Treeline survey closed last spring with a total of **51 responses** from partners in over **14 different ecoregions** in the Pacific Northwest.

Unequal Distribution of Climate Impacts and How Tribal Management Is Adapting on the Confederated Tribes of the Colville Reservation

An interview with Cody Desautel, Director of the Natural Resources Department

On an afternoon in late January, Cody Desautel, the director of the natural resources department for the Confederated Tribes of the Colville Reservation, sat down with Brent Davies and other Ecotrust staff to discuss the impacts of climate change on the Tribes' forest and economy and how they are responding to threats on the landscape. It's a wide-ranging conversation that shows the considerations and concerns of a forest tribe during these uncertain times.

Good afternoon, Cody. Can you tell us where the Confederated Tribes of the Colville Reservation's traditional territory is and the extent of your boundaries?

The reservation was created by executive order in 1872 and originally encompassed about 2.9 million acres.

It was everything west and north of the Columbia River, to the Canadian border, and then east of the Okanagan River. Then in 1891, there was an agreement with the federal government — I don't know how agreeable it was to the tribe at the time — where 1.5 million acres was ceded back to the federal government, an area we call the former north half.

The current-day reservation is 1.4 million acres, located in north central Washington state. It is the home of the 12 tribes that are part of the Colville Confederacy, which were included in the constitution which passed in 1937.

How have your people traditionally cared for land from pre-settler contact to now?

The management tool we utilized most was fire. It was the tool used across much of the west and that's something

that's rarely considered when we look at desired future conditions, historic fire regimes, and fire return intervals. Our people were mindful of how, when, and where they gathered traditional foods and medicines. It wasn't what you would consider agriculture as we know it in a modern context but definitely there were cultivations of plants that were important to the tribes.

There were certain ways that we learned and practiced gathering to ensure that species, such as camas and bitterroot, were perpetuated and that they would always be available for subsistence. It was a very different lifestyle where you had to have those things to survive through the year. Those foods were not something we consumed out of convenience, they were necessities. If you ever tasted bitterroot, you know what I'm talking about. You don't eat bitterroot because it tastes good.



Cody Desautel

Director of the Natural Resources Division for the Confederated Tribes of the Colville Reservation

Cody Desautel is the director of the natural resources division for the Confederated Tribes of the Colville Reservation and an enrolled citizen there. He also serves as the president of the Intertribal Timber Council and as a member of the State Forest Practices Board, the Wildland Fire Advisory Committee, and the Forest Health Advisory Committee for the state of Washington. He has a B.S. in Environmental Science and a master's degree in Indian Law.

You've been working for the Tribes for the past 25 years. What changes have you noticed to the land and what might you attribute to a changing climate?

A very drastic change I've seen over my career is the scale, intensity, and frequency of disturbance, primarily fire. Insect and disease activity has picked up but that's fairly miniscule compared to the number of acres that have burned. When I first started reading the Intergovernmental Panel on Climate Change (IPCC) reports, and hearing discussions about climate change, [my colleagues and I] recognized we were having more frequent and bigger fires than we had historically, and that we were having a much harder time suppressing them. We were seeing extreme weather events like we hadn't seen in the past, primarily wind events. Frankly, on those days, we were just getting our butts handed to us on wildfires. So, we started evaluating, 'if [increased frequency and severity of fire] was the trend, was that trend going to continue? Was it going to get worse?'

We started looking at climate change predictions. At the time, they predicted that in 25 to 40 years, we would see a

250% to 400% increase in burn acres. But we saw more than that. In the last six years, almost 700,000 acres of a 1.4 million acre reservation burned. That's by far the biggest indicator that climate change is real. We also have longer, hotter fire seasons with drier conditions. It seems we set a record every year for the energy release component (ERC), the metric we use to track the potential for large fire growth. When we look at restrictions we put on the forest for Industrial Fire Precaution Levels (IFPL) and other factors that evaluate fire risk and danger, they just seem to get a little worse every single year.

How have these changes and these fires impacted the Tribes' cultural resources?

If half the reservation burns, that's a significant portion of our cultural resources lost. In 2015, about 800 million board feet of timber burned. We're redoing our forest inventory now, but I'm sure it's well over a billion feet in total, particularly after the 2021 fire season where a big fire went through one of our most productive timber grounds. So, we've probably burned up more timber in the last six years than most reservations in the rest of

the country have. From an economic standpoint, we don't know what the long term implications are yet.

Thankfully, we haven't had to reduce our forest restoration accomplishments due to wildfire. We recognize the forest is going to burn, and it's likely going to burn soon. So, any work that you can do ahead of it is probably going to buy you something, at least from the fire severity standpoint.

How has climate change and a more drastic fire season impacted tribal businesses associated with natural resources?

Timber has always been a significant portion of the Tribes' revenue. It supports the governmental functions and basic services we provide to our tribal members, like health care, education, and law enforcement. If you take away that revenue stream, with the limited funding we get from the federal government already, it would really hurt. I don't know that we've necessarily seen a negative impact yet but I'm sure it's coming because of the number of acres that have burned. Many of those stands were 100 plus years old. Based on our management approach, it will take us




Image taken from the front door of the Confederated Tribes of the Colville Indian Reservation Tribal Government Center on the first night of the Chuweah Creek Fire, July 12, 2021. Photo Credit: Cody Desautel.

about 80 years to get them back to a size class and a forest structure where we can harvest them again.

You've had sustained trauma in your community because of all the fires. What does the community go through when there is a big fire?

That's tough to quantify but it has definitely changed people's perspective and priorities. We just finished a research project with the University of Washington, trying to understand smoke inhalation, the human health impacts of poor air quality, and how people perceive smoke. What they recognize is that people perceive fire but they don't really pay attention to smoke, regardless of how bad the air quality is because there's a higher risk over the hill, which is fire. They can see the fire coming. I've had to answer calls from people who are just scared to death because they see smoke. Historically, tribes would have seen smoke and said, 'Alright, somebody's doing something up the hill that they're supposed to be doing.' Now that mindset has completely reversed.

Anytime there's smoke nearby, there's panic. I'm sure it's similar to PTSD associated with people's experience with fires over the past decade or so. Historically, that wasn't the case. If we talk to our tribal elders, they tell us, 'You guys need to be burning more, you're setting us up for the big one, if you don't learn it now.' And they're right. I've been hearing it my entire forestry career. I think we knew they were right, we just didn't have the flexibility or funding to do what we thought we should do.

So I don't know how we quantify the trauma. I think for people my age and younger, this has become the norm or we're almost numb to it. You just expect that there's going to be a massive fire every year or at least every other year. And it's like, 'Oh, boy, here we go.'

As the impacts of climate change continue to worsen, how are tribes planning for it?

I think tribes are going to be the most impacted [by climate change]. Indigenous communities are going to struggle, whether here or around



Fire crews working the Summit Trail Fire, which was started by lightning at 10:30 pm on Monday, July 12, 2021 on the Colville Reservation. Photo Credit: Cody Desautel

the world. We are probably the least represented and have the least flexibility to move at the rate we're seeing. Historically, tribes would have moved when conditions changed, but that would have been slow change with lots of time to move your people and infrastructure. So if you're the Colville Tribe and half a million acres are burning up every six years, you're stuck with whatever is left after the smoke clears. Which is unfortunate, because, historically, we would have gone somewhere else that wasn't burned. But that's not an option now. And that's true of tribes across the country. If you're a western Washington tribe that has 3,000 acres — not a million and a half like we do — the likelihood of being impacted is huge.

For right now, I think we're doing pretty well on the resource side. We've

done a lot of good work over the last 40 years since we transitioned forest management practices. What we see for post-fire effects is considerably better than most adjacent federal and/or state lands that have burned. We have a mixed severity burn on the landscape that's similar to historic patterns. Definitely a little worse because of the conditions it's burning under today, but we have islands of green, lots of them.

From a social perspective, I don't know how we solve that problem. We have tried to look at other ways to generate revenue. We've looked at gaming, and our tax compacts and other ways that the tribal government can generate revenue and diversify so that we can have a consistent economic base to ensure we have plenty of jobs here, that we have comparable wages, that we can build housing and infrastructure

to support the tribal membership and give them opportunity. But as you know, that's difficult everywhere in the country right now. But we do recognize the problem and are trying to build that economic base to provide [stability and opportunity] going forward.

Are tribes prepared for climate change?

I think so. If you look at who's done a good job for a long time, tribes have always managed in a sustainable way. And it was never for climate change. Tribes recognize the value of clean air, clean water, good wildlife habitat, access to all of those things that culturally identify them. We have the perspective that you have to live with the environment. If you read those early journals from the explorers, they would ask the tribal people they encountered, 'well, who owns this?' and they would respond 'nobody owns it.' Tribes see themselves as a part of the natural environment, with a role to play like all other living things.

You always hear about Seven Generations in Indian Country. It's a difference in perspective. We don't

inherit the earth from our ancestors. We're borrowing it for our future generations. Those are two very different mindsets and decision points. The western world looks at things primarily from a resource extraction perspective. 'How can what's on the landscape benefit me?' versus 'what can I do to make this world a better place?'

Are you hopeful humans will make the shifts needed to lessen the impacts of climate change?

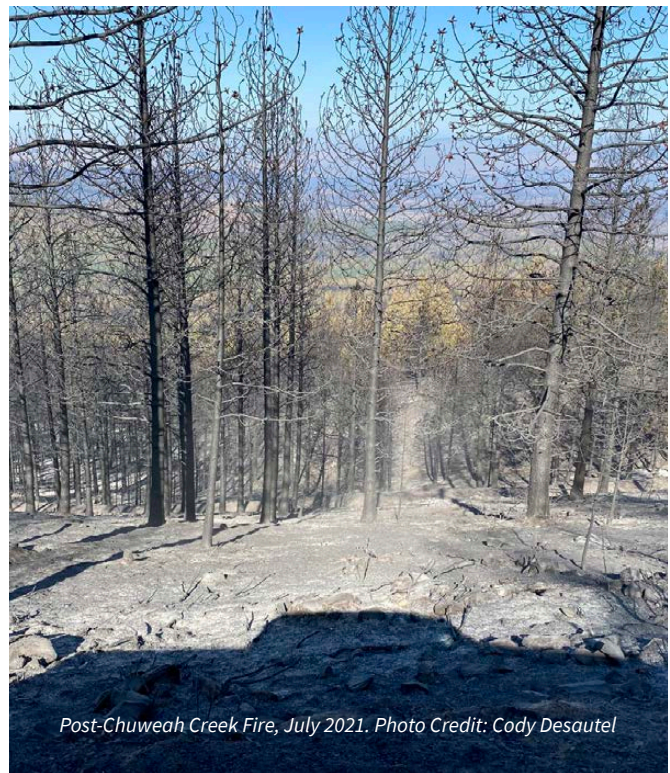
I think we will. It'll be begrudgingly and it'll be slow. I think you see enough traction, both politically and socially, especially over the last 10 years. Sadly, disaster is the mother of change. So whether it's really bad hurricanes in the southeast, or rising ocean levels that submerge cities, or massive fires, there are a number of different things that are pushing people to think about what we're doing and what the impacts are going to be. And, what the costs are. Even if you look at it purely from an economic standpoint, what is it going to cost to deal with all these things in the future? It'll probably be the financials that will make us change eventually.

If you look at what California spent on fire suppression in 2018, it was about a billion dollars based on reports I've read. But the insurance industry spent \$10 billion on replacing all the infrastructure that burned, based on those same reports. And that was a bad year but it wasn't the worst year they've had. The total costs are huge, particularly when you start looking at restoration of those fires and the timeline to fully recover those landscapes.

I argue on a regular basis that we put so much focus on defending homes, particularly expensive vacation homes, which can be rebuilt in about a year. If you burn down an old growth forest, you're 250 years from having that back, presuming you do everything right over the first 100 or so years. So I think we need to change our priorities a bit after we've ensured people are safe. We're almost to that point. Hopefully, we recognize it before it's too late. Otherwise, the road back is going to be long.



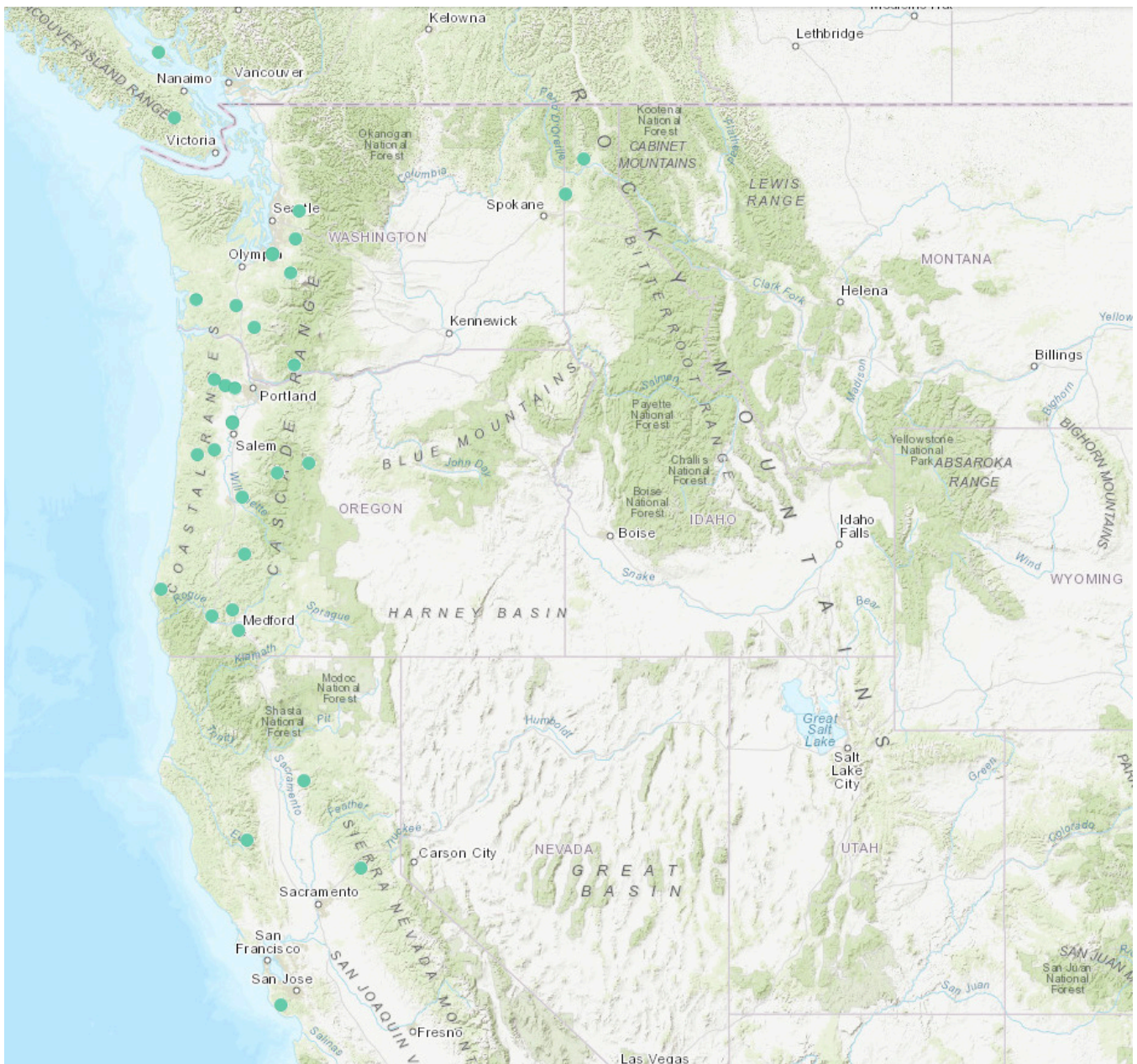
Big smoke, view from the incident command post of the Chuweah Creek Fire. The fire was started by lightning on July 12, 2021, and burned more than 36,500 acres. Photo Credit: Kathy Moses, Public Information Officer, Colville Tribes



Post-Chuweah Creek Fire, July 2021. Photo Credit: Cody Desautel

Assisted Migration Trial Map

The projects shown here represent current and past trials that may help inform assisted migration practices and principles. The publicly accessible layer is hosted on Data Basin and more information about each study can be found [here](#).





**NORTHWEST
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Keeping a Weather Eye Open:

Measuring Snowfall in the Nisqually Watershed

Maintaining a steady and reliable source of water in a changing climate is critical for the health of both people and ecosystems. Northwest Natural Resource Group (NNRG) has been testing methods of ecological forestry that will increase the resilience of future watershed forests.

At the Nisqually Community Forest near Mount Rainier, we have implemented several forestry techniques that you may recall from our previous article:

- 1 Thinning the forest to spread available soil moisture among fewer trees,
- 2 Installing snow gaps so that more snow accumulates and extends snowmelt season, and
- 3 Planting seedlings from warmer zones to provide a local source for adapted genetic traits.

The techniques were used on formerly industrial forests, and are part of our overall plan to restore the forest while also making it more resilient to the predicted future climate in the area.

In the gaps we thinned last year, we have been measuring snow accumulation to gauge whether the forestry techniques we have used have been effective. Staff use trail cams set to take a picture a day, aimed at 3-meter stadia rods to show the depth of the snowpack. They also walk transects, using avalanche probes to measure

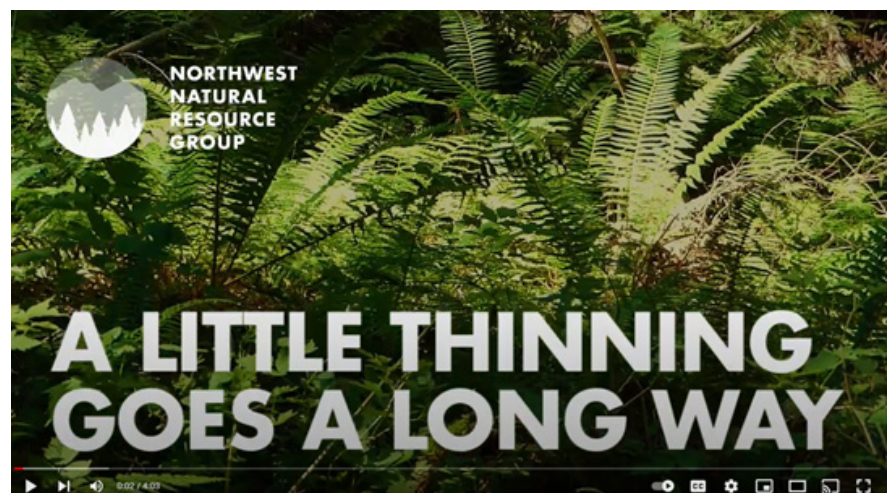
the depth of the snow. They have been walking those transects every two weeks while the snow is accumulating, and will walk them every week while it is melting (the “ablation season”).

Data collection is still ongoing, but so far the results match our prediction that snow accumulates in thinned areas and gaps more quickly. These efforts should gradually reduce the risk of tree mortality, improve the forest habitat, and supply snowmelt to headwater streams later into the spring.

This spring, we will be planting these snow gaps and thinned areas with seedlings sourced from warmer areas. As we were considering where we should source these seedlings, we used the [seedlot selection tool](#), looking ahead to the trees’ maturation years of years 2041-2070 under a RCP 4.5

climate trajectory. The latter number refers to a scenario of moderate future greenhouse gas emissions that would lead to 2-3°C of warming (as opposed to the ‘worst case scenario’ of RCP 8.5).

Given the abundant in-seeding we expect of volunteer silver fir, noble fir, and western hemlock from uncut areas adjacent to the forest gaps, we intend to plant at about 350 trees per acre and will focus on Douglas-fir and Western redcedar. Our canopy gaps cover about 16 acres in total, so we will plant 5,550 seedlings. To explore the survival and vigor of local and ‘imported’ seedlings, we will split plantings evenly between local and externally sourced seed stock. We also plan to plant 600 western white pine and seedlings and a few hundred western hemlock from lower elevations, to gauge how well they do compared with local seed stock.

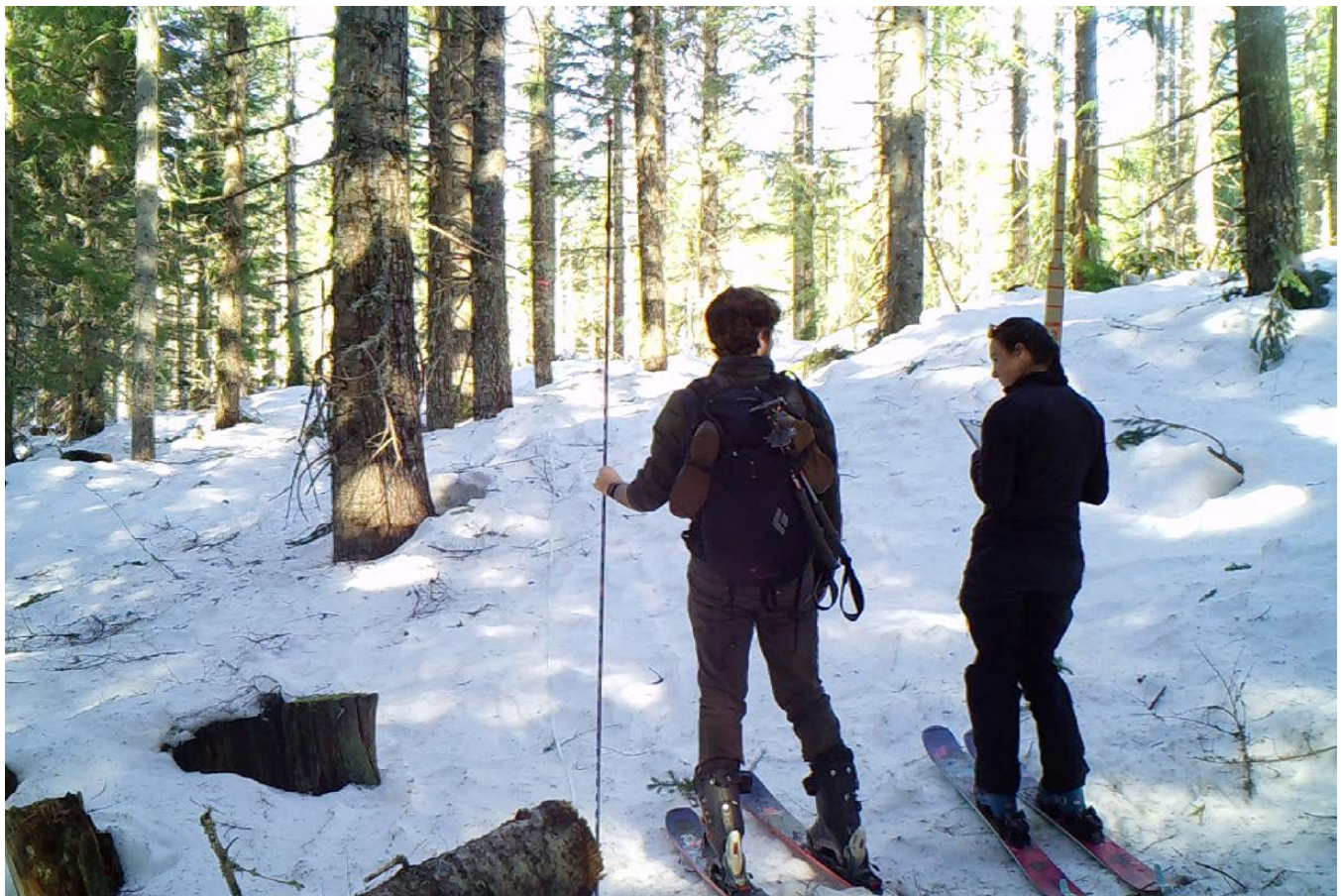


If you’re interested in seeing this project in action, take a look at our recent video, [‘A Little Thinning Goes a Long Way’](#).

As we have [discussed previously](#) in the Treeline Network, the assisted migration of species is an evolving and sometimes controversial topic. There are risks to more intensive forms of assisted migration; however, there is also a sense that the risks of inaction are greater. The [Forest Adaptation Network](#) (FAN) has been discussing how to develop professional best practices for assisted migration in our area and will share ideas through the network as they arise.



(Right) NNRG Forest Technician Nora Halbert installs a camera and a stadia rod to measure the accumulation and ablation of snow. Photo Credit: Jaal Mann/NNRG



NNRG Forest Technicians measure the accumulation and ablation of snow. Photo Credit: NNRG



Land Access as a Barrier to Seed Collection

By: Georgia Mitchell, Kayla Seaforth, Forest Shomer and Emily Wittkop

Most plants that restoration practitioners are putting in the ground this winter and spring were grown from local seed sources, often hand collected by a very small, highly knowledgeable network of seed collectors. The practice of collecting and propagating native plants is ancient, but the scale at which ecosystem restoration is happening is increasing to match the pressures felt by land development, loss of biodiversity, and the cascading effects of climate change. As nurseries scale up production to meet the demands for native plants, they are looking to both in-house and independent seed collectors to ensure that the stock they grow and sell maintains the necessary genetic diversity to stand up to all of the challenges that ecosystems are facing.

The complex interaction of threats that make ecological restoration necessary also pose challenges to seed collection. The intimate knowledge of ecosystems, phenology and genetic interactions between plant populations that seed collectors hold is often at odds with the pressures of modern economies of scale and an increasingly fragmented landscape.

As ecosystems experience stress caused by climate change some populations may respond with increasingly unpredictable seed crops, and in a landscape of mixed ownership with varying degrees of regulation around access, it can be difficult for collectors to adapt to these changes. If a collector only has access to one or two sites where a particular species grows and those sites experience a disease or insect outbreak, the collector may

have to scramble to find another site (and go through the permitting process attached to it) or be forced to forgo collection for that species altogether. Applied across a landscape that is responding to climatic shifts in different ways, this has the potential to cause serious disruptions in native plant seed availability and impact production.

Access to land is emerging as a significant barrier to seed collection. Many seed collectors rely upon their own networks and navigate the complicated permitting system of numerous land management agencies with little to no guidance. Collection may occur on a combination of public and private lands including properties managed by:

- Land trusts
- Tribal lands
- State agencies
- Federal agencies
- Counties, cities and regional parks
- Private landowners and businesses

Concerns held by land owners regarding granting access to lands include:

- Privacy
- Fire risk
- Endangered Species Act listed species
- Liability
- Logistics (eg gate access, multiple user conflicts, timing uncertainty)

Mitigating actions seed collectors take to address concerns include:

- Taking detailed notes about species population growth/decline and vigor year after year
- Removing invasive species
- Advocating for protection of populations from incompatible uses
- Reporting stewardship needs to land managers, or carrying out this work themselves

“There is a scarcity of seed collection areas in the lowlands to provide stock for our restoration sites, so it would be helpful to have permission to collect from as many conservation landowners as possible.”

- Brenda Clifton, Senior Restoration Botanist at Skagit River System Cooperative



The saponins in buffalo berry (*Shepherdia canadensis*) cause extensive foaming while these seeds are being cleaned. Photo Credit: Georgia Mitchell

“The timeliness for permit approval and native seed collection can be challenging to align each year. Federal, State, and private landowners all have different requirements and there is no database that clearly outlines application deadlines, contacts, costs, and land access limitations...

Some state agencies take up to three months to process permit applications, whereas other agencies limit access to scouting before the permit is in hand. In addition, there is a lot of misinformation regarding botanical surveys and some private landowners are reluctant to give approval. These limitations, while sometimes valid, can mean the difference between preserving genetic diversity and losing it.

There is also an intricacy to seed collection that is driven by the seasonality of flowering windows. When seed collectors are limited by the permitting process, we miss the opportunity to evaluate population health and vigor. Last April I collected *Montia linearis* on contract for a production field. As the funding was being approved the plants were already setting seed and I still needed to locate populations and contact landowners for approval. Luckily, this species ripens indeterminately and I was still able to meet the deliverable requirements but it was close. This is a common dynamic between the approval process and the sometimes-small collection window available. Streamlining this process or encouraging more collaboration among seed collectors, federal, state, and private landowners would greatly ease the collection process making more plant material available to the restoration industry.

We are at a crucial point with climate change and our responsiveness is needed more than ever. It is pertinent that we continue this work but with urgency, while working together and providing a holistic approach to land stewardship.”

- Emily Wittkop, Jonny Native Seed



Communication Informs Timely Trail Maintenance

One seed collector has gathered seeds along a publicly accessible trail for many years, but recently, user groups have started brushing these herbaceous plants before seeds have had a chance to ripen. As someone who monitors these plants closely, the collector has documented this loss and advocated for later trail brushing to the managers of the natural area. This way, the trail continues to be maintained for multi use purposes and the plants are allowed to complete their life cycle which in turn supports native fauna and provides seeds for ecological restoration.



Purple fruit season.
Photo Credit: Georgia Mitchell

Questions for future consideration:

What actions could we take to open access to key collection sites while addressing landowner concerns?

What lands/landowners are the most significant priorities for obtaining permissions for seed collection?

What barriers exist to implementing a cross-agency permission system?

How can public land managers address concerns about commercialization of resources in support of longer-term ecological restoration?

What roles could smaller organizations and landowner groups play in supporting access to qualified seed collectors?

Would an association or guild of seed collectors promote more streamlined permission models?

Would it be possible to add conservation of native seed resources to the list of values for which land managers are actively managing?

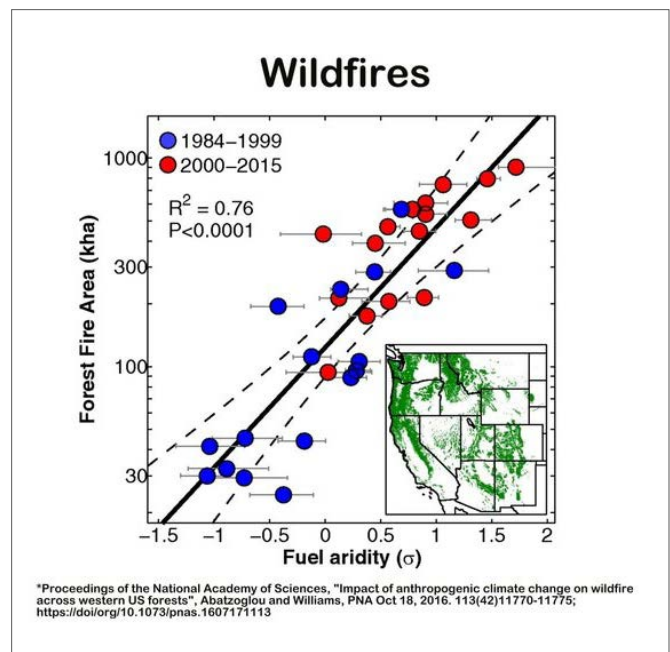
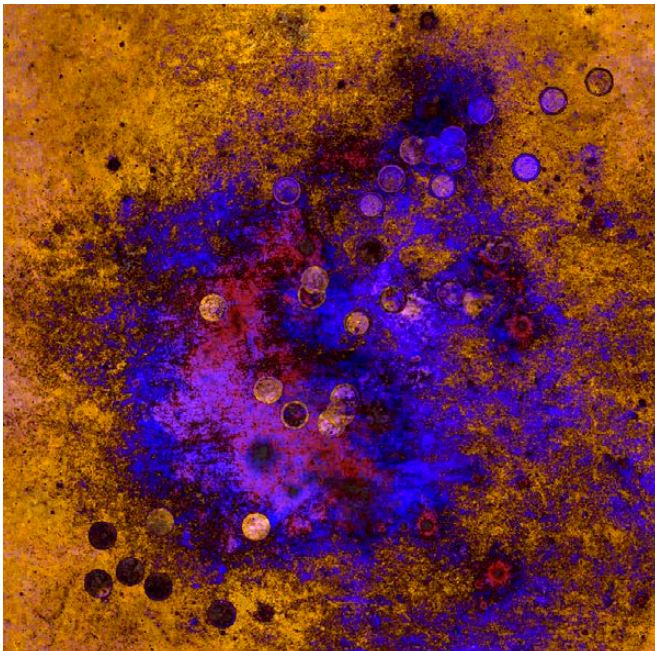
A Powerful Intersection of Art and Climate Science

Text by Dr. Dominique Bachelet,
Art by Alisa Singer

Visual artist Alisa Singer has combed through climate data ranging from models of sea level rise to CO₂ emissions to natural disaster frequency and transformed them into more than 75 pieces of striking digital artwork in a collection titled Environmental Graphiti®. Her piece “A Borrowed Planet - Inherited from our ancestors. On loan from our children” was recently featured as cover art on the [International Panel on Climate Change’s Sixth Assessment Report](#).

“Environmental Graphiti® is a series of digital paintings that builds a partnership between art and science. Seemingly abstract pieces are created from charts, graphs, maps, words or numbers reflecting key facts about climate change. The art draws people in and then, when they realize the image is not abstract, they become interested in learning more about the underlying science. The art makes the science more accessible. The science makes the art more meaningful. It’s a powerful combination.”

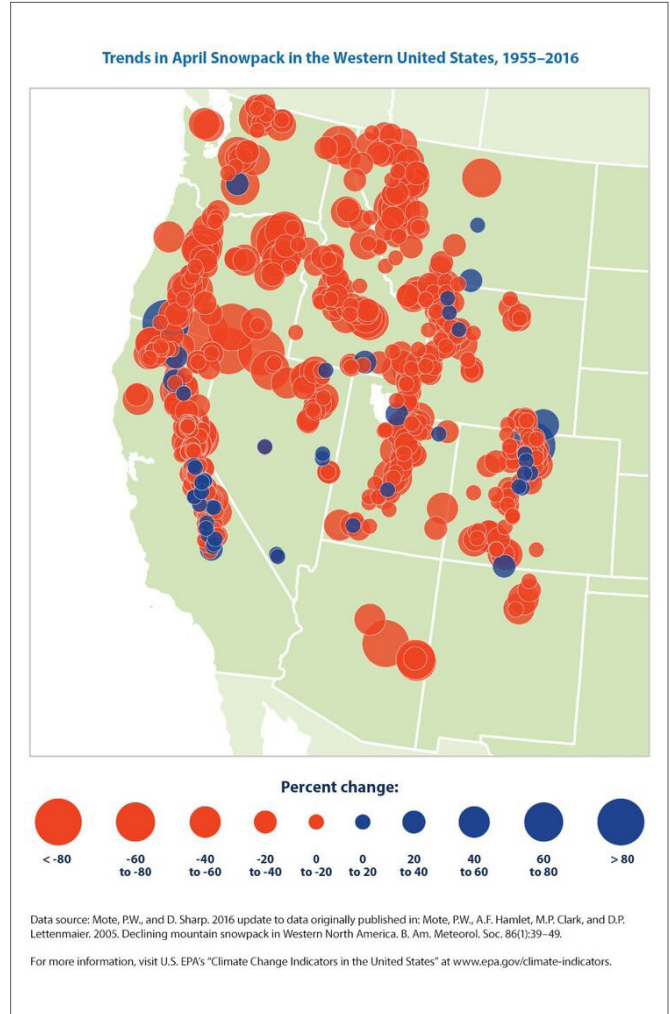
-Alisa Singer



The graph from Abatzoglou and Williams documents the close and evolving relationship between fuel dryness and forest fire area. It confirms that drought conditions caused by human-caused climate change are worsening and that one should fully expect this relationship to hold until the amount of forest fuel becomes limiting i.e. not enough biomass left to burn. Alisa Singer managed in her painting to illustrate the color of dried-up vegetation with browns and gold tones and the western forest area with blues, purple and even red reminiscent of fire flames. She uses the data points as stark reminders of the increasing fire risk in all western forests that scientists have been warning us about for the last 30+ years.

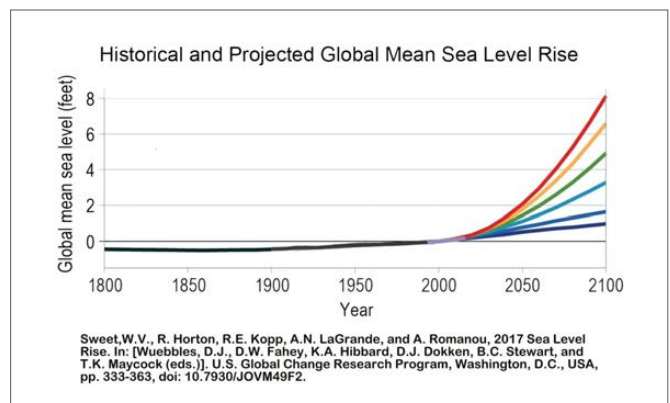


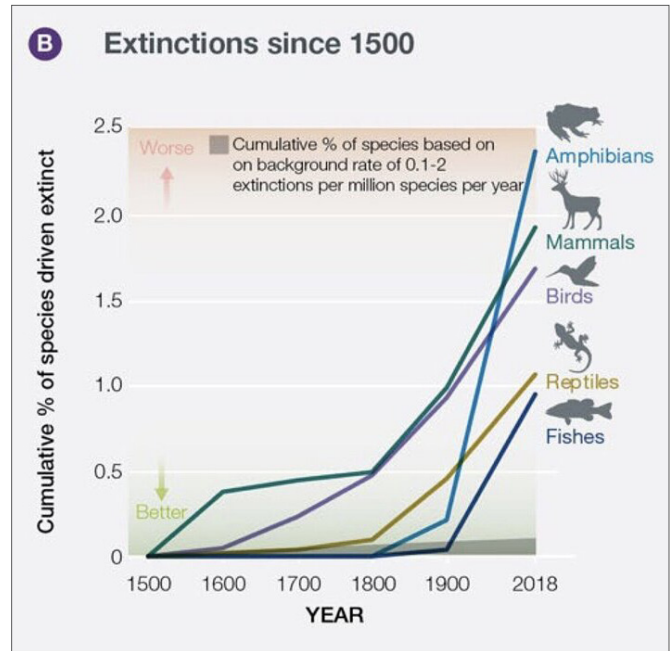
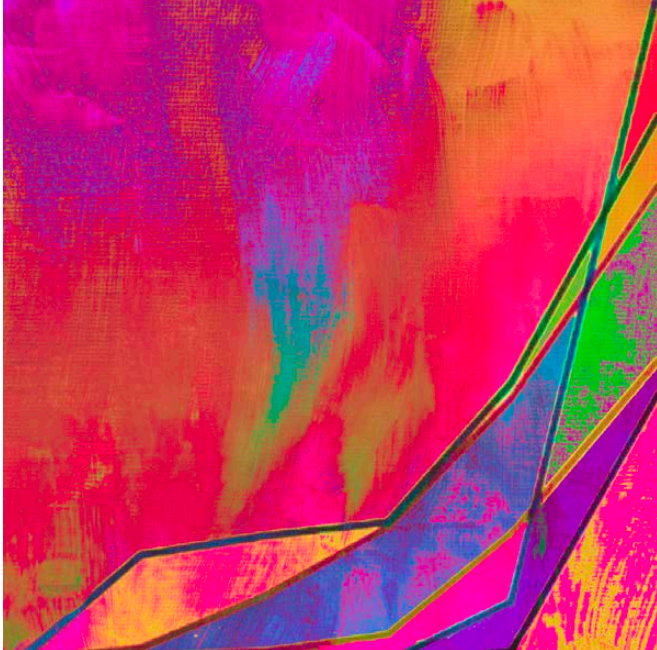
Mote and Sharp documented the magnitude of the ongoing decline in snowpack in western mountains. Alisa Singer uses blues that remind me of the rain that is now replacing the snow more often even at high elevation as well as brown and gold tones suggestive of warmth melting snow. She uses the data circles to conserve the overall shape of western states and emphasize the dire trend of snow loss using reds to stress the urgency and importance of this decline on both human societies and ecosystems at large.



I just love the beautiful and ominous center scene of the blue sky turning purple over a dark blue ocean lapping the even darker shoreline. Overhead one sees the warm and warmer hues of the future skies under climate change that causes ice sheets and glaciers to melt. And underneath we see yesterday's beaches with a cool cyan sea and a dry sandy beach which will not exist, at least in the same place, as sea level rise reduces the land area of our planet and redraws coastlines.

Alisa Singer uses the projections of future sea levels in a geometric design on the side of her painting to remind us of the real possibility of a very rapid change to a very different world.





In my mind, Alisa Singer screams with bright and shocking colors to raise the attention of the increasing role of climate change in exacerbating species extinction using the IPBS graph as a backbone of her geometric design. Be it through land use or overexploitation of land and oceans, we humans are responsible for killing many lives on this planet. Climate change is exacerbating what we have already started. While I personally believe many species will survive the chaos we have caused, it is certain that we have altered the dynamics of life on this planet. While mammals and birds (cooler color green) will likely be able to avoid some of the worst changes we caused by migrating across the fragmented landscape we have left them, less mobile species such as amphibians or reptiles will suffer more (red and purple). One hopes that fishes may be able to migrate also towards cooler deep water refugia. But the future could be dire for all. Our own species, due to our high vulnerability and much delayed response to a well-documented risk, may indeed also be at extreme risk of extinction.

To view the full gallery of Alisa's work please visit environmentalgraphiti.org.



For the Love of Ponderosa Pine

By Ramona Arechiga

I recently returned to Oregon to work for Oregon Department of Forestry (ODF) and became familiar with the J.E. Schroeder Seed Orchard. For much of the last two years I have been working on issues pertaining to reforestation of our State Forests. As part of this work, I have had the opportunity to spend some time at the Schroeder Seed Orchard, a repository of genetic resources for reforestation throughout our state. I vaguely remember visiting the orchard more than a dozen years ago, and when I revisited it for my current job, I was struck by the beautiful stand of ponderosa pines there. One of the big questions I had was, *do our partners in ecological restoration*

throughout the Willamette Valley (and even southern Washington) know about this amazing genetic resource?

In 1994 a thoughtful group of foresters, landowners, and scientists set out to address a gap in high quality seedling stock of native Willamette Valley ponderosa pine trees. In 1996 they formed the [Willamette Valley Ponderosa Pine Conservation Association](#) (WVPPCA) to improve our understanding of restoring this species to Willamette Valley and increase access to high quality seed. Through their efforts more than 400 native stands have been mapped, and about 150 parent trees have been grafted

into a fifteen-acre J.E. Schroeder Seed Orchard near St. Paul, Oregon operated by Oregon Department of Forestry.

This forward-thinking group of PIPO (*Pinus ponderosa*; PIPO) enthusiasts wanted to "...conserve and reestablish the native strain of Willamette Valley ponderosa pine for both genetic conservation and future timber, wildlife and urban uses." The PIPO seed orchard was initially planted in 1996 with seedlings from 40 different parent trees. The second phase included an additional 72 parent trees in 1998. The ultimate goal was to establish an orchard representing at least 160 different parent PIPO trees. This would



Willamette Valley ponderosa pines seed orchard. Photo Credit: Jason Cox

Curious about the current state of affairs on whether or not Willamette Valley ponderosa pine is its own unique variety?

Check out Willyard et al. (2017) article titled, "[Pinus ponderosa: A checkered past obscured four species.](#)"

improve the vigor and longevity by facilitating genetic crossing of the remaining native Willamette Valley ponderosa pine. Today, this seed orchard is approximately 4.5-acres with 78 individual families representing the vast majority of genetic variation present in Willamette Valley ponderosa pine. It is the largest repository of germplasm for this species in the area.

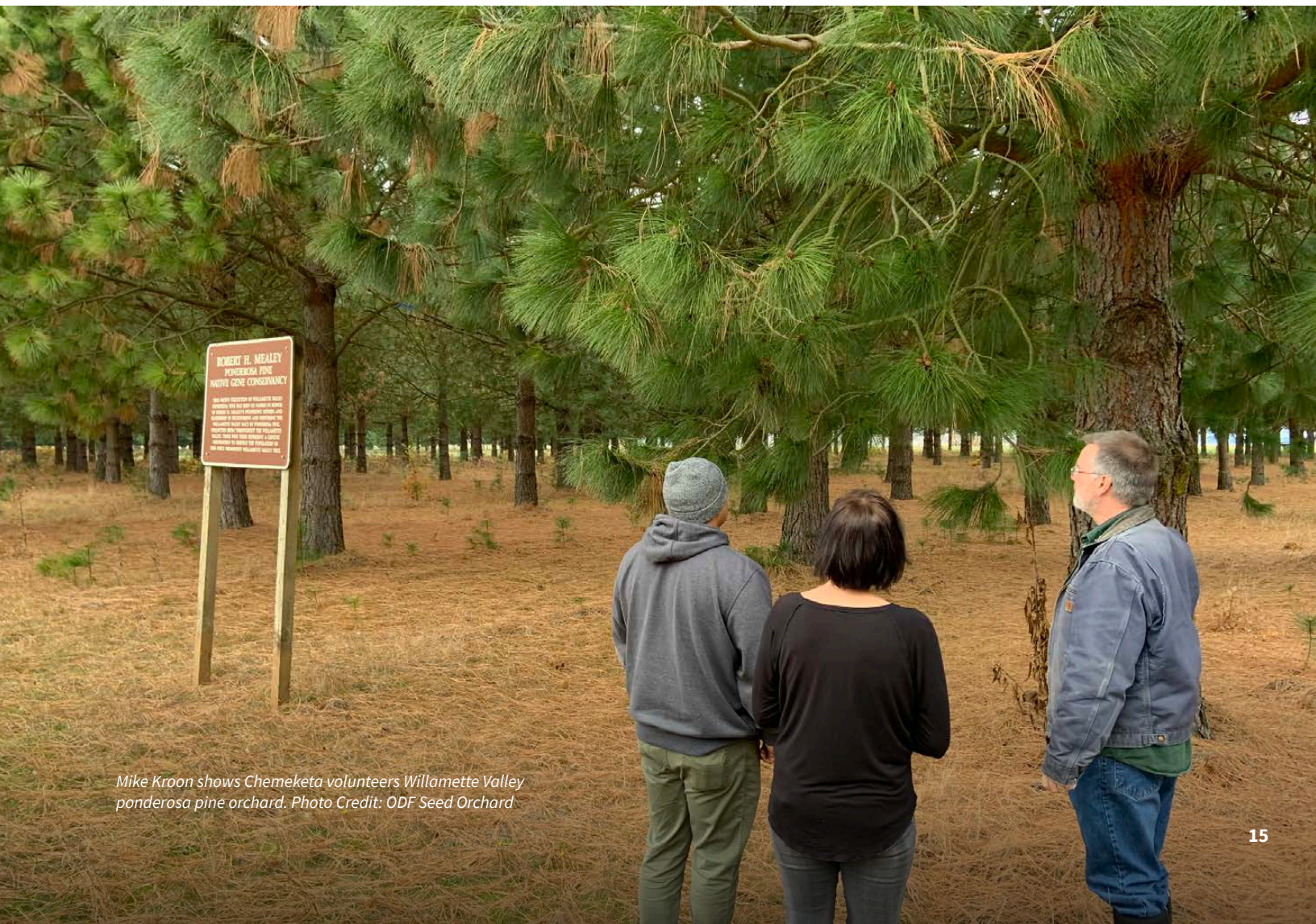
The ODF geneticist during this time, Sara Lipow, noted concerns about seed collections and seedlings grown out from the native PIPO stands. Lipow cited a report by Geoff Gooding (1998) that showed a high proportion of inbred seed resulting from these native stands. The resulting trees grown out from the seed collected from the native stands were at greater risk of failure due to environmental stressors like drought. Additionally, these trees were likely to be “shorter and skinnier than their

non-inbred relatives” (Lipow 1999). Fast forward to today, the JE Schroeder Seed Orchard in collaboration with the WVPPCA has established a healthy orchard representing much of the genetic variety of ponderosa pine found in the Willamette Valley. This orchard has produced a repository of high-quality improved seed through cross pollination of the collections done in the late 1990s and early 2000s. The seed available from Schroeder does not have the same issues as you would find in wild collections of these native ponderosa pine stands as Sara Lipow noted above.

Work by the WVCCPA is ongoing to ensure sound regeneration practices for Willamette Valley Ponderosa Pines. In 2002 they completed a project to map and identify native [Willamette Valley PIPO stands](#) for future genetic collections. Through this effort they

mapped and categorized over 400 stands of PIPO between Beaverton and Cottage Grove ranging from 1 to over 100 trees. The intended purpose of this project was to provide “... historical documentation, cone collection certification and soils correlation for site adaptability” (McNitt 2002). This group also developed [Establishing and managing ponderosa pine in the Willamette Valley](#) and several other resources including guides to common pests like ips, bark beetles, and others.

Coming home to Oregon has been a blessing for me and my family; I love the diversity of ecosystems and believe sharing knowledge and resources is critical to further our conservation and restoration goals. If you are interested in ordering Willamette Valley ponderosa pine seed for your next restoration project please contact the folks at [JE Schroeder Seed Orchard](#).



Mike Kroon shows Chemeketa volunteers Willamette Valley ponderosa pine orchard. Photo Credit: ODF Seed Orchard



New Research Demonstrates Viability of Pollinator Friendly Groundcovers in Agricultural Systems

Wendy and George Kral, PhD of Scholls Valley Native Nursery recently implemented a series of field trials and prepared a report that examines the suitability of a broad suite of native and naturalized plants as groundcovers in headland roads, hedgerows, production field furrows, woodlands and bioswales. The goal of the research was to “identify and test a diversity of native and naturalized herbaceous plants with potential to support birds, pollinating insects and other wildlife while also providing the benefits of groundcovers for erosion control, soil tilth and weed abatement.”

After testing a suite of species common to the Tualatin Valley in a pilot study, the Kral's examined the effectiveness of four groundcover mixes totalling 76 species across a mix of agricultural settings. They evaluated success of the seed application and plantings on their performance within the following metrics:

- germination/ease of establishment
- coverage
- seasonality
- pollinator support
- compatibility with crop systems/land use
- invasiveness/mobility

The authors found that increasing the plant diversity of non-farmed areas has demonstrable benefits to pollinators, and experienced no negative impact to their bare-root nursery crop yields. This project provides invaluable data that supports agricultural producers who are hoping to decrease reliance on large scale herbicide use and improve wildlife habitat and biodiversity on their farmland. This study was funded by a **TREE grant** awarded by the Tualatin Soil and Water Conservation District. Read the full findings [here](#).



(Clockwise from left) Bumblebee departing *Eschscholzia californica*, bee mimic pollinating *Madia elegans*, solitary bee on *Plagiobothrys scouleri*, Swallowtail butterfly visiting *Gilia capitata*, bee mimic pollinating *Spergularia rubra*. Photo Credit: Scholls Valley Native Nursery



Chinook Indian Nation
Cathlamet · Clatsop · Lower Chinook · Wáhkakum · Willapa

First Foods Restoration, Federal Recognition and more

Sam Robinson



Chinook Nation members take the outer bark off a slice of bark pulled from an old cedar tree. Photo Credit: Amiran White

Following a conversation with project staff about their work [restoring wapato and Columbia River floodplain habitat at Steigerwald National Wildlife Refuge](#), BEF Watersheds staff Kayla Seaforth talked with Sam Robinson, vice-chairman of the Chinook Indian nation to get his take on the project and discuss other areas of focus for him and the tribe.

This streamed interview is outside of the Treeline project's normal print newsletter format, but Sam's passion and skill as a storyteller were so apparent that we felt this was the best venue to share his insights.

“We need to do some of the things that the ancestors would do to help out the earth. But without federal status they ask us to have a seat at the table, but it’s not a seat at the table. That’s what we keep fighting for.”

Listen [here!](#)



The Chinook People continue to harvest and use Cedar bark for a number of traditional uses today. Photo Credit: Amiran White



Paddlers transport the Canoe KLMIN at a stop along the annual canoe journey. Photo Credit: Sam Robinson

Local Organizations Support Landowners in Post-Fire Revegetation

The North Santiam Watershed Council and Marion Soil and Water Conservation District partnered to give away 30,000 trees and shrubs to survivors of the Beachie Creek and Lionshead fires this February. These plants will aid private revegetation efforts that will stabilize soils and improve water quality following the devastating 2020 fires. Learn more about the efforts surrounding post-fire revegetation in the North Santiam Watershed [here](#). Plant materials were provided through funding from the Arbor Day Foundation, One Tree Planted and BEF.



Tree giveaway. Photo Credit: Amanda Bintliff



Forest Stewardship in a Changing Climate:

A Virtual Symposium For Forest Property Owners

Washington State University Extension Service is hosting a three part symposium to cover the following topics:

- How climate change is impacting Puget Sound area forests
- Maintaining a healthy forest in a changing climate
- How drought and heat affect trees
- Climate change impacts on forest wildlife
- Planting the right tree species
- Is assisted migration necessary?

Register [online here](#)



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 Kas Guillozet at kguillozet@b-e-f.org.

This work is supported by a Coordination and Collaboration grant from the Climate Resilience Fund