



The Learning Forest

Sharing scientific knowledge on sustainable land management in the Olympic Experimental State Forest and beyond

Issue 14 • Fall 2023

Editorial Board Message

This issue of The Learning Forest highlights the pivotal role that western Olympic Peninsula residents and project partners play in forest management.

In the featured article, **Olympic Natural Resources Center** (ONRC) research scientist Courtney Bobsin describes the learning-based collaboration process and explores **ethnoforestry**, a people-centered management approach being implemented as part of the **Type 3 (T3) Watershed Experiment** in the Olympic Experimental State Forest (OESF). Ethnoforestry helps bring together **Washington Department of Natural Resources** (DNR) managers, researchers, stakeholders, and Tribal partners to identify key issues and design new forest management tools to address them. Learning-based collaboration is a process used to engage stakeholders. Paul Anderson, the Director of the U.S. Forest Service Pacific Northwest Research Station, commented that “Somebody finally built a three-legged stool” when learning about ethnoforestry and learning-based collaboration at the 2023 OESF Science Conference. Courtney recently raised the profile of ethnoforestry and learning-based collaboration with an article in the international journal **Forest Ecology and Management**.

In the guest article, Kari Dresser and Dean Mia Boster describe a major new initiative by Peninsula College to increase education and workforce development opportunities through their new Natural Resource Program, which started on the Forks campus this fall. The program provides residents a path to local natural

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resource jobs and sets the stage for expanding educational collaboration between Peninsula College, DNR, and others.

This issue of The Learning Forest also marks a major milestone on the T3 Experiment: all of the timber sales being implemented as part of this project have been auctioned, and logging has begun on five of these timber sales. Reaching this point required the cooperative effort of managers, scientists, foresters, and many people from Tribes and local communities.



Stakeholders attending a recent field tour in the OESF.

Courtney Bobsin, UW

Featured Article

Ethnoforestry

A People-centric Approach to Forest Management

by Courtney Bobsin, ONRC, and Cathy Chauvin, DNR

A law is changed. A new species is listed as threatened or endangered. More people move into rural areas, increasing demand for trails and campgrounds.

Events like these spark efforts to adjust forest management. In identifying changes, land managers typically focus on the long-term health of the forest and what it provides, such as wildlife habitat, recreation, and revenue from timber and other forest products. The wellbeing of nearby rural communities is part of the planning process, but typically not central to it.

With more and more demands being placed on the forest, it may be time to see rural communities not just as stakeholders, but an integral part of the ecosystem. Rural community members work and recreate in the forest, and have connections to the forest that can span generations. These communities also help care for the forest. The health of the forest depends in part on the health of the community and vice versa.

What we need today is a more people-centric approach to management that addresses the wellbeing of the forest and the local communities *together*. Ideally, this approach would pair actionable science with the unique knowledge, experience, values, interests, and ideas that local people can provide to produce location-specific management solutions.

Fortunately, an approach like this exists. It is called ethnoforestry.

Environmental security now lies in integration of local knowledge and modern learning.

- Dr. Deep Narayan Pandey, **Introduction to Ethnoforestry**

What is Ethnoforestry?

Indigenous communities have been actively managing land since time immemorial to produce food, grow plant material for crafts such as basket weaving, harvest timber for homes and other needs, and meet a wide range of cultural values. An example is using fire to open the tree canopy and provide enough light for culturally important species, such as huckleberries, to flourish on the forest floor.

Ethnoforestry recognizes the intrinsic value of traditional practices and knowledge and seeks to bring them into modern land management. Dr. Deep Narayan Pandey, one of the first scholars to write and publish on this topic in the late 1990s, defined ethnoforestry as “the creation, conservation, management, and use of forest resources, through continued practice of customary ways by local communities.”

Ethnoforestry has mostly been used in research in India and other parts of Asia, and it often centers around agroforestry, a land-use system in which trees, food crops, and grazing are integrated on the landscape to improve farm productivity. It has seen limited use or study in North America.

A group of researchers from the University of Washington’s Olympic Natural Resource Center (ONRC) and Washington State Department of Natural Resources (DNR) would like to change that. In the context of Pacific Northwest forestry, they see ethnoforestry as more than using customary ways to manage forests. They see it as an opportunity to pool the knowledge of everyone who shapes, is affected by, and informs forest policy to develop new forest management tools that enhance the wellbeing of forest and rural community alike.

How it Works

To understand how ethnoforestry works, consider the **Type 3 (T3) Watershed Experiment** in the Olympic Experimental State Forest (OESF) on the western Olympic Peninsula. The T3 Experiment is a roughly 20,000-acre, operational-scale, cooperative effort led by DNR and ONRC. This effort aims to expand the current forest management toolbox with new tools that can achieve forest and rural community wellbeing on

the western Olympic Peninsula. Although forestry has evolved over the past 30 years, new tools are needed to meet modern challenges.

Two of these tools are being developed using an ethno-forestry approach and a process called learning-based collaboration. In this process, natural resource managers and practitioners, biophysical and social science researchers, stakeholders, and Tribes work together in a learning environment of trust, respect, and curiosity. This process creates a safe place to share and nurture creative solutions and is designed to bring diverse, often opposing viewpoints together. Participants learn from the outcome of this work, but they also learn from the process itself, through conversations, brainstorming, and the sharing of knowledge.

T3 Experiment researchers (the T3 Team) used learning-based collaboration to engage with stakeholders in workshops, field tours, conferences, interviews, and community events. Through these efforts, they gathered people's input and insight into the forest management issues that concern them the most.

For example, the T3 Team learned about the lack of culturally valuable species like beargrass and huckleberries in working forests. Under current laws, harvested areas must be replanted within three years. That requirement means that herbaceous plants and shrubs that could be harvested by local people are competing with planted tree seedlings, ultimately limiting the amount of time these plants and shrubs can grow and thrive before space and light become too limited (Photo 1).



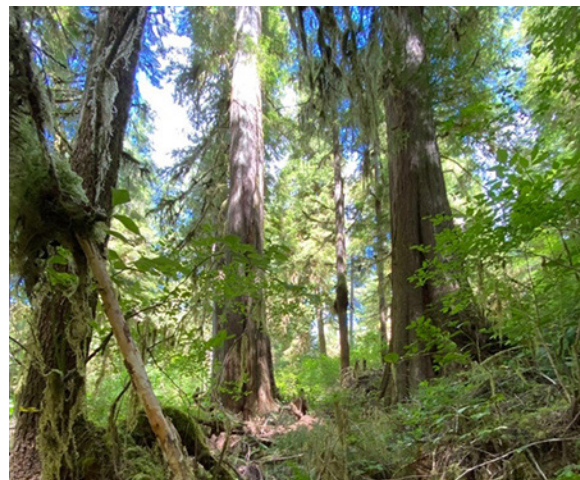
Bill Wells, DNR

Photo 1. Tree seedlings filling in a site in a harvested area in the OESF.

Another concern was the decline of western redcedar on the western Olympic Peninsula (Photo 2). This iconic, long-lived conifer species was historically more widespread, but its abundance has been greatly reduced by 20th-century logging, deer and elk browsing of seedlings, slower growth rate compared to other commercially valuable conifers, disease, and susceptibility to drought. Western redcedar is considered to be one of the most culturally important species for many western Washington Tribes. Increasing the number of accessible redcedar trees for cultural bark harvesting was a priority for many.

Next, the T3 Team developed ideas for new tools to address these concerns. For example, the T3 Team began to speculate on whether culturally important understory species could be grown in typical conifer forest rotations. This idea led to further discussions with Tribes and stakeholders that revealed broad support for increasing elk forage, the availability of first foods (foods that have been part of indigenous peoples' diets since before European settlement), access to working forests, and other issues.

One of the ideas that emerged from this process was to change how forests are replanted following stand-replacement harvest. Traditionally, conifer seedlings are densely planted in a fairly uniform pattern across the harvested area. The T3 Team designed a tool that involves planting trees in clumps instead, with open areas in-between. In the open areas, herbaceous plants and shrubs can grow that are beneficial to elk, deer, and people. The openings are wide enough to delay the closure of the tree canopy, which should allow these



Ally Kruper, UW

Photo 2. Western redcedar in the OESF.



plants to persist in the forest longer than they would under uniform tree spacing. This tool is called “ethnoforestry variable density planting.”

Another idea was to plant shade-tolerant, long-lived redcedar trees with fast-growing, sun-dependent red alder trees in varying proportions ranging from pure alder to pure redcedar (Figure 1). At age 35, the alder is expected to be harvested and the redcedar left to grow an additional 35 years. These two valuable and ecologically significant species are often seen growing together in nature, but rarely in working forests. This tool is called “ethnoforestry cedar-alder polyculture.”

Once the T3 Team designed the tools, they used learning-based collaboration to solicit feedback and thoughts from stakeholders and Tribes on how the tools, and the resulting forest conditions, may affect their wellbeing. This process allowed for additional refinement and changes based on their comments.

One stakeholder was concerned that harvesting the alder would harm the cedar. That concern became a research question that will be addressed during the study. Another stakeholder mentioned that “The higher

proportion of cedar, the more seedlings you will lose to deer and elk.” Cedar seedlings are notoriously attractive to grazing wildlife. In response, the T3 Team established a cedar browse learning group to explore possible solutions to this challenge. Learning groups enable people to cooperatively explore topics that interest them, but that are not being addressed through the T3 Experiment’s peer-reviewed study plans.

Does Ethnoforestry Work?

It is early days for ethnoforestry in the Pacific Northwest. But the response so far has been positive. For example, a 2021 field tour to discuss the cedar-alder polyculture and variable density planting tools, among other T3 tools, drew about 40 people (Photo 3). In addition, the team has noted a strong interest in the T3 Experiment itself. Numerous people have joined one or more learning groups associated with the T3 Experiment, and a panel discussion on the experiment at the 2023 OESF Science Conference was well attended by a highly engaged audience.

It is no wonder; seldom do people get a chance to collaborate with researchers and managers on developing

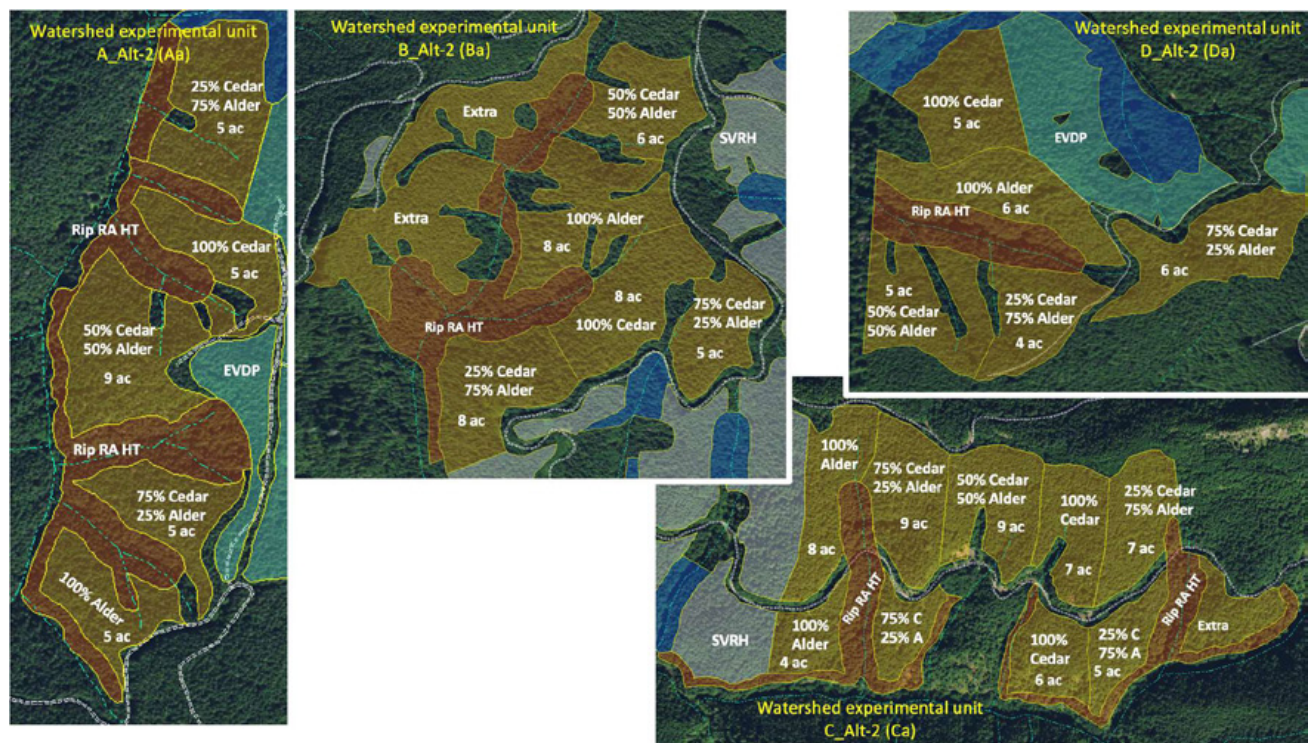



Figure 1. Layout of the ethnoforestry cedar-alder polyculture tool (areas shaded in yellow) in the four experimental watersheds selected for this tool as part of the T3 Experiment. Areas denoted with “Rip RA HT” will be heavily thinned and planted with red alder as part of a different T3 forest management tool. The abbreviation “EVDP” means ethnoforestry variable density planting, and “SVRH” means standard variable retention harvest.

forest management tools that can be implemented and studied at an operational scale. This level of interest also may indicate a need for people to engage in discussions with scientists and managers about forest management decisions that will affect their day-to-day lives. At the 2023 OESF Science Conference, Neil McWee, a small forest landowner, described past communication barriers with land managers as a wall, and said that “with this [T3] program...you drop that wall, and the community, Tribes, industry, activists, people in the community start to interact, and that is when you get that cohesiveness in the ideas.”

Such engagement could be essential going forward. As more and more competing demands are placed on the forest, the large-scale, generic forest management solutions of the past may prove inadequate. In its place could be the type of informed, creative, and location-specific solutions that meet human needs while maintaining the health and longevity of the forest. Such tools can arise from a powerful, people-centric approach like *ethnoforestry*. 

About the Author



Courtney Bobsin is a research scientist with the University of Washington's Olympic Natural Resources Center. She completed her master's and Ph.D. at the University of Washington, working on forest ecology and management studies on



Courtney Bobsin, UW

Photo 3. Stakeholders visiting an experimental site during an OESF field tour.

the west side of the Olympic Peninsula. Courtney is interested in the ways forest management can adapt to meet the needs of nearby communities, provide for wildlife, and produce sustainable timber. She manages several long-term ecological studies that address novel approaches to management. She can be reached at cbobsin@uw.edu.

Further Reading

- [Perspectives: Ethnoforestry, Ecosystem Wellbeing, and Collaborative Learning in the OESF](#)
- [Type 3 Experiment Project Fact Sheets](#)
- [Type 3 Experiment Uplands Study Plan](#)



The Learning Forest is an electronic, biannual newsletter published jointly by the [Washington State Department of Natural Resources](#) (DNR) and the [Olympic Natural Resources Center](#) (ONRC).

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Featured Article

Peninsula College Creates Pathways to Natural Resources Jobs

by Kari Dresser and Mia Boster, Peninsula College

Walking beneath the forested canopies along the Sol Duc River or taking a weekend drive up the Dickey River to scout for deer are activities that western Olympic Peninsula (west end) residents often do for fun (Photo 1). Few people know and have a passion for the area like its residents, and a cadre of leaders in the natural resources industry are hoping this passion translates into a solid student cohort for Peninsula College's new Natural Resources Program launching this fall.

Identifying Community Need

In 2022, Peninsula College surveyed local employers, all of whom expressed an acute need for natural resources workers and related job training. They also indicated an interest in offering work-based learning opportunities. According to Lightcast, a leader in labor market analytics, Clallam and Jefferson counties are hot spots for forest and conservation technicians, with significantly more jobs available than other areas nationally.

To meet these needs, Peninsula College and local employers designed a Natural Resource Program that will take students outside to train them for jobs that support and sustain the natural environment, offering a path to good state jobs for west end residents and a pool of qualified applicants for local employers (Photo 2). Beginning this September, the program will focus on the integration of science, technology, and sustainable practices for natural resources management. Classes will emphasize forest ecology and management, geographic information system (GIS), forest mapping, silviculture, water quality, stream habitat monitoring, timber harvesting, forest road management, restoration ecology, fisheries, river restoration, fire science, and wildlife habitat management (Text Box 1 on page 7).



Cathy Chauvin, DNR

Photo 1. A trail winding through a lush forest in the Sol Duc River watershed.



Teodora Minkova, DNR

Photo 2. Field technicians collecting water temperature data as part of a stream monitoring project.

On-the-ground learning in forests and waterways, classrooms, and labs, and through online modules and workplace internships will all be part of the curriculum. Online “HyFlex” teaching, in which students can attend class remotely or in person, will allow students in Port Angeles and Port Townsend to participate in the program as well.

Keeping it Local

The first to be based at the college's Forks campus, the new program is the only broad natural resources program of its kind being offered on the north Olympic Peninsula.

DNR Olympic Region Manager Bill Wells, who served on the advisory council for the program, calls the new

Text Box 1. Peninsula College's New Natural Resource Program

The program will provide students with the skills to achieve the following:

- Maintain and improve the quality of the forest and natural environment.
- Provide technical assistance for conservation of soil, water, forests, and natural resources.
- Compile data on characteristics of forest tracts.
- Assist conservation scientists to manage, improve, and protect rangelands and wildlife habitats.
- Work in a team to develop solutions and manage natural resources.

Program capacity is 25 students per year. Anticipated costs for each student in this program:

- Certificate (1 year/3 quarters): \$6,365 - \$7,032
- AAS-T degree (2 years/6 quarters): \$5,720 per year plus course-related fees

program a win-win for local students and employers, giving students an opportunity to learn about natural resources jobs without having to leave home.

“They can move from high school to higher ed and jump right into the workforce with us,” Wells said, adding that students will be able to get a feel for subject areas and target their learning toward areas in which they are interested.

“People don’t realize all of the ways that they can work in natural resources,” he said. “There are many professional careers available.”

“Growing up (in Forks) gives them the ability to go to school at home and find a job at home,” he said. “It’s a huge advantage for them and employers on the peninsula looking for professional applicants.”

Wells said most of the people hired for professional DNR positions on the peninsula come from out of the

area, which does not usually translate to career longevity in Forks.

“Living on the west end is a unique experience,” he said. “Most come for a year or two then transition to other regions. We’d like to develop a pool of west-end candidates who know what it’s like to live here and have opportunity to stay and advance their careers.”

Wells said he has seen many high school graduates leave the west end for school, only to return a short time later because adjusting to a new location was challenging.

As for positions in most need of filling, Wells said the DNR is short on entry-level foresters and are always looking for permanent and non-permanent fire staff (Photos 3 and 4).



Alan Mainwaring, DNR

Photo 3. A DNR forester reading a core sample.



DNR Communications


Photo 4. Wildland firefighters on a training exercise.



Helping Students Succeed

The new program is an investment in the future. “Our local employers are in urgent need of natural resource employees,” said Peninsula College President Dr. Suzy Ames. “Launching the Natural Resources Program will help prepare students for jobs in the industry while helping residents get living-wage jobs.”

To help ensure student success, the Peninsula College Foundation will provide a \$1,000 scholarship to every new Natural Resources Program enrollee for the first two years. Students can also apply for financial aid at the college.

For more information about Peninsula College’s Natural Resources Program, contact Dr. Mia Boster at mboster@pencol.edu, or Chris Morgan, Natural Resources Faculty and Program Coordinator, at cmorgan@pencol.edu. You can also find information about the program and coursework on the Peninsula College webpage at <https://pencol.edu/program/natural-resources>. 

About the Authors

Kari Dresser was the Director of Marketing and Communications at Peninsula College. She holds a master’s degree from Eastern Washington University in communications and college instruction, and a bachelor’s degree from Central Washington University in journalism. Her family homesteaded on the Hoh River in the 1800s and remains there today. Natural resources funded her education.

Dr. Mia Boster is the Dean for Workforce Education at Peninsula College. She holds a Ph.D. from Walden University in educational technology, a master’s degree from Western Washington University in adult education, a bachelor’s degree from Eastern Washington University in photographic science, and an associate’s degree from North Seattle College.

Recent Publications

Jeff Keck. 2023. New methods for coupling climate-driven hydrology with hillslope and channel geomorphic processes at the watershed scale. Ph.D. dissertation, University of Washington

This dissertation improves hydrology-driven, watershed-scale sediment production and transport modeling methods and understanding. Hydrologic representation and its impact on modeled-network-scale sediment transport is examined. A new landslide runoff model was developed, called MassWastingRunout, that is suitable for predicting probabilistic runoff extent, sediment transport, and topographic change. Finally, as part of a study on climate change impacts on landslides, a new method was developed for coupling climate and hydrology to sediment production and transport models. The method is called DistributedHydrologyGenerator. Sampling for part of the research was conducted in the Olympic Experimental State Forest (OESF).

Courtney Bobsin. 2023. Ethnobotany and adaptive management: generating new pathways to manage forests on the Olympic Peninsula, WA. Ph.D. dissertation, University of Washington

This dissertation demonstrates methods of better incorporating and integrating sciences, both biophysical and social, into management decisions, to assist in improving the collective capacity of managers, researchers, stakeholders, and Tribes to adapt to a rapidly changing world. Two OESF-based studies are featured: 1) the Long-term Ecosystem Productivity Study, with 25 years of data on an early-seral treatment with an area of Douglas-fir and red alder, and a pure Douglas-fir plantation; and 2) the Type 3 Watershed Experiment, which seeks to expand the management toolbox in upland and riparian forests. Stakeholder engagement strategies, and specifically learning-based collaboration, are described and evaluated.

Kyle Martens. 2023. [Riparian Validation Monitoring Program 2022 Annual Report](#). Forest Resources Division, Washington Department of Natural Resources, Olympia, WA, 40 p.

This report includes the monitoring methods, sampling activities, and results from the 2022 OESF field season. DNR crews conducted population surveys to estimate juvenile salmonid densities and biomass in 35 small watersheds. Additional sampling was conducted at the Bear Creek culvert removal site. Adult coho salmon redd surveys were conducted in 19 watersheds and snorkel and habitat surveys were completed in three monitored reaches, spanning more than 12 kilometers (7.5 miles) of the Clearwater River. DNR began this program in the OESF in 2016 to meet the commitments of DNR's [State Trust Lands Habitat Conser-](#)



Kyle Martens, DNR

A young Coho salmon measured as part of riparian Validation monitoring.

vation Plan (HCP) to understand and report on the links between DNR land management, stream habitat conditions, and salmonid populations on state trust lands.

Type 3 Watershed Experiment Project Updates

All 13 timber sales being implemented in the roughly 20,000-acre **Type 3 (T3) Watershed Experiment** have been auctioned, and logging operations have started in five of these timber sales. This is a significant milestone in this operational-scale project, which seeks to develop new forest management tools that benefit both communities and forests. Being experimental, these timber sales were a challenge to plan and sell. Learn more about the experimental treatments in the [Uplands Study Plan](#).

The T3 Experiment includes tools that change how forests are replanted after a timber harvest. Silviculture planning for these tools has begun, which includes ordering seedlings and delineating areas to be treated in a GIS database. The first silviculture activities are expected to start in the winter of 2024.

The team has completed its fourth year of pre-harvest monitoring for the 13 timber sales in the study. Sampling ranges from fish and leaf litter to bioacoustics and water temperature.

Learning Group Updates

Learning groups are an opportunity for people to work together on interesting forest management-related top-

ics that are not addressed through the T3 Experiment's peer-reviewed study plans. Seven learning groups are focusing on specific issues such as aquatics, carbon, cedar browse, invasive species, and forest economics.

The Carbon Learning Group worked with a diverse collaborative team of University of Washington researchers and non-profit organizations to submit a grant to the National Science Foundation for evaluating a veteran-oriented workforce model; exploring the regenerative, ecological-human wellbeing concept; preparing field trials to reduce wildland fuel loads; making biochar from harvest residue; and restoring fire-degraded soils.

In addition, a funding application was submitted to the Northwest Climate Adaptive Science Center to help implement a sub-study developed by the Cedar-browse Learning Group. The study will test different methods for deterring deer and elk browse of western red-cedar seedlings. Read more about this project in the [Spring 2023 issue](#) of this newsletter.

A third proposal was submitted to the U.S. Forest Service that would further the use of drone-based lidar and multispectral imagery in monitoring the Long-Term Ecosystem Productivity study at Sappho, Washington.



Education and Outreach

Washington Forest Practices Riparian Scientific Advisory Group Field Tour

The Advisory Group met on July 12, 2023, for a field trip to the Olympic Experimental State Forest (OESF). Attending were 23 people, including Forest Practices Cooperative Monitoring Evaluation and Research science staff, large forestland owners, representatives of western Washington Tribes, and staff from the University of Washington and the Washington departments of Natural Resources, Fish and Wildlife, and Ecology.

Dr. Teodora Minkova and Dr. Bernard Bormann briefed the group on the Type 3 (T3) Watershed Experiment and led discussion at three sites: an older riparian thinning and two sites that are part of the T3 Experi-



Lori Clark, DNR

Tour members visiting an experimental site in a riparian area.

ment. The latter included a riparian forest planned for a harvest that features light thinning with clear-cut gaps; and a planned variable-width riparian buffer. The group discussed the expected ecological effects, operational feasibility, implementation costs, and pre- and post-harvest monitoring. The tour clearly demonstrated the value of experimental research in understanding the complexity of riparian forest management. Read more about this tour in the Washington State Department of Natural Resources (DNR) Adaptive Management Program [August 2023 quarterly update](#).

Sustainability in Prisons Project

Researcher Lauren Kuehne, who collaborates with DNR on an [acoustic monitoring project](#) in the OESF to evaluate bird responses to forest management, is trying an unorthodox way to process the large volume of acoustic monitoring data generated by this project: engaging inmates in data processing as part of the Sustainability in Prisons Program. Inmates are trained to identify species of interest by screening audio files. She and the inmates recently shared their experience in an [engaging podcast](#).

Interns in the OESF

Five interns from the University of Washington School of Environmental and Forest Sciences worked in the OESF in 2023, helping with fish monitoring for the T3 Experiment and vegetation sampling in the Long-Term Ecosystem Productivity Study.



Teodora Minkova, DNR

University of Washington interns and DNR field technicians being trained in field safety and using CB radios.

Featured Photos



Bill Wells, DNR

Photo of elk grazing in a field near Forks, Washington taken from a helicopter. DNR staff were headed out for an aerial survey of forest conditions after a strong winter storm.



Teodora Minkova, DNR



Courtney Bobsin, UW

Researchers and DNR staff implementing the T3 Watershed Experiment visiting upland study units on November 3rd to discuss logging and silviculture experimental treatments.

