2023 ANNUAL ACCOMPLISHMENT REPORT

REGION 6 ECOLOGY PROGRAM

Larches in the Okanogan-Wenatchee National Forest. Photo from the Eastern Washington Ecology Program.

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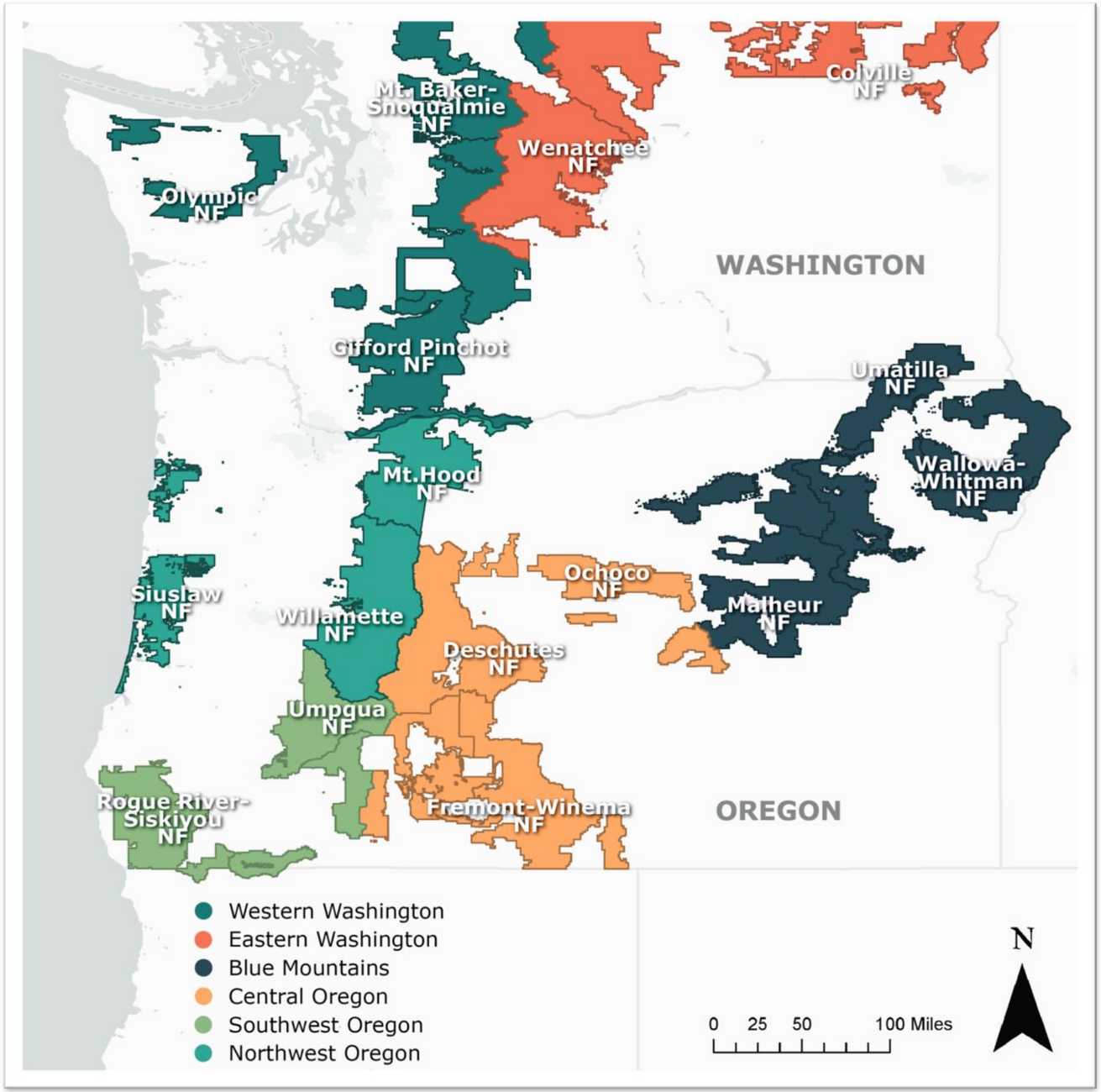


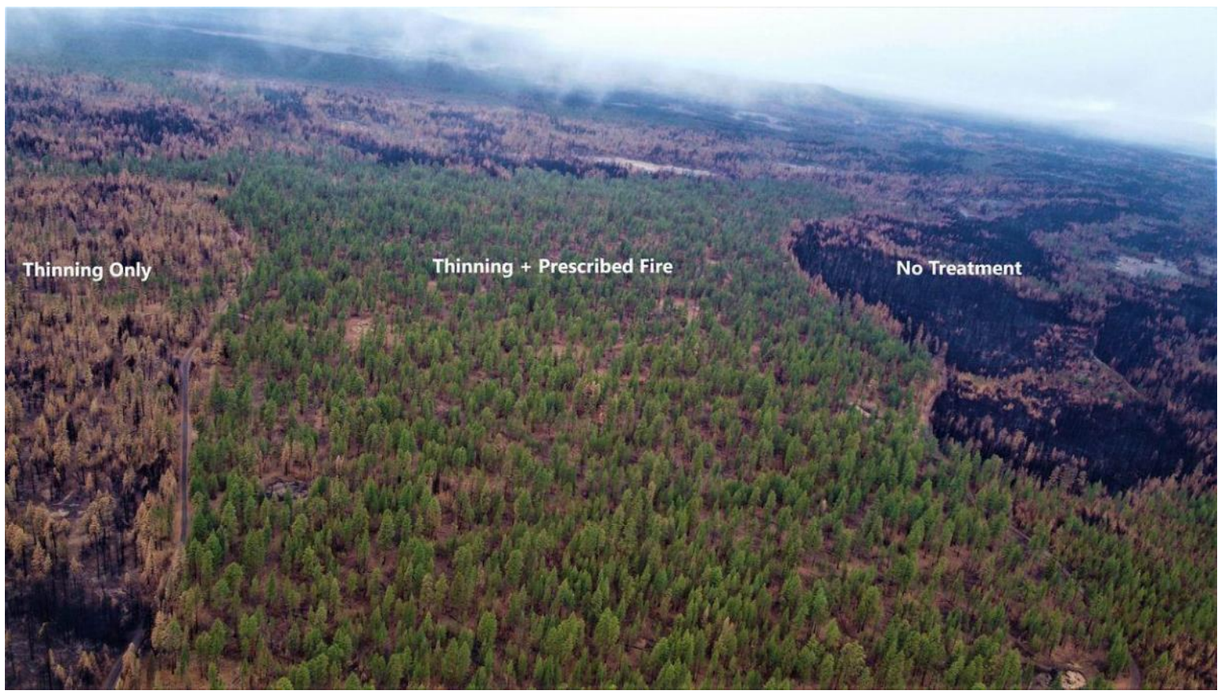
Report design by Karin Hernandez

LAND

The Ecology Program gratefully acknowledges we work on the ancestral lands of many Tribes in the Pacific Northwest. We deeply respect their wisdom developed over millennia, and seek to work with them as partners in land stewardship.

One recent example of partnerships we seek to foster in the future:

The Klamath Tribes planned and implemented a restoration treatment that included commercial thinning, precommercial thinning and prescribed fire on the Fremont-Winema National Forest. The treatment was conducted under the authority of a Master Stewardship Agreement between the Klamath Tribes and the Fremont-Winema National Forest. The treatment followed ICO stand management concepts. The Klamath Tribes use ICO, or "Individual, Clump, Opening" to restore forested areas because it replicates pre-20th century stand conditions and aligns with Klamath Tribes traditional ecological knowledge. These stand conditions result in stand structures that are productive, sustainable and resilient to wildfire and other disturbances. Restoration treatments for the stand depicted in the picture were completed in the spring of 2021 a few months prior to the Bootleg Fire. The Bootleg Fire exhibited crown fire behavior as it approached the restored area, dropped to a surface fire upon entering the restored area and resumed crown fire behavior after leaving the restored area. Note, the adjacent stand had been thinned using ICO concepts but had not yet been underburned. It experienced high intensity surface fire but only limited crown fire.



A Klamath Indian squatting next to a fire scarred ponderosa pine amongst a robust understory of fire adapted snowbrush.

Curtis E. S. (ca. 1923). In the forest—Klamath [photographic print]. Edward S. Curtis Collection, LC-USZ62-136575. Library of Congress, Prints and Photographs Division, Washington, D.C.

MISSION STATEMENT & PROGRAM OVERVIEW

The Ecology Program is a network of ecologists applying science to serve the National Forests in the Region through the following core services: climate change, landscape assessment, technology transfer, monitoring, support to planning, partnerships, and products (maps, publications, and databases). Many of these services support climate change adaptation. The Area Ecologists work as equal partners with other disciplines, the PNW Research Station, Forest Health, and external partners. They work on an area basis to serve multi-forest needs and provide a landscape perspective. Ecologists are based on National Forests and are hence accountable to Forest leadership. Ecologists are a bridge between science and implementation.

The Regional Ecology Program today has a terrestrial emphasis and is organized into 6 areas or zones. Area Ecologists carry out a program of work crafted to each National Forests' needs. The Regional Ecologist, representing Regional leadership, ensures issues at the regional scale are incorporated into the program.

The program is built on a social contract between National Forest leadership, ecologists on the ground, and the Regional Office. The program of work is crafted annually with Forest Leadership Team and Staff Officer guidance. A high degree of accountability of performance is characteristic of the program.

In FY22, at the direction of the Regional Investment Board, the Regional Ecology Program Steering Committee (SC) was formed to exchange information, promote integration, and provide advice and direction to the Program. The SC is led by the Natural Resources Director, and includes the Directors of Resource Planning and Monitoring, Fire and Aviation, and State, Private, and Tribal Forestry, as well as the Assistant Director for Vegetation Management and Ecology. Also included are two Forest Supervisors from the Eastside and two from the Westside, on a rotating basis. Finally, the SC includes a representative from the Pacific Northwest Research Station and the Regional Tribal Liaison. The SC met twice during 2022. After a hiatus, the SC will soon be meeting again.

The Regional Ecology Commitment has been a decision of Forest Supervisors collectively as an investment in the multi-Forest landscape perspective, continuity, and the many other services the ecologists provide. Ecologists do not count toward Forest-level head count caps.

Doug Glavich coring a tree for an Echo Mt. post-fire study.

THE 7 PILLARS

In Region 6, there are seven ecology programs: Western Washington, Eastern Washington, Blue Mountains, Central Oregon, Southwest Oregon, Northwest Oregon, and the Regional Office. Each area may cover a number of National Forests (NFs), grasslands, and scenic areas owned by the federal government. Accomplishments are categorized into core services that are referred to as "The 7 Pillars". These serve as the foundation for the R6 Ecology Program. The following pages will include each area's accomplishments categorized into these pillars.

CLIMATE CHANGE

Climate change is the overriding environmental issue of the 21st century, affecting all aspects of our lives. Ina program context, we work closely with Thomas Timberlake, the Regional Climate Change Coordinator, to implement the vulnerability assessments that have been prepared for each of the areas in the Region. Specifically, we support planning teams with technical assistance in using this information in the planning process. We also work with the research community on using climate change modeling, such as expected changes in water availability, to inform our landscape assessment.

LANDSCAPE ASSESSMENT

Land stewardship today means looking at different scales on the landscape, and how they interact. Ecologists, working in the area (zone) framework, are well placed for a landscape perspective. We provide mapping and other tools to assess landscapes, notably the annual update of the Region-wide departure map. The assessment of how landscapes are departed from a natural (sustainable, resilient) condition has become a standard, critical tool in the assessment phase of planning. It is a core component of the Wildfire Crisis Strategy, the assessment phase of plan revision, and monitoring of the Collaborative Landscape Projects (CFLRPs). We also collaborate with other disciplines in supporting mapping of fire risk, watershed condition, and other applications.

TECHNOLOGY TRANSFER

The concept of technology transfer, or science delivery, has evolved over the years from a top-down delivery of information to the masses, into an emphasis on mutual learning. Our communication is varied and expanding. Areas conduct plant association trainings annual, a key building block of silvicultural prescriptions and other applications. We hold seminars on important topics and new products, such as the rollout this year of the Terrestrial Ecological Unit Inventory (TEUI) portal. We maintain an open website (ecoshare.info) for sharing information. And ecologists are always available for troubleshooting problems at the Forest, Area, and Regional levels.

MONITORING

Monitoring is a critical part of land stewardship, but often neglected. Leadership is often skeptical of monitoring, fearing its costs, complexities, and delays. Over the years, we have sought to overcome the known failures of monitoring—such as long lists of questions to please everyone—to craft monitoring efforts that are simple, practical, and reflect the resources available. We emphasize the continuum of evidence—ranging from field trips to photo-monitoring to classic data-intensive research—realizing that not all questions require expensive, time-consuming monitoring, and mindful of the need for prompt reporting to inform leadership decisions. All these principles have been incorporated into the CFLRP monitoring process for well over 10 years, and were used to build the CFLRP Common Monitoring Strategy, now in its third year of implementation. They are also being used to influence the developing monitoring strategy for the Wildfire Crisis Strategy. We are keenly aware of how overstretched the Forests are, and seek to minimize the workload of the monitoring effort.

SUPPORT TO PLANNING

As ecology is an integrated science, so do many of our efforts integrate to support the planning process at project, Forest, and Regional levels. Landscape assessment is a core service in the early stages of the NEPA process. Technology transfer informs the planning process, providing a better sense of what is possible and what is not. Monitoring evaluates what we do, and informs the decision process to foster adaptive management. The Ecology program is actively supporting the planning process on many efforts, such as the Meadow Creek Collaborative Aquatic Landscape Restoration Project (CALRP), where we are closely collaborating with Tribal, hydrology, fisheries, wildlife and silvicultural colleagues to help provide the terrestrial component of this effort.

PARTNERSHIPS

The Ecology Program does not survive without networking and partnerships to support the work of the Agency. The Nature Conservancy was instrumental in helping us build departure maps, and the University of Washington is a key partner in maintain the maps and researching how climate change is affecting departure. We are collaborating with the University of Montana on what the future of potential vegetation may look like. We work closely with biometrics on old growth, wildlife on DecAid, silviculture on timber projects, soils with TEUI, hydrology on the Meadow Creek CALRP, fire on the Wildfire Crisis Strategy..... The list goes on.

PRODUCTS

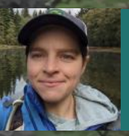
The Ecology Program has over the years generated an array of useful products to assist the Forests and others. We have the legacy of plant association and plant indicator guides covering the Region, available at ecoshare.info or on the TEUI portal. (Limited hard copies are also available.) Recently, after a multi-year effort, a new potential vegetation map was produced, covering the Region and is now available. Because PNV is the framework for Fire Regimes, this will be used to update the departure map and other applications. A General Technical Report (GTR) is also being prepared to accompany the map. Materials are available on the TEUI portal.

WESTERN WASHINGTON

GIFFORD PINCHOT, MOUNT BAKER-SNOQUALMIE, & OLYMPIC NATIONAL FORESTS

Jessica Hudec
Ecologist

Kevin James
Botany-Ecology Program Manager



Lisa Schomaker
Ecologist

Priorities

In FY2023, Western Washington Natural Resource Staff Officers, Ecologists, and the Regional Ecologist agreed that the focus for Western Washington Ecology Program would be support to planning, collaboration and partnerships, and climate change. Ecologists' work continues to be integral to all levels of project planning and forest management, including three-forest programmatic consultation, the development of broad-scale landscape management strategies and mid-level resource management plans, and support for specific project implementation. Furthermore, Western Washington Ecologists provide consistent and unbiased representation between the Forest Service and state, federal, and non-governmental resource management agencies, research institutions, tribes, collaboratives, and other partners.

Forest Health Protection fieldwork.

CLIMATE CHANGE

- Served as Climate Change Coordinators, participated in regional climate change calls, and shared information on national and regional level direction.
- Incorporated climate change into landscape level planning and project level NEPA as indicated by regional direction.
- Used information from vulnerability assessments to strengthen NEPA project proposals and analyses.
- Summarized climate change adaptation in planning and implementation at the unit level for annual Climate Action Tracker reporting.
- Developed summaries and technical guidance for resource specialists as part of updated analysis addendums to the 2011 Olympic Adaptation Partnership and 2014 North Cascades Adaptation Partnership vulnerability assessments.

LANDSCAPE ASSESSMENT

- Developed a forest-wide restoration priority planning schedule focused on wildlife habitat, aquatic habitat, and climate sensitive roads with Mt. Baker-Snoqualmie natural resource staff and leadership.
- Collaborated with WA-DNR on a Western Washington Landscape Evaluation pilot effort to explore methodologies for forest health assessments in priority planning areas.

Coralroot

SUPPORT TO PLANNING

- Provided broad-scale ecology information for pre-NEPA project proposals.
- Contributed ecological context for purpose and need and climate change reports for Environmental Analyses (EAs).
- Served as interdisciplinary team leader for a large, ecologically-focused project with multiple partners.
- Assisted WA-DNR with implementation of 20-year forest health strategic plan for Eastern Washington by applying outputs from landscape evaluations and dual benefit analyses to project planning in a priority watershed.
- Worked with WA-DNR fire scientists on stand level and landscape level fire modeling.
- Applied fire refugia (Oregon State University), Old Forest Assessment (USFS), and large/dense sustainability (WA-DNR) models to local landscapes to help refine potential treatment types and locations.
- Synthesized relevant literature on managing for forest health and resiliency and mitigating fire risk in priority planning areas.
- Led field trips to proposed vegetation management planning areas with IDTs, collaborative groups, USFWS, WA-DNR, tribes, and other partners.

Collaborative field trip.

PARTNERSHIPS

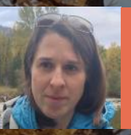
- Worked with researchers on post-fire monitoring, climate change and climate refugia, fire history and fire refugia, vegetation and habitat modeling, etc.
- Represented the Forest Service on climate change partnership project led by Tulalip Tribe to develop an effectiveness framework for hazard mitigations at the watershed scale.
- Collaborated with WA-DNR on a Western Washington Landscape Evaluation pilot effort to explore methodologies for forest health assessments in priority planning areas.
- Supported Line Officers by working with local tribes and collaborative groups.

PRODUCTS

- Hudec, J.; Duke, L.; Harvey, B. 2023. Sense of Place lecture: "Wildfire in the Gorge: The Good, the Bad, and Lessons from Eagle Creek." https://www.youtube.com/watch?v=gyo81IdAy5U.
- Hudec, J.; Fox, S. 2023. Mid-Columbia morning radio show, "Fire Ecology and Management in the Columbia River Gorge."
- [Presentation]: James, K. 2023. Olympic National Forest Vegetation Management Strategic Planning. Presentation to forest natural resource staff and leadership.
- Krawchuk, M.A., Hudec, J., Meigs, G.W. 2023. Manager's brief: Integrating fire refugia concepts and data into vegetation management decisions. A case study on the Gifford Pinchot National Forest, Little White Salmon Project Area. 20 pages. https://firerefugia.forestry.oregonstate.edu/export/krawchuk_fire_refugia_managers_brief_LWS_2023_final.pdf.
- [Presentation]: Ward, D.; Hudec, J. 2023. Conference presentation: Adapting to Climate Change in the Columbia Gorge.
- Participated in newspaper interviews for The Columbian, The Seattle Times, and The New York Times on climate change-related topics.

EASTERN WASHINGTON

OKANOGAN-WENATCHEE & COLVILLE NATIONAL FORESTS



Kerry Kemp
Area Ecologist

Vacant
(formerly Monique Wynecoop, Fire Ecologist)

Emily Leung
Ecologist

Priorities

The Eastern Washington ecology program priorities center on providing science, leadership and high-level guidance on fire and forest ecology, traditional ecological knowledge, special habitats, and landscape modeling and analysis to aid in project and landscape-level planning, assessments, and monitoring. In FY23, our priority work centered on (1) the development of monitoring protocol for two Collaborative Forest Restoration Projects (CFLRP), (2) providing landscape assessment expertise to project planning and Wildfire Crisis Strategy Landscapes, and (3) conducting and updating the Late Successional Reserve assessments for the Okanogan-Wenatchee NF.

Larches in the Okanogan-Wenatchee National Forest.

CLIMATE CHANGE

- Climate change coordinator for the Okanogan-Wenatchee NF. Completed and submitted the Okanogan-Wenatchee FY22 Climate Action Tracker Report.
- Helped plan and coordinate a Chelan Country Climate Resiliency Roundtable with Chelan County Natural Resources Dept. and WA Dept. of Natural Resources.
- Participating in workshops and discussions with University of Montana, TNC, and R6 Ecology program around climate analog modeling efforts for the Northwest.

TECHNOLOGY TRANSFER

- Developed and delivered workshops for local district staff, in cooperation with WA Dept. of Natural Resources, on the Forest Restoration Strategy and landscape evaluation tools.
- Coordinated internal and external learning sessions with the USFWS and the Central Washington Initiative team to learn more about the WA DNR 20-year Forest Health Strategy Landscape Evaluation process and toolsets.

LANDSCAPE ASSESSMENT

- Led the update of the Okanogan and Wenatchee Late Successional Reserve Assessments. This included analyzing the impacts of fire and insects and disease on old-growth and spotted owl habitat over the past 30 years. Developed a risk assessment framework for evaluating the sustainability of large and old forests across the Okanogan-Wenatchee NF and the Okanogan-Wenatchee LSR Network with climate change. Outlined framework for future management actions in LSRs.
- Coordinating with the RO WRITT team to determine analysis needs for landscape prioritization planning in the Central Washington Initiative Wildfire Crisis Strategy landscape.

MONITORING

- Coordinated the North Central Washington CFLRP for the Okanogan-Wenatchee NF. Led the completion and submission of the FY22 NCW CFLRP Annual Report.
- Coordinated and supported Colville NF staff and external partners with the development of the updated NEW Forest Vision 2020 CFLRP monitoring plan.
- Led and coordinated five multi-party monitoring committee (and subcommittees) for the North Central Washington CFLRP and developed and submitted the North Central Washington CFLRP Monitoring Plan.
- Organized and trained staff on CFLRP implementation monitoring, including developing monitoring protocol, selecting sites, and coordinating with local district staff on monitoring data collection.
- Worked with Okanogan-Wenatchee NF botany program to implement invasive species monitoring protocol on NCW CFLRP. Coordinated with range program on the Colville NF to help train and collect data on invasive species for the NEW Vision 2020 CFLRP project.
- Coordinated with program managers and project partners (on both the CNF and OWNF) to develop CFLRP monitoring proposals with Cascade Fisheries, Yakama Nation, CCNRD, Klamath Bird Observatory, WA DNR, the USFS Rocky Mountain and Pacific Northwest Research Stations, and the CoMFRT research group. Working to get partnership agreements in place with partners for outyear monitoring.
- Worked with the Methow Valley Ranger District on the Okanogan-Wenatchee NF to respond to third party monitoring report (from Methow Valley Citizens Council) on the Mission Restoration Project. Co-led engagement fieldtrip on the MVRD focused on landscape scale restoration.
- Helped coordinate a virtual Regional Fire and Fuels Monitoring Training with the Northern Rockies Fire Science Network and led an in-person monitoring field day on the Colville NF as part of the training.

SUPPORT TO PLANNING

- Working with partners (DNR, WCSI, Resilient Forestry) and colleagues to complete landscape evaluations (LE) and prescriptions for Chumstick to LP Wildfire Risk Reduction project on the Okanogan-Wenatchee NF.
- Co-developing a landscape evaluation template to use for future landscape restoration projects on the Okanogan-Wenatchee NFs.
- Provided feedback to RO on Mature and Old Growth draft threat assessment for forest types found in the Washington East Cascades, NE Washington, and the Blue Mountains of NE Oregon.

PARTNERSHIPS

- Northern Rockies Fire Science Network
- WA Prescribed Fire Council (Former Steering Committee Member)
- Association of Fire Ecology / AFE Diversity & Inclusivity Committee Member
- UW School of Environmental & Forest Sciences Precision Forestry Cooperative Advisory Member
- WA Dept. of Natural Resources/WA DNR Forest Health Advisory Committee Member
- North Central Washington Forest Health Collaborative participant
- US Forest Service Pacific Northwest Research Station collaborative partner
- US Forest Service Rocky Mountain Research Station collaborative partner
- Washington Conservation Science Institute

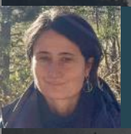
Coring trees at the WO visit.

PRODUCTS

- Davis, K.T., M. Robles, K.B. Kemp et al. 2023. Reduced fire severity offers near-term buffer to climate-driven declines in conifer resilience across the western United States. *Proceedings of the National Academy of Sciences* 120(11): e2208120120.
- Davis, K.T., M.A. Rozance, M. Wynecoop, K.B. Swensen, D.S. Lyons, C. Dohrn, M. Krosby. In review. Collaboratively managing post-fire vegetation transitions across cultural landscapes.
- Essen, M., M. Wynecoop, A. Chistiansen, F. Lake, S. Hoagland, A. Oxart. In preparation. Towards more respectful narratives around wildland fire – Countering erasure by centering Indigenous perspectives. Association for Fire Ecology Diversity & Inclusivity Paper.
- [Presentation]: Kemp, K.B., 12 Sept. 2023. LSR Assessment Update on the Okanogan – Wenatchee National Forest. Presentation during the monthly R6 Wildfire Crisis Strategy Coordinators Call. Virtual.
- Northern Rockies Fire Science Network and Spokane Tribal Network Cultural Burn Film
- [Presentation]: Kemp, K.B., 31 May 2023. Late Successional Reserve Assessment (LSRA) & the Okanogan-Wenatchee Forest Restoration Strategy. Presentation to Forest Trends NGO. Wenatchee, WA.
- [Presentation]: Kemp, K.B., 25 April 2023. Okanogan-Wenatchee LSR Assessment Update. Presentation to Trees & Coffee Group (internal USFS). Virtual.
- [Presentation]: Kemp, K.B., 4 January 2023. North Central Washington CFLRP Annual Report. Presentation to North Central Washington Forest Health Collaborative. Virtual.
- [Presentation]: Kemp, K.B. K. Davis, P. Higuera, M. Robles et al. 2 August 2023. Fire and climate drivers of post-fire conifer regeneration in the western US. Presentation to North Central Washington Forest Health Collaborative. Wenatchee, WA
- [Presentation]: Kemp, K.B. K. Davis, P. Higuera, M. Robles et al. 5 October 2023. Fire and climate drivers of post-fire conifer regeneration in the western US. Presentation to Chelan County Climate Resiliency Roundtable Workshop. Wenatchee, WA

BLUE MOUNTAINS

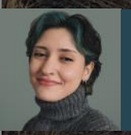
MALHEUR, UMATILLA, & WALLOWA-WHITMAN NATIONAL FORESTS



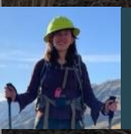
Amarina Wuenschel
Area Ecologist

Cameron Naficy
Landscape Ecologist

Paige Stephens
Ecologist



Karin Hernandez
Climate Change Resource Assistant



Christy Johnson
Ecologist
(departed for R5)

Priorities

In early 2023, the Blue Mountains Ecology Team met with four staff officers serving the Malheur, Umatilla and Wallowa Whitman NFs to develop a program of work that prioritized the following themes:

- Developing knowledge and monitoring of riparian forest thinning treatments
- Support of CFLRP projects on the three forests
- Whitebark pine: synthesize knowledge, provide modelling support
- Forest and grassland ecological monitoring support

Blue Mountains (background), prescribed burn on Confederated Tribes of the Umatilla Indian Reservation lands (left), proper functioning condition (PFC) assessments on the Malheur NF (middle), Karin Hernandez scouting the Double Creek Fire on the Wallowa-Whitman NF (right).

CLIMATE CHANGE ADAPTATION

- Provided climate change support to the Morgan Nesbit project on the Wallowa Whitman.
- Reviewed Dave Powell's stocking guide which revises stand density indices used in silvicultural prescriptions based on climate change factors.
- Wallowa Whitman NF Climate Change Coordinator.

LANDSCAPE ASSESSMENT

- Coordinating with Doug Glavich to produce a special habitat model for the Blues area.
- Convened a team of NFS staff and R&D from PNW Research Station and OSU to acquire data and develop protocol for landscape prioritization for the Wallowa Whitman NF.
- Worked with the LEMMA team to advance long-term effort to develop NAIP-based model of lidar and FIA variables for use as a forest monitoring tool, using the Malheur NF as a case study. Built a workflow and prototype Google Earth Engine map platform for viewing modeled lidar data.
- Developing a study plan with M. Krawchuk, A. Ager, B. Aparicio, A. Stinchfield to combine fire refugia models and simulation modeling on the Umatilla NF and evaluate the potential role of refugia in climate-driven fire dynamics and change.
- Served as part of the working group with a University of Montana and Nature Conservancy effort to model and map climate-driven vegetation changes across Oregon.

TECHNOLOGY TRANSFER

Includes trainings and technical support

- Drafted white paper synthesizing literature on small-diameter trees to help silviculturists navigate 2001 Roadless Area Rule direction.
- Multiple field visits and meetings to discuss riparian habitat conservation areas (RHCA) historical conditions and dynamics, treatments, potential data needs or guidelines. Conducted initial riparian field surveys, developed field sampling protocol for riparian HRV study, collected some preliminary dendroecological samples.
- Helped to form and convene the RHCA working group to build a restoration framework for RHCA management in the Blues.
- Provided feedback and review on portions of whitebark pine Programmatic Biological Opinion.
- Serve as a core member of the Insect & Disease working group (FHP) to develop improved insect and disease risk modeling tools and applications.
- Two plant association trainings on the Wallowa Whitman and Umatilla NFs.
- Webinar on WBP habitat suitability model development, interpretation, and uses for R6 botanists, FWS, and regional staff.
- Co-developed Terrestrial Ecological Unit Inventory training for R6.
- Analyzed invasives data for the Northern Blues collaborative and compiled into report for collaborative.

SUPPORT TO PLANNING

- Working with WWNF silviculturists to assess whether a plant association classified as cool/moist is correctly classified (the temp/moisture regime classification alters the prescription outcome).
- Core member of the Whitebark Pine Core Area Designation Committee for Region 6. Developed a Core Area Designation framework and map product that identified core restoration areas for WBP in R6 that was submitted to the Washington Office as part of the National Whitebark Pine Restoration Plan.
- Assisted whitebark pine coordinator in preparing a list of projects impacted by whitebark pine listing through mining old NEPA documents
- Assessed status of herbivore exclosures in Hells Canyon NRA after the Double Creek Fire.

MONITORING

- Drafted the Northern Blues CFLRP monitoring plan.
- Monitored post-fire effects on the Umatilla NF in the Lick Creek Fire footprint with Umatilla staff.
- Assisted with Global Observation Research Initiative in Alpine Environments (GLORIA) monitoring effort on the Wallowa-Whitman NF.
- Conducted mature and old growth mortality monitoring with James Johnston, Blue Mountain Forest Partners, on the Malheur NF.
- Conducted proper functioning condition (PFC) assessments in riparian areas with Emigrant Creek RD staff on the Malheur NF.
- Supported the design and implementation of pre-restoration treatment monitoring at Kelly Prairie in the Umatilla NF.
- Collected 7-year post-thinning monitoring data in a treated Riparian Habitat Conservation Area (East Fork Big Creek on the Malheur NF).
- Collaboratively developing whitebark pine monitoring protocols and sampling design for the Northern Blues CFLRP.
- Coordinated survey application to collect field presence/absence and basic indicator data for whitebark pine with Blue Mountain NF botanists.
- Co-developed whitebark monitoring protocol for are-

PARTNERSHIPS

- Contributed to a post-fire restoration project being developed by Washington State University for the Malheur NF.
- Prepared recommendations for the Umatilla NF and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) for riparian species to plant in the Meacham Creek restoration project across tribal and USFS lands.
- Worked closely with Regional and Washington-Office staff to create a mechanism for the NFS to use Cooperative Ecosystem Studies Unit agreements (which cap overhead and provide a mechanism to acquire external support).
- Attended prescribed burn with the Confederated Tribes of the Umatilla Indian Reservation.
- Partnered with Andrew Merschel (OSU) and Gregg Riegel on virtual intern mentorship and production of a tree ring chronology for central and northeast Oregon.
- Planning and coordination for the 2023 annual R6 Annual Regional Ecology Program Meeting.
- Engaged with Meadow Creek Collaborative Aquatic Landscape Restoration Program and co-authored landscape vision strategy.
- Highly engaged as members of the Northern Blues

Ecology program conducting high alpine monitoring in the Wallowas for project GLORIA.

PRODUCTS

- Maps, Presentations, Publications, Datasets
- Researched and compiled an extensive dataset of riparian area geospatial data including NetMap hydrology dataset and Montgomery-Buffington stream classes.
- Produced the whitebark pine habitat suitability modeling for R6 in response to listing.
- Margolis, E. Q., C. H. Guiterman, R. D. Chavardès, J. D. Coop, K. Copes-Gerbitz, D. A. Dawe, D. A. Falk, J. D. Johnston, E. Larson, H. Li, J. M. Marschall, C. E. Naficy, and others. 2022. Introducing the North American tree-ring fire-scar network. Ecosphere 13(7): e4159.
- Hernandez, K. 2023. Research Brief for land managers of 'Biomass stocks in California's fire-prone forests: mismatch in ecology and policy' (Bernal et al. 2022)
- Naficy, C. E., C. Emerson, A. Stratton, I. Yau. 2023. "Habitat Suitability Modeling for Whitebark Pine: Summary report." White paper report submitted to Region 6.
- Wuenschel, A., K. Saager, Z. Napkora. 2023. Meacham Creek RM10-11 Revegetation Plan. White paper report submitted to the Umatilla NF.
- Wuenschel, A. S. Geer. 2023. Post 2021 Lick Creek Fire Monitoring in Ridgetop Grasslands on the Umatilla National Forest. White paper report submitted to the Umatilla NF.
- Young, D.J., Estes, B.L., Gross, S., Wuenschel, A., Restaino, C. and Meyer, M.D., 2023. Effectiveness of forest density reduction treatments for increasing drought resistance of ponderosa pine growth. Ecological Applications, p.e2854.
- Wuenschel, A., J. Bartel, A. Bernal. 2023. Forty Years of Change in Piute Cypress (Hesperocyparis nevadensis), a Rare California Tree after Frequent Fire and Drought. Aliso, 41(1), pp-1-15. ISSN: 0065-6275 (print), 2327-2929 (online).
- [Presentation]: Naficy, C. E. "Regional habitat suitability modeling for whitebark pine." Forest Health Protection Technical Meeting. Walla Walla, WA. March 9, 2023.
- [Presentation]: Naficy, C. E., R. Davis, J. Rockweit, G. Meigs, M. Reilly, Z. Yang, S. Drury, M. Krawchuk. "Fire refugia, old forests, and northern spotted owls: a synthesis of key concepts, trends, and toolsets for local to regional conservation planning." Oregon Post-Fire Research & Monitoring Symposium. Corvallis, OR. February 7-8, 2023.
- [Presentation]: Wuenschel, A. Mature and Old Growth Assessment Update. Northern Blues Collaborative. May 24, 2023
- [Presentation]: Wuenschel, A. K. Shive, A. Bernal, L. Hardlund, M. Meyer, S. Hood, S. Morris, R. Pekelney. Giant sequoia wildfire mortality and recovery: a long lived and highly fire resistant species faces new threats in the 21st century. Ecological Society of America. August 23, 2023.
- [Presentation]: Wuenschel, A. Riparian Forest Systems: Treatment & Monitoring. Southern Blues Monitoring Workshop. May 16, 2023
- [Presentation]: Wuenschel, A. 2023 Blue Mountains Area Ecology Program. Malheur Natural Resources Staff. March 15, 2023.

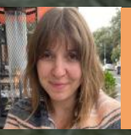
Christy Johnson in Kelly Prairie.

Paige Stephens in Cottonwood Gulch.

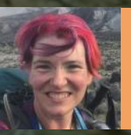
CENTRAL OREGON

DESCHUTES, FREMONT-WINEMA, AND OCHOCO NATIONAL FORESTS & CROOKED RIVER NATIONAL GRASSLAND

Gregg Riegel
Ecologist



Cristina McKernan
Ecologist



Bec Braisted
Ecologist

Maximillian Wahlberg
Ecologist

Skye Greenler
Ecologist (detailed)

Priorities

The Central Oregon Area Ecology Team specializes in addressing a wide range of eastside forest, upland range, and wetland and riparian ecological management issues. Our current focus is: 1) landscape assessment to support risk prioritization under the Wildfire Crisis Strategy 2) forest landscape vegetation and health assessments, stand analyses, and monitoring 2) drought and livestock grazing interactions, and 3) upland range inventory and monitoring.

- Provide Landscape Assessment-Departure Analysis support for vegetation of Central OR NFs & Grassland.
- Provide upland rangeland, riparian, meadow, and fen ecological expertise. Conduct Multiple Indicator and Monitoring (MIM) for long-term trend evaluation of livestock grazing management, and riparian ecological site status assessments for Rangeland Allotment Management Plan renewal NEPA process.
- Implement understory and fuel profile models for ponderosa pine forests to assist restoration and fuel treatment through our Alternative Fuel Treatment and Repeated fire Return Interval Administrative Studies.
- Define and establish Ecological Site Descriptions (ESD) for the Crooked River National Grassland fuel treatment and restoration planning.
- Provide support for invasive weed management and monitoring.
- Provide program support to Region, Forest, and Ranger Districts.

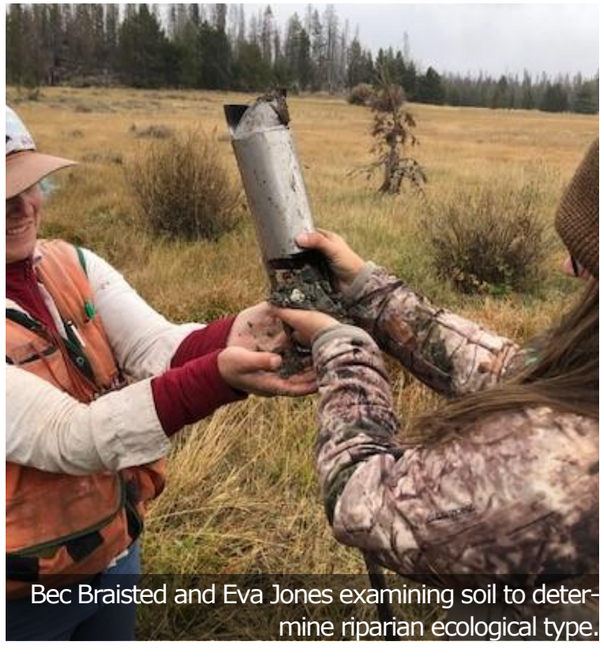
Measuring thalweg depth as part of the MIM monitoring protocol, on Skull Creek within the Bootleg Fire perimeter, Fremont-Winema NF.

CLIMATE CHANGE

- Developed a region wide quantitative climate vulnerability assessment for terrestrial ecosystems for use in landscape planning and informed application of climate adaptation strategies.
- Participated in the co-production process for the Oregon Vegetation Shifts Climate Assessment in collaboration with Oregon TNC and University of Montana.

LANDSCAPE ASSESSMENT

- Co-developed and implemented a regional framework for landscape assessment to support risk prioritization under the Wildfire Crisis Strategy with initial application on the Central Oregon WCS Investment Landscape.
- Coordinating with Doug Glavich to produce a special habitat model for the Central and South Central Oregon.



Bec Braisted and Eva Jones examining soil to determine riparian ecological type.

TECHNOLOGY TRANSFER

- National Rangelands Assessment, Inventory, and Monitoring National Technical Team.
- Virtual Internship Mentorship: Reconstruct forest structure, disturbances, and climate responses in Northeast and Central Oregon with Christy Johnson, Andrew Merschel. September 2022-June 2023.
- Rx 310 Introduction to Fire Effects: PNW Training Center Virtual Course, Regional Cadre, January 23-27, 2023.
- Vegetation GIS Data System (VGS) Coordinated training session with Chaz Perry, Univ. of Arizona for Central and Southern OR Range Programs, Bend, OR April 25-26, 2023.
- Interpreting Indicators of Rangeland Health: Interagency National Team, Cadre Instructor, Reno NV, April 24-28, 2023.
- Region 6 Range Program Managers All Hands Meeting, Indicators of Rangeland Health Overview: Application in Range, Pendleton OR, May 2-4, 2023.
- Coordinated Ecological Site Description (ESD) Workshop Instructed by Tamzen Stringham (Univ. of Nevada, Reno), Crooked River Nat. Grassland, May 23-24, 2023.
- Whitebark Pine Identification, Ecology, Insect and Disease, and Genetics Training, Deschutes NF, July 10-11, 2023.
- Deschutes and Ochoco Soil and Aquatics FY 23 Program of Work meetings – Riparian and Wetland Monitoring and Management.
- Central Oregon TREX – Considerations for Prioritizing Fuel Treatments at the Landscape Scale, April 24-May 5, 2023.
- Deschutes NF PODs Workshop.
- Central Oregon WCS Landscape Prioritization Workshop.

MONITORING

- Fen monitoring, Fremont–Winema NF: Completed a vegetation classification and identified six distinctive vegetative fen types. Established 36 long term monitoring sites in 12 fen/meadow complexes. Developed a draft monitoring protocol and report evaluating ecosystem integrity within three categories across ten indicators. (Implemented in collaboration with the Oregon Institute of Natural Resources and Colorado State University, and with funding support from and Oregon Watershed Enhancement Board (OWEB grant.).
- Wetland restoration monitoring, Deschutes NF.
- Collaborative USFS/USFWS monitoring of Oregon Spotted Frog habitat on the Deschutes and Fremont -Winema NF.
- Bootleg post-fire monitoring of riparian conditions on the north fork of the Sprague River on the Fremont-Winema NF. Conducted Multiple Indicator Monitoring (MIM) on six sites and ecological status measurements on four sites established in 2002 with our Riparian Ecological Type and Scorecard Guide for South Central Oregon.
- Whitebark Pine Monitoring – In collaboration with the Central Oregon Forest Health and Protection Service Center, completed the 15-year remeasurements of long-term whitebark pine monitoring plots.
- CFLRP monitoring for the Deschutes Collaborative Forest Project (DCFP).

SUPPORT TO PLANNING

- IDT support for the Deschutes Forest-wide Fuels Environmental Analysis.
- Wildfire Crisis Landscape Prioritization Analysis to support outyear project planning on the Deschutes NF and the Crooked River National Grassland.
- Measured and analyzed Ecological Site Description data with Jim Daivd Ochoco Forest Soil Scientist, to inform fuel treatment and restoration planning on the Crooked River National Grassland.
- Assist in assessing conifer encroached meadow-forest boundaries for potential meadow restoration on the Fremont-Winema NF in cooperation with Tim Sexton, The Klamath Tribes Fire Program Manager.

PARTNERSHIPS

- PSW Research Station - Long term effects of thinning and burning on causes and levels of tree mortality in central Oregon. Field assistance with ongoing research into the long-term effects of different treatment intensities on insect and disease related mortality in ponderosa pine dominated ecosystems.
- PSU Institute of Natural Resources - Fen Monitoring and Mapping on the Fremont-Winema NF.
- Colorado State University, Oregon State University – Cascades, & USFWS – Assessing water needs of fens in Central Oregon.
- Oregon Chapter of The Nature Conservancy & University of Montana - Co-Production support to the Oregon Climate-Driven Vegetation Shifts Project.
- Ongoing support the Deschutes Collaborative Forest Project, Central Oregon Shared Stewardship Alliance, and the Ochoco Forest Restoration Collaborative.
- PNW Research Station – Repeated fire return interval study post-20-year remeasurements, data analysis and manuscript preparation with Becky Kerns, Research Ecologist.
- Redmond NRCS Major Land Resource Area (MLRA) Technical Team. Provide Ecological Site Description (ESD) and Soil Survey assistance and review.
- BLM Lakeview District – Remeasurement of long-term Riparian Ecological Type Scorecard plots to track ecological status trends.

Gregg Riegel and Desi Zamudio measuring rooting depth to determine ecological status.

A high intensity burn caused overstory mortality and a robust understory of snowbrush ceanothus, Metolius RNA, Deschutes NF.

PRODUCTS

- Reiner, A.L., Baker, C., Wahlberg, M., Rau, B.M, and Birch, J.D. 2022. Region-Specific Remote-Sensing Models for Predicting Burn Severity, Basal Area Change and Canopy Cover Change Following Fire in the Southwestern United States. Fire. 5(5): 137. 26 p.
- [Presentation]: Inventory, Assessment, and Monitoring of Fens in the Antelope Allotment, Oregon USA. McKernan, C., Riegel, G., D. Cooper, and D. Weixelman. 2023. Northwest Scientific Assoc. 93rd Annual Meeting, March 21-24, 2023, Bellingham WA.
- Accelerated Tree Mortality of the Ochoco National Forest – Forest-wide Quantitative estimates of annual tree mortality on the Ochoco National Forest for 2020-2023 using Sentinel 2 and dNBR.
- Developed a methodology using Google Earth to assign Rosgen steam classification types on 336 riparian plots on the Fremont-Winema National Forest and BLM Lakeview District.
- Revisiting a long-term fire return interval study in the eastern Oregon Cascades. 2023. Wade, N. Berger, D., Harwood, U., Williams, G., Riegel, G., and Kerns, B. 10th Int. Fire Ecology and Mgmt. Congress, Assoc. for Fire Ecology, Monterey CA, Decem-

Fen Crew, Skye Greenler, Gregg Riegel, and Crisitna McKernan, Antelope Allottment, FRE-WIN NF.

SOUTHWEST OREGON

UMPQUA & ROGUE RIVER-SISKIYOU NATIONAL FORESTS

Bill Kuhn
Area Ecologist

Patricia Hochhalter
Ecologist

Devin McMahon
Ecologist

Priorities

2023 priorities for southwest Oregon included work in restoration and wildfire risk planning, postfire and forest health monitoring, and collaboration with staff, scientists, and partner organizations. The ecologists contributed data, analysis, and monthly meeting facilitation to the Umpqua Resilient Landscapes long-term planning group, resulting in a prioritized map and list of project areas and management needs across disciplines for at least the next five years. Priorities on the Rogue River-Siskiyou included support for forest-wide restoration planning, project planning, restoration implementation, monitoring, and reporting for the Rogue Basin CFLRP project, post-fire vegetation and conifer regeneration monitoring, and partner collaboration. We continued to work closely with several partner organizations focused on all-lands restoration across the Rogue River Basin to bring increased funding and capacity, and develop monitoring plans and protocols. Work also continued on compiling spatial datasets for use in restoration planning and prioritization, including the development of a dataset guide for Forest planners and specialists. Pat continued to lead writing on the general technical report for the regional Potential Natural Vegetation dataset, following publication of the map and user guide in 2022.

Frost-tipped Whitebark Pines in the Umpqua NF.

CLIMATE CHANGE

- Assisted Southern Oregon Climate Smart partner group to access available data on climate change and adaptation, and begin to develop adaptation guides for important forest types in southwest Oregon.
- Worked with Umpqua staff to standardize a framework for explicitly considering climate change in all NEPA decisions, which will be implemented on at least two major projects in FY2024.
- Co-hosted climate change resource assistant Leah Gelfand, who compiled adaptation resources and supported Umpqua Resilient Landscapes mapping efforts.
- Served as unit Climate Change Coordinators, sharing regional and national guidance and analyzing carbon emissions from proposed projects.
- Assisted restoration planners and specialists to access and interpret available spatial data relevant to climate change impacts and adaptation, and promoted climate adaptation frameworks such as the Resist, Accept, or Direct framework to assist with conceptualizing different strategies for adaptation.

Heterogeneity after the Taylor Creek Wildlife.

LANDSCAPE ASSESSMENT

- We conducted a restoration priorities analysis for the Snowy Butte planning area on the Rogue River-Siskiyou using the fuzzy logic modeling tools and assisted specialists with interpretation and use of climate change related datasets during restoration planning.
- We continued to be involved with the Rogue Forest Partners and other USFS staff on Rogue Basin CFLRP planning, with collaboration from Southern Oregon Forest Restoration Collaborative and Vibrant Planet. We provided spatial data and helped to guide Vibrant Planet project team in the development of a pilot project for restoration needs analysis and restoration scenario planning within the CFLRP planning area.
- Through Umpqua Resilient Landscapes working group, identified new forest restoration project areas on the Umpqua, and approaches to refine them.
- We assisted USFS Forest Health Protection specialists and partner organizations to better understand the emerging lower mixed conifer mass Douglas-fir mortality process impacting the Rogue River Basin. We worked with a group of partner organizations of discuss and plan potential management actions and communication needs.

TECHNOLOGY TRANSFER

- Plant Association training for botany and silviculture staff.
- Created and shared spatial data collection tools for field-going employees to share in mapping oaks, seed collection sites, and other mutually useful data.
- Continued development of a geodatabase of available geospatial data relevant to forest restoration needs and prioritization.
- Provided technical support for the Rogue Basin CFLRP project for restoration planning priori.

MONITORING

- Post-fire conifer regeneration and vegetation response monitoring on Rogue River-Siskiyou and Umpqua. Continuing monitoring from 2022, we surveyed approximately 90 plots within wildfires that occurred in 2018, using a Survey123 survey form we developed to improve monitoring and data management efficiency.
- We provided assistance with long-term high-elevation postfire vegetation monitoring on the Willamette.
- We assisted Forest Health Protection with Douglas-fir mortality monitoring and field validation of risk rating across southwest Oregon.
- With Forest Health Protection specialists, established two transects for long-term whitebark pine monitoring on the Umpqua.
- Provided fire severity trend data, writing, and technical support for Umpqua's Biennial Monitoring Evaluation Report, including updates to the forest-wide monitoring plan.
- We worked with partner organizations and assisted with the development of tree health and vigor monitoring protocols as part of the wider all-lands vegetation monitoring for forest restoration.
- We continued to work closely with partner organizations on the development of an all-lands spatial data geodatabase to track all aspects of forest restoration implementation from project to plot level.

SUPPORT TO PLANNING

- Rogue Basin CFLRP (RRS): worked with collaborators and contractors to develop restoration needs and analytical tools for restoration scenario planning for multiple benefits.
- Snowy Butte (RRS): assisted ID Team to identify current conditions, departures, and restoration priorities.
- Led interdisciplinary exercise to identify desired conditions in the next 100 years on the Umpqua

Taylor Creek Wildlife on Umpqua NF.

Ecotone regeneration monitoring in Umpqua NF.

PARTNERSHIPS

We continue to be involved with many partner groups across southwest Oregon that are focused on habitat, forest, and landscape restoration to improve climate and wildfire resilience, serving as members of organization and restoration project steering committees, planning committees, and monitoring committees. These include:

- Klamath-Siskiyou Oak Network and the Upper Rogue Oak Initiative (OWEB grant) and Lower Butte Oak Initiative (OWEB grant), focusing on oak habitat restoration on BLM and private lands.
- Rogue Forest Partners: Rogue Forest Restoration Initiative (OWEB grant) that included dry forest restoration on USFS, BLM and private lands.
- Southern Oregon Climate Smart, providing technical support and assisting with development of climate change adaptation guides for land owners and managers.
- Southern Oregon Forest Restoration Collaborative and Vibrant Planet – CFLRP restoration prioritization and scenario planning support.
- Led field trip to South Umpqua Experimental Forest with Forest staff and researchers from Pacific Northwest Research Station and Oregon State, and coordinated recurring in-person collaboration meetings with researchers
- Facilitated fuels treatment mapping exercise for new Umpqua Wildfire Risk Reduction Partnership.
- Wild Rivers Coastal Forest Collaborative, continuing to provide USFS support.

PRODUCTS

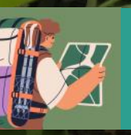
- [Presentation]: "Effectiveness monitoring for a sugar pine health improvement project on the Umpqua National Forest." McMahon, D., Lowrey, L., Kuhn, W., Hochhalter, P., and Zald, H. 2023. Ecological Society of America annual meeting, Portland, OR.
- [Presentation]: McMahon, 2023. "Job title: just 'Ecologist'." Panelist in well-attended non-academic careers session at Ecological Society of America annual meeting.
- Initiated and facilitated group of state and transition modelers, culminating in white paper "State and Transition Models Best Practices Guide" (2023) for use by analysts and Planning Service Centers
- [Presentation]: Current Ecological Conditions and Potential Restoration Priorities in the Snowy Butte Planning area. Presentation to the Snowy Butte ID Team and partner organizations.
- [Presentation]: Comparisons between Gradient Nearest Neighbor existing vegetation and Potential Natural Vegetation modeled datasets for Oregon. Presentation to the co-production team for the Oregon Climate Analogs project (led by Svetlana Yegorova at University of Montana).

NORTHWEST OREGON

MT. HOOD, WILLAMETTE, AND SIUSLAW NATIONAL FORESTS & COLUMBIA RIVER GORGE NATIONAL SCENIC AREA

Pek Wijayratne
Ecologist

Doug Glavich
Ecologist



Bobette Jones
Ecologist

Priorities

Priorities for the NWO Ecology Group include project work and planning support, particularly climate adaptation integration, fire and vegetation analyses, and Mature and Old Growth (MOG) forest interpretation. Special Habitat modeling and support for mapping across R6 has become one of the focal points of the NWO Ecology Area. Landscape level vegetation analyses, especially in landscapes that have had large fires, has risen to become a major priority as well. Other priorities include meadow restoration support, post-fire vegetation monitoring, and working on the wildfire crisis strategy. Underpinning our priority work is collaboration with Forest staff, Academic and Forest Service Scientists, and external partners.

Echo Mt. fire seedling density monitoring.

Doug Glavich coring a tree for an Echo Mt. post-fire study.

CLIMATE CHANGE

Worked with Siuslaw NF Hydrologist to provide a soft rollout of climate change affects to Coast Range vegetation and hydrology from the new in-press Climate Change Vulnerability Assessment for the area.

LANDSCAPE ASSESSMENT

Involved in landscape analyses to support the Integrated Vegetation Management Strategy for the Willamette NF.

TECHNOLOGY TRANSFER

- Provided 4 field plant association trainings: Willamette NF (Cascades), Mt Hood NF (Cascades), Siuslaw NF (west slope Coast Range), BLM (east slope Coast Range). Content included environmental setting influences on stand structure and composition, and USFWS staff attended some trainings.
- In collaboration with the Siuslaw NF Botanist, we taught a coastal dune ecology field class for an Oregon State University Marine Studies course.

MONITORING

- Conducted the 2nd vegetation remeasure for the Coast Range Post-Fire Project in the Echo Mountain burn, Siuslaw NF. In addition, we added more stand data: basal area, age and canopy cover. Tree seedling data was also added with sampling design collaboration with district Silviculturist.
- In collaboration with the PNW Research Station and OSU Permanent Sample Program, we measured a portion of plots in a long-term post fire monitoring study in a High Cascades RNA to develop research questions and next year planning: Willamette NF Torrey-Charlton RNA Charlton Fire and Cedar Creek reburn.
- Facilitated data collection in a long-term Coast Range Montane Meadow Restoration monitoring project: Mary's Peak on the Siuslaw NF.
- Conducted knobcone pine population sampling and improved methodology for Rigdon Point RNA: Willamette NF knobcone pine
- In collaboration with other Ecologists, we contributed to data collection for the GLORIA alpine project in the Blue Mountains.

Pek Wijayratne (back) and Amarina Wuenschel (front) hiking down a mountain after GLORIA monitoring.

SUPPORT TO PLANNING

- Participated as an extended member of east and west zone IDTs on the Mt. Hood, focused on climate change.
- Engaged with collaborative groups on the Mt. Hood and Willamette NFs.

PARTNERSHIPS

- PNW Station/OSU PSP – Torrey-Charlton RNA long term monitoring.
- Washington State University – Applied for NASA grant using special habitat modeling for further remote sensing rocky habitats.
- The Nature Conservancy/University of Montana – Oregon Climate Analogs Project (maybe have this be a regional partnership).
- USGS Northwest Climate Adaptation Science Center.
- International Programs/USAID.

U.S. Forest Service career fair.

Pek Wijayratne considering leaving during the GLORIA monitoring project.

Knobcone monitoring.

PRODUCTS

- For the R6 Special Habitat mapping project, we used the model in Google Earth Engine to produce 2 Special Habitat maps to complete the Siskiyou Range –Rogue River Siskiyou NF and a draft eastside test map was completed for the Upper Metolius watershed on the Deschutes NF.
- Completed DecAID updates.
- [Presentation]: Vegetation and Ecosystem Carbon: The Northwest Oregon Coast Range and the Siuslaw NF (Glavich). Presented at the Siuslaw NF annual Stewardship Group meeting.
- [Presentation]: Oregon Coast Climate Change Vulnerability Assessment: Climate, Vegetation, & Hydrology (Glavich & Ellingson). Presented to Siuslaw IDTs and FLT.
- [Presentation]: Fine Scale Special Habitat Mapping In Google Earth Engine (Glavich). Presented to the annual FS R6 Aquatics Meeting.
- [Presentation]: New Fine Scale Special Habitat Mapping and Applications to the Franklin's Bumble Bee. (Glavich & Colyer). Presented to the annual FS R6 Wildlife Meeting.
- ESA Inspire Session Speaker - Up, Down, and Across: Ecology in All Parts of the Forest Service (Wijayratne).
- ESA Special Session Panelist - Climate Adaptation Science to Service (Wijayratne).

REGIONAL OFFICE

Tom DeMeo
Ecologist &
CFLRP Coordinator

Skye Greenler
Ecologist

David. (n.d.). *Twin Sisters Mountain Range in the North Cascades*. Adobe Stock. https://stock.adobe.com/images/twin-sisters-mountain-range-in-the-north-cascades/320205037?prev_url=detail

COLLABORATIVE FOREST LANDSCAPE RESTORATION PROJECTS (CFLRPS)

The Region is a national leader in CFLRP projects, with seven in the Pacific Northwest: Central Washington, Colville, Northern Blues, Southern Blues, Lakeview, Central Oregon, and the Rogue Basin. Ecologists are integrated into these projects and play a key science/monitoring/facilitation role in moving them forward. Tom DeMeo serves as the Regional coordinator for this program, and was the lead on developing the Common Monitoring Strategy (CMS), now employed on CFLRPs across the country.

CFLRP Monitoring

Ecologists in our program are heavily involved with all of the seven Collaborative Forest Landscape Restoration Projects (CFLRPs) in the region from collaborative engagement and project planning and implementation and monitoring. FY 23 was the first year that all of the CFLRPs in the region have reported on the new Common Monitoring Strategy Questions, which address both ecological and socio-economic questions. Skye Greenler has led the effort to support and coordinate this monitoring program for all of the CFLRPs in the region. Having dedicated Regional support for this program has been key to developing social license for this robust monitoring program and ensuring it is not a burdensome workload for individual CFLRP projects. The ecological metrics assessed include fire behavior and risk, vegetation departure from historical conditions, wildlife habitat distributions across the landscape, watershed health, and invasive species response to wildfire risk reduction treatments. The socio-economic metrics assessed in the Common Monitoring Strategy include assessment of social and economic context, local jobs, local contracting, economic utilization of restoration products, collaborative membership, collaborative functioning, and partner investments. Tom DeMeo and Skye Greenler have also worked very closely with the National CFLRP monitoring team in development and refinement of the Common Monitoring Strategy and have supported several CFLRPs in other regions in implementation of the 13 monitoring questions.

POTENTIAL NATURAL VEGETATION MAPPING AND ASSOCIATED GENERAL TECHNICAL REPORT

In 2022, the ecology program team of Jane Kertis, Mike Simpson, Pat Hochhalter, and Steve Acker completed a Regional (and California) potential natural vegetation map at vegetation zone and subzone scales. The team is now developing an associated general technical report (GTR), adding Dave Bell (PNW Research Station), and Matt Gregory (Oregon State University) as coauthors. Rachel White at the PNW Station is assisting in an editor role.

WILDFIRE CRISIS STRATEGY

As a partner with Shasta Ferrantos's staff, the ecology program has provided substantial support to the five Wildfire Crisis Strategy (WCS) landscapes in the region at both the Area and Regional level. At the Regional level Skye Greenler has co-led a Regional interdisciplinary team with Audrey Maclennan (Regional Fire Ecologist in Fire and Aviation Management) to develop an analytical framework to support strategic planning and prioritization on the Wildfire Crisis Strategy (WCS) investment landscapes. This approach to strategic planning and accompanying analytical products are informed by legislative priorities and grounded in quantifiable, regional success metrics. It was developed using the best available science on wildfire risk, wildfire management, and ecological resilience, including the departure and restoration needs analysis from the ecology program.

This work builds upon ongoing strategic planning efforts already underway on all of the individual WCS landscapes and provides local flexibility, while ensuring regional consistency across the landscapes. Through local workshops and values identification, this process produces an individualized prioritization model for each landscape that is tuned to reflect the specific values, decision making processes, and ecology of each WCS landscape.

Tom DeMeo and Max Wahlberg (Central Oregon Ecologist) were instrumental in initial conceptualization and development of the WCS prioritization framework. In response to Washington and Regional Office direction to ensure vegetation climate vulnerability was included within this analytical framework, Max Wahlberg led an effort to develop a regional climate change vulnerability map based on the ecology program's potential natural vegetation map. The WCS strategic planning and prioritization team have facilitated two-day, in-person workshops to develop individual prioritization models for the Central Oregon and Mt. Hood WCS landscapes. Max Wahlberg and Upekala Wijayratne (Northwest Oregon) were integral members of the model development team on these landscapes. Work to develop prioritization models is ongoing with the Klamath Basin, Central Washington Initiative and Colville Northeast Washington Vision landscapes.

Tom, Skye, ad Max have also been instrumental in developing the WCS monitoring framework, in close cooperation with fire management staff (Ian Rickert and Jason McGovern), and the Quantitative Wildfire Risk Assessment (QWRA). Monitoring, done well, is an essential part of prompt reporting on basic questions to inform leadership decisions. We are designing the monitoring effort to minimize workload impacts on the Forests.

Finally, the ecology program has played a role in developing the WCS science integration strategy, in cooperation with the PNW Research Station and other partners. Ecology's network of ecologists working on the NFs, for the NFs, will be a great asset to this effort moving forward.

REGIONAL TERRESTRIAL ECOLOGICAL UNIT PORTAL

In 2022-2023 the ecology program, in cooperation with the Geospatial Technology and Applications Center (GTAC) in Salt Lake City, was able to capture the legacy of land type association and landform association work produced by Karen Bennett, formerly Regional soil scientist, and Jay Noller (Oregon State University). These map layers are part of the Terrestrial Ecological Unit Inventory (TEUI), a national and Regional application that integrates ecological factors (climate, geology, geomorphology, soils, and potential vegetation) into cohesive map units at multiple scales. Through GTAC's website and data management skills, these products were posted on a Regional page (portal) of the Forest Service's national TEUI website. Steps are being taken to ensure this product will be maintained over time. The site is also used to make our new potential vegetation map, associated documentation, and plant association guides available to all.

In late May a rollout and training in use of the portal was provided to interested users. During this phase, Karen Bennett, Eric Robertson (acting Regional soil scientist at the time), Wendy Peterman (Willamette NF soil scientist), Cheryl Friesen and Pek Wijayratne (ecology program) provided significant support to the training.

ECOLOGICAL DEPARTURE LAYER

Beginning in 2012, in close cooperation with The Nature Conservancy (TNC), the ecology program began developing the next generation of ecological departure maps. Ecological departure is based on several key concepts. Pre-European settlement landscapes (prior to about 1850) are assumed to have been functioning within a natural range of variation (NRV). This NRV included fire regimes framed by potential vegetation (PNV). For example, historically wet western hemlock was associated with infrequent but severe fires, and ponderosa pine with frequent, low-intensity fires. These landscapes also had characteristic abundances of different seral stages. Through the legacy of tree ring research and other information, we can use state and transition modeling to compare the current state of landscapes (by watershed or other delineation unit) to the historic state, and estimate how departed, or how far from a resilient, sustainable state, these landscapes are.

Ryan Haugo at TNC, as well as others, further developed this method to estimate the area in each seral stage, by PNV type and watershed, that would need to be treated (thinning/prescribed burning/wildfire), or let go to grow older (succession), in order to attain a sustainable condition. Thus, the departure map provides a useful tool to identify the work to be done to improve the ecological resiliency of landscapes.

In recent years the departure map has become a key Regional planning layer, for example in the bioregional assessment as a precursor to Northwest Plan revision, and the pre-assessment phase of Forest plan revision in the Klamath Basin. Departure is also key to addressing monitoring questions of the Common Monitoring Strategy (CMS) of the collaborative landscape projects (CFLRPs).

Annual updates, based on the fires and treatments of the previous year, are now conducted through an agreement with the University of Washington (UW) (Brian Harvey, Madison Laughlin, and other colleagues). The UW team is also researching way a changing climate will affect our understanding of ecological departure. We are also working with Svetlana Yegorova and colleagues at the University of Montana on complementary work on how PNV is expected to change over time.

RESOURCE ASSISTANTS

During the last year or so an important new program has developed in the agency. Resource assistants can be recruited to work at the technician level. Provided they serve in good standing for a specified period (about 6 months), they can be converted to permanent positions in the agency, provided there are open positions available.

At the Regional level, Luis Lopez-Contreras worked with us on field data collection for invasives monitoring as part of the CLFRP Common Monitoring Strategy, providing invaluable support. (Later in the year he also worked with the range and biometric programs.) We are now working through the process to bring him into a permanent position in the agency.

Ecologists on the Areas (notably the Blue Mountains and Southwest Oregon) also employed resource assistants. All agree these folks are an asset.

The ecology program will likely be interested in bringing on more resource assistants in the future, with the eventual goal of building capacity by formally bringing them into the program.

ANNUAL MEETING

The ecology program annual meeting was held in late October in Dayton, Washington. Hosted by the Blue Mountains ecology area, the agenda featured numerous speakers on the pressing topics of the day, including riparian and fen management, fuels management, old growth mapping, climate change, and invasive plants. We heard from our partners at the Washington Department of Natural Resources (DNR), the universities, and the PNW Research Station. The week was capped by a field trip investigating prescribed burns conducted by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). Special thanks to Amarina Wuenschel and colleagues for organizing the week and associated logistics, including staying at an historic (and haunted) hotel. It was just before Halloween, after all.

OLD-GROWTH ASSESSMENT

This year a significant inventory of old-growth was called for by an Executive Order. In the Region's response, led by Marin Palmer (Biometrics) and Ray Davis (Northwest Plan monitoring), ecologists on the areas contributing significantly to describing old-growth by PNV type. The ecology program will continue to contribute to this effort.

PRODUCTS

- Greenler S, Dunn C, Reilly M, Johnston J, Merschel A, Hagmann K, Bailey J. (2023). Too hot, too cold, or just right: Can fire restore dry forests in the Pacific Northwest? *PLOSOne.*
- [Data set and Map] 2022 Region 6 Ecological Departure and Restoration Needs Assessment. Collaboration between B. Harvey Lab (UW) and R6 Regional Ecology Program.
- Laughlin, M.M., J.D. Bakker, D.J. Churchill, M.J. Gregory, T. DeMeo, E.C. Alvarado, and B.J. Harvey. 2023. Trends in forest structure restoration need over three decades with increasing wildfire activity in the interior Pacific Northwest US. For Ecol. and Manage. 527(1):1-13.
- Olszewski, J., T. DeMeo, A. Markus, M. Laughlin, and M. Gregory. Changes in forest structural departure in South Central Oregon. Submitted to Northwest Science, 23 pp.
- [Presentation]: Greenler, S., J. Dickinson, A. Rozin. Fire as a process: An ecological perspective and organizational change. R6 Wildfire Crisis Webinar Series. January 19, 2023.
- [Presentation]: Greenler, S. Using the Interagency Fuel Treatment Decision Support System (IFTDSS) for collaborative monitoring and planning. CFLRP Monitoring Community of Practice. February 14, 2023.
- [Presentation]: Greenler, S., T. DeMeo. Health of forest landscapes in Region 6. Regional Leadership Team Meeting. March 1, 2023.
- [Presentation]: Greenler, S., T. DeMeo. Health of forest landscapes in Region 6. R6 Natural Resources Staff Officer Meeting. March 8, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Strategic Planning on National Priority Landscapes in Region 6. Central Oregon Forest Leadership Team Meeting. March 15, 2023.
- [Presentation]: Greenler, S., C. Dunn, J. Bailey. Too hot, too cold, or just right: Can fire restore eastern Oregon forests? Northwest Scientific Association Annual Meeting. March 23, 2023.
- [Presentation]: Greenler, S. IFTDSS Modeling Primer for CFLRP Common Monitoring Strategy Reporting. Western Klamath Restoration Partnership Monitoring Team Meeting. March 27, 2023.
- [Presentation]: Greenler, S., IFTDSS and Quantitative Wildfire Risk Assessments for Collaborative Planning. Willamette National Forest Fire and Planning Leadership. March 29, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Tools to assess forest health for strategic planning in Region 6. Ochoco Five-Year Strategic Planning Meeting. April 5, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Region 6 Prioritization Framework Update. Wildfire Risk Reduction Infrastructure Team National Point of Contact Call. April 18, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Region 6 Prioritization Framework Update. Region 6 Annual Wildlife Program Managers Meeting. May 5, 2023.
- [Presentation]: Greenler, S. Too hot, too cold, or just right: Can fire restore eastern Oregon forests? Blue Mountains Forest Partners Research and Monitoring Symposium. May 17, 2023.
- [Presentation]: Greenler, S., IFTDSS and Quantitative Wildfire Risk Assessments for Collaborative Planning. Blue Mountains Forest Partners Research and Monitoring Symposium. May 17, 2023.
- [Presentation]: Greenler, S., A. Maclennan. S. Ferranto, I. Rickert, M. Whalberg, T. DeMeo. Region 6 Wildfire Crisis Strategy Investment Landscapes Prioritization Framework. Central Oregon Prioritization Workshop. June 13-14, 2023.
- [Presentation]: Ferranto, S., A. Maclennan, S. Greenler. Region 6 Wildfire Crisis Strategy Investment Landscapes Prioritization Framework. Washington Department of Natural Resources Briefing. August 15, 2023.
- [Presentation]: Ferranto, S., A. Maclennan, S. Greenler. Region 6 Wildfire Crisis Strategy Investment Landscapes Prioritization Framework. Wildfire Risk Reduction Infrastructure Team National Leadership Briefing. September 22, 2023.
- [Presentation]: Ferranto, S., A. Maclennan, S. Greenler. Pacific Northwest Region Wildfire Crisis Strategy Team. Fish and Wildlife Service Bi-Weekly Regional Coordinator Meeting. September 27, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Region 6 Wildfire Crisis Strategy Investment Landscapes Prioritization Framework. NR Brown Bag Lunch Seminar. October 11, 2023.
- [Presentation]: Greenler, S., A. Maclennan. Region 6 Wildfire Crisis Strategy Investment Landscapes Prioritization Framework. Oregon Prescribed Fire Tabletop Discussion Group. October 19, 2023.

Amarina Wuenschel (middle row) and Pek Wijayratne (front row) in Tanzania for the U.S. Forest Service's International Program

LOOKING AHEAD

The Region 6 Ecology Program will continue to apply the best-available science to each of the core services we provide. The program is committed to sustaining core services through the following:

* Intentional science communication for forest specialists and collaboratives
* Representation of Forest Service and partners
* Fostering connection among people and places
* Expanding capacity
* Focusing on monitoring and support to forest plan revision
* Prioritizing climate change and adaptation into new projects
* CFLRP monitoring and Wildlife Crisis Strategy implementation into long-term planning
* Building and improving engagement with indigenous communities, USFS Research Stations, state agencies, partner organizations, and academic institutions to address key priorities
* Post-fire research and support
* Improving data management practices
* Interdisciplinary collaboration