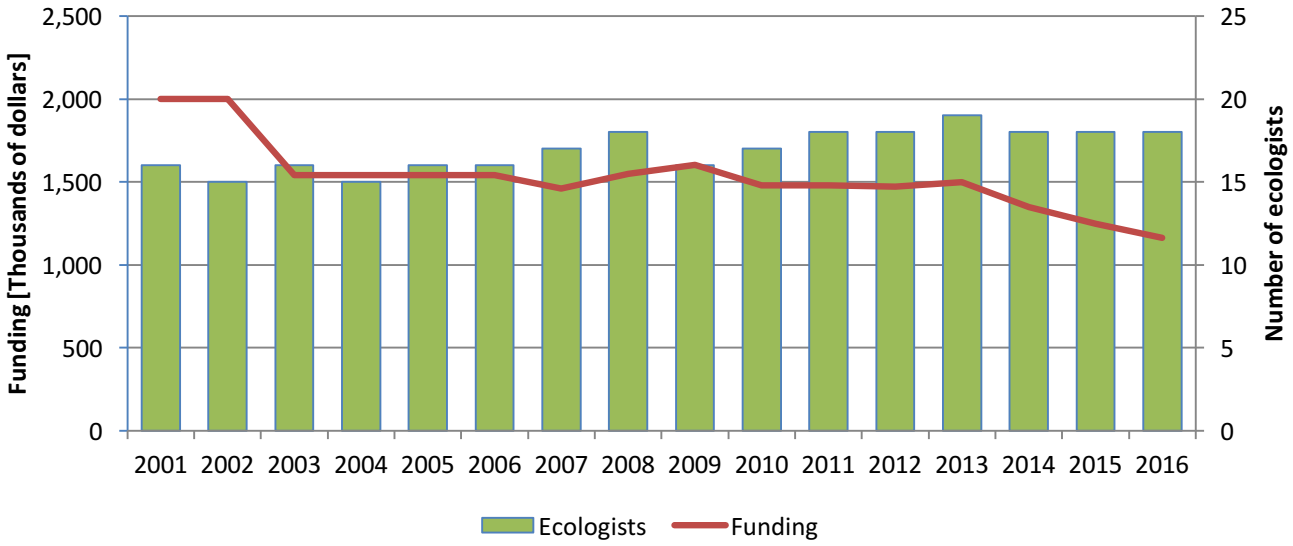
Capacity

2015 Yearbook of the Ecology Program

USDA Forest Service, Pacific Northwest Region

Finding a way…

Ecology Program Funding Compared with Number of Ecologists



Over the years, the ecology program has been able to maintain the same level of service despite a declining budget. We have adapted by addressing issues as they emerged and by forming internal funding partnerships with the forest health, botany, wildlife, and climate change programs, along with the Pacific Northwest Research Station. Additionally, we have a formal cost-sharing memorandum of understanding with the Bureau of Land Management (BLM) in Northwest Oregon and are seeking to expand this elsewhere.

In addition to sound fiscal management, this has fostered integration with other disciplines and agencies, and made us keenly aware of our interdependencies and accountability.

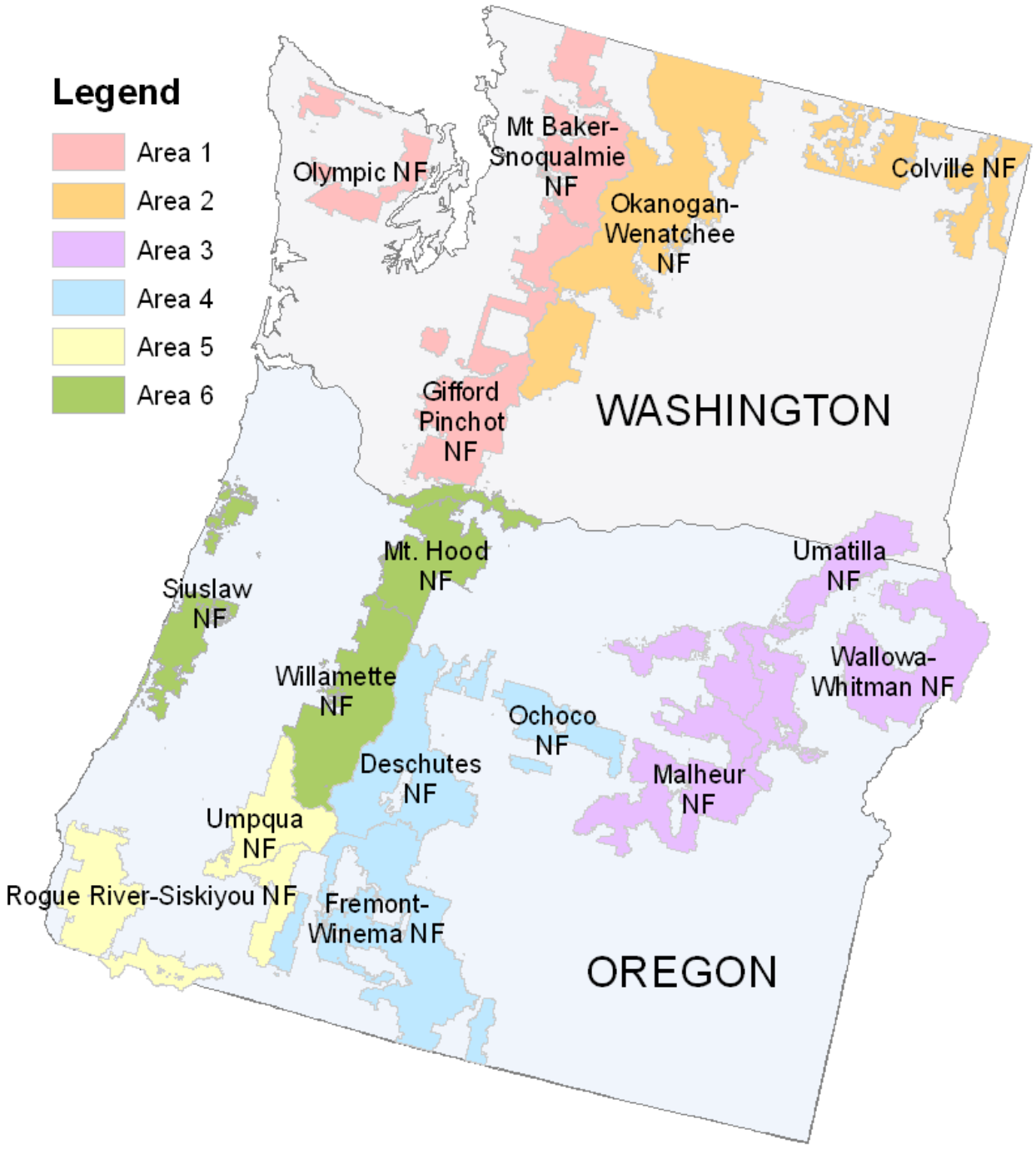


Figure 1. Ecology Program Areas in the Pacific Northwest Region, USDA Forest Service

Mission Statement

The Ecology Program is a network of ecologists applying science to serve the National Forests in the Region through core services of landscape assessment, technology transfer, monitoring, mentoring, products (maps, publications, and databases), ecosystem services, support to planning, and collaboration. The ecologists work as equal partners with other disciplines on a zone basis to serve multi-forest needs and offer a landscape perspective. Ecologists are based on National Forests and are hence accountable to Forest leadership.

Ecology Program Organization and Business Model

Ecology in the National Forest System

Ecology, as with other disciplines in the Forest Service, began as a result of the National Environmental Policy Act (NEPA) and the National Forest Management Act (NFMA) of 1976. The latter had been generated in part as a result of forest regeneration failures on the Bitterroot and Monongahela National Forests.

NFMA requires all logged sites to be reforested within five years of harvest. In the 1970s some tree plantings failed because tree species were not matched to the site; e.g., planting Douglas-fir at high elevation. Ecologists were hired in the National Forest system to classify vegetation into Plant Associations. The resulting habitat types, or potential natural vegetation classifications, can be associated with management implications not only for tree planting, but a variety of applications in silviculture, wildlife management, soils, and other disciplines.

In the Pacific Northwest Region, ecologists were hired for this work, supported by a Regional budget commitment. Their work led to successful production of Plant Association guides covering most forested areas on National Forests in the Region (see http://ecoshare.info/category/publications/). By the mid-1990s it was thought this work was complete, and that a Regional budget commitment was no longer necessary. Forests were left to themselves to fund ecologists.

By the late 1990s it became apparent that the Forests were not able to consistently fund positions. Given the myriad pressures they faced, the priority for funding ecologists dropped and positions became unfunded. Ecologists in some cases had to use funding for projects not directly related to a Forest's mission, leading to less support from the Forests.

In 1999 a core group of Forest Supervisors realized that re-establishing the Ecology Program Regional funding commitment was necessary to stabilize the program. Led by Forest Supervisor Gary Larson, from the Mt. Hood National Forest, they convinced Regional leadership to reestablish the Regional funding commitment for the ecology program.

In recent years ecological considerations have taken on paramount importance in the Forest Service's mission of managing the National Forests for the greatest good. For example, the recent (2012) Planning Rule mentions "ecosystem" over 200 times. The recent development of an eastside restoration planning team to improve the resilience of landscapes of the Blue Mountains, Oregon, is led by an ecologist and has three additional ecologists (of eight total) on the team.

Clearly, effective and timely ecological information and input is needed in order for the agency to meet its goals of restoring landscapes, as well as meeting targets to foster economic viability.

Ecology Program in the Pacific Northwest Region

The Regional Ecology Program today has a terrestrial emphasis and is organized by zones (areas). Six areas cover the Region (Fig. 1). Ecologists in these zones serve the entire area and have a program of work crafted accordingly. The ecologists covered by the ecology Regional commitment are indicated in Table 1. The ecology program is well-integrated with other disciplines. One of our ecologist positions is a half-time botanist and two others are half-time in the forest health program. Other ecologists receive funding from fire, wildlife, and other disciplines.

Table 1. Ecologists serving in the six areas in Region 6.

Area	Area Name	Ecologists
1	Western Washington	Jessica Hudec, Kevin James (with Botany), Susan Piper
2	Eastern Washington	Monique Wynecoop (with Fire), Vacant (vice Clausnitzer)
3	Northeast Oregon	Sabine Mellmann-Brown, Gunnar Carnwath, Michael Jennings (with Forest Health), Upekala Wijayratne
4	Central Oregon	Gregg Riegel, Sara Lovtang, Beth Johnson, Claire Addis, Mike Simpson (with Forest Health), Joe Washington (Botanist, supported by the Fremont-Winema NF)
5	Southwest Oregon	Patricia Hochhalter, Amy Nathanson, Vacant (vice Sensenig)
6	Northwest Oregon	Jane Kertis, Steve Acker, Wes Wong, Doug Glavich

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 carefully crafted annually with Forest Staff Officer guidance. A high degree of accountability of performance is characteristic of the program.

Funding is anchored by a Regional Office Program Delivery commitment covering about 2/3 of the cost of each Area's ecology program. The other one-third is made up of partnerships (Forest Health, Botany, BLM) and Forest contributions. **The Regional commitment has been a decision of Forest Supervisors collectively as an investment in the landscape perspective, continuity, and other services the ecologists provide.**

Core Services (the "Eight Pillars")

1. Landscape Assessment

In recent years a landscape perspective to understand disturbance regimes, multiple ownerships, and restoration priorities has become paramount for planning considerations. Forest staff officers consistently report this landscape, multi-Forest perspective as one of the key values of the ecology program. This is also consistent with the administration's "All Lands" approach.

Some specific examples in recent years include: 1) Taking on responsibility for completing the three terrestrial indicators in the Watershed Condition Framework; 2) Working with soils, wildlife, silviculture, and fire in developing a national terrestrial condition assessment pilot on the Mt. Hood National Forest; 3) Providing core GIS and fire regime condition class (FRCC) support for the Regional Forester's 2013 restoration map, which has an influence in moving the eastside restoration effort forward and securing funding; and 4) collaborating with The Nature Conservancy in developing a refined forest structural restoration map in 2014.

Landscape assessment in the Ecology Program illustrates how legacy work builds a foundation for both short-term and long-term products.

Assessing landscape departure from a natural (historic) range of variation requires potential vegetation mapping in order to frame both disturbance regimes and the relative amounts of seral stages in each potential vegetation type. The ecology program legacy of field data collection and subsequent descriptions of plant associations, developed to assist silviculturists with site-specific prescriptions, has also proven useful as the underpinning for potential vegetation maps at broader scales. Moreover, this legacy contributed much of the information to develop the state-and-transition models used in both LANDFIRE and the agency's Regional mapping effort, known as the Interagency Landscape Assessment Project (ILAP).

Moreover, within the ecology cadre, skills in mapping, GIS, state-and-transition modelling, and related topics are maintained, so that when assessments are needed they can be developed quickly. Integration with other disciplines and partners, such as The Nature Conservancy and the Bureau of Land Management, also facilitates rapidly produced products.

In 2012 we worked closely with soil scientist Karen Bennett, wildlife ecologist Kim Mellen-McLean, botanist Mark Skinner, analyst Ayn Shlisky, Keith Reynolds at the PNW Station in Corvallis, and staff on the Mt. Hood National Forest, in order to develop a National pilot of the Terrestrial Condition Assessment (TCA). This successful pilot identified restoration needs for a set of key ecological attributes. During this project we developed a refined version of Fire Regime Condition Class (FRCC; a national standard terrestrial metric of ecological departure from sustainable conditions), where we were able to offer an increased focus on just what acres in which potential vegetation types and seral stages needed treatment.

In late 2012/early 2013, the Regional Forester wanted a quick assessment of restoration needs in order to carry a message to the Washington Office and to Congress on the need for thinning and prescribed burning in dry forests in the Region. Within about 30 days, working with other disciplines at the Regional Office, Chris Ringo of Oregon State University was able to assemble the needed map (now known as the first of the Regional Forester's "five maps"). Chris was able to do this because he had worked in the Ecology Program for five years, and was thoroughly familiar with both potential vegetation and the analysis needed to do ecological departures.

Moreover, we were able to apply the refined FRCC principles we developed during the TCA assessment for the Mt. Hood NF.

At about the same time, we were in discussions with The Nature Conservancy to do a similar project. Because we would have more time (about a year), we decided to seek out improved datasets and develop better methodologies for both the maps and the FRCC concepts used to identify restoration needs. This effort included Regional office staff, Forest level experts, The Nature Conservancy offices of both Oregon and Washington, and Ayn Shlisky of the Eastside Restoration effort. Results were published in Forest Ecology and Management and are available on ecoshare (http://ecoshare.info/products/r6-analysis). Moreover, we are doing outreach with webinars and field visits in order to explain the work, such as an upcoming visit to the Colville National Forest where we will explore how this can be used in their planning. Results of the study were used for three of the five collaborative landscape projects (CFLRPs) in their recent five-year reporting requirement on ecological indicators.

NW Oregon Ecologists worked with Forest wildlife biologists to use the dead wood analytical tool DecAID to supply updated information on snag and down wood amounts and distribution. These broad scale watershed level data are be used to assess wildlife habitat health (e.g., abundance of large snags), and determine potential treatments. In FY15 Ecologists developed updated deadwood information for all the 5th-field watersheds with sufficient area for analysis on the Mt. Hood, Siuslaw, and Willamette National Forests, using the latest version of DecAID (incorporating 2012 GNN data). There were 3 large-scale (≥1000 acres) disturbances since the date of the new GNN layer that added snags to the landscape. In collaboration with Regional Wildlife Ecologist Kim Mellen-McLean and Cole Belongie of DRM, we used the RAVG (*Rapid Assessment of Vegetation Condition after Wildfire*) dataset managed by USFS to update current deadwood distribution for the watersheds containing the Government Flats (Mt Hood), 36 Pit (Mt Hood) and Deception Complex (Willamette) fires. To support planning on the Middle Fork Ranger District, we selected the 5th- field watershed containing the Deception Complex Fire as the initial location for delivery of deadwood information. These results were used in planning activities on the District.

- The program has been working for over a year to generate the next iteration of a potential vegetation map, at two broad scales: vegetation zone and subzone. A draft vegetation zone map has been prepared and is being further refined. Completion of the map, with an accompanying General Technical Report, is anticipated in late calendar 2016.
- Most ecologists In Region 6 are the Climate Change Coordinators for the Forests and they facilitated the completion of the Climate Change Scorecards for their forests. They are also contributing directly to Forest level vulnerability assessments for the Blue Mountains, Gifford Pinchot NF, and Deschutes-Ochoco NFs.
- Many ecologists serve on BAER teams for their respective forests, as well as Resource Advisors
- Completed Changed Condition Assessments for land management allocations in the Cougar Creek, Alder Lake, Horseshoe, and Riley Fires
- Deadwood analysis – completed DecAID (snag and down wood) analysis for every 5th field watershed on several forests throughout the Region, including the MT. Hood, Siuslaw, Willamette, and Rogue River-Siskiyou
- Assist with the Umpqua NF Vegetation Restoration Strategy
- Worked with South Gifford Pinchot Collaborative group to analyze potential early seral management opportunities.
- Completed landscape analysis for Strategic Placement of Fuels Treatments for Mt. Hood and Gifford Pinchot National Forests.
- Western Washington ecologists, natural resource staff officers, and other forest resource specialists brainstormed ideas for Late Successional Reserve management applicable across Western Washington.

- Provided information to NW Oregon ecologists regarding special habitats in the Columbia River Gorge National Scenic Area and on the Gifford Pinchot National Forest.
- Worked with forest specialists on preliminary components of forest restoration strategy and updated 10-year action plan.

2. Technology Transfer

Technology transfer (also known as science delivery or mutual learning) in all its forms has long been a core service of ecologists in the National Forest System. Because we do not have the publishing pressure of research, and are directly accountable to staff and line officers, we focus a great deal of time and energy on answering questions, visiting field sites, providing trainings (both in person and webinar), writing white papers, and providing presentations for a wide variety of audiences. All this helps build both technical understanding and good will as relationships are formed.

Presentations and Other Communication:

- Plant Association trainings on the Umatilla, Rogue River-Siskiyou, Deschutes, and Ochoco National Forests
- Co-hosted the workshop *Ecological, Economic, and Social Objectives for Managing Stands over 80*
- Presented fire ecology lessons to public high school students; assisted with RAP (Resources and People) Camp for high school students
- Western Oregon BLM Silviculture meeting: "Context for Silvicultural Regimes in Western Oregon: Natural Processes in Unmanaged Stands."
- 2015 Western International Forest Disease Work Conference (keynote address): "Ecology of the Oregon Coast Range."
- Marys Peak Alliance volunteer training: "Life on the Landscape: Ecosystems and Ecology of western Oregon and Marys Peak".
- Ecological, Economic and Social Objectives for managing stands over 80: "Historical and Current Dynamics in West-side Forests" (with Matt Riley).
- 2015 Annual Oregon Tribal Meeting: "Fire on the Landscape; Past, Present and Future Fire Regimes in western Oregon".
- Collaborated with Northwest Oregon ecologists to offer east side plant association training on Mt Hood National Forest.
- Provided trainings to Gifford Pinchot and Mt. Hood National Forests including lightning strike mapping, Wildland Fire Decision Support System, strategic risk assessment, and fuels and fire behavior analysis tools.
- Created a presentation on fire ecology and wildland fire management for the Regional Wilderness Awareness Workshop.
- Participated in discussions regarding public perceptions of wildfire and smoke with a group from the University of Washington.
- Worked with Cascade Mountain School to help develop their summer curriculum and provide instruction on aspen ecology, coring trees, reading tree cores, and forestry equipment.
- USFS cadre member for the multi-agency," Implementing Indicators of Rangeland Health Program". Participants in this 3.5 day course learn how to apply the qualitative evaluation protocol and learn how to quantify elected indicators. The protocol is widely applied by individuals and agencies to provide early warning of potential degradation, opportunities for recovery and to help design monitoring programs. Three courses are taught annually throughout the US.
- Instructors' cadre Rx310 Introduction to Fire Effects. Taught Flora and Fire Effects on Noxious Weeds modules. This course is taught annually in Redmond, OR through the Pacific Northwest Training Center.
- Worked with Deschutes National Forest Landscape Architect, on Cascade Lakes National Scenic Byway improvements.

- Oral presentation, Riegel G. and T. Wilson 2014.What the …My RNA is on Fire Again??! Northwest Scientific Association Annual Meeting, Missoula MT.

3. Monitoring

Monitoring in all its phases—objectives, planning, design, implementation, data storage and analysis, and reporting—are all strongly emphasized in the ecology program. For example, ecology is doing nearly all the field work for white-headed woodpecker (Management Indicator Species) baseline monitoring. The white-headed woodpecker data supports regional habitat occupancy modelling. The Northeast Oregon Ecology Group is a steward of data collected from a decades-long range monitoring program in the Blue Mountains. An important contribution to range monitoring comes from maintaining and collecting data from legacy exclosures established as early as 1937. These exclosures provide excellent reference areas that inform best available science when answering controversial questions about livestock and wildlife grazing effects. For example, grazing impacts to biological soil crusts has recently been a hot button issue in the Hells Canyon National Recreational Area. We are visiting several 3-way exclosures in the area, established about 40 years ago, to assess biological soil crust condition and potential ungulate impacts. Results from this study will be available for use in allotment management plans and provide guidance to line officers for science-based management decisions.

Other examples of ecology involvement in monitoring activities include:

- Support to the monitoring efforts of the collaborative landscape projects, particularly in developing standardized practical approaches. This has resulted in two white papers produced through the Fire Science Consortium.
- Oak Flat Restoration Project, Umpqua NF – pre-treatment plots were installed, with the intention of returning five years post-treatment
- Assisting with the development of monitoring plans for several forests for huckleberry (*Vaccinium membranaceum*)
- Assisted with planning for prescribed fire, vegetation recovery monitoring, savanna post-treatment vegetation response, and wetland consultation
- Conducted a second year of invasive weed monitoring along 14 miles of the Ruby pipeline where it crosses the forest and judiciously persuaded the company to implement timely treatments before current infestations get any worse.
- Continued monitoring of trampling disturbances in fens on the Chemult Ranger District; will continue to support water table monitoring on fens by Rick Dewey of the Deschutes NF.

4. Support to Planning

Ecologists normally play a supporting rather than direct role in planning efforts, by providing data, context, and landscape assessments. In FY2015 new and important planning needs emerged. The ecology program is contributing significantly as eastside Plans are reconfigured. The Regional Forester has requested that strategy teams develop outlines of needs for completing Forest Plan Revisions in four years. We are serving directly on the teams for Ecological Sustainability and Monitoring.

- **Blue Mountains Plan Revision Team.** Through most of 2015, Gunnar Carnwath has served as vegetation specialists on the Blue Mountain Forest Plan Revision Team to perform analysis, prepare reports and present technical information to line officers, scientific community, industry and the general public. Duties required specialized knowledge and skills in a broad field of topics and included the analysis of vegetation change during the last 15 years, review of different sources of historic range of variability for forest structure and composition, modeling of timber volume yield under different treatment scenarios and development of ecologically defensible standards and guides for salvage and harvest of large trees.

These contributions are essential to keeping a high priority Regional project on track during a prolonged vacancy of the permanent vegetation management position. Other Northeast Area ecologists participated in early seral and riparian working groups and contributed to associated Environmental Analyses.

- **Colville Plan Revision.** Sabine Mellmann-Brown supported the Colville Forest Plan Revision Team with analysis of existing and desired conditions of non-forested and forested rangelands. Tom DeMeo worked on the potential vegetation and natural range of variation needs for the Colville Plan, in cooperation with Max Wahlberg, Jonathan Day, Kim Mellen-McLean, and others.
- **Strategy teams to outline completing Forest Plans in four years**. We are actively participating in this process through the Ecological Sustainability and Monitoring Teams. We are continually stressing a minimalist approach to meet the objective of completing Plans on a constrained timeline, as well as Forest involvement and ownership in the process. Specifically, Jane Kertis of the Northwest Oregon ecology area has been serving as acting Regional ecologist and is actively engaged on the Ecological Sustainability team.
- **Interdisciplinary Teams** Ecologists serve as members of ID teams on many forests for many projects
- Identified and began the mapping of whitebark pine stands within ALR units proposed for cutting in 2016 and ensured protection of these unmapped or undocumented stands according to completed NEPA analysis; developed mitigation.

5. Ecosystem Services

The Region 6 Ecosystem Services program is based in Ecology and is jointly funded and designed with State and Private Forestry as well as the PNW Research Station. Examples of work related to each deputy area are provided below.

People and Ecosystems of the Rogue Basin: We are working with staff on the Rogue River-Siskiyou National Forest to conduct landscape scale, cross-jurisdictional assessments of ecosystem services provided by forested landscapes. This involves Basin-wide analysis in partnership with the Southern Oregon Forest Restoration Collaborative and the SW Oregon Office of The Nature Conservancy. We are also working on smaller landscape planning processes including the Shasta-Agness restoration project on the Gold Beach Ranger District (IDT member) and collaborative planning in the Applegate Adaptive Management area in partnership with the BLM. Have co-designed and participated in workshops for both projects.

Support for Planning: Collaborating with the Regional Social Scientist to address socio-economic components of Northwest Forest Plan monitoring, as well as social and economic sustainability under the 2012 Planning Rule.

McKenzie Collaborative: Member of a collaborative group formed by Eugene Water and Electric Board and the Willamette National Forest to address management of the McKenzie watershed, which provides Eugene's drinking water. The group is taking a landscape-scale approach to watershed management across ownerships. Efforts include development of a voluntary incentive program to support protection and restoration of high quality riparian areas on private lands. A second primary objective is development of stewardship contracting opportunities on the Willamette National Forest to sustain the resilience of the McKenzie headwaters and generate retained receipts for restoration actions. Work on the McKenzie was the focus of the 2015 Carpe Diem West event, which involves water utilities from across the west.

National Ecosystem Services Strategy Team: Member of a core team established by the Associate Deputy Chiefs to develop cohesive national strategy, policy and implementation plans for ecosystem services programs across Forest Service deputy areas. Products include communication tools, proposals for integrated program structure, identification of growth opportunities and Manual/Handbook language. Co-author of a GTR identifying opportunities and needs for integrating ecosystem services into USFS programs and operations (in press).

6. Collaboration and Partnerships

Collaboration is at the heart of the ecology program effort. By definition area ecology efforts are organized on team principles. Ecologists work closely with other disciplines, and with external partners. Research by the Rocky Mountain Station indicates ecologists are well integrated with the research and academic communities. To further this end, we are partially supporting Cheryl Friesen to further our liaison with the Pacific Northwest Research Station, and employing Cheryl's facilitation, workshop, and webinar skills to further technology transfer.

We are continuing work with the Collaborative Forest Landscape Restoration Monitoring effort on the Malheur National Forest. Effectiveness monitoring of treatments is being implemented at landscape, watershed and project level scale with high involvement of multiple stakeholders. We participated in discussions and field visits between the forests and collaborative groups, providing ecological context for vegetation management and restoration projects. Project level monitoring, in particular, provides a platform for shared learning between district specialists and collaborative members. In 2015, we have started pre-implementation monitoring on proposed riparian treatments that are currently controversial. We will continue with this work in other project areas in 2016. Effectiveness monitoring is allows the district to move forward with implementation of the project. Monitoring before and after treatments may assist resource specialists to reexamine assumptions and engage in adaptive management. For collaborative members it provides an opportunity to find a new level of agreement in previously controversial issues.

The Oregon dune ecosystem occurring on the Siuslaw National Forest is a unique, dynamic landscape. Invasive species (most notably European beachgrass and Scot's broom) have stabilized this system and altered natural processes and patterns. A passionate group of stakeholders--watershed council members, off road enthusiasts, birdwatchers, environmental groups, tribal representatives, and interested individuals, federal, state and county agencies among others, have come together to develop a strategy for tackling dunes restoration. The NW Oregon Ecology group has helped facilitate this process. The strategy includes information on why the dunes are unique, why the ecosystem is disappearing, and outlines opportunities and locations to achieve our restoration goals. We have successfully obtained Title II funds to work on site specific restoration goals, and are working on obtaining additional funds towards achieving all our goals. The strategy will be available in FY16.

7. Mentoring

Ecologists are valuable mentors. As the agency downsizes and as new people are hired, the value of ecologists as mentors and sources of know-how become increasingly valuable. Ecologists, on average, stay much longer in their positions than other disciplines. They know their area landscapes well and have the ability to work across disciplines to explain the landscapes of their area. As technical capacity on the Forests erodes, we provide "glue" to help hold things together.

Since 2011 we have been sponsoring DeLaSalle High School students as interns at the Regional Office under the Natural Resources Staff office. They played a central role in scanning the data legacy of ecologist Fred Hall, and to a lesser extent that of Jan Henderson and Robin Lesher. In turn, they are learning valuable data management skills to position them for further Forest Service work or other careers.

- Mentoring of new field technicians, hired through seasonal appointments and Pathway programs. We provide diverse experiences in ecological field methods and naturalist skills and often train new college graduates. We also invite employees from other programs such as botany and wildlife, so that they can learn more about the Ecology Program and services we provide
- Pre-Certification Silviculture Panel for, Fremont-Winema NF

- Organized the "Carex Identification Workshop" taught by Dr. Barbara Wilson and Dick Brainerd of the Carex Working Group. The sell-out class was comprised of enthusiastic Botanists and Range Specialists from the Deschutes, Ochoco NF, Fremont-Winema NF's, and Prineville BLM
- Courtesy Graduate Faculty, Oregon State University. Trent Seager, Oral Ph.D. Qualifying Exam. Department of Forest Ecosystems and Society, Oregon State Univ., Dissertation topic: In drying climate scenarios, can forest overstory removal increase soil moisture and allow the persistence of drought-sensitive tree species in dryland ecosystems?
- Oregon State University Lectures 1) Range Analysis Class: USFS Rangeland Assessment, Inventorying, and Monitoring 2) So You Want to be a Fire Ecologist: Career Pathway Choices.
- Instructor- Fire Effects and Ecology of Pacific Northwest Forests, Forestry 209, three unit 2nd year class, Central Oregon Community College.
- Mentored and lectured "Capstone Forestry Class" on the ecology and management issues of curl-leaf mountain mahogany Central Oregon Community College

8. Products (Maps, Publications, Databases)

The ecology program maintains, manages, and continues to collect and monitor ecological data and plots. This is a major component of the program and it is ongoing. Long-term data management involving temporal comparisons is a vital component of the science of ecology.

Some recent publications:

In Review:

- Churchill, D., G. Carnwath, A. Larson, S. Jeronimo. In review. Historical forest structure, composition, and spatial pattern in dry conifer forests of the western Blue Mountains, Oregon. Gen. Tech. Rep. PNW-GTR-XXX.
- Dwire, K.A. and S. Mellmann-Brown. In review. Climate change and special habitats in the Blue Mountains. Riparain areas, wetlands and groundwater dependent ecosystems. Blue Mountains Adaptation Partnership, Gen. Tech. Rep. PNW-GTR-XXX.
- Dwire, K.A., K.E. Meyer, G.M. Riegel, and T.A. Burton. In review. Riparian Fuel Treatments in the Western USA: Challenges and Considerations. Gen. Tech. Rep. RMRS-GTR-XXX.
- Haugo, R., C. Zanger, T. DeMeo, C. Ringo, A. Shlisky, K. Blankenship, M. Simpson, K. Mellen-Mclean, J. Kertis, and M. Stern. 2015. A new approach to evaluate forest structure restoration needs across Oregon and Washington, USA. For. Ecol. An Man. 335: 37-50.
- Kerns, B.K., D.C. Powell, S. Mellmann-Brown, D.L. Peterson, G. Carnwath and J. Kim. In review. Climate change and upland vegetation assessment. Blue Mountains Adaptation Partnership, Gen. Tech. Rep. PNW-GTR-XXX.
- Vögler, K.A., A. Ager, M. Day, M. Jennings, M. Bailey. In review. Prioritization of forest restoration projects: tradeoffs between wildfire protection, ecological restoration and economic objectives. Forests.

2015:

- Acker, S. A., J. R. Boetsch, M. Bivin, L. Whiteaker, C. Cole, and T. Philippi. 2015. Recent tree mortality and recruitment in mature and old-growth forests in western Washington. Forest Ecology and Management 336: 109-118.

- Acker, S. A., M. D. Tetreau, and D. W. Allen. 2015. Heritage plants at former homesteads in the Queets Valley, Olympic National Park. Natural Resource Data Series NPS/OLYM/NRDS—2015/968. National Park Service, Fort Collins, Colorado.
- Johnson, E and G. Riegel. 2015 Report: Effects of Fuel Treatment Alternatives on Bitterbrush Population Dynamics and Understory Composition along the Eastern Slopes of the Cascade Range of Oregon and California. Unpub. Rpt. 23p.
- Mellmann-Brown, S. 2015: Results of riparian vegetation monitoring, Murderers Creek Allotment, Malheur National Forest. Unpublished report, NE Oregon Ecology Program, 71p.

2014:

- Acker, S.A., M.D. Tetreau, and D.W. Allen. 2014. Invasive plants in the Queets Valley, Olympic National Park: Former homesteads and surrounding watershed. Natural Resource Technical Report. NPS/OLYM/NRTR—2014/898. National Park Service. Fort Collins, Colorado. (Aug. 2014).
- Johnson, E. and G. Riegel. 2014. Use of prescribed fire on Gray Butte in the Crooked River National Grasslands of Central Oregon. Unpub. Rpt. .11 p.
- McCain, C., C. B. Halpern, S. P. Lovtang. 2014. Non-forested plant communities of the northern Oregon Cascades. US Dept. of Agriculture, Forest Service, Pacific Northwest Region General Technical Report R6-NR-GTR-01-2014.).
- O'Halloran, T.L., S.A. Acker, V.M. Joerger, J. Kertis, and B.E. Law. 2014. Post-fire influences of snag attrition on albedo and radiative forcing. Geophysical Research Letters. 41, 9135–9142, doi:10.1002/2014GL062024 (Based on work at Charlton Fire).
- Patterson, P.L. J. Alegria, L. Jolley, D. Powell, J. Goebel, G.M. Riegel, K.H. Riitters, C. Ducey. 2014. Multi-agency Oregon Pilot: Working towards a national inventory and assessment of rangelands using onsite data. Gen. Tech. Rep. RMRS-GTR-317. 56 p.

Ecology Program Priority/Emerging Issues in FY16

Restoration. Ecology will continue to support the restoration effort through landscape assessment, CFLRP monitoring, and searching for ways to effectively implement a restoration strategy west of the Cascade Crest.

Support to Forest Plan Revisions. We are working closely with the planning effort as it evolves to face new challenges, such as the assessment of the Northwest Forest Plan area and the interest in accelerating completion of Forest Plan revisions. We are serving on the teams that are developing the strategy for accelerated Forest plan development, specifically the ecosystem resilience and monitoring teams. As further preparation, we are emphasizing landscape assessment skills as new ecologists are hired, are holding trainings in ST-SIM and R, and participating in the development of Regional strategies for LiDAR implementation and maintaining the Gradient Nearest Neighbor (GNN) vegetation map layer.

Landscape Assessments. Ecology worked with TNC and other FS disciplines to craft the latest version of the forest structure restoration map. This will be a valuable tool in furthering eastside restoration and developing the next generation of plan revisions. We are building capacity through the addition of a joint ecology/forest health position in LaGrande, and will stress landscape assessment skills as senior ecologists are hired to fill vacancies in eastern Washington and southwest Oregon.

In northeast Oregon, ecologists are working on a pilot study with the Umatilla National Forest that will utilize spatial state-and-transition models (ST-SIM) to evaluate departure of upland vegetation from natural range of variability in patch sizes, species composition, structure and density.

Monitoring. Ecology has helped shape the monitoring plans of all five collaborative landscape (CFLRP) projects in the Region. A science application paper outlining the monitoring process is completed and will soon be published by the Northwest Fire Science Consortium. The Northeast Oregon ecology team is particularly involved in developing CFLRP monitoring. FY 2015 was the second year for implementation of monitoring components. We are likely to have a role in shaping the monitoring component of the national restoration workshop in Denver to be held in April 2016.

Central and Northeast Oregon ecology areas have contributed significantly in each field season since 2009 with the monitoring of the white headed woodpecker and their habitat. These data provide a significant portion of the monitoring of this species' habitat to support forest planning and the collaboratives. White headed woodpeckers are the signature species for late-seral dry forests east of the Cascade Crest. Ecology areas east of the Cascade Crest also provide significant support to range monitoring to support the range program, for both riparian and upland areas.

Finally, ecology has supported fire and fuels reduction efforts since 2003 with landscape assessments of departure from the sustainable range.

Climate Change. Many of the Forest climate change coordinators are ecologists in our program. They are playing an invaluable role in completing the climate change scorecard, and participate in developing climate change vulnerability assessments for the Forests.

Ecologists Gregg Riegel, Mike Simpson, Sara Lovtang, and Nikola Smith are playing a significant role in the vulnerability assessment for the Deschutes and Ochoco National Forests. Tom DeMeo is contributing significant time to the vulnerability assessment for the Gifford Pinchot National Forest.

Legacy Datasets. As ecologists retire there is sometimes a need to capture their data for current and future Forest users. To this end, we have scanned all of Fred Hall's work and are in the process of completing the scanning of the Henderson/Lesher legacy. Our goal for FY15 is to get a substantial portion of this work documented and online. This will provide an invaluable resource for range monitoring and the assessment of long-term change.

Range of Variation (Historic, Natural, and Future Range of Variation). Ecology has been a national leader in the use of fire regime condition class (FRCC) since 2003. Over the years we have refined the method, and in 2013-14 worked with The Nature Conservancy and other FS colleagues to produce a refined method identifying how many acres in each seral stage in each potential vegetation type need to be treated (or allowed to grow) in each watershed. This was completed for fire-prone Forests in the Region; in FY15 we plan to complete it Region wide.

Desired riparian conditions and departure analysis. Eastside ecologists consistently receive requests to assist with the assessment of riparian condition and departure. There is general concern that fire suppression, stream regulation and lack of treatment in riparian zones have caused uncharacteristic fuel accumulation and uniform mid to late seral conditions for entire watersheds. Northeast Oregon will be working on a pilot study describing natural range of variability for riparian zones to inform project scale management actions.

The ecology program is also developing a new iteration of a Region-wide, wall-to-wall potential vegetation map at vegetation zone and subzone scales. Subzones are designed to better facilitate range of variation assessment better than current landscape delineations. The vegetation zone map is completed and already receiving use in the DecAID revision. Further refinement and review, particularly with the subzone layer, will take place this year, and publishing the work as a GTR is anticipated for early 2016.

Western Washington Ecology Program (Area 1)

Gifford Pinchot, Mount Baker-Snoqualmie, and Olympic National Forests

Program Priorities

FY-2015 was a rebuilding year for the Western Washington Ecology Program. Mount Baker-Snoqualmie National Forest filled a key Botanist/Ecologist position, and the Ecology Team re-assessed roles and focus areas. Ecology Team members consulted with resource specialists and met with Natural Resource Staff Officers and the Regional Ecologist to identify program priorities and inform future programs of work. Priorities include

- Re-invigoration of the Western Washington Ecology Program through the development of an area-wide program of work that focuses of common needs and interests.
- Acquisition of legacy ecology plot data and development of a database to store and disseminate that information.
- Development of methodology for landscape assessments to inform broad-scale restoration strategies. Late-successional reserve and early seral habitat sustainability are of particular interest.
- Analysis of habitat suitability for certain special forest products to inform long-term program management.
- Assessment of the current state of huckleberry management in the Pacific Northwest and formation of an interagency huckleberry working group.

Area 1 Ecology Program Team

Jessica Hudec

Susan Piper

Kevin James

Accomplishments

- Identified program priorities and established a process for engaging Natural Resource Staff Officers to develop short- and long-term programs of work.
- Completed field visits with retired Western Washington Area Ecologists.
- Collaborated both internally and externally with forest Program Managers, PNW Research Station- Wenatchee and Corvallis Forestry Sciences Labs on landscape assessment and decision support systems.
- Provided support to planning teams by participating in early seral and riparian working groups and by contributing to Environmental Analyses.
- Served as Climate Change Coordinators on the Gifford Pinchot and Mount Baker-Snoqualmie NFs and facilitated completion of the Climate Change Scorecard.
- Assisted Area Geneticist with development of oak (*Quercus garryana)* restoration project for future restoration implementation.
- Presented fire ecology lessons to public high school students.

Huckleberry shrubs (*Vaccinium membranaceum)* re-sprout one year after a prescribed burn.

Continued from previous page

- Completed Phase I of Skokomish Prairie restoration prescribed burn in partnership with the Olympic NF fire and wildlife programs, PNW Research Station, and South Puget Sound Ecological Fire Program (Center for Natural Lands Management, Joint Base Lewis McChord).
- Contributed to Forest Plan Monitoring Transition to the 2012 planning rule for all three Forests; Gifford Pinchot NF (pilot).
- Met with professors at Western Washington University to discuss potential for developing GIS internships with the Ecology Program.
- Participated in discussions and field visits with collaborative groups on all three forests. Ecology Team members provided ecological context for vegetation management and restoration projects.
- Assisted collaborative groups in developing monitoring plans and drafting funding proposals for huckleberry management, invasive weed monitoring, and thinning effectiveness.
- Co-led field tour for Pinchot Institute for Conservation. Group included retired Regional Forester and a retired Chief of the Forest Service. Ecology Team member presented on climate change, fire management, and stewardship.
- Completed Changed Condition Assessments for land management allocations in the Cougar Creek, Alder Lake, Horseshoe, and Riley Fires.

Skokomish Prairie restoration on the Olympic National Forest

- Participated in interviews with local newspapers and EcoAdapt. Interview topics included Fire Management and Climate Change, Wilderness Fire Management, Fire Ecology, and Special Forest Products.
- Co-led the Southwest Washington Climate Change Vulnerability Assessment with David L. Peterson, Pacific Northwest Research Station, and Jessica Halofsky, University of Washington. Partners include Gifford Pinchot and Region 6 Program Managers, Region 6 Ecosystem Services Specialists, Rocky Mountain Research Station, Washington Department of Natural Resources, Yakama Nation, Gifford Pinchot Task Force, and Pinchot Institute for Conservation. Introductory webinars were presented in FY-2015, and progress was made toward drafting a report. Process continues in FY-2016.

Responding to Future Needs

We will meet with Program Managers and Forest Leadership Teams to provide an overview of the R6 Ecology program, share our vision for Western Washington, and initiate dialogue with leadership. We envision our plan of work as a mixture of direct assistance to the units, technology transfer, collaboration, and landscape assessment.

We plan to perform QA/QC on legacy ecology monitoring plot data we acquire and develop a database to store and disseminate that information.

We will continue to lead plant association trainings for all employees to introduce this core Ecology product and encourage use of plant associations in land management.

We are developing processes for landscape evaluation to prioritize restoration needs and inform sustainable management of Late-Successional Reserves, early seral forests, and special forest products.

Eastern Washington Ecology Program (Area 2)

Colville and Wenatchee National Forests

2015 Priorities

- Promote Interagency Collaboration and relationship-building through shared monitoring to better inform resource manager's decisions.
- Continue to provide applied research and technology transfer for the Ecology Program: Implement necessary work, development, and collaboration for successful completion of Thesis and successful initiation of the CFLRP Socio-Economic question.
- Fuels Monitoring Coordinator duties ("Telling our story":
    - CFLRP NEW Vision 2020 Fuels Specialist for collaborative monitoring cadre
    - Work with DNR and NRCS to write a Collaborative Joint Chiefs Annual Monitoring Report
    - Colville National Forest Annual Monitoring Report
- WFDSS Coordinator
    - Implement interagency training
    - On call as a WFDSS driver for large fires on the Colville National Forest

Accomplishments

- Assisted with the development and management of the Colville National Forest Collaborative Forest Landscape Restoration (CFLR) Monitoring Program.
- Successfully developed a Colville CFLRP socio economic monitoring question/ Master's Thesis that addresses the impact of fuels treatments and wildfire on the understory vegetation, and the resulting impacts on cultural plant communities of interest to the Confederated Tribes of the Colville Reservation (CCT).
    - Presented Thesis successfully to Graduate Committee
    - Split duties between Graduate course work, commuting to campus, and office duties.
    - Adapted to recent NorthStar fire that burned over planned fuels treatment areas. Set up protocol for allowing fire qualified researchers to place quick FIREMON plots ahead of wildfires. Placed FIREMON plots in un-burned fuels ahead of Northstar Fire on the Republic and Tonasket Ranger districts.

Photo by Monique Wynecoop. Establishing FIREMON plots ahead of the Northstar Fire in Division Q.

Area 2 Ecology Program Team

Monique Wynecoop, Fire Ecologist/MS

Vacant (vice Clausnitzer)

- Successfully presented Monitoring proposal to Confederated Colville Tribes' Natural Resource Committee, Cultural Committee, and Tribal Council with help of University of Idaho, Rocky Mountain Research Station, and the Integrated Resource Management Program coordinator for the Colville Tribes.
- Collaborated with the Mt. Tolman Fire Center of the Colville Tribes to plan FY 2016 post fire FIREMON plots within the boundary of the Northstar fire on and off the Colville Reservation and within areas that previously had fuels reduction treatments done.
- Completed all of the required paperwork and research permits for the US Forest Service, Confederated Colville Tribes, and University of Idaho.
- Attended training/conferences that are relevant to Fire Ecologist Roles and Forest & Fire Program Mission. Promote knowledge sharing and improved relationships between the Colville National Forest and various agencies. This year, due to academic schedule conflicts, was only able to attend S390 Introduction to Wildland Fire Behavior and Calculations and the Tribal Forest Protection Act Training in Airway Heights, WA
- Nov, 2015: Completed the a multi-agency monitoring report for the Joint Chiefs Landscape Restoration Initiative, which is comprised of all fuels treatment monitoring completed this year by USFS, WA DNR, and NRCS.
- Updated the fire rehab guidelines in the Colville National Forest In briefing Packet
- Coordinated WFDSS (Wildland Fire Decision Support System) trainings and real life WFDSS simulations for fire events on the Forest. Help put on the Large Fire Simulation in the spring, which involves the participation of multiple local agencies.
- Put on a spring WFDSS Training for BLM Natural Resource employees.

Responding to Future Needs

- Will complete a Strategic Fuels Treatment Map and Plan for the Colville National Forest, Fall, FY 2016
- Will write the Annual Monitoring Report for the Colville National Forest Fire/Fuels Program, which will be completed every winter, starting FY 2016
- Will contribute on Forest Interdisciplinary Teams to help bridge gaps between fire science and other resource fields
- Plan to contribute to the Forest BAER program whenever possible to support post-fire rehab with the most current science available.
- Goal to continue to facilitate relationship-building and knowledge sharing between the USFS and the local tribes, colleges, and agencies whenever possible to enhance the benefits of our projects and fuels treatments on USFS lands.
- When practical and safe, plan to continue placing FIREMON plots ahead of wildfires whenever possible, to increase knowledge of wildfire effects within areas that received fuel treatments and outside of fuel treatment areas.
- Goal to develop a more a robust fire monitoring program and fire ecology program for Northeastern Washington.
- Whenever possible, attend and present at the Annual Regional Ecology Meetings, Intertribal Timber Council Meetings, and Large Wildland Fire Conferences.
- The vice Clausnitzer position is targeted for a senior ecologist with landscape ecology skills to assist in Forest planning, collaboratives, mentoring, and other efforts. At this writing announcement of this position is imminent.

Northeast Oregon Ecology Program (Area 3)

Malheur, Umatilla and Wallowa-Whitman National Forests

Program Priorities

The NE Oregon Ecology Team meets annually with all natural resource staff officers and other natural resource specialists to discuss program priorities, response to assistance requests from forest units and the annual program of work. Priorities for 2015 included several long-term projects:

- Develop consistent approaches for landscape restoration. Work on pilot project area on the Umatilla National Forest, stay engaged in planning the Blue Mountains Restoration Strategy Summit and lead discussions on the Malheur National Forest on needs for decision support system and landscape tool box.
- Develop a riparian restoration framework. Lead effort to develop spatially explicit future desired conditions within riparian valley bottoms and describe appropriate management actions. Start effort in pilot watersheds on different forests.
- Continue data stewardship for ecology legacy data and develop improved access for districts and forests.
- Assist Wallowa –Whitman NF with whitebark pine cone collection and management questions.

Area 3 Ecology Program Team

Sabine Mellmann-Brown, PhD

Gunnar Carnwath, PhD

Michael Jennings, PhD

Upekala Wijayratne, PhD

Accomplishments

- Assisted in the planning and implementation of the Malheur National Forest Collaborative Forest Landscape Restoration (CFLR) Monitoring Program. Completed spatial pattern monitoring of forest restoration projects, implemented pre-treatment riparian vegetation monitoring and helped with development of a new geodatabase for aspen stands.
- Secured funding from Eastside Restoration Team to develop desktop application to facilitate the analysis of geospatial tree patterning data. This application simplifies the analysis of stem-map data to be accessible to all Forest Service personnel.
- Developed externally funded project proposal to produce tools for remotely sensed monitoring and measuring large landscape pattern. These tools will be used to monitor landscape responses to collaborative management efforts.
- Explored concepts of classifying existing riparian conditions. Developed a funding basis for implementing a hydro-geomorphic valley bottom classification and delineation (HGVC) across the Blue Mountains with funding expected in FY 2016.
- Analyzed data and prepared and finalized reports and publications on riparian monitoring, Blue Mountain Climate Vulnerability and spatial forest pattern to support allotment management planning and development of effective restoration treatments.
- Re-measured vegetation plots in legacy rangeland exclosures to understand reference conditions and the effects of livestock on biological soil crust.

Field crew searching for white headed woodpeckers in the Blue Mountains, Oregon

- Accomplished 5th year of data collection for white headed woodpecker (Management Indicator Species). Data support regional habitat occupancy modelling and are delivered to local wildlife specialists for use in NEPA documents.
- Supported the Blue Mountains Forest Plan Revision by serving as vegetation specialist. Performed analysis and presented technical information to line officers, scientific community, industry, and the general public.
- Supported the Colville Forest Plan Revision by analyzing existing and desired conditions of rangelands.
- Served on BAER team for Wallowa-Whitman NF. Secured funding for vegetation treatments in the Cornett/Windy Ridge Fire.
- Served as Climate Change Coordinator on the Wallowa-Whitman NF and instructed two Potential Plant Association trainings for the Umatilla and Wallowa-Whitman National Forests.
- Derived downscaled climate data of current and future scenarios for the Blue Mountains. Data inform forest units on the form, magnitude, and direction of changes in temperature and precipitation relationships that are expected over the 21st Century in management areas of interest.

Products, Papers, Publications

Churchill, D., G. Carnwath, A. Larson, S. Jeronimo. In review. Historical forest structure, composition, and spatial pattern in dry conifer forests of the western Blue Mountains, Oregon. Gen. Tech. Rep. PNW-GTR-XXX.

Dwire, K.A. and S. Mellmann-Brown. 2016 – in press. Climate change and special habitats in the Blue Mountains. Riparain areas, wetlands and groundwater dependent ecosystems. In: Halofsky, J.E., D.L. Peterson, eds. Climate change vulnerability and adaptation in the Blue Mountains. Gen Tech. Rep. PNW-GTR-xxx. Portland OR: USDA Forest Service, Pacific Northwest Research Station.

Kerns, B.K., D.C. Powell, S. Mellmann-Brown, D.L. Peterson, G. Carnwath and J. Kim. 2016 – in press. Effects of climatic variability and change on upland vegetation in the Blue Mountains. In: Halofsky, J.E., D.L. Peterson, eds. Climate change vulnerability and adaptation in the Blue Mountains. Gen Tech. Rep. PNW-GTR-xxx. Portland OR: USDA Forest Service, Pacific Northwest Research Station.

Mellmann-Brown, S. 2015: Results of riparian vegetation monitoring, Murderers Creek Allotment, Malheur National Forest. Unpublished report, NE Oregon Ecology Program, 71pp.

Vögler, K.A., A. Ager, M. Day, M. Jennings, M. Bailey. In review. Prioritization of forest restoration projects: tradeoffs between wildfire protection, ecological restoration and economic objectives. Forests.

Responding to Future Needs

Scans of all ecology plot cards and a large number of ecology monitoring photos are now available on the O and T drives. We are working on detailed metadata, but meanwhile you can navigate to our corporate drives at O:\NFS\WallowaWhitman\Program\Ecology\PlotPhotoArchive\Ecology_Plot_Cards and T:\FS\NFS\WallowaWhitman\Program\Ecology\Plot_Photos for your data needs.

We will update natural resource officers on the status of our work this fall and are seeking input from forest leadership for work priorities in FY 2016. Our annual call for assistance requests from forests and districts will go out in January.

We envision our plan of work as a mixture of direct assistance to the units, technology transfer to forest units and long-term projects. Projects will likely continue to address restoration issues at the landscape scale.

Central Oregon Ecology Program (Area 4)

Deschutes, Ochoco, and Fremont-Winema National Forests and the Crooked River National Grassland

Program Priorities

The Central and South Central Area Ecology Team meets annually with Natural Resource Staff Officers and other natural resource specialists to discuss program priorities, respond to assistance requests from Forests and Districts, and to develop our annual program of work. Priorities for 2015 included several long-term projects:

- Climate Change Vulnerability Assessments for the Deschutes and Ochoco, and Fremont-Winema NF's.
- Develop understory and fuel profile development models for Central Oregon ponderosa pine forests to assist restoration and fuel treatment planning through our Alternative Fuel Treatment and the Repeated Fire Return interval Administrative Studies.
- Provide riparian monitoring expertise to measure ecological status attributes for Rangeland Allotment Management Plan renewal NEPA process. Produce analyzed data and interpretation for livestock grazing lawsuit defense.
- Assist Forest Restoration Collaboratives by providing statistical analysis, summarizing field data, generating graphics and GIS maps for interpretation of results, and writing findings.

Area 4 Ecology Program Team

Gregg Riegel, PhD
Sara Lovtang
Mike Simpson
Claire Addis
Beth Johnson
Joe Washington (with the Fremont-Winema National Forest)

Accomplishments

- Completed 5th year of data collection for white headed woodpecker (Management Indicator Species). Data support regional habitat occupancy modelling and are delivered to local wildlife specialists for use in NEPA documents.
- Conducted biannual fire return interval monitoring in Metolius RNA. Worked with forest and district employees to re-measure repeated prescribed fire treatments implemented at 5, 10, and 20 year intervals.
- Re-measured Alternative Fuels Treatments study plots. This long term study began in 2001 and covers the Deschutes, Fremont-Winema and Modoc National Forests. Treatments include prescribed fire, prescribed mowing, thinning followed by prescribed fire, and untreated control.
- Cleaned and compiled field data collected for the Lakeview Collaborative. An initial analysis was submitted to the collaborative in a draft report.
- Partnered with Western Wildlands Environmental Threat Assessment Center (WWETAC) to 1) to create a database of botanical and ecological characteristics of terrestrial invasive plants for "risk assessment" and 2) provide a summary of social science publications generated by WWETAC.
- Contributed to the Lakeview Collaborative annual report and the Aspen Areas of Agreement for the Ochoco Forest Restoration Collaborative.
- Identified and began mapping of whitebark pine stands within ALR units proposed for cutting in 2016 and ensured protection of these unmapped or undocumented stands according to completed NEPA analysis and developed mitigation.

- Taught two Forested Plant Association trainings; one each on the Deschutes and Ochoco NF's (60 people at both sessions).
- Presented individual tree based methods for analyzing Lidar datasets at 2 workshops: (Eastern Oregon Lidar Training Bend, Oregon and Lidar to Inform NEPA Salem, Oregon)
- Analyzed 2014 Lidar Acquisition on the Ochoco National Forest and Developed Forestry Metrics (Basal Area, SDI, and TPA by size-class raster datasets) for the acquisition area.
- Combined the Lidar datasets on the Ochoco NF and within the Green Ridge Project Area on the Deschutes National Forest with GNN species composition data to create FVS tree lists to facilitate project planning efforts.
- Contributed Potential Vegetation Descriptions to the South-Central Oregon Climate Change Vulnerability Assessment and crosswalked the vegetation types described to MC2 model vegetation classes.
- Continued monitoring of trampling effects on fens of the Chemult Ranger District
- Cleaned Regional Ecology Plot dataset (w/ Pat Hochhalter).

Responding to Future Needs

Long-term fire effects monitoring and administrative studies examining the effects of various fuels treatments and historic return intervals.

Range and riparian monitoring and project consultation.

Assistance with developing management strategies to address our invasive annual concerns.

Continue white-headed woodpecker population and habitat monitoring in conjunction with regional efforts.

Support Districts on project-level NEPA documents.

Products, Papers, Publications

Busse M.D. and G.M. Riegel. 2013. Fire Interval Study on Pumice Soils: 5, 10, and 20 Year Effects on Vegetation. Volcanic Forest Soils of the Pacific Northwest. Western Forestry and Conservation Assoc. Coeur d'Alene, ID.

Patterson, P.L. J. Alegria, L. Jolley, D. Powell, J. Goebel, G.M. Riegel, K.H. Riitters, C. Ducey. 2014. Multi-agency Oregon Pilot: Working towards a national inventory and assessment of rangelands using onsite data. Gen. Tech. Rep. RMRS-GTR-317. 56 p.

McCain, Cindy, Charles B. Halpern, Sara Prueitt Lovtang. 2014. Non-forested plant communities of the northern Oregon Cascades. US Dept. of Agriculture, Forest Service, Pacific Northwest Region General Technical Report R6-NR-GTR-01-2014.).

Johnson, E. and G. Riegel. 2014. Use of prescribed fire on Gray Butte in the Crooked River National Grasslands of Central Oregon. Unpub. Rpt.

Haugo, R., C. Zanger, T. DeMeo, C. Ringo, A. Shlisky, K. Blankenship, M. Simpson, K. Mellen-McLean, J. Kertis, and M. Stern. 2015. Forest Ecology and Management paper. A new approach to evaluate forest structure restoration needs across Oregon and Washington USA. Forest Ecology and Management. 335:37-50.

Johnson, E and G. Riegel. 2015 Report: Effects of Fuel Treatment Alternatives on Bitterbrush Population Dynamics and Understory Composition along the Eastern Slopes of the Cascade Range of Oregon and California. Unpub. Rpt.

Dwire, K.A., K.E. Meyer, G.M. Riegel, and T.A. Burton. *In Review* Riparian Fuel Treatments in the Western USA: Challenges and Considerations. Gen. Tech. Rep. RMRS-GTR-XXX.

Hessburg, P.F. T.A. Spies, D.A. Perry, CN. Skinner, A.H. Taylor, S.L. Stephens, D.J. Churchill, P.H. Singleton, B. McComb, W.J. Zielinskij, A.J. Larson, B.M. Collins, N.A. Povak, R B. Salter, J.J. Keane, J.F. Franklin, G.M. Riegel. *In review* (invited synthesis review paper). Management of Mixed-Severity Fire Regime Forests. Forest Ecol. and Manage.

Southwest Oregon Ecology Program (Area 5)

Rogue River-Siskiyou and Umpqua National Forests

Program Priorities

The Southwest Oregon Ecology Program is integrated with the Rogue River-Siskiyou and Umpqua NFs, as well as local collaboratives, to provide landscape-level and historic/future perspectives on current and future projects. Contributions include short, medium, and long-term data collection projects, as well as vegetation mapping projects and assistance with education and acquisition of newer technology, such as LiDAR.

- Continue to work with local collaborative groups on landscape restoration projects. Key contributions will involve assisting with formulating effective monitoring questions and protocols for the Elk Creek Restoration Project along with SURCP (South Umpqua Rural Community Partnership), and working with UFC (Umpqua Forestry Coalition) on designing a restoration project in the Calf-Copeland watersheds
- Climate Change Vulnerability Assessments for both the Rogue River-Siskiyou and Umpqua NF's – potential to start the process in FY16, before the start of Forest Plan revision for both forests.
- Assist with the completion of the new Regional Potential Natural Vegetation (PNV) map.
- Continue data stewardship for ecology legacy data, including the Fred Hall legacy photos and the Ecology Program permanent plot database.

Area 5 Ecology Program Team

Patricia Hochhalter

Amy Nathanson

Vacant (vice-Sensenig)

Accomplishments

- Umpqua NF Vegetation Restoration Strategy. This document and toolset is being developed by an interdisciplinary team whose goal is to identify the most pressing ecological restoration needs on the Umpqua National Forest and prioritize areas where those restoration needs can be achieved.
- Part of the Southern Oregon Forest Restoration Collaborative (SOFRC) technical team; developed a Rogue Basin Cohesive Forest Restoration Strategy that integrates wildfire risk mitigation with multiple lines of ecological need for opening up uncharacteristically dense forests in southern Oregon.
- Climate Change Coordinators for the Umpqua and the Rogue River-Siskiyou NF's.
- Oak Flat Restoration Project - Diamond Lake RD, Umpqua NF – put in pre-treatment plots within the Oak Flat Restoration Area. The project includes logging and burning of mostly Oregon white oak stands to improve the growth of the oaks. Nineteen permanent ecological and photo point monitoring plots were installed, with the intention of returning to the area five years post-treatment.

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- Calculated HRV values for every fifth field watershed for the Rogue River-Siskiyou NF in preparation for DECAID downwood and snag calculations and analysis needed for NEPA documents.

- LiDAR cost estimate and acquisition, working with DOGAMI, to arrange additional LiDAR flights for the Umpqua NF and the High Cascades RD of the Rogue River-Siskiyou NF.

- Served on BAER team for the National Creek Complex, the Collier Fire, and the Stouts Creek Fire. Served as a Resource Advisor on the Bunker Hill and the Stouts Creek Fires.

- Worked with forest silviculturist to create a Restoration Need and Opportunity Assessment to identify potential restoration and salvage opportunities on the four 2015 fires for Umpqua NF.

- Member of the following IDT's: 1) Elk Creek Project (Tiller RD) – an Integrated Resource Restoration project; mapped potential areas for oak restoration and used aerial photography (1954) to compare historic conditions to current conditions. 2) Quartz and CalDip Projects (Cottage Grove RD) – historical context and climate change input. 3) Calf-Copeland Project (North Umpqua and Diamond Lake Ranger Districts); multiple restoration objectives including sugar and ponderosa pine resilience, and ecosystem resilience for fire disturbance in northern spotted owl habitat.

- The Huckleberry SIA is a 9,555 acre area spanning the southeast part of the Umpqua Tiller Ranger District to the northwest part of the Rogue River- Siskiyou High Cascades Ranger District. It is an area of high spiritual and cultural significance to local Native American tribes. Designed a protocol to gather data on *Vaccinium membranaceum* within the Huckleberry SIA and started data collection.

- Range Allotment field reviews and monitoring, along with the Range Program Coordinator for the Rogue River-Siskiyou National Forest, as well as the Forest soil scientist, and Forest hydrologist – Alex Hole and Glade Creek Allotments, Siskiyou Mountains Ranger District.

- SWO Ecologists are a part of the team of ecologists working to improve upon the PNV zone, and eventual sub-zone, PNV map for Region 6. One key component is the cleaning of the very large ecology plot dataset (49,000 plots) to ensure that the most accurate data is used for the analysis. This is part of the SW Oregon program of work.

- Participated with the Lower Rogue Vegetation Strategy, Gold Beach RD – field review with IDT and the publics involved with the project.

- Assisted with RAP (Resources and People) Camp for high school aged students from Oregon and California.

- Data management of the Fred Hall legacy data photographs, mostly eastside, organization and photo sequencing (approximately 45,000 slides).

- SWO PVT Map Revision – working alongside the Medford BLM's silviculturist, Terry Fairbanks, and OSU's Emilie Henderson, we were able to improve upon the SWO Potential Vegetation Type (PVT) map.

Responding to Future Needs

The SW Oregon Ecology Group will continue to work with staff officers and forest/district specialists to determine data and project needs.

We envision our plan of work as a mixture of direct assistance to the units, technology transfer to forest units and long-term projects. Projects will likely continue to address restoration issues at the landscape scale, as well as in the context of climate change.

Northwest Oregon Ecology Program (Area 6)

Siuslaw, Willamette and Mt. Hood National Forest and Columbia River Gorge National Scenic Area

Program Priorities

The Northwest Oregon Ecology Program meets yearly with its working group (natural resource specialists from Forests and BLM units) to develop potential program of work ideas. Ideas are vetted and prioritized with the steering committee of Forest Natural Resource staff, Regional Ecologist and BLM representatives. Program priorities for 2015 included:

- Continuing long-term, landscape projects:
  - special habitat mapping and classification and meadow treatment inventories
  - Historical range of variability
  - Deadwood analysis
  - Tools for riparian vegetation management
  - Post-fire vegetation and CWD trajectories
- Continue to serve as Climate Change Coordinators (Siuslaw and Mt. Hood NFS). Work towards completing the initial NW Oregon vulnerability assessment
- Assist Forests with high priority issues
  - Dunes Restoration Strategy
  - Huckleberry management and Monitoring
- Assist with the completion of the new R6 Potential Natural Vegetation (PNV) map.
- Co-host workshops and collaborate with Central Cascades Adaptive Management Partnership

Area 6 Ecology Program Team

Jane Kertis

Steve Acker, PhD

Wesley Wong

Doug Glavich

Accomplishments

- Special habitat mapping and classification and meadow treatment inventories: Conducted initial multivariate analyses on FY14 data and NW Oregon non-forest data to help guide field sampling. Completed field validating computer generated polygons. Sampled 65 plots. Visited Mt. Hood Ranger District offices and located meadow treatment data. Interviewed and surveyed Mt. Hood Forest staff about meadow history and information sources. Identified approximately 80 meadows at Mt. Hood. Expanded existing restoration database to include Mt. Hood.
- Historical range of variability: Modified state and transition models to reflect historical disturbance regimes. Ran ST-SIM to calibrate and produce initial results for pilot area in the Willamette and Mt. Hood NFs.
- Tools for riparian vegetation management: Produced study plan describing process for development of tools, working with Willamette and Siuslaw NF, Eugene BLM, and PNW Research Station collaborators. Worked with staff from Willamette and Siuslaw NFs, and Eugene BLM to identify pilot study areas.

Deception Complex Fire, 2014, Willamette NF

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- Deadwood analysis: Completed DecAID (snag and down wood) analysis for all 5th-field watersheds on Mt. Hood, Siuslaw, and Willamette NFs, updated for recent fires (including Deception Complex on Willamette). Sent reports to and discussed results with wildlife biologists, silviculturists, and planners on the three Forests.
- Post-fire vegetation and CWD trajectories: Produced draft manuscript on tree regeneration and biomass dynamics for first 15 years following Charlton Fire. Digitally dated, labeled, and tagged over 170 photos, developed pictorial succession models for a subset of vegetation types for Rocky Fire monitoring.
- Climate change: Completed Climate Change scorecard for Siuslaw, Mt. Hood NFs. Aligned proposed monitoring with new Planning Rule provisions. Wrote sections for draft NW Oregon initial Vulnerability Assessment.
- Dunes Restoration Strategy: Co-led a collaborative group to identify issues, articulate restoration goals, and map potential restoration opportunities.
- Huckleberry management and monitoring: Compiled history of Mt. Hood huckleberry treatments through staff interviews. Information presented to Confederated Tribes of Grand Ronde. Developed a prospective working group including Forests, Tribes, researchers, retirees, partners, and others. (Collaborative project with W. WA Ecology)
- Assorted monitoring and consultation: Planning for prescribed fire in wilderness (Willamette NF); Vegetation recovery monitoring at Crowley Creek (Siuslaw NF); Jim's Creek Savanna post-treatment vegetation response with Univ. of Oregon (Willamette NF); wetlands consultation (Mt. Hood NF); RNA coordination and consultation (Mt. Hood NF).
- Regional Potential Natural Vegetation (PNV) mapping: Assisted in developing a process to create a consistent R6 PNV map.
- Collaboration with CCAMP: co-hosted (and presented) the workshop *Ecological, Economic and Social Objectives for managing stands over 80*

Products, Papers, Publications

- Presentations:
  - Western Oregon BLM Silviculture meeting: "Context for Silvicultural Regimes in Western Oregon: Natural Processes in Unmanaged Stands."
  - 2015 Western International Forest Disease Work Conference (keynote address): "Ecology of the Oregon Coast Range."
  - Marys Peak Alliance volunteer training: "Life on the Landscape: Ecosystems and Ecology of western Oregon and Marys Peak".
  - Ecological, Economic and Social Objectives for managing stands over 80: "Historical and Current Dynamics in West-side Forests" (with Matt Riley).
  - 2015 Annual Oregon Tribal Meeting: "Fire on the Landscape; Past, Present and Future Fire Regimes in western Oregon".
- Publications:
  - Acker, S. A., J. R. Boetsch, M. Bivin, L. Whiteaker, C. Cole, and T. Philippi. 2015. Recent tree mortality and recruitment in mature and old-growth forests in western Washington. Forest Ecology and Management 336: 109-118.
  - Acker, S.A., M.D. Tetreau, and D.W. Allen. 2014. Invasive plants in the Queets Valley, Olympic National Park: Former homesteads and surrounding watershed. Natural Resource Technical Report. NPS/OLYM/NRTR—2014/898. National Park Service. Fort Collins, Colorado. (Aug. 2014).
  - O'Halloran, T.L., S.A. Acker, V.M. Joerger, J. Kertis, and B.E. Law. 2014. Post-fire influences of snag attrition on albedo and radiative forcing. Geophysical Research Letters. 41, 9135–9142, doi:10.1002/2014GL062024 (Based on work at Charlton Fire).

Responding to Future Needs

The NW Oregon Ecology Group will continue to engage with our working group and Steering Committee to ensure that we deliver timely and relevant products and consultation. We anticipate progress on current projects including historical range of variability, riparian analysis and special habitats. We will continue to assist in Regional initiatives such as the new map of potential natural vegetation and the update of the DecAID analysis tool and website.

Regional Office

Program Priorities

- Provide leadership for the ecology program in the Region, in close consultation with Forest staff officers and Regional supervision
- Support to planning, particularly in the areas of landscape assessment, monitoring, and old-growth management
- Serve as an integral part of the Plan revision strategy teams for Ecological Sustainability, Monitoring, and Ecosystem Services
- Complete a new iteration of a Regional potential vegetation map, to serve as a framework for natural variation assessment and other planning applications
- Continue to implement ecosystem services approaches into project and Forest planning. In FY16 this will include completion of a template for integrating ecosystem services into project plans, and a detail with the Rocky Mountain Station to further our understanding of how best to integrate ecosystem services into Forest planning
- Contribute to the climate change vulnerability assessments for the Gifford Pinchot and Deschutes-Ochoco National Forests
- Continue with legacy data rescue and making range monitoring and other data available on line as a support to planning

Regional Office Ecology Program Team

Thomas DeMeo, PhD

Nikola Smith

Dillilai Rekemsik (student intern)

Guillermo Gamino-Barron (student intern)

Accomplishments

- Publication of a new iteration of departure estimates as a tool for restoration prioritization, in cooperation with The Nature Conservancy. This will soon be followed by further refinement using more recent data, and completing the assessment to include the entire Region.
- Support for monitoring efforts of the Collaborative Landscape projects. This has led to coordination and consistency in the monitoring approaches among the projects, documented in two white papers published by the Northwest Fire Science Consortium.
- Supported the Colville Forest Plan Revision in the areas of natural range of variation assessment and potential vegetation
- Ongoing ecosystem services assessments for the Rogue River-Siskiyou National Forest, Shasta-Agness area, and the Applegate Management Area.

- Working with the Eugene Water and Electric Board and the Willamette National Forest on better management of the McKenzie River Watershed

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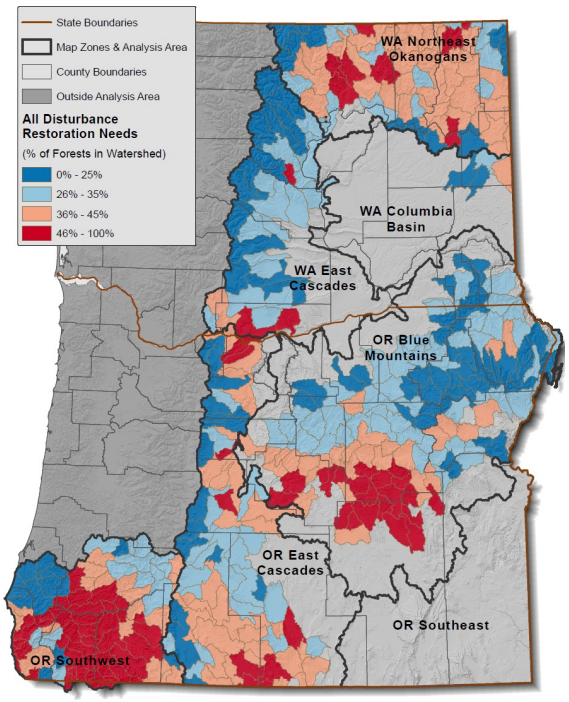

We completed a new departure assessment for the Region in cooperation with The Nature Conservancy, GIS programmer Chris Ringo, and field ecologists. This has been followed up by a more refined effort with more recent data to complete the map for the Region.

Products, Papers, Publications

DeMeo, T., A.Markus, B.Bormann, and J. Leingang. 2015. Tracking progress: The monitoring process used in Collaborative Forest Landscape Monitoring Projects in the Pacific Northwest. Eugene, OR: Ecosystem Workforce Program Working Paper No. 54, 20 pp.

Markus, A., E.J. Davis, T. DeMeo, and B. Bormann, with many others. 2015. Lakeview Collaborative Forest Landscape (CFLR) Project monitoring plan. Eugene, OR: Ecosystem Workforce Program Working Paper No. 59, 60 pp.

Haugo, R., C .Zanger, T. DeMeo, C. Ringo, A. Shlisky, K. Blankenship , M. Simpson, K. Mellen-McLean , J. Kertis , and M. Stern. 2015. A new approach to evaluate forest structure restoration needs across Oregon and Washington, USA. Forest Ecology and Management 335: 37–50.

Annual ecology meeting, Southwest Oregon, October 2015