NORTHWEST OREGON ECOLOGY GROUP NEWSLETTER

Version 9.0
April 2010

The Northwest Oregon Ecology Group is an association of ecologists with a wide range of interests from the Mt. Hood, Siuslaw and Willamette National Forests, the Columbia River Gorge National Scenic Area, and the Eugene and Salem Bureau of Land Management Districts. The group works from local to regional scales to provide tools, assessments, and analyses for ecological issues for planning, managing and monitoring forest ecosystems in Northwest Oregon. Through their own efforts, and affiliation with ecologists with Oregon State University, University of Oregon, Oregon Department of Fish and Wildlife, and private consultants, they have developed products most resource managers use every day.

How much carbon could a woodchuck chuck if a woodchuck could chuck carbon? Maybe a carbon calculator could tell us!

Richard Hardt, Ecologist, Eugene BLM

Land management actions can contribute to changes in atmospheric greenhouse gas levels, which can affect global climate, but addressing effects of federal actions on greenhouse gas levels presents some unique challenges within the NEPA process. In January 2010, the Bureau of Land Management in Oregon/Washington (BLM OR/WA) issued guidance for analysis of greenhouse gas emissions and consideration of climate change in NEPA documents. The BLM OR/WA guidance addresses quantification of greenhouse gas emissions with several examples.

To facilitate this guidance, BLM OR/WA has developed carbon calculators to quantify the effects of timber harvest projects on carbon storage and emissions. These calculators address carbon storage in live trees, carbon storage in harvested wood, carbon emissions from slash treatment, and carbon emissions from timber harvest operations (e.g., vehicle and equipment use). The inputs required for the calculators are:

- stand total timber volume, current and post-treatment in 10-year increments, in cubic feet or board feet
- timber harvest volume, in cubic feet or board feet
- biomass consumed in slash treatment, in tons
- timber haul distance, in miles

The carbon calculations require broad assumptions and involve several low-precision estimates based on regional averages. However, quantification of effects on carbon storage and emissions, even at low precision, provides tremendous information on the net effect of timber harvest projects and the relative importance of different sources of carbon emissions. Several other carbon calculators are currently available on-line, and future products will help managers assess trade-offs with this complex issue.

Restoration of Montane Meadows in Western Oregon: Research and Adaptive Management at Bunchgrass Ridge, Willamette National Forest

Charles B. Halpern, Research Professor, University of Washington,
Cheryl Friesen, Science Liaison, WNF

In a mountain landscape dominated by forests, meadows of the western Cascades are highly prized for their many ecological and aesthetic values. Gradual loss of these grass- and forb-dominated ecosystems to tree encroachment has spurred growing interest in the factors contributing to invasions, the ecological consequences of habitat loss, and the potential for restoration through tree removal and prescribed fire. We are exploring these questions as part of an evolving program of research, education, and adaptive management at Bunchgrass Ridge, in the Willamette NF. Our studies reflect a decade of collaboration among University faculty and students, PNW station scientists, and natural resource managers and ecologists with the Willamette NF. Financial and logistical support has come from a diversity sources: Joint Fire Science Program, Willamette NF, Mazamas, Native Plant Society of Oregon, Washington Native Plant Society, NSF-LTER, Rocky Mtn. Elk Foundation, and the Confederated Tribes of the Grande Ronde.

We have designed our work as an integrated set of observational and experimental studies to explore:

- two centuries of conifer encroachment (primarily lodgepole pine and grand fir) and the factors contributing to the timing and spatial patterning of establishment
- the consequences of encroachment for biological diversity (loss of meadow species and their replacement by forest herbs)
- the potential for reemergence or recovery of meadow species from the soil seed bank
- the potential for restoration of meadow through tree removal with or without prescribed fire
- the conditions under which these treatments can lead to successful recovery
- the operational and ecological tradeoffs of different methods of slash disposal (broadcast vs. pile burning)

The centerpiece of our research is a restoration experiment designed with three replicates of three treatments randomly assigned to 1-ha (2.5 acre) experimental units. Treatments include (1) control: no harvest; (2) "unburned": tree removal, with slash piled and burned (leaving 90% of the ground surface unburned); and (3) "burned": tree removal with slash broadcast burned.

Logging and yarding were conducted on snow during winter (Jan/Feb 2006) and slash was burned in the fall. Vegetation plots established and sampled prior to logging are periodically revisited to measure changes in ground-surface conditions, soil properties, density of tree seedlings, and abundance of vascular plant species. An additional set of plots is used to monitor vegetation recovery and soils in the scars left by burn piles.

The early (3-yr) results of our studies point to positive, but somewhat differing, responses to the restoration treatments. They also illustrate some of the challenges and tradeoffs associated with different methods of slash removal:

- Broadcast burning led to significant exposure of mineral soil, yet ruderal species (both native and exotic) were uncommon in the vegetation, despite their prominence in the seed bank.
- Piling of slash resulted in little ground disturbance. Although burn scars covered only 10% of the ground surface, they were characterized by intensive heating of surface soils and no plant cover. Colonization by native species was rapid, however, aided by the tunneling and soil-mounding activities of gophers.
- Burning of slash piles can be an effective method of fuel reduction, but hand piling is labor intensive. On the other hand, if piles are kept dry, they can be burned during late fall/early winter when fire risk and containment costs are low. In contrast, broadcast burning is highly constrained by weather conditions, and fire risk and containment costs are much higher.
- Tree removal, with or without burning, appears to benefit meadow species at the expense of forest herbs. Meadow species have increased in cover and diversity in both treatments, while forest herbs have declined (particularly in burned treatments).
- Meadow species show strong potential for recovery across a broad range of initial forest structures. Even in areas that supported older forest (>100 yr) at the time of treatment, responses to tree removal have been positive.
- Recruitment of conifer seedlings has been low (particularly in unburned treatments). Most establishment has occurred along the edges of experimental treatments (near seed sources).

In combination, these trends suggest significant potential for restoration of invaded meadows through tree removal—with or without prescribed fire—even in areas that have been forested for more than a century. Clearly, we need to be cautious in extrapolating from short-term results; these systems are inherently dynamic and still recovering from major disturbance. We expect the results of these and future experiments at Bunchgrass Ridge to contribute to the conservation and restoration of montane meadows throughout the region.

2007 (year 1)

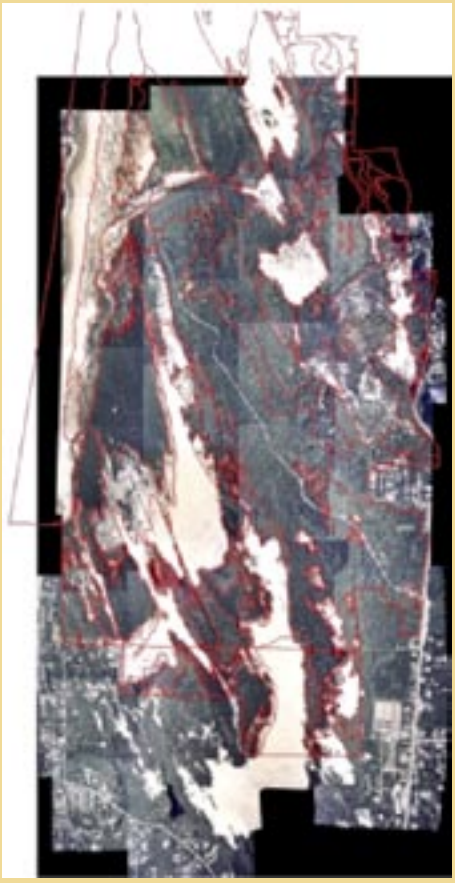
2009 (year 3)

A Day at the Beach: Partnering for Conservation at Heceta Dunes

Cindy McCain, Ecologist, Siuslaw and Willamette National Forests

Sometimes the sum is greater than the parts. This is especially true in the case of the Sutton Recreation Area, managed by the Siuslaw National Forest, and the Heceta Sand Dunes Area of Critical Environmental Concern (ACEC), managed by the Eugene Bureau of Land Management. Combined, the two management areas make up a continuous dune/coastal habitat rich in diversity and interest.

Sutton occurs at the north end of a 50-mile-long dune sheet that extends from Coos Bay on the south to Heceta Head on the north. Forty lineal miles of this dune sheet (31,500 acres) is part of the Oregon Dunes National Recreational Area. Immediately south of the Sutton Recreation Area is the 218-acre Heceta Sand Dunes ACEC.



These rich dunes contain plant associations, lichens, mosses and vascular plants of conservation concern, including large concentrations the shorepine / bearberry association, seashore blue grass / red fescue association, and rare mosses. Healthy stands of seashore blue grass and red fescue in several areas indicate that the overall Off Highway Vehicle (OHV) usage on the site remains relatively low and well-dispersed. Time to get to work to keep it that way!

NW Oregon Ecology Group members and GIS specialists have been collaborating to determine how to evaluate the current conditions and track future changes to the fragile vegetation. Special USFS low elevation aerial photography was used for locating plant communities, invasive species, and OHV impacts. John Christy, specialist in mosses and dune communities for the Oregon Natural Heritage Information Center, provided vegetation typing and location data. Eugene BLM GIS specialists assembled the GIS layer. Off road vehicle use, non-native invasion, and naturally occurring ecological changes are all being targeted for monitoring now that the base information has been compiled.

Where to go from here? The goal is to maintain healthy dune habitat far into the future, and recognizing existing values is the first step in a healthy partnership.

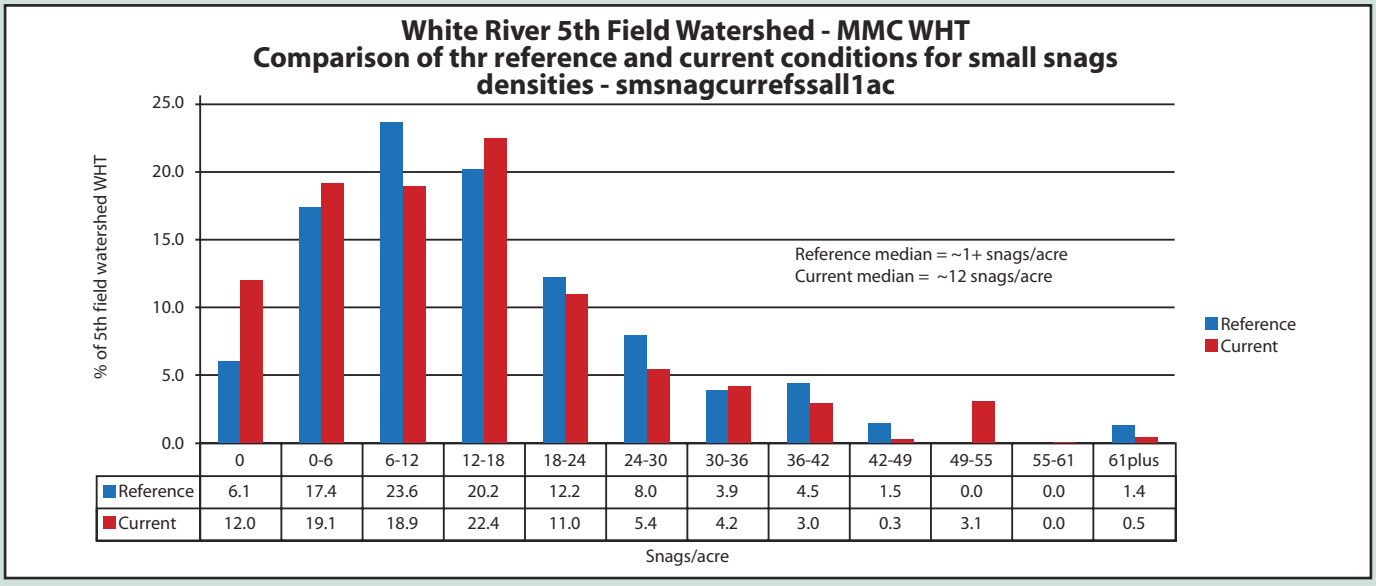
DecAID application in NW Oregon: Developing a forest strategy for snag and down wood management

Jeanne Rice, Ecologist, Mt. Hood National Forest,
and Cindy McCain, Ecologist, Willamette and Siuslaw NFs

On the Mt. Hood National Forest, a team of wildlife biologists led by ecologist Jeanne Rice, is developing a forest-wide strategy for deadwood management, and providing recommendations in preparation of the upcoming plan revision. The work will result in an inventory distribution and wildlife tolerance analysis (http://www.fs.fed.us/r6/nr/wildlife/decaid-guide/wildlife-tolerance-analysis-green-tree.shtml), leading to recommendations for management objectives for the next plan revision and a basis for development of deadwood prescriptions on projects. The Willamette National Forest is also working on this analysis.

The wildlife tolerance level analysis combined with the inventory distribution analysis will together be used to describe wildlife habitat conditions on the forest, leading to dead wood habitat objectives. Depending on management objectives, land allocation, capability of the site, local wildlife inventories and species trends, one can determine the appropriate level of habitat (i.e. tolerance level) that should be provided for dead wood- dependent species. While the inventory distribution analysis shows us the range of conditions across the landscape and the proportion of the landscape with high densities, the wildlife tolerance analysis shows what portion of the landscape currently meets wildlife needs for species being managed at various tolerance levels.

The process includes comparing current vegetation from remotely sensed data tied to the CVS/FIA plots (using Janet Ohmann's Gradient Nearest Neighbor - GNN coverage) to reference conditions using DecAid inventory data (unharvested plots). The GNN-derived current conditions for snags and logs have been summarized by DecAID Wildlife Habitat Type (WHTs) for NW Oregon's 5th field watersheds. FRCC seral stage refined the DecAid inventory data by providing reference distribution of seral stages. Where possible, the inventory data was also refined to plant series or subseries level to provide a more localized range of deadwood abundance. Areas of high density snag patches, fire polygon coverages and cumulative aerial detection mapping for insects and disease (already included in GNN) were used. This data is now available to NW Oregon forests.



	0	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-49	49-55	55-61	61plus
Reference	6.1	17.4	23.6	20.2	12.2	8.0	3.9	4.5	1.5	0.0	0.0	1.4
Current	12.0	19.1	18.9	22.4	11.0	5.4	4.2	3.0	0.3	3.1	0.0	0.5

The Interactions of Climate Change, Land Management Policies and Forest Succession on Fire Hazard and Ecosystem Trajectories in the Wildland-Urban interface

Bart Johnson, Univ. of Oregon, and Jane Kertis, Siuslaw and Willamette NF Ecologist

The NW Oregon Ecology group is working with scientists from University of Oregon, Oregon State University, PNW Research Station, and the R6 Regional Office to model interactions and feedbacks between human and biological systems under the influences of climate change and human population growth in the Willamette Valley and low foothills. By modifying the current potential vegetation types and VDDT modeling from the IMAP project and linking them with climate change (MC1) and fire (FlamMap) models, we hope to predict vegetation change through time. We'll then couple this information with a human systems model that parameterizes people's likely responses to climate change, land use regulation and incentives, land markets, perceived fire hazard, land management costs, and aesthetic preferences. The project is in the first year of a four year National Science Foundation Grant cycle. This pilot project will help the Region to develop a protocol to link our vegetation models to climate change projections.

What happens after it burns? Torrey/Charlton RNA and Charlton Fire post-wildfire monitoring

Jane Kertis, Ecologist, Siuslaw and Willamette National Forests

What happens to a forest after a fire? Dr. Klaus Puettmann (OSU) has been quoted as saying "after the fire is before the fire." We tend to forget our forests are on a continuum of change. At the Torrey/Charlton Research Natural Area, ecologists have been watching a slice of post-fire change since a wildfire swept the area in 1996. Monitoring of vegetation recovery in Torrey Lake Mire and the changes to snag and down wood patterns 10 years post-fire will make a significant contribution to our understanding of dynamics post-fire dynamics in the absence of salvage logging. The product is expected later this year.

Tree Invasion of Meadows at Jefferson Park: Complex Multi-scale Controls

Harold Zald, Postdoctoral Research Associate, Oregon State University,
and Cheryl Friesen, Science Liaison, WNF

Subalpine Parkland (also referred to as timberline, and the forest tundra ecotone), is the transitional area between forest and alpine biomes. In the Oregon Cascades, subalpine parklands such as Jefferson Park are a small part of the overall landscape, largely restricted to high elevations associated with Mount Hood, Mount Jefferson, and the Three Sisters. Throughout the Pacific Northwest, evidence indicates climate change may result in tree invasion of these areas, which could negatively impact the biodiversity of these sensitive landscapes, as well as alter the scenic beauty which makes them so popular for recreation. For these reasons it is important for inventory, monitoring, and increased understanding of future potential changes. With funding and additional support provided by the Forest Inventory and Analysis Program, PNW Research Station, Oregon State University, and the Willamette NF, this study examined spatial patterns of historical tree invasion, and its underlying climatic, topographic, and biotic controls in Jefferson Park.

Results of this study suggest Jefferson Park was dominated by alpine vegetation in 1600, with gradual tree encroachment into meadows from 1600 to the 1920's. Since the 1920's, there has been rapid encroachment of the meadows, coinciding with: increased regional and northern hemisphere temperatures, declines and cessation of livestock grazing, and a massive debris flow within Jefferson Park in 1934. Over the past five decades, both the extent and spatial patterns of tree invasion in Jefferson Park meadows have been shaped by a hierarchy of climatic, topographic, and biotic controls. Tree invasion has been greatest during periods with reduced annual snowfall, but this relationship between tree invasion and climate is decoupled on debris flows, which have seen rapid invasion rates compared to the rest of Jefferson Park. Tree invasion is also spatially constrained at fine spatial scales by topographic and biotic factors, with increased tree invasion on sites with high topographic positions and close proximity to overstory trees, both of which reduce summer snow depth and persistence.

Despite large areas of Jefferson Park having experienced tree invasion over the past 50 decades, tree invasion is largely absent from low lying areas, suggesting more hydric sites may be resistant to tree invasion in the future. The interactions of climate, landforms, and fine scale site suitability highlight the variability of subalpine parklands, where landscape context may be more important than large regional climate trends.

Jefferson Park, with Mount Jefferson in the upper left

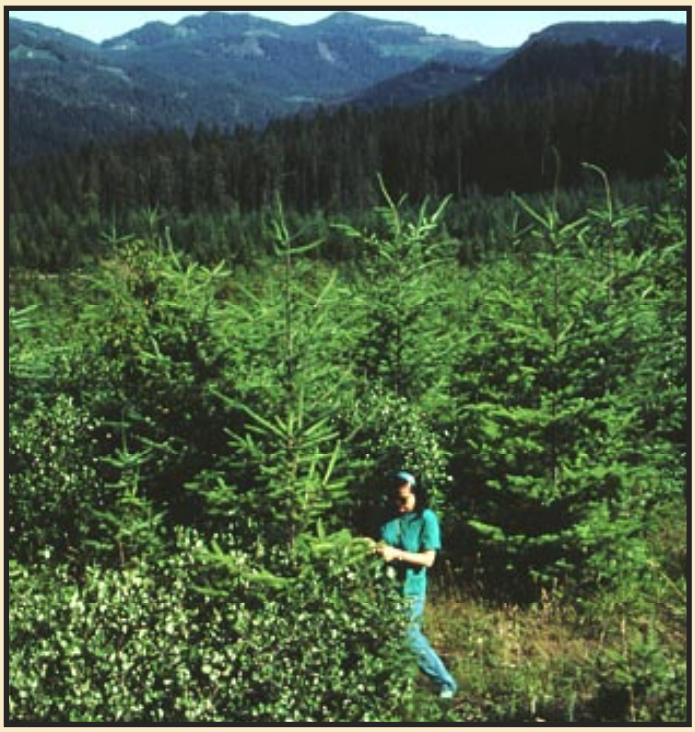
1934 debris flow in Jefferson Park with extensive mountain hemlock establishment

A BUSY YEAR FOR CENTRAL CASCADES ADAPTIVE MANAGEMENT PARTNERSHIP: APPLIED ECOLOGY DELIVERED!

Cheryl Friesen and Norm Michaels, Willamette National Forest

The Willamette National Forest, H.J. Andrews Experimental Forest, Eugene BLM, PNW Research Station, and Oregon State University collaborate to provide the best available science to the field practitioner, and to keep our science providers tied in to management challenges. We deliver topical workshops, do technology transfer, compile technical information for issues of interest, coordinate new studies, and look for answers in on-going research projects.

This past year we have focused on making science more accessible for specific management issues. If your NEPA would be strengthened by adding the best available science on thinning and dead wood management, thinning in older stands, or the state of the knowledge on gaps in commercial thins, we have compiled information especially for you. You can find synthesis papers on these issues at http://fsweb.edc2.r6.fs.fed.us/nr/sil/sil.htm).



Upcoming Workshops of Interest

Contact Cheryl Friesen, CCAMP, for more Information (cfriesen@fs.fed.us)

Early Seral Forest. April 28, 2010.
LaSells Stewart Center, Corvallis

Streamwood. May 13, 2010.
Willamette National Forest Headquarters, Springfield

Plant Association Training.
May 5-6 (Siuslaw NF);
May 19–20 (Willamette NF);
May 25-26 (Siuslaw NF)

Contact Information for the Northwest Oregon Ecology Group:

Cindy McCain, Ecologist,
Siuslaw and Willamette National Forests
E-mail: cmccain@fs.fed.us
Phone: 541-750-7050

Jane Kertis, Ecologist,
Siuslaw and Willamette National Forests
E-mail: jkertis@fs.fed.us
Phone: 541-750-7192

Jeanne Rice, Ecologist,
Mt. Hood National Forest
E-mail: jrice@fs.fed.us
Phone: 503-668-1668

Hugh Snook, Ecologist,
Marys Peak Resource Area, Salem District BLM
E-mail: hugh_snook@or.blm.gov
Phone: 503-315-5964

Barbara Raible, Cascades Resource Area Ecologist,
Salem District BLM
E-mail: barbara_raible@or.blm.gov
Phone: 503-375-5622

Nancy Sawtelle, Plant Ecologist and
Senior Staff Botanist,
Eugene District BLM
E-mail: nancy_wogen@or.blm.gov
Phone: 541-683-6600

Robin Dobson, Botanist/Ecologist,
Columbia River Gorge National Scenic Area,
Hood River, OR
E-mail: rdobson@fs.fed.us
Phone: 541-308-1706

Cheryl Ann Friesen, Science Liason,
Willamette National Forest and
Central Cascades Adaptive Management Partnership,
E-mail:cfriesen@fs.fed.us
Phone: 541-822-7226

Jennifer Lippert, Forest Botanist,
Willamette National Forest
E-mail: jlippert@fs.fed.us
Phone: 541-465-6440

Mark Stephen, Forest Ecologist,
Eugene BLM District
E-mail: mark_stephen@or.blm.gov
Phone: 541-683-6600

Richard Hardt, Ecologist,
Eugene BLM District
E-mail: rhardt@blm.gov
Phone: 541-683-6000

The Northwest Oregon Ecology Group relies on a variety of professionals throughout the area to support their activities. The following ecologists and biologists also contribute to the program.

Linda Geiser, Lichenologist and Air Quality Specialist,
Siuslaw National Forest.
Specialty: Lichens.

Tom O'Neil, Ecologist,
Northwest Habitat Institute.
Specialties: Oak restoration, wildlife habitat,
and biodiversity data management.

John Christy, Ecologist,
Oregon Natural Heritage Information Center.
Specialties: Wetland ecology and mosses.

Fred Hall, Plant Ecologist,
Specialty: Special Habitats.

Walt Kastner, Silviculturist,
Siulslaw National Forest.
Specialty: Tree diseases.

Dave DeMoss, Silviculturist,
Eugene BLM.
Specialty: Forest Ecology.

Allison Reger, Analyst,
Willamette National Forest.
Specialties: VDDT modeling, and landscape analysis.

Norm Michaels, Forest Silviculturist,
Willamette National Forest.
Specialties: VDDT, and forest ecology.

Stu Johnston, Forest Silviculturist,
Siuslaw National Forest.
Specialties: Forest Vegetation Simulation (FVS) modeling.