



NORTHWEST OREGON ECOLOGY GROUP NEWSLETTER

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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)

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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,
Siuslaw 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.