



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, University of Washington, and private consultants, they have developed products most resource managers use every day.



Forest Dynamics After The Warner Fire

Martin Brown, Private Consultant; Jane Kertis, Ecologist, Siuslaw and Willamette National Forests; and Mark Huff, USDI Park Service

We monitored coarse woody debris dynamics and natural tree regeneration over 14 years following the Warner Creek fire, a 3631 hectare mixed-severity fire in the western Cascade Range of Oregon. Rates for tree mortality in the fire, post-fire mortality, snag fall, and snag fragmentation all showed distinct patterns by tree diameter and species, with Douglas-fir (*Pseudotsuga menziesii*) more likely to survive a fire, and to remain standing as a snag, than other common tree species. Natural seedling regeneration was abundant, rapid and highly variable in space. Densities of seedlings >10 cm height at 14 years postfire ranged from 1530 to 392,000 per hectare. Seedling establishment was not concentrated in a single year, and did not appear to be limited by the abundant growth of shrubs. The simultaneous processes of mortality, snag fall, and tree regeneration increased the variety of many measures of forest structure. The singular event of the fire has increased the structural diversity of the landscape. We hope to have a publication out later this year.

New Forests Growing and Older Forests Getting More Diverse at Warner Fire



1998



2005



Gopher Disturbance and Plant Community Dynamics In Montane Meadows

Madelon Case, Princeton University in collaboration with Charlie Halpern,
University of Washington and the Willamette National Forest



Pocket gophers (Geomyidae) are common agents of disturbance in grasslands throughout North America. By depositing excavated soil on the ground surface, they bury existing plants and initiate succession, potentially influencing community structure by favoring species that are less competitive but more tolerant of disturbance. Mazama pocket gophers (*Thomomys mazama*) are active in mountain meadows of the Pacific Northwest, but we know relatively little about their effects on meadow communities. For my senior thesis, I investigated the relationships between gopher disturbance and plant community structure in meadows at Bunchgrass Ridge, Oregon, building on previous studies of gopher-plant interactions in this system.

Gophers are active year-round, even under a deep winter snow pack. This results in two distinct forms of disturbance. During summer and fall, gophers excavate soil from tunnels to create mounds. During winter, they also tunnel into the snow or at the snow-soil interface and fill these tunnels with excavated soil. When the snow melts in the spring, it leaves raised tubes or “castings” on the soil surface. Effects of plant burial by mounds have been widely studied, but



Old and fresh gopher mounds.



Gopher castings emerging from snow.

castings are a unique feature of higher-elevation grasslands and have not been considered. In this study, I evaluated the contributions of both forms of disturbance to plant community patterns, focusing on relationships between degree of disturbance (cover of mounds and/or castings) and various community attributes, including cover of forbs and graminoids, species richness, and heterogeneity (spatial variability) of species composition. In each of four plots in meadows of differing composition, I sampled 20, 5-m transects for cover and richness of plant species and cover of mounds and castings.

Among transects, the average cover of mounds and castings ranged from 0% to as high as 40% (castings) or 50% (mounds). Total plant cover declined with disturbance (Fig 1). Both mounds and castings contributed to this decline, but had differing effects on forbs and graminoids. Mounds benefited forbs relative to graminoids by reducing graminoid cover to a greater extent. However, graminoid responses to castings were more variable: relationships were negative in three plots but neutral/positive in one plot. This variability may reflect differences among plots in the abundance of grass species with differing regenerative traits or sensitivities to disturbance. Effects of castings may also be less consistent than those of mounds because castings are smaller, less dense, and more ephemeral. Mounds and castings also had differing effects on species richness and heterogeneity of species composition. Richness increased significantly with cover of castings, but not mounds; heterogeneity increased with cover of mounds, but not castings. However, both richness and heterogeneity increased with total disturbance (summed cover of mounds and castings; Fig. 1).

This study contributes to our understanding of the dynamics of montane meadow communities in two notable ways. First, it documents for the first time the distribution and abundance of castings and their effects on plant community structure. Second, it describes the consequences of gopher disturbance for community patterns at spatial scales considerably larger (5-20 m) than previously studied (individual mounds). Gophers play critical

roles in these disturbance-dependent systems, contributing positively to biological diversity, facilitating the persistence of less competitive species, and enhancing the spatial heterogeneity of species composition.

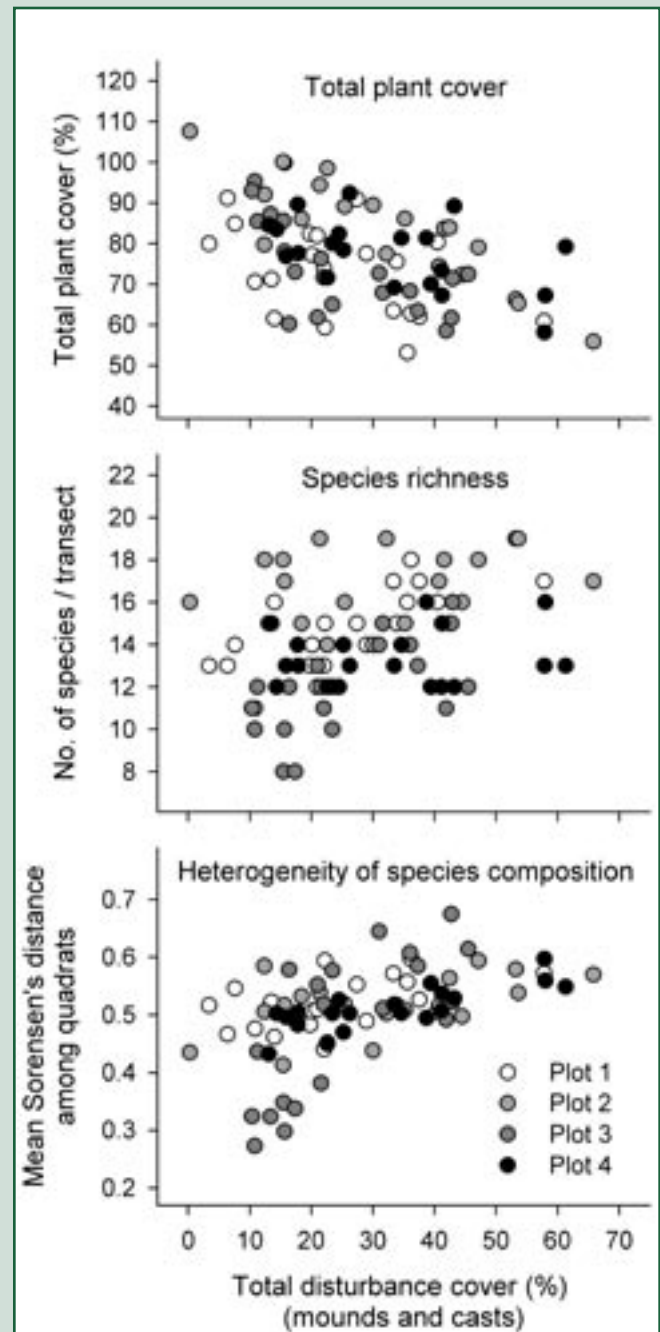


Fig. 1 Relationships between total disturbance (cover of gopher mounds and castings) and meadow community characteristics. Each of four plots was sampled with 20 transects.

Climate Change on the Mount Hood National Forest

Jeanne Rice, Ecologist

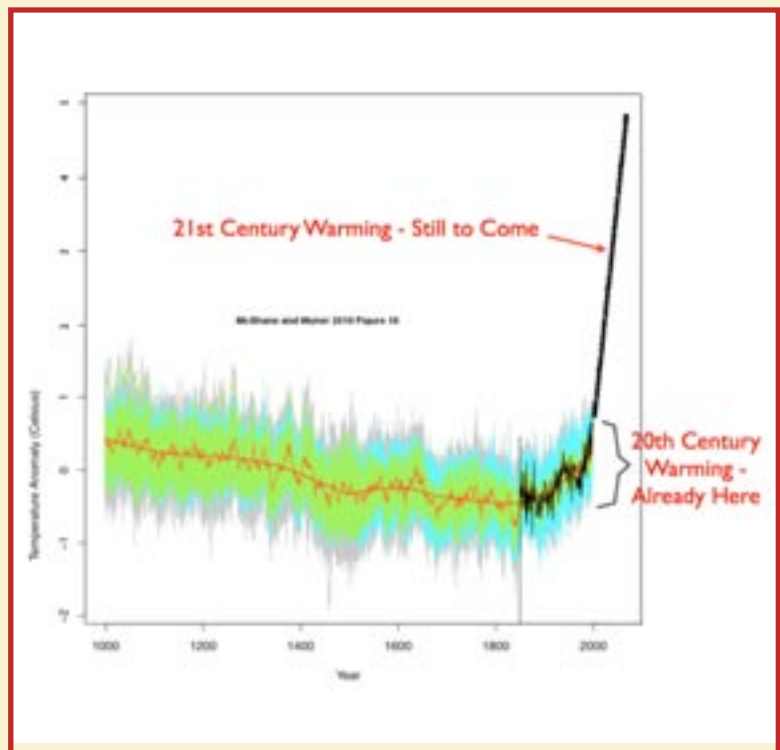
Every National Forest has been tasked with increasing awareness and creating plans for adaptation to climate change. Below is an example of work being done on the Mt. Hood National Forest. Other Forests in the NWO Ecology are engaged in similar activity, and the ecologists are often taking the lead.

Climate Literacy:

- We developed climate change resource links and posted them to Mount Hood National Forest intranet. This included links to primary sources of climate change information for the PNW and basic climate change information (CIG, CCRC, WWETAC, NOAA, OCCRI, EcoShare); climate change impacts by resource area, FS role and strategies, Management approaches to climate change (adaptation, mitigation, incorporating climate considerations), climate models & tools, and assessments (OR, WA, Vulnerability and Carbon).
- We provided a resource list of Sustainable Operations links for employee education, including links to county (Clackamas, Wasco, Hood River) and Portland metro programs for reducing environmental footprint, local recycling centers, and FS Sustainable Operations website.
- We launched the “Sustainable You” Challenge in April. This is a year-long incentive program and a voluntary way for employees to learn about how to reduce their environmental footprint at home and work. Besides having the potential to earn a day-off award, employees can benefit in saving money at home by implementing some of the practices.
- We finalized an Employee Engagement & Communication strategy, which includes action items to engage employees in learning about climate change.
- We delivered a “Zero Waste” presentation to the leadership team. Jeanne Rice attended a University of Oregon Sustainability Leadership Program on Zero Waste approach to reducing the agency’s environmental footprint. She presented the information emphasizing the “prevention” approach to reducing waste. This more holistic approach to sustainable operations should provide greater gains in reducing our environmental footprint than a focus on recycling.

Climate Strategies:

- We participated in the development of the Integrated Restoration Strategy for the Mount Hood. This is new approach is an integrated landscape-level prioritization strategy for multiple resources tied to ecological restoration and sustainability. We then filter the results through a socioeconomic filter, which brings in all the public and stakeholder values, priorities, and concerns. The IRS will provide a synthesis of the ecologically-based strategies already on the Forest and look at the integration and interrelationships of these strategies for a broad multi-resource application. The synthesis process will also incorporate climate considerations up front. The intent of the IRS is to inform out-year program of work, provide context to project-level planning, manage for resilience & sustainability in the face of uncertainty, and prepare for Forest Plan revision.



Bringing Social Science into the Mix

Cheryl Friesen, Science Liaison, Willamette National Forest Service

As ecologists, we've long been fans of studying trees and bugs and dirt and all things related to ecological processes. The bottom line of defining "success" in natural resource management, however, is often tied to the human dimensions of an issue. What do the people think. We've been expanding our Central Cascades Adaptive Management Program to integrate more social sciences into our program delivery. In February 2012, we sponsored a workshop on collaboration, including nationally recognized scientists Dr.'s Steve Daniels with Utah State University and Gregg Walker with OSU. Over 80 people were exposed to methods for evaluating collaborative potential for controversial issues and how to determine appropriate communication strategies. Testimonials were provided by The Nature Conservancy, the Small Log Network, and processes used by the Inyo National Forest for determining minimum road networks. It was an interesting couple days of activities and thinking outside of our usual boxes.

We've also coordinated the development of a collaborative potential assessment for the Forest with Cassandra Mosely from the University of Oregon. Her effort will answer

questions like what are the issues that are most ripe for collaborative efforts, and who out there has capacity to be involved?

We're also excited to be working with a graduate student at OSU to explore "cultural shifts" in the Willamette National Forest over the past 20 years. A lot has happened since Dr. Eric Forsman found the spotted owl at the H.J. Andrews Experimental Forest. Zachary Bolick, working with Dr. Denise Lach, will walk in the footsteps of our past.



Watch the CCAMP website for postings of these and other projects. <http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/>

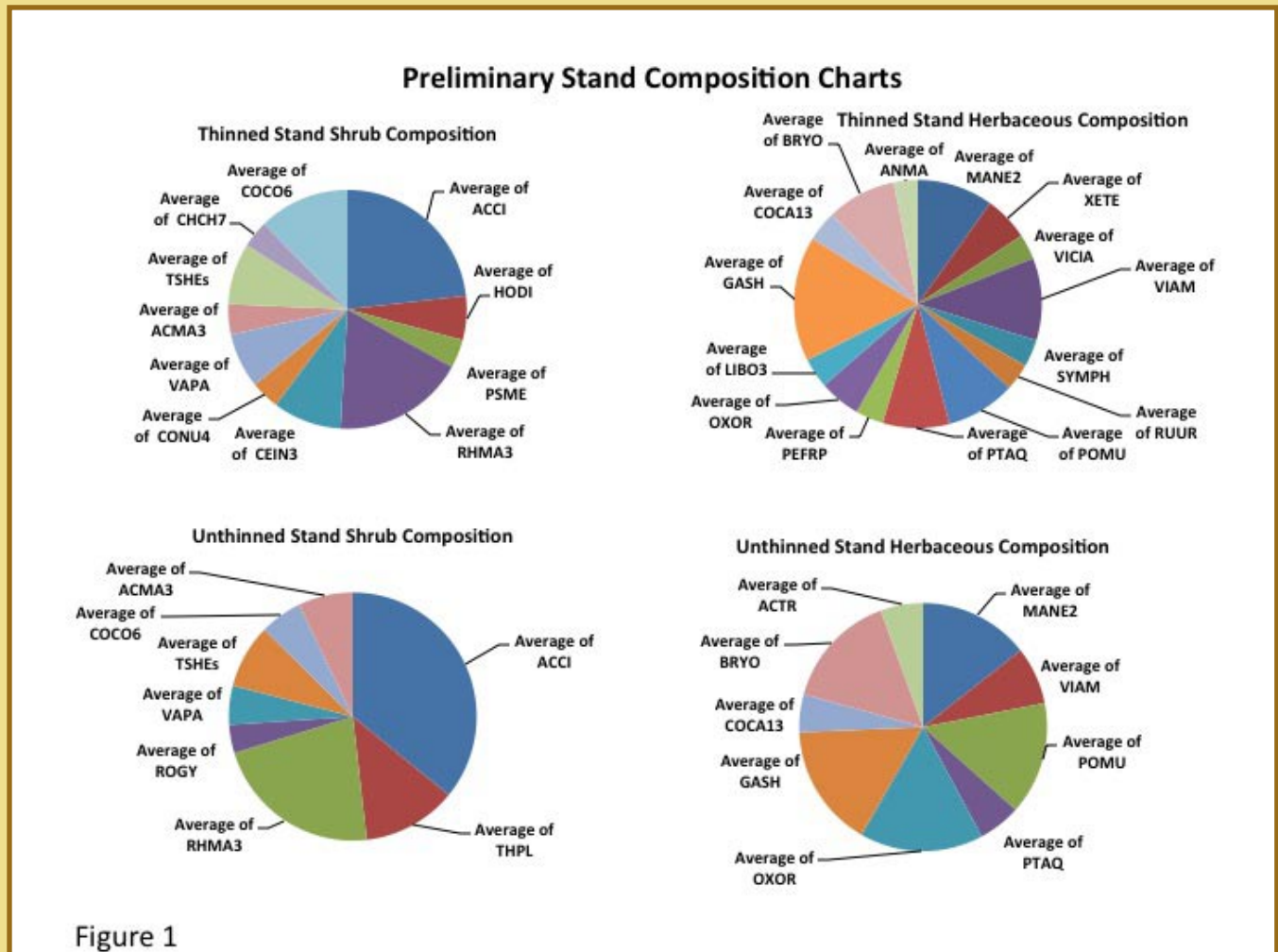


Understory Response to Thinning in Stands Over 80 ...What do we know?

Cheryl Friesen, Science Liaison, Willamette National Forest Service

Several years ago, we compiled a synthesis of science related to response of older forests to thinning (<http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/synthesis-papers/>). What we found was that little information had been collected over time on understory response. The vast majority of studies investigated how residual overstory conifer trees were released or were focused on younger stands. To fill that void, we sponsored an OSU Master's student, William Pollock, working with Dr. John Bailey, to find some answers. He spent the summer of 2011 measuring plots in stands

80-135 years of age on the Willamette National Forest. Though the analysis is ongoing and his thesis won't be completed until the end of this summer, there are a few interesting findings so far. The study showed that vine maple (*Acer circinatum*, ACCI) appeared to be an indicator of the unthinned group, while the indicator species for the thinned group are bracken fern (*Pteridium aquilinum*), western twin-flower (*Linnaea borealis*, snowberry (*Symphoricarpos Dubam*), and Douglas-fir (*Pseudotsuga menzeisii*). The Figures below compare the relative abundance. Watch for the publication on the CCAMP website.



High Elevation Plant Communities: Describing What's Under The Snow!

Cindy McCain, Ecologist, Willamette and Siuslaw National Forests



1 Subalpine cold meadow: Partridge foot community

A non-forest plant community guide for the Willamette, Mount Hood, and Cascade crest Deschutes NFs will be available next winter on Ecoshare (<http://ecoshare.info/>). A collaboration between NW Oregon ecologist Cindy McCain and UW researcher Dr. Charles Halpern, this set of 62 community descriptions brings together data from Mount Hood, Mount Jefferson Wilderness, Three Sisters Wilderness, and montane meadows in the Cascades. "Some of the plots date back to the 1960's," notes Cindy McCain. "Sorting through



2 Map of Mt. Hood NF plots

the beautiful pictures to choose the ones that represent each plant community was a highlight for my year."

Each community description includes species composition, environmental conditions, soils information, plot location map, and pictures to illustrate the most common non-forest habitats in our montane, subalpine, and alpine zones.



3 Former regional ecologist Fred Hall in the Three Sisters Wilderness: Black sedge (fan-leaved cinquefoil phase) community



4 Subalpine wet meadow: Mountain sedge-Few-flowered spikerush community

EVENTS AND WORKSHOPS

HJ Andrews Day.

June 28, 2012

A field day emphasizing current science of natural resource management.

See website for more info and to register

<http://andrewsforest.oregonstate.edu/new/hjaday/hjaday.cfm>

Best Available Science: Thinning in Riparian Reserves.

Oct. 30, 2012

A day of learning and discussion around managing forests in NWFP riparian reserves.

Contact Cheryl Friesen for more information cfriesen@fs.fed.us

Landscape Ecology and Management.

Modeling, visualization, analytical frameworks.

Jan or Feb 2013

Contact Cheryl Friesen for more information cfriesen@fs.fed.us

Synthesis Documents Available

<http://ecoshare.info/projects/central-cascade-adaptive-management-partnership/synthesis-papers/>

Best Available Science -- Thinning and Dead Wood

Best Available Science -- Thinning Response Varies By Stand Age

Best Available Science -- Gaps

Carbon Storage on the Willamette National Forest

Coming soon! Best Available Science -- Early Seral Forest

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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.

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

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

Laura Brophy, Estuarine Biologist,
Director, Estuary Technical Group, Institute for Applied Ecology.
Specialties: Wetland ecology.

Dirk Shupe, Fire Planner,
Willamette National Forest.
Specialties: Fire behavior modeling, landscape planning.

Marty Stein, Botanist,
Siuslaw National Forest.
Specialties: Invasive species management, dunes vegetation.

