NORTHWEST OREGON ECOLOGY GROUP NEWSLETTER

Version 14.0
April 2015

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.

Consequences of limited light availability on flower production of meadow communities in the Pacific Northwest USA

Jessica Celis, MS Student, School of Forestry, Oregon State University

This part of my Master's research addresses the relationships between reduction in light availability during encroachment and flower production in meadow species.

As trees establish and canopies close, meadow forbs and grasses are gradually replaced by forest understory plants. This has consequences not only for the community of meadow plants, but for the pollinator networks that rely on the nectar and pollen provided by these species. From previous research we know that some meadow species can survive encroachment for decades, although abundance can be greatly reduced. However, we know very little about the effects on flower production. During summer 2014, I quantified flower production in meadow species across a wide gradient of conifer encroachment (open meadow to closed forest) in two forest-meadow complexes on the Willamette National Forest: Bunchgrass Ridge (BG) and Frissel Meadows (H.J. Andrews Experimental Forest on the Willamette NF). Sites were visited 2-3 times over the growing season to capture maximum flower production among species of differing phenology. At 475 locations representing open to closed-canopy conditions I used quadrats to estimate the density of flowers (number of flowers/one percent cover) of each meadow species. Above each quadrat I also took a hemispherical photograph from which I estimated light availability as a proxy for encroachment. For each species, and for the full community of species, I then developed models of maximum flower production (adjusted for species' cover) as a function of total transmitted light (%).

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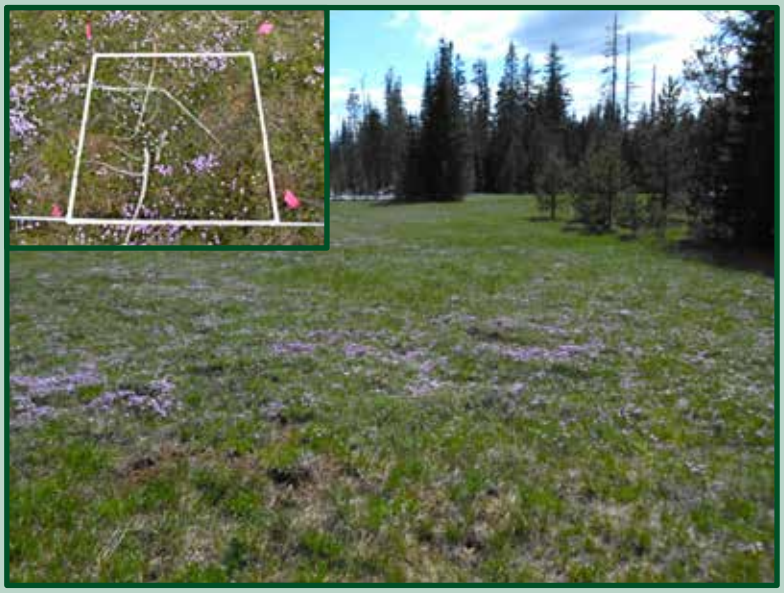

Phlox diffusa in peak bloom at Bunchgrass Ridge (inset photo is a sampling quadrat).

Eriophyllum lanatum (yellow) and *Cerastium arvense* (white) color Frissell Meadow (insert photo is a sampling quadrat).

(continued from page #5)

At both sites, flower production declined exponentially with decreasing light. With a 10% reduction in light there was a 21% and 36% decrease in flowering density at HJA and BG (see figure). These relationships are consistent with a large body of research that examines the effects of shading on flower and seed production. Here, encroachment dramatically reduces not only the abundance of species, but their ability to flower. The large reduction in flowering, even with a small reduction in light, has important implications for seed production and the diverse communities of pollinators that rely on these species for nectar and pollen resources. Removing trees early in the encroachment process may be critical to sustaining these meadow-based pollinator networks.

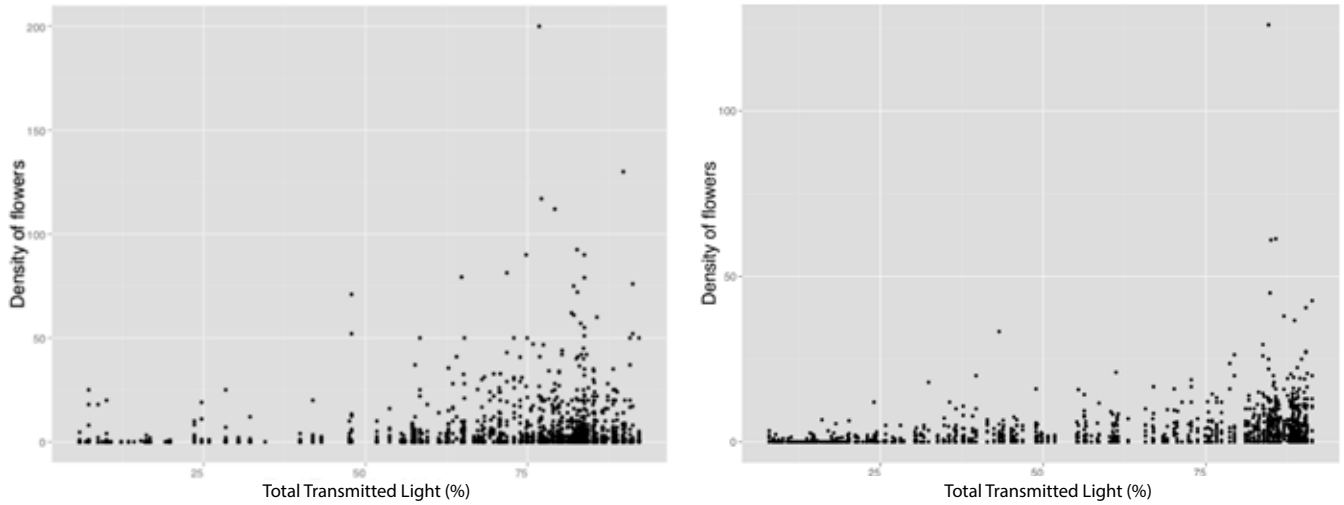

Figure 1: Change in total flowering density across the light gradient at HJA (left) and BG (right).

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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.

Brett Blundon, District Fisheries Biologist,
Eugene BLM.
Specialities: Stream Ecology.

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

Corbin Murphy, Wildlife Biologist,
Cascades Resource Area, Salem District BLM

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

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

Program Design: Alan Work, Mountain Hawk LLC, Graphic Design and Interpretive Services, www.mountainhawk.org