

# Tree Invasion and Mountain Meadows, the Story of Bunchgrass Ridge - Ryan Haugo

## Mountain Meadows and Tree Invasion

Meadows are small but unique habitats within the Pacific Northwest. Supporting a wide variety of species, meadows have long been valued for ecological, cultural and aesthetic reasons. However, these diverse habitats are being threatened by widespread tree invasion.

There are a range of possible causes including sheep/cattle grazing, wildfire suppression, and climate change. The specific cause of tree invasion is highly variable among locations, however, and is often the result of multiple factors.

## Consequences of Tree Invasion

One of my primary objectives has been to describe how the impact of tree invasion on meadow plants changes over time. To accomplish this I sampled the ground-layer vegetation beneath trees of varying ages at two different spatial scales – individual trees and 10x10m plots.

I found substantial declines in meadow vegetation within 20 years after trees first invaded. Surprisingly, lodgepole pine had only minimal effects on meadow vegetation compared to grand fir.



## Trees Helping Trees

While lodgepole pine may not directly impact meadows, it has played an important role in promoting invasion of grand fir.

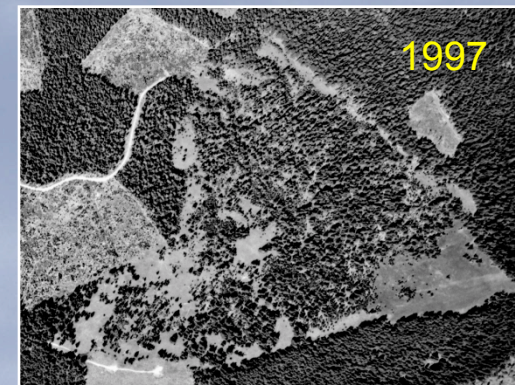
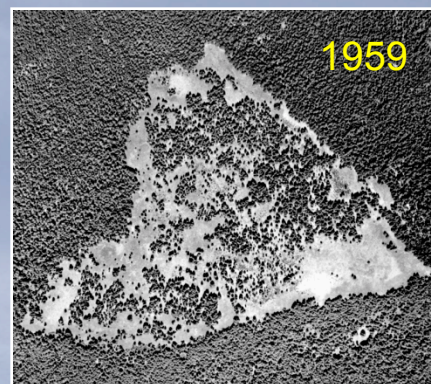


Examples of lodgepole pine facilitating grand fir directly beneath its canopy



## Study Site

Bunchgrass Ridge is a complex of dry, montane (~4200 ft elev.) meadows within the Western Cascades of central Oregon. During the past 150 years there has been substantial invasion by grand fir and lodgepole pine.



## Restoration Experiment

Bunchgrass Ridge is the first large scale study of mountain meadow restoration in the Pacific Northwest. Through removal of trees and use of prescribed fire, this study hopes to answer three main questions:

1. Is restoration possible?
2. Is fire necessary part of restoration?
3. How do initial conditions (i.e. tree age, density) affect the outcome?



After one year, tree removal appears to benefit meadow species. This was true with or without fire.

Although trends from the first year are promising, it will take several years to determine whether meadow restoration at Bunchgrass Ridge has been successful.

