

## AN ABSTRACT OF THE THESIS OF

Thais E. Perkins for the degree of Master of Science in Forest Science presented on December 11,2000. Title: The Spatial Distribution of Beaver (*Castor canadensis*) Impoundments and Effects on Plant Community Structure in the Lower Alsea Drainage of the Oregon Coast Range.

Stream systems in the Pacific Northwest have come to be understood in the absence of beaver (*Castor Canadensis*). To understand the effect of beaver upon riparian plant communities, four basins in the lower Alsea drainage were examined to determine the effect of beaver and their impoundments on streamside herbaceous/shrub and forest tree/shrub community composition. The forest tree/shrub transects were located from the water's edge perpendicular to the stream, so that transects included the streamside herbaceous/shrub communities. The streamside herb/shrub communities measured were restricted to the area before the forest understory communities began (the emergent and littoral zones). A comparison was made between beaver impoundments, impoundments caused by factors other than beaver (debris jams), and randomly located unimpounded sites. In the central Oregon Coast Range three sites of each type were chosen per basin in four basins. All sites were topographically similar, generally located in valley widths of 25-30m, on low gradients and streams 2-3m wide. I measured percent cover in the case of Herbs and shrubs, and counted individual trees >15cm dbh. The sites were analyzed using primarily multivariate techniques.

Streamside plant communities around beaver impoundments, consisting of the herbaceous and shrub communities, were different from those around unimpounded sites and debris dams. The differences were attributable to a graminoid-dominated emergent

zone present only at beaver impoundment sites, consisting largely of *Salix sitchensis*, *Juncus effuses*, *Typha latifolia*, *Callitriche heterophylla*, and *Lemna minor*. All communities were similar in richness. The communities at debris jam sites and unimpounded sites were not distinct from one another. Communities of the forest zone around beaver impoundments were not distinct from the communities at the other types of sites from the water's edge outward. At beaver impoundment sites, cover of the invasive *Phalaris arundinacea* was inversely correlated with species richness.

I also examined the effect of harvest pattern on impoundment presence. Seven basins in addition to the first four were chosen for presence of beaver and varying amounts of clearcut or young regenerating riparian forest and the relative percentages of stream length impounded in the different forest types calculated. Beaver impoundments were disproportionately associated with stream reaches flanked by clearcuts/young regenerating stands (80% of available reaches impounded by beaver) over forested reaches (29% impounded) within basins and were correlated over the landscape with basins possessing larger percentages of stream reaches flanked by clearcut/young regenerating stands ( $r^2=0.03$ ).

I conclude that beaver create a different, although simple, wetland community type that is not encountered elsewhere in the area and that beaver do not dramatically change the riparian forest tree/shrub communities from the water's edge outward. I also conclude that beaver impoundments are associated with reaches flanked by clearcuts/young regenerating stands in the area.