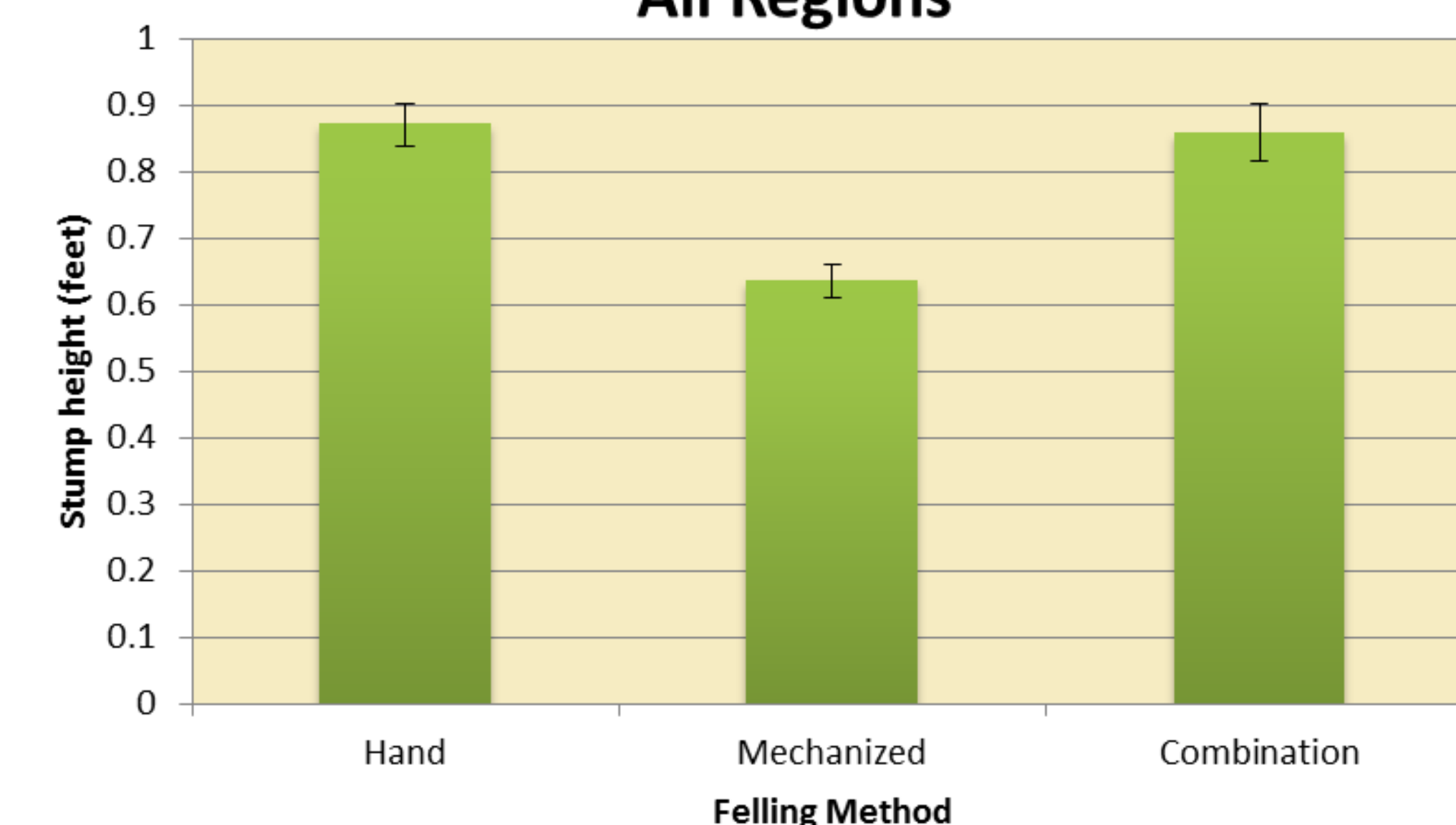


Eric A. Simmons, Erik C. Berg CF, Micah G. Scudder CF

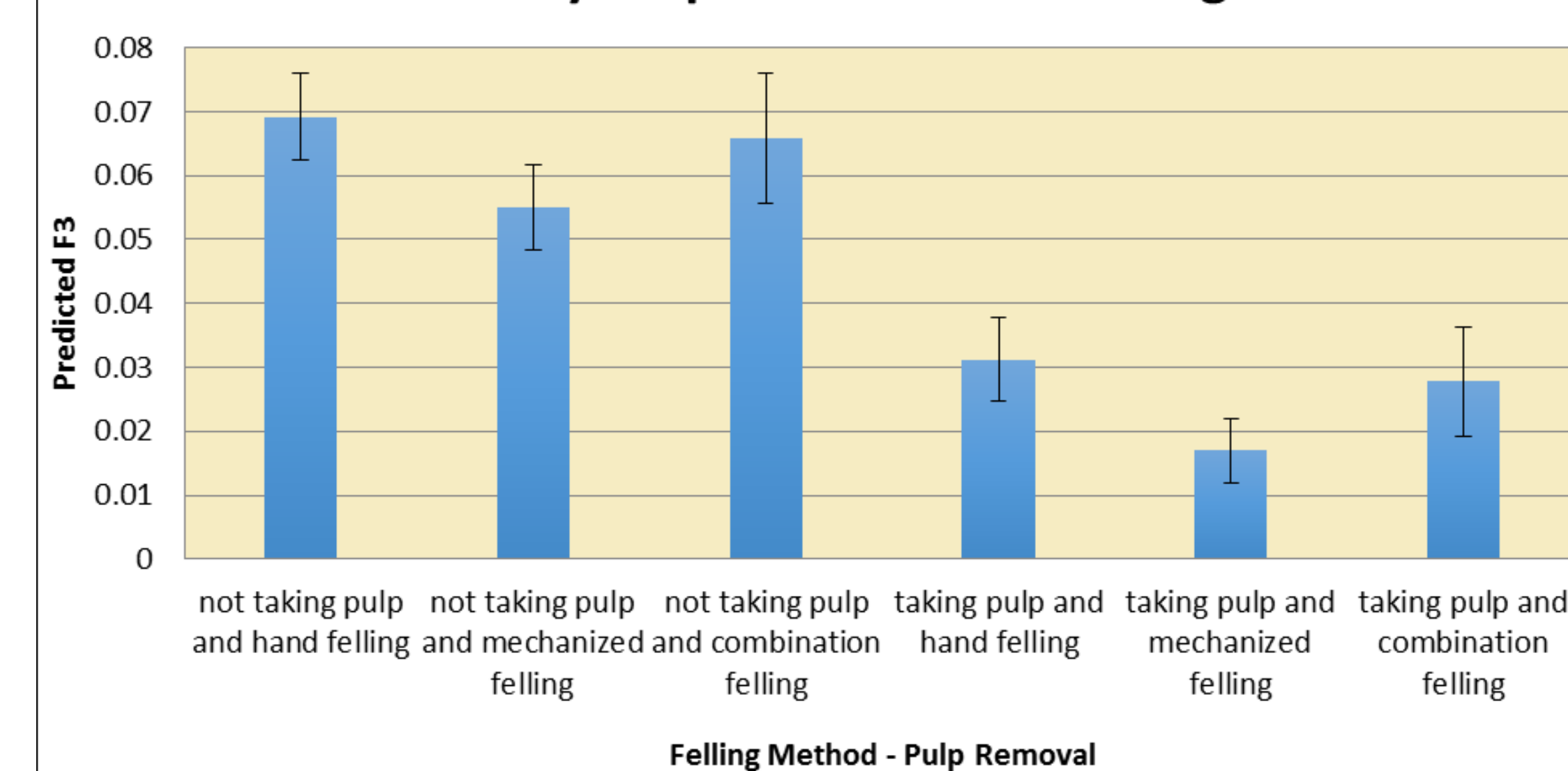
## Introduction:

Pacific Northwest forest land managers seek estimates of timber harvest woody residue volumes and biomass without the use of detailed inventory data. The logging utilization residue ratio, growing stock residue volume/mill delivered volume, can be applied to projected timber harvest volumes to estimate residue volumes without the use of tree list inventories at stand, landscape, and state levels. Research results characterize felled tree attributes such as residue and utilized volumes by tree section- from stump to tree tip. Bole, branch, and foliar biomass (i.e., non-growing stock portions of logging) residues can then be estimated with allometric equations.

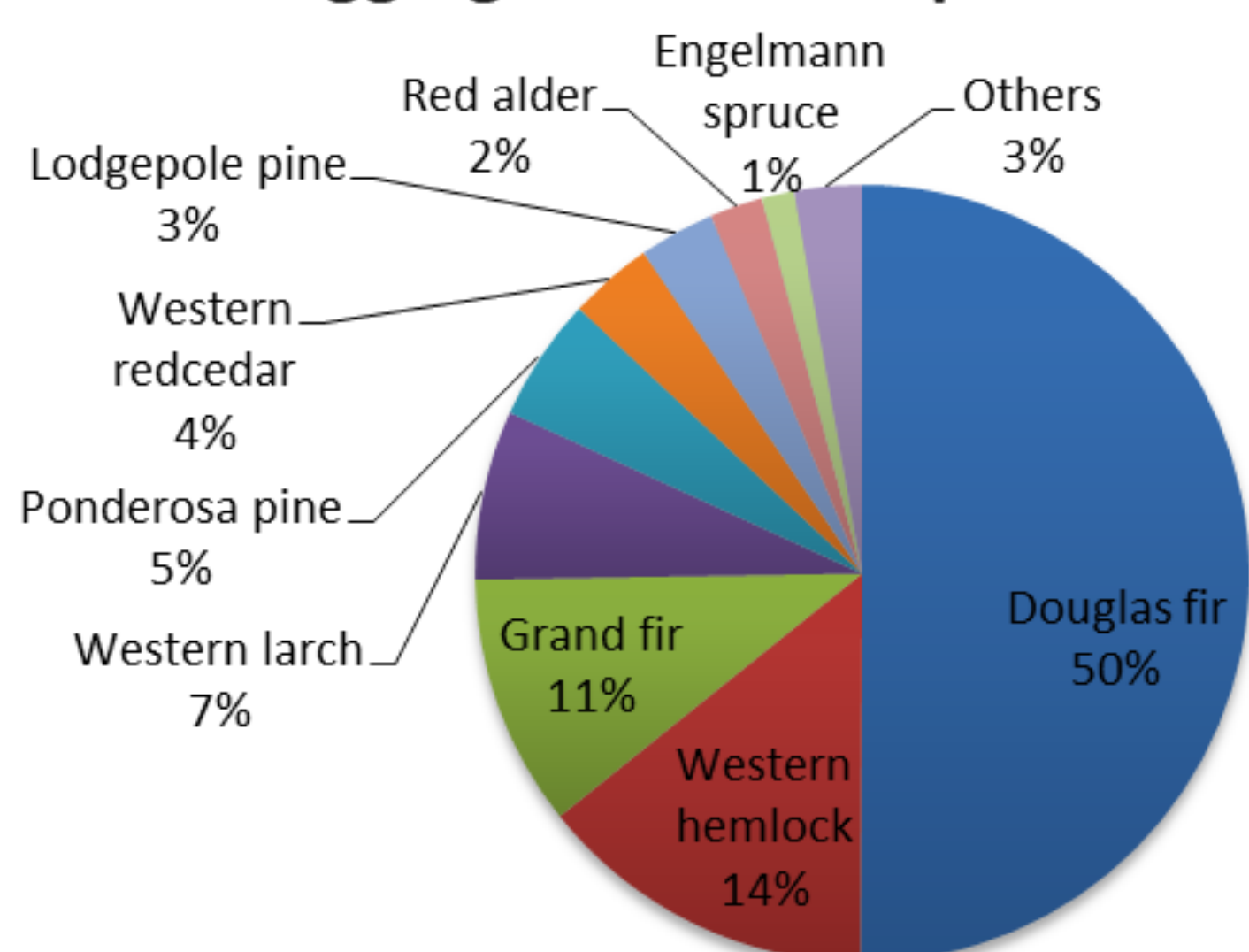
Mean Stump Height by Felling Method, All Regions



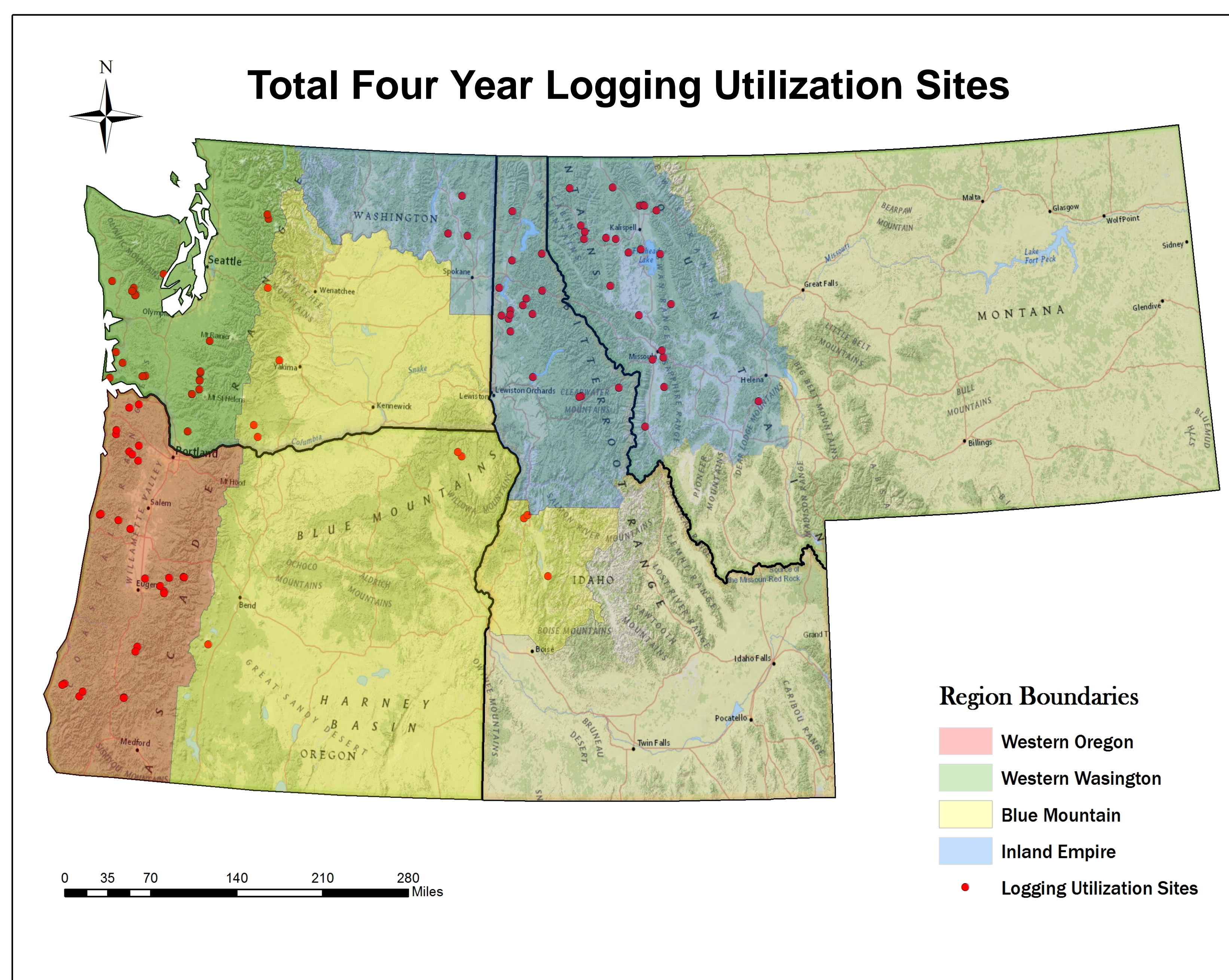
Predicted F3 by Pulp Removal and Felling Method



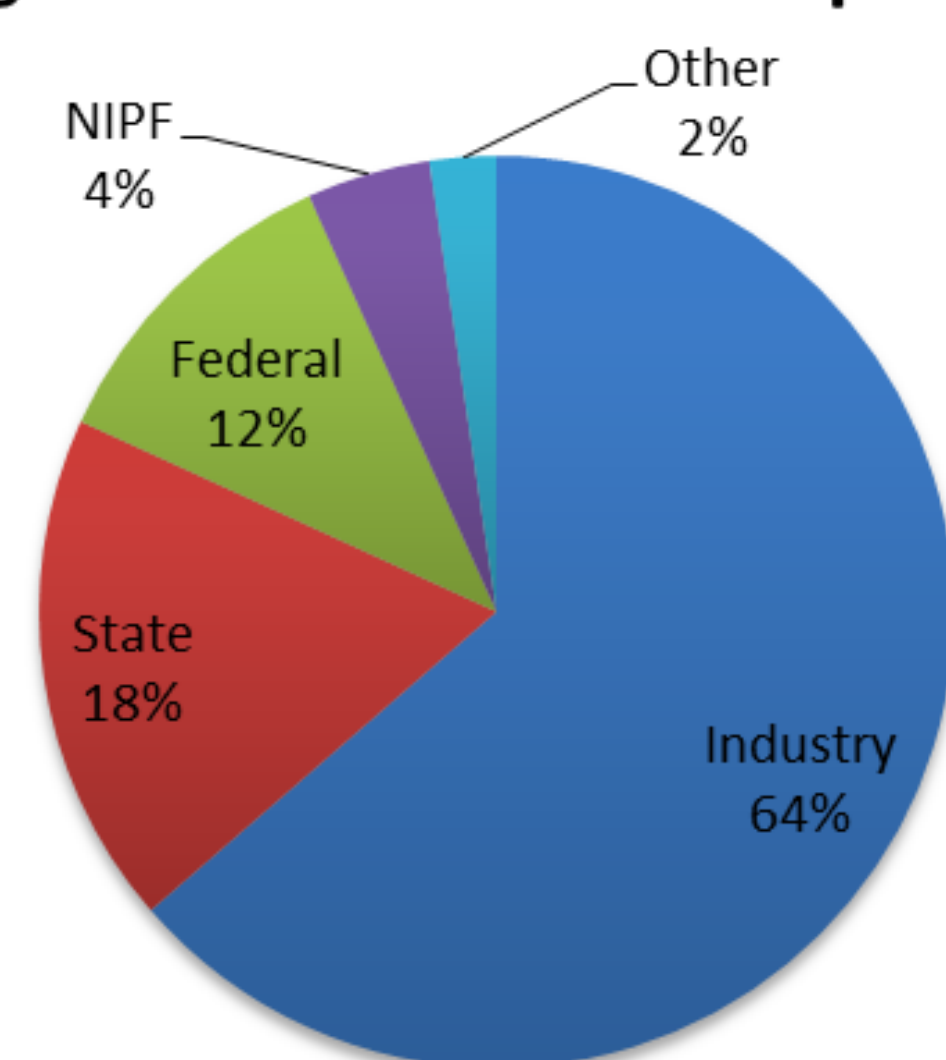
Logging Utilization Species Distribution



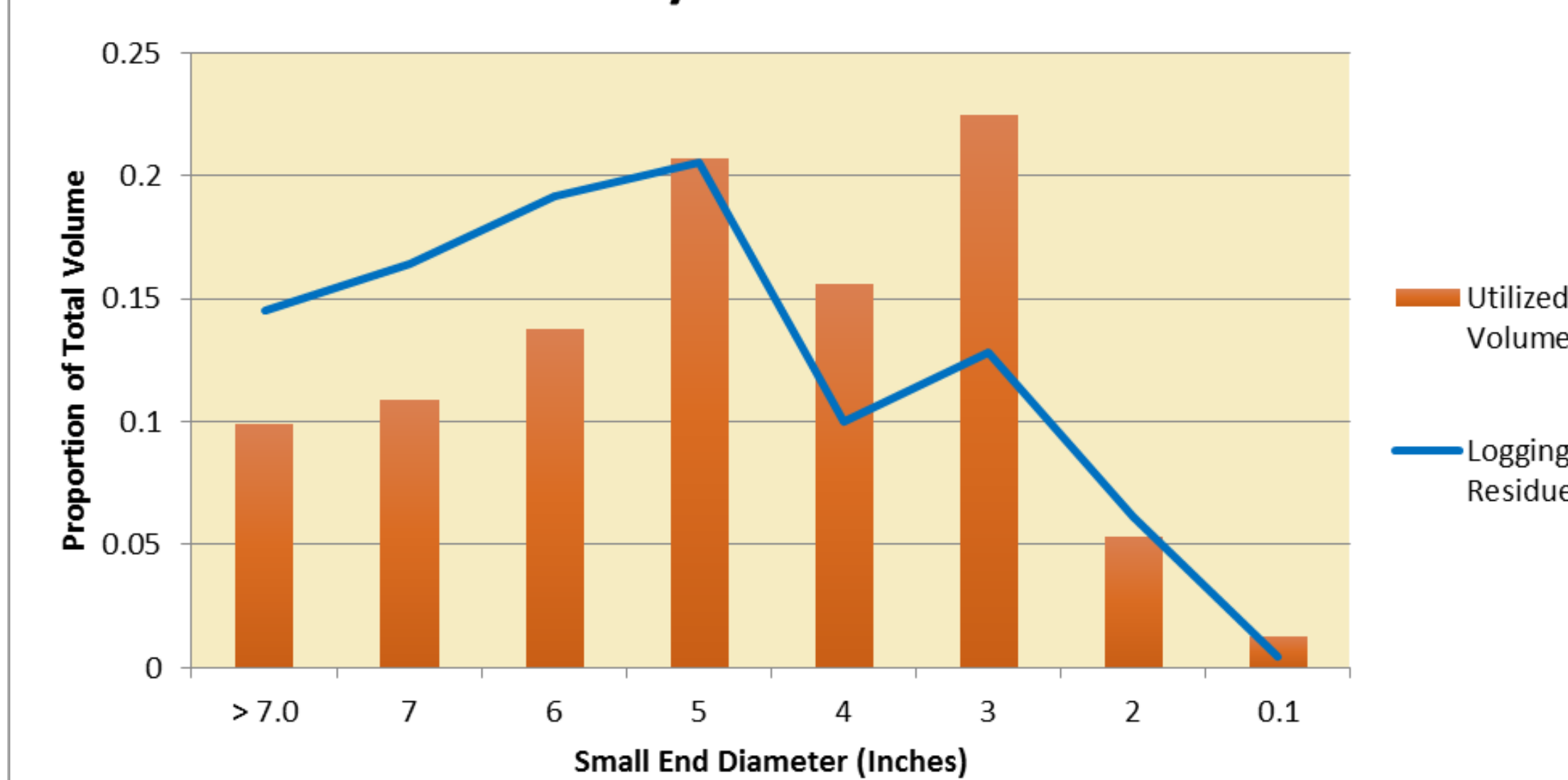
Total Four Year Logging Utilization Sites



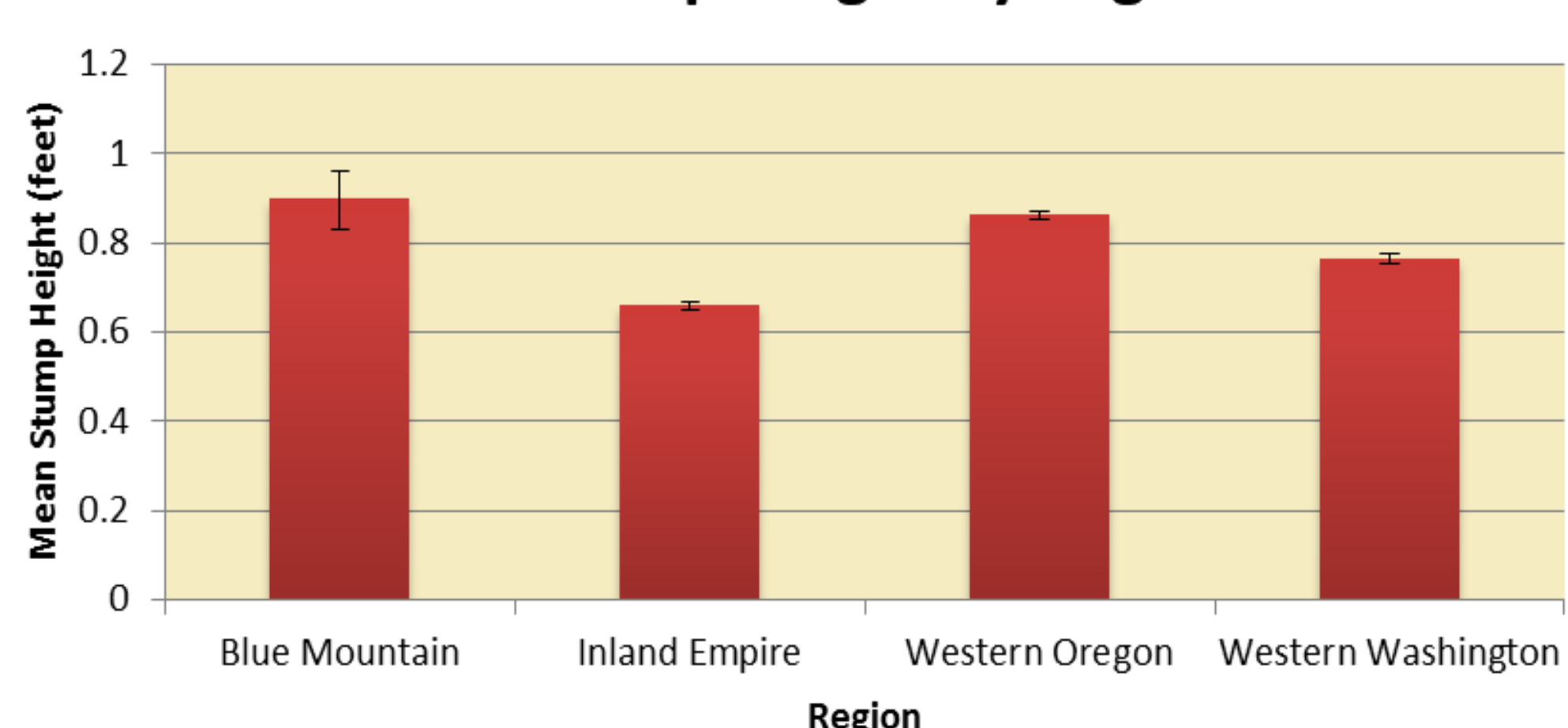
Logging Utilization Ownership Distribution



Proportion of Utilized and Logging Residue Volume by Small End Diameter



Mean Stump Height by Region



Logging Utilization Four Year Data Summary

Region	Number of logging sites sampled	Number of trees sampled	5 year timber harvest volume -Scribner MMBF
Blue Mountains	7	173	2,855
Inland Empire	53	1324	6,400
Western Oregon	21	519	12,639
Western Washington	20	486	11,061
Total	101	2502	32,955

## Highlights:

- The four-state overall residue ratio (growing stock residue volume/mill delivered volume) was 29 cubic feet of growing-stock logging residue generated per 1,000 cubic feet of mill-delivered volume.
- The predicted residue ratio decreased more than 250 percent when pulp was removed.
- The predicted residue ratio was lowest on mechanized felling sites where pulp products were removed and highest on hand felled sites where pulp was not removed.

Funding provided by:  
Northwest Advanced  
Renewables Alliance, USDA  
National Institute of Food and  
Agriculture



Contact Us:  
www.bber.umt.edu  
eric.simmons@business.umt.edu  
erik.berg@business.umt.edu