GERMINATION, SURVIVAL, AND GROWTH AFTER THREE YEARS OF FOUR CONIFEROUS TREE SPECIES ON BURNED AND UNBURNED SEEDBEDS OF THREE DIFFERENT DUFF DEPTHS ON A THUJA PLICATA/CLINTONIA UNIFLORA-CLINTONIA UNIFLORA HABITAT TYPE

A Thesis

Presented in Partial Fulfillment of the Requirements for the

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By

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Abstract

Four conifer species growing on three different duff depths on burned and unburned seedbeds were examined for germination, survival, and height and diameter growth after three years. Total above-ground biomass and number of trees also are reported. Douglas-fir (Psuedotsuga menziesii var glauca (Beissn.) Franco), ponderosa pine (Pinus ponderosa Dougl. ex Laws.), western larch (Larix occidentalis Nutt.), and western white pine (Pinus monticola Dougl.) were examined on a Thuja plicata/Clintonia uniflora-Clintonia uniflora habitat type (Cooper and others 1987) in Northern Idaho.

Germination was greater on mineral soil seedbeds and the three burned seedbeds. Within the burned seedbeds, germination increased as duff decreased. The same trends were true for seedling establishment. Therefore, on burned and unburned seedbeds natural regeneration increased proportionally with decreasing duff thickness.

At the end of the third growing season total height and basal diameter were recorded. Significant differences appeared between burned and unburned seedbeds, as well as differences between duff thicknesses for all species. Analysis of total above-ground coniferous biomass and number of trees showed significant differences between duff thickness, but not between burned and unburned seedbeds.

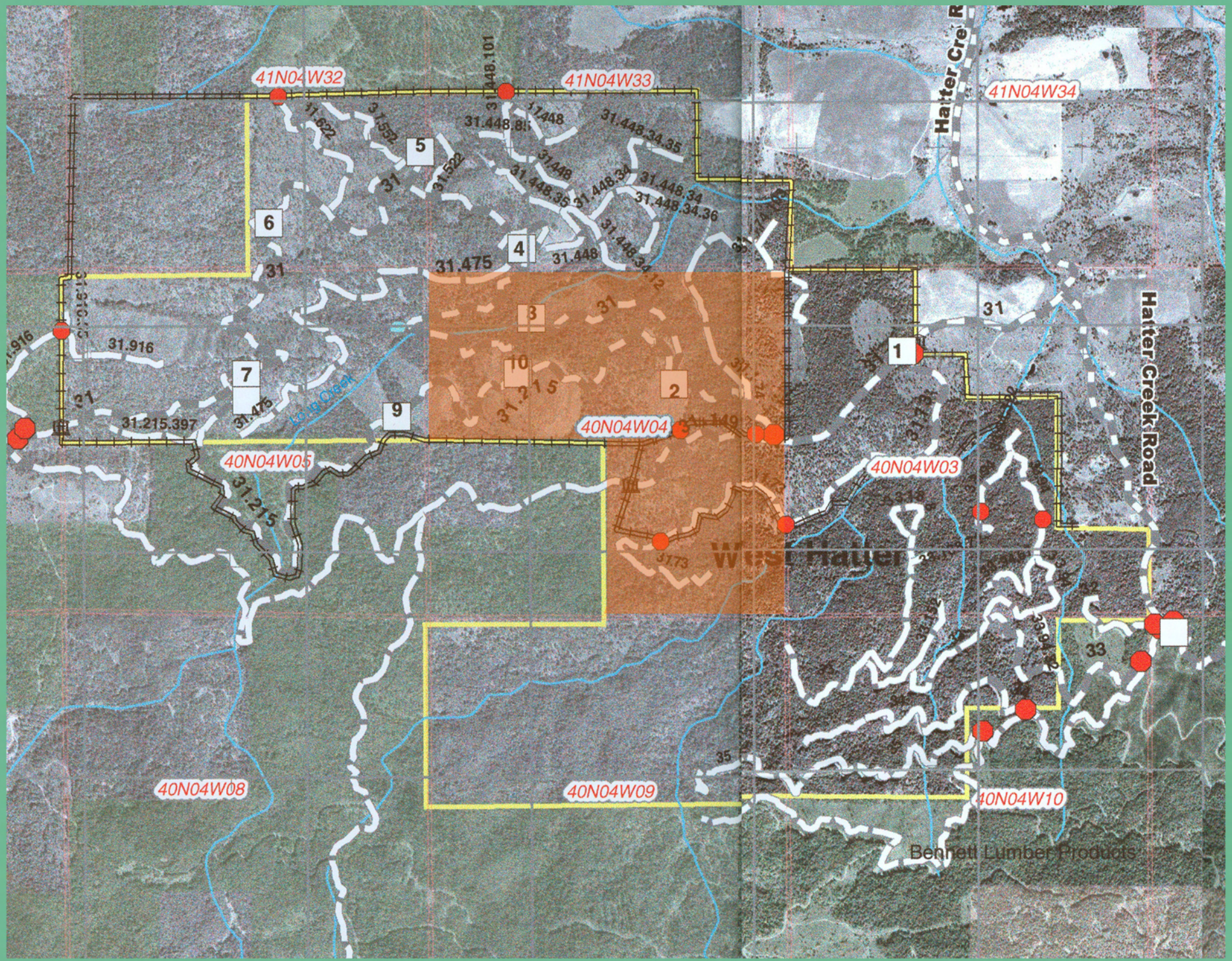
This study's results are similar to general trends reported for germination, survival and height in previous studies. The magnitude of some differences for burned and unburned seedbeds separated by duff thicknesses was greater than expected.

Study Site

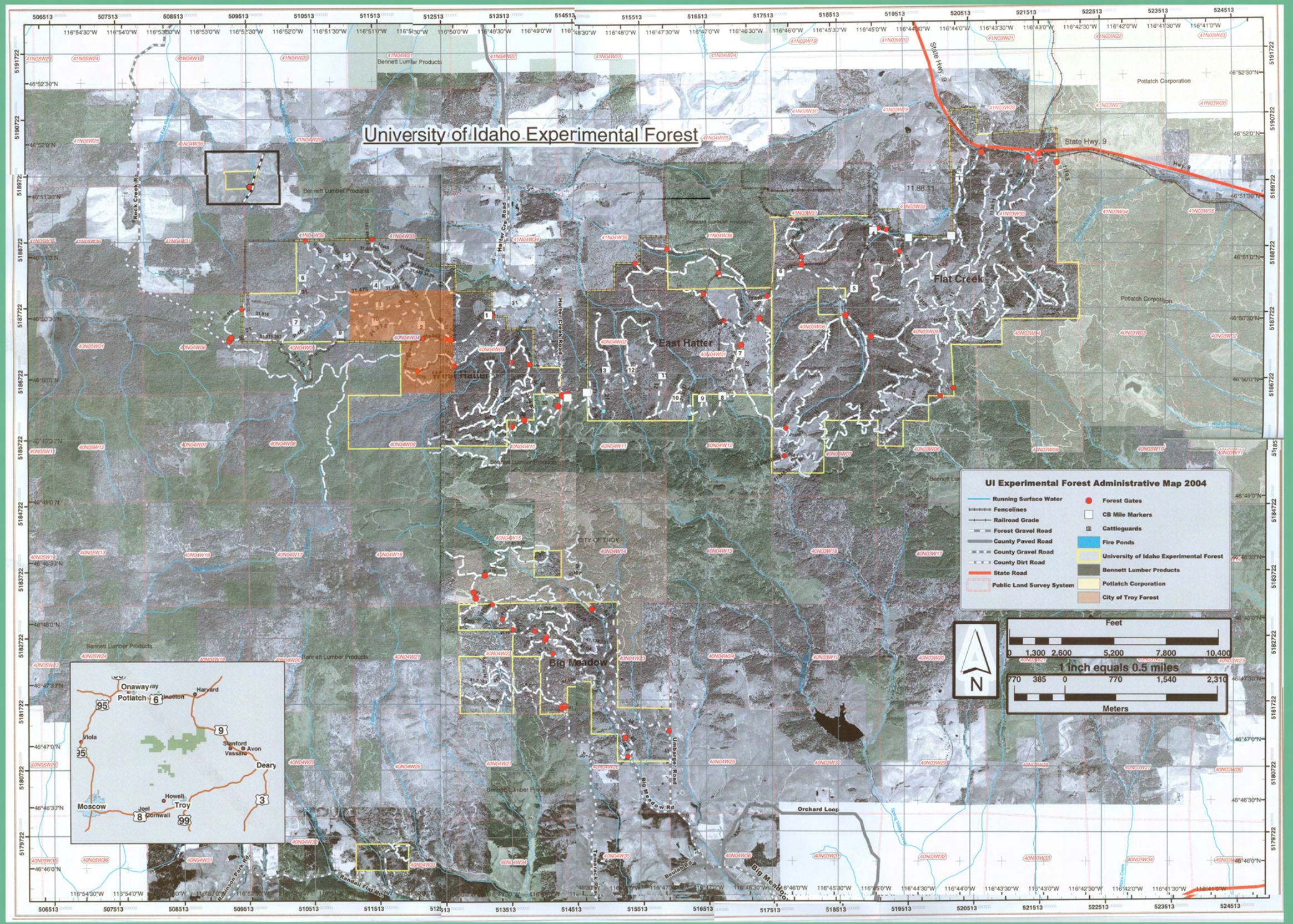
The study area is located on the West Hatter Creek Unit of the University of Idaho Experimental Forest, in Latah County Idaho. Four replications were located in three clearcuts in Section 4, Township 40 North, Range 4 West. This area is approximately 15 kilometers northeast of Moscow, Idaho.

Climate in this area is characterized by moist, moderate winters and dry summers. Prevailing westerly winds carry Pacific storms into this area resulting in an “inland maritime” climatic regime (Cooper and others 1987). Summers are dry because of prevailing westerlies carry dry subsiding air across the region.

The soil is classified as medial over loamy, mixed, frigid Andeptic Paleboralf. A volcanic ash mantle of approximately 30 centimeters covers deep loess deposits (Latah County Soil Survey 1981). The clearcuts used in this study are on north aspects, with an elevation range of 850 to 905 meters. Litter and duff depth averaged five cm.



West Hatter Creek-2004 map



University of Idaho Experimental Forest Map 2004

Location of Complete Research:

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