

**PRODUCTIVITY OF A SMALL CUT-TO-LENGTH HARVESTER IN  
NORTHERN IDAHO**

**A Thesis**

**Presented in Partial Fulfillment of the Requirements for the**

**Degree of Master of Science**

**With a**

**Major in Forest Products (Timber Harvesting)**

**In the**

**College of Graduate Studies**

**University of Idaho**

**By**

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**Major Professor: Harry W. Lee**

## **Productivity of a Small Cut-to-Length Harvester in Northern Idaho**

### **Abstract**

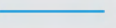

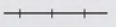



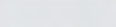

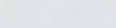

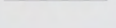

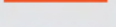


The use of small cut-to-length harvesters in forest stands composed of small-diameter trees is of increasing interest to natural resource managers. This interest is due to the efficiency and cost-effectiveness of using small harvesters in the harvest of small-diameter trees. This paper presents research regarding the productivity of a Neuson 11002 HV harvester in a clearcut with reserves and a thinning treatment of Douglas-fir tussock moth damaged stand, as well the investigation of the influence of tree branch characteristics upon harvester productivity. Tree heights, diameter at breast height (DBH), species, branch size and branch interval data were collected, to investigate the effect of these characteristics on productivity. An elemental time study was conducted using video footage of harvest operations to determine machine productivity. Production costs are estimated at \$5.54/m<sup>3</sup> in the clearcut, and \$6.22/m<sup>3</sup> for the thinning, on a scheduled machine hour and mean tree volume basis. Statistical analysis revealed that brush density, machine travel distance, tree DBH and branch size are influential upon tree harvest time in thinning. Branch size and branch interval are influential upon tree processing time, with branch size of high statistical significance. The Neuson 11002 HV harvester was found to be cost effective in the small diameter stand in which it was employed.

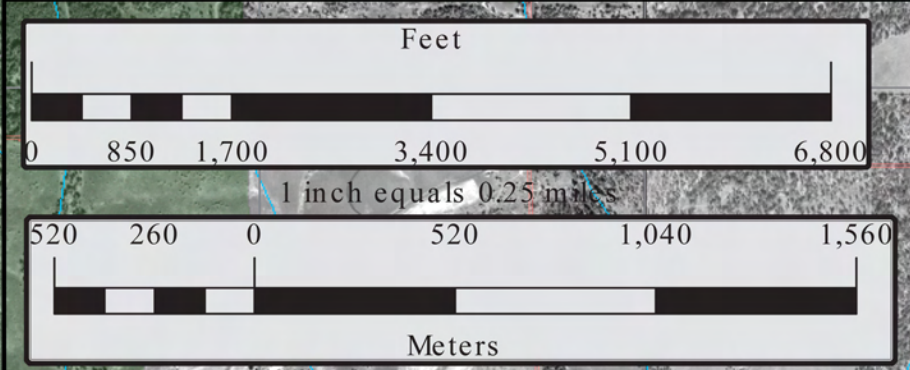
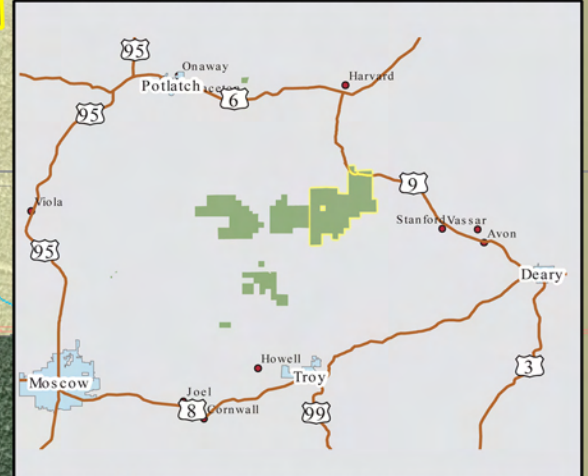
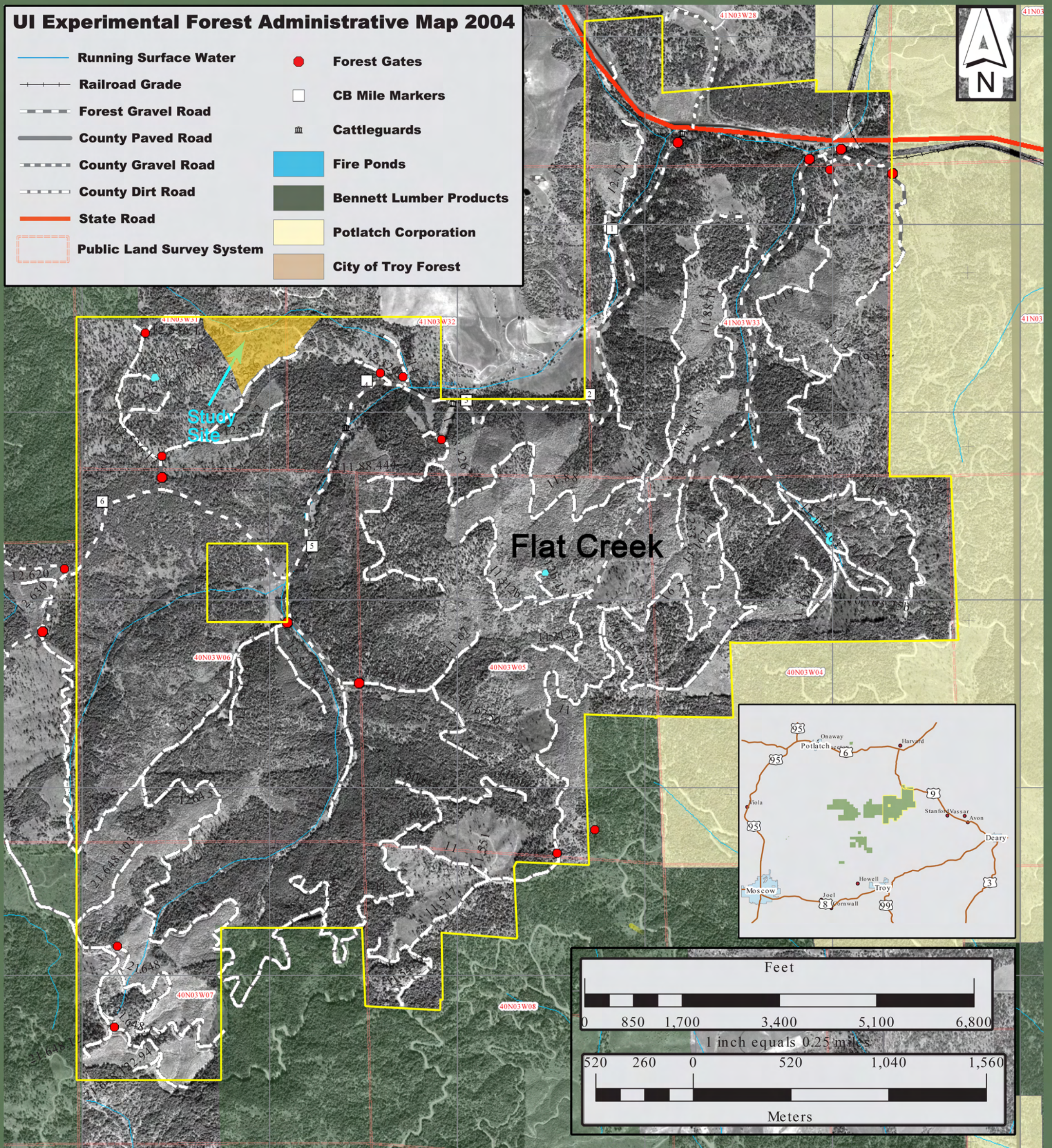
**Keywords:** small harvester, brush density, branch size, branch interval, branch characteristics, tree characteristics, Neuson 11002 HV, Logmax 3000, clearcut, thinning.

### **Research Site:**

University of Idaho Experimental Forest, Flat Creek Unit (NE ¼ of the SE 1/4, sect. 31, township 41N, Range 31W, Boise Meridian). Area is highlighted on 2004 map of Flat Creek.

# UI Experimental Forest Administrative Map 2004

- |   |                                  |   |                                |
|---|----------------------------------|---|--------------------------------|
|  | <b>Running Surface Water</b>     |  | <b>Forest Gates</b>            |
|  | <b>Railroad Grade</b>            |  | <b>CB Mile Markers</b>         |
|  | <b>Forest Gravel Road</b>        |  | <b>Cattleguards</b>            |
|  | <b>County Paved Road</b>         |  | <b>Fire Ponds</b>              |
|  | <b>County Gravel Road</b>        |  | <b>Bennett Lumber Products</b> |
|  | <b>County Dirt Road</b>          |  | <b>Potlatch Corporation</b>    |
|  | <b>State Road</b>                |  | <b>City of Troy Forest</b>     |
|  | <b>Public Land Survey System</b> |   |                                |



**Flat Creek**



## Location of Complete Research:

Author & Title: Turner, Douglas R.  
Productivity of a Small Cut-To-Length Harvester  
in Northern Idaho

University of Idaho Library:

Call Number- SD388.T87 2004

College of Natural Resources:

Department- Forest Products

Other Sources: