Draft: Version 1.3, updated 9-1-98

# Young Stand Thinning and Diversity Study (YSTDS) Post-thinning Woody Detritus Inventory Summary Report

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**Introduction** - Woody detritus serves key ecological functions in forest ecosystems. It stores and supplies nutrients and water to organisms, contributes to soil development, supplies energy for microbes and provides habitat for vertebrates and invertebrates.

The objective of this inventory is to provide post-thinning, base line information characterizing the aboveground woody detritus stores for each YSTDS treatment area. Our goals are to provide estimates of weight of each type of woody detritus per unit area, and, by using literature values of elemental concentrations of woody materials, provide crude estimates of nutrient contents of each detritus component.

Inventory of woody detritus is required for comparison between treatments, comparison with old-growth stands and for comparison with future entries into the YSTDS stands. These values can also be useful for statistical blocking in future analysis of other ecological features.

**Methods** - Five woody detritus fractions were measured to estimate total detritus values for the sampling areas. The forest floor component consisted of material above mineral soil and at least 1/4 inch in diameter. Fine woody debris was material greater than 1/4 inch and less than 1 inch in diameter. Coarse woody debris was downed material greater than 1 inch in diameter, stumps and snags.

Stumps and snags were individually measured in 0.1 ha fixed plots that varied from 13 to 33 plots per treatment, depending on the size of the treatment area.

Coarse woody debris other than stumps and snags was measured using a

modified Brown line transect method for fire fuel inventories. The modifications included addition of species and log decay classes to the data.

Fine woody debris was measured in $1m^2$ fixed plots and the forest floor was sampled using 0.1013 $m^2$-sampling rings. All sample areas were randomly placed in the treatment area.

**Preliminary results** - Table 1 shows summary values for all size fractions of woody detritus. There was no significant difference in total detritus levels between treatments. There were, however, significant differences in fine (0.25" to 1" diameter) woody detritus, coarse (1" to 3" diameter) woody detritus, snags and stumps. See table 1 for means separations.

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**Table 1.** Young Stand Thinning and Diversity Study summary of post-treatment woody detritus fractions and selected nutrient contents in kg/ha. Nutrient concentrations for coarse woody detritus are from Sexton and Harmon, 1996. Nutrient concentrations for forest floor are from Prescott and Preston, 1994.

| reatment | kg/ha | >3" Detritus | 1"-3" Detritus | Stumps | Snags | 0.24" - 1" Detritus | Forest Floor | Total |
|---|---|---|---|---|---|---|---|---|
| Control | Mass | 189,631 | 3,091*a* | 19,418*a* | 8,934*a* | 27,189*a* | 26,900 | 275,16 |
| - | N content | 175 | - | 21 | 9 | - | 401 | 606 |
| - | P content | 8 | - | 1 | 0 | - | 24 | 33 |
| - | K content | 30 | - | 3 | 2 | - | 24 | 58 |
| - | Ca content | 266 | - | 23 | 12 | - | 325 | 626 |
| Heavy Thin | Mass | 176,274 | 8,681*b* | 24,846*ab* | 1,976*b* | 57,045*b* | 56,313 | 325,13 |
| - | N content | 160 | - | 26 | 2 | - | 839 | 1,027 |
| - | P content | 7 | - | 1 | 0 | - | 51 | 59 |
| - | K content | 27 | - | 4 | 0 | - | 51 | 82 |
| - | Ca content | 247 | - | 31 | 2 | - | 681 | 962 |
| ght Thin | Mass | 194,496 | 6,592*b* | 22,575*ab* | 4,966*ab* | 42,474*b* | 41,929 | 313,03 |
| - | N content | 176 | - | 23 | 5 | - | 625 | 829 |
| - | P content | 8 | - | 1 | 0 | - | 38 | 47 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| - | K content | 30 | - | 3 | 1 | - | 38 | 72 |
| - | Ca content | 272 | - | 27 | 6 | - | 507 | 813 |
| Light Thin w/ gaps | Mass | 186,293 | 7,915*b* | 28,417*b* | 2,249*b* | 45,584*b* | 44,999 | 315,457 |
| - | N content | 169 | - | 29 | 2 | - | 670 | 871 |
| - | P content | 8 | - | 1 | 0 | - | 40 | 49 |
| - | K content | 29 | - | 4 | 0 | - | 40 | 74 |
| - | Ca content | 261 | - | 34 | 3 | - | 544 | 843 |

Note: Values for the detritus size fractions followed by the same letter are not significantly different ($p < 0.05$) based on an analysis of variance and LSD multiple comparison test.