

# Forest Biomass Supply Assessment



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**Natural Resources**  
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## Ecological Considerations

### Background

The “Washington Forest Biomass Supply Assessment” was completed in March 2012. The study examines the sustainable volume of residual forest biomass that can be collected from Washington’s working forests. The study is the first of its kind in the nation.

### What does it mean for the environment?

In the ongoing dialogue about using forest biomass as a feedstock for renewable energy production, questions and concerns have been raised about the ecological implications of this emerging sector. The report includes a literature review on the ecological functions of forest biomass and provides estimates of forest biomass volume at the site prior to, and post timber harvest. The report also indicates that in order to ensure ecological sustainability, the specific needs of each site need to be considered when developing a harvest plan.

### Forest Biomass’ Contributions to Ecological Health

Forest biomass plays important roles in maintaining and enhancing forest health. Forest biomass retained on site is a key ecosystem component that provides wildlife habitat, water retention, and building blocks for soil organic carbon and nutrient storage and retention within forest systems. For example, in areas where drought is common, the ability of decay resistant buried wood to retain moisture serves a specific ecological function. These ecological functions all require a variety of woody biomass with different characteristics. Removal of forest biomass for value-added utilization (renewable energy and fuel production) can be viewed as a competing use of this material that is so essential for ecological function.

### Forest Biomass Left at the Site

There are two sources of forest biomass retained at the site after timber harvest operation: pre-existing material and the volume that is the byproduct of the operation. The study team was asked to evaluate both and make initial conclusions about the overall ecological impacts of biomass removal at a scale likely to occur for value-added utilization.

Effects of forest thinning on biodiversity on larger landscapes have generally reported positive or neutral effects on diversity and abundance of terrestrial vertebrates and invertebrates across all taxa, although thinning intensity and the type of thinning may influence the magnitude of response (Verschuyl et. al. 2011).



To meet ecological function, literature suggests a range of 2.5-38.0 bone dry tons (BDT) per acre of coarse woody debris (>3" depth) be retained on site depending on the forest type in question. The study found that there is a wide range of pre-existing woody material in forests across the state. This is material that was on a site prior to a timber harvest and will remain on the site after the timber harvest. Pre-existing woody material was determined by consulting the decayed wood advisor (DecAID, USFS).

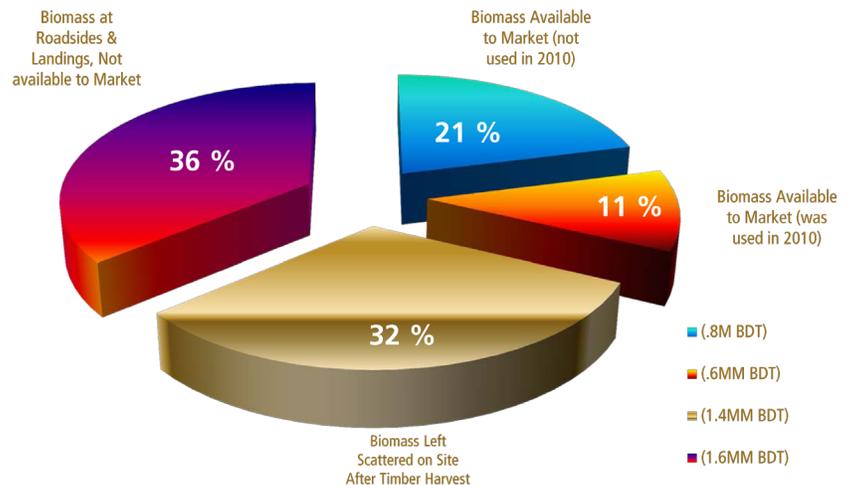
The study's calculations of post-timber harvest biomass produced show that retained forest biomass immediately following a timber harvest will always add to pre-existing levels. On average, 22 bone dry tons of forest biomass per acre will be added in Eastern Washington; 32 bone dry tons will be added per acre in Western Washington. A harvest unit will gain forest biomass after a timber harvest even when a portion of residual biomass is brought to market.

Chart A. describes the fate of the 4.4 million bone dry tons of forest biomass in Washington State in 2010. Of the total biomass produced by a timber harvest operation, 32 percent is left scattered on the harvest unit (due to breakage in bringing the tree from the harvest unit to the roadside or landing), adding to the volume of pre-existing biomass that was on the unit prior to harvest and that will remain on the unit after harvest. Of the total residual forest biomass produced by the harvest operation, 32 percent is available to be marketed (only 11percent actually was).

The potential biomass volumes suggest that if demand for forest biomass were to double, the least costly available supply is already at roadside and landings from harvest activities. This also implies that the volume of biomass left behind, scattered and at roadside,

**Chart A**

**Residual Forest Biomass Fates in 2010**



“Overall,  
negative effects  
on site productivity  
due to biomass  
removal were  
rare.”

unavailable for potential markets, remains significant, even with a growth in demand for forest biomass.

## Conclusions

The literature review indicates that forest debris retention requirements are neither a one size fits all nor an exact science. The ecological consequences of forest biomass removal and retention will depend on site conditions and limiting factors. Overall, negative effects on site productivity due to biomass removal were rare. Harvesting guidelines that permit managers the flexibility to tailor prescriptions to site conditions and to modify practices or correct problems as they emerge would make the most sense when considering the addition of biomass collection to current harvest practices. In Washington, any harvesting guidelines or forest biomass specific prescriptions would be in addition to the existing requirement to comply with the state's Forest Practices Rules.

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