

## **FREQUENTLY ASKED QUESTIONS**

### **Biomass Harvest Guidelines**

#### **➤ What do Biomass Harvest Guidelines offer?**

They offer recommendations to manage forest-, brush- and open- land with the intent to protect water, timber, soils, wildlife, recreation, forage and vegetation. They are mostly voluntarily. However, they could become obligatory when mandated in legal documents.

#### **➤ What does biomass harvest mean?**

Biomass harvest is the removal of more woody material from a site than would be removed under typical roundwood harvest. Often biomass harvesting is conducted in addition to roundwood harvesting on the same site, either in conjunction with the roundwood harvest or soon after. However, biomass harvest could also be conducted on sites where a roundwood harvest is not occurring.

#### **➤ What is biomass utilization?**

Biomass utilization is utilizing tops and limbs from trees harvested in a roundwood operation and utilizing small diameter trees, or stems which have historically been “nonmerchantable” such as dead trees, down and dead woody material, and brush.

#### **➤ Why is biomass harvesting happening?**

Woody biomass harvest provides the opportunity to manage forestlands, brushland and open land habitats, as well as provide a source of renewable products, such as fuel. There are many functions for removing biomass from a site. Those include:

- Reduce fuels and the risk of escaped fires from pile and burn treatments.
- Site preparation
- Maintain and protect vegetation stands.
- Protect biodiversity.
- Promote healthy forest ecosystem services.
- Reduce management costs.
- Generate an income.

#### **➤ What are the units linked to biomass utilization? (Help me visualize these units)**

- 1 bone dry ton (BDT) chips = 2.0 green tons (GT) (assuming 50% moisture content)
- 1 bone BDT chips = 2000 dry lbs. (assumes no moisture content)
- 1 ccf roundwood (logs) = 1.2 BDT chips

➤ **What are the transportation, electricity and thermal energy conversion units attached to biomass? (Source: <http://www.sustainablenorthwest.org>)**

**Transportation Factors**

- 1 standard chip van = 25 green tons
- 1 standard chip van = 12.5 BDT (assuming 50% moisture content)
- 1 standard log truck = 25 green tons
- 1 standard log truck = 10 cords
- 1 standard log truck = 12.8 ccf or 1280 cubic feet
- 1 standard log truck = 4.5 MBF or 4500 BF

**Electricity Factors**

When woody biomass is utilized in a commercial (10+ MW electrical output) scale power generation facility the following energy output rules of thumb apply:

- 1 BDT woody fuel = 10,000 lbs. of steam
- 1 megawatt hour (MWH) = 10,000 lbs. of steam
- 1 BDT woody fuel = 1 MWH
- 1 MW = 1,000 horsepower
- 1 MW = power for approximately 750 to 1,000 homes annually

**Thermal Energy Factors**

- 1 lb woody fuel = 7,870 British Thermal Units (BTUs)
- 1 lb sawdust/shavings = 3,850 BTUs
- 1 therm = 100,000 BTUs
- 1 BDT woody fuel = 78.7 therms
- 1 BDT sawdust/shavings = 38.5 therms

➤ **What are some of the different biomass harvest systems used in Minnesota?**

Biomass harvest systems are usually based on conventional harvesting operations. Biomass harvest involves felling, piling, skidding or forwarding, chipping or grinding or bundling and then trucking to the end user. Conventionally brushlands are sheared or mowed and then burnt. However, there are experiments underway to remove this material in a more efficient manner in the future.

➤ **Can any form of biomass material be burnt for energy?**

No. There are biomass standards that facilities specify. For example, dirt and stones would not burn well in facilities. Furthermore, boilers differ in their specifications for the type of wood chip or hog fuel they burn.

**➤ What should be considered when thinking about biomass utilization in any given site?**

The potential for biomass is site specific and depends on several factors such as:

- Site primary management goals
- Sustaining forest soil, hydrology, habitat and ecosystem services
- Whether or not biomass production has a potential to generate a profit, or reduce primary management costs.
- Factors such as machinery type, machinery trucked distance, biomass hauled distance, number of machines involved in a given harvesting operation, operator skills, practicality of site prescriptions to facilitate biomass harvest operations, area of the site harvested and biomass stocking in a given site can impacts biomass harvesting cost effectiveness.

**➤ How does Minnesota Department of Natural Resources appraise biomass?**

Biomass is sold in timber sales. The winning bidder can choose to buy biomass at the time he/she opens the timber sale. Biomass is appraised using a percentage calculation based on the roundwood appraisal. Biomass is then sold as "Added Timber". The price used is currently 75 cents per 1000 pounds (as of 2007).

**➤ What is the difference between a forestland, brushland and an openland?**

Forests are communities of plants, animals and microorganisms, and the physical environment they inhabit, in which trees are the dominant life form.

Brushlands and open lands are predominantly non-forested plant communities dominated by shrubs, grasses or sedges, and herbs.

Brushlands and open lands differ from each other only by the percent cover of trees and shrubs:

- Open lands are plant communities with less than one-third (1/3) total cover by trees and shrubs.
- Brushlands have higher tree and shrub cover.

Both brushlands and open lands may be found in the following ecological systems: peatlands, upland prairies, rock outcrops, wet meadow/carrs and wetland prairies. These systems are defined in the Minnesota DNR Field Guides to the Native Plant Communities of Minnesota. (For visual examples of these various ecological systems, refer to photos on pages 40-42 in the brushlands guidelines.)

➡ **How do I know which guidelines to follow?**

MNFRC in conjunction with MNDNR have developed sets of guidelines for Forest biomass harvest, Brushland woody biomass harvest and Open land woody biomass harvest.

For forest biomass harvest: Follow guidelines in the chapter titled: Biomass Harvesting on Forest Management Sites.

For brushland woody biomass harvest: Follow guidelines in the chapter titled: Brushland Biomass Harvesting. However, where specific differences are indicated between brushland habitats and open land habitats, follow recommendations made for structural habitat for brushland habitats (see Table BHB-1, page 38-39).

For open land woody biomass harvest: Follow guidelines in the chapter titled: Brushland Biomass Harvesting. However, where specific differences are indicated between brushland habitats and open land habitats, follow recommendations made for structural habitat for open land habitats (see Table BHB-1, page 38-39).

➡ **How could I get a copy of the complete biomass harvesting guidelines?**

- You could request a hard copy from the Minnesota Forest Resources Council (address listed below)
- You could also download the entire forest management and biomass harvest guidelines from the website:  
<http://www.frc.state.mn.us/FMqdlne/BHGC.html>

➡ **Where can I find out more information about biomass harvest guidelines?**

Contact:

**Minnesota Department of Natural Resources** (for technical assistance with guidelines implementation)

500 Lafayette Road  
St. Paul, MN 55155-4040  
Phone: 651-296-615  
Phone: 888-646-6367

**Minnesota Forest Resources Council** (for copies of biomass harvesting guidelines)

2003 Upper Buford Circle  
St. Paul, MN 55108-6146  
Phone: 651-603-0109

**Minnesota Logger Education Program** (for training details)

301 West First Street, Suite 510

Duluth, MN 55802-1634

Phone: 218-722-5442

**University of Minnesota Extension**

240 Coffey Hall

1420 Eckles Ave.

St. Paul, MN 55108-6068

Phone: 612-624-1222

**Sustainable Forests Education Cooperative**

Cloquet Forestry Center

175 University Road

Cloquet, MN 55720

Phone: 218-726-6404

## Biomass Harvest Guideline Considerations

### ↻ **Swamping**

Removal of live woody vegetation may temporarily *increase* wetness of some sites due to decreased transpiration.

*Retention* of transpiring vegetation reduces the potential for swamping of some sites.

### ↻ **Artificial Regeneration**

Biomass harvesting can be a means for improving sites preparation for planting.

Removal of biomass from a site *reduces* the need for site preparation practices, such as brush raking or shearing.

### ↻ **Browse Deterrent**

*Retaining* heavy slash on a site can deter browsing by large ungulates, such as deer and moose.

In natural oak regeneration sites, retaining biomass from heavy oak tops and branches can be used as a *deterrent* to browsing and promote regeneration.

### ↻ **Natural Regeneration Of Conifers**

Timing of harvest, site conditions and species managed for influence strategies. In natural regeneration of conifers from seeds, consider retaining all or some cone bearing slash for the seed source.

In other cases, *removal* of biomass from understory brush may facilitate natural regeneration by removing competition and scarifying the seedbed.

### ↻ **Bark Beetles**

Biomass harvesting may *promote* management strategies for insect and disease control.

Removal of fresh slash and non-merchantable stems, along with logs from abandoned piles and log decks on harvested sites can prevent bark beetle build up in the following season.

### ↻ **Thinning Stands**

Biomass harvesting from stand thinning benefits in stand structures for some wildlife species and improves growth.

While harvesting, damage to residual stems and root systems should be **avoided**.

## **Biomass Harvest Considerations**

- Greater communication and coordination among operators, and with the forest managers and operators in early planning stages, ensures a more efficient and effective implementation of biomass harvesting guidelines and operations.
- Harvesting prescriptions need to be realistic in accommodating entry, extraction and exit of operations with smaller material than roundwood.
- Operators working on the same biomass harvest operations need to know what type of machine follows, and how material can be best prepared or aligned for the machine that follows, to provide for a speedier and more efficient biomass harvesting operation.
- Currently biomass harvest operations only are unlikely to cover the entire costs of the harvest operation. However, research has shown there is potential to reduce site management costs, such as mechanical fuel treatment costs, when biomass harvest is considered.
- It is generally recommended to visit a site prior to operations to assess potential profit from biomass harvest.