Woody Biomass Retention Guidelines

TIMBER HARVESTING always involves a trade-off between what is removed from the forest and what is left behind. Along with applicable regulations and Water Quality Best Management Practices (BMPs), these guidelines are intended for use by loggers, foresters, and landowners to protect soil, water quality and biodiversity on timber harvesting sites in Maine.

These guidelines can be adapted and included in site-specific recommendations developed by a Licensed Forester. They are intended to inform the landowner's decision-making as they review the forester's prescription. Most importantly, implementation of these practices on the ground depends on the professional judgment, knowledge, and skill of the logger conducting the harvest operation. These guidelines are intended to be used by loggers, foresters, and landowners in this context.

Every acre of forest cannot be managed the same way and these guidelines should not be interpreted in that manner. The guidelines address elements of forest structure related to soil, water quality and biodiversity. These elements include snags, wood of all sizes left on the forest floor, live cavity trees and mast-producing trees. The guidelines are applicable to any harvest operation, but they may be of greatest importance on harvests where woody biomass is a significant part of the product mix.

General Recommendations

Develop a site-specific harvest plan that addresses the forest values identified in this brochure. Publications and programs, such as the Water Quality BMPs, Master Logger Harvest Integrity System, and the Certified Logging Professional Program, can provide general pre-harvest planning guidance. Contact your local MFS District Forester for on-the-ground assistance. Call 1-800-367-0223, or visit www.maineforestservice.gov, for more information.

- Follow all applicable regulations and Water Quality BMPs.
- Strive to optimize utilization and value of all products removed from each site. For example, it is worth considering whether tops, limbs or other woody material has greater value on a trail to prevent erosion or on the landing as biomass chips.

Soil Productivity

Except where scarification of the soil is important for regeneration, leave the litter layer, stumps, and roots as intact as possible. Wood decaying on the ground, especially tops and limbs, contributes nutrients that help build up the growth potential of the soil.

- Leave as many tops and branches as possible on:
  - low-fertility sites,
  - shallow-to-bedrock soils,
  - coarse sandy soils,
  - poorly drained soils,
  - steep slopes, and
  - other erosion-prone sites.

Water Quality

The Water Quality BMP manual describes many fundamental approaches to protect water quality on harvest operations. These include anticipating site conditions, controlling water flow, and stabilizing exposed soil.

- In particular the Water Quality BMP manual highlights that:
  - disturbance of the forest floor should be minimized;
  - woody biomass may be used to control water flow, to prevent soil disturbance, and/or to stabilize exposed mineral soil, especially on trails and the approaches to stream crossings; and
  - woody biomass used for erosion control and soil stabilization may be left in place if it is above the normal high water mark of streams or other water bodies.

Forest Structure

Wood of all sizes provides a range of habitats for other organisms that are essential to a fully productive forest.

- **Leave as much dead wood on site as possible.**
  - Leave as many snags standing as safety and access will permit.
  - Leave any felled snags in place.
  - Limit disturbance to existing down logs.
  - If large woody material is lacking on the ground, consider leaving some newly-cut logs scattered throughout the harvest area.
  - Large woody material can be created over time by retaining all snags possible and leaving some large trees to die.
- **Leave some live wildlife trees.**
  - Retain live cavity trees on site. Cavity trees are live trees with holes, open seams or hollow sections that wildlife can use.
  - Leave live trees with rot when cavity trees are not available.
- **Leave some mast producing trees.**
  - Species such as oak, beech, apple, black cherry, pin cherry, hickory, and raspberry produce valuable food for many wildlife species.

- **Vary the amount of snags, down logs, and wildlife trees across the harvest area.**
  - Stream buffers, retention patches and other protection zones provide an opportunity to leave more large trees than may be possible in other harvest areas.
  - Leaving lightly cut or un-cut patches in heavy harvest areas yields more biodiversity benefits than widely dispersed single trees.
  - The larger the retained patch, the greater the benefit to sensitive understory species.
- **Leave as much fine woody material as possible.**
  - Where possible and practical (depending on harvest method and system) retain and scatter tops and branches (fine woody material) across the harvest area.
  - If trees are delimbed at roadside, haul a portion of the tops and limbs back into the woods. Leave the material along skid trails if carrying it off the trail would cause greater damage.

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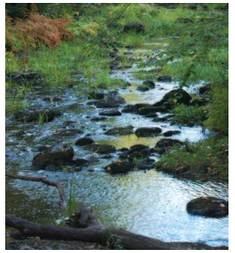

These guidelines were developed as a collaborative effort between the Maine Forest Service, the University of Maine, and the Trust to Conserve Northeast Forestlands. They are based on a technical review of environmental issues related to woody biomass retention from timber harvest sites in Maine prepared for the Natural Resources Conservation Service. A copy of the full report [Benjamin 2010, MAFES Misc. Pub. 761] can be found on the publications link at the following website:

www.forest.umaine.edu/faculty-staff/directory/jeffrey-benjamin

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FBRI Forest Bioproducts Research Institute

Department of Conservation Maine Forest Service — MAINE FOREST SERVICE

The University of Maine — Maine Agricultural & Forest Experiment Station

NRCS Natural Resources Conservation Service

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Considerations and Recommendations for Retaining Woody Biomass on Timber Harvest Sites in Maine