

The attached guidance is a revision of *Wisconsin's Forestland Woody Biomass Harvesting Guidelines*. They are designed to provide guidance to forest resource managers, loggers, equipment operators, contractors, and landowners on the sustainable harvest of woody biomass from forested areas within the context of generally accepted forestry practices. For the purpose of this guidance, biomass harvesting refers to operations in which the entire aboveground portion of a tree may be removed, including trunk, branches, bark, and leaves or needles (fine woody material < 4" dib). The harvest of fine woody material from forests results in increased removals from a site as compared to traditional timber harvesting, and a higher level of nutrient export.

The guidelines were initially drafted in 2008 at the request of the Wisconsin Council on Forestry by a technical team comprised of WDNR staff using best available information. Draft guidelines underwent technical review by a select group of experts, and a stakeholder review by Advisory Committee members who were selected by the Wisconsin Council on Forestry from industry, government, landowners, tribal interests, conservation organizations, and non-profit groups. In 2013, the guidelines were reviewed and revised by the Advisory Committee at the direction of the Council on Forestry with the assistance of DNR staff and other experts with research or implementation experience related to the guidelines. The Advisory Committee recommended some revisions to the guidelines; those revisions were accepted by the Council on Forestry in September 2013. The revised guidelines build on the work completed in the initial development of the guidelines and incorporate new research and address implementation concerns.

For more information about the Biomass Harvesting Guidelines revision process and supporting documents please refer to the Council on Forestry website at:
<http://www.wisconsinforestry.org/initiatives/other/woody-biomass>.

We are now soliciting comments from the public on the proposed revisions to Wisconsin's Forestland Woody Biomass Harvesting Guidelines. The new proposed guidelines are listed below followed by the current guidelines for comparison.

Once the 21 day notice period is complete, all comments will be considered and revisions will be made to *Wisconsin's Forestland Woody Biomass Guidelines Field Manual* as needed. The revised field manual will be made available to internal and external stakeholders and will be available to the public on the Council on Forestry webpage referenced above. Comments related to this draft guidance document should be sent to Sarah Herrick - Division of Forestry, Forest Sciences Section at:
Sarah.Herrick@wisconsin.gov

Wisconsin's **Proposed** Forestland Woody Biomass Harvesting Guidelines

Guidelines 1, 2, and 3 apply only to sites with the specific soil conditions described below. These are not generally applicable to all sites, but only to sites with poor soil nutrient conditions. Guidelines 4, 5, and 6 are generally applicable to any site. Reminders A, B, and C refer users to existing guidance on issues that apply to all timber harvests, including biomass harvests. It is recommended that the Biomass Harvesting Guidelines (BHG) be implemented in addition to any applicable silvicultural guidelines, forest management guidelines (FMGs) and best management practices (BMPs). For detailed information on the background and implementation of the Biomass Harvesting Guidelines see Chapter 3 of this field manual.

These Biomass Harvesting Guidelines may be modified for specific site conditions, for specific operational issues or to meet specific management objectives. Examples of where a modification may be warranted include site preparation to facilitate tree regeneration, control of invasive or exotic species, fuel reduction treatments, barrens/savanna restoration or prescribed fire. For more examples and a more detailed look at guideline modifications see Chapter 4 of the field manual.

1. Do not harvest fine woody material on dry nutrient-poor sandy soils.

- Dry nutrient-poor sandy soils are components of soil map units that meet certain criteria, such as low clay content. See Appendix D for a complete list of criteria.
- Areas with dry nutrient-poor sandy soils are identified by using soil survey maps produced by the Natural Resources Conservation Service (NRCS). A list of soil map units that are considered to meet these criteria appears in Appendix D. See the Web Soil Survey for soil maps: <http://websoilsurvey.nrcs.usda.gov/app/>.

Exceptions:

- Jack pine stands may be harvested for woody biomass at rotations of 40 years or longer.
- Red pine stands may be harvested for woody biomass at rotations of 40 years or longer.

2. Do not harvest fine woody material on shallow soils where bedrock is within 20 inches of the surface.

- Areas with shallow soils are identified by using soil survey maps produced by the Natural Resources Conservation Service (NRCS). A list of soil map units that are considered to meet these criteria appears in Appendix D. See the Web Soil Survey for soil maps: <http://websoilsurvey.nrcs.usda.gov/app/>.

3. Do not harvest fine woody material on soils classified as dysic Histosols. These are wetland soils with at least 16 inches of organic material that are nutrient-poor with a low pH.

- Areas with dysic Histosols are identified by using soil survey maps produced by the Natural Resources Conservation Service (NRCS). A list of soil map units that are considered to meet these criteria appears in Appendix D. See the Web Soil Survey for soil maps: <http://websoilsurvey.nrcs.usda.gov/app/>

4. Retain down coarse woody debris (CWD) already present. Minimize disturbance, including crushing, fragmenting, and displacing existing down CWD except on roads, skid trails, and landings.

5. The goal is to retain at least 5 oven-dry tons per acre of fine woody debris (FWD; < 4" in diameter) on site following harvest. This can be achieved by:

- Retaining down FWD already present (before cutting) except on roads, skid trails, and landings, to the extent feasible.
- Retaining FWD resulting from incidental breakage of tops and limbs in the general harvest area, to the extent feasible.
- Retaining and scattering additional tops and limbs in the general harvest area, if needed.

Considerations:

- In aspen stands, retaining FWD already present and created through incidental breakage is usually sufficient to achieve at least 5 oven-dry tons per acre of FWD.
- In non-aspen systems, retain at least an additional 10% FWD in harvested tops and limbs or the equivalent volume in other FWD material, in addition to FWD already present and incidental breakage, to achieve at least 5 oven-dry tons per acre of FWD.
- The average stand in Wisconsin has approximately 3 oven-dry tons per acre of FWD already present. Generally, there should be approximately twice as much FWD post-harvest to achieve at least 5 oven-dry tons per acre of down FWD.
- Consider retaining additional amounts of FWD and/or Coarse Woody Debris (> 4" in diameter) at sites that appear to lack sufficient woody debris prior to a harvest.
- If possible, leave most of the FWD well-distributed throughout the site to maintain nutrient cycles. Retaining some small slash piles may benefit some animals and plants.
- If possible, maintain FWD from a diverse mix of species to enhance soil nutrients and preserve ecosystem functions.

6. Do not remove the forest litter layer, stumps, and/or root systems.

Important Reminders:

- A. Stand-level tree and snag retention is important to accomplish sustainable forest management goals. For tree and snag retention guidelines, refer to WDNR Silviculture Handbook, Chapter 24.**

- B. Salvage operations sometimes include biomass harvesting, especially after severe disturbances. For salvage operation guidelines, refer to WDNR Silviculture Handbook, Chapter 23.**

- C. Always consider Federal and State Endangered and Threatened Species, State Special Concern Species, Species of Greatest Conservation Need, and sensitive natural communities prior to forest management operations. The Wisconsin Natural Heritage Inventory database is the most comprehensive source of documented locations for these elements, and species guidance documents and specialists in WDNR's Bureau of Natural Heritage Conservation can provide avoidance strategies or management options.**

Wisconsin's **Current** Forestland Woody Biomass Harvesting Guidelines (for comparison)

General Guidelines

These guidelines are generally applicable to any site. It is recommended that these guidelines be implemented in addition to any applicable silvicultural guidelines, forest management guidelines (FMGs) and best management practices (BMPs). The Guidelines may be modified for specific site conditions, for specific operational issues or to meet specific management objectives. Examples of where a modification may be warranted include site preparation to facilitate tree regeneration operations, control of invasive or exotic species, fuel reduction treatments, barrens/savanna restoration or prescribed fire.

1.A Retain and limit disturbance to down coarse woody debris (CWD) already present, except on skid trails and landings.

Exception: For complete salvage operations, follow Guidelines 2.B.

2.A Retain down fine woody debris (FWD) on site following harvest.

- *Retain down FWD already on present (before cutting), except on skid trails and landings, to the extent feasible.*
- *Retain FWD resulting from incidental breakage of tops and limbs in the general harvest area.*
- *Retain and scatter tops and limbs (<4" diameter) from 10% of trees in the general harvest area (e.g. one average-sized tree out every 10 trees harvested).*
- *Fine woody debris (FWD) on site following harvest is a combination of pre-existing down FWD, along with wood that was cut or broken during harvest operations and left on the ground.*

Considerations:

- *Some forests lack woody debris because of past management; consider retaining additional amounts of FWD and/or CWD in these areas.*
- *If possible, leave most of the FWD well-distributed throughout the site to maintain nutrient cycles. Retaining some small slash piles may benefit some animals and plants.*

3.A Do not remove the forest litter layer, stumps, and/or root systems.

Reminder: For tree and snag retention guidelines, refer to WDNR Silviculture Handbook, Chapter 24.

Site Specific Guidelines

Site specific guidelines apply only to sites with the specific conditions described in the Guideline; they are not generally applicable to all sites. It is recommended that these Guidelines be implemented in addition to any applicable silvicultural guidelines, forest management guidelines (FMGs) and best management practices (BMPs). The Guidelines may be modified for specific site conditions, for specific operational issues, or to meet specific management objectives. Examples of where a modification may be warranted include site preparation to facilitate tree regeneration operations, control of invasive or exotic species, fuel reduction treatments, barrens/savanna restoration, or prescribed fire.

1.B Protect and sustainably manage species of greatest conservation need and sensitive ecosystems.

- Do not harvest fine woody material from sites where Federal or State Endangered or Threatened Species are known to exist or are discovered during operations.
 - Exception: If harvests of fine woody material have been demonstrated to maintain or improve habitat for the species present, then follow appropriate management guidelines to sustain the occurrence or condition. Limit, to the extent possible, the establishment of landings and roads in these areas.
- Before harvesting fine woody material, determine the presence (and location) of and potential impacts on:
 - State Special Concern Species and Species of Greatest Conservation Need (those not listed as Federal or State Endangered or Threatened)
 - Element Occurrences (EO) of Wisconsin Natural Heritage Inventory (WNHI) Community Types
 - Designated High Conservation Value Forests (HCVF)
 - Communities demonstrating exceptional composition or structure, and sensitive sites (those not listed as WNHI EO or HCVF), including:
 - Relict forests, old-growth forests, old forests, large bogs, vernal pools, seeps, cliffs, rock outcrops, ravines, and caves

Follow management strategies to protect and conserve species of greatest conservation need and sensitive ecosystems. Limit, to the extent possible, the establishment of landings and roads in these areas.

- Consult specialists, management guides, and databases to assess occurrence, habitat requirements, community characteristics, potential impacts of proposed management activities, and management alternatives and recommendations.
 - Specialists are those who have in-depth knowledge regarding conservation and management of the species or ecosystem of concern, and may include wildlife biologist, conservation biologist, community ecologist, and forest ecologist.

2.B For complete salvage operations, following severe disturbance (e.g. crown fire or complete blowdown), implemented on areas >10 acres under one ownership, that include the harvest of fine woody material:

- Retain at least 5% of area in unsalvaged (no harvest) patches at least 0.1 acres in size. These should include large diameter reserve trees, mast trees, cavity trees, snags, and down coarse woody debris if present.

Exceptions:

- Retention is deemed a threat to human health and safety
- Retention would interfere with effective sanitation methods to control pathogen outbreaks

3.B Do not harvest fine woody material on shallow soils where bedrock is within 20 inches of the surface.

- Areas with shallow soils are identified by using soil survey maps produced by the Natural Resources Conservation Service (NRCS). A list of soil map units appears in Appendix 2. See the Web Soil Survey for soil maps: <http://websoilsurvey.nrcs.usda.gov/app/>

4.B Do not harvest fine woody material on dry nutrient-poor sandy soils.

- Dry nutrient-poor sandy soils are components of soil map units that meet certain criteria, such as low clay content. See Appendix 2 for a complete list of criteria.
- Areas with dry nutrient-poor sandy soils are identified by using soil survey maps produced by the Natural Resources Conservation Service (NRCS). A list of soil map units appears in Appendix 2. See the Web Soil Survey for soil maps: <http://websoilsurvey.nrcs.usda.gov/app/>

Exception: Jack pine stands may be harvested for woody biomass at rotations of 40 years or longer.

5.B Do not harvest fine woody material on soils classified as dysic Histosols. These are wetland soils with at least 16 inches of organic material that are nutrient-poor with a low pH.

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