



Kentucky Division of Forestry

Recommendations for the Harvesting of Woody Biomass October 2011

According to the **Kentucky Statewide Assessment of Forest Resources and Strategy**, the harvesting of woody biomass to help meet energy needs could increase the economic potential of Kentucky's trees and forests. However, the assessment cautions that over-harvesting and poor forest management could threaten the sustainability of Kentucky's forests, the emerging biomass industry and traditional forest industries. The strategy, in Issue 4, Tactics 2.3.2 and 2.3.4, states that the Division of Forestry (KDF) is to promote harvesting, biomass removal, and forest management practices that enhance the value and the sustainability of Kentucky's forest resources; and to work to develop criteria for the sustainable production of woody biomass. A well managed environmentally conscious approach to utilizing forest slash, inferior quality trees, and dedicated production for bioenergy can help Kentucky diversify its energy portfolio while protecting water quality, improving air quality, creating jobs, increasing tax revenue, and improving our state's energy independence.

The following recommendations are offered to assist landowners, loggers and the users of woody biomass in making sound decisions regarding biomass harvesting and removal while ensuring the sustainability of the forest resources. Careful consideration of the use of woody biomass in forest management activities can lead to productive, healthy and resilient forests and also provide a multitude of benefits to the landowner, forest industry and our state and nation in meeting our renewable energy needs. Biomass removal can be an asset to management as well as possible detriment to forest sustainability if not done properly.

Harvesting forests for the biomass market differs from harvesting for saw logs or the pulp market. It potentially removes much more woody material, such as smaller and less economically desirable trees, limbs and tops, leaves and other down material normally left behind from timber harvesting. This could result in possible impacts to soil productivity, soil compaction, water quality and quantity, wildlife habitat, and other environmental influences tied to forest sustainability.



Use of best management practices to protect water quality as established in the *Kentucky Forest Conservation Act* applies to all harvesting, including cutting or removal of trees for biomass since the trees will be a raw material for a commercial process or purpose.

The Division of Forestry encourages forest landowners to have a forest management plan prepared by a qualified natural resource professional (a forestry graduate or a person who by training and experience understands silviculture and can make forest management recommendations) in place before beginning any timber harvest.

Preharvest planning should include a written contract between the landowner and the logger to include all expectations and requirements of both parties.

Recommendations for Biomass Harvests

- Forest landowners should consider the highest and best use of the trees to be harvested to maximize the value of the wood and to promote the sustainability of their forest while expanding the utilization of woody biomass.
- All commercial harvesting must comply with Kentucky’s harvesting requirements and best management practices (BMPs) in accordance with the *Kentucky Forest Conservation Act* and the silvicultural BMPs in the *Kentucky Agriculture Water Quality Act*.
- ⊖ Woody biomass harvesting operations should be completed in conjunction with a traditional harvest or other management activity when possible to minimize soil compaction and other detrimental effects on site productivity, water quality and quantity, wildlife habitat, and other environmental influences tied to forest sustainability.
- Hardwood forests regenerate through stump sprouts, seedlings (naturally occurring and planted) and samplings; therefore, re-entry to harvest biomass after the site has been retired from a traditional harvest should occur within five years of the traditional harvest. Biomass harvesting should be avoided five years after the traditional harvest until the regenerated trees have grown large enough for a normal harvest rotation for typical round wood products. The removal of stumps, roots, and litter from the forest floor is discouraged in order to maintain site productivity for the regeneration and growth of a new forest.



- Timing harvest operations to avoid logging in wet soil conditions or concentrated equipment travel patterns can prevent unnecessary impacts, such as compaction and rutting, which degrade site productivity.

- The removal of woody biomass has the potential to increase the surface and subsurface flow of water resulting in increased soil movement, erosion, and stream flow.
- Biomass harvesting should avoid or minimize biomass removal on steep slopes with highly erodible soils and other sensitive sites, such as habitats for threatened and endangered species, special consideration areas, nature preserves, prairie types, and wetlands.

- To ensure enough logging slash is left scattered across the area to maintain site productivity and wildlife habitat diversity, KDF and the Kentucky Department for Fish and Wildlife Resources recommend leaving 15-30% of logging residue (tops and log butts) disbursed across the harvest area.



- Woody biomass harvests can both positively affect some wildlife populations while negatively affecting others. Retaining key structural features such as snags, den trees, and large coarse woody debris is critical to wildlife. Consult a qualified natural resources professional regarding this issue.
- Harvesting activities that destroy the habitats of federally threatened or endangered animals are prohibited under the Endangered Species Act of 1973 and can result in civil or criminal penalties. Contact the U.S. Fish and Wildlife Service for more information.
- When considering a short rotation woody crop (SRWC), select species that are native to Kentucky, appropriate for the site where the plantation will be established, and have available markets. Some SRWCs are invasive and highly aggressive and can negatively impact the environment and Kentucky's native forests. Consult a qualified resource professional prior to establishing a biomass plantation.
- Soil disturbance from harvesting creates conditions favorable to the establishment of non-native plants and aggressive native plants. Prescriptions for treatment of specific invasive plants can be found at several locations on the internet.

DEFINITIONS

- *Woody biomass*: Any woody organic material that is available on a renewable or recurring basis including trees, wood, and wood residues. [See KRS. 152.715 (4)]
- *Sustainable Forest Management*: The stewardship and use of forests to maintain their health, productivity, diversity, and overall integrity, in the long run, in the context of human activity and use.
- *Renewable Energy*: Renewable energy sources are constantly available, or can be replenished in a short period of time. The most common sources include solar, wind, geothermal, hydropower, and biomass (e.g. wood, solid waste, landfill gas, ethanol, and biodiesel).
- *Exotic or nonnative plants*: A plant or species introduced from another country or geographic region outside its natural range.
- *Biodiversity (biological diversity)*: The variability among living organisms from all sources.
- *Litter*: The natural organic material on the forest floor.
- *Slash*: Residual material from the harvesting operation.
- *Short rotation woody crops*: Woody biomass grown in a short rotation (typically 2-5 yrs) for the purposes of producing fiber or alternative energy.
- *Genetically modified organisms* are generally created by gene implantation vs. *genetically improved* (select genotypes or hybrids) are not produced through gene implantation but are superior families or hybrids produced through open-pollination, mass controlled pollination, or vegetative means (i.e., clonal/variatal).
- *Regeneration*: Renewing tree cover by establishing young trees naturally or artificially.

RESOURCES

Greis, John G.; Development of Guidelines for Woody Biomass Harvesting – Some Considerations; a White Paper Prepared by: USDA Forest Service State and Private Forestry Southern Region April 29, 2009

Evans, Alexander M., and Robert T. Pershel; 2009; An Assessment of Biomass Harvesting Guidelines. Forest Guild, Santa Fe, NM

Woody Biomass Harvesting Guidelines; – A white paper prepared by the Services, Utilization and Marketing Task Force and approved by Southern Group of State Foresters 2009

Kentucky Statewide Assessment of Forest Resources and Strategy; Kentucky Division of Forestry, June 2010

Dictionary of Forestry, Society of American Foresters, 1998

National Report on Sustainable Forests—2010: United States Department of Agriculture, Forest Service; FS-979; June 2011

Contributing Agencies: Kentucky Division of Water, Kentucky Department of Fish and Wildlife Resources, Kentucky Department of Conservation, Kentucky Nature Preserves Commission, University of Kentucky Department of Forestry, U.S. Forest Service, U.S. Fish and Wildlife Service