

SUBJECT: FOREST BIOMASS HARVESTING

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1.0 Policy

1.1 Policy statement

It is the policy of the Department of Natural Resources to permit harvesting of forest biomass from Crown lands while ensuring the sustainable management of Crown forests.

Forest biomass is an important component of a forest ecosystem, vital to nutrient cycling, wildlife habitat, biodiversity and overall forest health.

Further research and analysis is necessary to fully understand the impacts of removing forest biomass on both forest growth and ecological values. The University of New Brunswick has developed a decision support model to examine forest growth impacts. The model will be integrated into the 2012 management planning process in order to incorporate forest biomass harvesting as part of the sustainable management of Crown forests.

The Department of Natural Resources (DNR) recognizes that forest stands harvested for bioenergy purposes may not provide the full suite of ecological values identified in the document “The New Brunswick Public Forest – Our Shared Future”. The DNR has developed criteria and objectives for the provision of forest for wildlife and other ecological values and will endeavor to determine the extent to which biomass harvesting is suitable for stands identified as providing those values currently or in the future.

The forest area that is outside of special management areas is recognized as also providing ecological value, particularly connectivity between special areas. The DNR will endeavor to determine the extent to which those functions are maintained in stands harvested for biomass.

The direction provided within this policy may change as the results of these analyses become available.

1.2 Background

Uncertainty in long term supplies of fossil fuels and associated increasing costs coupled with environmental requirements to reduce green house gas emissions have renewed interest in utilizing forest biomass to produce energy.

In 2002, Canada ratified the Kyoto Protocol for climate change to reduce green-house gases. Canada has since committed to develop and implement a “Made in Canada” plan to reduce green-house gas emissions and ensure clean air, water and energy. To this end, the use of forest biomass for cogeneration is considered carbon neutral and a form of green energy.

In June 2007, the New Brunswick government launched its Climate Change Action plan which defined green-house gas emission targets for the province beginning in 2012. Within this action plan, government committed to implement a Crown land forest biomass policy.

1.3 Policy objectives

The objectives of this policy are:

- To define forest biomass.
 - To identify a procedure to assess the impact of harvesting forest biomass on nutrient sustainability and forest growth.
 - To provide a set of guidelines in selecting eligible forest stands for biomass harvesting.
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2.0 Scope and Application

2.1 Policy scope

This policy applies to the harvest of forest biomass material from Crown forests.

2.2 Forest biomass definition

Forest biomass is all the above-ground components of a tree that are not identified under the current Department of Natural Resources (DNR) utilization standards for Crown land. Forest biomass includes residual tree tops, branches, foliage, non-merchantable woody stems of trees and shrubs, pre-existing dead woody material and flail chipping residue. Pulpwood fibre generated from full-tree chipping is not considered biomass under this policy.

2.3 Forest biomass sustainability

The procedure for selecting forest stands for biomass harvesting is to be scientifically-based, utilizing the most current sources of information available relating to soils, climate and forest growth and yield.

A DNR approved GIS-based decision support model is to be used to complete the proper analysis in identifying forest stands that are eligible for biomass removal. This model is to incorporate information relating to soil types, bedrock types, atmospheric nutrient deposition and tree nutrient content in calculating the total nutrient supply for a forest stand. In addition, forest composition and associated stand growth rate information will be incorporated to determine nutrient demand. The impact of removing forest biomass on forest growth is determined by assessing the total available supply of nutrients minus the nutrient demand to sustain a pre-defined growth rate of any given forest stand.

It is recognized that GIS-based information requires on the ground verification. Pertinent field information including soil depth, depth to water table and current stand conditions are to be used in association with the decision support system in assessing biomass sustainability.

The expected future forest growth rate is an important factor in determining biomass harvesting eligibility (as identified in section 3.2). The sustainability analysis will examine the impact of removing forest biomass on the resultant forest stand condition. The assessment is limited to post harvest growth rates of partial harvest treatments and to naturally regenerating stands following clear-cut treatments.

3.0 Guidelines

3.1 General

New Brunswick Crown forests are to be managed in a sustainable manner to ensure that objectives set forth for forest diversity, wood supply, wildlife habitat, watercourses and wetlands are achieved.

Forest biomass harvesting must work within the framework of sustainable forest management, ensuring the application of biomass harvesting does not jeopardize current goals, objectives and policies for Crown forests.

Tree branches, foliage and tops are important sources of nutrients for forest growth and development.

Silviculture treatments can further impact nutrient demands beyond the requirements of a natural forest condition.

3.2 Forest stand selection.

Biomass removal is to be limited to forest stands within harvest blocks of the current approved forest management plan.

A forest stand's eligibility for biomass harvest is to be determined through an analysis utilizing an approved decision support model, supported by a field verification process to validate the model base information (Appendix 1 – Biomass sustainability guidelines).

Forest stands are considered eligible for biomass removal when the following post harvest condition is met:

- Minimal site nutrient loss resulting from the harvest of forest biomass, thereby, resulting in no reduction in the predicted growth of the future forest stands.

Under the current Crown land management framework, harvest and silviculture planning remain as separate processes. Consequently, the impact of silviculture treatments are not to be included as part of the biomass sustainability analysis.

Biomass harvesting sustainability for all forest stand types is to be assessed over an 80 year time period, equivalent to the life span of an average forest stand.

Forest stands that qualify for biomass harvesting are to be spatially identified.

3.3 Harvest block selection

As harvest blocks are composed of multiple forest stands, it may be operationally impractical to harvest biomass at the forest stand level.

An entire harvest block is eligible for forest biomass harvesting when the area of eligible forest stands within the harvest block make up greater than 90% of the total block area.

Alternatively, eligible forest stands can be operationally delineated and harvested to the eligible stand boundary.

**3.4 Full-tree
harvesting
criteria**

As best management practice, harvest operations occurring in forest stands that are not eligible for biomass removal will leave biomass material at the site of initial harvest (at the stump).

Slash and other harvest residue resulting from full-tree forest operations that occur in biomass ineligible areas are required to be evenly distributed across the harvest block as part of the original harvest operation. This requirement is also applicable to biomass eligible areas where the harvest slash material is not intended to be utilized. Slash material is not to be left roadside under these conditions

Where biomass harvesting occurs, all biomass is to be removed from the harvest block within one operating year.

**3.5 Roadside
harvest residue**

Roadside harvest residue material existing on previously operated harvest blocks (pre 2008) is available to be removed as forest biomass.

4.0 Responsibility

4.1 Licensee

Crown Timber Licensees are required to identify as part of a block operating plan submission all forest stands in which biomass harvesting is to occur. Licensees are to employ a DNR approved decision support system to select forest stands and harvest blocks that meet the guidelines identified in the previous section.

Licensees are to implement and monitor harvest operations, including forest biomass removal to ensure these operations meet all departmental standards, policies, goals and objectives for Crown land.

4.2 DNR

DNR will audit biomass eligibility and biomass harvest operations to ensure departmental standards and guidelines are adhered to.

5.0 Inquiries

5.1 Inquiries Inquiries concerning this policy may be directed to the Director of Forest Management Branch.

APPENDIX 1

Forest Biomass Harvesting Guidelines

The Forest Biomass Decision Support System (FBDSS) was developed to identify areas that are ineligible for biomass harvesting due to “high risk”. High risk areas are defined as those site conditions that are sensitive to biomass removal resulting in a significant loss of nutrients and expected growth rates of the future forest.

The FBDSS utilizes GIS based information interpreted at varying scales to assess nutrient sustainability. It is recognized that this information requires additional refinement and verification through improved mapping protocols and on the ground assessment.

In assessing a harvest block for biomass harvest, the FBDSS is to be first used to determine the impact based on the map attribute information and the expected growth rates.

In developing the harvest block operation plan, a ground assessment is to be completed to verify and validate the FBDSS. Operational plans will be reviewed for compliance of the forest biomass policy and associated guidelines. Licensees will be required to provide justification as part of the operational plan submission for any deviation from the FBDSS analysis based on map attribute information.

In addition, a monitoring program to assess long term sustainability and decision making is required for areas of low and high risk to biomass harvesting.

General Guidelines:

- Forest biomass harvesting is limited to the harvest of residual tree tops, branches, foliage, non-merchantable woody stems of trees and shrubs, pre-existing dead woody material and flail chipping residue.
- Do not remove the forest floor including, litter layer, soil surface, stumps and root systems.
- Forest biomass harvesting is only to occur in “low risk” or “eligible” areas.
- Harvest systems are to be designed to minimize soil disturbance, including compaction, rutting and erosion.
- As a best practice, foliage should remain on the site following harvest. Seasonal timing is to be considered in planning a biomass harvest.
- Forest biomass harvesting operations are to be in accordance to the Forest Management Manual, Crown land forest biomass policy, and other related Crown land policies and directives related to forest management.

Site Productivity

Forest biomass harvesting is not occur on areas identified as “high risk” or areas identified by the FBDSS as “ineligible”. It is critical that field verification of risk is to be completed in association with utilizing the FBDSS to ensure that site productivity is sustained on Crown Lands.

High Risk Areas:

- Areas identified as wetlands in accordance to the New Brunswick Integrated Land Classification System and the “Wetland Classification Manual”
- Shallows soils, depths of less than 30 cm.
- Rocky and stony areas.
- Dry and poor soils.

Field Assessment

Forest biomass eligibility as identified from the FBDSS model utilizing mapped attribute information is to be used in the development of a harvest block operational plan. Based on field assessment, Licensees may challenge the status of ineligible areas. In order to do so, Licensees are required to collect the following information:

- Soil depth.
- Depth to water table.
- Existing forest stand condition – m³/ha.

If it is determined that the field assessment data differs significantly from the FBDSS base information, the user can adjust the appropriate model parameters to better reflect the field condition. The biomass sustainability analysis would then be rerun to represent the harvest block ground information.