



Forest Development Section

New Brunswick Sugar Bush Silviculture Program Manual

2019-20

General Information

The Sugar Bush Silviculture Program is intended to promote silvicultural treatments in sugar bush stands that will enhance the growth, health, and vigor of maple trees for syrup production. Treatments will focus on the thinning/spacing of both young and mature stands of maple trees. Funding is available to existing or new sugar bushes on Crown Land or private woodlots. **This program is only available for treatments completed under the term of the 2019-20 agreement.**

Funding for the Sugar Bush Silviculture Program is provided by the Province of New Brunswick. The New Brunswick Department of Energy and Resource Development (ERD) is responsible for management of this program. Program delivery and on-site technical assistance for sugar bush managers will be provided by the NB Maple Syrup Association (NBMSA) and its members.

There are two treatments eligible for funding:

- Pre-commercial thinning (PCT): to enhance the growth of young sugar maple trees for future sap production in a new or existing sugar bush.
- Commercial thinning (CT): to enhance the growth of sugar maple trees for sap production in stands that are sapling age or older in a new or existing sugar bush.

Approved pre-commercial thinning and commercial thinning activities will be funded in 2019-20 at a maximum rate of \$500/ha. This rate may be adjusted lower, at the discretion of the NBMSA, if the number of applicants to the silviculture program exceeds funding capacity. A producer needs to be a registered member of the NBMSA to be eligible to apply for the silviculture program.

Eligible sugar bush must be at least 5 ha in size with a minimum potential of 150 taps/ha. This assessment is to be determined by a stand inventory (cruise) conducted by the NBMSA.

Commercial thinning treatments must be conducted between **August 15, 2019 and February 28, 2020** if the harvest is to be conducted using skidders or other mechanical harvest methods.

To be eligible for funding, participants must not have any outstanding financial claims with the Province of New Brunswick (e.g. lease payments, royalty payments, etc).

Signed Landowner / Crown Lease Holder Agreement: In order for any work under this program to qualify for funding, the *Landowner / Crown Lease Holder Agreement* (see Appendix 1) must be signed. A signed Landowner / Crown Lease Holder Agreement is

needed for each treatment (identified by the PID number). If the private woodlot / Crown lease changes hands and the new owner(s) want to participate in the program, then a new Landowner / Crown Lease Holder agreement must be signed. The NBMSA may also have an existing version of a Landowner / Crown Lease Holder agreement. In that case, the NBMSA own agreement will be valid and attached to the signed ERD Landowner / Crown Lease Holder Agreement.

Participants are required to provide a map or copy of an aerial photograph of their intended treatment area with their application. For producers on Crown Land sugary leases, the proposed treatment area must match the Site Development Plan within their lease documentation; any changes to the Site Development Plan must be made and be approved at their local ERD office. An X-permit, available from local ERD offices, will be required for operations on Crown Land producing merchantable wood products. Producers must provide a copy of their approved application form and treatment description when applying for an X-permit. Applicants are responsible for layout of treatment areas within their sugar bush and ensuring the treatments are conducted properly.

Application Process for Sugar Bush Silviculture Funding

NBMSA will administer and implement the funding program:

1. Applicants are to ensure that their sugar bush is eligible for treatment and will provide a map of their proposed treatment area or a copy of an aerial photo and application form (complete and legible) to NBMSA.
2. Applicants on Crown leases must ensure that their treatment conforms to their Site Development Plan.
3. NBMSA to document request and producer information on a first-come, first-served basis.
4. NBMSA to conduct pre-treatment assessments with producers to verify eligibility and to develop treatment prescriptions.
5. For operations on Crown land where merchantable timber is being produced, the applicant must possess an X-permit from ERD.
6. Producers must conduct or ensure operations are conducted to prescription guidelines.
7. NBMSA will conduct pre-treatment and post-treatment assessments to ensure adherence to standards and to determine the actual area treated. Assessments must be signed by a practicing Forester or Forest Technician.

Post-Treatment Performance Monitoring by ERD

ERD Access to Property: Any property that has received treatments under this program may be inspected by ERD staff members for compliance with criteria, rules and regulations outlined in this manual. For these purposes, ERD staff members may enter upon and pass through private properties and Crown Lease property without being liable for trespass at any time during or after treatment.

Perimeter Marking: To facilitate post-treatment inspection, all work area perimeters shall be marked by NBMSA staff, by tying distinctive colored flagging tape at intervals ≤ 25 m along the entire perimeter of the work area represented on the post-treatment certification form. When more than one parcel (PID) is included in a work area, property lines should be clearly marked, and, the number of hectares treated on each PID clearly noted on the submission.

Random Auditing: ERD staff will conduct random inspections, by area (ha), across the current Sugar Bush Silviculture Program to verify compliance with both treatment criteria and site area (ha) treated. The auditing intensity will be **greater or equal to (\geq) 10%** of the total area treated.

Post Treatment Assessment: Once a treatment site is selected for auditing, it will be sampled. ERD staff reserve the right to take high resolution ortho-imagery of the treatment site using UAV systems, if so required for auditing purposes.

Post-Treatment Joint Evaluation: If an ERD inspection finds that a treatment site does not meet criteria, the NBMSA will have the option of requesting a joint evaluation. Results of joint evaluation will be final. Treatment sites deemed not meeting program criteria will have the total site area rejected and applied to a year-end area reconciliation calculation.

Site Area Difference: If during inspection a difference of more than 5% in a submitted individual site area is found, the NBMSA will be notified. NBMSA will have the option of accepting the ERD area measure, or calling for a joint evaluation, the results of which will be considered accurate. If work area boundaries are not evident, the NBMSA will be contacted to identify the boundary. Note: all untreated areas larger than 0.04 ha are considered voids and shall be deducted to calculate net area. All voids 0.5 ha and larger shall be mapped. When measuring voids, a growing space is allowed around stem of sugarbush stand trees - 1 m in pre-commercial thinning, 2.5 m in commercial thinning.

Year End Area Reconciliation: A year-end financial adjustment will be made if an overall area difference (measured difference and/or difference related to treatment not meeting standard) of greater than 3% is assessed for the NBMSA. The % difference will be applied to the total area submitted under the Sugar Bush Silviculture Program and a

financial reimbursement to ERD will be required equaling the product of this area difference times the treatment rate paid by ERD.

Program Technical Standards

These standards will be used by NBMSA staff for developing silviculture prescriptions in cooperation with sugar bush operators. Appendix 2 (*NBMSA Sugar Bush Silviculture Treatment Certification Form*) shall be completed for each treatment and provided to ERD upon request for audit purposes.

Pre-treatment approval must be obtained from ERD for treatment of any sites which do not meet all criteria.

Pre-commercial Thinning (PCT):

- Average crop tree (sugar maple) height must be $\geq 5\text{m}$, in all cases.
- Sampling criteria:
 - In young stands with no existing overstory, thinning is to be uniform throughout the stand with each crop tree free to grow on all sides.
 - Stands with >5000 stems/ha, >1 m in height (pre-treatment) are eligible for treatment
 - release of >750 stems/ha of quality young sugar maple with reasonable distribution throughout stand (75% stocking of 40 m^2 plots).
 - Total density post treatment, 1500 - 2000 stems/ha (including non-sugar maple)
 - In a stand with an existing overstory, the intent is to select young sugar maple between existing mature trees with the expectation that they will form the next sap production overstory.
 - Stands with >3000 stems/ha, >1 m in height (pre-treatment) are eligible
 - release of >300 stems/ha of quality young sugar maple with reasonable distribution throughout stand (60% stocking of 40 m^2 plots)
 - Total density post treatment, 500 - 1000 stems/ha (including non-sugar maple)
- Crop tree selection:
 - Dominant or co-dominant size trees
 - Healthy, vigorous trees
 - Wide and deep crown trees
 - Trees with little or no physical damage
 - Trees with a single main stem and branching angle of ≤ 45 degrees

- Maintain $\geq 10\%$ stand composition of non-sugar maple species where appropriate to maintain biodiversity and prevent development of other vegetation/competition.
- This treatment does not include routine cutting of underbrush in an existing sugar bush.
- Accurate GPS shapefile of treatment area must be submitted to ERD

Commercial Thinning (CT):

- This treatment involves commercial harvest removal of both non-sugar maple species as well as sugar maple trees to maximize the benefit to the remaining stand for current and future syrup production.
- Sampling criteria:
 - Basal area of stand must be $>24\text{m}^2/\text{ha}$ before treatment.
 - Basal area removal shall be a minimum of 15% and shall not exceed 33%.
 - Residual basal area must be $\geq 20\text{m}^2/\text{ha}$ after treatment.
- Maintain $\geq 10\%$ stand composition of non-sugar maple species, where possible.
- Emphasis to be placed on removal of suppressed or codominant trees interfering (immediately adjacent or touching) with the crowns of crop trees.
- Table 1 shall be used as a guide for Sugar Bush Stocking.
- Consideration should be given to exposed boundaries that may be at risk of windthrow, in which case, maintaining a higher basal area within 10 m of edge is recommended and acceptable.
- Logging damage to crop trees must not exceed 10% (bark abrasions $>600\text{ m}^2$, breakage of main stems or branches $>8\text{ cm}$ in diameter, root damage due to ground disturbance)
- Accurate GPS shapefile of treatment area must be submitted to ERD

Table 1. Sugar Bush Stocking Guidelines		
Average Diameter (cm)	Trees per Hectare	No. of Taps per Tree
<10	>690	0
10 - 24	175 - 690	0
24 - 34	125 - 175	1
34 - 44	85 - 125	2
>45	<85	3

(Table 1 adapted from A Guide to Sugar Bush Thinning 1988, Natural Resources and Energy, New Brunswick).

Appendix 1: Landowner / Crown Lease Holder Agreement



Landowner / Crown Lease Holder Agreement for Participation in the Department of Energy and Resource Development (ERD) 2019-20 New Brunswick Sugar Bush Silviculture Program

Background: The New Brunswick Sugar Bush Silviculture Program has provided financial incentive to registered landowners and Crown Lease holders interested in conducting specific silvicultural treatments to help enhance maple syrup production. The program targets early interventions (pre-commercial thinning) and stand improvement harvests (commercial thinning) all of which necessitate many decades for the benefits to mature.

Program assistance is available on properties providing the following conditions are met;

- all program requirements and treatment criteria listed in this manual are met;
- the registered landowner/ Crown Lease holder agrees in writing to manage the property in a manner consistent with the time frame necessary to produce maple syrup;
- the registered landowner / Crown Lease holder agrees to repay moneys received under this program should they fail to manage area that is treated under this program, and;
- ERD staff members may enter upon and pass through these private properties or Crown Lease properties without being liable for trespass at any time during or after treatment to check compliance with criteria, rules and regulations outlined in this manual.

LANDOWNER / CROWN LEASE HOLDER AGREEMENT:

I _____(print) am the registered Landowner , or Crown Lease Holder of the property identified by PID #_____. I have read and understand this document. I agree that in accepting financial assistance under this program, I am committing this property to the production of maple syrup. I agree to manage this property in a manner consistent with the time frame necessary to produce maple syrup. I agree to allow ERD staff members to enter upon and pass through my properties at any time during or after treatment to check compliance with criteria, rules and regulations outlined in this manual. I also agree to repay moneys received under this program should I fail to manage area that is treated in a manner consistent with maple syrup production. I acknowledge that I have read the *2019-20 New Brunswick Sugar Bush Silviculture Program Manual* and understand the contents within.

Signature of Registered Landowner or Crown Lease Holder

Date

NB Maple Syrup Association

I _____ (print), of the NB Maple Syrup Association shall verify all operations pertaining to the silviculture treatments undertaken within this agreement and will ensure that the quality of the work completed meets the criteria stipulated in the *2019-20 New Brunswick Sugar Bush Silviculture Program Manual*.

Signature of NB Maple Syrup
Association Representative

Date

This document is required for each treatment and shall be on file with the NBMSA. ERD may request this signed form as part of a program audit

Appendix 2 - NBMSA Sugar Bush Silviculture Treatment Certification Form

Registered Landowner / Crown Lease Holder Name:	
Parcel Identification (PID):	Location:
Treatment area (ha):	Funding rate/ha (\$):
Pre-inspected by (NBMSA Representative):	Date of pre-inspection (dd/mm/yy):

Pre-Commercial Thinning	overstory <input type="checkbox"/>	no-overstory <input type="checkbox"/>
Average crop tree height (within density plots)	pre: m	post: m
Density (pre-treatment 5m ² plot, post treatment 40 m ² plot) 1 plot /ha, minimum 8 plots	pre:	post:
Stocking of quality young sugar maple (40 m ² plot) 1 plot /ha, minimum 8 plots	pre:	post:
Crop tree selection meets standard post-treatment: dominant/co-dominant, healthy, vigorous, wide/deep crowns, minimal physical damage, single main stem	General observation:	
Stand composition of non-sugar maple based on density measurements	Specie(s) and %:	

Commercial Thinning		
Basal Area of stand 1 plot /ha, minimum 8 plots	pre: m ²	post: m ²
Crop tree selection meets standard post-treatment: removal of suppressed or co-dominant trees interfering with crowns of crop trees	General observation:	
Stand composition of non-sugar maple based on BA measurements	Specie(s) and %:	
Logging damage: bark abrasions > 600 cm ² , breakage of main stem or branches >8 cm, root damage due to ground disturbance	% of trees damaged (BA sweeps):	

Comments

Verification Signature (NBMSA Rep): _____ **Date Complete (dd/mm/yy):** _____