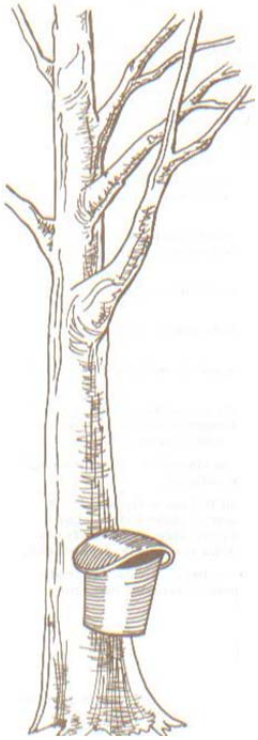
Survey of Northern Forest Landowners Regarding the Potential to Expand Maple Syrup Production



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Introduction

The Northern Forest covers a large, heavily forested region stretching across 4 states in the northeastern United States. Maple syrup production is an important component of the Northern Forest economy and way of life for many landowners in Maine, New Hampshire, New York, and Vermont. The Northern Forest contains a tremendous resource of untapped maple trees, sugarmakers interested in producing more syrup, and potential to expand maple syrup markets locally and worldwide. In response, we are researching the realistic growth potential of the Northern Forest maple industry, what obstacles exist for increasing production, and effective strategies for overcoming these barriers. In particular, this report discusses our survey of 2400 landowners carried out in Fall 2009 aimed at acquiring a greater understanding of the barriers and incentives landowners perceive for utilizing their trees for syrup production.

Survey Methodology

The survey built upon the findings of an earlier survey that had been sent to 1600 landowners and members of the New York Forest Owners Association (Farrell & Stedman 2009). We framed a lot of the questions in the same manner as the earlier survey while also including new questions to gather additional data.

The Human Dimensions Research Unit in the Department of Natural Resources at Cornell handled survey administration. The surveys were sent to random samples of 600 landowners in each of the 4 states who owned at least 100 acres. The Maine database was drawn from the LURC database that includes all of the Unorganized Territories in the Counties of the State of Maine. For New Hampshire, because a state database for all landowners does not exist, we relied on the database of all landowners enrolled in the current use program as provided by SPACE- New Hampshire's Current Use Coalition. The New York sample was derived from a database of landowners provided by the Real

Property Tax Service Agency. Finally, the Vermont sample was drawn from a listing of property owners provided by the state Department of Taxes.

The survey was carried out according to standard practices as outlined by Dillman (2000). The first surveys were mailed on October 15, 2009 and a reminder letter was sent on October 22. Those producers who did not respond within 2 weeks were mailed a second copy of the survey on November 5 while a final reminder letter was mailed on November 12 to people who still had not responded. Data entry began in early January and continued until mid-February 2010 when the last completed surveys arrived.

Sampling Frame Analysis

Of the 2,400 questionnaires that were mailed, we received 1,100 completed questionnaires, with 163 undeliverable and 7 not usable, resulting in a total adjusted response rate of 49%. Table 1 below presents the results of the sampling frame according to the four states.

Table 1. Response rate for survey according to state.

State	Useable Returns	Undeliverable	Not Usable	Response Rate
Maine	268	55	0	49%
New Hampshire	288	34	4	51%
New York	265	44	2	48%
Vermont	279	30	1	49%
Total	1100	163	7	49%

The descriptive statistics of the total acreage, wooded land, and acres of potential sugarbush (as identified by the landowner) are presented in Table 2. Some of the respondents from Maine and those who owned land in multiple states had the largest properties. While their responses skewed the mean results for these categories, the median figures were also larger for Maine and multiple states. Across all states, most of the land was classified as woodland whereas a smaller percentage of that was self-

identified as capable of supporting a sugarbush. It is worth noting that Northern New York had the lowest percentage of land classified as woodland, most likely due to the abundant farmland near the St. Lawrence River and Lake Champlain.

Table 2. Descriptive Statistics on Total Acreage, Acres of Woodland, and Acres of Sugarbush Owned by Respondents according to State.

	Mean	Median	Standard Deviation	Minimum	Maximum
Total Acreage Owned					
Multiple (n=77)	30,611	490	135,340	15	1,000,000
Maine (n=236)	11,603	275	84,791	15	1,200,000
New Hampshire (n=249)	317	190	669	15	9,000
New York (n=230)	275	200	243	20	2,000
Vermont (n=231)	687	219	2,061	12	20,000
Acres of Woodland Owned					
Multiple (n=77)	28,519	420	126,035	12	920,000
Maine (n=236)	6,491	250	32,602	10	300,000
New Hampshire (n=249)	294	157	690	10	8,950
New York (n=230)	162	100	211	9	1,800
Vermont (n=231)	671	184	2,122	9	20,000
Acres of Sugarbush Owned					
Multiple (n=77)	6,644	50	22,558	0	100,000
Maine (n=236)	945	10	8,048	0	100,000
New Hampshire (n=249)	54	10	216	0	2,500
New York (n=230)	36	10	63	0	400
Vermont (n=231)	301	70	1,433	0	18,000

Landowner Attitudes & Practices Regarding Syrup Production

To increase the supply of maple syrup produced in the Northern Forest, there must be increased landowner involvement with the industry, either through direct production, gathering and selling sap, or leasing their trees to an existing producer. Given that the vast majority of landowners are not currently tapping themselves or having others tap their trees, we wanted to know whether they felt that tapping their trees was appropriate. Therefore, we asked several questions to gather information on landowners' attitudes towards managing their property in general and maple tapping in particular.

The first set of questions asked landowners if they felt their land should be managed and whether they feel that they (or others) actually do manage their land. We defined management directly in the question as follows: *By "manage" we mean take deliberate actions to influence the value of the land. Some examples of management activities are harvesting firewood, marking a trail, tapping maple trees, or improving habitat for wildlife.*

Table 3. Landowners attitudes towards whether their land should be managed.

	Definitely No (1)	No (2)	Not Sure (3)	Yes (4)	Definitely Yes (5)	Mean
State						
Multiple (n=77)	1%	3%	14%	25%	57%	4.3
Maine (n=236)	3%	10%	6%	33%	47%	4.1
New Hampshire (n=249)	5%	12%	6%	35%	42%	4.0
New York (n=230)	8%	16%	13%	30%	32%	3.6
Vermont (n=231)	0%	4%	9%	31%	55%	4.4
Ownership Category						
privately owned non-industrial (n=850)	4%	11%	9%	32%	44%	4.0
private business/corporation (n=76)	1%	5%	7%	32%	55%	4.3
private recreational/hunting club (n=55)	4%	15%	9%	28%	43%	3.9
non-profit organization (n=18)	6%	0%	11%	22%	61%	4.3

Table 4. Landowners practices regarding whether they actually manage their land. Results are presented as percentages of respondents who checked that option and are stratified according to 'State' and 'Ownership Category'.

	No	Yes	Not Sure
State			
Multiple (n=77)	18%	79%	3%
Maine (n=236)	16%	83%	1%
New Hampshire (n=249)	19%	78%	3%
New York (n=230)	37%	60%	3%
Vermont (n=231)	14%	83%	3%
Ownership Category			
privately owned non-industrial (n=850)	22%	75%	3%
private business/corporation (n=76)	12%	88%	0%
private recreational/hunting club (n=55)	31%	67%	2%
non-profit organization (n=18)	28%	72%	0%

The data clearly indicate that most landowners feel that their property should be managed and slightly less are actually following through with management. Previous studies (Connelly & Smallidge 2007) have determined that time, not having the right equipment, and high costs were the main reasons why landowners have not been managing their

land. Although these factors would also prohibit landowners from becoming engaged in maple syrup production directly, it would not prohibit landowners from leasing their forestland to a nearby maple producer.

Private businesses are much more likely to manage their land than hunting clubs or non-profit organizations, as businesses are generally more focused on financial returns. It is worth noting that NY had a much higher percentage of landowners who (1) do not feel they should be managing their land and (2) are not actually managing it. This might be due to the prevalence of the Adirondack Park and preservation attitude that many landowners share, especially those who own their land as part of a second home.

In order to separate the current producers from other landowners and gauge their level of syrup production, we asked current producers how many taps they put out each year (Table 5).

Table 5. Descriptive statistics on respondents who currently produce syrup.

State	Number (and %) of Producers	Mean # of Taps	Median # of Taps	Standard Deviation	Minimum # of Taps	Maximum # of Taps
Multiple (n=77)	13 (18%)	913	500	1,204	20	4,000
Maine (n=236)	27 (12%)	4,522	50	20,724	11	107,764
New Hampshire (n=249)	26 (15%)	1,031	250	2,696	1	14,000
New York (n=230)	20 (9%)	900	275	1,307	10	4,000
Vermont (n=231)	37 (17%)	6,651	550	15,915	10	70,000

Vermont clearly dominated in terms of the number and percentage of landowners that are producing syrup as well as the median and mean number of taps per landowner. New York was well below the other states in all aspects of production[1].

In order to determine the attitudes of landowners who are not currently producing syrup, we asked the following question (15): Do you feel that the maple trees on your property should be tapped for syrup production, either by yourself or someone else?

[1] Because we did not conduct non-respondent follow up interviews to gauge non response bias, these figures should not be used to estimate the total syrup production in each of these states. The National Agricultural Statistics Service tracks syrup production for each of these states and is a more reliable source of information on current production practices and levels.

Table 6. Landowner attitudes towards whether they feel their trees should be tapped.

	Yes, By me	Yes, By somebody else	No	Not Sure
State				
Multiple (n=77)	4%	30%	33%	33%
ME (n=236)	15%	5%	53%	27%
NH (n=249)	9%	13%	41%	37%
NY (n=230)	6%	8%	57%	30%
VT (n=231)	14%	10%	38%	38%
Total Acreage Owned				
> 2,000 acres (n=62)	10%	20%	45%	25%
between 500 and 2,000 acres (n=166)	13%	12%	44%	31%
between 200 and 500 acres (n=364)	13%	10%	47%	31%
less than 200 acres (n=435)	8%	9%	47%	36%

This question was only answered by landowners who were not currently producing syrup and the results (Table 6) indicate an opportunity to have more landowners involved with maple production. Generally speaking, whereas ~47% of landowners will probably never get involved with maple production, there is a good chance that 20% would (if given the right opportunity) and an additional 33% might be encouraged to participate.

Larger landowners were more likely than smaller landowners to want someone else to tap their trees, as 20% of landowners with at least 2,000 acres landowners chose this option vs. only 9% for those with less than 200 acres. At 30%, those who own land in multiple states are the most likely to want someone else to tap their trees. This makes sense given the fact that the owner would not live near at least some of the property they own. Landowners in Maine (15%) and Vermont (14%) are the most willing to produce syrup themselves whereas those in New York (6%) are the least likely to get into direct syrup production.

Why Landowners Have Not Yet Tapped Their Trees

If maple syrup production is to expand in the Northern Forest, it is important to understand why some landowners have not yet utilized their maples for syrup production. Therefore, we first asked landowners who are not currently tapping and producing syrup

themselves the primary reasons why they have not done so. Later on we also asked why they have not leased their trees to another sugarmaker (refer to pages 24-26 for a discussion on this topic). We stratified the results according to several categories, including (1)state, (2) total acreage owned, (3) ownership category, (4) childhood involvement with maple production, (5) gender, (6) retirement status, a (7) landowners attitude towards whether their trees should be tapped, and (8)the number of maple producers a landowners knows.
This section discusses the results of this question while offering recommendations on how to overcome the obstacles identified by the landowners.

While the results in Table 7 can be interpreted in many different ways, we are most interested in determining how a person's feelings on whether their trees should be tapped or not relate to the perceived barriers of doing so.

Among the respondents who stated that they do not think their trees should be tapped, the greatest reason given (61%) was simply that they do not have enough tappable maple trees. Certainly not all landowners are fortunate to own a potential sugarbush, so it was expected that our mail survey would reach landowners that do not own a significant number of maple trees. It is possible that some of these landowners would want to produce syrup if they owned a sugarbush, though it was not possible to determine that percentage based on our survey. The next highest responses were that they do not have any interest in tapping (29%), the trees are not accessible (28%), and they do not have enough time (26%). While it is often debated whether maple sugaring or timber management will yield greater revenues (Fast and Roberge 2010), only 13% in this category indicated that they were concerned about losing sawtimber value.

For the respondents who were not sure if their trees should be tapped, the top two responses were that they had never thought about it (47%) and did not have enough time (42%). Based on these results, leasing to an existing producer could be an attractive option for these landowners. Since leasing is a very passive activity that does not require

Table 7. Reasons why landowners are not tapping their own trees for syrup production.

	Never thought of it	No interest in the process	Not enough trees	Land regulations prohibit tapping	Don't know how to get started	Trees are not accessible	Not enough time	Not enough helpers	Cost of equipment is too high	Syrup production is not profitable enough	Live too far from my land	Tapping would interfere with other uses	Concerned about sawtimber value	Tubing would look bad	Tubing would interfere with trails
State															
Multiple (n=77)	25%	11%	25%	0%	8%	25%	41%	10%	8%	16%	25%	16%	25%	2%	5%
Maine (n=236)	34%	21%	46%	1%	8%	26%	35%	9%	12%	10%	24%	9%	10%	2%	2%
New Hampshire (n=249)	26%	17%	52%	1%	9%	35%	38%	13%	16%	8%	21%	5%	5%	2%	6%
New York (n=230)	30%	23%	43%	0%	10%	18%	31%	14%	19%	10%	16%	7%	9%	1%	5%
Vermont (n=231)	21%	15%	22%	1%	9%	25%	43%	15%	29%	14%	32%	14%	26%	3%	10%
Total Acreage Owned															
> 2,000 acres (n=62)	16%	16%	11%	2%	4%	18%	29%	4%	4%	13%	13%	38%	47%	2%	0%
between 500 and 2,000 acres (n=166)	28%	22%	26%	0%	9%	29%	40%	9%	21%	17%	15%	14%	21%	2%	3%
between 200 and 500 acres (n=364)	24%	18%	41%	0%	8%	23%	40%	12%	18%	11%	22%	8%	9%	2%	7%
less than 200 acres (n=435)	32%	18%	48%	1%	10%	28%	35%	15%	19%	8%	28%	5%	9%	2%	6%
Ownership Category															
non-profit organization (n=18)	7%	7%	33%	0%	0%	33%	40%	7%	20%	0%	0%	20%	7%	7%	7%
private business/corporation (n=76)	23%	12%	28%	0%	7%	22%	35%	10%	7%	13%	10%	25%	35%	3%	3%
private recreational/hunting club (n=55)	41%	27%	33%	0%	8%	20%	43%	14%	16%	6%	45%	4%	8%	0%	6%
privately owned non-industrial (n=850)	27%	19%	42%	1%	9%	27%	37%	13%	20%	11%	23%	8%	12%	2%	6%
Childhood Experiences with Maple Production															
No Involvement (n=437)	39%	23%	39%	1%	11%	22%	35%	15%	15%	9%	26%	8%	11%	3%	6%
Visited Sugarhouses (n=229)	24%	13%	43%	1%	11%	30%	46%	17%	24%	14%	29%	10%	17%	2%	7%
Helped Produce (n=376)	15%	15%	44%	0%	4%	31%	40%	12%	21%	14%	20%	11%	16%	1%	6%
Gender															
Female (n=204)	34%	25%	44%	1%	9%	31%	36%	16%	18%	9%	26%	3%	5%	1%	5%
Male (n=813)	26%	17%	39%	0%	9%	25%	37%	11%	18%	12%	23%	10%	15%	2%	5%
Working Status															
Not Retired (n=552)	29%	15%	36%	1%	12%	25%	49%	13%	21%	13%	24%	11%	16%	2%	6%
Retired (n=432)	27%	23%	47%	1%	4%	27%	21%	12%	13%	8%	22%	6%	9%	2%	5%
Should the maple trees on your property be tapped?															
No (n=369)	20%	29%	62%	0%	1%	28%	26%	10%	11%	11%	18%	10%	13%	1%	4%
Not Sure (n=260)	47%	14%	27%	1%	17%	27%	42%	16%	20%	9%	28%	8%	13%	3%	7%
Yes, By me (n=82)	7%	1%	7%	0%	13%	11%	61%	10%	44%	16%	16%	9%	15%	6%	9%
Yes, By somebody else (n=81)	22%	7%	17%	0%	14%	22%	51%	19%	20%	12%	41%	9%	15%	2%	5%
Number of Maple Producers Known by Respondent															
> 10 producers (n=73)	11%	3%	27%	0%	3%	16%	43%	3%	30%	14%	11%	16%	38%	3%	14%
between 1 and 10 producers (n=673)	26%	18%	40%	1%	7%	29%	41%	13%	19%	11%	21%	9%	12%	2%	6%
Zero (n=165)	45%	25%	45%	1%	18%	21%	35%	14%	14%	11%	38%	4%	8%	2%	2%

any interest or effort of the landowner, it is certainly possible that if one of these landowners was approached by a maple producer about leasing, then he/she would agree to the request.

For landowners who stated that they would like to tap their own trees, the major limiting factors were, by a wide margin, not enough time (61%) and the cost of equipment being too high (44%). A viable option for these landowners is to tap their trees and sell the sap to a nearby producer. The cost per tap of setting up a tubing system is roughly $6-10/tap, much lower than that of building a sugarhouse and buying an evaporator, reverse osmosis, filter press, and all of the other equipment items necessary for producing high quality syrup in a cost-effective manner. Simply selling the sap and not processing it oneself also greatly reduces the time invested on the part of the landowner. Once the tubing is installed and the trees are tapped, it only takes a limited amount of time to maintain the tubing lines and gather/transport sap. This avoids having to spend many days and long nights processing the sap into syrup. Another no-cost option is to "purchase" the tubing materials with the syrup that will be produced. Some large producers buy in sap from neighboring landowners and provide them with the tubing materials in exchange for syrup the following sugaring season. This can be an attractive option for landowners who would like to tap their trees but are not willing to make any financial investments and do not have enough time to process the sap into syrup.

Landowners who believe that others should tap their maple trees are limited primarily by lack of time (51%) and living too far from their land (41%). Although these are barriers for being able to produce syrup, they do not pose any problems for a landowner who is leasing their property. On the contrary, they are strong incentives for landowners to have others do the work in collecting and processing sap from their property.

The following section describes the results presented in Table 7 in greater detail (i.e., comparing across categories of respondents) They are described in order of decreasing importance, with the top reason given for not producing syrup listed first and the least important reason discussed last.

(1) Not Enough Trees

40% of respondents selected "*I do not have enough tappable maple trees,"* making this the most commonly chosen option. This was a surprising finding, given the prevalence of maples throughout the Northern Forest region. However, this was not as significant an issue for landowners in Vermont (22%) and those who owned land in multiple states (25%). Also, as one would expect, larger landowners were also less likely to identify this as an issue, with only 11% of those with at least 2,000 acres selecting this vs. 48% of those with 200 acres or less. There were also significant differences based on how many other producers a landowner claimed to know. Only 27% of landowners who know at least 10 producers selected this option vs. 45% of those who do not know any producers. One hypothesis is that landowners who do not know other producers are less likely to know the attributes of a good sugarbush and therefore may not know that they have enough maple trees to be worthwhile for tapping. It is possible that greater outreach to landowners will educate them about the potential for sugaring opportunities on their land that they are currently unaware of.

(2) Not Enough Time

With 37% of respondents selecting "*I do not have enough time"*, this ranks a close 2nd among all possible choices. The major difference was in retirement status, as 49% of those who are not retired claimed to not have enough time vs. only 21% of those landowners who are retired. In fact, many of the maple producers that are getting started now are doing it in their retirement as an enjoyable activity that can yield some supplemental income.

(3) Never Thought of It

27% of landowners selected "*I have never thought about it as an option"* . The largest discrepancies were based on the number of maple producers a landowner knows and a landowner's childhood experiences with maple production. Nearly half (45 %) of

landowners who do not know any other producers chose this option vs. only 11% of landowners who know at least 10 producers. Furthermore, only 15% of those landowners who helped produce syrup as a child selected this option vs. 39% of those that had no involvement with maple in their youth. Ownership category and size were also significant factors. Landowners representing hunting clubs were most likely to choose this option (41%), suggesting the importance of other reasons for owning land, while 16% of large owners(>2,000 acres) selected this option vs. 32% for those with 200 acres or less.

(4) Trees Are Not Accessible

Even though a landowner may have plenty of maple trees on their land, often times they are hard to get to, as seen by the fact that 25% of respondents selected "*My trees are not easily accessible"*. There were not any major differences when stratified according to the various categories; the landowner's trees are either accessible or they aren't. The only interesting finding is that 11% of landowners who would like to tap the trees themselves selected this barrier vs. 22% of those that would like someone else to tap their trees. One hypothesis is that since the trees are difficult to get to, twice as many landowners would rather let someone else do the difficult job of tapping them. It is worth noting that modern vacuum tubing systems and pumps are able to overcome almost any situation that is originally deemed inaccessible, especially if a landowner is willing to put in the necessary infrastructure to gather and pump sap.

(5) I Live Too Far From My Land

"*I live too far from my land*" was selected by 23% of respondents, ranking it fifth among all possible choices. This figure falls in line with the fact that 31% of landowners live at least 25 miles from their property while 26% live more than 50 miles away. Certainly there are many absentee landowners in the Northern Forest and maple production is not necessarily something you can do on weekend visits. Not surprisingly, landowners from

hunting clubs (45%) were most likely to choose this option, as many of the members live far away from their properties.

(6) No Interest in the Process

Since only 18% of respondents selected "*I have no interest in the process,"* this indicates a strong potential for more landowners to get involved in syrup production, assuming the other barriers for entry can be overcome. The greatest differences can be seen among the number of maple producers a landowner knows: only 3% of respondents who claimed to know at least 10 producers selected this option vs. 25% of those who did not know any producers. Landowners from hunting clubs were by far the least interested in tapping their trees, as 27% of hunting club respondents selected this option vs. only 7% of non-profit groups.

(7) Cost of Equipment is Too High

The first six obstacles all had to do with accessibility, time, and interest among the landowner. Assuming that a landowner had enough accessible trees to tap and the time and motivation to do so, the first major hurdle that many landowners must overcome is that the initial cost of purchasing equipment is too high. Overall this was selected by 17% of respondents, yet 30% of the landowners who know at least 10 producers checked this option vs. only 14% of those who do not know any landowners. This difference is likely due to the fact that landowners who know other producers have a greater understanding for how expensive the equipment can be.

(8) Concern about Reducing Sawtimber Value

"*I am concerned about reducing sawtimber value*" was only selected by 13% of all respondents, ranking it is a surprising eighth among all possible choices. However, there were strong discrepancies based on the state, ownership category and total acreage of the landowner. Vermont (26%) and those with land in multiple states (25%) exhibited the

highest concern about sawtimber devaluation whereas Maine (10%), New York (9%), and New Hampshire (5%) had far fewer landowners identify this as a concern. Private business/corporations were the most concerned about sawtimber at 35%, far above all of the other ownership categories. Total acreage was strongly correlated to concern over sawtimber value, as 47% with at least 2,000 acres selected this option vs. only 9% of those landowners with less than 500 acres. It is also worth noting that 15% of males selected this option vs. only 5% of females, suggesting a gender bias towards sawtimber production. Finally, the number of maple producers a landowner knows also led a respondent to be more concerned about reducing sawtimber value. Whereas only 8% of the landowners who do not know any producers selected this option, 38% of those who know at least 10 producers did. It is possible that these landowners have learned from other producers that the butt log is not worth nearly as much on the commercial markets once it has been tapped.

(9) Not Enough Helpers

"I don't have access to family, friends, or neighbors who could help me" was only chosen by 12% of respondents. This result was surprising given that labor is often the limiting factor in the ability to produce syrup or expand an existing operation. Only 3% of the landowners who know at least 10 producers checked this option whereas 14% who do not know any producers checked it. This difference could be due to the fact that those who know other producers feel that they can count on them for guidance and assistance.

(10) Syrup Production is Not Profitable Enough

Only 9% of respondents chose "*Syrup production is not profitable enough*". This may be due to the fact that syrup prices have been unusually high over the past few years starting with the supply shortage that began in 2008. It is likely that the results would have been much different if this survey was administered before the jump in bulk and retail prices. Furthermore, if syrup prices fall in the future, this should also impact the importance of this potential barrier.

(11) Don't Know How to Get Started

There is also a tremendous amount of information and resources out there for people looking to get started in syrup production, especially in the Northern Forest region. Thus, it was encouraging 9% of respondents selected "*I don't know how to get started"*, as this figure would probably have been much greater in other states. The greatest differences were seen among the number of maple producers a landowner knows. Only 3% who know at least 10 producers checked this option vs. 18% of those who do not know any producers. Again, this is likely due to the support network that landowners who already know producers feel they can count on.

(12) Tapping Would Interfere with Other Uses

The fact that only 9% of respondents selected this option was not surprising, as syrup production is an activity that can co-exist with many other activities on a given piece of land. However, among the largest landowners with at least 2,000 acres, 38% selected this option, ranking it a close second behind "concern about reducing sawtimber value" for this group. Given that the 'other use' that tapping would interfere with is likely timber harvesting, these are very similar results.

(13) Tubing Would Interfere with Trails

"I am concerned that the tubing would interfere with recreation and trails" was only chosen by 5% of respondents. The highest percentage of any category (14%) came from landowners who know at least 10 maple producers, as many of them probably have seen tubing systems that did block off trail systems during sugaring season. However, it is important to note that a well designed tubing system, through the use of sap ladders and/or burying mainlines, is able to gather sap without ever blocking a trail or road.

(14) Tubing Would Look Bad

Only 2% of respondents chose "*I'm concerned that the tubing would look bad*", making this appear to be a non-issue. The highest response of any group was 7% for the non-profit ownership, as these owners tend to be more concerned with aesthetics. Whereas our results indicate that this is not a concern, anecdotal reports from many producers reveal that landowners are often concerned with how the tubing will look on their property. In fact, maple equipment companies now manufacture clear and grey tubing specifically designed to be difficult to see in the woods.

(15) Land Regulations Prohibit Tapping

Less than 1% of respondents selected this option, thereby rendering it a non-issue. It is highly unlikely that privately owned land would have deed restrictions against tapping, so it is not surprising to have had so few landowners select this category.

Facilitating landowner involvement with maple production

As previously discussed, there are many more landowners who would like to use their maples for syrup production—or at least would consider doing--than are actually doing so. There are also a number of obstacles or barriers that landowners perceive for getting into the business of sugaring. In order to better gauge what the best enticements are for people to get involved with the maple industry, we asked landowners how likely they would be to start utilizing their maples for syrup production based on a number of possible scenarios.

Table 8. Likeliness of landowners to get involved with maple production based on different scenarios.

	Very unlikely	Somewhat unlikely	Somewhat likely	Very likely
Syrup producton was more profitable	48	17	29	6
More education and training opportunities existed	56	20	20	4
You had more tappable trees	35	17	38	10
You lived closer to your land	50	16	25	9
You could qualify for a tax break	33	17	33	17
Easy financing was available	48	21	23	8
You had more people available to assist	42	19	28	10

The number of landowners who selected “somewhat likely” far outnumbered those who selected “very likely” for all of the possible scenarios listed above. While there is a good chance that the landowners who selected “very likely” will follow through with their intention to get involved with maple production, the chances of those who selected “somewhat likely” following through are probably much lower. Thus, it is doubtful that a high percentage of landowners will be getting into sugaring any time soon, no matter what scenarios take place in the future. Nevertheless, we anticipate that more people will continue to get involved in the maple industry and this question revealed the importance of property tax reduction and having more trees available for tapping as the two most important enticements for landowners.

Our results clearly indicate the importance of taxation policy in enticing landowners to utilize their maples for syrup production. Approximately 17% of landowners indicated that they would be very likely and 33% somewhat likely to get involved with maple production if it would allow them to qualify for a reduced tax assessment as a result. Through the Agricultural Assessment program, New York State is the only state that provides a tax reduction for maple sugaring as an agricultural activity. Maine, New Hampshire, and Vermont all have programs that could qualify a sugarbush for tax savings, but these programs only require that either the land is not developed and/or forestry activities are taking place. There is no specific incentive to do maple sugaring in these states as there is with the agricultural assessment program in NY.

Although New York also has a property tax reduction program for forestry through the Forest Tax Law 480-A, the savings tend to be lower than Agricultural Assessment and

the program is much more onerous for landowners to participate in. While the 480-A program provides up to an 80% reduction on property taxes, it requires that landowners own at least 50 acres of timberland, develop and follow a written management plan for 15 years, pay an 6% excise tax on stumpage fees whenever harvesting takes place, and incur severe penalties for failure to adhere to the program requirements. On the other hand, the Agricultural Assessment program only requires landowners to have 7 acres of sugarbush, it can be tapped oneself or leased to a neighbor, no excise taxes are imposed on timber or syrup production, and the penalties for withdrawing from the program are much less severe. The assessed value is based on the soil type and generally fluctuates between $200-300/acre. In areas with high land values, this can result in savings well over 80% whereas in rural areas the savings may be less than 80%.

After property tax savings, the next greatest enticement would be if landowners had more maple trees available for tapping (38% somewhat likely and 10% very likely). These results make intuitive sense, as there are likely many landowners who would want to be maple producers, but just don't have enough maple trees on their own land. The perception of limited maple trees may or may not exist in reality, and the challenge with some landowners will be to educate them about the existing maple resource on their land.

Another opportunity for these landowners is to encourage them to work with their neighbors who do have an abundance of trees available for tapping. There are many maple producers who own their own sugarhouse but tap exclusively on others property. Although this is not as preferable as being able to tap on one's own property, it can certainly be done. It is especially desirable in states such as New York if the landowner can qualify for agricultural assessment as a result.

A pervasive problem throughout the agricultural sector is the shortage of quality labor. This is especially true in the maple industry, as the work is very seasonal and primarily takes place in the winter/early spring under uncomfortable conditions. In fact, the third greatest incentive identified by landowners was having more people available to assist (28% somewhat likely and 10% very likely). Again, for some landowners collaboration

with nearby existing producers would be advantageous through sap selling arrangements. Shifting the burden of processing the sap to an existing sugarhouse that is already set up with efficient equipment would free up more labor to devote towards tapping trees and gathering sap.

Prices for syrup also have a significant influence on the level of syrup production. In fact, 29% of landowners would be somewhat likely and 6% very likely to get involved with maple production if it was more profitable. Syrup production can be a profitable venture for landowners who are able to control costs and maintain high yields. Prices rose to record high levels over the past few years as a result of a supply shortage. This has spurred tremendous expansion in the industry among existing and new producers. However, prices will eventually fall if production starts to outpace demand, which could certainly happen in the next couple of years if the appropriate weather conditions exist. In addition to the new taps being put out, advancements in vacuum tubing technology have the potential to revolutionize the industry by drastically increasing yields per tap. In order for demand to keep pace with an increasing supply, the maple industry must continue its promotion efforts both domestically and abroad.

Landowner Activity with Leasing

The six most common barriers for landowners to produce syrup are all concerned with not having the time, interest, or ability to tap trees and process sap themselves. However, none of these obstacles would prevent a landowner from leasing their sugarbush to a nearby producer, so there are excellent opportunities for greater collaboration between landowners and sugarmakers. While this is a major opportunity for expansion, we also wanted to know how much leasing was currently taking place. We asked about leasing activities in our survey and of the 1100 useable responses, only 41 indicated that they lease or have leased their forestland to a maple producer. Of these, only 2 stated that they had a written contract for the arrangement, a surprisingly low number. We also asked

these landowners if they were satisfied with their leasing arrangement and received 24 responses, as seen in Table 9.

Table 9. Satisfaction level of respondents who have leased land for tapping. These values are total numbers of respondents in each category.

	Very Dissatisfied	Satisfied	Very Satisfied
Multiple	0	0	1
Maine	0	1	1
New Hampshire	1	3	4
New York	0	4	0
Vermont	1	6	2
Total	2	14	8

Only 2 landowners were very dissatisfied whereas 22 were either satisfied or very satisfied with the arrangements. Although there were not enough responses to yield statistically significant results, our findings were encouraging for the potential to increase these activities.

Maple Producer Outreach to Landowners

Given that many producers wish to expand on nearby properties, there is a great opportunity for more collaboration between producers and landowners. Thus, we asked landowners whether or not they have been approached by a maple producer asking permission to tap on their property. We stratified the responses according to state, acreage, ownership category, and how many maple producers the landowner knows, as seen in Table 10.

Landowners in Vermont were the most likely to have been approached about leasing and also the most likely to decline the request. 20% had been approached, yet roughly ¾ of these landowners did not want to lease their trees for tapping. Only ~10% of the landowners in New Hampshire or New York had ever been approached by a producer, yet they accepted the request more than half of the time.

Table 10. Percentage of landowners that have been approached by a maple producer asking permission to tap on their property.

	No	Yes, I accepted	Yes, I declined
State			
Multiple (n=77)	86.7	3.3	10.0
Maine (n=236)	93.4	2.5	4.1
New Hampshire (n=249)	89.9	6.6	3.6
New York (n=230)	90.9	5.1	4.0
Vermont (n=231)	79.4	6.0	14.7
Ownership Category			
non-profit organization (n=18)	80.0	0.0	20.0
private business/corporation (n=76)	76.7	8.3	15.0
private recreational/hunting club (n=55)	92.2	3.9	3.9
privately owned non-industrial (n=850)	89.4	4.8	5.8
Total Acreage Owned			
> 2,000 acres (n=62)	60.5	7.0	32.6
between 500 and 2,000 acres (n=166)	82.4	9.2	8.4
between 200 and 500 acres (n=364)	90.6	4.0	5.4
less than 200 acres (n=435)	92.1	3.8	4.1
Female (n=179)	92.2	4.5	3.4
Male (n=650)	87.5	5.1	7.4

Large landowners were much more likely to be approached by a producer than smaller landowners. This finding is not surprising, given the fact that producers would rather be working in a large sugarbush with thousands of potential taps than several scattered smaller sugarbushes. Larger landowners are also more likely to have a viable sugarbush of any size on their property, so one would expect larger landowners to have been approached more often.

The largest landowners with more than 2,000 acres were also nearly 5 times as likely to deny than approve a lease request, whereas those with less than 2,000 acres were roughly evenly divided on this issue. These results are very promising for the potential to increase collaboration between maple producers and small landowners with less than 2,000 acres. If producers become more aggressive in their outreach efforts, there are abundant landowners willing to lease.

Reasons landowners have not leased

We have already reported on the reasons why landowners have not tapped their maple trees themselves; however it is also worth exploring why they have not leased their land to a producer. Whereas tapping and making syrup oneself requires a lot of time and expertise, leasing land to someone else to do the work requires hardly any effort on the part of the landowner. We provided the landowners with a list of seven possible reasons why they have not leased and asked them to check off the ones that applied to them. The results can be seen in Table 11.

By far the greatest reason landowners have not leased their forestland to a maple producer is simply that they not been approached by one. As previously discussed, only 12% of landowners have been approached by a producer, and when asked about leasing, landowners are almost half as likely to say yes. The other major reason given by landowners is that they do not have enough maple trees. While certainly not all properties contain a viable sugarbush, given the general species composition of the Northern Forest, it is hard to imagine that such a large percentage of the properties do not contain enough maple trees for tapping. This barrier is likely an educational issue for some landowners and can easily be overcome if a maple producer notices a viable sugarbush on a property and approaches the landowner about leasing.

When stratified by acreage, it is clear that large landowners are much more concerned about the lost sawtimber value. 60% of landowners with at last 2,000 acres checked this option vs. only 13% of those with less than 500 acres. At 19%, male landowners were also more likely to be concerned about sawtimber value than females at 7%. Finally, landowners who know at least 10 producers (43%) were much more likely to be concerned about sawtimber value than those who do not know any producers (13%).

Nearly ¼ of respondents indicated that ‘the revenues were not worth the trouble’ for leasing taps on their property. Indeed, for some of the more affluent landowners, the typical lease fee of 50 cents/tap does not add up to nearly enough money for them to be

Table 11. Reasons landowners have not leased their forestland for tapping.

	Never been approached	Not enough maple trees	Concerned about sawtimber	Tubing would look bad	Tubing would interfere with trails	Revenues are not worth the trouble	Tapping might harm/kill trees
Overall	62%	45%	17%	3%	5%	23%	8%
State							
Multiple (n=77)	70%	30%	26%	0%	0%	23%	7%
ME (n=236)	68%	53%	15%	4%	2%	23%	7%
NH (n=249)	62%	54%	8%	2%	3%	21%	7%
NY (n=230)	58%	50%	11%	2%	5%	19%	5%
VT (n=231)	57%	25%	31%	5%	11%	28%	14%
Total Acreage Owned							
> 2,000 acres (n=62)	45%	15%	60%	6%	4%	36%	21%
between 500 and 2,000 acres (n=166)	62%	28%	24%	2%	2%	25%	10%
between 200 and 500 acres (n=364)	64%	47%	14%	3%	7%	25%	7%
less than 200 acres (n=435)	63%	53%	12%	2%	5%	18%	7%
Should the maple trees on your property be tapped?							
No (n = 369)	51%	65%	17%	3%	5%	19%	10%
Not Sure (n = 260)	79%	30%	17%	3%	6%	27%	8%
Yes, By me (n = 82)	54%	20%	22%	6%	6%	31%	9%
Yes, By somebody else (n = 81)	75%	22%	14%	1%	4%	23%	4%
Ownership Category							
non-profit organization (n=18)	53%	20%	13%	0%	0%	20%	13%
private business/corporation (n=76)	52%	30%	38%	5%	7%	23%	11%
private recreational/hunting club (n=55)	56%	42%	10%	0%	6%	21%	4%
privately owned non-industrial (n=850)	64%	48%	16%	3%	5%	23%	8%
Gender							
Female (n=204)	66%	53%	7%	1%	2%	17%	8%
Male (n=813)	61%	43%	19%	3%	6%	24%	8%
Number of Maple Producers Known by Respondent							
> 10 producers (n=73)	33%	28%	43%	3%	13%	33%	18%
between 1 and 10 producers (n=673)	62%	46%	15%	3%	5%	23%	8%
Zero (n=165)	74%	47%	13%	2%	2%	21%	6%

bothered with. However, these landowners may like the novelty of having syrup from 'their own land' to use themselves and provide as gifts to family, friends, and business associates. As such producers may want to offer these landowners syrup instead of cash for obtaining tapping rights on their land.

While there are some landowners who do not need to generate income from their land, there are also many landowners who are highly concerned with obtaining economic profits from active management. Many of these landowners believe that sawtimber production will yield the highest returns and are lured into cutting by large stumpage offers. This one-time payment usually dwarfs the annual lease payment and either (1) prevents landowners from ever entering into lease agreements, or (2) causes landowners to terminate their lease agreement in order to allow logging in the sugarbush. However, there are many factors that influence whether a landowner will earn greater revenues through leasing or sawtimber management; further research and extension is necessary to allow landowners to make informed decisions on what course of action to take in the future.

Whether or not tapping would harm or kill the trees proved to be a minor issue. It appears that most landowners in the Northern Forest know that you can tap a tree year after year without killing or hurting the tree. However, the wording of the question probably confused some of the landowners, as we were mostly interested in finding out whether landowners were concerned about hurting or killing the trees, not reducing the sawtimber value. Given that the same categories of landowners that were most likely to select "concern about sawtimber value' were also the most likely to choose 'tapping might harm/kill the trees', it is likely that the harm they were worried about was to the sawtimber value.

Finally, there are some landowners that do not want to see plastic tubing strung through their woods and/or are worried about keeping trails open, but this does not seem to be a major obstacle. With less than 5% of respondents choosing these options, the impact of

tubing on recreational opportunities and aesthetics turned out to be a non-issue for the vast majority of landowners.

Where do landowners get their syrup?

We hypothesized that whether or not a landowner uses pure maple syrup and where he/she gets it from could have a strong influence on their desire to use their maples for syrup production. Thus, we asked landowners "where do you get your syrup?" in order to determine the current use and purchasing practices of Northern Forest landowners towards pure maple syrup.

Table 12. How landowners get their maple syrup.

	Overall		Do not want their trees tapped	Not sure if their trees should be tapped	Want to tap trees themselves	Want somebody else to tap their trees
Artificial syrup purchaser	7%		11%	9%	0%	4%
Don't buy any syrup	4%		5%	7%	0%	3%
Get it from family/friends	25%		24%	23%	42%	23%
Purchase at grocery store	17%		19%	20%	18%	25%
Purchase from local producer	33%		37%	40%	33%	44%
Make it myself	14%		3%	0%	7%	1%

Before discussing the results, it is important to realize that our survey is by no means a representative sample of consumers in the United States. Landowners who live in the Northern Forest where maple syrup production is a strong tradition are much more likely to consume pure maple syrup than an average citizen in the US. They have a readily accessible supply of local syrup through friends, family, farm stands, farmers markets,

etc. Being landowners, they are also more likely to have the means to afford pure maple syrup. Only 17% of respondents purchased pure maple syrup from a grocery store whereas the vast majority of syrup is usually sold this way. The majority of respondents relied on their social networks, as 33% purchased syrup directly from a local sugarmaker and 25% got it from family or friends that produce syrup. The remaining respondents either produced it themselves (14%), purchased artificial syrup (7%), or didn't purchase any syrup (4%).

Table 12 also presents the results according to a landowner's feelings on whether their trees should be tapped. This reveals a tremendous possibility for landowners who are currently purchasing maple syrup for their own use to get involved in syrup production. Of those that would like someone else to tap their trees, 67% are currently getting syrup from family, friends, or other local producers. Thus, it is possible that they may be willing to let these folks tap their trees, assuming they live close enough. For those that wish to tap trees themselves, 75% are either getting it from friends, family, or local producers. Once again, if they live in close enough proximity, it may be possible for these landowners to collaborate with a nearby producer to deliver sap for processing into syrup.

Summary and Conclusion

The four states that comprise the Northern Forest form the heart of the maple syrup industry in the US. On an average year over 75% of total syrup production comes from Vermont, Maine, New York, and New Hampshire. The maple industry is strong in these states and poised for further growth. Of the 640 million potential taps in these 4 states, only 6.3 million are currently used for syrup production (Farrell 2009). With an overall utilization rate of less than 1%, there is certainly room for growth.

In order for the Northern Forest region to increase its production of maple syrup, it is imperative that additional landowners become engaged in the industry. This report focused on the current attitudes of these landowners towards maple production, the

barriers that have prevented from using their maples for sugaring, and the incentives that would entice them to get involved with the industry. We have found that many landowners have positive feelings towards maple production, yet feel they lack the time, expertise, labor force, or financial means to start a sugaring operation on their land. However, these barriers for getting involved in direct production can be partially overcome by leasing or selling sap to nearby producers. Since many producers have already tapped all of the accessible trees on their own property, collaboration between existing producers and nearby landowners will be essential in growing the industry. The findings of this survey illustrate this potential.

Maple syrup production used to be a more vital component of rural life in the Northern Forest. The original settlers used maples as their staple source of sugar and sold or traded the surplus to acquire other necessary items. Our survey of current landowners revealed that the common barriers to produce syrup today were not problems faced by the early settlers. They had the time to do sugaring in late winter, the sugarbushes that were saved from cutting were located in accessible areas, and the farmers certainly had the knowledge, interest, and labor force to do the work. Most of their equipment was crude and handmade and they were not concerned about reducing the sawtimber value by tapping. During the peak of maple production in the 1800s, making syrup was MUCH more difficult, yet the Native Americans and early settlers were able to produce far more syrup than we do today. Now that the forest has grown back, technology has improved, and the demand for pure maple syrup is growing, we are poised to grow this traditional industry throughout the Northern Forest.

Social norms and cultural traditions will continue to play a major role in the development of the maple industry, yet economic factors will also drive expansion. Much of the potential expansion could occur on private businesses and Timber Investment Management Organizations (TIMOs). These ownership categories make up the bulk of the properties where very large commercial sugaring operations are possible. These owners are clearly focused on profits and many have pre-conceived notions that timber management is more lucrative than syrup production. The exception is in Maine, where

residents of Quebec have been coming across the border for many years in order to make syrup in the Somerset County region. The TIMOs have mostly continued on with or expanded the lease agreements that were originally started on paper company lands, yet many of these same companies are hesitant to lease trees in other regions. More research and development is necessary so that landowners can understand the economics of leasing taps vs. timber management. With increased knowledge, it is possible that more landowners will enter into leasing agreements with sugarmakers when it is the most profitable option for their property.

As with all agricultural products, the future of the maple syrup industry in the Northern Forest is uncertain. There are many promising opportunities to expand production and several areas for concern. The survey of landowners clearly shows tremendous interest among landowners in getting involved with the industry. How successful they are and the future of maple production in the Northern Forest will depend on the collaboration of landowners and sugarmakers to produce syrup, conserve the maple resource, and maintain viable and profitable markets for pure maple products.

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