

**AN ANALYSIS OF CONSERVATION EASEMENTS AND  
FOREST MANAGEMENT IN NEW YORK, VERMONT, NEW  
HAMPSHIRE, AND MAINE**

FINAL REPORT

Prepared for  
North East *State* Foresters Association

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July 2004

## Executive Summary

The purpose of this study was to investigate how conservation easements are influencing forest management in the Northeast, specifically Maine, New Hampshire, Vermont, and northern New York. Our primary interest was potential effects of easements on management planning and investments, harvest volumes, and conservation values.

Through the course of this study we assembled a partial database of easement properties in the study region, including a spatial database for New Hampshire and Vermont. We believe there are about 3,000 properties with at least 25 acres of forest land under easement, encompassing a total of 2.5 million acres.

The centerpiece of our research was a mail survey to 201 randomly selected property owners with easements on their land, stratified by state, property size, and easement age. We had 136 returns, a response rate of 68%. Survey results seem to indicate that conservation easements are having positive influences on forest management. Notable findings from the survey include:

- Seventy-six percent of respondents agreed that, overall, easements encouraged good management of their property. Only 8% disagreed.
- Compared to a 1994 survey, the use of management plans on easement properties seems to be increasing. Nearly three quarters (74%) of respondents use written plans to guide forest management activities.
- Forest health, wildlife, and wood products continue to be the most popular management priorities for landowners with easements. Two in five respondents chose “forest health” as the *most* important objective. One in four chose “wood products.” The prevalence of recreation as a management objective seems to be growing, as 60% of respondents identified it as one of their management priorities.
- Easements do not seem to be curtailing forest management investments.
- Commercial harvesting occurred since the easement was enacted on 54% of the properties for which we received responses. Most respondents (nearly two-thirds) who have not harvested attributed that decision to economic reasons, including low stocking, or planned to harvest soon. The easement itself was rarely cited as a reason for not harvesting.
- Twenty-one percent of respondents who have conducted commercial timber harvesting on their conserved property indicated that their harvest volumes have dropped since the easement came into effect. However, these drops appear unrelated to the easement. In just 11% of cases did the respondent indicate the harvest volumes would be higher *if* the easement were *not* in place.

We conducted a total of 30 site visits and forester interviews to verify selected survey results and discern information about easement properties that was unlikely to be conveyed through a mail survey. Two key discoveries from site visits and interviews emerged:

- Conserved properties that are not being actively managed tend to be poorly stocked, often from excessive cutting that occurred before the easement was enacted.
- For the most part, recent harvesting on conserved properties appears to have been done carefully, with legitimate forest management objectives in mind. Management seems to have considered BMPs, stand improvements, wildlife considerations, etc.

We complemented the survey with an analysis of working forest easement language in the Northern Forest region of the Northeast (Part 2 of this report). We reviewed 32 actual easements and four additional easement templates, focusing on large acreage properties. The dates of easements in our pool ranged from 1984 to 2003. The purpose of this was to compare content (i.e., language) of easements among different states and grantees, and to see how easement language has been evolving as forestry in the region changes and land trusts and state agencies gain experience as easement holders.

Among the key findings from this exercise:

- Easements in the Northeast can be roughly divided into “older” and “newer” generation easements. Older generation easements focus on prohibiting the conversion of forests into other uses, but offer little forest management guidance or expectations. Newer easements attempt to proactively promote good forest management. This “generational” shift seems to have started in the early 1990s.
- Older easements tend to be quite prescriptive, even complicated, regarding cutting practices. More recent easements tend to have more flexibility and often defer to the professional judgment of foresters.
- Today’s easements almost always require that forest management be guided by a written plan. Compared to older easements, more management details are dealt with in the plan, based on direction provided in the easement. In most cases a professional forester must prepare the plan. The role of the grantee in reviewing and/or approving a proposed management plan depends on the preferences of the easement holder and the state in which they operate. There are no clear trends.
- Grantees are increasingly giving themselves the option to defer some of their roles in overseeing management planning to certification schemes where properties become certified (e.g., FSC, SFI).
- Most easements we reviewed encouraged harvest volumes to not exceed a sustainable level, either explicitly or as an issue to be addressed in a management plan. However two easements we reviewed – Nash Stream (NH) and Champion (VT) – also set a low bar; they appear to *require* a set amount of harvesting.

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## 1.0 Introduction

A conservation easement is a legal agreement between a landowner and a nonprofit land trust or government entity that permanently restricts the uses of a property to protect specified conservation values (Gustanski and Squires 2000). Most conservation easements on forest land in the northeastern United States prohibit permanent land conversion to residential, commercial, and industrial uses, but allow forest management. Where active management for timber or other forest related receipts occurs, the term “working forest” easement is often used (Lind 2001). Following a proliferation of easements since the late 1980s some 2,000 properties covering over two million acres of forest are now under easements in Maine, New Hampshire, Vermont, and northern New York. The popularity of easements has caused many forest stakeholders in the Northeast, including timber companies, land trusts, and state agencies to seek a better understanding of how easements are affecting the sustainability of forests in this region and reshaping the regional forest industry. This project proposal responds to that interest. It investigates how easements are influencing the management direction of timberlands in the Northeast.

The first section of this report assesses how easements influence forest management in the Northeast primarily through a landowner survey, site visits, and interviews with foresters. We paid particular attention to how easements affect forest management objectives and planning, forestry investments, timber production and the flow of timber products to market, and the conservation of ecological forest values.

The second part of this report analyzes and compares the language used in working forest conservation easements across the so-called Northern Forest (Northern Forest Lands Study 1990). This predominantly forested region extends for 26-million-acres from northern New York to Downeast Maine; it is a subset of the region studied in the first section.

## **2.0 Part 1. Influence of working forest conservation easements on forest management in the Northeast**

### **2.1 Background**

#### Evolution of easements in the Northeast

Conservation easements in the Northeast date back to the 1960s. The first generation of easements was scattered across the landscape and limited to small acreages. Perceived and actual influences on forest management and forest economies in the region were limited. However, a global restructuring in the forest industry beginning in the 1980s caused several forestry companies to divest of expansive land holdings (Northern Forest Lands Study 1990). It could no longer be assumed that traditional forest lands would remain accessible for timber harvesting. State governments in Maine, New Hampshire, Vermont, and New York responded by creating the Northern Forest Lands Council to advise them on how to limit the conversion of forests to other uses. One of the Council's key recommendations was to expand the breadth of conservation easements to conserve large tracts of working forest across a 26-million-acre Northern Forest region that stretches across the heavily forested northern portions of the four states (Northern Forest Lands Council 1994).

While the pace of land sales has not slowed - nearly 20% of the region (over 5.5 million acres) has changed hands since 1998 (Northern Forest Alliance 2003) – conservation organizations and state agencies have jumped into the fray, becoming more aggressive in pursuing easements. As a result, the Northeast has witnessed an explosion of new easements, especially those applied to large properties (Figure 1 shows the extent of easements in Vermont and New Hampshire.). There are now over a dozen easements in the region exceeding 10,000 acres. Several existing or proposed easements are over 100,000 acres. This trend toward more and bigger easements appears unlikely to diminish soon. Contributions to easement purchases in the study area from the Forest Legacy program of the USDA Forest Service doubled from \$21.7 million to \$45.4 million between 2002 and 2003 (USDA Forest Service 2003). The Forest Service expected this program to help secure an additional 600,000 acres of land under easements in 2003 alone.

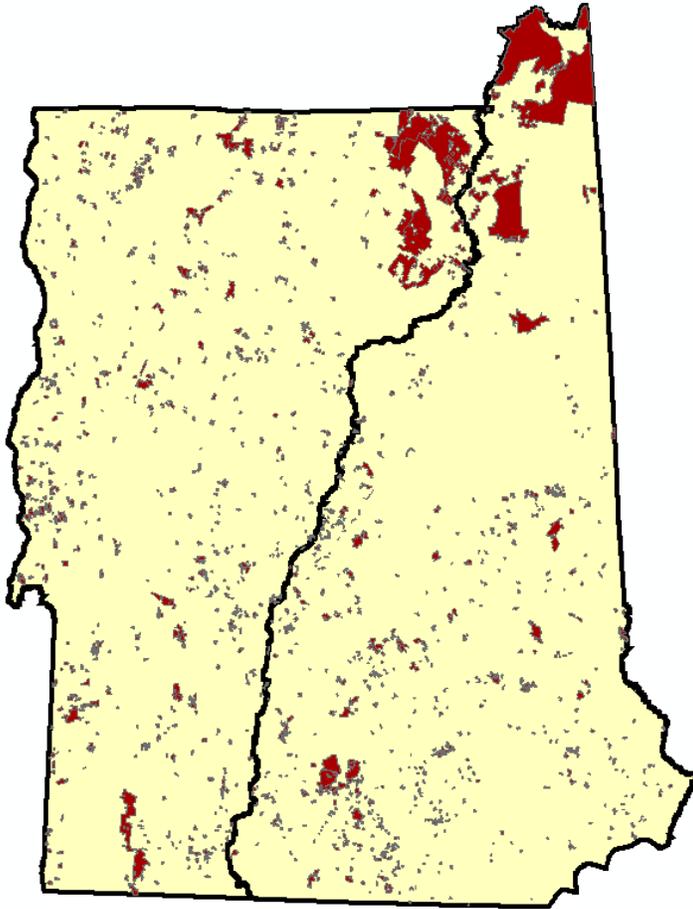


Figure 1. Working forest conservation easement properties in Vermont and New Hampshire (January 2004). Properties with less than 25 acres of forest land are not shown.

Easement literature, much of it prepared and disseminated by land trusts, tends to focus on the organizational and legal aspects of securing and managing individual properties (e.g., Lind 1991, Land Trust Alliance 1993, Lind 2001). Surprisingly little has been published about their cumulative effects in a region. Merenlender et al. (2004) attribute this to the inherent difficulty of assessing the influence of a wide assortment of management philosophies among easement holders and property owners, which is reflected in highly variable easement content.

The best synthesis of how conservation easements influence land use in the Northeast is probably Boelhower's (1995) study of working forest easements in Maine, New Hampshire, and Vermont. The centerpiece of her study was a mail questionnaire directed at easement landowners. Boelhower (1995) found that most easement properties are regularly subject to forest management and that management is sustainable to the extent that it typically adheres to a forest management plan and is supervised by a professional forester. However, the survey was conducted in 1994, just as the unprecedented application of easements to many large properties was beginning to occur in earnest. We queried the University of New Hampshire's spatial database for conserved lands (GRANIT 2003) and found that since her study the acreage under easement in New Hampshire alone has more than tripled from 100,000 to over 350,000 acres.

### Sustainable forest management

Sustainable forest management had become somewhat of a hackneyed term even ten years ago, with interpretations varying according to the interests of different stakeholders (Noss 1993). Most definitions are a variant of the concept that forest management activities will not diminish a forest's economic, social, or ecological values beyond a certain level deemed to be sustainable (Davis et al. 2000). Others stress maintaining resiliency, or what Perry (1988) calls protecting the mechanisms that allow ecosystems to "roll with the punches." Foresters and conservation biologists have struggled to devise criteria and indicators upon which to measure sustainable forest management. The Montreal Process (1995) devised a set of forest management standards at the international level to guide sustainable forest management in temperate and boreal nations. It lists seven criteria: conservation of biological diversity, maintenance of productive capacity of forest ecosystems, maintenance of forest ecosystem health and vitality, conservation and maintenance of soil and water resources, maintenance of forest contribution to global carbon cycles, maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies, and legal, institutional, and economic framework for forest conservation and sustainable management. To varying degrees these criteria are reflected in some forest management systems. For example, the set of principles for certified sustainable forest management adopted by the Forest Stewardship Council (FSC 2003) and the American Forest and Paper Association (AFPA 2002), roughly overlap the above criteria. The FSC and AFPA have competing certification schemes that operate in the Northeast. Guidelines that define the lower bar of acceptable harvesting practices, so-called "acceptable" or "best" management practices (e.g., Vermont Department of Forests, Parks, and Recreation 1987, New York Department of Environmental Conservation 2000), capture some of the Montreal Process' criteria, although they were not specifically designed to do so.

One contentious aspect of sustainability surrounding easements is the question of whether or not easements are sustaining economic and social benefits to the regions in which they are located. A perception exists in some circles that easements may stymie the flow of wood products to market, and thereby deprive communities of sustained economic and social benefits. It has been alleged that giving easement holders the right to withhold approval of harvesting plans – a common clause in easements – often causes easements to function as *de facto* reserves (Van Zile 2002). Discerning the accuracy of this claim will help determine the contribution of easements to sustainable forestry in the Northeast.

## **2.2 Objectives**

This project attempts to answer the question: Do conservation easements promote sustainable forest management in the Northeast? It will assess the degree to which easements influence forest management objectives, planning, and practices.

## **2.3 Methods**

The following steps outline the methodology for this section:

- Compile a database of conservation easement properties in New York, Vermont, New Hampshire, and Maine;
- Select a stratified random sample of easement properties for analysis;

- Design a survey for easement landowners that focuses on the relationship between forest management activities on their property (e.g., land use history, current forest management, and objectives) and their easement;
- Disseminate the survey to the landowners in the sample pool and collect and tabulate results; and
- Augment survey results with site visits and interviews with foresters.

#### Database compilation

Initial research for this project centered on compiling a database of easement properties within the study area of northern New York, Vermont, New Hampshire, and Maine. Spatial data on conserved properties is available for Vermont and New Hampshire, while a non-spatial registry of easements maintained by the state is available for New York. For Maine, we compiled partial records by contacting easement holders and reviewing land trust websites. The state does not have a registry of easements.

Entries into the database were restricted to properties with enough forested land to be reasonably capable of sustaining commercial timber harvesting. We required properties to contain at least 25 acres of forested land to be included in the database easement pool. While somewhat arbitrary, this is the same cutoff applied by Boelhower (1995). Equal thresholds help ensure meaningful comparisons between our two studies.

In addition to serving as a data pool from which to draw a sample (see below), the database has immediate value to other researchers and interested publics as a standalone deliverable. The database can be considered virtually complete for New York, Vermont, and New Hampshire, and is available from the University of Vermont Spatial Analysis lab. The variation in available easement data among states led to different methods of database compilation.

#### *New York*

Data on easements in New York are held in two separate registries maintained by the New York Department of Environmental Conservation (NYDEC). One registry lists privately held easements, the other is for easements held by the NYDEC. Both registries list the acreage and county for each easement. The private registry also lists easement holders. New York law requires all private easements be registered with the state. We acquired paper versions of both registries from NYDEC, as well as a partial GIS database of easements held by NYDEC.

We eliminated easements for properties in five counties proximate to New York City (Bronx, Nassau, Queens, Suffolk, and Westchester) as well as easements that were obviously not working forest easements (e.g., scenic easements surrounding Interstate 87 exit ramps). Properties from all other parts of the state are included in the database.

Because there is no spatial database for privately-held easements in New York, we cannot use spatial analysis to determine which easements apply to forest land. Therefore, we included all easements exceeding 25 acres in the database, but acknowledge that a number of records almost certainly apply to unforested properties.

#### *Vermont*

All property information for the Vermont portion of our easement database comes from the Vermont Conserved Lands Database (CLD) maintained by the University of Vermont Spatial Analysis Lab (SAL). The CLD includes several useful attribute fields (e.g., acreage, protecting agency), but usually does not include property owner or a descriptive easement name. The SAL regularly updates the database. Using ArcGIS, we overlaid a land-cover/land-use raster grid (derived from 1993 Landsat imagery) on the easement parcels to identify those that exceeded 25 acres of forest cover. Doing so eliminated several small farm properties from further consideration.

### *New Hampshire*

The New Hampshire Conserved Lands database is a comprehensive and current spatial database of conserved lands in New Hampshire, nearly identical to the Vermont CLD. It is publicly available through the New Hampshire GRANIT project website, maintained by the University of New Hampshire. We used an updated version of the database from June 2003 to identify all easement properties in the state. As with Vermont, we overlaid a land-cover/land-use grid to refine our selection to those properties containing at least 25 acres of forestland.

### *Maine*

Of the four states, Maine has the most scattered data on conservation easements. There is no central registry or spatial database at this time. Maine records in our easement database stem from two sources. For easements held by the state or land trusts with permanent staff (e.g., TNC) we acquired easement listings by requesting them from the easement holder. We referred to the websites of smaller organizations in cases where we could not make direct contact.

An overview of easement properties for each state in the study area is provided in Appendix 1.

### Property sampling

We created an Excel spreadsheet for each state that lists all easement properties from the database that met our selection criteria. At this point we still included all Maine and New York properties over 25 acres despite being unable to verify in some cases whether they contained at least 25 acres of forestland. We used Excel to assign a random number to each record, and then sorted records in ascending order according to that number. We then selected 201 properties, starting at the top of each list, until stratification conditions were met.

Stratification conditions were based on state, property size, and year of easement enactment as follows:

#### *Stratification by state*

Condition: selection should balance number of easements and acreage under easement for each state.

Results:       New York: 43 records  
                  Vermont: 55  
                  New Hampshire: 71  
                  Maine: 32

The number of records selected for Maine was disproportionately high compared to the number of easements in the state because Maine has proportionately more easements over 10,000 acres.

The number of records selected for Vermont is disproportionately small because the majority of easements in the state are held by a single organization. That is, we deviated from our stated condition for stratification to avoid redundancy and to avoid an overwhelming request for names and addresses from a single office.

### *Stratification by size*

Condition: selection should favor large properties.

Results:        25 – 100 acres: 45  
                  101 – 250 acres: 52  
                  251 – 500 acres: 24  
                  501 – 2,500 acres: 46  
                  2,501 – 10,000 acres: 16  
                  greater than 10,000 acres: 18

Although 80% of the easement properties in our database are 250 acres or smaller, they account for less than half of our sample. Conversely, our sample captures nearly all easement properties over 2,500 acres even though they represent a small fraction of all easement properties. The rationale is that the study focuses on how easements influence forest management across a region, and large acreage properties have can be assumed to have a greater influence on regional forest management and regional forest conditions.

### *Stratification by easement year*

Condition: selection should favor older easements.

Results:        before 1980: 18  
                  1980 – 1990: 48  
                  1991 – 1994: 49  
                  1995 – 1999: 42  
                  after 1999: 20  
                  unknown: 24

Older easements were favored because they offer a longer period over which easement influences can be appraised. Stratification by this condition was somewhat confounded by incomplete data on easement year for Maine and Vermont. From the records that do exist, it appears that our sample disproportionately captures older easements relative to their frequency in the overall record pool. It was necessary, however, to include a number of newer easements in order to capture some records from the newer generation of “big acreage” easements.

The initial sample of 201 properties was necessarily chosen before we could track down addresses from land trusts and state agencies. The actual make-up of the sample changed somewhat depending mostly on whether or not we could obtain contact information from

easement holders. For example, three land trusts holding 14 easements that we selected did not wish to share contact information. Several more properties were dropped because we could not make contact with the easement holder (e.g., some small rural land trusts), and a few properties in New York and Maine were found to be unforested after consulting with easement holders. We also eliminated a few properties that were incorrectly selected due to errors in the database. We tried to maintain our stratification rules when selecting substitute properties to replace those we dropped.

### Surveys

We prepared an eight-page survey aimed at the owners of conservation easement properties selected in our sample. Survey questions inquire about landowner attitudes regarding their easements and forest management planning and activities on the property before and after the easement was enacted. The survey is attached as Appendix 2. Highlights of the survey are discussed in the Results and Discussion section of this report. Appendix 4 contains the complete results.

Surveying techniques followed Dillman (1978) except that mail outs were necessarily staggered to coincide with the various response times in acquiring mailing addresses from easement holders, and follow-up was pursued by telephone rather than by mail. 201 surveys were disseminated.

The number of surveys mailed during various months:

August 2003	137
September	47
October	5
November	2
February 2004	12
Total sent:	201

A total of 136 surveys was completed. One hundred and thirty-four were returned by mail and two were conducted by telephone. We consider this response rate of 68% to be acceptable (pers. comm., P. Stokowski, Univ. of Vermont).

Most property owners from whom we did not originally receive a survey were contacted in follow-up telephone calls. This resulted in about 30 more returned surveys. In about 20 cases we resent surveys to respondents who said they had lost or not received the survey. Usually resent surveys were filled out and returned.

Nine property owners said in follow-up calls that they had received the survey and would return it, but did not. Nine respondents said they had received the survey but did not want to participate. We could not locate another eight property owners who did not respond because neither the easement holders nor directory assistance had active phone numbers. We were unable to make contact with the remainder of non-respondents despite leaving messages or making multiple phone calls.

### Site visits

Survey results provide insight into forest management from the perspective of only the landowner. They do not tell the complete story about what is actually occurring on the ground.

This project included field assessments of a sub-sample of easement properties for which surveys were returned. We conducted 16 site visits: five each in New Hampshire and Vermont, and three each in Maine and New York. Summaries of site visit observations are attached in Appendix 5.

The purpose of conducting site visits was to make general assessments of the sustainability of forest management on the property and to verify survey results. During site visits we assessed:

- land use and harvesting history of the property;
- current stocking;
- indicators of sustainable forest management: regeneration, harvest levels, best management practices, protection of fragile areas, etc.;
- effectiveness of management in obtaining stated management objectives (e.g., wildlife, recreation); and
- special features of the property.

We targeted properties that were identified by returned surveys as having a cutting history prior to the easement being enacted. Properties targeted for site visits also were typically those that are either not managed by professional foresters, or for which surveys provided no contact information for foresters. This is because we can obtain much of the same information by interviewing foresters.

#### Forester interviews

The mail survey to property owners allowed respondents the option of providing contact information for the forester of their conserved property. More than 20 respondents provided the name and phone number of their forester. We conducted telephone interviews with the foresters of 14 conserved properties, provided that they were not also the landowner. Objectives of these interviews are similar to those for the site visits, listed above.

## **3.0 Part 2. Content analysis of easements in the Northeast**

### **3.1 Background**

Language in conservation easements that apply to the Northeast has evolved and broadened substantially since the first generation of easements in the 1970s. Some early easements under which forestry is practiced simply prohibit permanent conversion of forest land to other uses. They give little or no guidance on forest management activities. More recently, easements tend to go beyond just limiting development. Some proactively promote a vision for the property, with content to steer management in a particular direction. Others focus on what is *not* wanted – big clearcuts, for example – but leave it up to landowners to decide what's important to conserve and how. Common clauses in contemporary working forest easements in the Northeast range from requiring written forest management plans with regular updates to specifying numeric targets for future species composition and diameter distributions. And yet this trend is not universal. Many towns that hold easements and small land trusts, for example, continue to take a hands-off approach. The multiple pathways of easement evolution appear to have created a mishmash of objectives, provisions, prohibitions, and requirements for working forest easements in the Northeast. Lack of consistency - all we really know is that these properties are “conserved” – can confound attempts to predict a property's future forest conditions or the extent to which the easement will promote sustainable forest management (Merenlender et al. 2004). It is helpful to know what values are being protected, and how, especially given the large area of many easements in this region and the potential for their influences to be regional in scope. This necessitates an examination of easement content.

Our literature search revealed only one cursory attempt to analyze the progression of easement language in the Northeast or offer a comparison among different types of easement language used by various land trusts in the region (Nova Scotia Nature Trust 2000). And while easement holders sometimes prepare summaries to simplify the easement content for individual properties (e.g., New England Forestry Foundation 2003), a regional summary of easement language appears to be lacking. We felt it would be worthwhile to untangle some of the nuances of working forest easement language that apply to the northeast.

The purpose of this section is therefore to describe and compare the content of working forest easements that apply to the northeast, particularly as it relates to forest management.

### **3.2 Objectives**

We initially envisioned two deliverables. First, a cryptic or “quick reference” summary (i.e., an Access data file) of easement provisions for various easements or groups of similar easements in the region. This would be a valuable resource for researchers and other stakeholders interested in understanding the architecture of actual easements that apply to the Northeast without having to acquire and comb through reams of easements themselves. While this information was compiled and synthesized, it turned out to be too detailed to include in this report. Instead, interested parties should contact the authors. The second deliverable is a qualitative summary highlighting the contents of 32 easements and four easement templates that apply to properties across the Northern Forest. It is included in this report. We limited our analysis to the Northern Forest region (Fig. 2) where changes in the forest industry have had a particularly important influence on the regional culture, politics, and economy. As such, this region has also been the recipient of many of the latest and largest conservation easements in the country.



Figure 2. Map of the "Northern Forest" (source: Northern Forest Center website)

To ensure that the summary is meaningful in a regional context we focussed on large acreage easements or easements whose language is closely repeated in other easements held by the same land trust. This descriptive summary expands on the tabulated data to provide some insight into what provisions are most common, interesting anomalies, potential trends, and so on.

### 3.3 Methods

- Selectively expand our collection of working forest easements in the Northern Forest to capture easements that would maximize the acreage to be evaluated. We did not try to limit our selection to easements from the survey pool, although there was considerable overlap;
- Review each easement to determine how it addresses issues that are often found in working forest easements;
- Compare the easements to identify norms of and exceptions to content;
- Where necessary, confer with easement holders to ensure we have accurately interpreted their easements, and to understand why their easements evolved the way they did; and
- Prepare a written comparison of easement content.

Below is a list of topics that are often included in working forest easements (based on our preliminary review and Lind [2001]). Our summary and comparison includes:

- purpose – what is the stated role of forest management in the purpose of the easement?
- forest management objectives
- prohibited uses – what land uses does the easement not allow?

- role of management plan – is a forest management plan required, and what must it address? does a professional forester need to prepare the plan? what is the easement holder's role in reviewing or implementing the plan?
- forest management restrictions – how prescriptive is the easement toward harvesting practices and other forest management activities? does the easement specify harvesting rules (e.g., a maximum allowable clearcut size), requires BMPs, etc.?
- exceptions to restrictions – are restrictions flexible (e.g., for salvage)?
- special management areas – does the easement recognize sensitive or special sites? how are they managed differently?

## 4.0 Part 1 - Results and discussion

### Findings from mail surveys

A total of 136 of 201 surveys was completed (a response rate of 68%). We received 23 responses for properties in New York, 30 for Vermont, 52 for New Hampshire, and 31 for Maine. Easements for these properties are held by 38 different agencies and organizations. The total area of all properties for which we received responses was 1,253,805 acres. The mean property size was 9,499 acres, and the median 293 acres.

Appendix 4 depicts the responses for the entire survey. Some interesting results that may be representative of easement properties and owners in the study region follow.

#### Easement history

Almost two-thirds (65%) of respondents owned the conserved property when the easement was signed. Thirty-one percent indicated that they were not the property owner when the easement was enacted. For comparison, in Boelhower's 1994 study (Boelhower 1995) just 18% of respondents claimed their conserved property was already under easement when they acquired it.

Our survey suggests that a genuine desire to conserve land is driving the popularity of easements in the region. Seventy percent of respondents who signed easements did so primarily "to keep it in a 'natural' condition in perpetuity." The second most common reason was to sell the easement as a good business venture (15%). Only 3.5% of respondents indicated that improving forest management was the primary motive for seeking an easement.

Just over half (53%) of respondents indicated that they (or their family or company) obtained the easement by approaching the current easement holder. A third party or the easement holder approached the current landowner in just 14% of cases.

#### Management plans

Easements may encourage the preparation of management plans where one did not exist previously. Written management plans guided forest management on between 48% and 60% of properties prior to their easement coming into effect ("Don't know" responses account for the range. Assuming that these properties break in similar proportion to the properties with a known history, the figure is 55%). By contrast, 74% of respondents indicated that a written forest management plan is now in place. This is probably not a fluke; most easements that are held by state agencies and large land trusts require written management plans.

The survey suggests that the likelihood of a management plan on an easement property is related to where the property is. Management plans were most common in Vermont (in use for 90% of responses) and least common in New York (52%). New Hampshire and Maine fell in the middle at 76% and 74% respectively. The popularity of management plans in Vermont can be attributed to the high proportion of easements in the state that are held by the Vermont Land Trust (VLT). Management plans are a standard provision in VLT easements.

A comparison of our results with Boelhower’s (1995) might suggest that management plans are gradually becoming more common for conserved properties. Her research, which did not include New York, found that 70% of respondents followed a written management plan. When we adjust our results to exclude New York, the proportion of easement properties with management plans rises to 79%. Management plans are becoming more popular in all three states – Vermont, New Hampshire, and Maine - if both surveys were representative of all easements for the period in which they occurred.

Table 1. Proportion of easement properties that follow a forest management plan

<b>State(s)</b>	<b>This study</b>	<b>Boelhower (1995)</b>
Overall (NY, VT, NH, ME)	74%	n/a
VT, NH, ME	79%	70%
New York	52%	n/a
Vermont	90%	87%
New Hampshire	76%	64%
Maine	74%	68%

#### Management objectives

We deliberately worded a survey question on management priorities exactly the way it was by posed by Boelhower (1995) nine years earlier. We asked, “What are your primary land management goals on your property? (check all that apply)” and offered six options. We then asked the respondent to identify the single most important management goal from the list. Table 2 compares the survey results from the two studies.

Table 2. Management priorities for easement properties.

Management goal	This study		Boelhower (1995)	
	included as a priority	most important	included as a priority	most important
wood products	68%	25%	73%	27%
forest health	83%	40%	79%	40%
wildlife	77%	6%	72%	10%
aesthetics	67%	12%	66%	14%
recreation	60%	10%	48%	5%
other	15%	6%	n/a	4%

A comparison of the numbers suggests the priorities of easement property owners have not changed significantly since 1994. The most noteworthy change seems to be an increased level of interest in recreation as a management goal.

#### Current use programs and certification

Seventy-one percent of respondents are enrolled in a state program that provides property tax relief for forest management. Ninety-three percent of those claim that enrollment in so-called “current use” programs does not influence how much wood they harvest.

Twenty-six percent of respondents indicated that their property was certified (e.g., FSC, SFI, Certified Tree Farm), while another three respondents (2%) indicated that they were in the process of being certified. Properties that were certified were almost evenly divided between FSC, SFI, and Tree Farm, with some properties certified under more than one scheme. Overall, 70% of respondents were aware of certification programs.

#### Easement restrictiveness

Respondents overwhelmingly reject the notion that their easements unreasonably restrict harvesting methods, harvesting locations, or road building, or that their easement unreasonably limits the amount of wood they can harvest. Only four respondents (3% of total) agreed or strongly agreed with the statement “The easement unreasonably restricts the amount of wood that can be harvested (from the conserved property).” In fact, the survey suggests that most landowners with easements on their property think their easement encourages good forest management. Seventy-six percent of respondents agreed or strongly agreed with the statement, “Overall, the easement has encouraged good management of the property”. Eight percent disagreed or strongly disagreed.

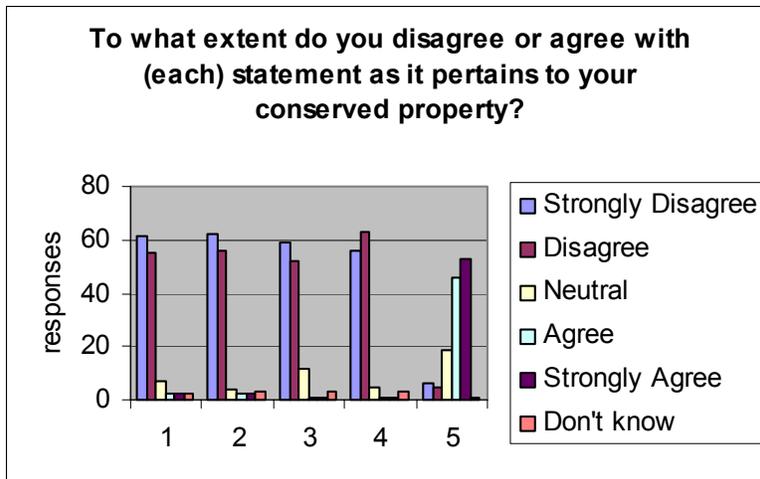


Figure 3. Level of agreement with statements about easements.

- 1) The easement unreasonably restricts harvesting methods and prescriptions that can be used on the property.
- 2) The easement unreasonably restricts where harvesting on the property can occur.
- 3) The easement unreasonably restricts road building.
- 4) The easement unreasonably restricts the amount of wood that can be harvested.
- 5) Overall, the easement has encouraged good management of the property.

We did not ask why landowners thought their easement encouraged good management. However, some landowners told us that they better appreciate forest values and management options on their property as a result of regular contact with their easement holder (e.g., land trust staff). One might also speculate that some landowners who did not have a management plan prior to the easement are now experiencing or perceiving benefits from a formal plan required by the easement.

#### Forest management investments

Taken as a whole, properties now under easement appear just as likely to receive forest management investments as they did in the 20-year period before they were conserved. Correcting for “don’t know” replies, there is little change in the proportion of properties benefiting from planting, pre-commercial thinning, spraying, equipment acquisition, or professional consulting. There does seem to be a difference over road building, however. Where property history was known to the respondent, the survey indicates road construction investments occurred on 64% of properties before they were conserved, versus 42% afterwards. We do not attribute the difference to easements. New road construction, especially on small properties, is usually not an ongoing investment. Most of the properties we visited had good road networks, some of which were clearly put in a long time ago but are still maintained and in use.

Twenty-one percent of respondents indicated that they have made no forest management investments of any kind since the easement was enacted. There were too many “don’t know” responses about specific management investments prior to the easement to offer a meaningful overall comparison with that period.

#### Do easements influence harvesting effort?

We wanted to know if placing a property under an easement makes it, for whatever reason, less likely to be harvested. The survey found that commercial harvesting occurred on most

properties in the 20-year period preceding the easement (between 76% and 81%, depending of the actual cutting history for “don’t know” responses). By contrast, commercial harvesting occurred on just 54% of properties after they were conserved. This raises an interesting question: why have some properties with a history of forest management not been harvested since coming under an easement? Results to Question 27, asked only of landowners whose properties meet this condition, suggest the answer is tied to operational realities more so than to easement conditions or an aversion to harvesting. “Harvesting would not be economical” was a reason selected by 17 of the 45 (38%) respondents in this category. However, seven *additional* respondents (another 16%) indirectly cited a financial rationale connected to the property’s low stocking in the “other (specify)” category. For example, “not ready yet”, “heavily cut in the 1960s”, and “previous landowner just left junk.” Another five participants in the survey indicated that, while cutting had not yet occurred under the easement, harvesting plans were in the works.

Only one respondent identified easement restrictions alone as a reason for not pursuing commercial timber harvesting. Two more respondents who identified easement restrictions as contributing factor to not harvesting on their property also identified additional reasons for not harvesting.

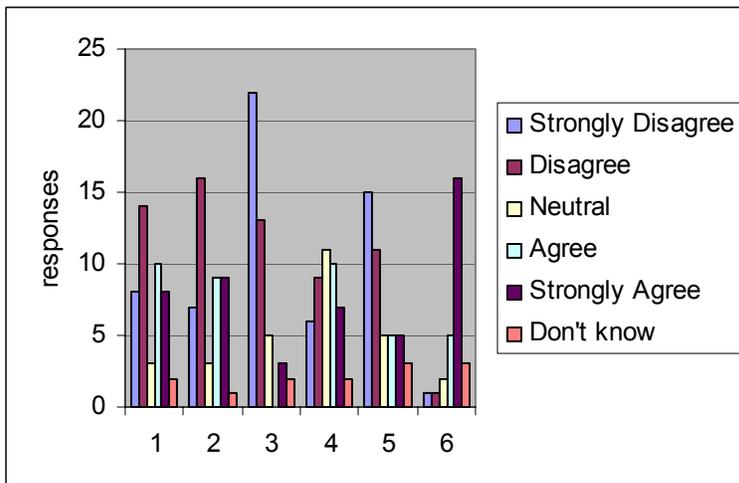


Figure 4. Level of agreement with the following statements on reasons for not pursuing commercial harvesting:

I/we chose not to pursue commercial timber harvesting on the property because:

- 1) ...harvesting would diminish the condition of the forest.
- 2) ...harvesting would diminish other natural values (e.g., wildlife, water).
- 3) ...the easement is too restrictive.
- 4) ...harvesting would not be economical at this time.
- 5) ...a professional forester recommended against harvesting.
- 6) ...(another reason specified by the respondent)

Our site visits (targeted to properties that, according to the survey, are currently too depleted to support commercial harvesting) verify the survey’s findings. Properties with a history of forest management that have not been harvested since being put under an easement tend to be poorly stocked.

When considering only properties where harvesting *has* occurred under the easement, it appears that easements do not strongly influence the volume of wood that is cut. Respondents whose properties supported commercial harvesting both prior to and after their easement's enactment were asked to compare harvesting levels between the two periods. Forty-five percent of the respondents in this category indicated that harvest levels "remained about the same" after the easement came into force, compared to the 20-year period preceding the easement. Slightly more than one-third indicated a change in harvesting levels; 21% reported lower harvest volumes after the easement was enacted, 14% reported higher volumes. The rest were unsure.

Of course, many factors may cause fluctuations in harvesting levels around the time an easement comes into force that have nothing to do with the easement. To address this, we asked participants in the survey to speculate on how harvest volumes on their property would differ *if* their property were *not* under an easement. The results provide perhaps the most compelling evidence that easements have little influence on harvest volumes. Eighty-six percent of respondents who have pursued commercial timber harvesting on their conserved property indicated that the easement has "little or no effect on how much wood is harvested". Eleven percent indicated that, "without the easement", harvest volumes would have been somewhat or much higher. Two respondents (3%) felt that they would have harvested less wood had the easement not been in place.

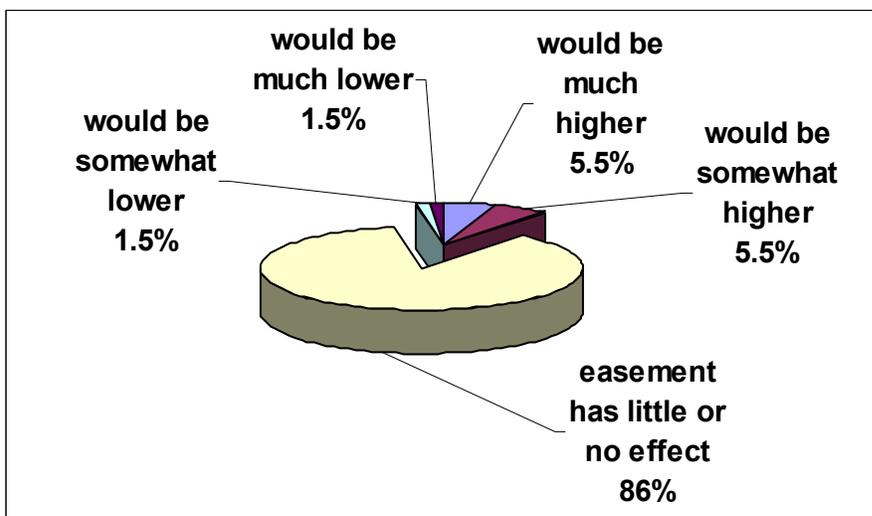


Figure 5. Likely change in volume of timber harvest if easement were not in place.

Based on the survey results, we see little evidence that easements commonly restrict the amount of wood harvested from conserved properties.

#### Harvesting intentions

The survey suggests that landowners with easements want to retain the right to pursue commercial forestry on their property, but place less importance on whether it actually occurs. A solid majority of respondents (82%) indicated that being "allowed" to pursue commercial timber harvesting was important to them, while slightly fewer (71%) thought it was important that harvesting "actually occurs on a regular basis." All but one of the landowners with large properties (>10,000 acres) indicated that regular harvesting was "very important."

Most landowners intend to pursue commercial timber harvesting on their conserved property within the next 10 years. Forty-seven percent of respondents said they were “very likely” to do so, while another 31% were “somewhat” or “moderately” likely. Twenty percent said they were “not at all” likely to pursue commercial timber harvesting in the next ten years, and the remainder (2%) were unsure of their harvesting plans.

## **5.0 Part 2 – Results and Discussion**

### **Content Analysis of Working Forest Conservation Easements**

We reviewed the content of 32 working forest easements that apply to properties in the Northern Forest, along with four templates for working forest conservation easements applicable to this region. A template is a generic draft easement that many grantees use as a starting point for developing easement content in discussions with landowners. Like actual easements, templates vary between easement holders depending on their conservation focus and management style. Organizations and agencies that supplied templates in lieu of actual easements indicated that the content of their actual easements does not significantly depart from their template.

Easements were selected for analysis based primarily on their relative potential to influence regional forest conditions. Thus, most of the easements we analyzed cover large acreages; they either apply to a single large property or are typical of easements (e.g., templates) that encumber multiple small to mid-sized properties. The total land area covered by easements in our pool exceeds 1.75 million acres.

Table 3. Easement pool for content analysis.

State	Easement name <sup>1</sup>	Easement holder <sup>2</sup>	Year enacted	Acreage
<b>Easements</b>				
Maine	Attean	FSM	1984	18,000
Maine	West Branch	FSM	2003	282,000
Maine	Pingree	NEFF	2003	762,000
Maine	Hancock 1	Maine DC	2003	900
Maine	Hancock 2	Maine DC	2002	7,800
Maine	Mattawamkeag Lake	Maine DC	2003	3,300
Maine	Nicatous	Maine DC	2000	20,300
Maine	Pierce Pond	Maine DC	1998	1,300
Maine	Katahdin	TNC Maine	2003	200,000
Maine	Cupsuptic	USDA FS	1993	1,300
Maine	Maine Wilderness Watershed Trust	USDA FS	1996	1,800
Maine	SD Warren	USDA FS	1996	6,700
Maine	NH Audubon 1	NH Audubon	1989	100
Maine	NH Audubon 2	NH Audubon	1991	100
New Hampshire	Bunnell	NH DRED	2001	18,400
New Hampshire	Connecticut Lakes	NH DRED	2003	146,400
New Hampshire	Pond of Safety	NH DRED	2001	10,200
New Hampshire	Pittsburg	State of NH	1988	1,200
New Hampshire	Nash Stream	USDA FS	1989	39,600
Vermont	Hancock	VT ANR	1997	31,400
Vermont	Brunswick/Granby	VLT	1998	3,200
Vermont	Champion	VLT	1999	84,000
Vermont	Guildhall	VLT	1997	1,300
Vermont	Holland	VLT	1997	800
Vermont	Irasburg	VLT	1996	1,200
Vermont	Johnson	VLT	1996	600
Vermont	Westfield/Jay	VLT	1999	3,400
New York	Trout Pond	ALT	1991	300
New York	Champion – Santa Clara	NYDEC	1999	72,800
New York	Lassiter/Diamond	NYDEC	1988	19,000
New York	Long Pond	NYDEC	1999	19,000
New York	Yorkshire Timber	NYDEC	1990	19,500
<b>Templates</b>				
VT, NH, ME		NEFF	rev.2002	
New Hampshire		SPHNF	rev.2002	
New York		ALT	current	
New York		NYDEC	rev.2003	

<sup>1</sup>Some easement names refer to their location rather than landowner.

<sup>2</sup>FSM = Forest Society of Maine, NEFF = New England Forestry Foundation, Maine DC = Maine Department of Conservation, TNC Maine = The Nature Conservancy, Maine Chapter, USDA FS = United States Forest Service, NH Audubon = Audubon Society of New Hampshire, NH DRED = New Hampshire Department of Resources and Economic Development, VT ANR = Vermont Agency of Natural Resources, VLT = Vermont Land Trust, ALT = Adirondack Land Trust, NYDEC = New York Department of Environmental Conservation, SPHNF = Society for the Protection of New Hampshire Forests.

## Content Comparison and Discussion

### Role of forest management in easement purpose

The purposes of a working forest conservation easement vary among easements, as different landowners and grantees have different reasons for conserving forests. Stated purposes are significant because they provide management direction to both the landowner and grantee, and help both parties assess whether existing or proposed activities are consistent with the intentions of the easement.

All but three of the easements we reviewed included an explicit “purpose” clause. Those that did not had “whereas” clauses in the preamble that implicitly state a purpose by listing the values that the easement sets out to conserve.

Forest management is cited as a purpose in all the easements we reviewed with the exception of the two easements held by the Audubon Society of New Hampshire in Maine. While all these easements (NH Audubon included) recognize the legitimacy of forest management, some use language to make clear a strong preference that forestry continue on the property. For example, they may refer to forest management as a “the principle objective.” Other easements emphasize retaining forest conditions (e.g., the productive capacity of the land) such that forest management can occur if so desired by the current or future landowner. These easements do not place forest management above other objectives.

Examples of excerpts taken from the purpose clauses of easements that encourage forest management:

- “...to maintain the Property forever in its present and historic primarily undeveloped condition as a working forest,...” (Pingree, Forest Society of Maine)
- “The principle objective...is to establish and maintain productive forestry resources...and in consideration of the contribution timber products make to the economy and communities of the region, to encourage the long-term, professional management of those resources, and to facilitate the economically sustainable production of forest resources in a manner that minimizes negative impact and the duration of impact on surface water quality, recreational benefits to the public, wildlife habitat, and other conservation value...” (Champion, Vermont Land Trust)
- “The principle objective of this Easement is to perpetuate, as a sustainable working forest, the productive forest resources of the Protected Property; to encourage the long-term professional management of those forest resources; and to facilitate the biologically and economically sustainable production of forest resources while minimizing the impacts on water quality, scenic benefits, wildlife habitat, recreational, and other conservation values” (Champion – Santa Clara, NYDEC)
- “...the parties mutually seek to assure...the perpetual public use and protection of the Nash Stream tract with primary management emphasis being the sustained yield of forest products consistent with the traditional uses of the land, including public access and the conservation of other resource values.” (Nash Stream, USDA Forest Service)

For comparison, excerpts from other easements:

- “...to maintain [the property’s] economic capacity as forest land without compromising its ecological integrity” (Adirondack Land Trust template)
- “...to assure the sustained, natural capacity of the Protected Property and its soils to support healthy and vigorous forest growth and allow, but not require, commercial forest management” (Katahdin, TNC Maine)
- “...to restrict development rights on the Protected Property and to protect scenic and recreational values of the Protected Property from conversion to non-forest uses, yet allow commercial forestry and public recreation consistent with such protection.” (Cupsuptic, USDA Forest Service)

Other purposes listed in easements include the conservation of fish and wildlife habitat, scenery, water quality, cultural features, and rare, threatened, and endangered species.

### Forest Management Objectives

Explicitly stated forest management objectives provide a level of management direction beyond the broad intentions offered in the “purpose” of the easement. Purposes like “allow commercial forest management” or “maintain productive forestry resources” do not ensure that forest management will conserve other values, optimize economic benefits, or create desirable future forest conditions, as envisioned by the easement holder. In many of the easements we reviewed, details like these are dealt with in stated forest management objectives. It is here that easements begin to steer the future of the property away from some outcomes and towards others.

Not surprisingly, the level of detail regarding forest management objectives varies among the easements in our pool. Some easements do not list any forest management objectives. Among them are easements held by the State of Maine, the Audubon Society, and the USDA Forest Service. The absence of forestry objectives that are written into the easement gives the landowner wide reign to set their own priorities. And if the easement does not stipulate that the landowner must include their own objectives in the management plan, they could choose to forego setting priorities altogether. Regardless, with easements that do not list forest management objectives, the easement holder has little influence on things like what the future forest ought to look like, what forest products ought to be managed for, or how intensively the property should be managed. Our initial reaction is that properties governed by easements that lack management objectives rely on the good intentions of the landowner and their forester and may be susceptible to forestry activities and outcomes that would be discouraged on other conserved lands.

At the other end of the spectrum are easements with very specific forest management objectives. These easements give a clear picture of where the easement holder and landowner want to take the property. Vermont Land Trust easements are the best example. Instead of deferring the management direction to each individual landowner, the VLT easements we examined all specify a variant of the following objective:

“Manage for forest stands with long rotations that maximize the opportunity for the production of maple sap and/or for harvesting, sustained over time, of high quality hardwood sawlogs or veneer, while maintaining a healthy and biologically diverse forest. Grantor and grantee acknowledge that site limitations and biological factors may preclude the production of high

quality sawlogs, and further that the production of a variety of forest products can be consistent with the goal of producing high quality sawlogs.”

The two most recent VLT easements in our pool (both from 1999), including the Champion easement, also specify minimum diameter (DBH) targets for several merchantable species of trees. Clearly VLT sees its easements as a tool to maintain and restore diverse, structurally complex, and valuable forests, rather than simply to keep forests from being converted to other uses.

The middle ground on forest management objectives comes from language in the SPNHF template and also written into other New Hampshire easements for Bunnell and Pond of Safety held by the State. The SPNHF template lists seven broad forest management objectives that must be addressed in the forest management plan: maintenance of soil productivity; protection of water quality, wetlands, and riparian zones; maintenance or improvement of the overall quality of forest products; conservation of scenic quality, protection of unique or fragile natural areas; protection of unique historic and cultural features; and conservation of native plant and animal species. Easements with these goals provide more certainty about future management than easements that lack objectives altogether or give the landowner a “blank check” to set their own objectives in a management plan without conditions. At the same time, these seven objectives are broad enough to give landowners and their foresters lots of latitude regarding what they manage for or what the future forest should look like.

### Prohibitions

Land use restrictions are a centerpiece of working forest conservation easements in the Northeast. The easements we reviewed all prohibit or limit the conversion of forested lands to non-forest uses. They all prohibit mining and industrial, residential, or commercial development. This direction is consistent with the recommendations of the Northern Forest Lands Council (1994). Minor exceptions occur in some cases to recognize a pre-existing land use, or to allow otherwise prohibited activities that support forest management or other easement objectives. For example, most easements prohibit the construction of permanent structures, but allow buildings that are erected to support logging operations (e.g., a maintenance shed). Likewise, gravel pits to supply on-site road construction or maintenance are usually permitted.

### *Agriculture*

Working forest easements on large industrial timberlands tend to prohibit ranching, grazing, and farming. Agricultural activities are generally allowed by easements that apply to smaller family-owned properties (e.g., typical SPNHF easements). VLT easements on family-owned properties (e.g., woodlots, farms) recognize agriculture as a legitimate use. On VLT’s larger forestland easements, including those in our pool, agriculture is seen as incompatible with the usual stated purpose to “maintain productive forestry resources” and is discouraged. It may only be practiced if the Trust does not object and provides special permission to the landowner (Leslie Ratley-Beach, VLT, pers. comm.).

### *Subdivision*

The Northern Forest Lands Council (1994) identifies the division of large forest tracts into smaller properties and more ownerships as a key threat to forests in the Northeast. Thirty-four of the 38 easements we reviewed restrict property subdivision.

All seven New Hampshire easements and the SPNHF template prohibit subdivision outright. These include the large properties of Nash Stream, Bunnell, Pond of Safety, and Connecticut Lakes.

The remaining easements that limit subdivision do so by:

- capping the number of new divisions that are allowed;
- specifying a minimum required size for new conveyances from the conserved property;
- permitting individual properties covered by the easement to be conveyed to different new owners so long as each individual tract remains intact; or
- requiring the easement holder's approval of any subdividing.

Some easements use a combination of these rules and their restrictiveness reflects the property's current area. For example, the 282,000-acre West Branch property may be divided into a maximum of 15 parcels, but each parcel must be at least 5,000 acres. The 20,000-acre Nicatous property may be split into no more than 5 parcels, with a minimum size of 4,000 acres each. The easement on the 762,000-acre Pingree property seems to be an anomaly. It allows any number of divisions, so long as each new parcel is at least 1,000 acres.

Five of the seven VLT easements we reviewed require the Trust's permission prior to any subdividing. The other two allow a limited amount of subdividing, with the Trust's permission required to do more. The NEFF template, which is imbedded into their easements throughout New England, also requires grantee approval for subdividing.

Recent easements drafted by the two New York easement holders contain stronger provisions on subdivision than their predecessors. Two older NYDEC easements – Lassiter/Diamond (1988) and Yorkshire Timber (1990) – fully reserve the landowners' right to subdivide without conditions. Similarly, the older Adirondack Land Trust easement we reviewed (from 1991) did not restrict subdivision. By contrast, NYDEC's 1999 Long Pond and Champion-Santa Clara easements cap the number of new properties that can be created through subdividing to 6 and 13 respectively. Both current NYDEC and ALT templates prohibit the practice.

### Forest Management Plans

The use of forest management plans is increasingly being recognized as a smart way to guide forestry activities on conserved properties (Lind 2001). Advantages of following a plan include reducing the need for prescriptive language in the easement and allowing flexibility in management options to deal with changing or unforeseen conditions. Plans are easier to amend than easements.

Our landowner survey (see previous section) suggests that the use of forest management plans on conserved properties is growing. And now our review of easement content seems to confirm that. A mandatory forest management plan is the norm for recent working forest easements in the Northern Forest. In fact, every easement and template we reviewed that had been written since the early 1990s requires that forestry activities be guided by a forest management plan. The easements in our sample that do not require a management plan are all from an earlier generation of working forest easements. They include Lassiter/Diamond and Yorkshire Timber (NYDEC, 1988 and 1990, respectively), Trout Pond (Adirondack Land Trust, 1991), Nash Stream (USDA Forest Service, 1989), and Attean (Forest Society of Maine, 1984). However, when we reviewed more recent easements held by the same grantees we found that they have since embraced the concept of mandatory management plans. Newer easements enacted by all of these grantees require that forestry activities be guided by a written forest management plan.

### *Plan content*

Beyond simply requiring a management plan, most easements also set conditions on the content or scope of those plans. Standard plan elements (e.g. forest stand descriptions, cutting history, proposed treatments, wildlife considerations) are typically listed in the easement as required plan content. In the easements we reviewed grantees often added their own requirements where necessary to ensure that plans would hit upon what they consider to be additional important points.

### *Grantee role in plan review or approval*

The role that grantees play in reviewing and/or approving forest management plans varies among easement holders. We found three distinct roles in our easement pool:

- The grantee must review and approve the forest management plan before forestry activities may commence.
- The grantee may review the forest management plan (which must be submitted by the landowner) and notify the landowner of potential activities in the plan that, if pursued, could violate the easement. No approval or disapproval is given.
- The grantee neither approves nor reviews the forest management plan.

The different approaches reflect the stewardship resources and philosophies of different easement holders. Some easement holders, satisfied with the bounds set by the easement, prefer to see landowners directing their own management decisions. They do not want to get into what they perceive as micromanaging on-the-ground activities (Nova Scotia Nature Trust 2000). Other grantees feel that being engaged in a plan's development helps them constructively formulate and guide management approaches with the landowner (Lind 2001).

Contemporary Vermont Land Trust, State of New Hampshire, and NYDEC working forest easements adhere to the first option. The landowner must submit a proposed forest management plan to the easement holder before any harvesting can occur. The holder reviews the plan and determines whether or not, in their judgement, the proposed activities abide by easement's restrictions and are consistent with its purposes.

The VLT and State of New Hampshire easements we reviewed specify that the grantee may consult with experts of their choice (e.g., state fish and wildlife department personnel) to help make that determination. If there are no conflicts, easement language stating that plan approval "shall not be unreasonably withheld" compels the easement holder to approve the plan. If the grantee discovers something in the plan they believe would violate the easement they may withhold approval until revisions are made to their satisfaction. VLT has yet to experience a prolonged disagreement with a landowner over approval of a forest management plan. The Trust attributes this to keeping in contact with property owners and building good relationships with them (Leslie Ratley-Beach, VLT, pers. comm.). Two of the VLT easements we looked at (from 1996 and 1997), require that disputes over plan approval be referred to the Green Mountain Chapter of the Society of American Foresters (SAF) for a "binding review." More recent VLT easements do not contain this clause.

The second approach requires that a proposed forest management plan be submitted to the easement holder for review in advance of scheduled forestry activities. The easement holder may, at their discretion, notify the landowner if the plan appears to contain elements that could potentially lead to an easement violation. But easement holders using this approach do not have the authority to approve or disapprove the plan. And legally, the landowner does not have

to heed their advice. Easements in this category specify that actual activities on the ground – not proposed activities in the plan – will determine whether a violation has occurred. However, it is obviously in the landowner’s interest to be attentive to the easement holder’s warnings to avoid violations.

The easements from our pool that follow this approach are all in Maine: West Branch (Forest Society of Maine, 2003), Katahdin (TNC, 2003), Pingree (NEFF, 2003), and recent Forest Legacy easements held by the State of Maine.

Easements that take the third approach do not require the grantee to approve or review the forest management plan. The current SPNHF template is structure this way. Although SPNHF may request the plan and review it if they wish, they rely primarily on a “written certification” from a professional forester to ensure that the plan complies with the easement. In effect, the responsibility for reviewing the plan falls to the forester who prepared it. This third approach is the least onerous for the easement holder.

Regardless of the approach, all the easements we reviewed are clear that the responsibility for preparing a plan is borne by the landowner, as are the costs.

#### *Certification in lieu of plan review or approval*

The evolution and growing popularity of green certification schemes like FSC and SFI (McEvoy 2001, see also Journal of Forestry 2003, vol. 101(8)) is beginning to be reflected in working forest conservation easements.

Six of the most recent easements in our sample contain a clause that can defer responsibility for reviewing or approving management plans to a third party certifier in the event that the property becomes certified under a sustainable forestry certification scheme like FSC or SFI. The easements we reviewed vary slightly in this regard. Under normal circumstances, West Branch (Forest Society of Maine, 2003), Katahdin (TNC, 2003), Mattawamkeag Lake (State of Maine, 2003) and the two Hancock easements held by the State of Maine (2002 and 2003) require the landowner to submit a management plan to the easement holder for review. The Hancock easements state that a plan meeting the certifier’s requirements for certification shall also be deemed to comply with the easement, without explicitly stating that the certifier must also judge the plan against the easements’ provisions. The other three state that if the certifier attests to the plan “being consistent with the terms of this easement...as part of the certification process” then the plan is in compliance with the easement. There is no need for the easement holder to duplicate or second-guess the judgment of the certifier.

Connecticut Lakes (State of New Hampshire, 2003) is the only easement with a certification provision that we reviewed where the easement holder is normally required to approve (not just review) the management plan. If this property is certified the State “may, at its sole discretion, elect to delegate the [management] plan review and easement monitoring responsibilities...to the certification agency” (p.35). However, the State must still approve the plan. This set-up allows the easement holder to “double-up” on the certifier’s review of the plan for certification purposes while retaining ultimate responsibility for plan approval.

Based on the content of the NYDEC template, new NYDEC easements can also be expected to have certification provisions. The template allows the grantor to “opt out” of clauses requiring the State to approve their forest management plan if the property is enrolled in a certification program approved by the State. Audits must “review all aspects of [forestry] activities including policy, procedures, and practices,...involve one or more physical inspections of the protected

property, and thoroughly evaluate Grantor's compliance with the applicable terms of this conservation easement" (p.8). The template's "mandatory forestry provisions", which address things like BMPs, plantations, and so on, must be adhered to regardlessly.

One might expect that the proportion of landowners who opt for this alternative will increase if, in fact, certification programs continue to earn converts. In fact, our landowner survey (see previous section) suggests that as many as a quarter of easement properties in the region may already be certified (includes Certified Tree Farms) and a solid majority of landowners (70% in our survey) are aware of certification programs.

#### *Role of professional foresters in plan preparation*

Another trend of recent easements is that they explicitly require forest management plans to be prepared by a professional forester or other qualified person approved by the easement holder. The only easements in our sample that require a forest management plan but not a forester to prepare it were enacted in the mid to late 1990s – three Forest Legacy easements from Maine and three VLT easements. More recent easements of both types specify that a professional forester must prepare the plan. Requiring a forester is a moot point for New Hampshire and Maine easements, where state law allows only licensed foresters to be retained to write a management plan.

#### *Renewal frequency*

Most easements that require a forest management plan specify that the plan must be updated no less than every 10 years. The ALT template specifies 15 years, the NYDEC template 5 years. A handful of older easements do not specify a renewal frequency. When plans are updated they go through the same review or approval process that applies to new plans.

#### Harvesting Restrictions

Working forest conservation easements are designed to prevent what the easement holder views as excessive or environmentally unsound harvesting, or to conserve other values recognized by the easement. To that end, easements often specify controls on harvesting practices. The absence of easement clauses that restrict harvesting should not be interpreted to mean that activities on those properties occur unfettered. As previously noted, harvesting standards can also be addressed in the forest management plan. Addressing standards in the easement or the plan is a choice between certainty and flexibility. Some easements defer standards to the plan, some make them explicit in the easement, and some do a combination of both.

#### *Clearcutting*

The silvicultural definition of a clearcut is a harvest that removes all the trees in an area in a single entry for the purpose of regenerating an even-aged stand (McEvoy 2000). But the term is also used colloquially – and indeed in many easements – to refer to the harvesting of all or most of the trees in a given area regardless of whether a management rationale exists or what it is.

Eleven of the easements we reviewed specify a maximum allowable clearcut size. This figure ranges from 5 to 100 acres, but most were in the 25- to 35-acre range. Six easements limit the percentage of the property that may be in a clearcut condition at any one time or that may be clearcut in a given period (e.g., 1 year, 10 years).

Two easements also require separation zones between clearcuts: 250' for the Hancock easement in Vermont (Vermont Agency of Natural Resources, 1997) and 300' in the Adirondack Land Trust template.

Here are some examples of how different easements handle clearcutting:

- The Niatous easement (Forest Society of Maine, 2000) stipulates that no more than 1% of the entire property may be clearcut per year, although that acreage may be aggregated over 5 years. Clearcuts must have an irregular shape and be designed to minimize aesthetic impacts.
- The Pingree easement (NEFF, 2003) allows up to 3% of the property to be in a clearcut condition at any one time, but this figure can rise to 10% with “offsets” for new plantations and thinning elsewhere. Overstory removals, wildlife cuts, and plantation establishments or harvests are not considered clearcuts.
- The SD Warren easement (USDA Forest Service, 1996) allows clearcuts of up to 100 acres. Up to 50% of the property may be clearcut within a 10-year period.
- The Nash Stream easement (USDA Forest Service, 1989) allows clearcuts to a maximum of 30 acres. No clearcut may be made adjacent to a recent clearcut until the average height of regeneration in the latter exceeds 15 feet. No more than 15% of the property may be clearcut within any 10-year period.

In Vermont, clearcutting is restricted by Act 15, the so-called “heavy cut” law. This state law defines a “heavy cut” as a harvest that reduces the stocking of acceptable growing stock below the C-line on 40 or more acres (Long 1997). Such a harvest is not permitted unless the landowner can demonstrate a legitimate forest management rationale for it. Accordingly, Vermont Land Trust working forest easements enacted since the law’s passage in 1997 allow the Trust to deny approval of a forest management plan proposing a heavy cut. VLT uses a 25-acre cut-off, slightly less than what is otherwise required by the state. Like Act 15, VLT easements provide exceptions for overstory removal and salvage.

### *Best Management Practices*

Best Management Practices or BMPs are a set of operational standards designed to protect soil and water resources (Davis et al. 2000, NYDEC 2000). They address things like riparian buffer widths and standards for road construction and stream crossings. In the study region, each of the four states has developed their own unique set or sets of BMPs. They are cited in this publication as New York Department of Environmental Conservation (2000), Vermont Department of Forests, Parks, and Recreation (1987), New Hampshire Department of Resources and Economic Development (1998), New Hampshire Forest Sustainability Standards Work Team (1997), and Maine Forest Service (1991, 1995). BMPs are normally voluntary so long as their non-use does not trigger a discharge that violates water quality laws.

Most of the easements we reviewed stipulated mandatory compliance with that state’s BMP reference, effectively elevating what would be guidelines on a non-easement property to requirements. Easement holders whose earlier easements - like Attean (Forest Society of Maine, 1984) – do not include language requiring adherence to a specific set of BMPs now have standard BMP references in their more recent easements.

The absence of a BMP reference in an easement does not automatically mean that the conserved property has no riparian or soil safeguards. Some easements contain their own unique provisions. For example, the Pierce Pond (1,315 acres) and Maine Wilderness

Watershed Trust (1,770 acres) easements stipulate that no more than 40% volume can be removed every 10 years within 100 feet of any stream, while making no mention of the Maine Forest Service (1991) BMPs. However other objectives – aesthetics, in this case – are also driving these conditions and water and soil protection may as fortuitous as they are planned.

### Salvage

Appropriate harvesting practices following, or in anticipation of, a catastrophic disturbance has generated debate among resource professionals in the Northeast and elsewhere (see Dale et al. 1998, Lindenmayer et al. 2004). Every easement in our pool with clearcutting or heavy cut restrictions includes a provision to suspend those rules if the landowner is faced with potential salvage harvesting. Two different approaches are used. In some cases - Maine Forest Legacy easements and NYDEC and ALT templates - the easement allows salvage harvesting to override clearcutting restrictions. Other easements, like Nicaous, Pond of Safety, and VLT easements require the landowner to apply for an exemption to the clearcutting restrictions. Where these restrictions are imbedded in the forest management plan - like in VLT easements – the exemption is in the form of an amendment to the plan and cannot be “unreasonably” withheld.

### Sustained Timber Supply

Like just about everything else regarding easement content, easements differ in the way they approach the potential problem of overharvesting. Generally, older easements or easements in which forest management is just one of many equally important goals have the least to say about harvest volumes. Even easements that were written with working forests in mind typically do not set rigid conditions on the how much wood may be harvested, although there are some exceptions. Some examples are:

- The SPHNF template implicitly defers judgments on wood supply to the forester through the management plan. Easement language is limited to a general goal for “maintenance or improvement of the overall quality of forest products”.
- VLT easements address overharvesting in part by giving the Trust the option to disapprove plans calling a cut exceeding 25 acres that would bring stocking below the C-line.
- The NYDEC template prohibits stocking from falling below the C-line, except where it can be justified silviculturally. The template also states that “timber harvests shall not remove more than 20% of the net merchantable forest inventory of commercial species in any 10- year period.” Again, exceptions can be made for special cases (e.g., salvage or proof of updated growth and yield data).
- NYDEC’s Champion – Santa Clara easement of 1999 restricts harvesting to no more than 70% of periodic annual growth on growing stock trees for the first 20 years of the easement. Beginning in July of 2019 this ceiling is elevated to the full periodic annual growth. This approach supports the grantor’s investment strategy “to manage the land for long-term appreciation building towards a strong exit value in a 20 year period.” (Appendum C)

Easement language addressing the volume of timber harvests is not limited to preventing overharvesting. We found two easements that appear to also require a minimum level of harvesting:

- The Nash Stream easement (USDA Forest Service, 1989) was one of the first large acreage easements in New Hampshire. It states that “Timber resources shall be managed on a sustained yield basis.” It goes on to define sustained yield as “the achievement and maintenance in perpetuity of an approximately even amount of annual or periodic wood yield consistent with multiple use objectives without impairment of the productivity of the land and forest resources” (p.3). Departures from the sustained yield may be made for salvaging.
- VLT’s Champion easement of 1999 contains a similar provision, but it is much more specific. The “Enforcement of Productive Forestry Purposes” clause stipulates that, “after January 1, 2040, a failure to harvest at least 50% of the cumulative Net Annual Growth over a continuous period of 20 years, shall constitute a violation of this Grant”. Net Annual Growth is defined as 0.38 and 0.44 cords per acre for fully stocked hardwood and softwood stands, respectively. The grantor and grantee may mutually agree to redefine these numbers. This clause was inserted in response to concerns from Northeast Kingdom residents that that the easement could otherwise lead to a substantial drop in timber harvesting with negative economic consequences for the region (Tudish 2002).

### Special Management Areas

Several of the easements we reviewed contain additional safeguards to protect areas that the easement considers sensitive, unique, scenic or otherwise meriting special management attention. Some easements explicitly define such places as “Special Treatment Areas” or “Special Management Areas” and go on to stipulate conditions on how they must be managed. Other easements do not attach any particular labels to these areas, but create *de facto* special management areas by requiring management considerations beyond what is standard elsewhere on the property. This section does not distinguish between the two, and the term Special Management Area (SMA) is used for both.

Easements we reviewed delineate SMAs to protect a wide range of different forest values. Included among them are high-elevation forests, old-growth forests, forests with uncommon tree species composition, known habitats of rare, threatened, or endangered species, high-value recreation destinations, scenic hillsides, deer yards, mast stands, wetlands and watercourses.

Forests adjacent to wetlands and watercourses easily account for the majority of Special Management Areas acknowledged in the easements. The purpose is often two-fold: to protect riparian features and to maintain viewplanes.

Examples of SMAs around watercourses:

- The Cupsuptic easement in Maine prohibits clearcutting within 250 feet and road building within 600 feet of Cupsuptic and Mooselookmeguntic Lakes, two popular recreation destinations.
- The Attean easement has several cutting restrictions on lands near Attean Pond and prohibits cutting within 250 feet of the well-traveled Moose River.
- The Connecticut Lakes easement in northern New Hampshire stipulates Special Management Areas along streams and ponds. The width of these areas expands incrementally as stream order and pond size increase. Widths range from 100 feet on each side of small ponds (<10 acres) and first and second order streams to 660 feet for fourth

order streams. SMAs along watercourses are subject to a combination of no-cut and uneven-aged management zones.

- The most dramatic watercourse restrictions are found in the Pingree easement. That easement allows virtually no forest harvesting within 1000 feet of either side of the St. John River. Limited cutting may occur in exceptional circumstances, and any only with the permission of TNC. Stated reasons for the Special Management Area include protection of rare or imperiled riparian species, old forest structure, and low impact recreation values.

Examples of other SMAs:

- High elevation forests are treated as Special Management Areas on all four of the large New Hampshire easements. Cutting is prohibited above 2,700 feet elevation at Bunnell and Nash Stream and 2,500 feet elevation at Pond of Safety. The Connecticut Lakes easement restricts road building and harvesting above 2,700 feet and requires the easement holder to be involved in any high-elevation harvest planning.
- The Vermont Land Trust sometimes inserts special management provisions into their easements for portions of a property where the landowner and the Trust agree they are desirable. These can get fairly prescriptive. For example, VLT's Westfield Mountain easement contains two "Special Treatment Areas" totaling 48 acres, where "Grantors shall: i) maintain or enhance mast production by managing the key mast stands for rotations greater than or equal to 80 years while maintaining a stocking level between 60 and 90 square feet per acre of hardwoods; and ii) manage the key mast stands as multi-aged stands with a minimum of 30 square feet per acre of American Beech trees."
- In addition to SMAs for wetlands, ponds, and deer wintering areas, VLT's 1999 Champion easement identifies two old-growth forest sites (East Mountain: spruce-fir; Willard Mountain: red pine) that are completely off-limits for timber harvesting, road construction, or mechanized equipment.

The Bunnell easement in New Hampshire (18,430 acres) is unique in that over half the property is managed as a nature reserve. The reserve portion (10,330 acres) is subject to its own "easement within an easement" (Duane Hyde, TNC, pers. comm.) In this case a separate "forever wild" easement guides management of the reserve portion, but it is nonetheless referred to and enacted by the larger easement for the whole property.

As has been noted with other potential easement content, the lack of Special Management Areas explicitly defined in the easement does not necessarily mean that "special" areas are being ignored in management planning or operations. Some easements defer that direction to the forest management plan. For example, TNC's Katahdin easement stipulates that the forest management plan must address how forestry activities will protect "unique and exemplary natural areas documented by state agencies". But the easement itself does not specify how to do this. That is left to the judgment of land managers.

## Conclusion

The number of conservation easements in the Northeast and the acreage of forest land covered under easements has grown dramatically over the past decade. Today, easements in Maine, New Hampshire, Vermont, and northern New York apply to about 3,000 forested properties encompassing 2.5 million acres. This trend is expected to continue for several years, as many easement holders have already identified priorities for new easements, and some of those properties are quite large (USDA Forest Service 2003).

We attempted to determine what influence easements in this region are having on forest management. The results contribute to our understanding of forest management today, but will also help to predict how easements may influence forest management in the region as easements continue to grow in popularity and guide the management direction of even more acreage.

The survey we conducted suggests that the typical landowner with a conservation easement is happy with that easement, has multiple management objectives including keeping the forest in a “natural condition” *and* harvesting wood products, and does not believe that the easement hinders their freedom to manage the property in the way they want. This holds true for both individual/family and corporate landowners. The size of the property does not seem to influence landowner attitudes towards their easement.

Most landowners regularly harvest wood from their conserved property. Those that do not usually plan to harvest soon, have properties that are poorly stocked, or are influenced by other operational or financial barriers that have nothing to do with the easement. Site visits and forester interviews confirm this phenomenon. Where wood is being harvested, the easement usually does not affect the harvest volume. However, our survey suggests that easements may be lowering volumes in a small number (~10%) of cases.

During the time that easements have been spreading across the Northeast, their content has been evolving. Easement language evolves as land trusts and state agencies recalibrate based on experiences that have had working with landowners, monitoring, and enforcement (Lind 2001). “Older” easements in the Northeast (e.g., 1980s, early 1990s) focus largely on what is “not allowed” while saying little if anything about the landowner’s or grantee’s long-term expectations for the property. Easements enacted over the past decade tend to provide more direction – that is, they are more explicit about what forest values are to be conserved and why. They may also stipulate more specific forest management objectives. But the details – or the “how to” part – are usually deferred to a management plan prepared by the landowner (or their forester) that can be updated on a regular basis. Because the easement usually sets conditions on plan content and offers the grantee a role in reviewing or approving the plan, the easement holder can nonetheless influence management without micromanaging activities on individual properties. This seems to satisfy both landowners and easement holders.

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## **APPENDIX 1: Overview of conservation easement properties by state**

### **New York**

Most forest easements in New York are privately held, but state-held easements cover more land.

According to NYDEC files, the state holds 55 easements on 81 properties that exceed 25 acres of forested land. Most of these are on large properties in northern New York. NYDEC lists the total acreage for the 55 easements at 295,067 acres. NYDEC holds all of the State's forest easements.

NYDEC's private easements registry lists 979 records for the whole state. Eliminating records for properties that are small (<25 acres) or located in and around New York City reduces the list to 406 records covering 63,165 acres.

#### Summary

Total easements (containing at least 25 acres): 461

State-held: 55

Private: 406

Total acreage under easements >25 acres: 358,000

Number of organizations / agencies holding easements (including the state): 30

### **Vermont**

The Vermont Conserved Lands Database lists 2,896 easement properties totaling 389,430 acres. When we overlaid land cover on these properties we found that nearly two-thirds of them contain less than 25 acres of forested land. The remaining 1,009 easement properties total 336,828 acres.

The Vermont Land Trust holds easements for 778 of the 1,009 properties.

#### Summary

Number of properties under easement (minimum 25 forested acres): 1,009

Total acreage under easements with >25 acres of forest: 336,828

Number of organizations / agencies holding easements (including state agencies): 43

### **New Hampshire**

We identified 1,933 easement properties covering 371,201 acres. Restricting for easement properties with at least 25 acres of forested land produced 862 records (i.e., properties), covering 354,903 acres. These totals do not include four tracts with "forever wild" easements associated with the Connecticut Lakes or Bunnell land assemblies. Including these properties increases the state's easement acreage totals to 406,531 acres (all sizes) and 390,233 acres (properties with at least 25 forested acres).

One hundred twenty-eight different agencies and organizations hold easements in New Hampshire. The Society for the Protection of New Hampshire Forests has by far the most easements with 276 (June 2003).

### Summary

Number of properties under easement (minimum 25 forested acres): 862

Total acreage under easements with >25 acres forested: 354,903

Number of organizations / agencies holding easements (including state agencies): 128

### **Maine**

Maine does not currently have a registry or spatial database of easements. We compiled statistics from the Maine Land Trust Network (<http://www.mltn.org>) website to get an approximation of easement properties and total acreage to 2001. To that we added additional easements and acreage based on follow-up calls to the state Department of Conservation and selected land trusts.

Through this process we identified 783 easements totaling 1,415,500 acres. Seventy-six different easement holders were identified. For Maine we could not distinguish between properties under or over the 25 forested acres threshold.

**APPENDIX 2**

**Conservation Easements and Forest Management: A Survey of Conservation Easement Landowners in New York and Northern New England**

**School of Natural Resources, University of Vermont  
August 2003**

*Part I: The first part of this survey asks questions about the history of the easement on your property, and the reasons for placing your property under an easement. Please check the best answer for each question.*

1. Are you (or your company) the owner under whom the easement was signed?

Yes                       No                       Don't know

2. **If "Yes":** What was your primary reason for choosing to place this property under an easement? (check only one)

- I wanted to keep the property in a "natural" condition in perpetuity
- I wanted to improve forest management
- I wanted to qualify for a state land conservation / current use tax credit program
- I wanted to benefit from a charitable income tax deduction
- I sold the easement as a good business venture
- Other (please specify): \_\_\_\_\_

3. **If "No":** What type of landowner signed the easement?

- A forestry company; Name of company (if known): \_\_\_\_\_
- A prior family member
- An individual or family not related to me/my family
- Don't know
- Other (please specify): \_\_\_\_\_

4. How was the easement initiated?

- I (or my family/company) approached the current easement holder
- The easement holder approached me (or my family/company)
- An intermediary for the easement holder approached me (or my family/company)
- The easement was initiated under a previous landowner
- Don't know
- Other (please specify): \_\_\_\_\_

**Part II. The next series of questions asks about forest management on your conserved property.**

5. Before the easement was applied to your property, was forest management of your property directed by a written forest management plan?

Yes                       No                       Don't know

6. Is forest management of your property currently directed by a written forest management plan?

Yes                       No                       Don't know

7. **If "Yes":** As landowner, do you (or your company) prepare the forest management plan for the property?

Yes                       No

8. What are your primary land management goals on your property? (check all that apply)

- Management for wood products
- Management for forest health
- Management for wildlife
- Management for aesthetics
- Management for recreation
- Other (please specify): \_\_\_\_\_

9. Which of the goals identified in Question 8 is the most important management goal?

\_\_\_\_\_

10. Is your land enrolled in a state land conservation / current use tax credit program?

Yes                       No                       Don't know

11. **If "Yes":** how does enrollment in such a program affect how much wood is harvested from your property?

- The program forces me/us to harvest more wood than I/we would otherwise harvest.
- Enrollment in the program does not influence how much wood is harvested.
- The program forces me/us to harvest less wood than I/we would otherwise harvest.

12. Are you aware of programs for formally certifying sustainable forest management?

Yes                       No

13. Are forest management activities on your property certified or in the process of being certified?

- Yes, the property is currently certified.
- Yes, the property is in the process of being certified.
- No, the property is neither certified nor in the process of being certified.
- Don't know

14. If your property is certified or in the process of being certified, under what system(s) have you pursued certification? (check all that apply)

- Forest Stewardship Council (FSC)
- Sustainable Forestry Initiative (SFI)
- Other (please specify): \_\_\_\_\_.

15. Easements may affect forest management in a variety of ways. Please circle one number following each statement that best indicates the extent to which you disagree or agree with that statement as it pertains to your conserved property.

	<b>Strongly Disagree 1</b>	<b>Disagree 2</b>	<b>Neutral 3</b>	<b>Agree 4</b>	<b>Strongly Agree 5</b>	<b>Don't Know 6</b>
a. The easement unreasonably restricts the harvesting methods / prescriptions that can be used on the property.	1	2	3	4	5	6
b. The easement unreasonably restricts where harvesting on the property can occur.	1	2	3	4	5	6
c. The easement unreasonably restricts road building.	1	2	3	4	5	6
d. The easement unreasonably restricts the amount of wood that can be harvested.	1	2	3	4	5	6
e. Overall, the easement has encouraged good management of the property.	1	2	3	4	5	6

16. Have you or a previous landowner made any investments in forest management on your conserved property? Please indicate, to the best of your knowledge, which of the following investments have been made on the property, both after the easement was enacted, and during the 20 year period preceding the easement.

<b>Investment</b>	<b>Made after the easement?</b>	<b>Made within 20 years prior to the easement?</b>
a. Constructed roads for the purpose of forest management	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
b. Planted seedlings	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
c. Done pre-commercial thinning	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
d. Sprayed herbicides or insecticides	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
e. Acquired equipment for forest management	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
f. Paid legal fees pertaining to forest management	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
g. Paid consulting fees for forest management	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know

**Part III. The following questions ask about your experience with and views about commercial timber harvesting. The term “commercial timber harvesting” is used below to refer to activities undertaken for commercial gain; it does not include small scale logging for personal use (e.g., firewood, harvesting lumber for personal use, etc.).**

17. How important is it to you that commercial timber harvesting be allowed to occur on your property? (circle one)

Not at all important	Somewhat important	Moderately important	Very important	Don't know
1	2	3	4	5

18. How important is it to you that commercial timber harvesting actually occurs on your property on a regular basis? (circle one)

Not at all important	Somewhat important	Moderately important	Very important	Don't know
1	2	3	4	5

19. What is the likelihood that commercial timber harvesting will occur on your property within the next 10 years? (circle one)

Not at all likely	Somewhat likely	Moderately likely	Very likely	Don't know
1	2	3	4	5

20. To the best of your knowledge, did commercial timber harvesting occur on your property within 20 years prior to the easement being enacted?

Yes                       No                       Don't know

21. To the best of your knowledge, has commercial timber harvesting occurred on your property under your ownership since the easement was enacted?

Yes                       No                       Don't know

**If “Yes”:** Please complete Part IV (Questions 22-26), beginning on the next page.

**If “No”:** Please complete Part V (Question 27) on the last page of this survey.

**If “Don't know”:** The survey ends here. **THANK YOU** for participating! Please return the completed questionnaire in the enclosed, pre-stamped envelope.

**Part IV. Questions 22 to 26 should only be completed ONLY if you answered “Yes” for Question 21.**

22. The following table lists a series of possible endings to the sentence: “I/we chose to pursue commercial timber harvesting on the property because...” Please circle one number following each statement that best indicates how much you disagree or agree with that statement.

<b>I/we chose to pursue commercial timber harvesting on the property because...:</b>	<b>Strongly Disagree 1</b>	<b>Disagree 2</b>	<b>Neutral 3</b>	<b>Agree 4</b>	<b>Strongly Agree 5</b>	<b>Don't Know 6</b>
a. ...harvesting would enhance the condition of the forest.	1	2	3	4	5	6
b. ...harvesting would enhance other natural values (e.g., wildlife).	1	2	3	4	5	6
c. ...harvesting would provide an economic return on an investment.	1	2	3	4	5	6
d. ...the easement requires or encourages harvesting.	1	2	3	4	5	6
e. ...a professional forester recommended harvesting.	1	2	3	4	5	6

23. To the best of your knowledge, how does the volume of commercial timber harvests on your property since the easement was enacted compare to the volume of commercial timber harvests during the 20-year period preceding the easement? (check only one)

- Harvest volumes have been much higher since the easement was enacted.
- Harvest volumes have been somewhat higher since the easement was enacted.
- Harvest volumes have remained about the same since the easement was enacted.
- Harvest volumes have been somewhat lower since the easement was enacted.
- Harvest volumes have been much lower since the easement was enacted.
- Don't know.

24. If the easement were not in place, to what extent do you think the commercial timber harvest volume from your property would differ?

- Without the easement, harvest volumes would likely be much higher.
- Without the easement, harvest volumes would likely be somewhat higher.
- The easement has little or no effect on how much wood is harvested.
- Without the easement, harvest volumes would likely be somewhat lower.
- Without the easement, harvest volumes would likely be much lower.

25. What silvicultural prescription(s) have been used on the property since the easement was enacted? (check all that apply)

- Clearcut
- Shelterwood cut
- Single tree selection
- Group selection
- Pre-commercial thinning
- Don't know
- Other (please specify): \_\_\_\_\_

26. Which of the silvicultural prescriptions listed above have been *predominantly* used since the easement was enacted? (please list only one)

---

**OPTIONAL:** In the next phase of this project we will be interviewing some of the people who manage forest lands under conservation easements. If management of your property is directed by a professional forester we might, with your approval, like to contact that forester for an interview.

If you would like to assist the project in this way please provide the name and telephone number of your forester. Otherwise leave blank.

Name of forester: \_\_\_\_\_

Phone: \_\_\_\_\_

***This is the end of the survey. Please do NOT go on to Part V.***

***THANK YOU for participating!***

***Please mail the completed questionnaire back to us in the enclosed pre-stamped envelope.***

**Part V. This section (Question 27) should be completed ONLY if you answered “No” to Question 21.**

27. The following table lists a series of possible endings to the sentence: “I/we chose not to pursue commercial timber harvesting on the property because....” Please circle one number following each statement that best indicates how much you disagree or agree with that statement.

<b>I/we chose <u>not</u> to pursue commercial timber harvesting on the property because...:</b>	<b><u>Strongly</u> Disagree 1</b>	<b>Disagree 2</b>	<b>Neutral 3</b>	<b>Agree 4</b>	<b>Strongly Agree 5</b>	<b>Don't Know 6</b>
a. ...harvesting would diminish the condition of the forest.	1	2	3	4	5	6
b. ...harvesting would diminish other natural values (e.g., wildlife, water).	1	2	3	4	5	6
c. ...the easement is too restrictive.	1	2	3	4	5	6
d. ...harvesting would not be economical.	1	2	3	4	5	6
e. ...a professional forester recommended against harvesting.	1	2	3	4	5	6
f. ...of another reason (please specify, if applicable to you): _____	1	2	3	4	5	6

***This is the end of the survey. THANK YOU for participating!***

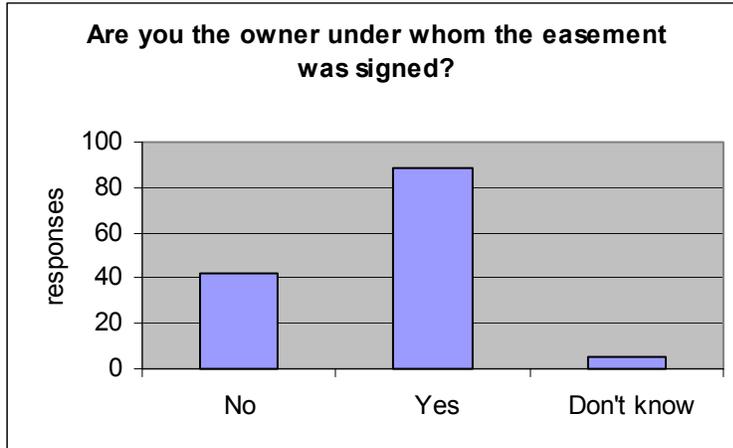
***Please mail the completed questionnaire back to us in the enclosed pre-stamped envelope.***

ID#: \_\_\_\_\_

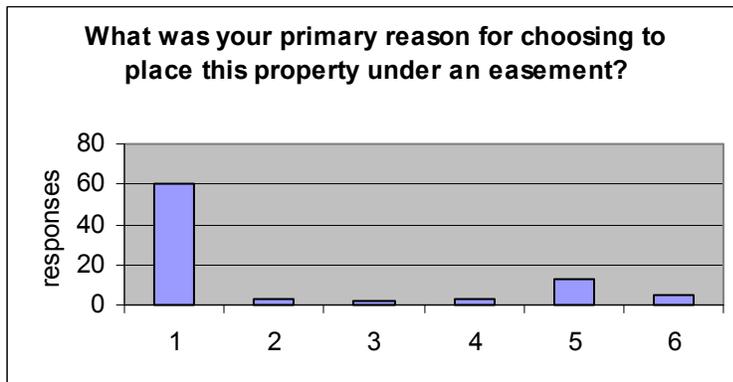
### APPENDIX 3: Final Survey results

The following graphs depict 136 responses from the survey of conservation easement landowners in the study region. No statistical tests have been applied to these results.

Question 1.

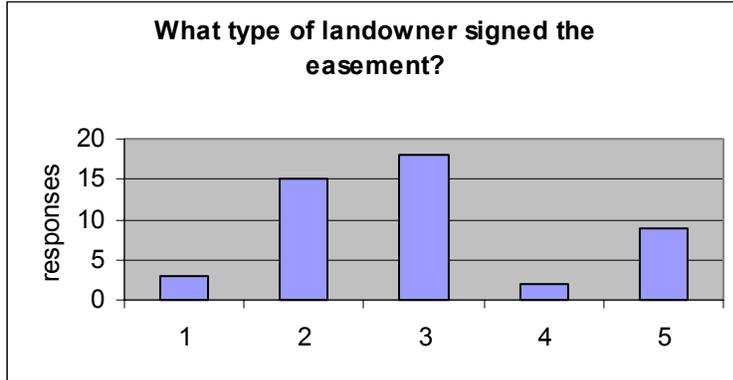


Question 2. (Answered only by those who answered "Yes" to Question 1.)



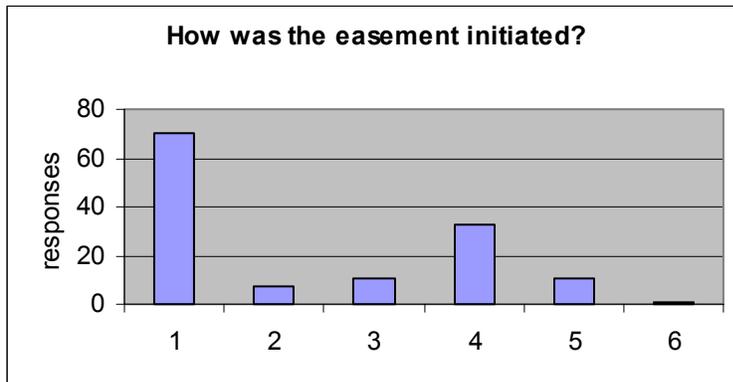
1. I wanted to keep the property in a "natural" condition in perpetuity.
2. I wanted to improve forest management.
3. I wanted to qualify for a state land conservation / current use tax credit program.
4. I wanted to benefit from a charitable income tax deduction.
5. I sold the easement as a good business venture.
6. Other

Question 3. (Answered only by those who answered “No” to Question 1.)



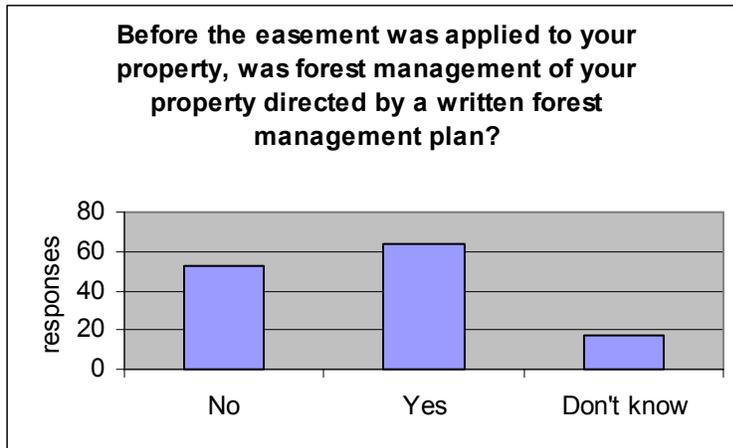
1. A forestry company
2. A prior family member
3. An individual or family not related to me/my family
4. Don't know
5. Other

Question 4.

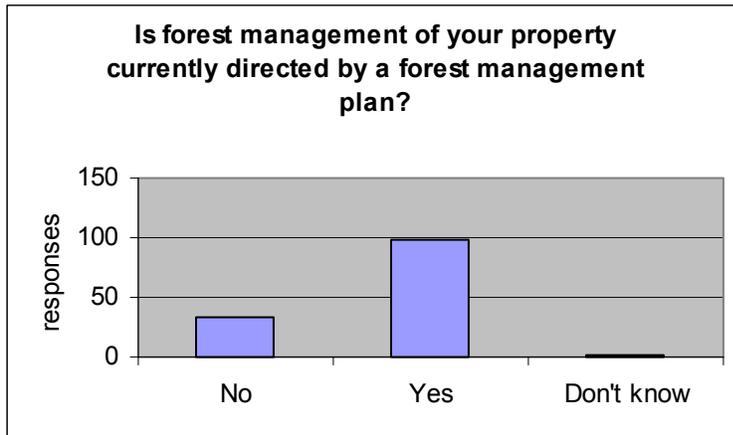


1. I (or my family/company) approached the current easement holder.
2. The easement holder approached me (or my family/company).
3. An intermediary for the easement holder approached me (or my family/company).
4. The easement was initiated under a previous landowner.
5. Don't know
6. Other

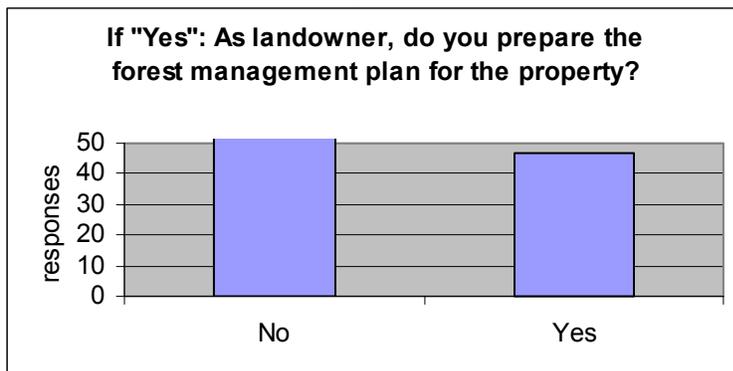
Question 5.



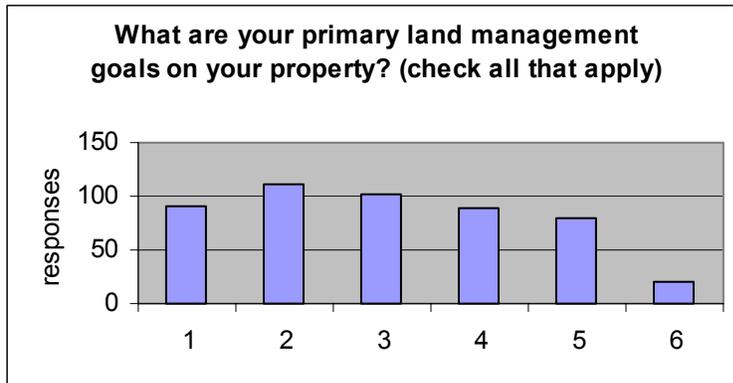
Question 6.



Question 7. (Answered only by those who answered "Yes" to Question 6.)

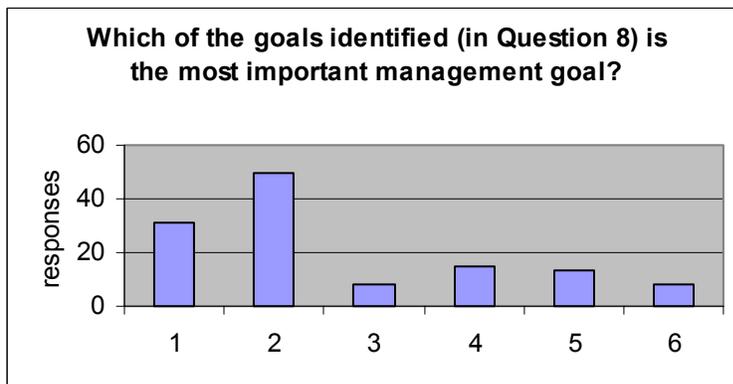


Question 8.



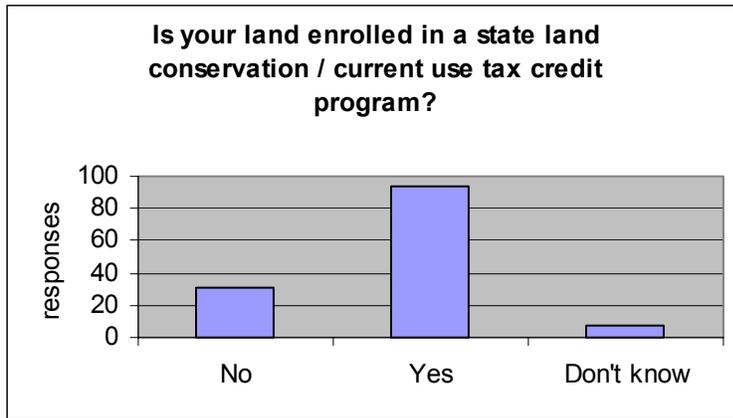
1. Management for wood products
2. Management for forest health
3. Management for wildlife
4. Management for aesthetics
5. Management for recreation
6. Other

Question 9.



1. Management for wood products
2. Management for forest health
3. Management for wildlife
4. Management for aesthetics
5. Management for recreation
6. Other

Question 10.

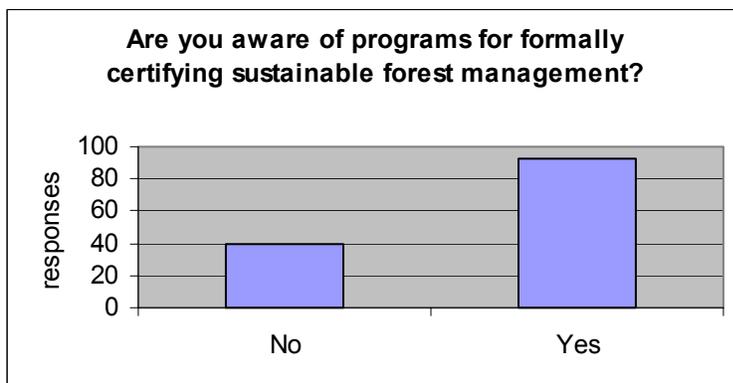


Question 11. (Answered only by those who answered "Yes" to Question 10.)

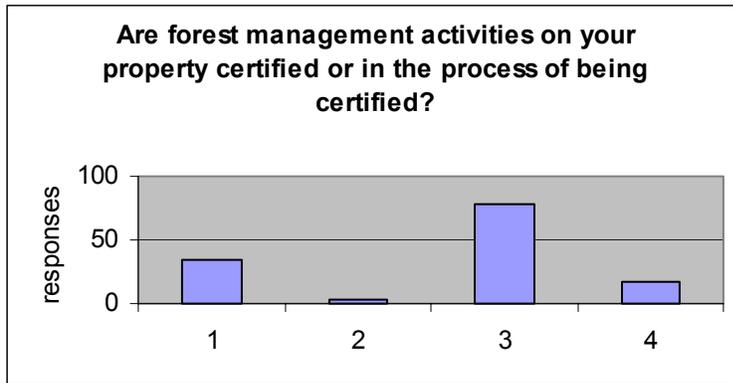


1. The program forces me/us to harvest more than I/we would otherwise harvest.
2. Enrollment in the program does not influence how much wood is harvested.
3. The program forces me/us to harvest less than I/we would otherwise harvest.

Question 12.

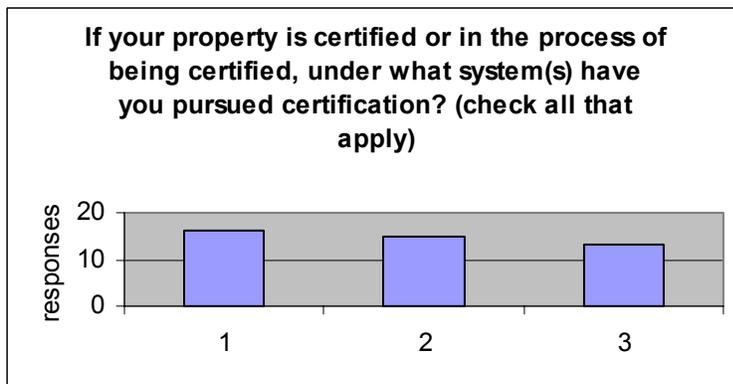


Question 13.



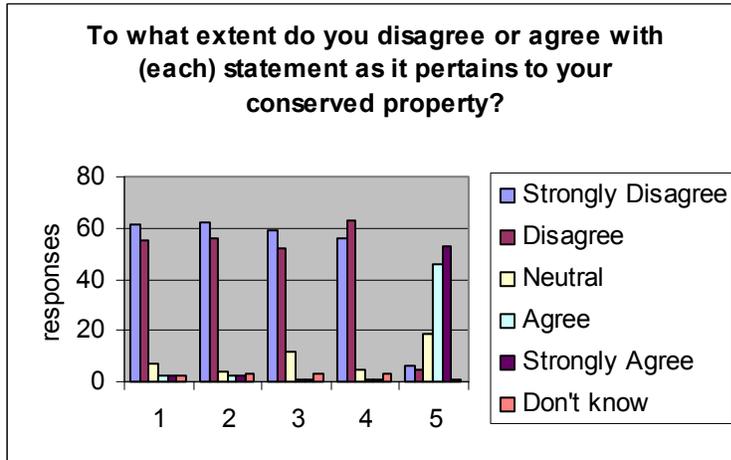
1. Yes, the property is currently certified.
2. Yes, the property is in the process of being certified.
3. No, the property is neither certified nor in the process of being certified.
4. Don't know

Question 14.



1. Forest Stewardship Council (FSC)
2. Sustainable Forestry Initiative (SFI)
3. Other

Question 15.



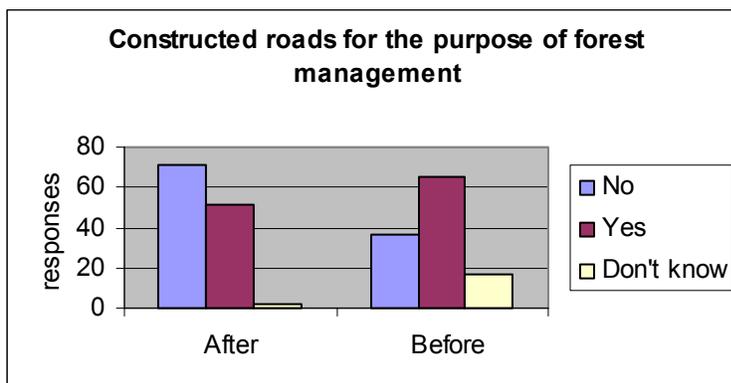
1. The easement unreasonably restricts the harvesting methods / prescriptions that can be used on the property.
2. The easement unreasonably restricts where harvesting on the property can occur.
3. The easement unreasonably restricts road building.
4. The easement unreasonably restricts the amount of wood that can be harvested.
5. Overall, the easement has encouraged good management of the property.

Question 16.

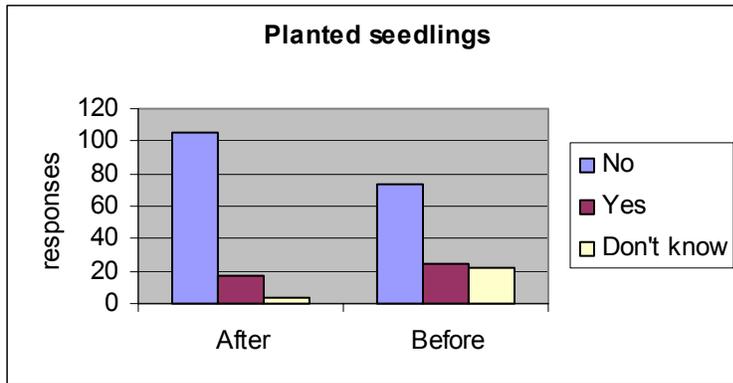
The following seven graphs depict responses to the following question: "Have you or a previous landowner made any investments in forest management on your conserved property? Please indicate, to the best of your knowledge, which of the following investments have been made on the property, both after the easement was enacted, and during the 20 year period preceding the easement."

The left side of the graph depicts the number of responses to investment options after the easement was enacted. The right side depicts responses for the 20-year period preceding the easement.

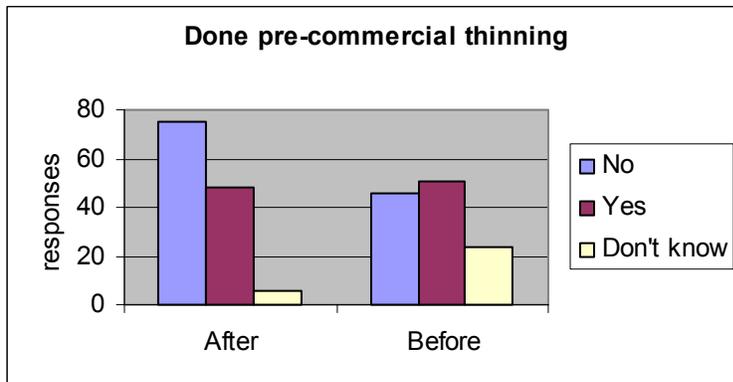
16a.



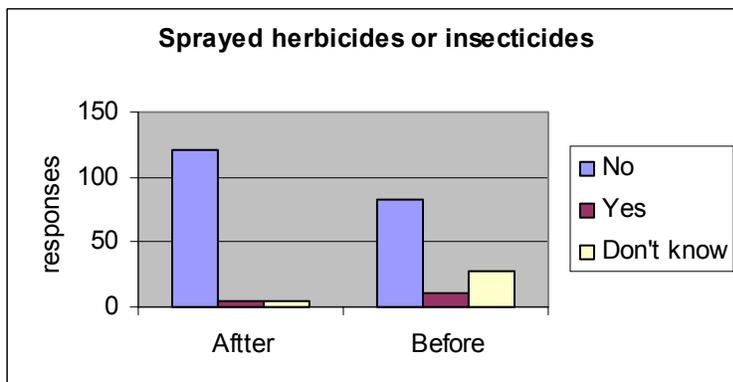
16b.



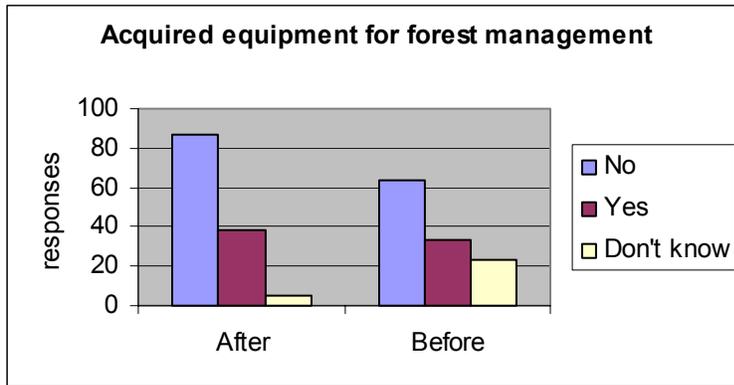
16c.



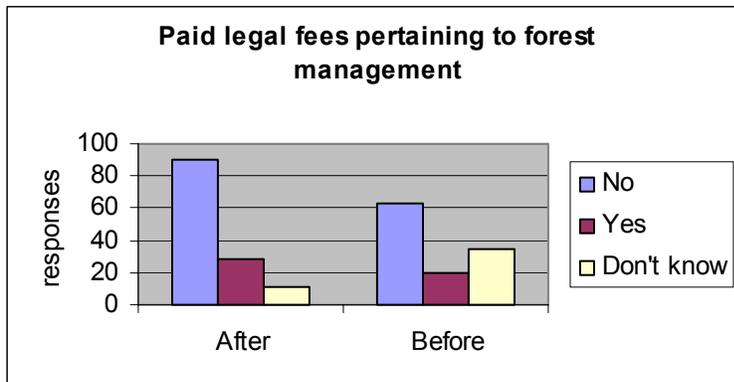
16d.



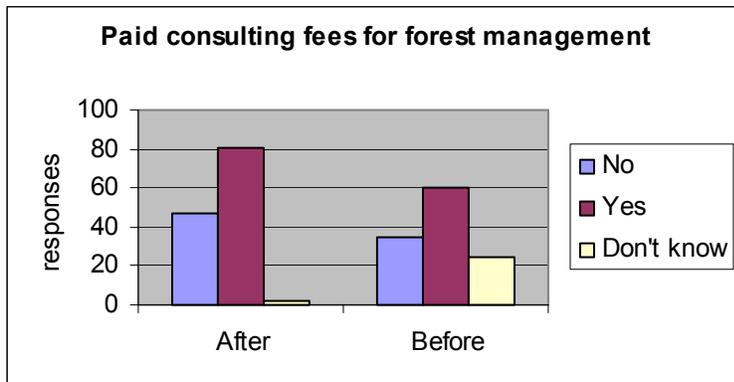
16e.



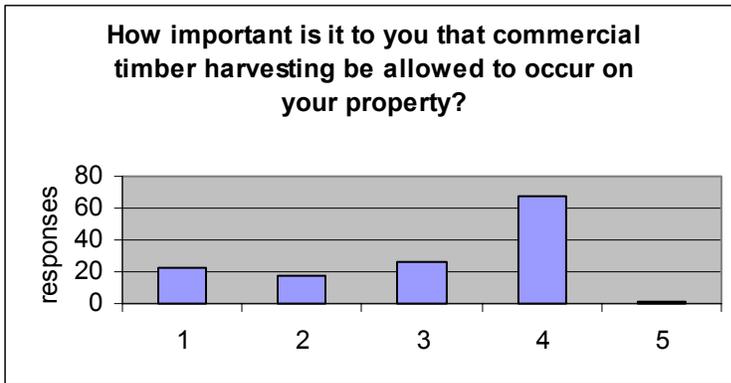
16f.



16g.

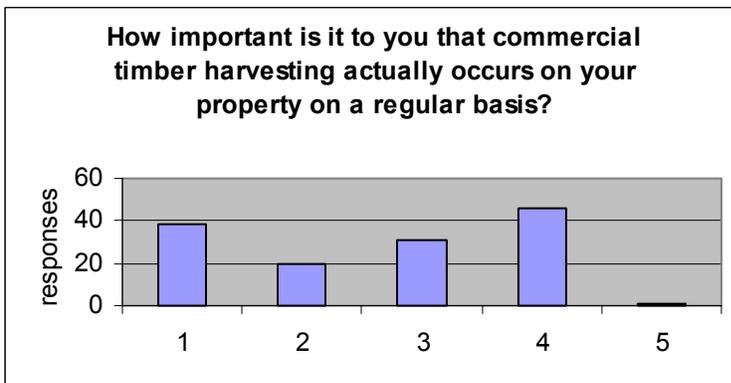


Question 17.



1. Not at all important
2. Somewhat important
3. Moderately important
4. Very important
5. Don't know

Question 18.



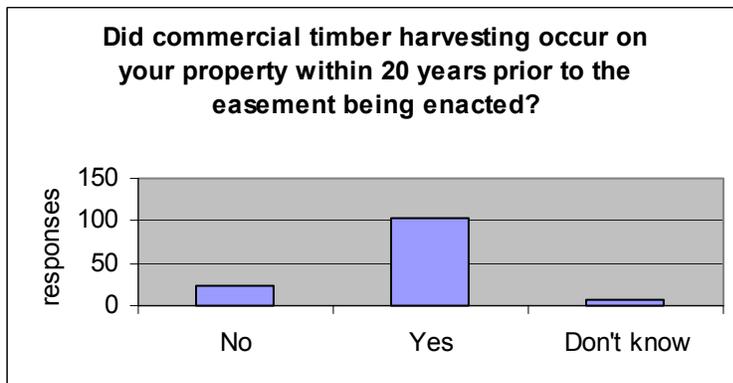
1. Not at all important
2. Somewhat important
3. Moderately important
4. Very important
5. Don't know

Question 19.

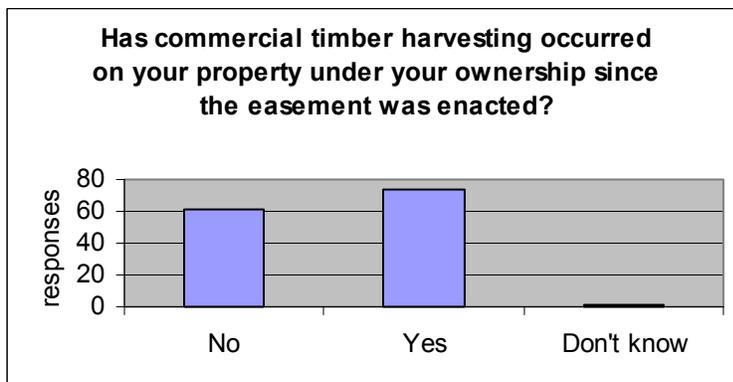


1. Not at all likely
2. Somewhat likely
3. Moderately likely
4. Very likely
5. Don't know

Question 20.

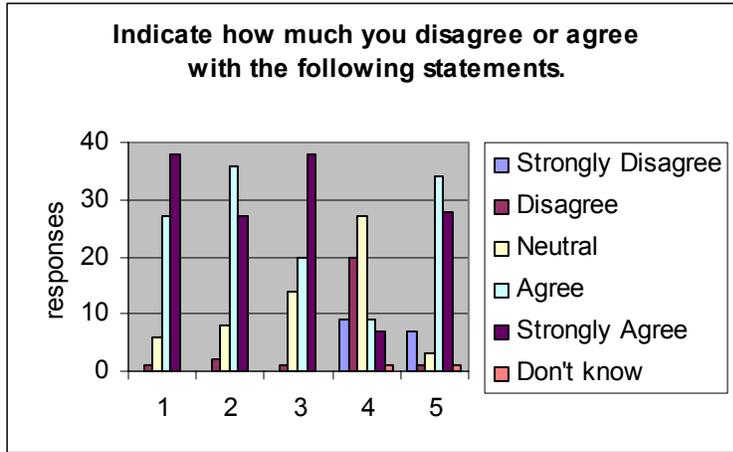


Question 21.



Questions 22 to 26 were answered only by respondents who answered "Yes" to Question 21.

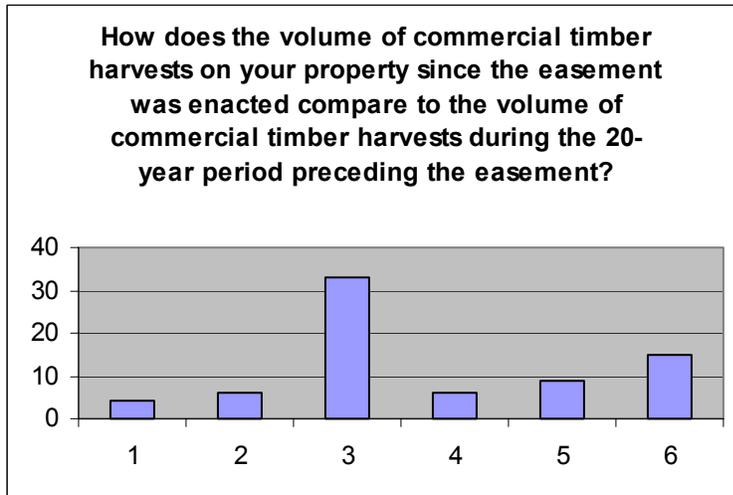
Question 22.



I/we chose to pursue commercial timber harvesting on the property because...:

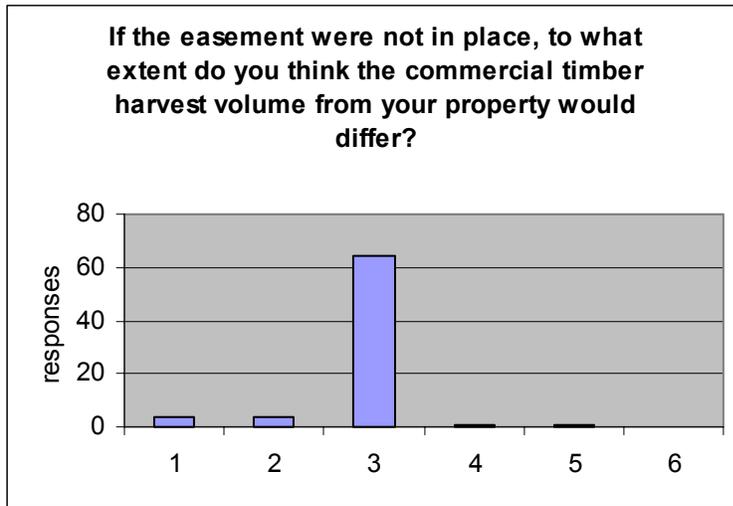
1. ...harvesting would enhance the condition of the forest.
2. ...harvesting would enhance other natural values (e.g., wildlife).
3. ...harvesting would provide an economic return on an investment.
4. ...the easement requires or encourages harvesting.
5. ...a professional forester recommended harvesting.

Question 23.



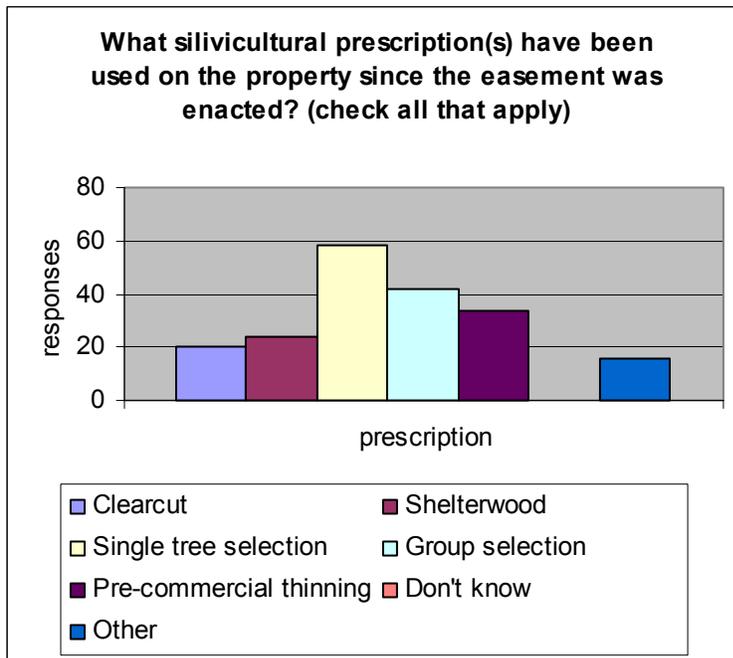
1. Harvest volumes have been much higher since the easement was enacted.
2. Harvest volumes have been somewhat higher since the easement was enacted.
3. Harvest volumes have remained about the same since the easement was enacted.
4. Harvest volumes have been somewhat lower since the easement was enacted.
5. Harvest volumes have been much lower since the easement was enacted.
6. Don't know

Question 24.

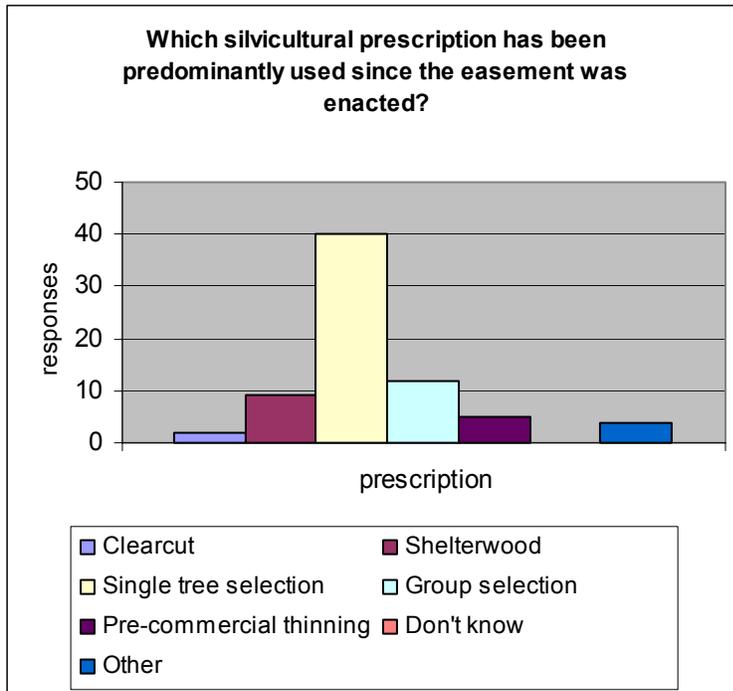


1. Without the easement, harvest volumes would likely be much higher.
2. Without the easement, harvest volumes would likely be somewhat higher.
3. The easement has little or no effect on how much wood is harvested.
4. Without the easement, harvest volumes would likely be somewhat lower
5. Without the easement, harvest volumes would likely be much lower.

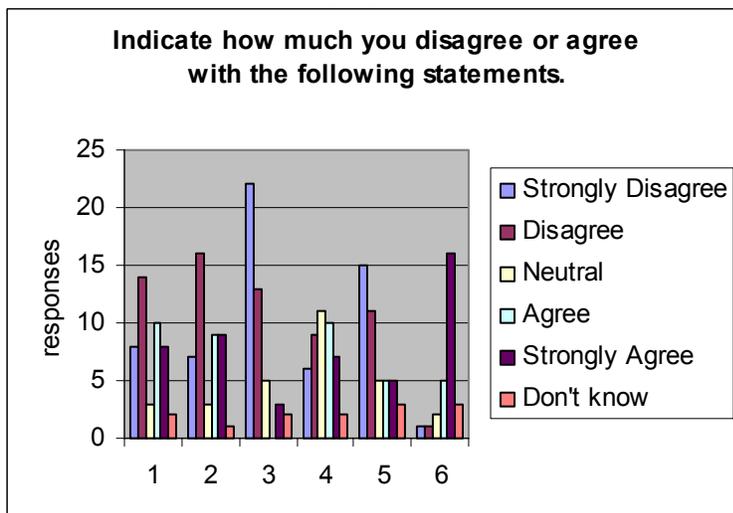
Question 25.



Question 26.



Question 27. (Answered only by those who answered “No” to Question 21.)



I/we chose not to pursue commercial timber harvesting on the property because...

- 1 ...harvesting would diminish the condition of the forest.
- 2 ...harvesting would diminish other natural values (e.g., wildlife, water).
- 3 ...the easement is too restrictive.
- 4 ...harvesting would not be economical.
- 5 ...a professional forester recommended against harvesting.
- 6 ...of another reason (please specify, if applicable to you).

## **APPENDIX 4: Site visit observations**

We visited 16 of the properties that we received surveys for in order to ground-truth survey results and see firsthand a sampling of easement properties around the region. The number of properties we visited does not represent a statistically significant sample, nor was it ever our intention that it would. And while forest types and management histories varied we consistently witnessed some of the same occurrences on different properties. In particular, two things stood out. First, site visits confirmed that large portions of properties that have not been harvested since coming under an easement are poorly stocked. In most of these cases, there was clear evidence that cutting prior to the easement's enactment contributed substantially to the current low stocking. Second, properties that are under active management appear well managed. For example, in most cases BMPs are being adhered to, immature trees of acceptable growing stock are being left to accumulate volume, and properties tend to be producing a diverse complement of timber products.

This appendix summarizes each site visit:

**Site 1** was a 100-250 acre property in southern Vermont. The survey indicates the property was conserved to maintain public recreational use. The survey also indicates that the property was cut indiscriminately prior to the easement.

The property was a hardwood dominated site draped over a hillside. Stands along the hillside included red oak, sugar maple, beech, and yellow birch, with some hemlock. These species were increasingly mixed with white pine, red spruce, paper birch, and white ash along the base of the slope. Stocking and stem quality on the flatter and accessible parts of the site was variable due to past logging (Basal area averaged 90ft<sup>2</sup>/acre from eight plots). Judging by the number of scattered large stumps, it appears that some easily operable areas were highgraded about 15-20 years ago. However, some high quality residuals were left behind. The mid slope at one end of the site harbored impressive stands of mature red oak with minor components of sugar maple and white pine. Regeneration was moderate in most plots but better where cutting had opened up areas or promoted root sprouting (e.g., beech). There was no evidence of past cutting on steep slopes or on the ridge top, nor evidence of active management of any type today.

Skid roads on this site were still in good shape and an old landing had been cleaned up. Woody debris was uncommon along the base of the slope, but increasing common on mid slopes.

**Site 2** was a small property (<100 acres) adjacent to a National Forest in central Vermont. It was completely forested and dominated by near mature mid to late successional species such as yellow birch, hemlock, sugar maple, beech, and scattered red spruce. Most of the site was on a moderate slope, but not inoperable. The site had a history of logging, but not recently. Stocking varied. We took three basal area plots: 40, 105, and 140 ft<sup>2</sup>/acre. Regeneration was generally moderate to good, with prolific beech regeneration in several places. The most heavily stocked portion of the site (~ 200 ft<sup>2</sup>/acre of fir and spruce) was a thin strip along the easily accessible foot of the slope. Old skid roads were common on the site. One had been modified with waterbars to prevent gullying, another had not. A major stream canyon bounded the property on one side. Many large trees proximate to a major stream canyon that bounded one side of the property had not been cut in previous logging operations. There was no evidence of special measures taken to promote wildlife.

**Site 3** was a dairy farm under 100 acres in central Vermont. The forested portion of the property, about half the total acreage, was dominated by conifers, especially white cedar. There were lesser components of balsam fir, red spruce, and red pine, along with a small sugar bush, and a small area of white pine. Numerous streams ran through the property, and forests were generally low lying and poorly drained.

The property was overstocked in many places. At one plot, basal area was 220 ft<sup>2</sup>/acre. A white pine stand had been heavily cut by the previous landowner. The current landowner, who acquired the property in the past ten years, occasionally harvests small quantities of single trees and groups with horses in the winter. He roughly adheres to a management plan inherited from the previous owner. Plan objectives include growing spruce, hemlock, and fir to 14" DBH and white pine to 18" DBH. There was no evidence of damage to wet areas. Some residuals were damaged from harvesting. Regeneration was generally poor throughout the property, and the property was easily accessible from a public road.

**Site 4** was in a 100-250 acre farm property in northern Vermont. It was roughly 50% forested. The site visit confirmed survey information that the property had been heavily cut a long time ago. The western third of the property was low-lying and excessively poorly drained. It was difficult to keep your feet dry. It was blanketed with many large and well-decayed stumps. Basal area in this portion of the property was typically around 80 ft<sup>2</sup>/acre, often comprised of pole sized hemlock, fir, and red spruce. Few trees in the western portion of the site exceeded 8" DBH. Regeneration was moderately good, and often dominated by paper birch, yellow birch, and balsam fir.

The eastern two-thirds of the site was on a terrace, separated from the low-lying area by a steep rock outcrop. Old but deep skidder ruts ran along the base of the slope. The eastern portion of the property appeared to have been high-graded for large hemlock and yellow birch about 15 years ago, although the slightly decayed stumps mixed with very old stumps. Basal area here was between 80 and 100 ft<sup>2</sup>/acre, with moderate regeneration of red maple, yellow birch, and hemlock. Since cutting clearly extended to the property boundary, the adjacent property provided a hint of how this property may have evolved. It was well-stocked (150 ft<sup>2</sup>/acre) with pole-sized to mature hemlock with prolific hemlock regeneration. No skidder roads were observed on this property.

**Site 5** was a 500-2500 acre property in New Hampshire. Dominants were primarily paper birch and white ash, although lesser components of balsam fir, black cherry, yellow birch, beech, and red spruce are present. According to the landowner, the previous owner heavily cut the property in the early 1990s. Today most of the property is poorly stocked with basal area from three representative plots ranging between 60 and 80 ft<sup>2</sup>/acre. Furthermore, the 1998 ice storm left many trees with broken tops or branches. The landowner has used funding from the USFS Stewardship Investment Program and invested considerable personal time and money into repairing damage from both the previous landowner and the ice storm. He has rebuilt and seeded several hundred yards of eroding roads, built bridges over streams (the previous skidded over logs laid in the stream), and replaced malfunctioning culverts. He plans to continue doing this elsewhere on the property. The landowner is waiting for the forest to recover before harvesting any significant quantities of wood. He currently takes firewood.

Locals use the property for moose hunting. People have seen bears on the property. No attempt has been made to manipulate habitat for wildlife, although the ice storm created a

moderate amount of woody debris. Regeneration of fir, spruce, and beech is prolific throughout the site.

**Site 6** was a 250-500 acre Certified Tree Farm property in New Hampshire. It is about 70% forested, with the remainder in active agriculture. Most of the site appeared to be dominated by mature hemlocks. There were lesser components of red oak, beech, white pine, paper birch, and fir. Much of the site has an open “park-like” appearance. Stocking ranges from 110 to 160 ft<sup>2</sup>/acre. I did not observe evidence of recent logging. Stumps, where they exist, are well decayed. While tree species composition was fairly consistent, some areas are gapier than others. Consequently regeneration varies widely, from virtually non-existent to prolific.

Narrow roads (mostly old cart tracks) wind through the property. The terrain is gentle, the access easy. No indicators of past logging damage were observed.

**Site 7** was a Certified Tree Farm property in southern New Hampshire. It contained between 250 and 500 acres, and was obviously under active management for multiple objectives including sawtimber production. Conifers (e.g., hemlock, white pine, balsam fir) dominated most of the site, but lots of mature sugar maple, yellow birch, paper birch, red oak, and beech were also present.

Crop tree release and single-tree selection were the most common silvicultural prescriptions I witnessed, having been applied throughout the property. Basal area typically hovered between 90 and 140 ft<sup>2</sup>/acre. There was one small patch cut where mature white pine had been removed and a small plantation (<10 acres) of <15-year-old white pine. The plantation was in the process of being thinned and pruned, but some trees had endured weevil damage. The northern 15% of the site appeared to be heavily cut about 30 years ago. It was prolifically regenerating with all the species that were common elsewhere on the property.

Overall, I saw very little damage to residuals or non-compliance with best management practices. Roads were well built and appropriately scaled for the site: narrow, meandering, elevated, and well drained, below a closed canopy. Stream crossings were well constructed. Wildlife concerns seem to have been considered as snags and woody debris were relatively abundant. The site is a local recreation destination; trails are marked for snowmobiling and mountain biking and I met a man walking his dog on the property. Aesthetics is another management objective. Trails and landings were cleaned up and a “park-like” grove of large white pines bordered the main access point and parking area.

**Site 8** was an actively managed property in western New Hampshire between 100 and 250 acres. Most of the site was abandoned pasture on a slight slope. Considerable variation in past land use practices produced distinctly different stand compositions ranging from young even-aged hardwoods (e.g., red oak, white ash, sugar maple, and beech) entering the stem exclusion phase to densely stocked stands of white pine, red maple, red oak, and white ash well into the understory re-initiation phase. This property is presently under active management; a lot was happening. A 40-year-old red pine plantation (<10 acres) with stems approaching pole size was in the process of being pre-commercially thinned to below 130 ft<sup>2</sup>/acre, with all cut stems left on-site. Red maples had been removed or girdled from one cut block. Trees were marked for harvest on much of the western half of the site. The distribution and characteristics of selected trees was consistent with good selection harvesting. Old sugar maples that lined cart tracks were tapped for sugar. Regeneration was moderate to prolific across the property with many

different species represented (e.g., white pine, yellow birch, beech, oak). The site was criss-crossed with old cart tracks, making access for logging easy. No damage of residuals was observed.

The eastern portion of the site appeared to have been cut for large diameter white pine, but not recently, judging by the deteriorated condition of stumps. Large stumps were common and basal area had been reduced to 85 ft<sup>2</sup>/acre in one representative plot. Skidder tracks badly rutted a wet area between the cut block and landing. It is doubtful that the current manager supervised this cut because the easement is relatively recent and the property under new ownership. There appeared to be a stark contrast in how carefully the two halves of the property had been managed.

**Site 9** was a property in eastern Maine that is larger than 10,000 acres and is owned commercially. I was able to access only a small portion of the property because of gated roads, but viewed large expanses from a hilltop and concluded that forest practices did not differ substantially across the ownership. This is a parcel with expanses of fir and spruce, with hemlock common on wet sites, and white pine abundant on dry sites. Much of the acreage appears to have been harvested heavily after the spruce-budworm infestations and is dominated by sapling and pole-sized hardwood regeneration. Some, but not a lot, of the acreage supports softwoods suitable for lumber, but most opportunities appear to be for fiber. Adjacent lands owned by International Paper are in similar condition, and I observed active harvest of tree-length material that appeared to be destined for pulp mills. This property is clearly being managed, although the roads that I traversed did not look like they had been improved for log trucks in several years. The roads were, however, in good shape, reflecting adequate construction and care in the past. Recent harvests appear to have been conducted by processors, leaving little evidence of access roads. Diversity of cover for wildlife was evident, although I did not observe any instances of legacy trees or any stands of especially old forest. A major lake occurs on the property, and very wide buffers appeared to surround the shoreline. Access is provided to a number of campsites near the lake. After the site visit, I referred to data files and noted that this property is FSC certified.

**Site 10** was in southern Maine and is in the 100-250-acre category of ownerships. The property contains a residence, some open land, a several-acre stand of mature red oaks, and some extensive stands of white pine. Site conditions for oak and pine appear to be excellent. The current owners purchased the land from the owners who established the easement and who made a very heavy harvest of pine before selling the property. Current owners, with advice of a forester, are doing the work to restore this forest back to a productive distribution of age classes. Regeneration of white pine is abundant. A recent non-commercial thinning is evident, having been conducted from a new system of logging roads that were carefully constructed and show no evidence of erosion. Damage from the 1998 ice storm is still in evidence in this forest, although the oaks look healthy and thinning of the pine stands has eliminated most evidence of damage.

**Site 11** is in the 500-2500-acre category and occurs in eastern Maine. It has been owned for many years by non-residents and as a family vacation spot during summer months. The site contains a significant mountain feature and cliffs that are popular with climbers, one especially scenic lake, and several smaller ponds. The property is mostly forested with a mix of second-growth hardwood and softwood types. Property owners were not really interested in forest management until they sold an easement to the property. They have since hired a forest management consultant, developed a management plan, conducted the first of a number of planned thinnings, and have become certified as a Tree Farm.

**Site 12** lies in Vermont's Champlain Valley. It was a large and mostly open farm property dotted with patches of mature white pine, sugar maple, beech, and red oak forests. The forested portions total about 400 acres. Forestry activities are FSC certified and abide by Vermont Family Forests' guidelines. The landowners have taken a "slow grading" (i.e., leaving the best) approach. They are trying to better diversify the age class distribution of mature stands and retain biological legacies like snags and coarse woody debris. Stocking of mature and pole sized trees is excellent. Sapling regeneration was prolific in one sugar maple stand I visited but was more typically severely confounded by deer browsing and vigorous competition from buckthorn. Controlling the property's exceptionally high deer population a key management challenge for the landowner. A limited hunt occurs annually. The landowner harvests high-quality sawlogs and veneer every year to supply a small woodshop onsite. The woodshop mills clear wood and character wood into furniture. The property contains a small area of rare clay plain forest where restoration (e.g., control of exotics and deer browsing) is the primary management objective.

**Site 13** exceeds 10,000 acres. It was in New Hampshire and has a long history of forest management. Since the 1980s the property twice changed hands between paper companies before being acquired a land investment interest through a conservation-minded intermediary. I visited the property over three days and spoke with a number of foresters managing it. The previous owners concentrated on harvesting fir and spruce, which were historically abundant. Some hardwood highgrading also occurred in the 1980s. This harvesting history, compounded with a budworm outbreak and salvage in the 1970s and 80s, has left the present forest dominated by northern hardwoods. Much of that is of poor quality. The challenge now is to rebuild timber volumes and quality, while cutting enough to keep the operation viable. Today, hardwoods account for 90% of the volume taken from the property. Most of that is sold as pulp. The most prevalent prescriptions are overstory removal (OSR) and shelterwoods. I walked through a recent OSR job and soon-to-be-harvested OSR site. In both cases regeneration was vigorous and approaching the sapling stage. The recent harvest included an uncut patch of legacy trees anchored around a giant snag. Riparian areas, steep slopes, and high elevation forests are subject to special management guidelines in the easement. The property has an extensive and well-maintained road network. I visited during a period of prolonged heavy rains, yet did not observe any problems with erosion, culverts, etc. Poorly drained sites are only harvested in the winter.

**Site 14** was in Adirondack Park in upstate New York. It falls in the second largest size class, greater than 2,500 acres but less than 10,000 acres. The forest composition could be described as mixed and was one of the most diverse I've witnessed during this project. It included climax Northern Hardwood species, along with aspen, ash, white pine, white cedar, balsam fir, and red spruce. According to the landowner the forests here had been badly damaged by the 1998 ice storm. I walked through part of the property that looked like it was last harvested 20 or 30 years ago judging by the decay of stumps and wooden culverts, and abundance of pole sized stems. This area had a multi-cohort structure. Along with the poles were several scattered large hardwoods, cedars, and spruce, and prolific sapling regeneration of several species. Ice damage did not appear extreme in this corner of the property. I then drove up a main hauling road for several miles. The road is also used by cottage owners. This portion of the property was clearly subject to recent harvesting, most of which looked like ice storm salvage. Harvesting occurred in large patches, leaving some sapling and pole sized residuals and the occasional well-formed mature stem. Skidder trails appeared well drained (no ruts) and landings had been cleaned up. No harvesting had occurred within 80' of a brook. On the way

out I noticed a small stand of tall white pines. It appeared to have been thinned about ten years ago and was now well-stocked.

**Site 15** was a property between 2,500 and 10,000 acres in Adirondack Park. The landowner for this property indicated on their survey that recreation was the primary management objective here. That was immediately obvious upon visiting the site. About a quarter of the property is developed as a summer camp, but I also encountered a steady stream of campers and boaters, and their vehicles, even four miles beyond the property entrance. It was easy to see why people are drawn here – this is an incredibly scenic region of small ponds and rolling hills. Recreation infrastructure is well developed. It includes good roads, parking areas, boat launches, and marked hiking and snowmobile trails. Several portions of the property contained impressive mature forests, but they were situated in places that clearly did not lend themselves to conventional forestry - scenic vistas, narrow ridges between ponds, and steep slopes. In these areas, there was little if any evidence of past cutting. In a more remote part of the property that I visited there was evidence of cutting, but not recently. This is consistent with the landowner's contention that the property had incurred forest management prior to the easement's enactment, but not afterwards. The area I viewed will not be ready to be cut any time soon. Most of the stems are in the sapling stage. My overall impression of this site is that stands here are not being logged because they either have exceptionally high non-timber values or, where this is not the case, are not yet mature.

**Site 16** is another Adirondack property in the 2,500 to 10,000 size class. I visited two compartments that would be "ready" and accessible for harvesting. Both sites were impressive and did not appear substantially different. Forests in both areas were multi-aged and of mixed conifer and hardwood species, with good stocking, well formed healthy trees, complex vertical structure, and abundant coarse woody debris. One area had been recently thinned. Landings were in good shape. The road network was not extensive, but well maintained. Another area, this one poorly drained and dominated by black spruce and white cedar had no evidence of harvesting.

## Appendix 5 Results of forester interviews

Because of the expense and time required for site visits, we followed up on some properties from the survey by conducting telephone interviews with foresters. In these cases, the contact information for foresters was supplied by their clients, the respondents. The results of forester interviews mirror the findings of our site visits. The most common management challenge is restoring the value of the forest from harvests conducted prior to the easement. And in only one case (see Site 21) did a forester indicate that a property under the easement was or might become subjected to what they considered poor forest management.

**Site 17** was a property over 10,000 acres within the Adirondack Park that is being managed primarily for wood products. The easement is held by NYDEC. The property is dominated by northern hardwoods with a lesser portion of boreal type forest characterized by red spruce and balsam fir in hollows. According to the current forester, the property was heavily logged by the previous owner. The new owner intends to incorporate more uneven-aged management and lengthen rotations to encourage the growth of high value saw timber. They have recently focused on salvage operations stemming from the 1998 ice storm. The forester described the property as relatively productive with good regeneration in most places. The easement requires that forest management on the site abide by state BMPs. The Adirondack Park Agency (APA) has some additional rules aimed mostly at maintaining recreational values. For example, the Park regulates the timing of harvests in “quiet zones” along wilderness canoe routes. No herbicides are currently in use, except for a few small (20+/- acres) test plots. The forester indicated that his company leaves wider stream buffers than required by BMPs, and continues to clean up and seed old landings, remove wood piles left by the previous owner, and rehabilitate malfunctioning stream crossings that were on the property when they acquired it. The company organizes routine workshops with loggers to ensure they understand and can apply BMPs. Beyond APA regulations and BMPs (e.g., riparian buffers) the company has not identified sites of exceptional cultural or ecological significance that would merit special management or set aside areas.

**Site 18** was a 501 – 2,500 acre property in the Adirondacks that has been under an easement since the late 1980s. It is used mostly for hunting. Excepting for about 20% of the property that was cleared for sheep pasture around 1900 there is no evidence of forest cutting in the past century. Most of the property contains beech-dominated northern hardwoods. The pastures now contain plantations of white pine and Norway spruce, started in the 1920s. The forester considers the plantations to be overstocked. The owner has a longstanding conservation interest and has asked the forester to prepare a forest management plan centered on restoration, rather than commercial harvesting, objectives. When complete, the management plan will focus on gradually replacing the plantations with species and structures of well developed northern hardwood stands. Beyond that, there are no plans for commercial harvesting.

**Site 19** was between 251 and 500 acres. It is in New York state. The property is dominated by northern hardwoods, including red oak, sugar maple, yellow birch, and beech. Commercial harvesting occurred in 2001. Today it is well stocked (above the B-line) with young sawtimber. The forester reports good sapling and pole regeneration from regeneration treatments and TSI conducted by a previous owner in the mid 1980s. The forester is in the process of preparing a new management plan for the current owner. Accelerating timber growth and maintaining recreational amenities (e.g., trails) will be the two key objectives. The forester anticipates

another thinning in 20 years to “get rid of crap” and release crop trees. Wildlife trees (e.g., snags) will be retained. The only notable sensitive area is a springy section of the property where harvesting will only occur in the winter or dry summer. An old stagecoach road that meanders through the property will be preserved.

The landowners of **Site 20** have a long-standing conservation interest. Their property of roughly 1000 acres was one of the first conserved properties in Vermont. It is dominated by typical Northern Hardwoods species and has a history of uneven-aged management. Forestry operations are FSC certified by Smartwood. The forester agrees with the landowner’s survey response that “forest health” is the primary management objective for this property. He says the “very comprehensive” management plan takes a conservative outlook on timber production to ensure forest health and to maintain good stocking of high-value wood. He describes stocking as very good to exceptional. Silvicultural practices are mostly single tree selection and thinning. Regeneration is described as acceptable. The management plan contains provisions for soil, wildlife, and water protection, and recognizes the property’s location at the headwaters of a major river. Cutting is restricted in riparian areas. Woods proximate to seeps and vernal pools are off-limits for harvesting. Wildlife trees (e.g., bear scoured beech) are not cut. The forester reports that the easement does not inhibit any of the forestry activities that he or the owners desire for the property.

**Site 21** was in southern Vermont. It falls into the 101-250 acres size class and is dominated by northern hardwoods, with some red spruce and eastern hemlock. The property was subjected to a diameter limit cut about twenty years ago (prior to the easement). It is well stocked with moderate to good regeneration. This is the only property in which the forester I contacted indicated significant misgivings about the current management direction. Apparently the landowner was recently approached by a mill forester and talked into allowing a harvest that greatly exceeded harvest levels prescribed in the management plan. While the management plan aims for increasing the long-term value of wood on the property, the forester I contacted considered the tree-marking done by the mill forester to be closer to high-grading. In their opinion, too many immature high-quality trees were marked, and proposed harvesting was too aggressively in riparian areas. The forester thought the site should be left alone for at least five more years to produce more merchantable timber. By Christmas of 2003 the problematic sale had been marked but not harvested, and the easement holder was investigating.

**Site 22** was in western Vermont. It is a red oak dominated site under 100 acres. The property has been logged three times - in 1990, 1995, and 2001 - since the easement was signed in 1990. The forester is concerned that previous harvesting was not heavy enough to encourage red oak regeneration. Oak is being out competed by diseased beech and honeysuckle. Although a fifteen year cutting cycle would be ideal, intermediate treatments may be required to open up the stands. The forester has not ruled out a prescribed burn to eradicate the beech in favor of oak. Stocking on most of the property is around the B-line, with trees averaging about 12” DBH. Some acreage is in shelterwoods, where stocking is lower, but DBHs reach 24”. Other than a small buffer around a house site (foundation) and a natural spring, there are no special management areas. Forestry on the site adheres to Vermont state AMPs. The property abuts a nature reserve.

**Site 23** was a conifer dominated forest in western Maine. It is under 100 acres. Except for some thinning in early 2003, the property was last logged around 1983. Today it is well stocked with white pine and eastern hemlock. The present management plan calls for the removal of poor quality white pine and eastern hemlock to improve stand quality and promote regeneration. The forester expects hardwood and pine seedlings to complement hemlock regeneration as

thinnings scarify the ground and break up the canopy. Most logging on this site is done in the winter when crews can better traverse streams. Crews adhere to a 40-50' no cut buffer along major streams.

**Site 24** was a small (101 – 250 acres) property in New Hampshire. White pine is the most common species, with some red oak and red maple. It has a long history of forest management, with a Tree Farm certification dating back to 1965. The forester claims harvesting practices have been steadily improving since that time, and cited more attention to harvesting in the appropriate season and reducing rutting as two examples. Harvesting has followed a schedule from a “bare bones” management plan drafted under the Tree Farm program. There was a major harvest in 1969, small harvests in 1987 (for white pine biomass) and 1996, and TSI on over half the property in 1998 and 1999. Thinning will occur on the remainder of the property soon. The forester is planning to draft a full stewardship plan soon with long-term growth and forest health as key management objectives. He did not know of any species sites within the property or unique values that required special management attention.

**Site 25** was a roughly 1,250 acre property in New Hampshire. The landowner apparently acquired the property in several stages starting with under 20 acres in 1964. They gradually purchased abutting parcels after they became devalued following heavy cutting, and continue to scoop up cutover land as it becomes available. One property consisted of 400 acres that were completely clearcut in the mid 1950s. The stewardship plans for the combined property have four main objectives: maintain site productivity, maintain a sustainable supply of timber, improve wildlife habitat, and manage recreation opportunities. Given the logging history, harvesting is focussed on thinning and pruning, with roughly 10% of the property being treated each year. Most of the crop trees are at the pole or small sawlog stage. Red oak, red maple, sugar maple, white pine, eastern hemlock and balsam fir are all present. The forester reports excellent regeneration and expects the value of standing timber to continue rising substantially. The forester, who is in his 80s, abides by an informal set of BMPs he’s “learned over the years”, including no clearcutting, no harvesting near streams and wetlands, and leaving mast and apple trees for wildlife. The current owner has built several miles of access roads through the properties.

**Site 26** was a New Hampshire property just under 250 acres. It contains valuable red oaks and some eastern hemlock and white pine. The property is part of an FSC (Smartwood) certified pool. The current forester supervised its last harvest in 1984, eleven years before the easement was enacted. He thinks it is again ready for some harvesting. The twenty year old management plan lists timber, wildlife, and recreation as the main management objectives. Except for small some rocky and wet areas, regeneration is good to excellent. The landowner is taking special precautions to protect stonewalls, cellar holes, and a deer yard.

**Site 27** was in New Hampshire. It is between 500 and 2,500 acres. Parts of the property have been held by current owner’s family for three generations. The owner has added several more tracts to his holdings since acquiring the property. Consequently, the property has a variety of different land use histories. However, the forester claims that much of it appears to have been cutover through the 1930s to 1950s. Today it has diverse species composition, including pure pine stands, pine/oak, northern hardwoods, spruce/fir, upland oak, and hemlock. The forester, who has worked on this property for over twenty years, claims the current owner is more conservation-minded than previous owners, (i.e., his father and grandfather), and seeks regular periodic income through occasional harvesting. Harvesting occurs primarily through uneven-aged prescriptions, although he also uses shelterwoods. The forester claims that stands are either fully stocked or have a fully stocked understory where overstory densities are low. He is

having success regenerating oak and pine, but reports that regeneration is still a challenge due to “droughty” soils. A few years ago roughly 70% of the oak regeneration succumbed to a prolonged May frost. All operations abide by state BMPs. At the request of the landowner, the forester observes a 250’ no-cut buffer around watercourses.

**Site 28** fits in the 251-500 acre size category. It is on undulating terrain in western Maine. Most of the property was cleared in the 1800s. Today hemlock and cedar dominate low areas, mid slopes are covered mostly in hardwood, and hilltops are dominated by conifers (mostly balsam fir with some red spruce and scattered white pine). The property was largely unmanaged until the late 1980s, when the landowner agreed to let a large industrial paper company oversee management. In the early 1990s stands dominated by balsam fir (over a third of the property) were subjected to strip cutting, while conifers were “combed out” of mixed stands. These prescriptions were recommended in a 1992 management plan prepared by the company forester. Today there is a new forester and there has been no cutting since 1994, a year before the easement was enacted. While the forester considers the property to have “excellent” stocking, he is letting the hardwood stands accumulate growth before they are treated. At some point he may harvest the leave-strips from previous balsam fir harvesting. The forester reported good regeneration of fir, white pine, red spruce, and white spruce. There are no “special” management actions proposed to enhance wildlife or other non-timber values, but the forester pointed out that white pine blister rust has created many fine snags. He also thought coarse woody debris was abundant, particularly in the hardwoods. He did not know of any abuses of BMPs.

**Site 29** falls into the 501-2,500 acre category. It is in Vermont. Until the late 1990s a large paper company owned and managed the property. Today it is owned by the USFS but timber rights are held by a town. The previous owners focussed harvesting on softwood pulp. As conifers were cut over several decades, the forest transitioned into sugar maple and yellow birch dominated hardwoods. Red maple and paper birch are also common. The forester says stocking is mostly at the B-line, although it is common to find stands with stocking down in the 30-50 ft<sup>2</sup>/acre range. He describes the present forest as two-aged; it typically consists of very good regeneration coming up below a poor quality overstory dominated by trees about 60-70 years old. He claims the overstory quality was influenced more by the 1998 ice storm than by previous management. Immediate planned harvesting activities are almost entirely focussed on salvaging damaged stands from the ice storm and will be concentrated on about 10% of the property. The prescription here will be overstory removal. Beyond salvaging, a long-term management objective is to diversify age classes by prescribing group selection harvests. Non-salvage harvesting is still 10 to 15 years away to allow timber to grow more. When asked about BMPs the forester commented that the previous owner appeared to be following them. He has not seen evidence of rutting, erosion, and so on, and reports no current challenges to following BMPs. There are no Special Management Areas on this property, but adjacent sensitive sites (i.e., abutting a pond and wetland) that were formally part of the same property are being conserved by The Nature Conservancy.

**Site 30** was between 500 and 2,500 acres. It is a family-owned property in western Maine that is valued in the community for its location on a scenic and popular lake. Prior to the easement’s enactment in 1998, the property was last harvested in the late 1960s. At that time white pine and red spruce were targeted, leaving a current forest composition dominated by hardwoods, especially sugar maple and yellow birch, with a softwood component (hemlock, fir, red spruce, and some white pine) in low elevation areas along the lake. The forester did not consider the last harvest to be excessive. The landowners want to maintain aesthetics while realizing periodic income from timber harvesting. These are the main objectives in the management

plan. The easement prohibits large openings that could be visible from the lake and cutting within 100' of the lake. Both conditions are being adhered to. Silvicultural prescriptions are limited to uneven-aged treatments, primarily single tree selection, and harvesting only occurs in the winter. The forester says that harvests do not exceed net growth. He describes both the stocking and regeneration as very good. Overall, the forester is happy with the easement and believes it encourages sustainable forestry.