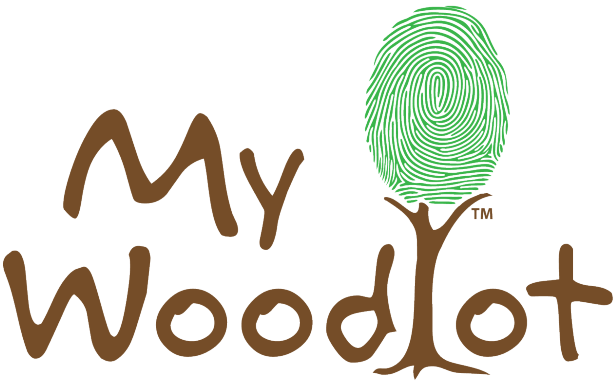
Refining the Watershed Forest Management Planning Program: MyWoodlot.com

WATERSHED AGRICULTUAL COUNCIL (WAC)
2017 FILTRATION AVOIDANCE DETERMINATION (FAD)
RECOMMENDATIONS



Prepared by:

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Forestry Program
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MyWoodlot.com: A Refinement to the Watershed Forest Management Planning Program

Executive Summary

The Watershed Agricultural Council's (WAC) Forestry Program has invested over $1 million in Watershed Forest Management Plans (WFMP's) since 1998. Subsequent evaluation has indicated that WFMP's 1) don't result in the implementation of Best Management Practices (BMP's), and 2) don't result in sustainable forest management.

In order to address these deficiencies, WAC Forestry Program staff recommended limiting WFMP Program eligibility to properties that are enrolled in the 480-a Tax Law (see "A Focus on 480-a" Business Plan for more information). Focusing the WFMP Program on 480-a, however, can at best provide forest management plans for 2,600 out of 31,000 family forest owners in the NYC Watershed.

Family forest owners are more than just property owners. They are stakeholders in decisions that affect private and public forests in the Watershed. By educating these owners through forest management plans, proven tools for increasing landowner interest in forest management (Laford and Parker 1988), WAC can affect the attitudes and opinions that govern the working landscape. WAC needs to find a cost-effective method for providing forest management plans to the 28,400 family forest owners who are not eligible for a 480-a Focused WFMP Program.

Mass Customization is a system commonly used in industrial settings to increase efficiency and expand capacity. It integrates computers into traditional manufacturing systems. Mass Customization allows a manufacturer to efficiently mass produce parts at a low cost. Consumers are then able to use a website to combine these parts into a product that is tailored to their specific wants and needs. Applying the concept of Mass Customization to the WFMP Program provides a cost-effective method for providing tailored forest management plans to a large number of family forest owners.

Mass customizing forest management plans through a website, MyWoodlot.com, will allow family forest owners to create and maintain their own plans. Family forest owners will populate their plans by selecting from lists of "parts" – goals, activities and supporting information - that have been tailored to suit their reasons for owning forestland and their concerns for their woodlots.

The purpose of the Filtration Avoidance Determination (FAD) is to prescribe conservation tools to protect water quality for 9 million New Yorkers. In a watershed where 67% of the forest is owned by 31,000 private individuals it is vital to possess a tool that can reach a significant portion of this audience. MyWoodlot.com has the potential to increase the reach of the WFMP Program, create a plan that is tailored to the needs of family forest owners, and deliver the knowledge these people need to make positive conservation decisions. In light of the challenge of supporting positive conservation decisions among 31,000 family forest owners in the NYC Watershed WAC recommends the following addition to section 4.5 of the FAD:

- In section **4.5 Watershed Forestry Program** under the **Activity and Reporting Requirements** add "*Use MyWoodlot.com and Forest Landowner Education Programs to provide family forest owners access to the knowledge they need to make positive conservation decisions for their Watershed forests.*"

The Problem: Missed Opportunities

The Watershed Agricultural Council's (WAC) Forestry Program started funding forest management plans in 1998. Since then, over $1 million has been spent on plans, over $85,000 in 2012 alone. More than 1,000 plans covering 200,000 acres[1] have been written for landowners in the NYC Watershed. In 2009 the WAC Forestry Program evaluated the Watershed Forest Management Planning (WFMP) Program. This evaluation identified two problems - forest management plans 1) don't result in the implementation of Best Management Practices (BMP's), and 2) don't result in sustainable forest management. In July 2013, WAC Forestry Program staff presented a solution for these problems - focusing the WFMP Program on the 480-a Tax Law.

But only 2,600 family forest owners out of a total 31,000 in the Watershed are eligible to receive a 480-a focused WFMP. Research shows that forest management plans provide an effective way to teach family forest owners about forests. By focusing on 480-a, WAC misses 28,400 opportunities to teach people about their forests.

The Opportunity: Teaching Family Forest Owners

Family forest owners are more than just property owners. They are stakeholders in decisions that affect private and public forests in the Watershed. They are voters, town board members and environmental activists - individuals whose attitudes and opinions create policies and laws that govern the working landscape. WAC has the opportunity to teach these owners about the issues that confront their forests. In doing so WAC can affect the attitudes and opinions that govern the working landscape.

Affecting the attitudes and opinions that govern the working landscape can be accomplished by educating family forest owners. Teaching even a portion of 28,000 family forest owners is a daunting task, especially given the complex nature of forests. A management plan is an effective way to educate family forest owners (Laford and Parker 1988) because it uses their property to provide context. Context helps to make an idea or fact more understandable. It takes the abstract ideas of forestry and turns them into real actions landowners can take to interact with and improve their properties.

WAC's current approach to planning, however, cannot generate plans fast enough to deliver this context to a large number of family forest owners. In order to benefit from the context forest management plans provide, WAC needs a more cost-effective mechanism for creating those plans.

The most effective tool for reaching a large audience at minimal cost is the Internet. WAC Forestry Program staff propose to develop a website that will allow family forest owners to develop their own plans from the comfort of their home. This site will be called MyWoodlot.com.

[1] WAC WFMP's cover 203,143 total acres. WAC has funded 157,114 forested acres.

The Benefits: A Win for Family Forest Owners, WAC, and Funders

Using a website to create forest management plans will benefit family forest owners in three ways:

3 Family Forest Owner Benefits of MyWoodlot.com
Allows them to create a forest management plan based on their individual ownership interests and concerns
Allows them to maintain their management plan over time as their interests, concerns and woods change
Provides them with information and activities that will improve their knowledge and understanding of their woods

Using a website to create forest management plans will benefit WAC in five ways:

5 WAC Benefits of MyWoodlot.com
Educates family forest owners whose attitudes and opinions govern the working landscape
Creates a forest management plan that can react to changes in WAC priorities
Increases WAC's capacity to create forest management plans
Decreases WAC's unit costs for producing forest management plans
Increases WAC's ability to engage previously unengaged landowners

Using a website to create forest management plans will benefit WAC's funders in four ways:

4 Funder Benefits of MyWoodlot.com
The ability to track a wide variety of metrics that can document effectiveness
The ability to continually evaluate effectiveness
The opportunity to export this model to other areas should it prove successful
The ability to communicate priority topics to target audiences efficiently and effectively

Goals and Objectives

1. Goal: Increase the number of landowners with a forest management plan in the Watershed.
   a. Objective: Increase the number of landowners participating in the WFMP Program on an annual basis
      i. Action: Create a Mass Customizing website, MyWoodlot.com, for developing WFMPs that will create more than 80 forest management plans on an annual basis.

2. Goal: Teach family forest owners about forests
   a. Objective: Landowners who participate in the WFMP Program will demonstrate a higher level of knowledge regarding forest-related issues.
      i. Action: Develop a mechanism for evaluating change in landowner knowledge that will be integrated into MyWoodlot.com.

3. Goal: Lower the costs of WAC's annual forest management planning efforts.
   a. Objective: Lower the cost of WAC's annual forest management planning efforts.
      i. Action: MyWoodlot.com will produce forest management plans for less than the current Watershed Forest Management Planning Program.

Background

Forest management planning is a cornerstone practice for promoting the long-term stewardship of family-owned forests. It ranks among the most common financial incentive programs offered to family forest owners (Jacobson et al. 2009). From 1991-2006, the U.S. Forest Service's Forest Stewardship Program produced over 270,000 management plans for more than 31 million acres of family forests (USFS 2012). Often, management planning is a prerequisite for additional landowner financial assistance. Sixteen states require a written management plan before a landowner can participate in preferential property tax programs for forestland (Hibbard et al. 2003). The effort is understandable, since family forest owners control over 260 million acres of U.S. forestland, 35% of the total (Butler 2008).

Despite the extensive time and money spent promoting and subsidizing management plans, recent studies have cast doubt on their ability to conserve private forests. Butler (2008) found that only 4% of U.S. family forest owners have written management plans. Kittredge (2009) predicted it would take 144 years for all forest landowners in the Northeast and Lake States regions of the US to receive management plans.

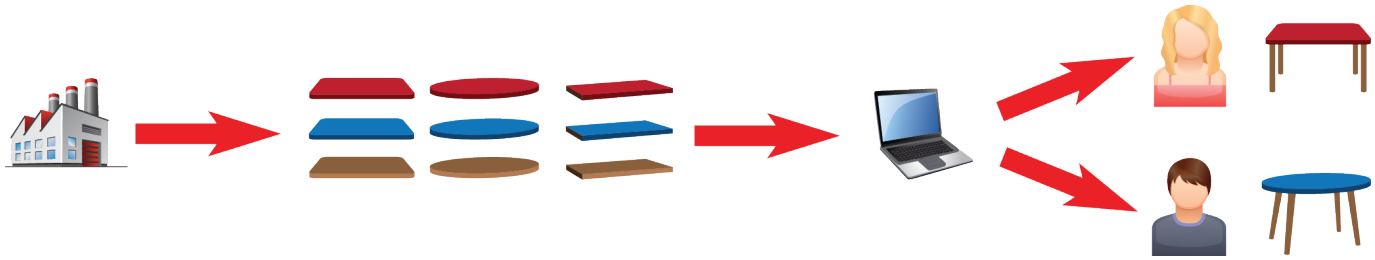
The "144-year problem" Kittredge (2009) identified applies to the New York City Watershed. WAC funds approximately 80 management plans per year, yet analysis has identified 31,000 family forest owners[2] in the Watershed. Forest management plans are only valid for 10 years, at which point the plan needs to be updated to reflect changes in the forest and landowner goals. At current planning rates, WAC can only create and maintain 800 management plans in any given ten-year period. WAC's existing WFMP Program can therefore only provide planning services to 3% of the total number of family forest owners in the Watershed.

[2] Family Forest Owner was defined by the US Forest Service definition of forest land: at least 1 contiguous acre of forest with 10% stocking, and was determined using the National Land Cover Database.

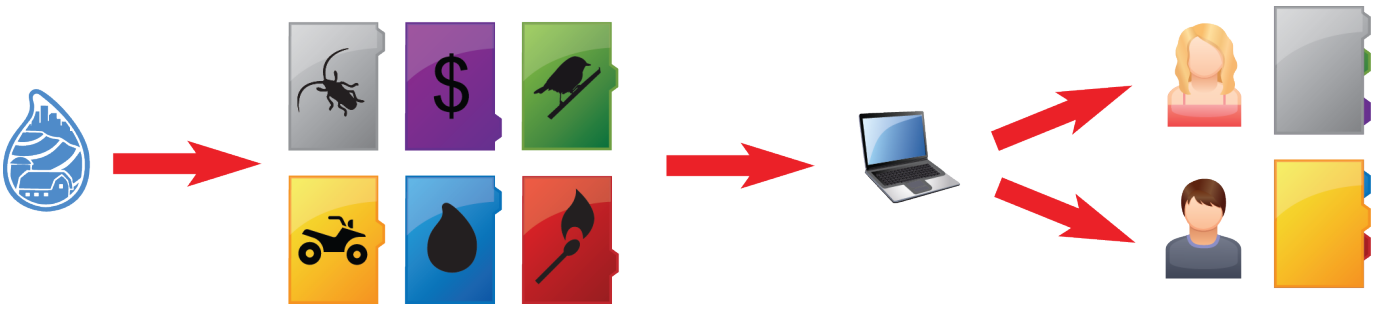
The Product: Mass Customizing Forest Management Plans

The traditional WFMP Program's reliance on consulting foresters to create forest management plans cannot produce them fast enough to aid the tens of thousands of Watershed family forest owners. WAC can address this problem by borrowing an approach from the world of manufacturing: mass customization.

In mass customization, a manufacturer mass produces a variety of parts at low cost. Consumers are then able to use a website to combine these parts into a custom product. This process lowers costs for the producer since individual parts can be cheaply replicated. At the same time, it increases value for the consumer by giving them a product tailored to their exact needs.



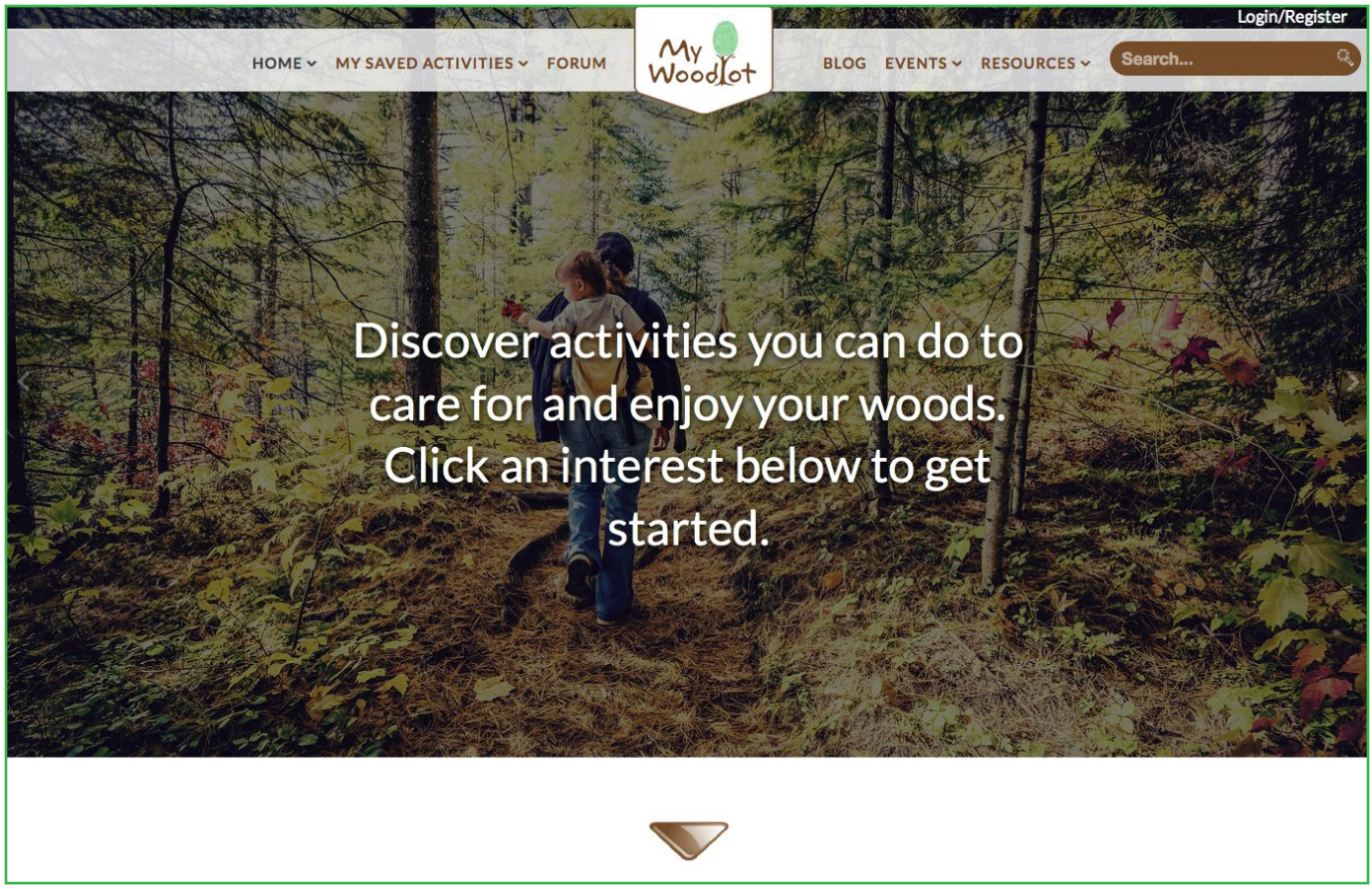
Mass customizing forest management plans through a website, MyWoodlot.com, will allow family forest owners to create plans that are tailored to their specific wants and needs. Family forest owners will populate their plans by selecting from lists of "parts" that suit their reasons for owning forestland and their concerns for their woodlots. These "parts" – goals, activities and supporting information - will be mass produced by WAC at low cost. Mass producing goals, activities and supporting information will allow WAC to develop high quality educational material. Disseminating this information through MyWoodlot.com will allow WAC to provide forest management plans to thousands of family forest owners at minimal cost.



The Service: Creating and Maintaining Tailored Management Plans

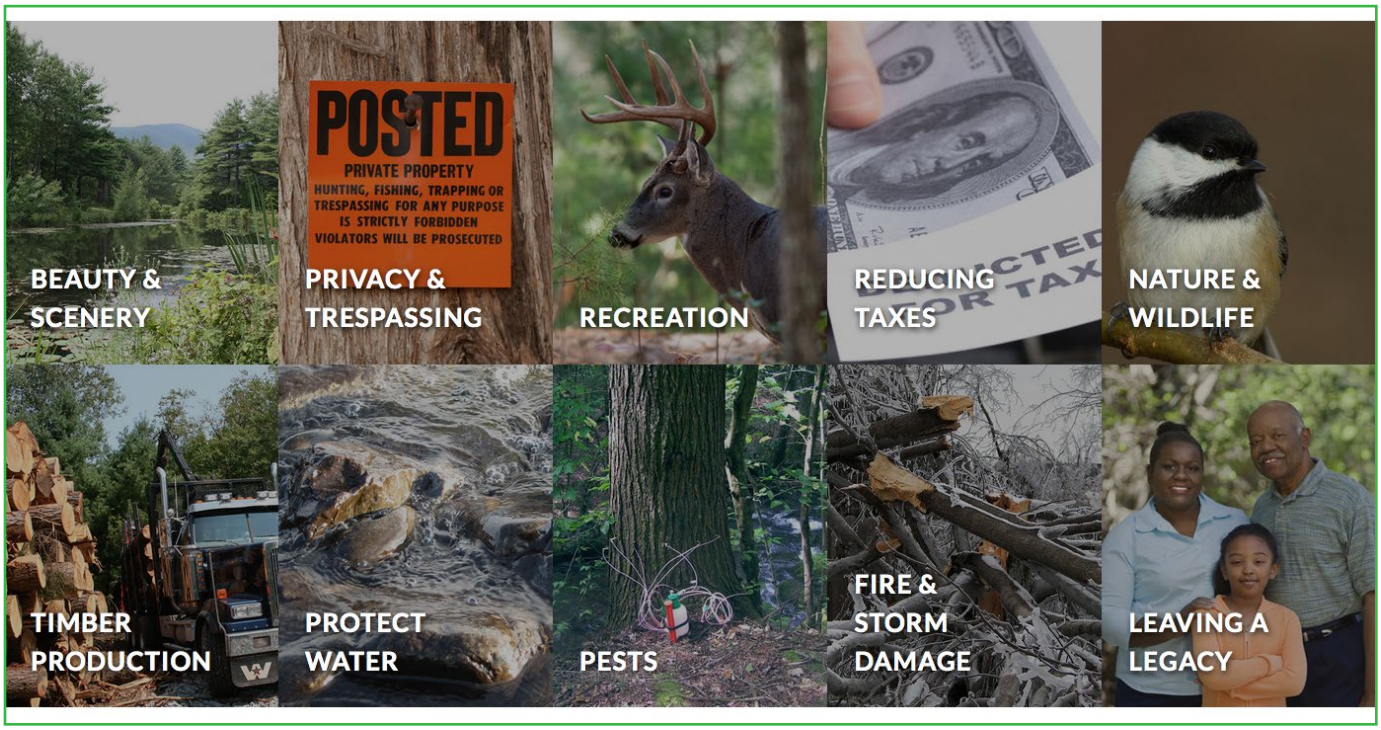
Family forest owners are increasingly turning to the Internet. 50% of family forest owners in Connecticut and 46% in Massachusetts indicate that the Internet is their preferred source of information about their woodlots. A fall 2009 survey of MassAcorn.net users found that the Internet is more effective at reaching unengaged landowners than traditional forest outreach methods. 66% of these family forest owners were seeking information about their forests for the first time by using the Internet.

The service MyWoodlot.com will provide to family forest owners is the creation and maintenance of a forest management plan that is tailored to their wants and needs. Landowners will use MyWoodlot.com to create their own forest management plans by selecting goals, activities and supporting information that correspond with their interests.



Interests

Interests include both family forest owners' reasons for ownership and concerns about their woodlots. The interests used on MyWoodlot.com will be those identified through the National Woodland Owner Survey (NWOS) - a project of the US Forest Service.



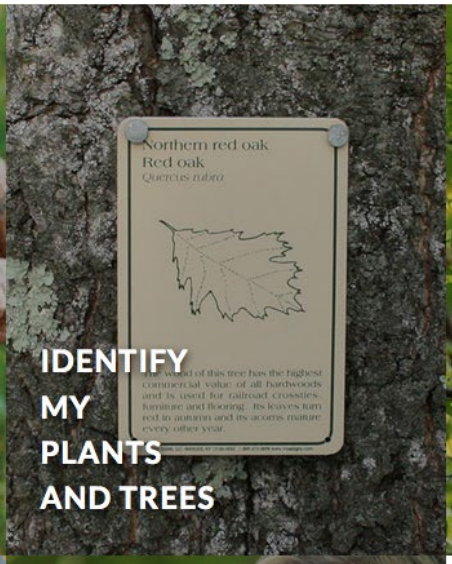
Goals

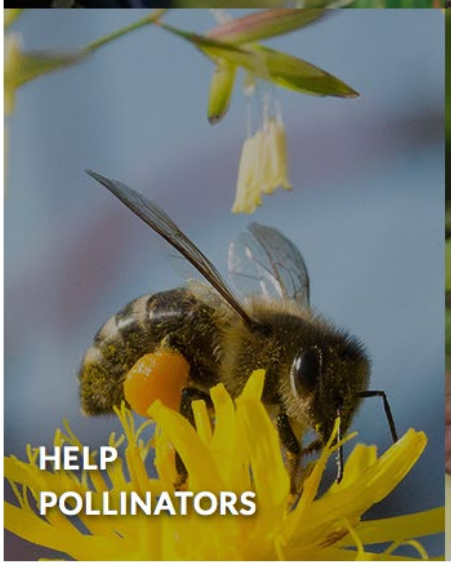
After the selection of interests, MyWoodlot.com will allow landowners to select from a list of potential goals that correspond with each interest.

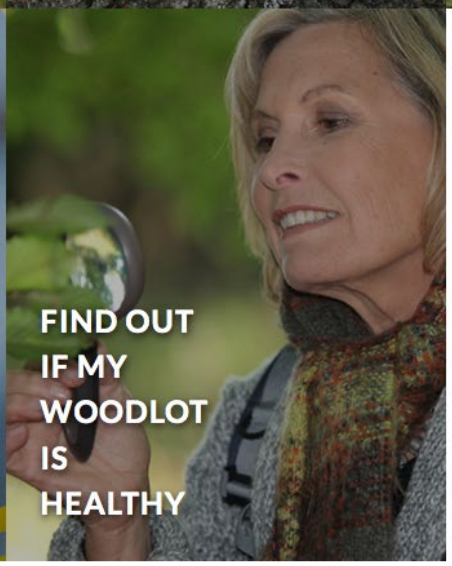
Nature & Wildlife

Discover the many ways nature depends on your land, and find out how you can make it even more attractive to wildlife.

Nature & Wildlife: Goals







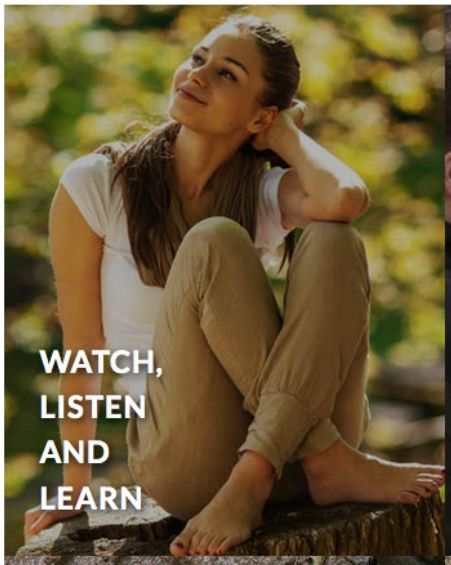
Activities

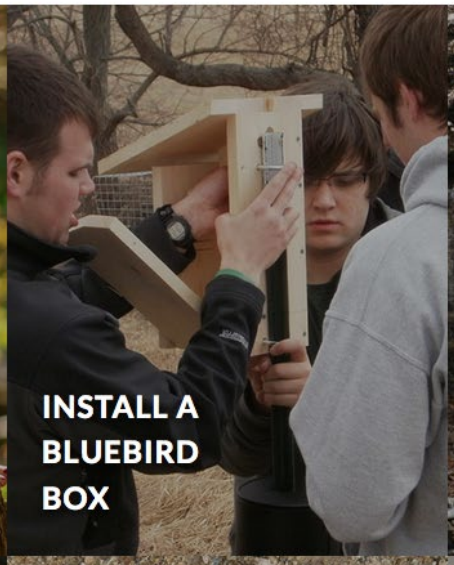
After goals have been identified, MyWoodlot.com will allow landowners to select from a list of potential activities that have been designed to achieve the desired goal.

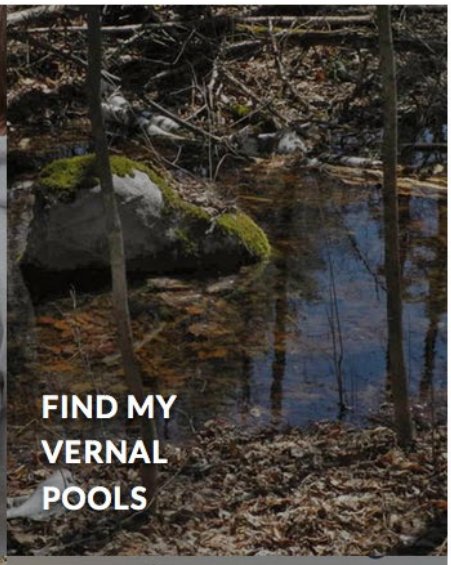
Discover Nature

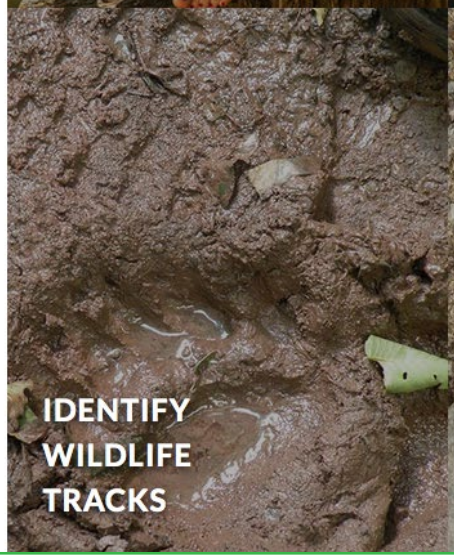
Discover nature by observing and learning about the surprising variety of life on your woodlot.

Discover Nature: Activities



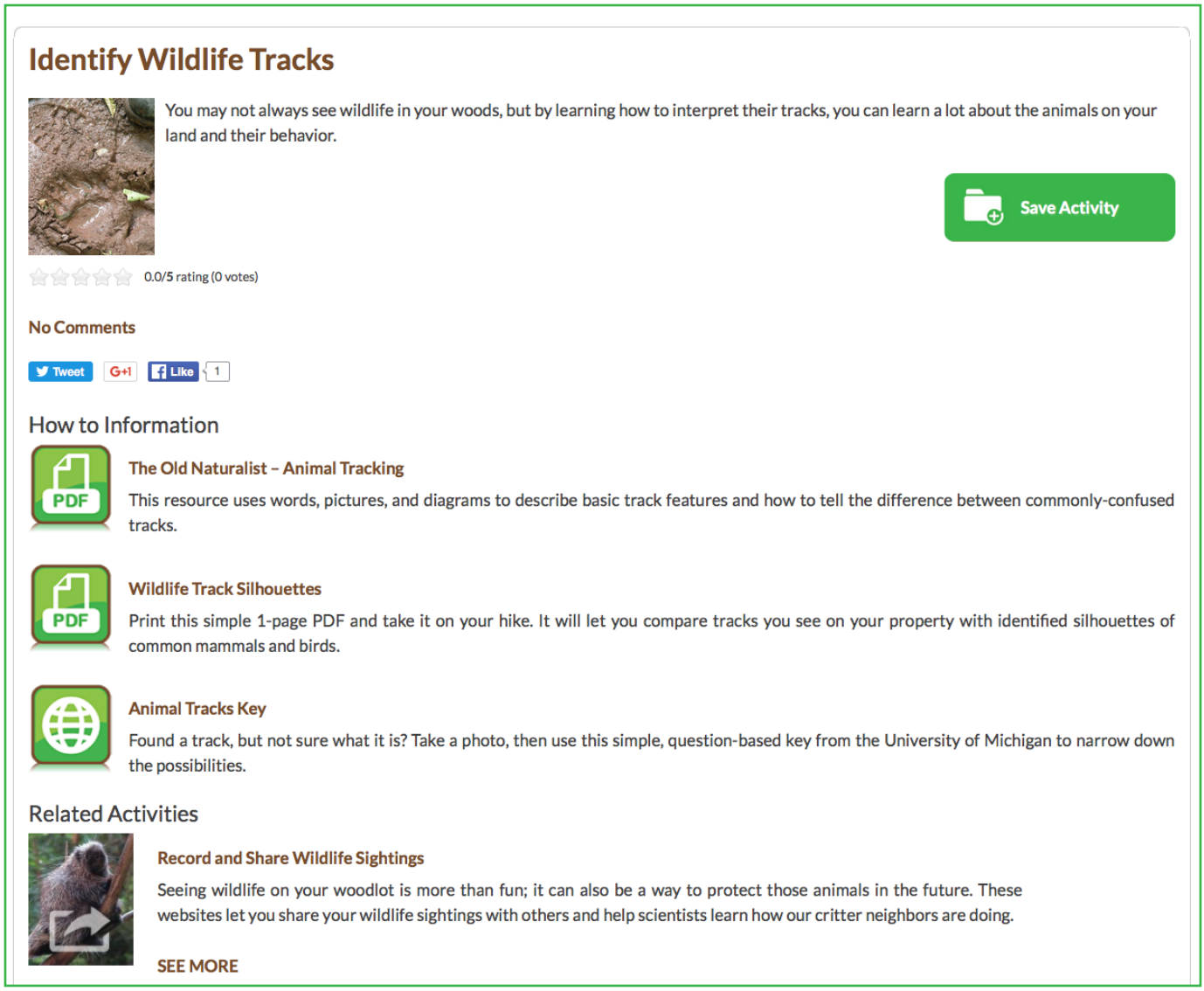






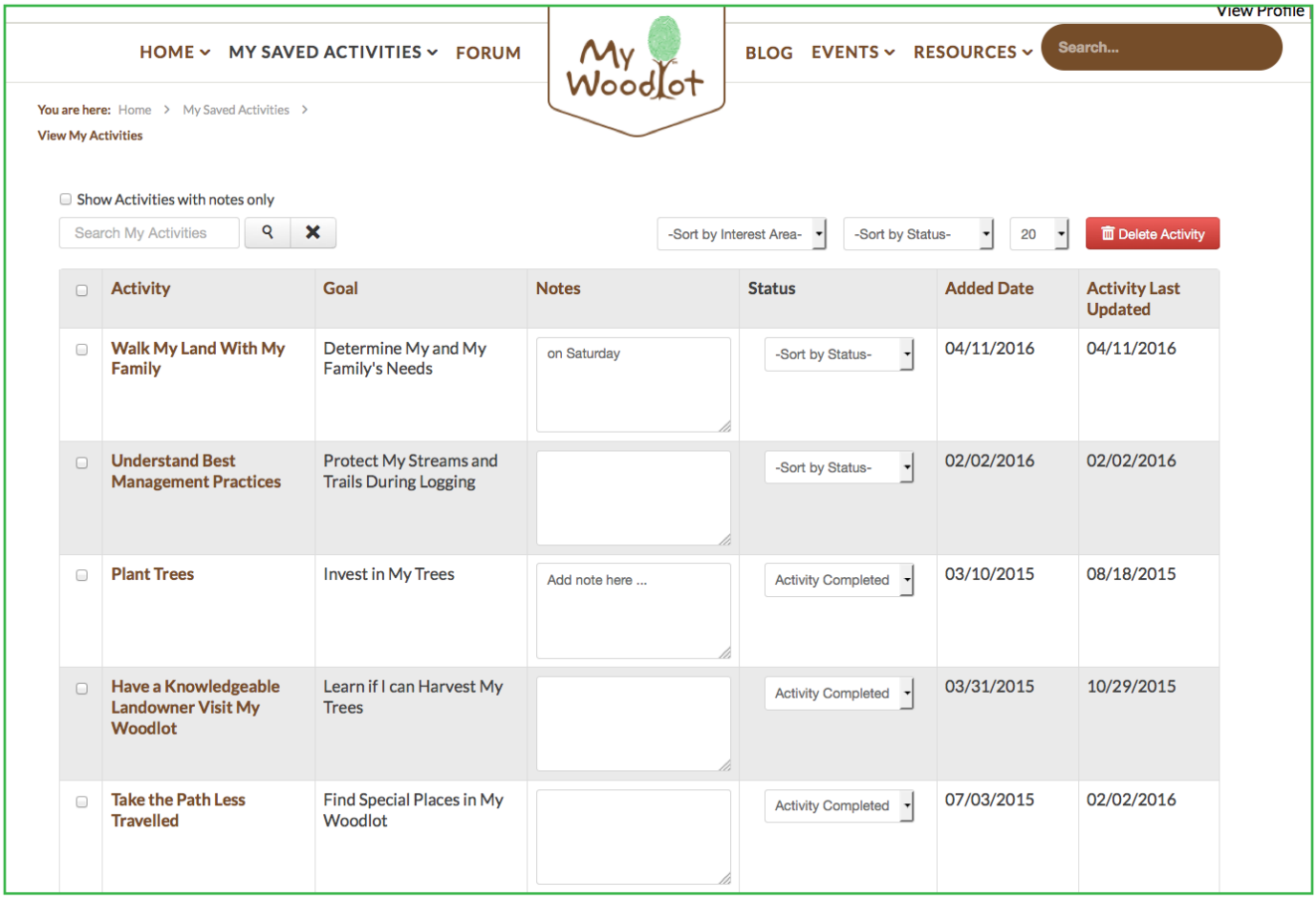
Supporting Information

Supporting information helps a landowner complete an activity and in turn achieve a goal. MyWoodlot.com will deliver supporting information using multiple educational tactics, such as publications (fact sheets), workshops, peer learning, and videos.



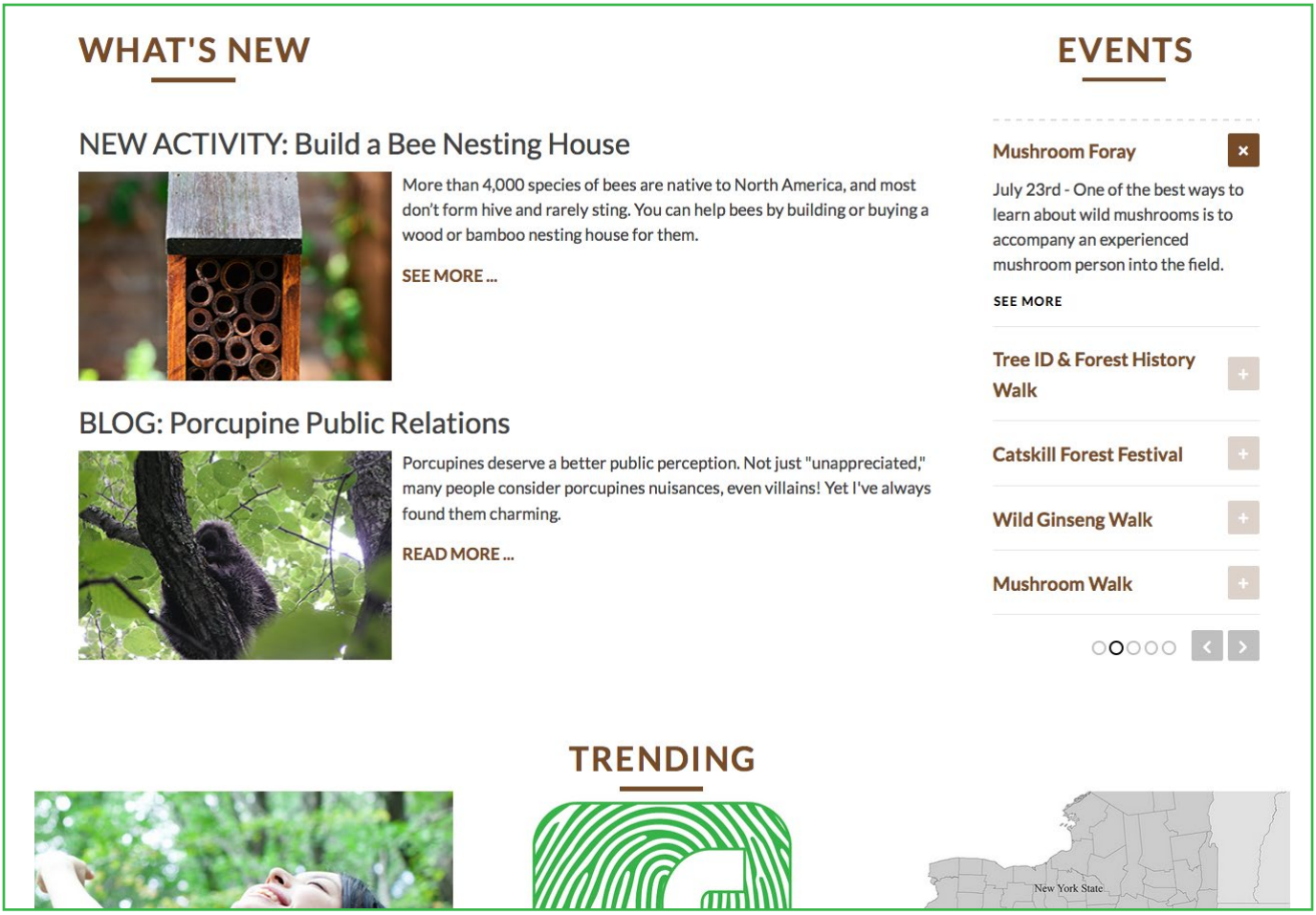
MyWoodlot Management Plan

The interests, goals, activities and supporting information that are selected by a landowner will be saved in a customized forest management plan that is accessible through the *Plan Interface*. Landowners will be able to reference and update their MyWoodlot.com plan at any time using this interface.



Prompts

Amazon.com encourages the continued consumption of new goods by prompting consumers with products they may be interested in based on their purchasing history. Facebook re-engages users in its social media experience by making people aware of updates to their friends' statuses. In much the same way, MyWoodlot.com will be able to continually re-engage landowners in their forest management plans by prompting them with new goals, activities and supporting information based on their interests.



Competitive Analysis: Is a *MyWoodlot.com* plan a forest management plan?

The MyWoodlot.com website will allow family forest owners to create and maintain their own forest management plans. But how does a MyWoodlot.com plan compare to its competition - a traditional Watershed Forest Management Plan?

To make this determination, it is necessary to analyze whether or not both traditional WFMPs and MyWoodlot.com plans adhere to the definition of a management plan.

Definition of a Management plan (Dictionary of Forestry definition) is:

A predetermined course for action and direction to achieve a set of results, usually specified as **goals** and **objectives**, and policies.

Note: a management plan is a **working instrument** that guides actions that changes in response to feedback, changed conditions, goals and activities.

The table below identifies the four fundamental attributes of a forest management plan based on its definition in the *Dictionary of Forestry* (Helms 1998). A discussion of these attributes in the context of each management planning model follows this table. This table also analyzes Mylandplan.org, a website that seeks to promote the use of forest management plans among family forest owners.

"What is a plan" table:

	Predetermined course for action	Goals	Activities (Objectives)	Living Document
Traditional WFMP's	X	X		
MyWoodlot.com Plan	X	X	X	X
Mylandplan.org		X		

A **predetermined course of action** can also be called a work schedule. This work schedule brings together three pieces of information that are fundamental for the successful implementation of a plan: goals, activities and a timeline.

A Predetermined Course of Action	
Traditional WFMP's	Include a work schedule that details specific management recommendations provided by a consulting forester, (i.e. TSI, Thinnings, Shelterwood) by stand over 15 years.
MyWoodlot.com Plan	Features a "Work Schedule" user interface that will allow landowners to view a summary of the goals and activities they have selected and the associated timelines.

A **goal** is a broad, general statement, usually not quantifiable, that expresses a desired state or process to be achieved. A management goal is stated in terms of purpose, often not attainable in the short term, and provides the context for more specific activities.

Landowner Goals	
Traditional WFMP's	Requires a "landowner's goal statement [that] include[s] specific goals and objectives including water quality protection measures".
MyWoodlot.com Plan	Provides a landowner with the opportunity to select goals that correspond to NWOS interests and concerns.

Activities are concise, time-specific statements of measurable, planned results that correspond to pre-established goals in achieving a desired outcome. An activity includes information on resources to be used, forms the basis for further planning, and assigns responsibility in achieving the identified goals.

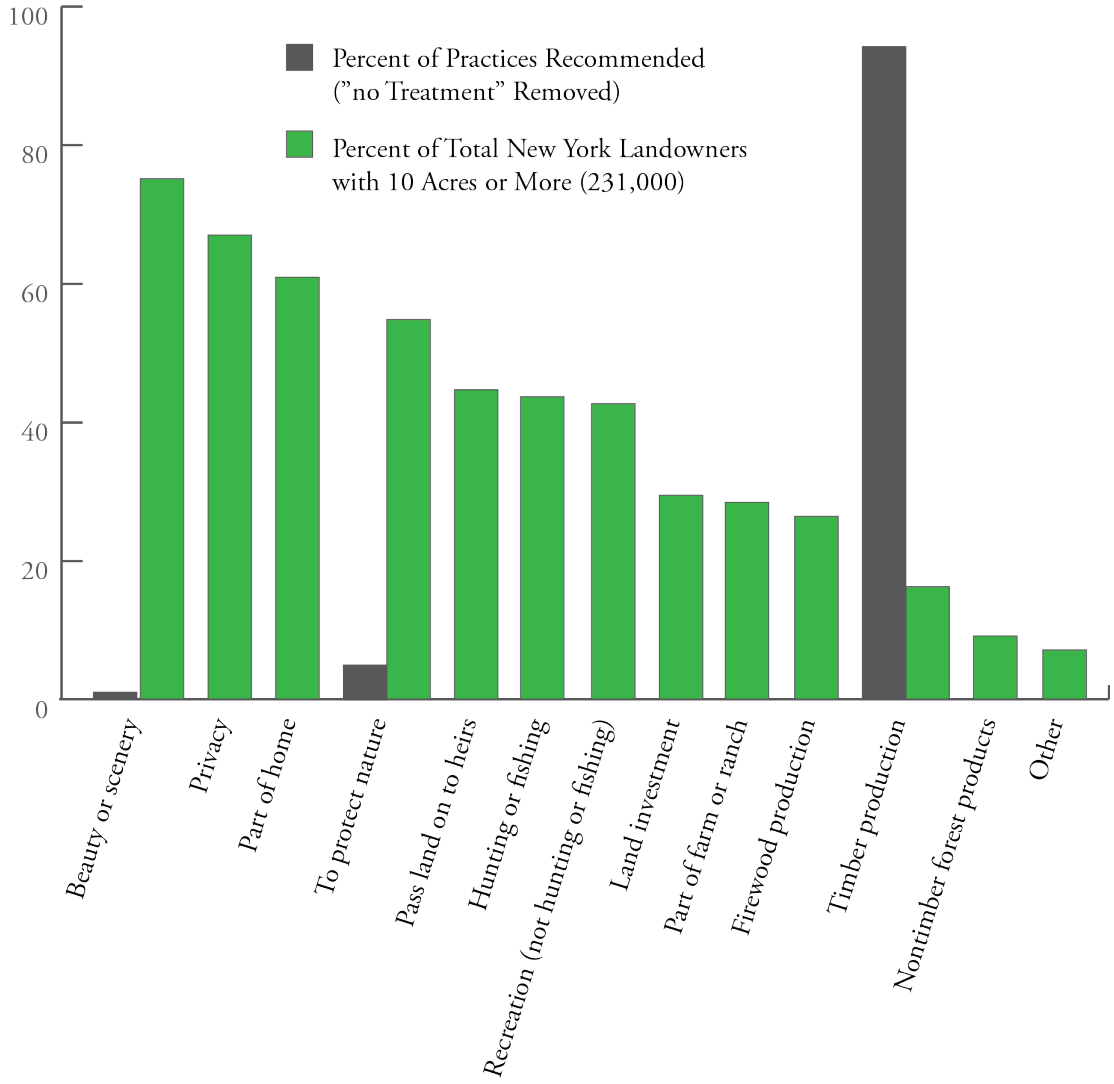
Activities	
Traditional WFMP's	Current WFMP specifications do not specifically address the need for activities.
MyWoodlot.com Plan	Provides a landowner with the opportunity to customize their management plan by selecting from a list of activities that correspond to the goals they previously selected.

A management plan is a **living document** that guides actions. It changes in response to feedback, changed conditions, goals and activities.

Living Document	
Traditional WFMP's	Eligible to be updated at ten year intervals. There is no formal mechanism for changing a landowner's WFMP within this ten-year period.
MyWoodlot.com Plan	Provides an interactive, web-based interface where a landowner can access and easily amend their forest management plan as needed at no cost.

Although a MyWoodlot.com plan meets the *Dictionary of Forestry's* definition and can therefore be considered a management plan, the true value of a forest management plan does not lie in its adherence to a term. Management plans are intended to serve family forest owners by providing them the information they need to make decisions about and take action in their woods. In this respect, a MyWoodlot.com plan may actually be superior to a traditional WFMP.

WAC analyzed the work schedules from 600 traditional WFMP's that were written between 1998 and 2008. Over 90% of the recommendations contained in the work schedules relate to the production of timber. By contrast, the NWOS indicates that New York family forest owners are interested in aesthetics, privacy, nature protection and recreation. The production of timber ranks eleventh on the list of landowner interests. Traditional WFMP's cannot serve the needs of family forest owners, because the plans do not contain recommendations that match known interests for New York family forest owners. MyWoodlot.com will offer activities in these interest areas, helping landowners meet their needs and increase their engagement with their properties.



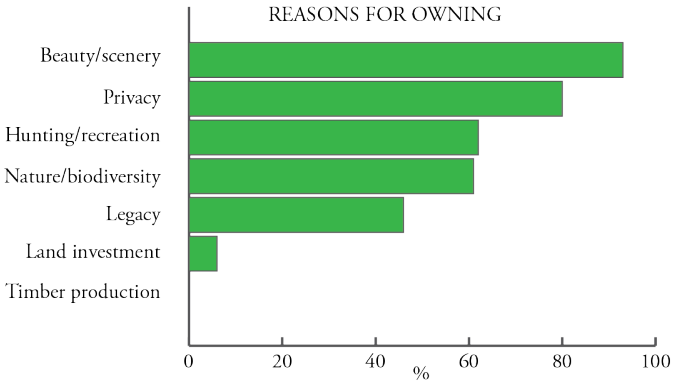
Marketing Plan[3]

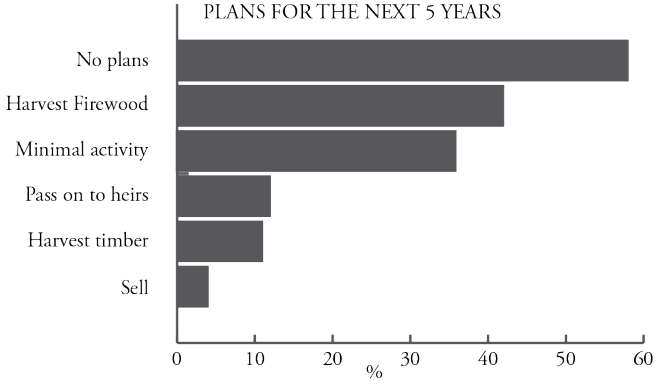
Encouraging family forest owners to create a management plan on MyWoodlot.com will require substantial effort. This marketing plan identifies the target audiences and identifies the marketing tactics necessary to communicate the value of MyWoodlot.com to family forest owners.

Target Audience

There are approximately 31,000 family forest owners in the Watershed. For marketing purposes, these owners can be subdivided into four target audiences based on their ownership attitudes:

1. **Woodland Retreat Owners:** 56% of family forest owners in the Watershed are Woodland Retreat Owners. These landowners place a high importance on lifestyle and amenity reasons for owning their woods, but low importance to financial reasons.



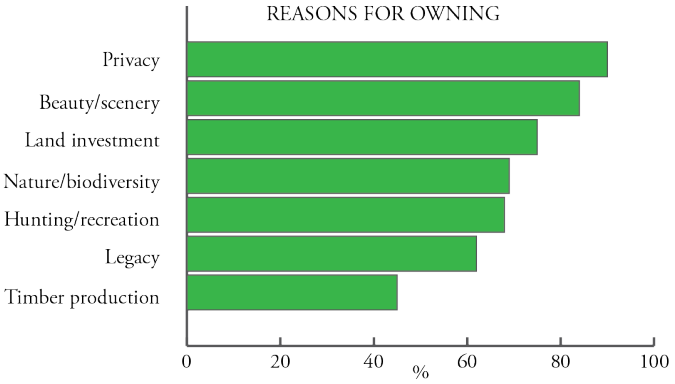


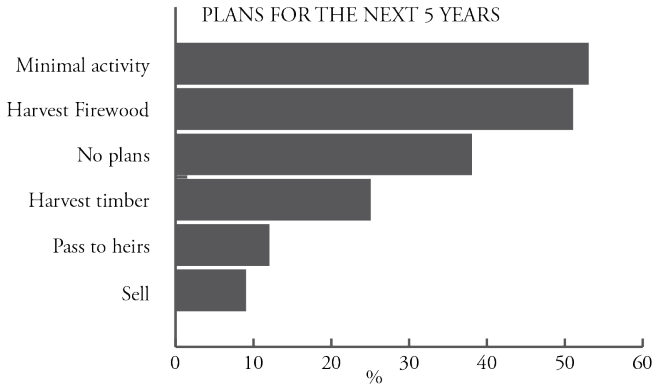
Woodland Retreat Owners' Top Three Concerns
Property Taxes
Air and water pollution
Trespassing

Woodland Retreat Owner Demographics	
Age	7 % are under 45
	52% are 45 to 64
	41% are over 65
Education	55% have a college degree or better
Income	37% earn less than $50K per year
	42% between $50K and $99K per year
	21% earn $100K or more per year

[3] The information used in the marketing plan was obtained from the Tools for Engaging Landowner Effectively (TELE) website (www.engaginglandowners.org). TELE is a project of the Sustaining Family Forests Initiative (SFFI). The goal of TELE is to provide a practical set of tools to help conservation and forestry professionals reach more landowners with effective stewardship messages and develop programs that serve the needs and values of the landowners.

2. **Working the Land Owners:** 31% of family forest owners in the Watershed are Working the Land Owners. These landowners assign a high importance to both lifestyle and financial reasons for owning woods.

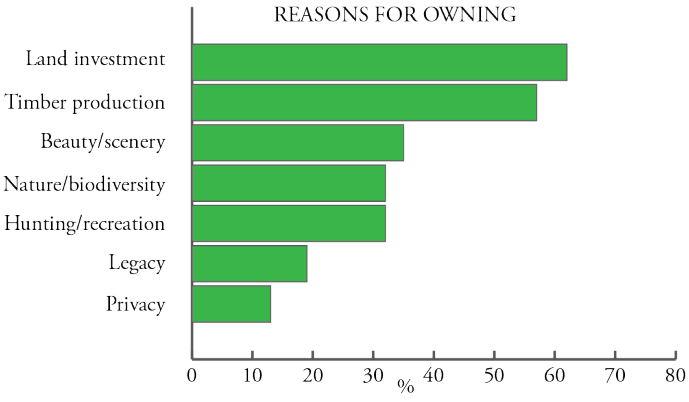


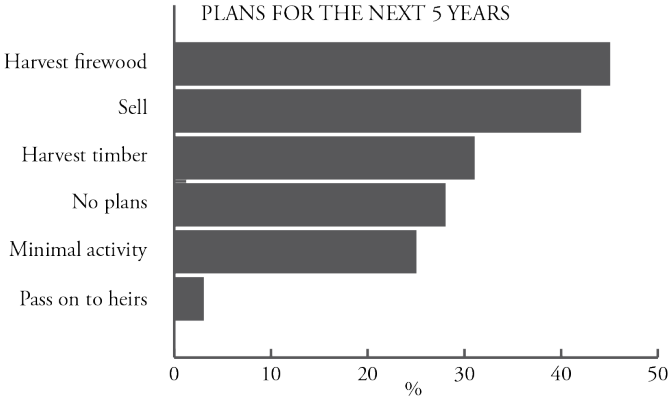


Working the Land Owners' Top Three Concerns
Property Taxes
Trespassing
Wind or ice storms

Working the Land Owner Demographics	
Age	16% are under 45
	65% are 45 to 64
	19% are over 65
Education	33% have a college degree or better
Income	41% earn less than $50K per year
	47% between $50K and $99K per year
	12% earn $100K or more per year

3. **Supplemental Income Owners:** 3% of family forest owners in the watershed are Supplemental Income Owners. These landowners are the opposite of Woodland Retreat Owners. They rank financial reasons for ownership highly, but they are unconcerned with amenity values.

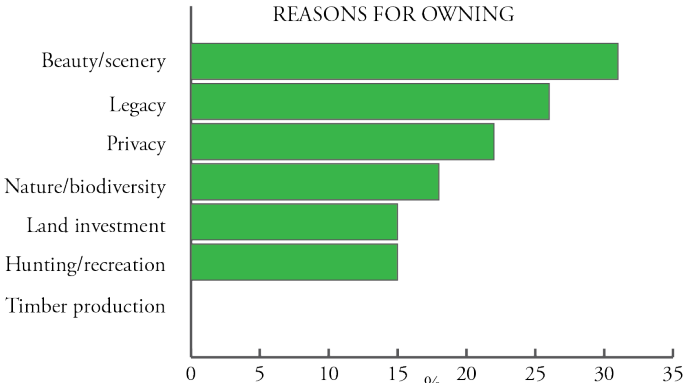


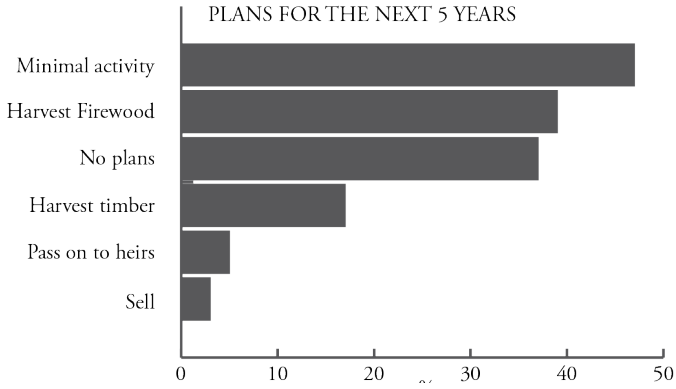


Supplemental Owners' Top Three Concerns
Vandalism
Trespassing
Timber Theft

Supplemental Income Owner Demographics	
Age	8% are under 45
	46% are 45 to 64
	46% are over 65
Education	58% have a college degree or better
Income	59% earn less than $50K per year
	18% between $50K and $99K per year
	23% earn $100K or more per year

4. **Uninvolved Owners:** 10% of family forest owners in the Watershed are Uninvolved Owners. These owners give low importance ratings to all the reasons for owning woods.





Uninvolved Owners' Top Three Concerns
Property Taxes
Insects or plant diseases
Vandalism

Uninvolved Owner Demographics	
Age	2% are under 45
	38% are 45 to 64
	60% are over 65
Education	28% have a college degree or better
Income	79% earn less than $50K per year
	16% between $50K and $99K per year
	5% earn $100K or more per year

Prospects

Family forest owners differ in their willingness to participate in stewardship programs like MyWoodlot.com. Recognizing these differences is fundamental to developing a successful marketing plan. There are four types of landowner prospects that must be considered:

1. **Prime Prospects** are landowners who have a stewardship mindset but are not engaged in managing their woods. They don't have management plans, don't consult foresters, and don't participate in programs such as cost-shares and easements. These are the landowners WAC is most likely to be able to influence through marketing efforts. Understanding the proportion of landowners within each target audience that fall into this category will allow WAC to hone its marketing messages.

Percent of Owner Types that are Prime Prospects	
Woodland Retreat Owners	73%
Working the Land Owners	73%
Supplemental Owners	56%
Uninvolved Owners	32%

2. **Model Owners** have a stewardship mindset and are already taking many of the actions that natural resource professionals recommend.

Percent of Owner Types that are Model Owners	
Woodland Retreat Owners	5%
Working the Land Owners	21%
Supplemental Owners	4%
Uninvolved Owners	2%

3. **Opportunists** are doing some management activities but not out of a stewardship orientation - they may find these actions to be financially beneficial or otherwise convenient

Percent of Owner Types that are Opportunists	
Woodland Retreat Owners	8%
Working the Land Owners	2%
Supplemental Owners	28%
Uninvolved Owners	35%

4. **Write-Offs** are people who are not managing their land sustainably and don't demonstrate a stewardship mindset toward their land.

Percent of Owner Types that are Write-Offs	
Woodland Retreat Owners	15%
Working the Land Owners	5%
Supplemental Owners	12%
Uninvolved Owners	31%

Value Proposition

A value proposition forms the centerpiece of any marketing endeavor. It is the reason why a consumer will purchase a product or participate in an activity. In the context of MyWoodlot.com, the consumers are family forest owners in the Watershed. Our value propositions are the reasons these landowners should create and maintain a forest management plan on MyWoodlot.com.

The primary target audience for MyWoodlot.com marketing efforts will be *Woodland Retreat Owners*. 56% of family forest owners in the Watershed are considered *Woodland Retreat Owners*, and 73% of these individuals are considered Prime Prospects. The secondary target audience for MyWoodlot.com marketing efforts will be *Working the Land Owners.* 31% of family forest owners in the Watershed are considered *Working the Land Owners*, and 73% of these individuals are considered Prime Prospects. If WAC proceeds with developing MyWoodlot.com, two value propositions, one for each of these target audiences, will need to be developed as part of a more detailed marketing plan.

Target Audience Interests

Family forest owner interests are the foundation of MyWoodlot.com. Interests drive the identification of goals and the selection of activities. MyWoodlot.com will address nine landowner interests that have been identified for the primary and secondary target audiences. The nine interests represent the *Reasons for Owning Land* and *Top Three Concerns* identified for the target audiences through the marketing research provided earlier in this section:

MyWoodlot.com Landowner Interests	
1. Beauty & Scenery	6. Privacy & Trespassing
2. Recreation	7. Nature
3. Legacy	8. Timber Production
4. Property Taxes	9. Pollution
5. Storm Damage	

Marketing Tactics

The new WFMP Program will use both traditional and online marketing tactics to introduce landowners to MyWoodlot.com. The following marketing tactics will be used to engage target audiences:

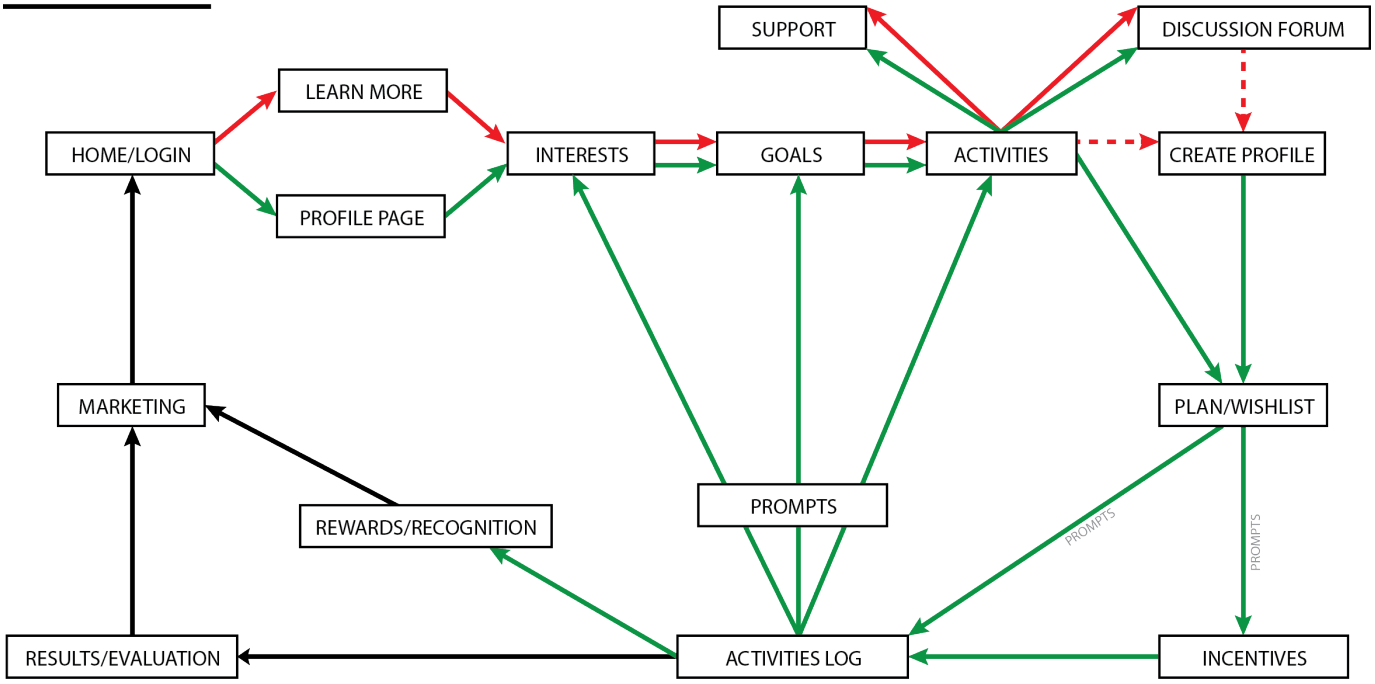
Traditional Marketing Tactics	**Online Marketing Tactics**
Direct Mailings	Search Engine Optimization
Press Releases	Google Adwords
Co-promoters	e-newsletters
Magazine Advertisements	Social Media
Event Attendance	

Organization

Non-account Holder

Account Holder

WAC



1. **Home/Login Page:** The Home/Log in Page will welcome users and provide two options for proceeding – "Learn More" and "Log into Profile."

    a. **Learn More:** MyWoodlot.com does not require a user account to access basic features. However, a user account will be required to access advanced features such as the Plan and Prompt features. Users without an account will be able to explore the public portion of MyWoodlot.com: Interests, Goals, Activities, Supporting Information and Discussion Forum. After users explore the public portions of MyWoodlot.com, they will be prompted to create a profile in order to access the advanced features.

2. **Profile Page:** The Profile Page gives users an interface for creating, maintaining and engaging in their forest management plan. The Profile Page will feature social media links, a calendar of events, an activity log, prompts for engaging landowners in new aspects of MyWoodlot.com, and access to the MyWoodlot.com forum. In short, the Profile Page will provide users with a dashboard that allows them to easily interact with the various components of MyWoodlot.com.

3. **Interests:** Interest areas will be derived from the NWOS. MyWoodlot.com users will select their interests from this list as the first step in creating their customized forest management plan.

4. **Goals:** When a user selects an interest area, they will move on to view the various goals that correspond with their interest. The user will then select goals and move on to select activities that correspond with each goal.

5. **Activities:** An activity is a concise, time specific action or set of actions that a landowner can implement to achieve a desired goal. Activities include supporting information on resources (cost, time, etc.,) to be used and the precise steps to be taken in order to implement the activity.

    b. **Supporting Information:** All activities will have supporting information that will facilitate action on the part of the landowner to achieve an identified goal. Supporting information can take different forms to suit various learning styles.

6. **Plan:** The landowner will be able to return to the Plan Page to access supporting information. The Plan Page will also allow landowners to access, amend and update their interests, goals and activities over time.

7. **Activities Log:** MyWoodlot.com will allow users to track the status of their goals and activities. This log also allows WAC to track landowner engagement in their management plan.

8. **Prompts:** Actions undertaken by WAC that induce a landowner to complete an activity or select a new interest or goal.

9. **Evaluation:** MyWoodlot.com will gather information to quantify effectiveness. User feedback; the rating of interests, goals and activities; tests and surveys will form the foundation of evaluation efforts.

10. **Marketing:** See Marketing Plan section

Management

MyWoodlot.com will require two phases of development – the start-up phase and the administration phase.

Start-up Phase

The start-up phase will consist of four activities –programming; research and development; supporting information development; and the development of a detailed marketing plan. The table below outlines the staff time required to implement the Start-Up Phase.

Start-up Phase	
Task	***Time (% FTE)***
1. Programming	
a. Outreach Specialist	10%
2. Research and Development	
a. U&M Specialist	20%
3. Supporting Information Developmnent	
a. U&M Specialist	30%
b. Outreach Specialist	30%
c. Watershed Educator	20%
4. Marketing Plan Developmnet	
a. Forestry Program Manager	10%
b. Outreach Specialist	10%
c. Croton Watershed Forester	10%
Total	**140%**

Programming will consist of the development of a detailed website scoping document, the graphic design of web pages, the retention of a contract web developer, and the administration of the contracted programming.

Research & Development will consolidate information and develop the various goals and activities that will accompany each interest. In the Start-up Phase, MyWoodlot.com will have nine interests. Each interest will have three goals, and each goal will have three activities. Together, these 9 interests, 27 goals and 81 activities will provide family forest owners with the "parts" they need to create their forest management plan.

Supporting Information Development will consist of the creation of the educational material that supports the implementation of each goal and activity. This educational material can take the form of fact sheets, webinars, videos or other methods for disseminating information. During the Start-Up Phase, the sourcing of supporting information will be limited to content that is in the public domain or accessible from partnering organizations. The content will then be screened for suitability, with suitable content requiring minimal design and editing. During the Start-Up Phase, there will be no "from-scratch" content development because this process will exceed available staff resources. Also for this reason, during the Start-Up phase, each activity will be limited to one supporting information piece.

Content Development		
Content Type	***Description***	***Time Estimate (Per piece of supporting information)***
As is	Content that requires minimal or no improvement in order to post on MyWoodlot.com	8 hours
Polish	Content that requires a nominal investment of time to improve. Improvements may include basic editing, design and research	16 hours
From scratch	Content that requires a significant investment of time to create or improve. Improvements may include a significant level of research, the creation of narrative, editing and design	54 hours

Marketing Plan Development consists of the refinement of the Marketing Plan section of this business plan in order to identify specific tactics and timelines for marketing MyWoodlot.com. In addition, a detailed Geographic Information Systems analysis of forest landowners within the Watershed will be conducted to explore residency patterns. This analysis will guide the selection of marketing tactics and scheduling.

Start-up Phase Staffing Model

The staffing model for the Start-up Phase will pull from five Forestry Program staff – a total of 1.4 Full Time Employees (FTE's). Resourcing the Start-up Phase staffing model will require the temporary restructuring of Forestry Program priorities. The following paragraphs indentify and explain the sources of FTE's that are necessary to resource MyWoodlot.com. When appropriate, the need to restructure priorities is identified.

The staffing model requires 50% of the Outreach & Communications Specialist's time. This time is available because of the recent decision to add a new position to the Forestry Program - the Watershed Educator. The Watershed Educator will be responsible for the administration of the Urban/Rural Education Program (UREI), a responsibility previously handled by the Outreach & Communications Specialist that required 30% of an FTE. In addition, the Outreach & Communications Specialist will use 13% of the time allocated to General Program Outreach Support to work on MyWoodlot.com. Lastly, the Outreach and Communications specialist will not be required to assist with the new pilot forest easements program, so the remaining 7% of an FTE will be sourced from this surplus.

The staffing model will require 20% of the new Watershed Educator's time. This time is available because of the phased integration of the UREI to the in-house model. The phased integration of UREI retains the services of a subcontractor to implement the Watershed Forestry Bus Tour Program with a Green Connections option. This approach was selected to preserve staff resources to allow for contingencies in the integration of UREI to the in-house model. The current projected workload of the Watershed Educator allocates 50% of an FTE to the implementation of a portion of the UREI Programs - Watershed Institute for Teachers (WFIT) and Catskill Stream and Watershed Education Program (CSWEP). Using 20% of the remaining Watershed Educator FTE will allow WAC to accomplish two things - 1) resource a staffing need for the MyWoodlot.com project and 2) provide a cooperative project that will allow the new Watershed Educator to engage with their co-workers for the purpose of building team.

The staffing model will require 50% of the Wood Products Utilization & Marketing Specialist's time. 30% of this time will be made available by refining the Watershed Forest Management Planning Program to focus on 480-a. The remaining 20% of this time will be made available by refocusing Program priorities from Utilization & Marketing to Watershed Forest Management Planning - the deliverable that MyWoodlot.com serves. In order to work on MyWoodlot.com, the U&M Specialist will no longer pursue biomass projects or collaborate with the Farm to Market Program to develop cooperative marketing efforts.

The staffing model will require 10% of the Forestry Program Manager's time. This time will be sourced from the 20% of time reserved for miscellaneous projects in the Forestry Program Work Plan.

The staffing model will require 10% of the Croton Watershed Foresters time. This time will be will be sourced from the 14% of time allocated to the Croton Trees for Tributaries (T4T) Program. The Croton T4T Program is an unfunded deliverable with no required project goals. The remaining 4% of time will be used to implement a reduced Croton T4T Program. The reduced T4T Program will implement approximately one project per year for the Start-up phase in order to free staff time to work on MyWoodlot.com.

Administration Phase

The Administration Phase will consist of six activities – Application Approval, Research & Development, Supporting Information Development, Marketing Plan Implementation, Website Maintenance, and Evaluation. The table below details the staff time required to implement the Administration Phase.

Administration Phase	
Task	***Time (% FTE)***
1. Application Approval	
a. WOH Watershed Forester	3%
b. Support Staff	6%
2. Research & Development	
a. U&M Specialist	20%
3. Supporting Information Development	
a. U&M Specialist	10%
b. Outreach Specialist	8%
c. Waterhsed Educator	8%
4. Marketing Plan Implementation	
a. Outreach Specialist	15%
5. Website Maintenance	
a. Outreach Specialist	10%
6. Evaluation	
a. Forestry Program Manager	5%
b. Croton Watershed Forester	5%
Total	**90%**

Application Approval will function in a manner identical to the WFMP Program. Submitted applications will be reviewed by the WOH Watershed Forester and processed by the Forestry Program Support Staff.

Research & Development in the Administration Phase will develop interests, goals and activities to supplement those created during the Start-Up phase. In addition, the goals and activities created during the Start-Up Phase will be refined and improved. The creation of new content and the improvement of old content during the Administration Phase will serve to maintain the relevance and usefulness of MyWoodlot.com for landowners.

Supporting Information Development in the Administration Phase will consist of the creation and refinement of the educational material that supports the implementation of the goals and activities developed during Research and Development. Eight pieces of supporting information will be created and eight pieces will be refined annually during the Administration Phase. During the Administration Phase the sourcing of supporting information will be expanded to include the creation of content that is unique to MyWoodlot.com. The eight pieces of new supporting information will be composed of six polish pieces and two from scratch pieces.

Marketing Plan Implementation in the Administration Phase consists of the implementation of the tactics identified in the refined Marketing Plan in accordance with the planned timeline.

Evaluation is a vital part of maintaining MyWoodlot.com as a relevant and useful planning tool for family

forest owners. Evaluation will focus on the numerous metrics that MyWoodlot.com will track: landowner preferences as derived from their selections, completed activities, and landowner feedback through Profile Pages. The monitoring of MyWoodlot.com usage will also provide quantifiable guidance for marketing endeavors. Finally, evaluation will provide WAC's funders with the metrics necessary to evaluate the effectiveness of MyWoodlot.com and WAC efforts.

Administration Phase Staffing Model

The staffing model for the Administration Phase will pull from five Forestry Program staff - a total of .90 Full Time Employee's (FTE's). The Administration Phase staffing model requires 33% of the Outreach & Communications Specialist's time. 30% of this time is available because of the recent decision to add the Watershed Educator position as described above. In addition, the Outreach & Communications Specialist will use 3% of the time allocated to General Program Outreach Support to work on MyWoodlot.com.

The Administration Phase staffing model will require 8% of the new Watershed Educator's time. This time is available because of the phased integration of the UREI to the in-house model as described above. MyWoodlot.com will provide a cooperative project that will allow the new Watershed Educator to continually engage with their co-workers for the purpose of building team.

The Administration Phase staffing model will require 30% of the Wood Products Utilization & Marketing Specialist's time. This time will be made available by refining the Watershed Forest Management Planning Program to focus on 480-a as described above.

The Administration Phase staffing model will require 5% of the Forestry Program Manager's time. This time will be sourced from the 20% of time reserved for miscellaneous projects in the Forestry Program Work Plan.

The Administration Phase staffing model will require 5% of the Croton Watershed Forester's time. This time will be will be sourced from the 14% of time allocated to the Croton Trees for Tributaries (T4T) Program as described above.

Financial Plan: Putting Savings to Work

Financial projections compare annual costs of implementing MyWoodlot.com against projected savings from focusing the WFMP Program on 480-a over ten years. The projections also include estimates of start-up costs. Because staffing is addressed above and additional staff will not need to be hired for this project, staffing costs are not included in this assessment.

Analysis Methods and Assumptions

Website Operational Costs

Website costs include maintenance, hosting, and programming. Maintenance and hosting are required baseline costs to keep MyWoodlot.com on the Internet. Programming allows for regular bug fixes and periodic upgrades. We used the website costs from Pure Catskills Marketplace as estimates for MyWoodlot.com.

Content Costs

Creating quality content has a cost. WAC may be required to hire contractors or hold contests to obtain content. Funds may also be needed to obtain rights to publications not in the public domain or to produce videos. In addition, content may require changes to make it suitable for use. Due to the high priorities of these tasks, $10,000 is budgeted for content creation, and $5,000 is allocated for content editing.

Marketing

Marketing refers to efforts to get new participants on the site. A placeholder budget of $3,000 is included in the financial analysis. A more detailed figure will be developed as part of a full marketing plan should MyWoodlot.com be approved.

Prompts

MyWoodlot.com is set apart from other landowner information sites by its emphasis on re-engaging landowners in the selection of new goals and the completion of new activities. This encouragement is done through prompts. While some prompts may be free, such as reminder emails, others will require cost to assemble, such as landowner success story articles and videos. Accordingly, $2,000 annually is set aside for developing new prompts.

Inflation

Inflation was set at 3% per year, a standard value for financial analyses. All costs included in the analysis increase annually at 3%.

Savings

We used the annual savings from the two 480-a Solution scenarios (excluding staff time) to provide bounds for estimates of how much money is available for MyWoodlot.com.

Results

Start-up Costs

Website start-up costs were derived in part from those for Pure Catskills Marketplace. Exclusive of staff time, total start-up costs are estimated at $64,000.

Item	Cost
Programming and Design	
Software Purchase	$5,000
Website Creation	$15,000
Custom Programming	$20,000
Contingency (10%)	$4,000
Total Programming and Design	*$44,000*
Initial Content Development	*$10,000*
Partnership Building and Initial Promotion	*$10,000*
Total Start-up Costs	***$64,000***

Operational Costs

Exclusive of start-up costs and staffing, MyWoodlot.com is expected to cost $27,835 in its first year of operation. This cost compares favorably with savings from focusing the WFMP Program on 480-a. Even under the High Cost Scenario, which projects an over three-fold increase in the rate of 480-a enrollment from the current pace, WAC saves over $6,000 in Year 1. Under the Low Cost Scenario, savings in Year 1 are over $35,000. Actual savings are expected to fall between these bounds.

The level of savings depends not on MyWoodlot.com but on the pace of participation in a 480-a focused WFMP Program. MyWoodlot.com costs are stable through time except for inflation. By contrast, WAC's costs increase with each new property that participates in the 480-a focused WFMP Program. This bears out when comparing the Low and High Cost Scenarios. By Year 10 in the Low Cost Scenario, WAC will have saved over $350,000 compared with leaving the WFMP Program unchanged, and savings pay for MyWoodlot.com start-up costs by the end of Year 2. Under the High Cost Scenario, however, the site does not make up its start-up costs. Indeed, by Year 10, WAC will have spent over $21,000 more than it would have had it left the WFMP Program unchanged. This switch occurs because as participation in the 480-a focused WFMP Program rapidly increases, new enrollees eventually become eligible for 480-a Incentive payments. The increase in those payments, combined with new enrollment, leads to higher costs as the program ages.

Costs (Excluding Staff Time)	Year 1	Year 5	Year 6	Year 10
Website Maintenance	$1,000	$1,126	$1,159	$1,305
Website Hosting	$4,835	$5,442	$5,605	$6,309
Website Programming	$2,000	$2,251	$2,319	$2,610
Total Website Operational Costs	*$7,835*	*$8,818*	*$9,083*	*$10,223*
Content Creation/Acquisition	$10,000	$11,255	$11,593	$13,048
Content Editing	$5,000	$5,628	$5,796	$6,524
Total Content Costs	*$15,000*	*$16,883*	*$17,389*	*$19,572*
Marketing	$3,000	$3,377	$3,478	$3,914
Prompts	$2,000	$2,251	$2,319	$2,610
Total Annual Costs	**$27,835**	**$31,329**	**$32,268**	**$36,318**
Annual Savings from 480-a Solution (Low Cost Scenario, Excluding Staff Time)	$63,474	$67,318	$67,307	$71,381
Annual Savings from 480-a Solution (High Cost Scenario, Excluding Staff Time)	$34,218	$36,280	$23,643	$25,057
Annual Savings (Low Cost Scenario)	$35,639	$35,989	$35,038	$35,062
Cumulative Savings (Low Cost Scenario)	**$35,639**	**$177,201**	**$212,239**	**$354,603**
Annual Savings (High Cost Scenario)	$6,383	$4,951	($8,626)	($11,261)
Cumulative Savings (High Cost Scenario)	**$6,383**	**$27,382**	**$18,757**	**($21,473)**

The possibility that WAC could spend more than it currently does suggests a need for intermediate indicators so management and funders can know if that threshold is approaching. Fortunately, two such indicators will be part of regular reporting for the 480-a focused WFMP Program: acres enrolled annually in 480-a and dollars spent on 480-a Incentive payments.

Currently, an average of 2,900 acres enrolls in 480-a annually after receiving WAC funding (40,000 acres in 480-a with WAC-funded plans divided by the program's 14-year life). This is the amount of enrollment estimated for the Low Cost Scenario. The High Cost Scenario more than triples that enrollment rate to almost 9,000 acres per year. By tracking the acres enrolled in 480-a through the 480-a focused WFMP Program, WAC can gain a sense of future costs. If annual enrollment approaches 9,000 acres, WAC will know it is in High Cost Scenario territory.

Similarly, WAC can tell if it is approaching that scenario by tracking 480-a Incentive payments. In the High Cost Scenario, the surge of new enrollment in Year 1 causes a jump in 480-a Incentive payments in Year 6 as those new participants become eligible for their first incentive payment. This jump, from $6,000 in Year 5 to $18,000 in Year 6, overwhelms program savings. If WAC observes that 480-a Incentive payments are approaching $18,000, it will know it is nearing the High Cost Scenario.

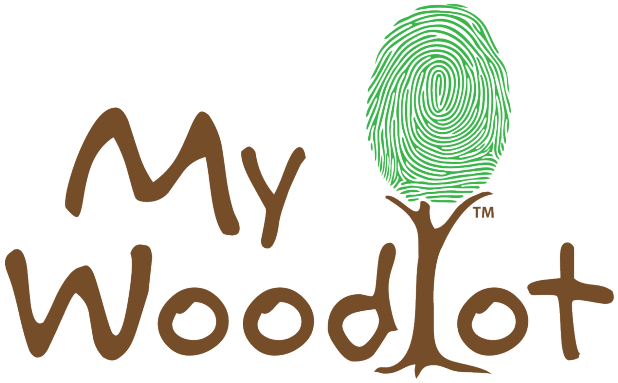
Although the High Cost Scenario is theoretically possible, it is not a concern for two reasons. First, it represents an extremely unlikely upper bound. It assumes more than a tripling of the pace of 480-a enrollment. The most likely outcome is that enrollment will be lower. Second, even if enrollment spikes, WAC can control the impact to its budget. If the organization finds that 480-a enrollment is surpassing its ability to fund, it can deny new WFMP Program applications. It can also decrease cost-share rates for both the Enrollment and Update Incentives.

Critically, an increase in costs due to surging enrollment is not bad. Rather, it represents overwhelming program success. It indicates that knowledge of and interest in 480-a have vastly improved. Given that WAC receives multiple benefits from increased 480-a enrollment as detailed in its "Focus on 480-a" business plan, this increase in cost should be seen as a positive, not a negative. If such increases occur, WAC should pursue additional contract funds to encourage that increase rather than risk stifling it.

FUNDING SECURITY IN A WORST-CASE SCENARIO

The turmoil in the federal government's budget is one of the greatest threats to WAC's Forestry Program. The WFMP Program is funded exclusively by the U.S. Forest Service. In a worst-case scenario, political gridlock or escalating firefighting costs could theoretically cause WAC's Forest Service funding to be temporarily reduced or eliminated.

Under the current WFMP Program, this scenario would end management planning, because cost-share funding would not be available. By contrast, MyWoodlot.com provides a safety net in a worst-case event. Although the site is projected to spend approximately $30,000 annually, the only truly mandatory costs in a given year relate to website hosting and maintenance (about $6,000) and staffing. The rest, in an emergency, would not need to be spent. Content creation, for example, could be put on hiatus. While this is only a short-term solution, it at least allows management plans to be created under a funding lapse.



1. BMP Research Study
2. Sustained Yield Management Research Summary
3. Spatial Analysis of NIPF in the NYC Watershed
4. National Woodland Owner Survey overview
5. Screenshot Compendium
6. Full financial spreadsheet with Years 1-10
7. Frequently Asked Questions (FAQ's)
8. Literature Cited

ANNEXES

Annex 1: BMP Research Study

RESEARCH ARTICLE

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education & communication

Do Forest Management Plans Increase Best Management Practices Implementation on Family Forests? A Formative Evaluation in the New York City Watershed

Joshua D. VanBrakle, René H. Germain, John F. Munsell, and Stephen V. Stehman

Financial incentive programs for forest management plans on private forestland are common in the United States. Few studies, however, have examined the relationship between management plans and "on-the-ground" forest management practices. We used the New York City Watershed as a case study to evaluate the impact of management plans on best management practices (BMP) implementation. We conducted field surveys during 2009 and 2011 and evaluated properties for implementation by comparing postharvest conditions with New York BMP guidelines. We also compared the data with previously published results from 2002. Evaluation scores for properties with plans were significantly better in only two of six BMP categories: skid trails and forest roads. Although not invalidating forest management plans, this case study suggests a need for further evaluation of planning initiatives and a potential shift in funding away from management plans to programs such as logger training and timber sale contract education.

Keywords: management plan, private forest, timber harvesting, policy outcomes, nonindustrial private forestland

Forest management planning on private forestland is a cornerstone practice for promoting long-term stewardship. Management planning support ranks among the most common financial incentive programs (Jacobson et al. 2009). From 1991 to 2006, the USDA Forest Service's Forest Stewardship Program produced more than 270,000 management plans for more than 31 million acres of family forests (USDA Forest Service 2012). Often, management planning is a prerequisite for additional landowner financial assistance. Sixteen states require a written management plan before a landowner can participate in preferential property tax programs for forestland (Hibbard et al. 2003). The effort is understandable, considering that family forest owners collectively control more than 260 million acres of US forestland, representing 35% of the total (Butler 2008).

Despite the extensive time and money-spent promoting and subsidizing management plans, recent studies have questioned their ability to meaningfully affect private forest conservation given their low adoption rate. Butler (2008) found that only 4% of US family forest owners have written management plans, despite decades spent promoting them. With this in mind, Kittredge (2009) predicted that it would take 144 years for all forest landowners in the northern and Lake State region of the United States to adopt management plans.

Beyond concerns of low participatory rates, there is a lack of "on-the-ground" research regarding the effectiveness of these plans in improving management practices. Previous studies evaluating management planning programs have largely avoided field measurements, relying instead on written surveys. For instance, the evaluation by

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Egan et al. (2001) of the Forest Stewardship Program in West Virginia surveyed landowners to find out whether they had implemented activities recommended in their plans. The results indicated that more than half of responding landowners reported implementing management activities recommended in their plans, but there was no follow-up in the field. Similarly, Kilgore et al. (2007) and Jacobson et al. (2009) evaluated the effectiveness of eight federal financial incentive programs (including the Forest Stewardship Program) by surveying forestry officials responsible for administering those programs. Administrators considered the Forest Stewardship Program at least as effective in promoting sustainable forest management and protecting water quality and soil productivity as other federal programs, including the Conservation Reserve Program (which establishes long-term cover crops to reduce soil erosion) and the Forest Legacy Program (which purchases permanent conservation easements). However, neither study verified results with a field component.

To examine the on-the-ground impact of management plans, we used a region with a particularly strong emphasis on forest management planning, the New York City (NYC) Watershed, as a case study. The NYC water supply system is the largest unfiltered surface water system in the United States, providing more than 1.3 billion gallons of water daily to the greater metropolitan area as well as several upstate communities (Galusha 2002). Its primary water supply systems, the Catskill/Delaware Watersheds, are 78% forested, of which 75% is in family forest ownership (Figure 1; Hall et al. 2008). Because of the dominant family forest role, forest management planning has become a foundational method for engaging regional landowners.

The Watershed Agricultural Council (WAC), a nonprofit group based in the NYC Watershed, shares the cost of writing Watershed Forest Management Plans (WFMPs). Available to private landowners with at least 10 acres of forestland, the program offsets costs associated with hiring a consulting forester to develop the plan. In most cases, funding covers the full cost of the WFMP. Beyond providing information about timber resources, WFMPs contain water quality-specific provisions for managing riparian areas and implementing best management practices (BMP). While WAC incentivizes plan creation, implementation is voluntary (WAC 2009a). Between 1996 and 2009, more than 800 plans encompassing more than 140,000 acres, greater than 13% of the Catskill/Delaware Watersheds' total area, received funding (WAC 2009b).

Given the interest in protecting water quality in the NYC Watershed, we compared implementation of water quality BMP after timber harvests between properties with and without written forest management plans. For this project, BMP are defined as techniques that protect surface and groundwater quality while allowing for the accomplishment of other objectives (Wenger 1984). These simple, often low-cost techniques include locating and designing landings, skid trails, forest roads, and stream crossings and the correct installation of water diversion devices, such as waterbars, broad-based dips, open-top culverts, water deflectors, and diversion ditches. Water diversion devices are especially important because they regulate the flow of surface water on exposed soil created by harvest access systems, which have been found to contribute as much as 90% of the sediment generated from logging (Patric 1976, Swift 1984). Although BMP have been shown to reduce soil erosion associated with timber harvesting (Kochenderfer et al. 1997), they are currently voluntary in New York and many other states (Cesa et al. 2004).

Previous research in the region found that forest landowners were knowledgeable about BMP, but implementation quality was often poor, particularly the installation of water diversion devices (Schuler and Briggs 2000, Munsell et al. 2006, Munsell and Germain 2007). However, these studies did not specifically address management planning and had relatively small sample sizes. This case study expands this work by comparing BMP implementation between landowners with and without forest management plans. The results of this evaluation will help inform debate about management plan efficacy and assist organizations and agencies that promote management plans in deciding whether to redirect funding to alternative programs.

Methods

The population for this case study included nonindustrial private forest (NIPF) owners with at least 20 contiguous acres of forestland within the NYC Watershed. Because the study involved private owners, permission was required to visit a property. To obtain permission, we mailed 3,350 trifold brochures with detachable reply cards asking for landowner contact information, confirmation that they were willing to have researchers visit their property, and information on whether a timber harvest (other than firewood for personal use) occurred on their property in the past 5 years and, if so, the year it took place. The harvest requirement was included to facilitate BMP evaluation. A total of 752 cards were received, for a response rate of 22%. Of these, 172 (23%) indicated a timber harvest had been conducted in the past 5 years.

The need to obtain permission from landowners affects the generalizability of research results. It is possible that landowners who feel their job will meet the researchers' approval will be more likely to submit their property for study. Anecdotal conversations with participating landowners indicated that this issue may be less problematic than it appears. Although many landowners were indeed proud of their land and work done on it, others indicated they volunteered because the harvest had not gone well and

Management and Policy Implications

This case study suggests that subsidizing management plans does not meaningfully increase BMP implementation on family forests. For organizations concerned with water quality, particularly in states with voluntary BMP, programs such as logger training, BMP cost sharing, timber harvest contract assistance, and peer-to-peer landowner forums may be more effective for meeting goals than subsidizing management plans. This case study does not invalidate forest management planning as a conservation tool. Indeed, Kilgore et al. (2007) found that landowners in focus groups considered one-on-one interaction with a professional forester the most highly valued assistance incentive programs could offer. The study does, however, highlight the need for evaluation of the results of incentive programs, including management planning. It challenges these initiatives to critically examine "on-the-ground" results, comparing them against desired outcomes and program costs. In addition, it indicates a need for research on the full range of impediments to BMP implementation, such as financial constraints, inexperienced operators, and a lack of regulatory oversight, among others.

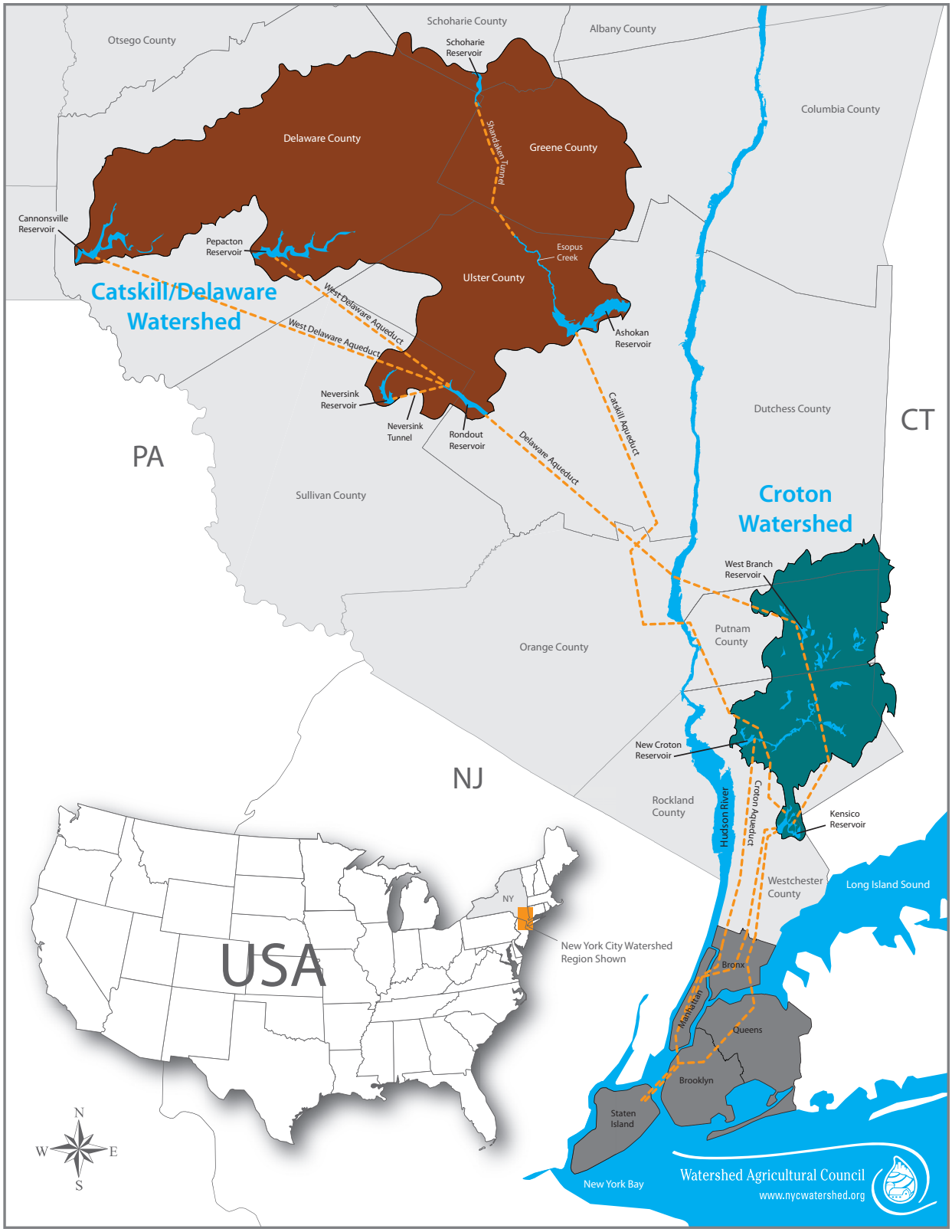

Figure 1. The NYC water supply system. (Image courtesy of Watershed Agricultural Council.)

viewed the project as an opportunity to provide an objective opinion. In addition, because BMP are voluntary in New York and researchers were not affiliated with regulatory agencies, landowners did not need to be concerned with any regulatory reprisals for volunteering their properties. That said, a truly random sample was not possible, and results should be considered accordingly.

BMP implementation was evaluated on 89 properties during the summers of 2009 and 2011. In 2009, 48 properties were examined (26 with and 22 without plans). In 2011, 41 properties were assessed (21 with and 20 without plans). For analysis, the two

assessments are combined and referred to as the "2009/2011" group. Data from Munsell and Germain (2007), which included 31 woodlots sampled in the NYC Watershed in 2002, were added to the analysis. These data were also collected from landowners who volunteered their properties. Combined, the data from the 2002 and 2009/2011 evaluations provided 120 properties for analysis.

To compare BMP implementation in 2009/2011 with observations in 2002, scoring methodology of BMP indicators followed that of Munsell and Germain (2007), which were derived from the New York BMP Field Guide (New York State Department of Environmental Conservation 2007). Six categories of BMP were examined: landings, forest roads, forest road stream crossings, skid trails, skid trail stream crossings, and water diversion devices. Sample sizes differed among BMP categories because not every property had conditions for which all BMP applied (e.g., not every property had a stream crossing). In total, 63 BMP indicators were evaluated: 10 each for landings and skid trails, 15 each for forest roads and forest road stream crossings, and 13 for skid trail stream crossings. The score for the category "water diversion devices" was computed by averaging applicable scores across the other five categories. Applicable indicators included water bars, broad-based dips, water deflectors, open-top culverts, and diversion ditches. Scores for each indicator were based on a 0–3 system, in which higher scores denote better BMP implementation. Regardless of BMP category, scores were defined as follows: 0, BMP not applied; 1, BMP applied with major deviations from New York BMP guidelines; 2, BMP applied with minor deviations from New York BMP guidelines; 3, BMP applied correctly according to New York BMP guidelines; and N/A, BMP not applicable and not scored.

Similar scoring systems have been used in other BMP audits. Montana's BMP monitoring program has a nearly identical breakdown, with an additional level for BMP that "exceed requirements" (Sugden et al. 2012). In the scoring methodology for this study, "minor" deviations included those of small consequence, such as waterbars spaced slightly too far apart but otherwise installed correctly. "Major" deviations were of larger magnitude, such as waterbars that did not extend across the trail. The same principal investigator from 2002 and 2009/2011 ensured consistency in scoring, allowing for objective data set comparisons.

This scoring methodology does not explicitly address BMP effectiveness; instead, it examines prescriptive implementation. Three reasons explain the approach. First, prescriptive scoring better approximates New York's BMP guidelines. For example, guidelines specify that on a given slope, waterbars should be spaced at a certain distance. Second, the case study sought to examine the degree to which management plans, as educational tools, translate BMP recommendations into actual implementation. Finally, adoption of implementation-based methodology allowed for direct comparisons with previous studies.

One BMP not addressed in this study is harvest planning. The New York BMP field guide includes several planning recommendations, such as timing harvests to coincide with dry, frozen, or snow-covered ground. However, field trials were unsuccessful in developing a scoring methodology to assess these recommendations (Munsell and Germain 2007), leading to the decision to exclude evaluation of planning in this study.

The BMP assessment protocol for both 2002 and 2009/2011 included a census of landings, forest roads, and forest road stream crossings on each harvested property. The census was taken by walking all roads. For the 2002 properties, a census of skid trails and skid trail stream crossings was used. For 2009/2011, time constraints required sampling rather than a census. Skid trails were sampled by evaluating the main skid trail (defined as the skid trail by which most logs would have reached the landing) in 300-ft segments until the first fork (other than single entry marks). Other skid trails were sampled using a line-intercept method. Transects through the harvest area were installed, and skid trail intersections were evaluated 150 ft in both directions from the intersection point. Transects were designed to cover as much of the harvest as possible, so that larger harvests had greater distances between transect lines. Distances between transects were as small as two chains for the smallest harvests (less than 10 acres) and as large as eight chains for the largest harvests (more than 200 acres). Transect starting points were located by walking a random number of paces perpendicular to the harvest or property boundary, turning 90° and entering the cut, so that transect lines paralleled harvest or property boundaries whenever practical. Skid trail stream crossings were evaluated when they occurred in sampled sections of the skid trail.

The score for an individual road, trail segment, landing, or stream crossing was calculated as the unweighted average of all applicable indicators. Overall scores for each relevant BMP category were calculated by averaging the scores for individual roads, trail segments, landings, or crossings. A weighted average was used based on the length of each sampled segment (for roads and trails) or area (for landings), whereas an unweighted average was used for stream crossings. Weighted averages were necessary because not all landings, roads, and skid trail segments were the same size. For example, a sampled skid trail segment measuring 200 ft in length would not contribute as much toward a property's skid trail score as a 300-ft-long segment.

BMP category scores were treated as continuous variables. Each BMP category score is an average of the 10–15 scores for the individual indicators within that category. Each individual indicator score is assumed to represent an underlying continuous scale, and the ordered classification of scores (0, 1, 2, and 3) can be regarded as a grouping or approximation of this continuous scale (Snedecor and Cochran 1980, p. 204). Mean scores from properties with plans, those without plans, and those sampled in 2002 were compared using analysis of variance. Because actual plans were not uniformly available for all participants, the presence of a written management plan was treated as a simple "Yes/No" variable.

The BMP data from 2002 were not collected with particular reference to management plans, whereas 2009/2011 management plan properties were deliberately oversampled to obtain roughly equal numbers of properties with and without plans. To compensate for this targeted sampling of management plan properties, a weighted mean was computed for the 2009/2011 data for which the weights for the sample data for properties with plans and those without plans were based on their relative proportions in the study population. Based on data provided by WAC, 30% of the 2009/2011 properties in the target population had plans and 70% did not; therefore, the 2009/2011 population mean was defined as $\mu_{09} = (0.3\ \mu_P + 0.7\ \mu_{NP})$ where μ_P is the population mean for the 2009/2011 management plan group and μ_{NP} is the population mean for the 2009/2011 no management plan group. The 2002 scores and combined

weighted 2009/2011 scores were compared using the following contrast of means:

$$C_1 = \mu_{09} - \mu_{02}; \quad (1)$$

$$H_0 : C_1 = 0,\ H_a : C_1 \neq 0$$

where μ_{02} is the mean for properties in 2002. The null hypothesis, H_0, indicates that there is no difference between the weighted 2009/2011 group and the 2002 group, whereas the alternative hypothesis, H_a, indicates that a difference does exist. In addition to this contrast, pairwise comparisons of the three groups (properties with plans in 2009/2011, properties without plans in 2009/2011, and properties in 2002) were conducted using the Waller-Duncan test. An α level of 0.10 was applied for all tests of significance. All statistical analyses used SAS 9.1.

Results

Overall, mean scores for landings, skid trails, and forest roads were in the "2" range for properties both with and without management plans, for which a score of 2 indicates only minor deviations from BMP standards in these areas (Table 1). In contrast, the mean scores for stream crossings (both on skid trails and forest roads) were closer to 1.5, suggesting moderate BMP implementation. Water diversion device installation was lowest of all the BMP categories, with average scores around 0.5, indicating that on most properties, these BMP are either poorly or not implemented. Properties with management plans in the 2009/2011 group had statistically significantly better BMP implementation on skid trails and forest roads compared with properties without plans (Table 1). BMP implementation for the other four categories did not differ significantly between properties with and without management plans.

The weighted contrast from Equation 1 combines properties with and without plans from the 2009/2011 group and then compares that mean to the mean for properties in 2002. This analysis suggests modest improvements in BMP implementation over time in landings, skid trails, and water diversion devices (Table 2). The landings score was slightly higher in the 2009/2011 group, rising from 1.89 to 2.07, but the mean scores for both groups were close to 2, indicating only minor deviations from BMP standards. The water diversion devices mean the score increased from 0.28 in 2002 to 0.52 in 2009/2011, indicating minor improvement yet still ongoing implementation problems within this category. The skid trail scores were 1.56 in 2002 and 1.92 in 2009/2011, representing the most substantial difference across BMP categories.

Table 1. Mean BMP scores for the six BMP categories for properties sampled in 2002, properties sampled in 2009/2011 without management plans, and properties sampled in 2009/2011 with management plans.

BMP category	Mean BMP score (n)			Pooled within group SD (P value for test of no differences among 3 treatment group means)
	2002	2009/2011 (no plan)	2009/2011 (plan)	
Landings	1.89[a] (31)	2.05[ab] (39)	2.12[b](44)	0.50 (0.15)
Skid trails	1.56[a] (31)	1.87[b] (42)	2.04[c](47)	0.40 (<0.0001)
Skid trail stream crossings	1.83[a] (8)	1.65[a] (14)	1.44[a](15)	0.88 (0.58)
Forest roads	2.16[ab] (8)	1.92[a] (16)	2.32[b](28)	0.53 (0.07)
Forest road stream crossings	1.99[a] (2)	1.84[a] (6)	1.35[a](9)	0.96 (0.53)
Water diversion devices	0.28[a] (31)	0.44[ab] (42)	0.70[b](47)	0.64 (0.02)

Scores range from 0 (no BMP attempted) to 3 (all BMP implemented according to guidelines). Within a BMP category, means with the same superscript letter are not statistically different, as determined by the Waller-Duncan pairwise comparison test (experimentwise error rate $\alpha \approx 0.10$).

Table 2. Comparison of mean BMP scores in 2002 and 2009/2011.

BMP category	2002	2009/2011	P value
Landings	1.89	2.07	0.10
Skid trails	1.56	1.92	0.0001
Skid trail stream crossings	1.83	1.59	0.50
Forest roads	2.16	2.04	0.58
Forest road stream crossings	1.99	1.69	0.70
Water diversion devices	0.28	0.52	0.09

Scores range from 0 (no BMP attempted) to 3 (all BMP implemented according to guidelines). The 2009/2011 mean is weighted by the proportion of the 2009/2011 study population with and without management plans: 30 and 70%, respectively (see Equation 1).

Discussion

Modest differences between "plan" and "no plan" BMP implementation scores, coupled with minimal differences compared with the 2002 data, indicate that forest management plans may not facilitate meaningful improvements in BMP implementation. Beyond BMP, case study results indicate a need for critical evaluation of forest management planning programs. They may also signal to organizations and agencies promoting forest management plans a need to examine funding priorities.

The significant improvement in BMP implementation on skid trails is potentially heartening, because they are often the largest component of harvest access systems on smaller, family forest properties (Kochenderfer 1977, Germain and Munsell 2005). Similarly, although landings only differed narrowly, the high average scores in that category are also encouraging because landings are a publicly visible side of logging operations.

Despite these encouraging results, stream crossings and water diversion devices, BMP most critical to water-quality protection, had the lowest scores. Furthermore, they did not differ significantly between properties with and without management plans and did not differ significantly compared with data from 2002. These results somewhat overshadow the scores and differences observed in other categories because achievements in access system design and installation are less meaningful from a water quality standpoint if water diversion devices and stream crossings are not properly implemented.

Case study results suggest a disconnection between the documented steps and education provided by management plans and on-the-ground implementation. Numerous studies confirm the value of plans as educational tools (Laford and Parker 1988, Egan et al. 2001, Kilgore et al. 2007). The planning process ostensibly establishes a trusting relationship between the landowner and a professional forester. Plan holders are more likely to participate in educational activities associated with forest stewardship (Munsell and Germain 2004). This finding is noteworthy, because landowner familiarity with

BMP was positively linked to implementation in a study in East Texas (Carraway et al. 2000).

Landowner knowledge, however, does not necessarily translate into management action and stewardship decisions. Stone and Tyrrell (2012) found that the presence of a forest management plan did not influence landowners' decisions about whether to subdivide their property. Similarly, although Caron et al. (2012) found that landowners with management plans had a deeper knowledge of forest management practices than landowners without plans, there was no difference in the quality of forest stocking between the two groups, both exhibiting poor stocking. Specific to BMP, Munsell et al. (2006) argued that a family forest owner's influence on the implementation process may be limited and that foresters and loggers play a more critical role.

The results of these studies and ours suggest that a narrow focus on educating landowners through forest management plans may be inefficient and ineffective in substantively improving private forest stewardship. A better approach may be an integrated model that focuses on the "forest management triangle" comprising landowners, loggers, and foresters. Loggers are vital to BMP implementation, because they are typically charged with installation. How well BMP are implemented, if they are even attempted at all, may largely depend on a logger's knowledge and skill. Carraway et al. (2000) reported the highest BMP compliance when a forester was involved in the harvest, and the logging contractor received formal BMP training. In contrast, the lowest compliance rates were associated with property owners lacking BMP knowledge, coupled with logging contractors without formal BMP training. Expanding the effort to help loggers integrate BMP into their business model is a logical priority. Particularly in states with voluntary BMP, shifting funding from management planning to activities such as logger training and certification as well as cost sharing BMP installation may be a more prudent use of limited resources.

Along the same lines, foresters play a critical role by advocating BMP to clients and including and enforcing BMP provisions in timber sale contracts. Carraway et al. (2000) reported that explicitly mandating BMP in timber sale contracts and having foresters enforce BMP implementation during and after the timber sale were key factors to BMP compliance. These contracts may therefore have a greater potential to affect on-the-ground practices than management plans. In particular, in states such as New York, which has no forest practice law and has voluntary BMP, these contracts may be the only written documents that specifically detail what BMP are called for, who is responsible for their installation, and what penalties result from an unsatisfactory job. Along with support for logger training, programs that assist landowners and foresters with forest harvest contracting could be a more effective use of funding.

Finally, although forest professionals are critical to the BMP implementation process, the landowner's role cannot be completely forgotten. Landowner education and involvement in forest stewardship remain important. However, the results of this case study and the low adoption rate of management plans reported by Butler (2008) indicate that the traditional transfer-of-knowledge focus commonly used for forestry outreach is in need of revision. Some recent studies have called for a paradigm shift in landowner education away from management plans and workshops led by forestry professionals. Van Fleet et al. (2012), for instance, advocated greater use of the Internet and peer learning through landowner discussion forums so that landowners could provide each other with information and support. A pilot approach of this peer-to-peer method in Massachusetts effectively attracted not only landowners with a forestry background but inexperienced landowners as well (Ma et al. 2012). Landowners involved in the forums shared a willingness to spread information gained from the forums, and they also retained knowledge such as correctly identifying foresters, land trusts, and sources for land management advice.

Conclusion

Although management plans are among the most common financial incentive tools used in US private forestry, a growing body of research questions both their ability to reach a majority of landowners and their influence on family forest stewardship practices. In the NYC Watershed, voluntary, subsidized forest management plans represent one tool to encourage stewardship and protect water quality. However, this case study found minimal differences within the NYC Watershed with respect to BMP implementation between properties with and without plans. It also found little difference in BMP implementation over time in that region. These results, combined with the research findings, suggest that for organizations concerned with water-quality protection, subsidizing forest management plans may not be the most prudent use of limited resources. A more integrated approach that engages multiple management stakeholders through logger training, timber sale contract support for landowners, encouragement of foresters to include and enforce BMP provisions in timber sale contracts, subsidizing of BMP installation by loggers, and peer-based learning opportunities for landowners may be a more effective use of funding.

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Annex 2: Sustained Yield Management Research Summary

Do Forest Management Plans Lead to Sustained Yield Management on Family Forests? A Formative Evaluation in the New York City Watershed

Joshua D. VanBrakle

Abstract

Forest management planning on private forestland is a cornerstone practice for promoting long-term stewardship. Recent research, however, has cast doubt on both management planning's ability to reach a substantial portion of private landowners and its influence on those landowners' behaviors. The Watershed Agricultural Council used a region heavily invested in management planning, the New York City Watershed, as a case study to examine the impact of forest management plans on the implementation of silvicultural practices during timber harvests on family forests. We expanded on field data collected from previous research to evaluate 123 timber harvests over a span of 10 years. We used standing tree and stump data to assess pre- and post-harvest conditions, and then used both a decision-tree and numerical scoring system to evaluate harvest types and whether or not sustained yield management principles were applied. Properties with management plans did not have significantly different management from those without written plans. Combined with previous research, this study suggests that free, voluntary management plans are not effective at improving stewardship practices on family forestland. Even if they were, the current pace of plan adoption cannot keep up with trends in ownership transfer and parcelization.

Introduction

Forest management planning on private forestland is a cornerstone practice for promoting long-term stewardship. Management planning support ranks among the most common financial incentive programs (Jacobson et al. 2009). From 1991 to 2006, the USDA Forest Service's Forest Stewardship Program produced more than 270,000 management plans for more than 31 million acres of family forests (USDA Forest Service 2012). Often, management planning is a prerequisite for additional landowner financial assistance. Sixteen states require a written management plan before a landowner can participate in preferential property tax programs for forestland (Hibbard et al. 2003).

Despite the extensive time and money spent promoting and subsidizing management plan plans, recent studies have questioned their ability to meaningfully affect private forest conservation. Butler (2008) found that only 4% of US family forest owners have written management plans, despite decades spent promoting them. Caron et al. (2012) found no statistically significant difference in forest stocking between properties with and without management plans. Similarly, VanBrakle et al. (2013) found no significant difference in water quality Best Management Practice implementation between properties with and without plans. This result led the researchers to question the value of subsidizing management plans for organizations emphasizing water quality protection.

Although these studies raise concerns about management planning, none specifically examine timber harvesting practices. Do more sustainable harvests occur on family forest properties with written management plans than on properties without plans? To answer this question, we examined the New York

City (NYC) Watershed as a case study. The NYC water supply system is the largest unfiltered municipal surface water system in the U.S., providing over 1.3 billion gallons of water daily to the greater metropolitan area as well as several upstate communities (Galusha 2002). Its primary water supply systems, the Catskill/Delaware Watersheds, are 78% forested, of which 75% is in family forest ownership (Figure 1) (Hall et al. 2008). Because of the dominant family forest role, forest management planning has become a foundational method for engaging regional landowners.

The Watershed Agricultural Council (WAC), a non-profit group based in the NYC Watershed, shares the cost of writing "Watershed Forest Management Plans" (WFMPs). Available to private landowners with at least 10 acres of forestland, the program offsets costs associated with hiring a consulting forester to develop the plan. In most cases, funding covers the full cost of the WFMP. While WAC incentivizes plan creation, implementation is voluntary (WAC 2009a). Between 1996 and 2009, over 800 plans encompassing more than 140,000 acres, over 13% of the Catskill/Delaware Watersheds' total area, received funding (WAC 2009b).

Combining existing datasets with additional field work, we compared the implementation of sustained yield management on properties with and without forest management plans. We defined sustained yield management using the definition from Helms (1998): "The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources without impairment of the productivity of the land." Because of the complexity of evaluating all of the "various renewable resources," for this study we focused on just one of these – timber.

The results of this evaluation will help inform debate about management plan efficacy and assist organizations and agencies that promote management plans in deciding whether to continue current efforts or redirect funding to alternative programs.

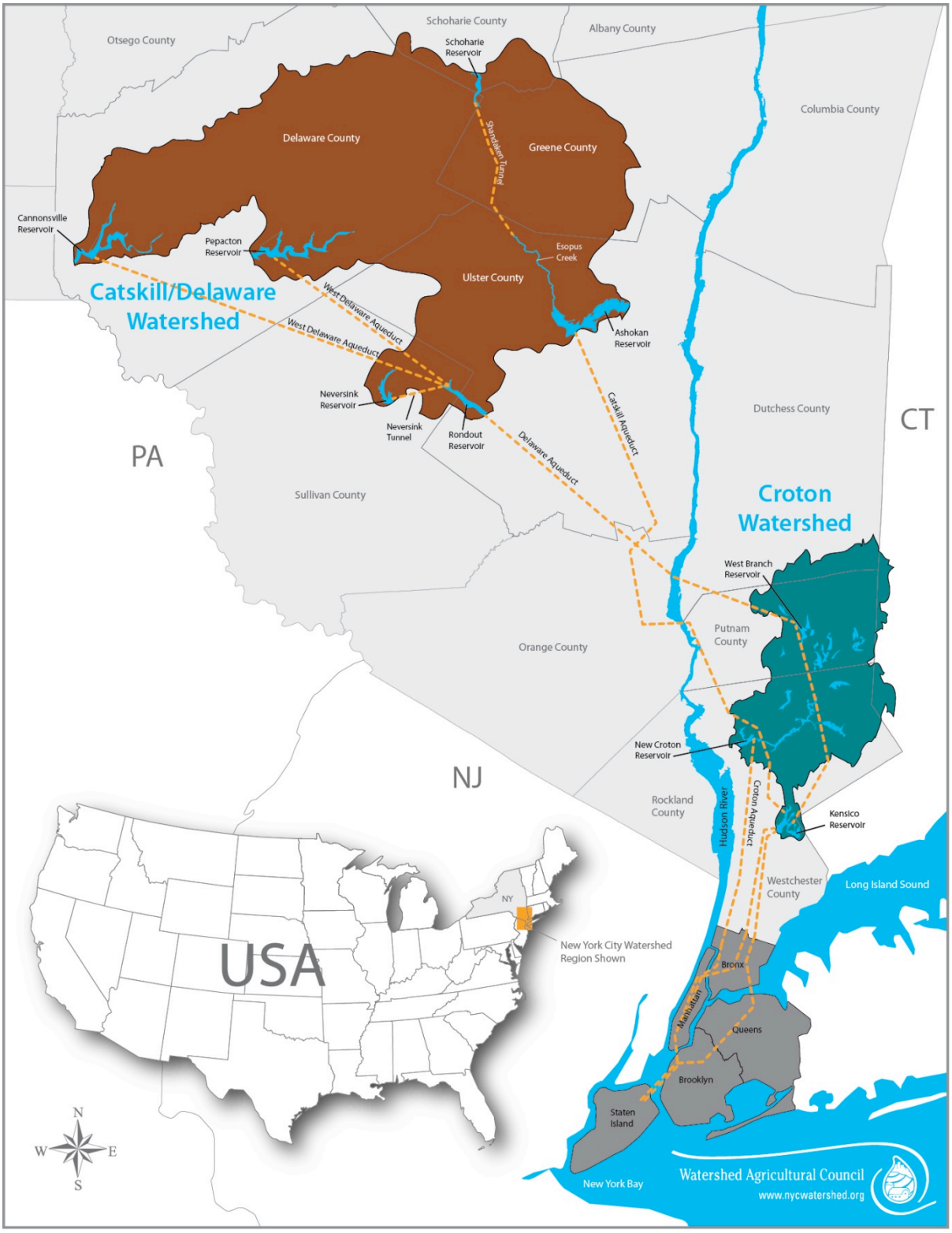

Figure 1. The New York City water supply system.

Methods

The population for this case study included nonindustrial private forest (NIPF) owners with at least 20 contiguous acres of forestland within the NYC Watershed. Because the study involved private owners, permission was required to visit a property. To obtain permission, we mailed 3,350 tri-fold brochures with detachable reply cards asking for landowner contact information, confirmation that they were willing to have researchers visit their property, whether a timber harvest (other than firewood for personal use) occurred on their property in the past five years and, if so, the year it took place. The harvest requirement was included to facilitate evaluation. Seven hundred fifty-two cards were received, for a response rate of 22%. Of these, 172 (23%) indicated they had conducted a timber harvest in the past five years.

The need to obtain permission from landowners impacts the generalizability of research results. It is possible that landowners who feel their job will meet the researchers' approval will be more likely to submit their property for study. Anecdotal conversations with participating landowners indicated that this issue may be less problematic than it appears. While many landowners were indeed proud of their land and work done on it, others indicated they volunteered because they felt the harvest had not gone well and viewed our research as an opportunity to receive an objective opinion. In addition, because New York has no Forest Practice Law and researchers were not affiliated with regulatory agencies, landowners did not need to be concerned with any regulatory reprisals for volunteering their properties. That said, a truly random sample was not possible and results should be considered accordingly.

Our sample built on previous data gathered for Munsell et al. (2008), which included evaluations of 50 properties also from the NYC Watershed region. These properties were harvested between 2001 and 2005. We expanded that dataset by visiting an additional 76 properties in the summer and fall of 2011. Of these, 73 had data collected – the remaining three were disqualified during the visit for a lack of harvest – providing a total of 123 harvests spanning from 2001 to 2011. Of these, 66 had written management plans and 57 did not. We deliberately over-sampled properties with plans relative to the overall population in order to have roughly equal numbers in each group. We determined if properties had written management plans using WAC's database and by asking the landowners when we contacted them to schedule our visit to their property.

Our field methods followed those of Munsell et al. (2008). We used a systematic sampling method, installing transects that covered the harvest. We installed a minimum of ten $1/10^{th}$ acre fixed area plots. Additional plots were installed if margin of error of basal area per plot was over 20%, according to the technique used in Munsell et al. (2008). To facilitate field work and avoid inconveniencing property owners, we only ever spent one day at any given property.

At each plot, we measured all standing trees six inches or larger, recording species, diameter-at-breast-height (dbh), condition (acceptable or unacceptable growing stock), and either the number of 16-foot logs if the tree had any or 8-foot bolts if it did not. We defined acceptable growing stock (AGS) as a tree of a commercial species that currently or at some point in its life would yield at least one Grade 2 sawlog as defined by the USDA Forest Service. In addition, we measured all stumps six inches and greater located within each plot, recording species and stump diameter. We converted stump diameter to dbh using conversion factors developed for the Catskill region for Munsell et al. (2008).

We assessed the use of sustained yield management by comparing pre- and post-harvest stand conditions. Post-harvest conditions were determined using only standing trees. We determined pre-harvest conditions by combining the standing tree and stump data to extrapolate what our plots would have looked like prior to harvest.

We evaluated whether or not sustained yield management had occurred through two methods. First, we used the "decision tree" framework developed by Fajvan et al. (1998) to evaluate harvests in West Virginia. The decision tree uses pre- and post-harvest inventory data to separate harvests into one of six types divided between two categories. "Shelterwood, low thinning, and seed tree," "crown thinning," and "clearcut" are all considered "silvicultural" cuts. By contrast, "sawtimber potential," (will produce a viable sawtimber harvest in 10-15 years) "fiber potential," (sawtimber potential exhausted, but could yield a viable pulpwood harvest in 10-15 years) and "regenerate stand" (both sawtimber and pulpwood potential exhausted for this rotation) are considered "nonsilvicultural" (Figure 2).

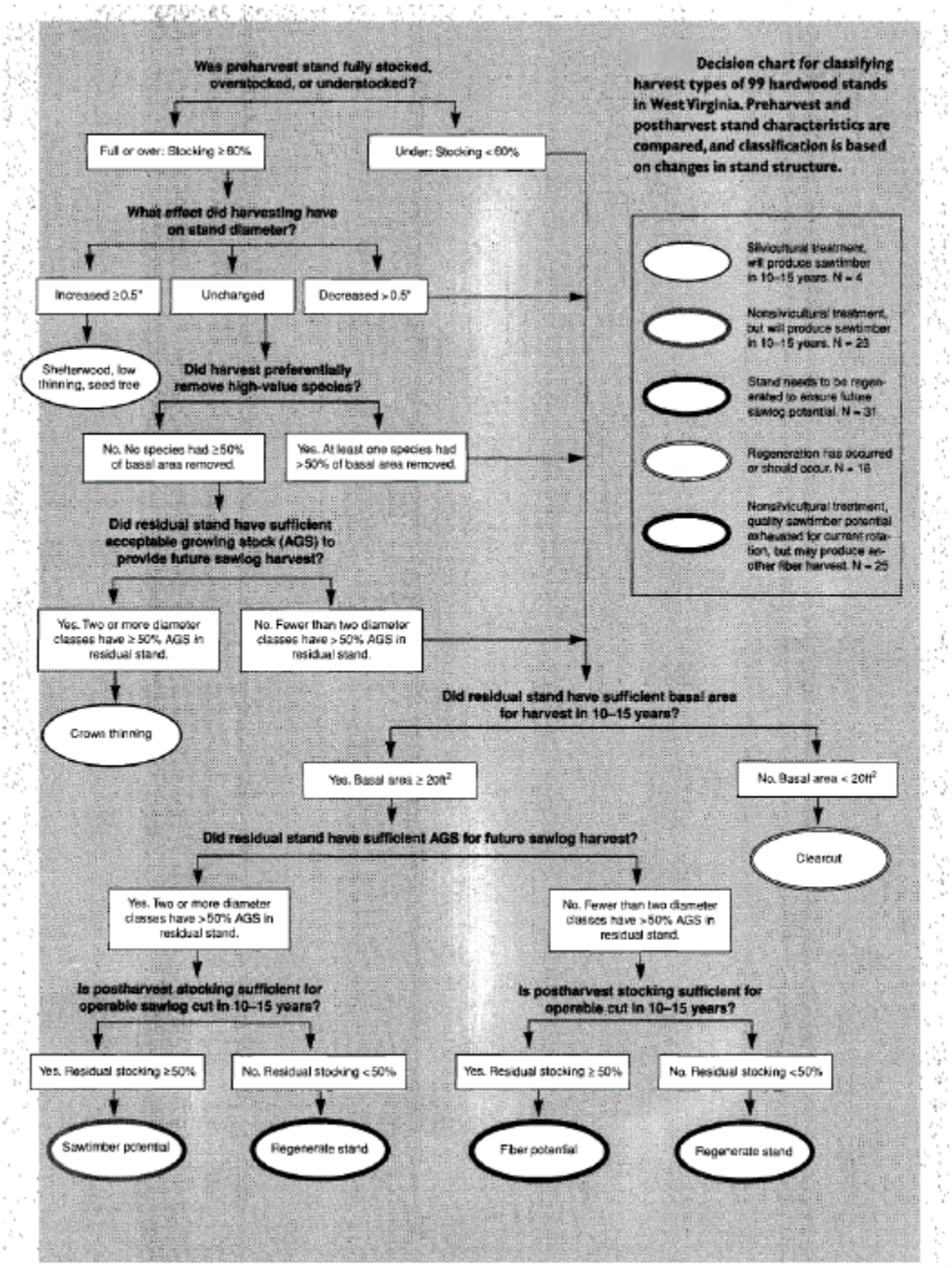

Figure 2. Decision-tree set-up (copied from Fajvan et al. 1998).

Because the decision tree is descriptive, it does not allow for statistical comparisons between groups. To obtain numerical scoring that would allow for such testing, we also evaluated the properties using a system based on that from Munsell et al. (2008). This scoring system assesses seven criteria identified in forestry literature as recommendations when implementing silvicultural operations. The first five criteria came from Munsell et al. (2008) and emphasize pre- and post-harvest relative density, relative density removed, change in quadratic stand diameter, sawtimber removed, and poletimber removed. The two additional criteria further help differentiate between silvicultural operations and those that focus simply on extracting value, such as high-grading. Criterion six assesses change in the stocking of high value species. We defined "high value" as the top six economically valuable species based on regional stumpage prices to follow Fajvan et al. (1998). Criterion seven assesses the stand's future potential by examining the post-harvest relative density in AGS (Table 1). Scores were based on the following system:

0: the harvest did not meet the criterion, indicating a negative change
0.5: the harvest moderately addressed the criterion (not all criteria had a middle level)
1: the harvest met the criterion, indicating a positive change

The score for an individual harvest was the sum of all seven criteria scores. As a result, harvest scores could range from 0 to 7, with 0 representing a worst case and 7 representing a best case. The scoring system was only designed to evaluate even-aged thinning operations, rather than uneven-aged or regeneration cuts. Since no uneven-aged or regeneration harvests were observed, every property could be evaluated using the seven-criteria system.

Scores between groups were compared using analysis of variance (ANOVA). We divided the sample into four groups using a 2x2 factorial format, separating them out by presence or absence of a plan and by year sampled (2005 or 2011). We also conducted a t-test comparing cuts considered silvicultural or unsilvicultural according to the decision tree. We did this as a way of checking the validity of the seven-criteria scoring system. We hypothesized that if the scoring system were robust, we should see significantly higher scores among silvicultural cuts compared with nonsilvicultural ones. Finally, we also conducted a t-test comparing properties with management plans and enrolled in New York State's Forest Tax Law Program (480-a) with properties that had plans but were not enrolled in the program. 480-a enrollment information was not available for properties visited in 2005, so only properties visited in 2011 were evaluated in that comparison. ANOVA analyses were conducted using Statistical Analysis Systems (SAS), while t-tests were conducted using Microsoft Excel. Statistical tests were considered significant if the p-value was less than 0.05.

Criterion	Score of 0	Score of 0.5	Score of 1	Source(s)
Pre-harvest relative density (RD)	< 80%	N/A	≥ 80%	Marquis et al. (1992); Munsell et al. (2008)
Post-harvest RD, and total stocking removed	Post harvest RD < 60%, and harvested RD > 35% of Pre-harvest RD	Post harvest RD < 60%, or harvested RD > 35% of Pre-harvest RD	Post harvest RD ≥ 60%, and harvested RD ≤ 35% of Pre-harvest RD	Marquis et al. (1992); Munsell et al. (2008)
Change in quadratic stand diameter (QSD)	QSD reduced > 0.5 in.	QSD reduced ≥ 0.25 in. but ≤ 0.5 in.	QSD reduced < 0.25 in.	Roach (1977); Munsell et al. (2008)
Sawtimber Removals	> 35% preharvest basal area removed	N/A	≤ 35% preharvest basal area removed	Nyland (1994); Munsell et al. (2008)
Pole Removals	< 20% preharvest basal area removed	N/A	≥ 20% preharvest basal area removed	Nyland (1994); Munsell et al. (2008)
Stocking in High Value Species	At least one high value species had >50% of basal area removed	N/A	No high value species had >50% of basal area removed	Fajvan et al. (1998)
Acceptable Growing Stock (AGS) RD	AGS RD < 35%	AGS RD ≥ 35% but < 45%	AGS RD ≥ 45%	Marquis et al. (1992); Nyland (2002)

Table 1. Scoring criteria and associated levels used to evaluate sustained yield management and the sources used to derive them. Scores of "0" indicate failure to meet the criterion and a negative impact, scores of "0.5" indicate moderate implementation of the criterion, and scores of "1" indicate full implementation of the criterion and a positive impact. Not all criteria had a middle level; these are indicated by "N/A" in the "Score of 0.5" column.

Results

Although the Fajvan et al. (1998) decision tree is only descriptive, a breakdown of harvest types between properties with and without management plans shows minimal differences (Figure 2). About one third of all harvests in both groups were considered silvicultural, and all of those were classified as crown thinning. Neither group had any regeneration cuts – shelterwoods, seed-trees, or clearcuts.

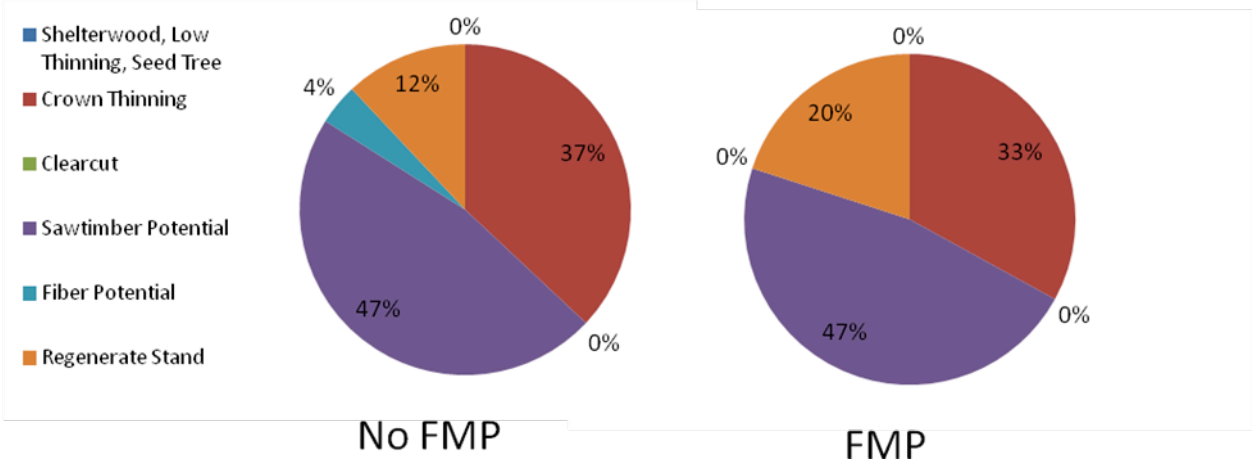

Figure 2. Harvest types based on Fajvan et al.'s (1998) decision tree for properties with (n=66) and without forest management plans (FMPs) (n=57).

The seven-criteria scoring system was effective at differentiating between silvicultural and non-silvicultural operations. The t-test comparing silvicultural and non-silvicultural cuts was highly significant (p-value <0.0001). Mean scores for silvicultural cuts were 4.8, while scores for unsilvicultural cuts averaged 2.6. In addition, no nonsilvicultural cut earned a score higher than 5, and only one silvicultural cut scored below 3. This distribution allows the scoring range to be distilled into three categories:

Score of 0 – 2.9: Unsustainable
Score of 3 – 5: Indeterminate
Score of 5.1 – 7: Sustainable

ANOVA results showed significant improvement in sustained yield management scores from 2005 to 2011 (p-value=0.0109). The mean score in 2005 was 2.9, while the mean in 2011 was 3.7. The biggest change was evident in the "sustainable" range of the scores. While only about 5% of properties evaluated in 2005 scored above 5, in 2011, over 20% met that benchmark, a four-fold increase (Figure 3).

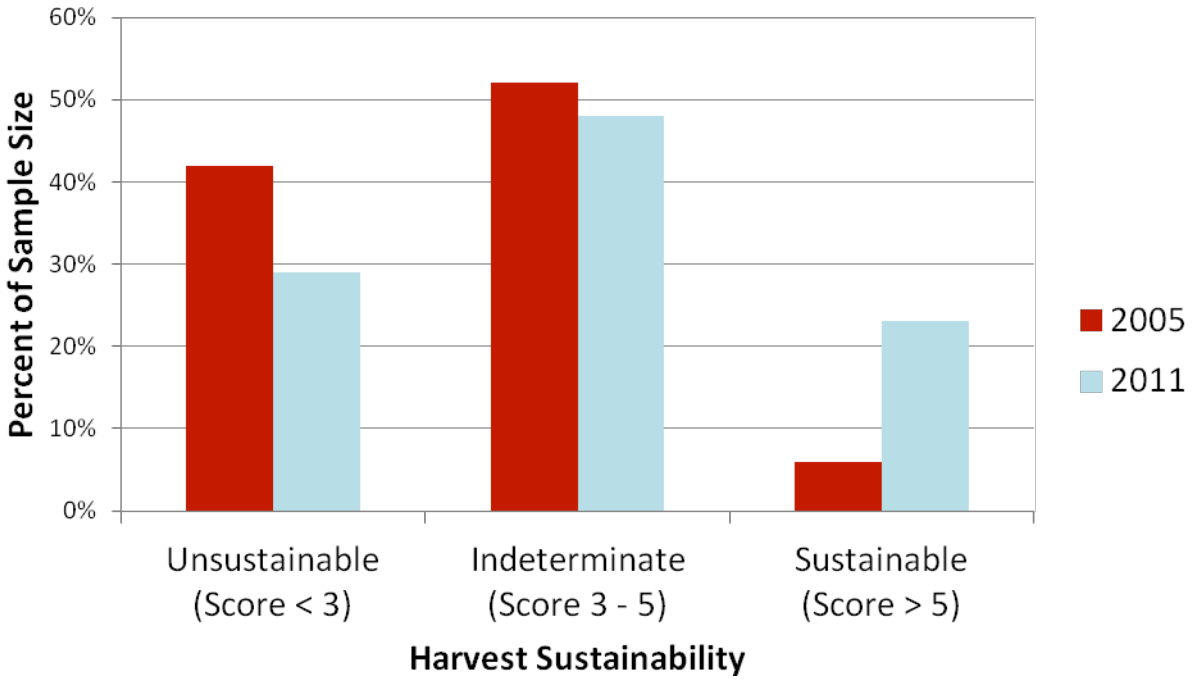

Figure 3. Distribution of seven-criteria sustained yield management scores based on year sampled – 2005 (n=50) and 2011 (n=73).

In contrast to year sampled, there were no significant differences between properties with and without management plans (p-value=0.79). The mean score for properties with plans was 3.3, while the mean for those without plans was 3.4. The distribution of scores among the three levels of unsustainable, indeterminate, and sustainable also indicates a lack of difference (Figure 4). In both groups, slightly less than 20% of properties examined scored in the "sustainable" range.

Although there was no significant difference between properties with and without forest management plans, enrollment in 480-a yielded a significant improvement (p-value=0.017). Properties with management plans enrolled in 480-a had a mean score of 4.4 (n=23), the highest of any group examined in this study. By contrast, properties with management plans but not enrolled in 480-a had a mean score of 2.9 (n=11).

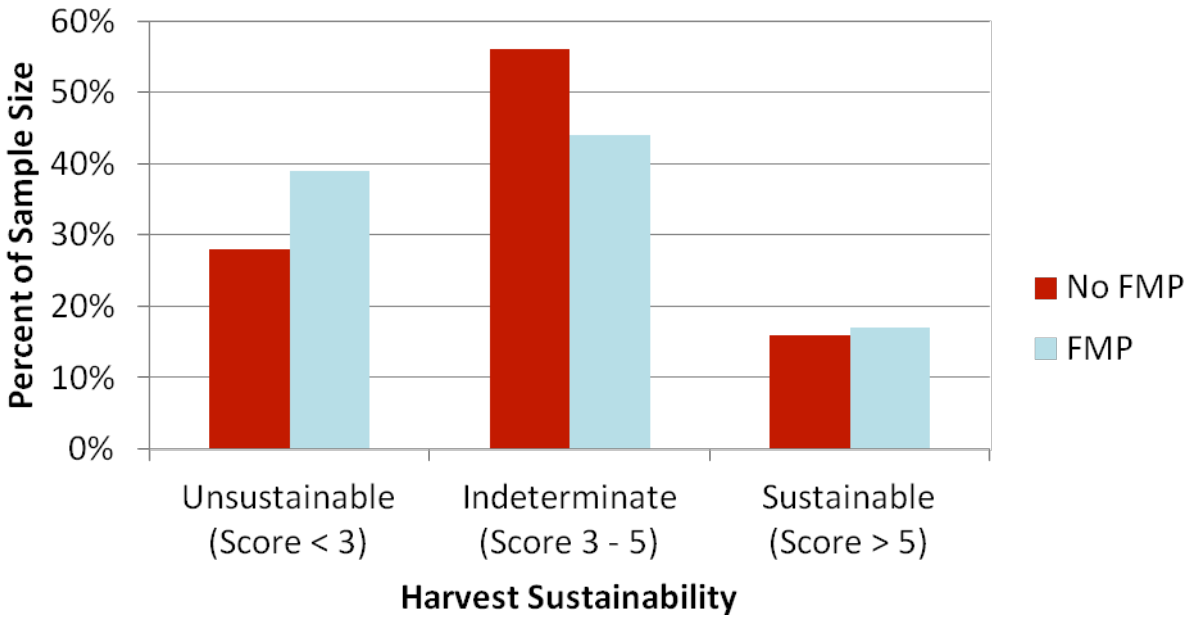

Figure 4. Distribution of seven-criteria sustained yield management scores based on presence (n=66) or absence (n=57) of a forest management plan (FMP).

Discussion

While the data indicate that significant improvement in sustained yield management took place from 2005 to 2011, it is unclear from this study what caused that improvement. There are too many potential factors to consider, among them education efforts by WAC and other environmental organizations, changing public sentiment, and reduced stumpage prices resulting from the housing crisis of 2007-2009. Although the source of this improvement may be an area for future examination, it was beyond the scope of this study to examine.

Whatever caused the improvement from 2005 to 2011, however, management plans do not appear to be the source. There were minimal differences between properties with and without management plans, indicating that these plans were ineffective at improving on-the-ground management practices. That said, properties enrolled in 480-a, which requires a management plan, had the highest scores of any group evaluated. 480-a provides a property tax break to landowners in exchange for those landowners' following an approved management plan and agreeing not to subdivide or sell their property. The law requires a rolling 10-year commitment and has some of the highest non-compliance penalties among similar laws across the U.S.

The higher scores for 480-a properties combined with the lack of significant difference between properties with and without management plans indicates that free, voluntary management plans as currently enacted by WAC do not produce more sustainable timber harvests. Combined with the results of Caron et al. (2012) and VanBrakle et al. (2013), it is clear that management planning as currently conducted is neither helping protect water quality nor improving forest sustainability over what would have happened otherwise.

WAC's forest management planning program as enacted is helpful in one way in that it may encourage enrollment in 480-a. Although 480-a requires a management plan to enroll, landowners must obtain that plan at their own expense – an upfront cost that can easily measure in the thousands of dollars. WAC's management planning program removes that barrier to entry, because its typically free plans satisfy all of 480-a's requirements. One way WAC could improve its management planning efforts is simply by focusing resources on where they are most effective, namely doing more to encourage enrollment in 480-a.

The Regeneration Problem

Although it was not an original goal of the study, an unintentional finding was that a substantial portion of visited stands would be better served by regenerating than trying to continue the present cohort. Based on the Fajvan et al. (1998) decision tree, 16% of properties sampled have been so degraded by poor harvesting that they have exhausted their potential for a sawtimber or even pulpwood harvest and need to be regenerated to become economically viable again. The seven-criteria scoring indicates an even higher percentage based on its measure of post-harvest relative density in AGS. Marquis et al. (1992) recommends that once an even-aged stand falls below 35% relative density in AGS, the landowner is better off regenerating and starting over rather than trying to manage the existing cohort. Nyland (2002) recommends an even high threshold of 45% relative density in AGS as the tipping point for regenerating. Using these thresholds, 44% of properties evaluated need to be regenerated according to Marquis et al. (1992), and 66% according to Nyland (2002).

Despite this need for regeneration harvests, we encountered no such cuts on the over 120 properties examined between 2005 and 2011. This finding is disconcerting not only because of the degraded nature of many Catskills timber stands, but also because of the state of regeneration itself within the region. In their examination of regeneration in New York, Shirer and Zimmerman (2010) found that regeneration of native canopy species was adequate in most of the state – except the Catskill/Lower Hudson region, which had regeneration the researchers considered "fair" or "poor," indicating that regeneration was unlikely absent human intervention. The findings were even more stark when regeneration of desirable timber species was considered – nearly all of the Catskill/Lower Hudson region ranked as "poor" for regeneration of these species (Figure 5). Combined with the findings of the present study, the conclusions of Shirer and Zimmerman (2010) raise doubt on whether or not, given the lack of both regeneration and regeneration harvests, the Catskills will be able to sustain their working forest landscape over the course of the 21st century.

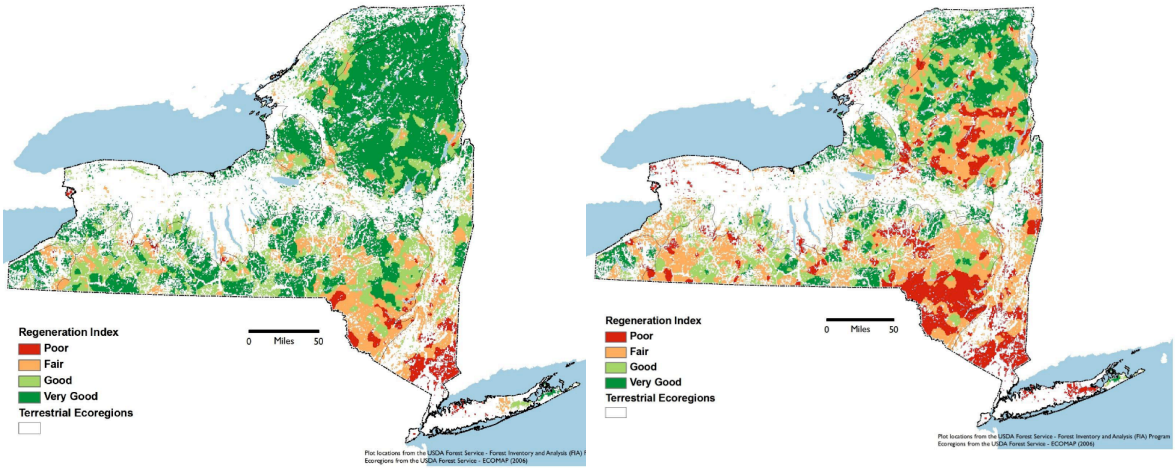

Figure 5. Regeneration index values in New York State for native canopy species (left) and desirable timber species (right) (copied from Shirer and Zimmerman 2010).

Conclusions and Management Implications

Combined with the results of previous studies, this research casts doubt on the ability of free, voluntary forest management plans to meaningfully affect either water quality or forest sustainability. Although management plans have been shown to increase landowner knowledge and interest in forest stewardship (Laford and Parker 1988), that increased knowledge does not appear to translate to better practices on the ground.

Even if management plans had been found to be effective, a shift in forestry's approach to them is still warranted. The traditional model of management planning has yielded plans on only a small fraction of the private forest landscape. Operating under the status quo, Kittredge (2009) estimated that over 140 years will be required to reach every landowner. In the New York City Watershed, even that amount of time is insufficient. Indeed, WAC's current approach cannot plan fast enough to keep pace with the number of landowners and the rate of ownership transfer. WAC geospatial analyses estimate that 9,000 landowners are eligible for the organization's Forest Management Plan Program. Since WAC plans have a ten-year lifespan, WAC would need to fund 900 plans per year in order for every eligible landowner to have a current plan – over a tenfold increase from current expenditures. This rate also does not account for parcelization and ownership transfer, which exacerbate the problem by increasing the number of landowners and requiring a new management plan when a new landowner acquires a property. Already the rate of parcelization in the NYC Watershed surpasses the national average (LaPierre and Germain 2005), and ownership tenure for forest landowners in the region is only 17 years, also below the national average (Caron et al. 2012).

Absent an enormous increase in funding, WAC's existing management planning structure cannot meaningfully impact regional forest stewardship. To increase its effectiveness, WAC will need a paradigm shift in its approach to planning and landowner education that enables it to reach more landowners at a smaller cost per contact.

One bright spot for WAC's existing program is that it does facilitate enrollment in 480-a, which this research found positively impacted forest sustainability. WAC gains other benefits from 480-a enrolled properties as well, such as restricting development and parcelization without having to purchase development rights. Changes to WAC's management planning efforts should strive not to lose this benefit and, if anything, should encourage even greater participation in this program.

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Annex 3: Spatial Analysis of NIPF in the NYC Watershed

Spatial Analysis of NIPF's in the NYC Watershed

Effective conservation programs require an understanding of the target audience. The target audience for forest management planning is private landowners in the NYC Watershed who own woodlands, also called Non-Industrial Private Landowners, or NIPF. The goal of this analysis is to gain spatial knowledge of NIPFs in the NYC Watershed.

Methodology

Study Area

The study area is the 3 reservoir systems of the NYC Watershed totaling 1,262,063.2 acres; the Catskill and Delaware systems (West of Hudson) representing 80.3% of the NYC watershed at 1,013,953.0 acres, and the Croton (East of Hudson) representing 19.7% of the NYC Watershed at 248,110.2 acres.

System*	Basin	Acres	% of NYC Watershed
West of Hudson	Catskill & Delaware	1,013,953.0	80.3%
East of Hudson	Croton	248,110.2	19.7%
		1,262,063.2	**100%**

*For the purposes of this analysis, all watershed lands East-of-Hudson are referred to as the Croton.

This includes the watershed portions of the 8 watershed counties; Delaware, Dutchess, Greene, Putnam, Schoharie, Sullivan, Ulster, and Westchester. Fairfield County in Connecticut was excluded from the analysis due to data insufficiencies, however the effect of this is minimal as Fairfield County represents 1.1% of the NYC watershed. The following table provides geographic statistics for each County with respect to the NYC Watershed.

County*	Total Acres	Watershed Acres	% In Watershed	% Of Watershed
Delaware	938,860.4	502,670.2	53.5	39.8%
Dutchess	527,657.6	20,491.0	3.9	1.6%
Greene	420,836.5	199,849.5	47.5	15.8%
Putnam	157,433.6	92,376.5	58.7	7.3%
Schoharie	400,547.6	35,414.1	8.8	2.8%
Sullivan	637,430.2	45,043.7	7.1	3.6%
Ulster	742,766.3	230,976.5	31.1	18.3%
Westchester**	319,966.4	58,114.9**	37.9**	4.6%
	4,145,498.6	**1,184,936.4**	**28.6%**	**93.8%**

**Does not include Fairfield County.*

***Represents only the municipalities with complete tax parcel data. Actual values are higher. See explanation below.*

Data Limitations

The tax parcel dataset was incomplete for Westchester County. Several municipalities had no landowner information and had to be omitted from the analysis. This analysis includes 47.8% of the Westchester portion of the NYC Watershed, while omitted municipalities represent 5.1% of the NYC Watershed. The following table shows status of the Westchester County analysis by municipality.

Municipality	Total Acres	Watershed Acres	% of NYC Watershed	% of Westchester Watershed	Included in Analysis
Bedford	25,321.3	21,643.5	1.7%	17.8%	Yes
Cortlandt	32,277.9	3,744.1	0.3%	3.1%	Yes
Harrison	11,103.8	788.4	0.1%	0.6%	No
Lewisboro	18,731.4	14,160.2	1.1%	11.7%	No
Mount Kisco	1,979.1	1,979.1	0.2%	1.6%	Yes
Mount Pleasant	20,980.8	2,045.5	0.2%	1.7%	No
New Castle	15,023.9	9,824.1	0.8%	8.1%	Yes
North Castle	16,711.4	4,904.5	0.4%	4.0%	No
North Salem	14,849.8	14,721.6	1.2%	12.1%	No
Pound Ridge	14,788.3	6,039.6	0.5%	5.0%	No
Somers	20,553.6	20,506.6	1.6%	16.9%	No
White Plains	6,322.5	21.6	0.0%	0.0%	No
Yorktown	25,235.8	20,924.1	1.7%	17.2%	Yes

Total data limitations, comprised of Westchester and Fairfield Counties, resulted in the omission of 6.2% of the NYC Watershed. While not included in the business plan, staff can extrapolate NIPF in the omitted regions using data from other Westchester municipalities. The result is an estimated 5,359 NIPF's owning 32,085.8 acres that were omitted from the analysis, bringing the unofficial watershed total to an estimated 36,342 land owners owning 671,061.2 acres. This number will not be highlighted in the report, but it points to the need for further analysis pending the necessary data that can be addressed in the marketing plan.

Other data limitations from this GIS procedure include a known error resulting in a 0.6% and 1.9% overestimation of small landowners (412) and their cumulative acreages (483). The estimate of error was determined by rerunning a modified version of the GIS workflow for Dutchess County, and then extrapolating across the other Counties. These errors are within acceptable range for the objectives of this analysis.

Defining NIPF

Private land was determined by deleting all non-private lands from the County datasets including lands owned by Towns, Villages, Cities, New York State, New York City, the Federal Government, Schools, Transportation Entities, and Utility Lines. Due to the sheer size of the datasets, parcels less than 0.25 acres were deleted.

NIPF was defined as landowners owning the minimum equivalent of the Forest Service definition of forestland; at least 1 contiguous acre of forest with 10% stocking. Forest cover was derived from 2001 National Land Cover Database (NLCD) data; all forest types were included.

Woodland acres represent the total amount of woodland owned by NIPF's. *Landowners* represent actual ownership – parcels were merged on common mailing addresses. This was accomplished by manually correcting all remaining records in the County datasets.

Results and Discussion

Overview

The following chart is a summary of NIPF property in the watershed.

Size Class	Landowners	%	Woodland Acres	%	Ave. Ac.	Median Ac.
1-9	21,913	70.7	79,365.5	12.4	3.6	2.9
10-49	6,119	19.7	135,957.4	21.3	22.2	18.6
50+	2,956	9.5	423,652.5	66.3	143.4	97.6
	30,983		**638,975.4**			

The total number of NIPF's is 30,983 with a cumulative woodland acreage of 638,975.4 acres. Ownership size was broken into 3 categories; 1-9 acres, 10-49 acres, and 50+ acres. These intervals were chosen to represent current program eligibility (greater than 10 acres), 480-a eligibility (greater than 50 acres) and the Forest Service definition of forest (at least 1 acre).

Approximately 66% of the forest is owned by 10% of the landowners, and approximately 90% of the landowners only own 33% of the forest.

Approximately 30% of the NIPF owning 90% of the forest are currently eligible for WAC cost-share money for forest management planning, with the remaining 70% of landowners owning too few acres to be eligible.

Landowners Living Abroad

As seen in the chart below, there are 51 NIPF's from 20 other Countries or Territories owning 1,577.1 woodland acres. They represent 0.16% of landowners and 0.02% of woodland acres. This speaks to the diversity of the watershed NIPFs.

Country/Territory	Landowners	Woodland Acres
Bermuda	1	54.6
Brazil	1	150.7
Canada	4	251.8
China	1	1.5
Croatia	1	5.5
Ecuador	1	5.2
England	13	137.1
Germany	5	415.3
Greece	1	2.1
Guam	1	6.1
Israel	2	23.3
Japan	3	137.9
Philippines	1	5.3
Puerto Rico	3	19.4
South Korea	1	157.6
Spain	2	84
Switzerland	3	68
Thailand	1	4.8
Virgin Islands	1	6.5
Bermuda	1	54.6
	51	**1,577.1**

Landowners by State

People who own woodlands in the NYC Watershed live in 49 states (including D.C), the highest proportion of which live in New York at 87.2% (26,964 landowners) and own 80.9% (515,501 acres) of the woodlands. The only states with no representation were Arkansas and Mississippi.

State	Landowners	%	Woodland Acres	%	Average
Alabama	7	0.0%	149	0.0%	21.2
Alaska	2	0.0%	72	0.0%	35.8
Arizona	34	0.1%	460	0.1%	13.5
California	124	0.4%	5,595	0.9%	45.1
Colorado	25	0.1%	260	0.0%	10.4
Connecticut	382	1.2%	8,929	1.4%	23.4
Delaware	15	0.0%	547	0.1%	36.5
District of Columbia	9	0.0%	1,913	0.3%	212.6
Florida	422	1.4%	9,478	1.5%	22.5
Georgia	26	0.1%	539	0.1%	20.7
Hawaii	5	0.0%	54	0.0%	10.7
Idaho	1	0.0%	5	0.0%	5.4
Illinois	27	0.1%	785	0.1%	29.1
Indiana	6	0.0%	218	0.0%	36.4
Iowa	7	0.0%	443	0.1%	63.3
Kansas	2	0.0%	23	0.0%	11.7
Kentucky	7	0.0%	1,326	0.2%	189.4
Louisiana	8	0.0%	271	0.0%	33.8
Maine	11	0.0%	232	0.0%	21.1
Maryland	60	0.2%	9,025	1.4%	150.4
Massachusetts	106	0.3%	2,687	0.4%	25.4
Michigan	14	0.0%	163	0.0%	11.6
Minnesota	4	0.0%	167	0.0%	41.8
Missouri	4	0.0%	21	0.0%	5.3
Montana	2	0.0%	15	0.0%	7.3
Nebraska	1	0.0%	1	0.0%	1.3
Nevada	15	0.0%	836	0.1%	55.7
New Hampshire	27	0.1%	714	0.1%	26.5
New Jersey	2,098	6.8%	57,928	9.1%	27.6
New Mexico	8	0.0%	112	0.0%	13.9
New York	26,964	87.2%	515,501	80.9%	19.1
North Carolina	65	0.2%	4,043	0.6%	62.2
North Dakota	1	0.0%	39	0.0%	38.8
Ohio	24	0.1%	677	0.1%	28.2
Oklahoma	5	0.0%	158	0.0%	31.6
Oregon	7	0.0%	352	0.1%	50.2
Pennsylvania	164	0.5%	5,438	0.9%	33.2
Rhode	13	0.0%	367	0.1%	28.2
South Carolina	31	0.1%	524	0.1%	16.9
South Dakota	7	0.0%	76	0.0%	10.9
Tennessee	11	0.0%	423	0.1%	38.5
Texas	53	0.2%	1,503	0.2%	28.4
Utah	5	0.0%	127	0.0%	25.3
Vermont	20	0.1%	1,465	0.2%	73.3
Virginia	78	0.3%	2,483	0.4%	31.8
Washington	15	0.0%	1,201	0.2%	80.0
West Virginia	3	0.0%	8	0.0%	2.6
Wisconsin	4	0.0%	35	0.0%	8.7
Wyoming	3	0.0%	10	0.0%	3.3
	30,932	100.0%	**637,395**	100.0%	20.6

The State with the greatest representation is New York with 87.2% of landowners. More significantly is that New Yorkers own only 80.9% of the woodlands, meaning that non-New Yorkers own larger properties than New Yorkers. The State with the 2nd highest representation is New Jersey with 6.8% of landowners owning 9.1% of the woodlands.

Landowners living in New York own an average of 19.1 woodland acres. This is only slightly below the average of 20.6 for all watershed NIPFs, however over two thirds of States have a high average than New York, with more than 25% of States having an average twice that of New York. This indicates that non-resident landowners own larger tracts of woodlands.

NIPF Property by County

The following table is a summary of NIPF property location by County.

		NIPF Landowners	%	Acre	%
Delaware	1-9	5,478	54.1%	24,779.1	7.7%
	10-49	3,000	29.6%	68,800.0	21.4%
	50+	1,649	16.3%	227,832.3	70.9%
		10,127		**321,411.4**	
Greene	1-9	3,679	71.0%	14,385.3	13.6%
	10-49	1,029	19.8%	22,262.3	21.1%
	50+	476	9.2%	68,902.8	65.3%
		5,184		**105,550.5**	
Schoharie	1-9	701	62.0%	3,328.6	13.3%
	10-49	305	27.0%	6,156.2	24.5%
	50+	125	11.1%	15,617.3	62.2%
		1,131		**25,102.1**	
Sullivan	1-9	669	65.8%	2,346.6	8.0%
	10-49	203	20.0%	4,966.0	17.0%
	50+	144	14.2%	21,842.1	74.9%
		1,016		**29,154.8**	
Ulster	1-9	2,814	72.5%	10,363.9	12.1%
	10-49	743	19.2%	16,355.0	19.0%
	50+	322	8.3%	59,224.3	68.9%
		3,879		**85,943.2**	
WoH	**TOTAL**	**21,337**	**69.9%**	**567,162.0**	**28.8%**
Dutchess	1-9	1,116	85.4%	3,499.4	22.0%
	10-49	133	10.2%	2,855.4	17.9%
	50+	58	4.4%	9,559.6	60.1%
		1,307		**15,914.4**	
Putnam	1-9	3,851	88.3%	10,229.6	31.9%
	10-49	400	9.2%	8,458.8	26.4%
	50+	112	2.6%	13,378.6	41.7%
		4,363		**32,067.1**	
Westchester	1-9	3,604	90.6%	10,431.2	43.8%
	10-49	306	7.7%	6,103.6	25.6%
	50+	70	1.8%	7,295.4	30.6%
		3,980		**23,830.2**	
EoH	**TOTAL**	**9,650**	**31.1%**	**71,811.7**	**11.2%**
TOTAL	**TOTAL**	**30,983**		**638,973.7**	

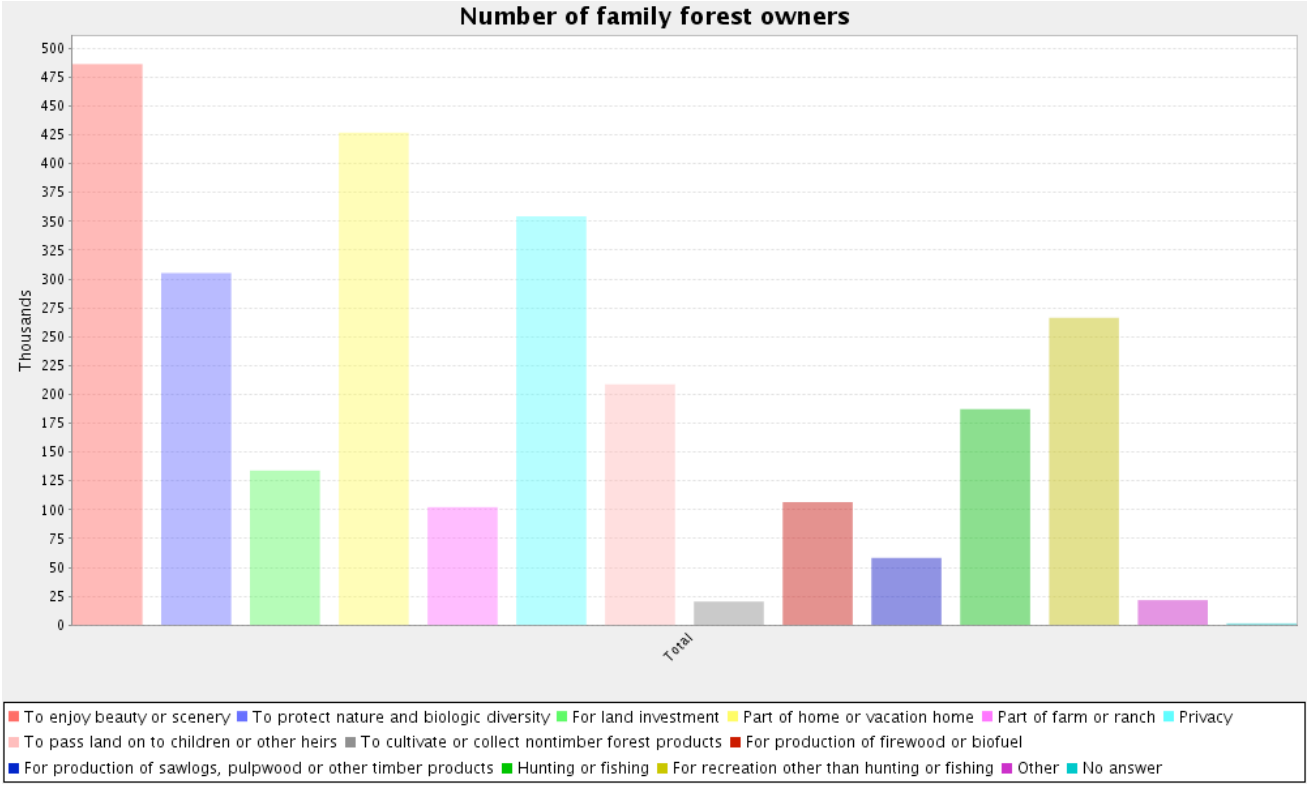
Annex 4: National Woodland Owner Survey Review

National Woodland Owner Survey – reasons for ownership and concerns

Purpose: To help WAC Forestry staff identify what categories, at a minimum, the mass customized management plan website needs to address.

Rationale: A management plan would address not only how to improve the values of forestland (why someone owns it), but also how to mitigate those areas of ownership that worry landowners (concerns). The planning website should account for both of these aspects. The National Woodland Owner Survey (NWOS) provides state-level information on both of these areas.

Reasons New York family forest owners own land (from the NWOS Tablemaker[1]):

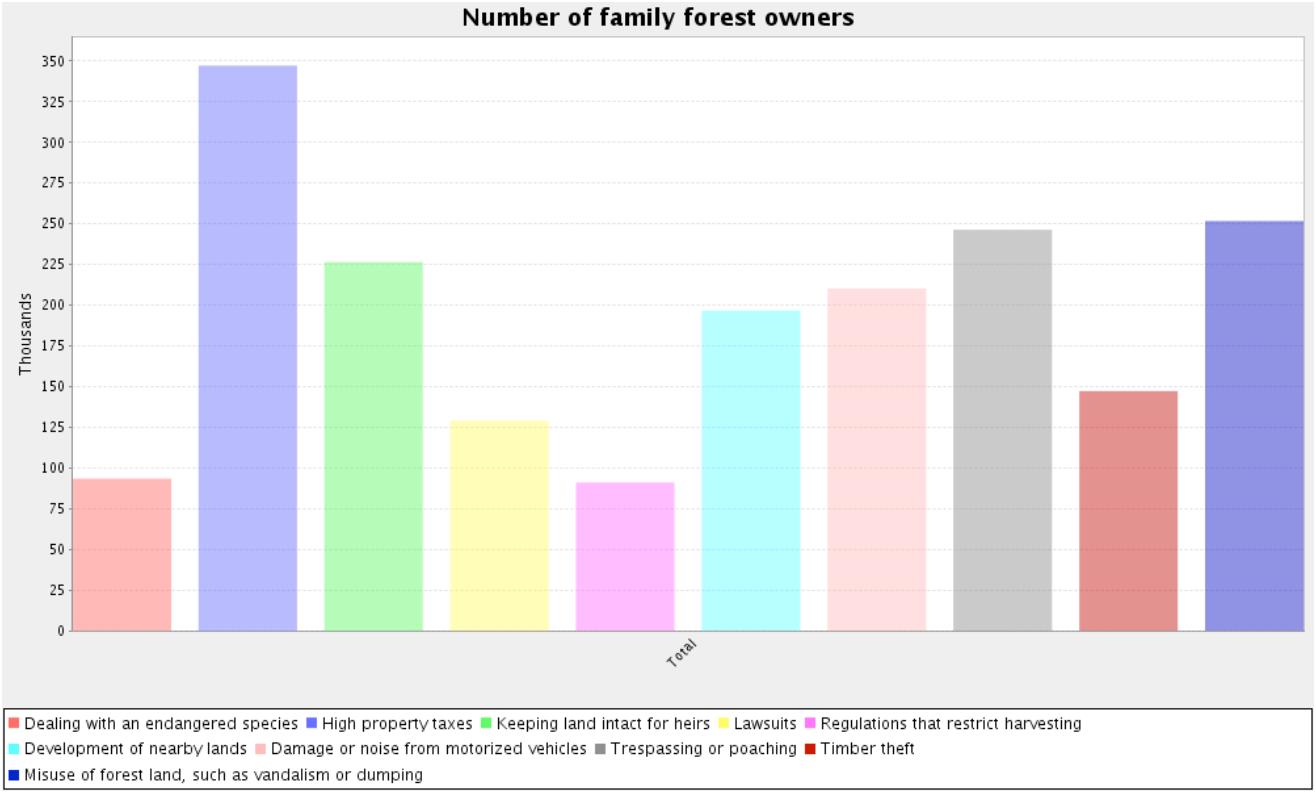


Top reasons:

1. Beauty/scenery
2. Part of home or vacation home
3. Privacy
4. To protect nature and biologic diversity
5. Recreation other than hunting or fishing

[1] I've only included the "owners" versions of these charts (there are also "area" versions). Looking at them, I didn't see any drastic differences between the two, so including just "owners" simplifies the document.

From the NWOS Tablemaker: New York landowners' "sociopolitical" concerns about their forestland

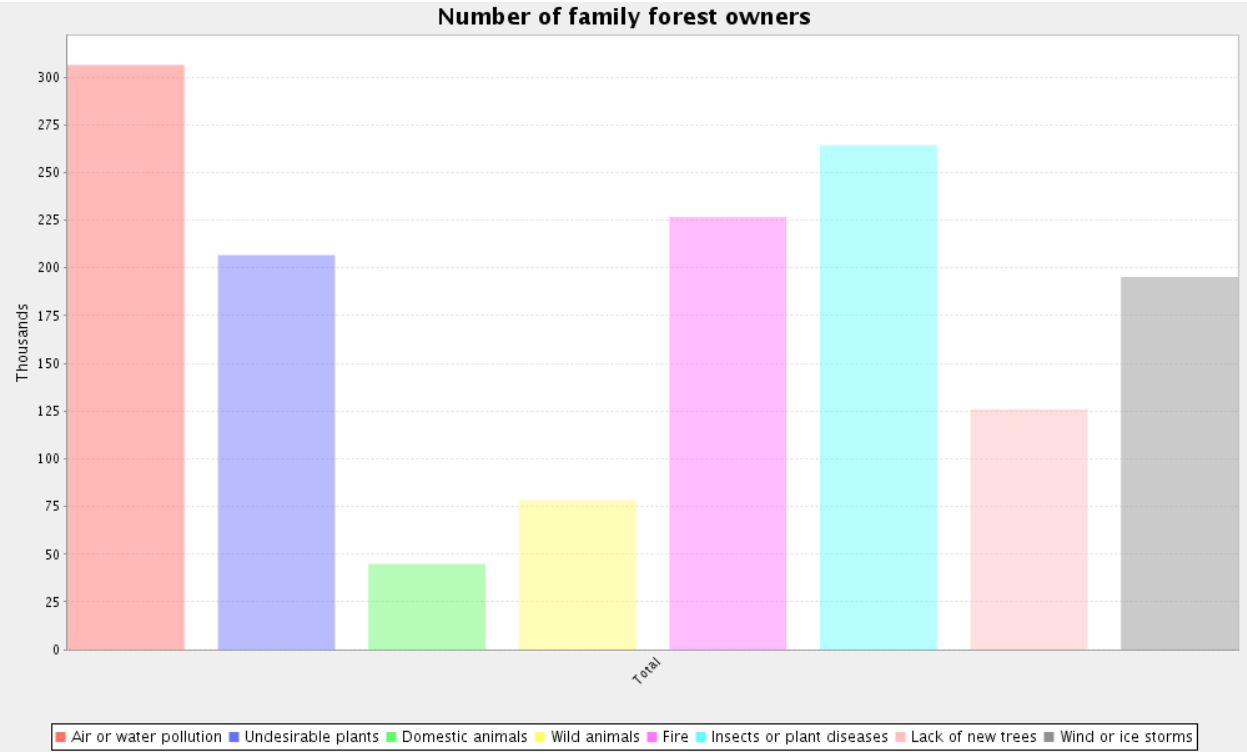


Top 3 sociopolitical concerns of New York landowners:

1. Property Taxes
2. Trespassing
3. Vandalism

Note that although they don't make the top 3, "keeping land intact for heirs," "damage or noise from motorized vehicles," and "development of nearby lands" are also high-level concerns for New York landowners.

Biological concerns of New York landowners:



Top biological concerns for NY landowners include:

1. Air or water pollution
2. Insects or plant diseases
3. Fire
4. Undesirable plants

Combining the two, the top concerns are:

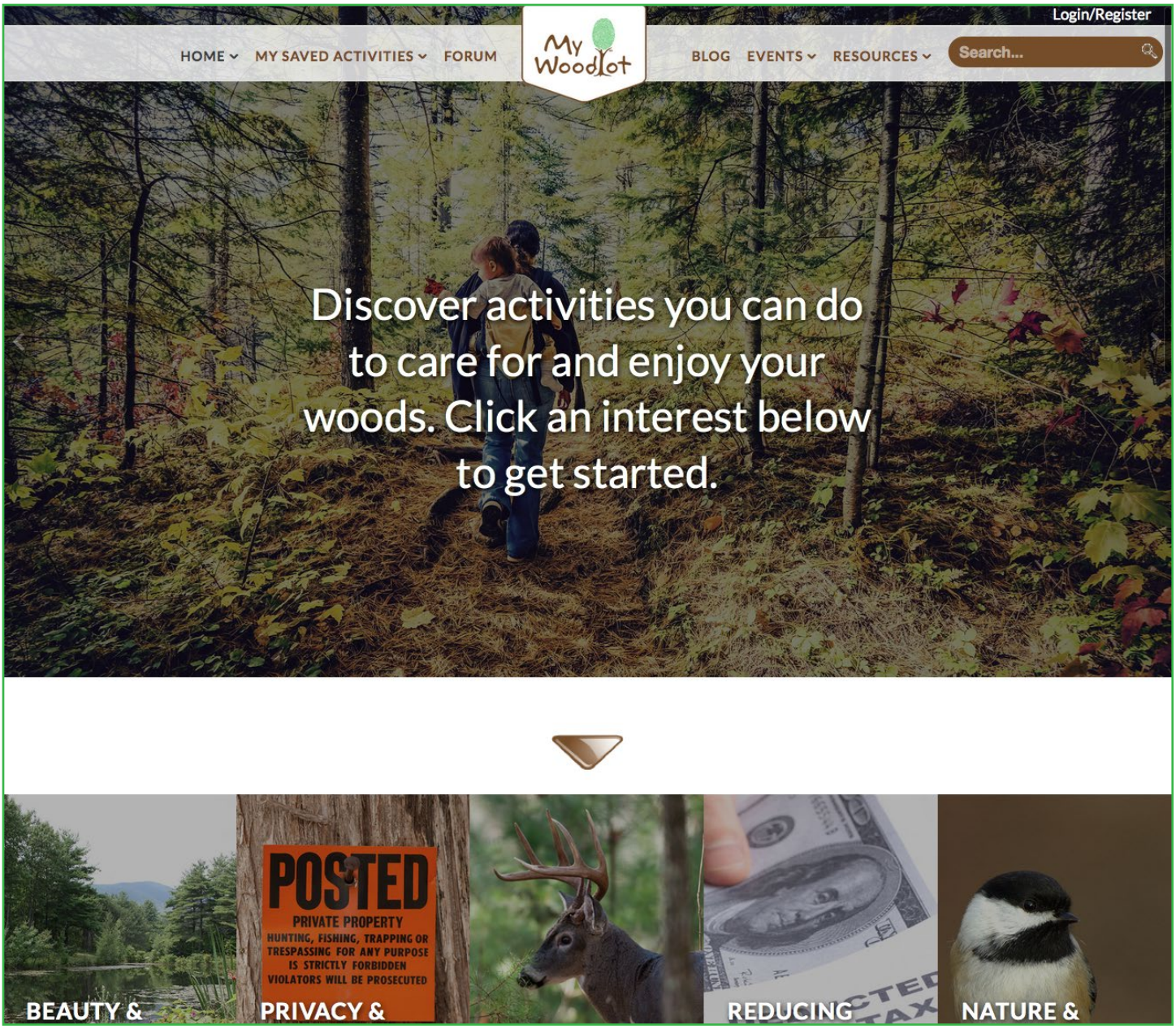
1. Property taxes
2. Air or water pollution
3. Insects or plant diseases

Based on the NWOS breakdown, critical categories for the website to address are:

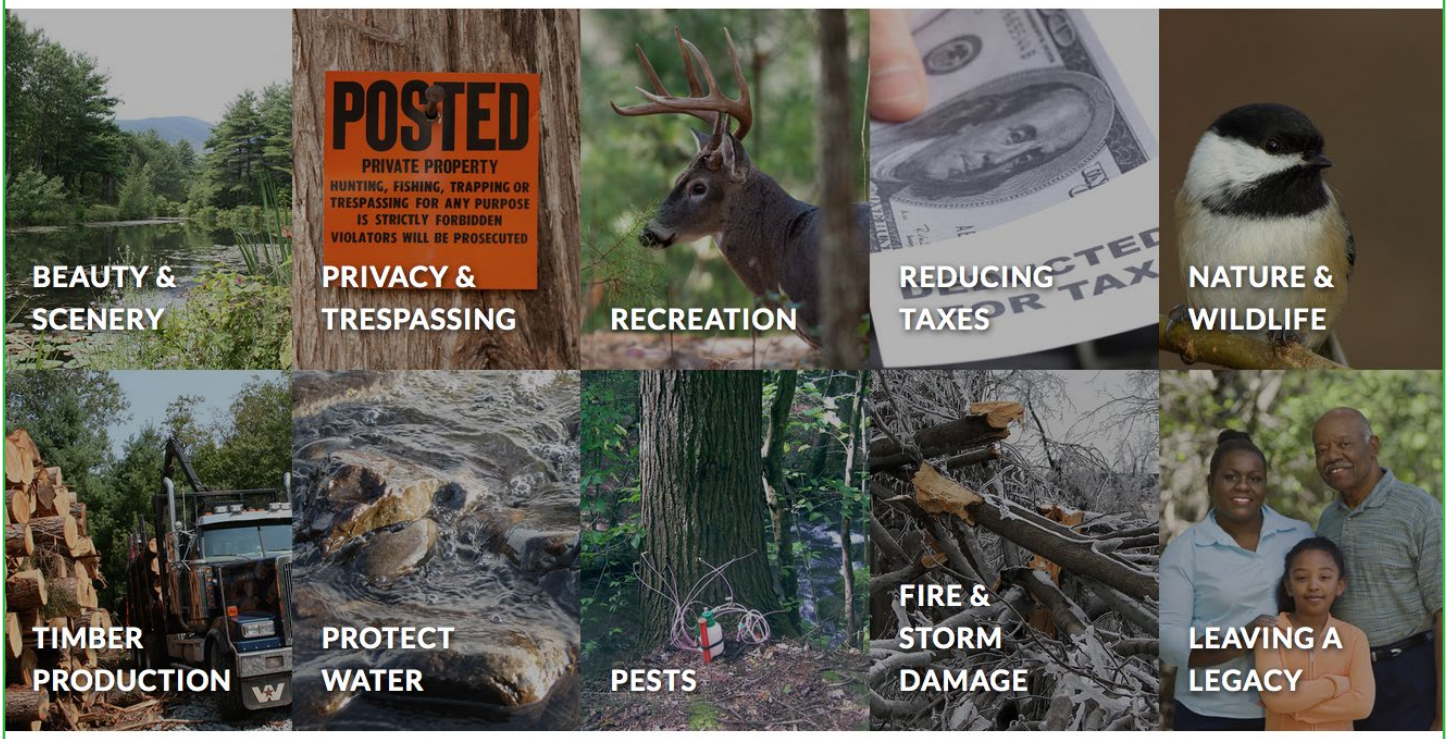
1. Aesthetics
2. Privacy (ex. boundary marking, tips for reducing noise)
3. Wildlife ("nature protection" sounds weird)
4. Recreation
5. Property Taxes
6. Reducing pollution
7. Insects and diseases ("Woods Health")
8. Fire control

The above categories represent the top reasons for ownership and top concerns of New York family forest owners. That said, the other reasons for ownership and concerns are still prevalent among many family forest owners, so other categories like "keeping land intact" (estate transfer), logging, and nontimber forest products are still relevant, just not as high a priority.

Annex 5: Screenshot Compendium


Login/Register
HOME
MY SAVED ACTIVITIES
FORUM
My WoodLot
BLOG
EVENTS
RESOURCES
Search...
Discover activities you can do to care for and enjoy your woods. Click an interest below to get started.

POSTED
PRIVATE PROPERTY
HUNTING, FISHING, TRAPPING OR TRESPASSING FOR ANY PURPOSE IS STRICTLY FORBIDDEN VIOLATORS WILL BE PROSECUTED
BEAUTY &
PRIVACY &
REDUCING
NATURE &



WHAT'S NEW

NEW ACTIVITY: Build a Bee Nesting House

More than 4,000 species of bees are native to North America, and most don't form hive and rarely sting. You can help bees by building or buying a wood or bamboo nesting house for them.

SEE MORE ...

EVENTS

Mushroom Foray

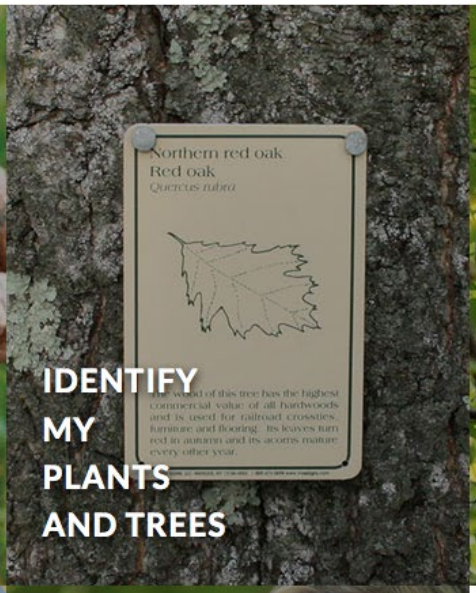
July 23rd - One of the best ways to learn about wild mushrooms is to accompany an experienced mushroom person into the field.

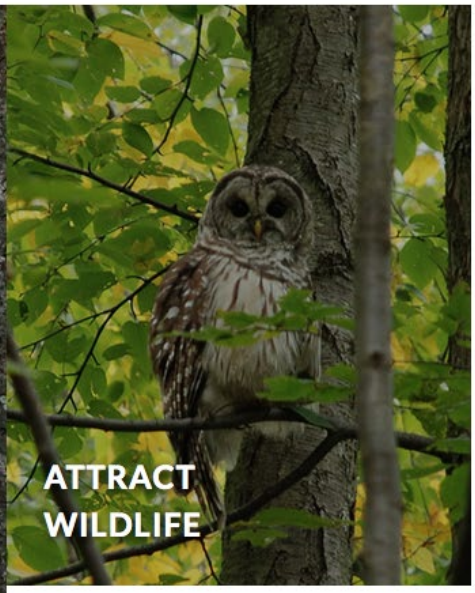
SEE MORE

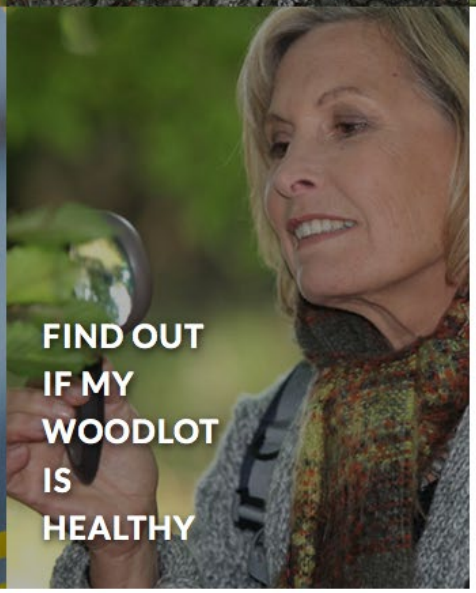
Nature & Wildlife

Discover the many ways nature depends on your land, and find out how you can make it even more attractive to wildlife.

Nature & Wildlife: Goals



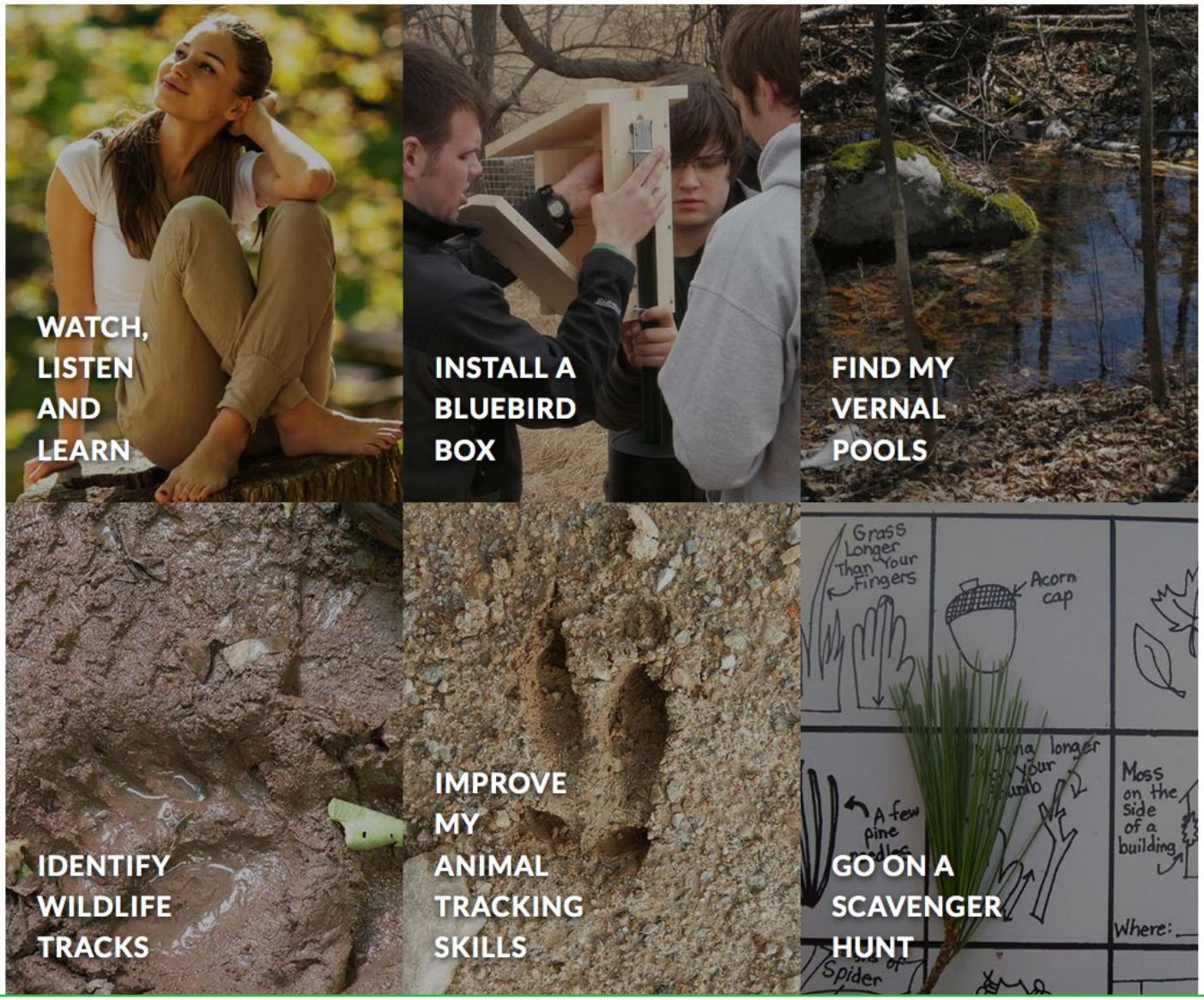




Discover Nature

Discover nature by observing and learning about the surprising variety of life on your woodlot.

Discover Nature: Activities



Identify Wildlife Tracks

You may not always see wildlife in your woods, but by learning how to interpret their tracks, you can learn a lot about the animals on your land and their behavior.

Save Activity

0.0/5 rating (0 votes)

No Comments

How to Information

The Old Naturalist – Animal Tracking

This resource uses words, pictures, and diagrams to describe basic track features and how to tell the difference between commonly-confused tracks.

Wildlife Track Silhouettes

Print this simple 1-page PDF and take it on your hike. It will let you compare tracks you see on your property with identified silhouettes of common mammals and birds.

Animal Tracks Key

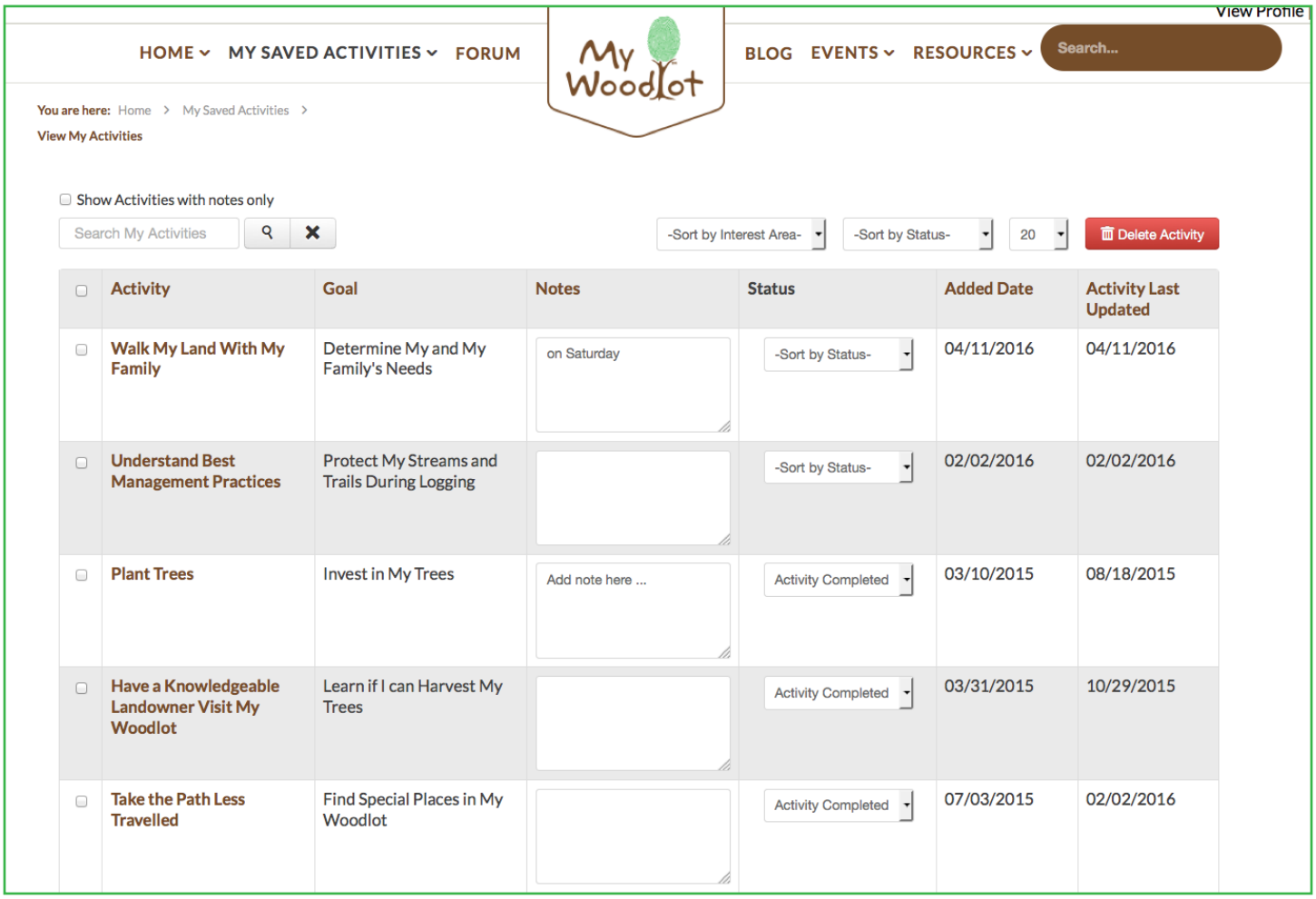
Found a track, but not sure what it is? Take a photo, then use this simple, question-based key from the University of Michigan to narrow down the possibilities.

Related Activities

Record and Share Wildlife Sightings

Seeing wildlife on your woodlot is more than fun; it can also be a way to protect those animals in the future. These websites let you share your wildlife sightings with others and help scientists learn how our critter neighbors are doing.

SEE MORE


View Profile
HOME
MY SAVED ACTIVITIES
FORUM
My Woodlot
BLOG
EVENTS
RESOURCES
Search...
You are here: Home > My Saved Activities >
View My Activities
Show Activities with notes only
Search My Activities
-Sort by Interest Area-
-Sort by Status-
20
Delete Activity
Activity
Goal
Notes
Status
Added Date
Activity Last Updated
Walk My Land With My Family
Determine My and My Family's Needs
on Saturday
-Sort by Status-
04/11/2016
04/11/2016
Understand Best Management Practices
Protect My Streams and Trails During Logging
-Sort by Status-
02/02/2016
02/02/2016
Plant Trees
Invest in My Trees
Add note here ...
Activity Completed
03/10/2015
08/18/2015
Have a Knowledgeable Landowner Visit My Woodlot
Learn if I can Harvest My Trees
Activity Completed
03/31/2015
10/29/2015
Take the Path Less Travelled
Find Special Places in My Woodlot
Activity Completed
07/03/2015
02/02/2016

MY WOODLOT BLOG

Porcupine Public Relations

Tom Foulkrod Monday, 27 June 2016

Porcupines deserve a better public perception. Not just "unappreciated," many people consider porcupines nuisances, even villains! Yet I've always found them charming.

SEE MORE »

Enjoying a Strawberry? Thank Sixty Bees

Joshua VanBrakle Monday, 20 June 2016

It's June, and here in upstate New York, that means strawberries. But I might not be eating strawberries at all were it not for the help of an insect that gives a lot of people the heebie-jeebies: bees.

SEE MORE »

How You Can Do Right by This Downstream Dad

Tyler Van Fleet Monday, 13 June 2016

Dads do a lot all year long. This Father's Day, we're paying homage to one particularly incredible downstream daddy: the lined seahorse.

SEE MORE »

Calendar View | Upcoming Events

Upcoming events

Saw Mill River Audubon Second Saturday Walk at Brinton Brook Sanctuary

Join Saw Mill River Audubon (SMRA) for a two-hour nature walk to explore local birds and seasonal changes at Brinton Brook Sanctuary in Croton-on-Hudson, NY. Beginners encouraged.

Event Date	Sat-09-Jul-2016 9:00 am
Event End Date	Sat-09-Jul-2016 11:00 am
Capacity	Unlimited
Individual Price	Free
Location	**Brinton Brook Sanctuary**

Edit | Unpublish | Details

Forest Regeneration Walk

CFA, NYFOA, & NYS DEC have teamed up to help demonstrate what forest regeneration looks like on NYS DEC's Steam Mill State Forest.

Event Date	Sat-09-Jul-2016 10:00 am
Event End Date	Sat-09-Jul-2016 1:00 pm
Capacity	Unlimited
Individual Price	$10.00
Location	**Country Cream**

Edit | Unpublish | Details

Index | Recent Topics | New Topic | No Replies | My Topics | Profile | Help | Search

Welcome, **Hilson**

Last login: Just now

Logout

Announcements

Forum ▸ Index

Mark all topics read

Board Categories | Go

GENERAL FORUM

Welcome Mat We encourage new members to introduce themselves here and meet the MyWoodlot Team. Get to know one another and share your interests.	2 Topics	9 Replies	Last Post: **New Members** by **Hilson** 2 months 2 weeks ago
General Questions (1 NEW) Have a general question and don't know where to post it? Or some feedback and input to share? Don't be shy, and drop us a note. We want to hear from you and strive to make our site better and more user friendly for our guests and members alike.	7 Topics	19 Replies	Last Post: **Tree injury from dee ...** by **Murphy** 6 days 21 hours ago
Ask the MyWoodlot Team (1 NEW) The MyWoodlot Team includes professionals knowledgeable in forestry, wildlife, environmental education and more.	6 Topics	11 Replies	Last Post: **Girdled Tree Won't D ...** by **Murphy** 1 month 1 week ago

INTEREST AREAS

Beauty & Scenery (1 NEW)	6 Topics	15 Replies	Last Post: **Tree Programs?** by **Murphy** 6 days 20 hours ago
Reducing Taxes	1 Topics	0 Replies	Last Post: **FYI - NY Forest Tax ...** by **VanBrakle** 11 months 1 week ago

Annex 6: Full Financial Spreadsheet with Years 1-10

MyWoodlot.com - 10 year Income Statement

	YEAR 1	YEAR 2
Costs (Excluding Staff Time)		
Marketing	*$3,000*	*$3,090*
Prompts	*$2,000*	*$2,060*
Content Creation/Acquisition	$10,000	$10,300
Content Editing	$5,000	$5,150
Total Content Costs	*$15,000*	*$15,450*
Website Maintenance	$1,000	$1,030
Website Hosting	$4,835	$4,980
Website Programming	$2,000	$2,060
Total Website Operational Costs	*$7,835*	*$8,070*
Total Annual Costs	**$27,835**	**$28,670**

Cumulative Cost		
Annual Savings from 480-a Solution (Low Cost Scenario, Excluding Staff Time)	$63,474	$63,464
Annual Savings from 480-a Solution (High Cost Scenario, Excluding Staff Time)	$34,218	$34,208
Annual Savings (Low Cost Scenario)	$35,639	$34,794
Cumulative Savings (Low Cost Scenario)	**$35,639**	**$70,433**
Annual Savings (High Cost Scenario)	$6,383	$5,538
Cumulative Savings (High Cost Scenario)	**$6,383**	**$11,920**

YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
$3,183	*$3,278*	*$3,377*	*$3,478*	*$3,582*	*$3,690*	*$3,800*	*$3,914*
$2,122	*$2,185*	*$2,251*	*$2,319*	*$2,388*	*$2,460*	*$2,534*	*$2,610*
$10,609	$10,927	$11,255	$11,593	$11,941	$12,299	$12,668	$13,048
$5,305	$5,464	$5,628	$5,796	$5,970	$6,149	$6,334	$6,524
$15,914	*$16,391*	*$16,883*	*$17,389*	*$17,911*	*$18,448*	*$19,002*	*$19,572*
$1,061	$1,093	$1,126	$1,159	$1,194	$1,230	$1,267	$1,305
$5,129	$5,283	$5,442	$5,605	$5,773	$5,946	$6,125	$6,309
$2,122	$2,185	$2,251	$2,319	$2,388	$2,460	$2,534	$2,610
$8,312	*$8,562*	*$8,818*	*$9,083*	*$9,355*	*$9,636*	*$9,925*	*$10,223*
$29,530	**$30,416**	**$31,329**	**$32,268**	**$33,236**	**$34,234**	**$35,261**	**$36,318**

$65,368	$65,357	$67,318	$67,307	$69,326	$69,314	$71,393	$71,381
$35,234	$35,223	$36,280	$23,643	$24,352	$24,340	$25,070	$25,057
$35,838	$34,941	$35,989	$35,038	$36,089	$35,080	$36,133	$35,062
$106,270	**$141,211**	**$177,201**	**$212,239**	**$248,328**	**$283,408**	**$319,541**	**$354,603**
$5,704	$4,807	$4,951	($8,626)	($8,885)	($9,894)	($10,190)	($11,261)
$17,624	**$22,431**	**$27,382**	**$18,757**	**$9,872**	**($22)**	**($10,212)**	**($21,473)**

Annex 7: Frequently Asked Questions

MyWoodlot: Frequently Asked Questions

1. A MyWoodlot plan won't have forest inventory data. How is a landowner supposed to get useful management recommendations when they don't know what they have?

Although a forest inventory is needed for some management activities, for the vast majority of them, a formal inventory is unnecessary. This is borne out by research. Laford and Parker (1988), in their evaluation of New Hampshire's forest management planning program, interviewed consulting foresters about their experiences with the program. The researchers found that "in some instances the practice guidelines [including a formal inventory] required more information than necessary. Given the character of many woodlots and owners' objectives, the consulting foresters believed a less comprehensive examination, or a general 'walk-through,' might have been sufficient to produce acceptable management recommendations."

Critically, although MyWoodlot will not directly provide a forest inventory, it can indirectly supply one. In cases where a formal inventory is needed, such as a landowner with timber harvesting objectives, MyWoodlot can recommend as an activity that landowners contact a consulting forester and get an inventory done, as well as provide a list of Watershed Qualified Foresters to get them started.

2. Why should a forest management plan be a living document?

Forest conditions as well as landowner interests are constantly changing. Landowners need to be able to access information that will allow them to make informed decisions regarding the future of their woodlot. MyWoodlot.com will allow WAC to disseminate new information about threats like Emerald Ash Borer to thousands of landowners effectively and efficiently.

3. Watershed Forest Management Plans may not result in the implementation of BMP's or Sustained Yield Management but do they help landowners in other ways?

An analysis of 600 WFMP's indicates that more than 90% of the recommendations contained in WAC funded forest management plans relate to commercial forestry. The National Woodland Owner Survey (NWOS) indicates that commercial forestry ranks eleventh on the list of landowner priorities. It is doubtful that WFMP's help landowners in other ways since the highest landowner priorities represent such a small portion of the total recommendations contained in plans.

4. Does the WAC Forestry Program have the staff and financial resources to create and manage MyWoodlot.com?

MyWoodlot.com will require a significant investment of resources. However, The WAC Forestry Program can utilize resources saved by focusing on 480-a and the addition of the Watershed Educator position to make it a reality. The most intensive phase of MyWoodlot.com development is the start-up. This will require a temporary shift in Program priorities. The Start-

up Phase will last approximately one year, after which Program priorities can return to normal allocations.

5. The *Management* section indicates that 50% of the Wood Products Utilization and Marketing Specialist's time will be needed for this project. Does this mean the Forestry Program is walking away from part of WAC's mission – economic viability?

Baseline economic viability activities – the Catskill WoodNet website, the WoodNet e-newsletters, and logger training – will continue with MyWoodlot. However, MyWoodlot represents a shift in economic viability "closer to the ground," focusing on landowners more than wood products businesses. Research has shown that in northern hardwoods, the dominant forest type in the Catskills, the use of silviculture, rather than diameter-limit cutting or high-grading, results in greater sawtimber volume, more large-diameter sawlogs (which in general are of higher quality, a key determinant of economic value in hardwoods), and higher long-term revenues (Nyland 2006). As a result, focusing on landowner education and encouraging sustainable harvesting techniques not only help protect the environment and keep forests as forests, but also promote greater economic returns for landowners.

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Annex 8: Literature Cited

Literature Cited

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