Evaluating Public Response to the Young Forest Initiative on Wildlife Management Areas (WMAs): Surveys of Landowners and Hunters Living Near Four WMAs

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Prepared by:

Nancy A. Connelly, T. Bruce Lauber, and Richard C. Stedman
Center for Conservation Social Sciences
Department of Natural Resources
Cornell University

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EXECUTIVE SUMMARY

In 2014 the New York State Department of Environmental Conservation (DEC), Division of Fish and Wildlife initiated a habitat management program to significantly increase young forest habitat in Wildlife Management Areas (WMAs) across New York State. The purpose of the program, called the Young Forest Initiative (YFI), is to provide habitat for those species that depend on young forest, such as Golden-winged Warbler, New England Cottontail, American Woodcock, and Ruffed Grouse. As part of their evaluation of this program DEC asked the Center for Conservation Social Sciences (CCSS) at Cornell University to undertake research to provide DEC with information from key stakeholders regarding their awareness of and support for the program.

In response, CCSS engaged in three research efforts in 2017 and 2018. The results of the first two research efforts are reported in Connelly et al. (2018) and are included in a synthesis of findings in this report. The purpose of the third research effort, reported here, was to examine the views of hunters and landowners who live near four WMAs in New York regarding young forest management actions taking place on these WMAs. We also assessed use of the WMAs and satisfaction with their management more generally. We selected multiple WMAs for more intensive study to see if awareness and support for the YFI was site specific or more broad-based. We divided the sample of hunters into two subsamples, a general sample of licensed hunters and a specific sample of woodcock hunters, to assess whether awareness and support for young forest management actions differed between these groups, as well as compared with landowners. Woodcock hunters were a group of particular interest to DEC because woodcock were one of the species most likely to benefit from young forest management actions.

Mail surveys were sent to 1,000 hunters (general hunters and woodcock hunters) and 1,000 landowners living near each of the four selected WMAs (Connecticut Hill, High Tor, Upper and Lower Lakes, and Cranberry Mountain) in March, 2018. A telephone follow-up survey was implemented in mid-May, 2018 to estimate the degree to which respondents differed from non-respondents.

Response rates to the survey varied between WMAs: from 24% to 46% for landowners, and 27% to 36% for general hunters.[1] We found woodcock hunters were most likely to respond (34-56%), probably because of the saliency of the topic to them. As expected, non-respondents were less likely to have visited their local WMA in the past 5 years. They were, however, more supportive of DEC efforts to restore young forest habitat at their local WMA.

Almost all survey respondents (landowners and both samples of hunters) had heard of WMAs (82-100%). In three of the four areas, almost all landowners and woodcock hunters (90-99%), and most general hunters (77-89%) had heard of their local WMA. All three stakeholder groups living near Cranberry Mountain WMA were less likely than groups in other regions to be aware of their local WMA (63-77%). The majority of those who had heard of the local WMA had

[1] Ranges represent responses from different WMAs and sometimes different stakeholder groups depending on the context.

visited it at some point (60-88%). These findings suggest a high level of awareness and use of WMAs.

Local WMAs were used for a variety of recreational pursuits. As expected, most general hunters (79-84%) and almost all woodcock hunters (73-100%) who had visited their local WMA in the past 5 years had used it for wildlife-dependent recreation (i.e., hunting, fishing, trapping, and wildlife observation). Over 50% of landowners used the local WMA for wildlife-dependent recreation. Landowners were generally more likely to use the local WMA for recreation that does not depend on wildlife (51-75%) than hunters (general and woodcock [19-58%]). While some hunters favored limiting use of WMAs to consumptive wildlife recreation activities (i.e., hunting, fishing, and trapping) (25-49%), and the management mandate favors wildlife-dependent recreation, these areas are being used by many people for recreation that does not depend on wildlife, such as hiking.

The majority of all stakeholder groups at all WMAs (53-74%), except woodcock hunters at Connecticut Hill (45%) were at least somewhat satisfied with their visits to the local WMA in the past 5 years. Woodcock hunters, in general, were less satisfied than general hunters, who were in turn less satisfied than landowners with their visits to their local WMAs. Very few people in any stakeholder group were very dissatisfied (0-9%). We found that those with a stronger attachment to the WMA were more satisfied with their experiences at the WMA than those who were less attached. We also found that more avid hunters were less satisfied with their experience than less avid hunters.

We described the young forest habitat management program in the questionnaire and then asked respondents if they were aware of any of the actions DEC has undertaken to make people aware of it. One-quarter to one-third of landowners indicated they were aware that DEC had used their website to communicate about its young forest habitat management program. More general hunters (35-48%) and woodcock hunters (40-52%) were aware of the use of the website as a way to communicate information. Fewer people were aware of public meetings (12-31%) and emails from DEC (9-31%) as sources of young forest habitat management information, except woodcock hunters who were somewhat more aware of emails from DEC (16-48%).

The overall level of support for DEC's effort to restore young forest habitat at the local WMA was high. Three-quarters or more of the respondents from each WMA in each stakeholder group supported restoration efforts to some degree. Ten percent or less opposed DEC's efforts. Support was strongest among woodcock hunters (93-98%) and more muted among landowners (78-88%), with fewer strongly supporting DEC's efforts (41-54% for landowners vs. 75-88% for woodcock hunters).

Support for specific actions DEC could take to restore young forest habitat at the local WMA was generally high and widespread, with little variation between WMAs. Support was highest for planting native shrubs and trees in open fields to create young forest (78-90% support). There was very little opposition to this action (4-11%). Support was also high (66-94%), with little opposition (3-20%), for two other actions – using mulching or mowing machines to spur regrowth of shrubs, and cutting trees to make patches of new growth in forests. The number of people supporting a particular action varied by stakeholder group: woodcock hunters were most

likely to support each action and landowners least likely; general hunters were intermediate. For example, controlled burning to spur regrowth of trees and shrubs was supported by over 80% of woodcock hunters, but only 51% to 61% of landowners. Twenty to twenty-eight percent of landowners opposed this action. Using herbicides to remove non-native and/or invasive plant species was supported by 39% to 63% of respondents. Two-fifths of landowners opposed this action taking place at their local WMA.

Woodcock hunters are an important subset of hunters because they are seeking a species that young forest management actions are intended to benefit. These hunters clearly recognized the relationship between woodcock and young forest habitat. They felt populations of woodcock were declining, and were less satisfied than general hunters and landowners with the current situation. They were more supportive than general hunters and landowners of actions to increase young forest habitat, and they expect these management actions will positively impact their hunting experience. Woodcock hunters could be an important group to survey in the future because they will be more likely to use areas where young forest management has been implemented, and notice changes in their hunting experience because of management actions.

This survey of landowners and hunters living near four WMAs is the last in a series of research efforts we undertook to provide DEC with information from key stakeholders regarding their awareness of WMAs and support for young forest habitat management. By comparing results from all three surveys we found that 37% of downstate residents, 70% of upstate residents, 78% of small game hunters statewide, 82-96% of landowners living near a WMA, and 92-100% of hunters living near a WMA (general and woodcock samples) indicated they were aware of WMAs. These high levels of awareness may or may not be correlated with in-depth knowledge about the WMAs, but the increasing levels of awareness from group to group was as expected.

We also found that landowners living near WMAs and NYS residents expressed similar levels of support for the three management actions we asked about:

- 62-71% of landowners living near WMAs and 72% of NYS residents supported adjusting water levels on small ponds to maintain wetlands.
- 70-75% of landowners living near WMAs and 71% of NYS residents supported mowing to maintain grasslands.
- 66-67% of landowners living near WMAs and 65% of NYS residents supported cutting trees to make patches of new growth in forests.

Lastly, we found that small game hunters statewide supported young forest habitat management on WMAs in similar proportions to general hunters living near WMAs, with 58% of small game hunters and 48-58% of general hunters strongly supporting it.

These survey findings taken together provide us, for the first time, with estimates of awareness of WMAs and support for wildlife-related management actions among a range of stakeholders from the general public to woodcock hunters living near WMAs in New York. These results form an extensive baseline of information, which could be compared with similar surveys conducted in the future after the results of management actions to increase young forest habitat have been more fully realized.

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TABLE OF CONTENTS

Executive Summary ii
Acknowledgments v
Table of Contents vi
List of Tables vii
Introduction 1
  Previous Research on Private Landowners' Support for Young Forest Habitat 1
  Key Stakeholders 2
  Study Objectives 2
Methods 3
  Study Areas 3
  Sample Selection 4
  Questionnaire Design 4
  Mail Survey Implementation 5
  Non-respondent Telephone Follow-up 5
  Analysis 5
Results 6
  Survey Response 6
  Non-response Bias Analysis 6
  Stakeholder Characteristics 8
  Beliefs about General WMA Management 11
  Awareness and Use of Local WMA 13
  Satisfaction with Use of Local WMA 18
  Awareness and Support of Young Forest Habitat Management on Local WMA 26
  Support for Other Management Actions on Local WMA 32
Discussion and Recommendations 35
Synthesis of Findings from Three Research Efforts 37
Literature Cited 38
Appendix A: Landowner Questionnaire (High Tor Version) 39
Appendix B: Hunter Questionnaire (High Tor Version) 50
Appendix C: Non-respondent Telephone Interview 61
Appendix D: Additional Tables 64

LIST OF TABLES

Table 1. Response rate, by WMA and stakeholder group. 7
Table 2. Socio-demographic characteristics and measure of political leaning, by WMA and stakeholder group. 9
Table 3. Hunting activity questions, by WMA and stakeholder group. 10
Table 4. For those who have visited local WMA in past 5 years, measures of place attachment, by WMA and stakeholder group. 11
Table 5. Beliefs about woodland management, by WMA and stakeholder group. 12
Table 6. Beliefs about general management of WMAs, by WMA and stakeholder group. 13
Table 7. Awareness and use of WMAs, by WMA and stakeholder group. 15
Table 8. Participation in wildlife-dependent and non-wildlife dependent recreational activities at local WMA in past 5 years, by WMA and stakeholder group. 16
Table 9. Estimated number of visits per year[a] for wildlife-dependent and non-wildlife dependent recreational activities and percent of total that is wildlife-dependent, by WMA and stakeholder group. 17
Table 10. For those who have visited their local WMA in past 5 years, satisfaction with various aspects of the experience, by WMA and stakeholder group. 19
Table 11. For those who had hunted on the local WMA in the past 5 years, satisfaction with various elements of the hunting experience, by WMA and stakeholder group. 22
Table 12. For those who have visited local WMA in past 5 years, mean change[1] in the number of animals seen by species over the last 5 years, by WMA and stakeholder group. 23
Table 13. For those who have visited the local WMA in past 5 years, overall satisfaction with their visits, by WMA and stakeholder group. 25
Table 14. For those who were aware of the local WMA, and for those who had visited the WMA in the past 5 years, the percent who were aware of the communication methods used by DEC to make people aware of the young forest habitat management program, by WMA and stakeholder group. 27
Table 15. Support for actions to restore young forest habitat, by WMA and stakeholder group. 29
Table 16. Of those who had visited the local WMA within the time specified[*], the percent who had noticed young forest habitat management activities that had taken place on the local WMA, by WMA and stakeholder group. 30
Table 17. Of those with an opinion[1], the percent indicating the quality of various recreational experiences will be “much better” because of young forest management actions at the local WMA, by WMA and stakeholder group. 31
Table 18. Overall support for restoration of young forest habitat at local WMA, by WMA and stakeholder group. 33
Table 19. Support for other (non-young forest) actions to manage habitat for wildlife, by WMA and stakeholder group. 34

INTRODUCTION

The New York State Department of Environmental Conservation (DEC), Division of Fish and Wildlife has begun a habitat management program to significantly increase young forest habitat in Wildlife Management Areas (WMAs) across New York State. The purpose of the program, called the Young Forest Initiative (YFI), is to provide habitat for those species that depend on young forest, such as Golden-winged Warbler, New England Cottontail, American Woodcock, and Ruffed Grouse.

As part of their evaluation of this program, DEC asked the Center for Conservation Social Sciences (CCSS) at Cornell University to undertake research to provide DEC with information from key stakeholders regarding their awareness of and support for the program. Additional goals were: (1) to understand users and their use of WMAs, their satisfaction with the recreation opportunities available at WMAs, their desire for additional opportunities, their awareness of and support for habitat management activities in addition to young forest management, and their satisfaction with access to WMAs; and (2) to understand the general public's level of awareness of public land management goals in New York. This research will also provide a baseline against which changes in stakeholder opinions could be measured as more management activities take place.

CCSS engaged in three research efforts in 2017 and 2018 to address the goals listed above. The first, reported previously in Connelly et al. (2018), was a survey of New York State (NYS) residents to assess general awareness of land management and WMAs in NYS. We gathered information via several questions on an annual survey of New York State residents conducted by Cornell University. The second effort, also reported in Connelly et al. (2018), involved assessing awareness of and support for WMAs and the YFI through the addition of questions to DEC's annual small game hunter survey. The third research effort included surveys of landowners and hunters living near four WMAs. These surveys asked more detailed questions than the previous two research efforts on the use of WMAs, and awareness of and support for habitat management occurring on the WMAs.

Results from the third research effort are discussed in this report. The final section of the report synthesizes the results of all three research efforts and makes some general conclusions and recommendations.

Previous Research on Private Landowners' Support for Young Forest Habitat

Previous research by CCSS (formerly the Human Dimensions Research Unit) was carried out to understand private landowners' attitudes, knowledge, motivating factors and constraints for engaging in young forest habitat management on their lands. The first research effort, conducted in New York's Southern Tier, found that landowners preferred to cut single trees rather than patches of trees, which would create young forest habitat (Dayer et al., 2011). If, however, landowners learned that cutting patches of trees would benefit wildlife, they would be more open to taking that action. In the second research effort, focused specifically on developing habitat for New England cottontail rabbit in the Hudson Valley region, a survey of landowners found that they had positive feelings toward managing habitat for New England cottontail (Allred et al.,

2014). The authors recommended that efforts to encourage habitat management emphasize aesthetic and conservation values of management rather than utilitarian or economic values. They also cautioned that their findings were limited to this region of New York and might not apply statewide. Since these studies were undertaken DEC has also begun managing for young forest habitat on public lands, specifically WMAs. As a result they have asked us to undertake research to understand the acceptability of management actions on public lands by those living near public lands and those most likely to use those lands.

Key Stakeholders

DEC identified three stakeholder groups of interest. Landowners living near WMAs are thought to be the most likely to observe management actions taking place on WMAs. Licensed hunters living near WMAs are likely to be aware of the WMAs because of their proximity to them and are considered key users of these properties. Finally, hunters who had hunted for woodcock in the past year and lived near a WMA are of particular interest. DEC thought they were a group most likely to utilize the WMA, utilize the areas where young forest management is implemented, and notice changes in their hunting experience (e.g. see/harvest more birds) as a result of management actions.

Study Objectives

The purpose of this research effort was to examine the views of hunters and landowners who live near four WMAs in New York regarding young forest management taking place on these WMAs. We also assessed use of the WMAs and overall satisfaction with their management. The reason for selecting multiple WMAs for more intensive study was to see if differences between the areas in terms of recreational activities available, location in the state, proximity to urban centers, or stage in young forest restoration would lead to differences in satisfaction/acceptability of management actions.

The specific objectives for this work were:

1. Assess awareness and use of WMAs by nearby hunters and landowners.
2. Assess factors influencing their current and future use of WMAs, including their satisfaction with the recreation opportunities available at WMAs, their desire for additional opportunities, and their satisfaction with access to WMAs.
3. Assess their awareness of and support for young forest management taking place on WMAs.
4. Assess their awareness of communication efforts to explain young forest management.
5. Assess their beliefs and attitudes related to specific habitat management strategies, in addition to young forest management.
6. Gather basic socio-demographic characteristics, place attachment, and avidity measures that might highlight differences in answers to other questions in the survey.

We also developed several hypotheses that we wanted to examine in this study. We wondered if differences in the importance of the WMA to the individual, or the recreational activities in which they participated (e.g., avidity of hunters) would lead to differences in satisfaction with or acceptability of management. Also, we wanted to explore whether the distance from home to the

WMA was related to differences in satisfaction with or acceptability of management. We used recreation specialization, place attachment, and proximity concepts to examine these questions. The specific hypotheses we developed were:

1. Hunters are more supportive of young forest management actions than landowners.
2. Woodcock hunters are more supportive/knowledgeable about young forests than other hunters.
3. Avid hunters are more supportive/knowledgeable about young forest management actions than other hunters.
4. Nearby landowners are less supportive of young forest management actions than those living further away.
5. Those with a stronger attachment to the WMA are more satisfied with their experiences at the WMA, and more supportive of young forest management actions.

METHODS

Mail surveys were sent to hunters and landowners living near the four selected WMAs in March, 2018. A telephone follow-up survey was implemented in mid-May, 2018 to estimate the degree to which respondents to the mail survey differed from non-respondents.

Study Areas

DEC staff chose four WMAs for this study located in different parts of the state (see map on front cover), offering different types of recreational activities, and at slightly different points in the process of implementing young forest management actions.

- Connecticut Hill WMA is located in central New York, specifically Schuyler and Tompkins Counties. It is the largest WMA in the state, with an extensive unpaved road system. Hiking, bird watching, and deer hunting are very popular in this WMA. There is a habitat management plan in place, which includes young forest, with young forest-related management actions occurring in the past three years. The WMA has a long history of habitat management, and was the site of extensive studies on grouse life history, ecology and management (e.g., Edminster, 1947).
- High Tor WMA is located in western New York in Ontario and Yates Counties. Nature observation, and hunting for deer and turkeys are popular in this WMA. Forest management has been ongoing for many decades, but with little activity since the 1990s. There is a habitat management plan in place, which includes young forest, with young forest-related management actions occurring in the past two years.
- Upper and Lower Lakes WMA is located in northern New York in St. Lawrence County. Waterfowl hunting, boating, fishing, and trapping are popular in this WMA. There is a habitat management plan in place, which includes young forest, with young forest-related management actions occurring in the past two years. Indian Creek Nature Center is also located on the WMA.
- Cranberry Mountain WMA is located in southeastern New York, near more urban areas of the state. It is thought to be used heavily by hikers, dog walkers, and mountain bikers, with some hunting of deer, turkey, pheasant, and rabbits taking place. There is a habitat

management plan in place, which includes young forest, with young forest-related management actions occurring in the past two years.

Sample Selection

We surveyed three populations in this study – landowners, hunters, and woodcock hunters. Each population was sampled by selecting all members of the population who lived in zip code areas within a certain distance from the WMA, and drawing a random sample from that population. Different distances were used for each population because we wanted to identify the minimum area necessary that contained a large enough population from which we could draw a sample for statistical analysis. A circle of the desired radius was drawn from the center point of the WMA on a map of zip codes. Zip codes with at least 50% of their area within the circle were selected as areas from which to draw the sample. Thus, each sample is representative of the population who lives in the zip codes within a specified distance from the center point of the WMA. Since a small portion of some zip code areas could be outside the distance selected, it is possible that some members of the sample lived more than the specified distance from the WMA. We sampled each population in the following manner:

- One thousand landowners living in zip codes within six miles of each WMA were randomly selected from property tax records.
- Samples of 753 to 778 hunters[2] living in zip codes within 12 miles of each WMA were drawn from New York State hunting license records, including all forms of resident hunting license types and lifetime license holders. This group will hereafter be referred to as "general hunters" to differentiate them from "woodcock hunters." It is possible, however, that the samples might contain a few hunters who have hunted woodcock.
- All woodcock hunters (n=222 to 247) living in zip codes within 40 miles for Connecticut Hill, High Tor, and Cranberry Mountain, and 75 miles for Upper and Lower Lakes were surveyed. The names were taken from the 2016-17 HIP database. Hunters indicated that they harvested at least one woodcock during the previous hunting season.

Questionnaire Design

The questionnaire included sections on awareness and use of the local WMA[3], satisfaction with WMA use, awareness of the young forest habitat management program, and support for young forest management actions and other types of management actions, such as trail maintenance and mowing to maintain grasslands. We asked about support for different management actions at each WMA depending on the work being undertaken at each one. Questions regarding support for forest land management and the attachment people feel toward the local WMA were taken from past surveys of Hudson Valley landowners (Allred et al., 2014) and Albany residents living near the Albany Pine Bush (Naiman et al., 2018). Socio-demographic questions differed slightly between the hunter and landowner questionnaires, as gender and age were known from hunting license records. Eight versions of the questionnaire were printed to tailor them for each

[2] Samples sizes differed by WMA because the populations of woodcock hunters differed by WMA, and we were limited to a total sample size of 1,000 hunters per WMA.
[3] We will use the term "local WMA" hereafter to refer to the one of the four WMAs that the survey respondent was being asked about.

WMA and stakeholder group (general hunters and woodcock hunters received the same version of the questionnaire). The full text of the landowner questionnaire is available in Appendix A; the hunter questionnaire is in Appendix B.

Mail Survey Implementation

We implemented the mail survey starting on March 28, 2018. We sent up to three follow-up mailings to non-respondents over the course of the next four weeks to encourage their response.

Non-respondent Telephone Follow-up

We implemented a telephone follow-up survey of 400 non-respondents (50 hunters and 50 landowners for each WMA) approximately two months after the first mailing of the questionnaire to understand how non-respondents differed from respondents. The samples of general hunter and woodcock hunter non-respondents were combined into a hunter sample for the non-respondent survey. Key questions from the mail survey were asked over the telephone about awareness and use of the local WMA, and support for young forest habitat management. The same survey instrument was used for hunters and landowners. A copy of the telephone interview instrument can be found in Appendix C.

Analysis

Data analysis was done using SPSS (IBM SPSS Statistics 24). Pearson's chi-square test and t-tests were used to test for statistically significant differences between respondents and non-respondents at the $P \leq 0.05$ level.

A measure of distance between a respondent's home and the local WMA was created using the geocoding feature in ArcGIS (ArcMap 10.5.1). Respondents' addresses were geocoded using the NYS detailed statewide address point database, and plotted on a map using ArcGIS software. The distance between the address and the center point of the WMA was measured in miles and added to the database.

Because the population size was limited for each stakeholder group at each WMA (Table 1), we conducted statistical analyses using the complex samples procedure in SPSS, which accounts for the limited populations sizes and results in smaller standard errors than if very large or infinite populations were assumed. Two-way analysis of variance was used to test for differences between stakeholder groups and between WMAs. If differences were found, the Wald F test was used to identify which stakeholder groups or WMAs were different. Regression analysis that accounted for WMAs and stakeholder groups was used to identify differences in satisfaction with the visit and support for management actions by socio-demographic characteristics, place attachment, hunting avidity, and distance from the local WMA.

The number of woodcock hunters in our sample who lived near Cranberry Mountain WMA and who had visited the WMA in the past 5 years was quite low (n=29). Typically, we would not report results when the sample size drops below 30, but we are making an exception in this case because the population of woodcock hunters is small to begin with and this stakeholder group is

important as an indicator of awareness of young forest management actions. Instances where the sample size drops below 30 are noted in the tables.

RESULTS

Survey Response

We expected response rates to differ between groups based on the saliency of the survey topic. We found that between 24% and 46% of landowners responded to the survey depending on which WMA they lived near (Table 1).[4] The response rate was lowest for landowners living near Cranberry Mountain WMA; Cranberry Mountain WMA is located near an urban area where lower response rates are typical. The response rate was lower on average for general hunters (32%) than for landowners (37%). We would expect hunters to be more interested in WMAs because of the hunting opportunities they provide, and therefore more likely to respond. On the other hand, we would expect people living closer to the WMA to be more likely to respond than those living further away, and our landowner sample lived within 6 miles, whereas our hunter sample lived within 12 miles. Thus, in this case it seems that proximity may have a stronger influence on response rate than interest in the area because of the recreational opportunities provided.

Woodcock hunters had among the highest response rates, with three of the four areas achieving response rates over 50%. The response rate for woodcock hunters was lower for the Upper and Lower Lakes WMA than the other three WMAs, presumably because we had to go a further distance from the WMA to identify a sufficient sample of woodcock hunters (75 miles compared with 40 miles). Thus, it is more likely that Upper and Lower Lakes woodcock hunters were not aware of the WMA, and therefore less likely to respond to the survey than woodcock hunters living nearer the other three WMAs.

Non-response Bias Analysis

Non-respondents differed from respondents in their level of interest and experience with WMAs. For example, landowner non-respondents were less likely to have heard of WMAs (86% vs. 91%) and less likely to have visited the local WMA in the past five years (44% vs. 59%) than respondents (Appendix Table D-1). Hunter non-respondents appeared to be less likely to have heard of the local WMA than hunter respondents (82% vs. 87%), but the difference was only significant at the $p=0.06$ level. Both landowner and hunter non-respondents were less likely to have hunted deer on the local WMA in the past five years compared with their respective respondent groups (14% vs.26% for landowners, 34% vs. 51% for hunters).

[4] Ranges represent responses from different WMAs and sometimes different stakeholder groups depending on the context.

Table 1. Response rate, by WMA and stakeholder group.

Strata	Population size	Initial sample size	Undeliverables	Responses	Response rate adjusted for undeliverables
Landowners					
Connecticut Hill	1,665	1,000	91	397	43.7
High Tor	1,922	1,000	137	395	45.8
Upper and Lower Lakes	2,345	1,000	67	348	37.3
Cranberry Mountain	3,633	1,000	85	218	23.8
All		4,000	380	1,358	37.5
General hunters					
Connecticut Hill	2,006	774	39	256	34.8
High Tor	1,162	753	29	262	36.2
Upper and Lower Lakes	3,713	778	32	229	30.7
Cranberry Mountain	1,651	761	25	201	27.3
All		3,066	125	948	32.2
Woodcock hunters					
Connecticut Hill	226	226	35	107	56.0
High Tor	247	247	8	125	52.3
Upper and Lower Lakes	222	222	15	70	33.8
Cranberry Mountain	239	239	8	117	50.6
All		934	66	419	48.3

When asked about their overall support for DEC's efforts to restore young forest habitat at their local WMA, non-respondents were more supportive than respondents (Appendix Table D-1). Their support for several specific young forest habitat management actions, however, did not differ.

Landowner respondents were more likely to be men (70%) and non-respondents were more likely to be women (59%). A check of the key questions by gender did not reveal significant differences, so no weighting of the data was done.

Hunter respondents were older on average than hunter non-respondents (56 years old vs. 48 years old). This difference reflects a common finding among mail surveys, with older people

more likely to respond. A check of the key questions by age did not reveal significant differences, so no weighting of the data was done.

Stakeholder Characteristics

As expected most hunters (both the general hunter and the woodcock hunter samples) were men (85-99%), and as previously mentioned, the mean age was over 50 (Table 2). Landowners were even older on average with a mean age of over 60. Landowners were more likely to have a college degree than general hunters (41-58% vs. 23-36%), but not so for woodcock hunters who were also more likely to have a college degree (44-50%) than the general hunter sample. The majority of hunters, except general hunters living near Upper and Lower Lakes, identified themselves as somewhat to very conservative (50-63%); landowners were less likely to see themselves as conservative (36-42%). Roughly one-third of respondents in each stakeholder group (25-44%) considered themselves moderate or middle of the road. For each stakeholder group at each WMA the proportion of respondents considering themselves to be conservative was greater than those considering themselves to be liberal. Over one-third (36-40%) of landowners in three of the four WMAs were also hunters (Table 3).

All hunters were asked several questions about their hunting participation to distinguish more avid or active hunters from those who were less avid. One-quarter to one-third of general hunters, and over 40% of woodcock hunters were defined as avid by identifying hunting as their most important recreational activity (Table 3). Both general hunters and woodcock hunters had hunted on average for over 30 years. Both groups also estimated they went afield over the previous 12 months for over 20 days on average, with woodcock hunters going afield more days on average (32-48 days) than general hunters (22-30 days). We hypothesized that hunters who were more avid would be more likely to be knowledgeable and supportive of habitat management, and young forest management in particular.

Table 2. Socio-demographic characteristics and measure of political leaning, by WMA and stakeholder group.

Socio-demographic characteristics	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
	Percent			
Gender- Male				
Landowners[a]	68.8	69.2	72.7	68.2
General hunters[b]	92.5	88.2	85.5	94.0
Woodcock hunters[b]	99.1	96.8	95.7	94.9
Education- College Degree				
Landowners[a]	41.3[x]	41.2[x]	53.4[y]	58.1[y]
General hunters[b]	35.9[x]	25.6[y,z]	23.2[z]	31.1[x,y]
Woodcock hunters[a]	43.9	47.6	48.6	49.6
Political leaning- Conservative				
Landowners[a]	38.9[x,y]	42.3[x]	36.3[y]	39.5[x,y]
General hunters[b]	49.6[x]	58.5[y]	42.0[x]	57.6[y]
Woodcock hunters[c]	49.5	58.6	63.2	61.8
	Mean			
Age				
Landowners[a]	62.1	61.1	62.2	61.9
General hunters[b]	56.3	54.1	55.9	55.3
Woodcock hunters[b]	54.4	53.9	53.4	57.6

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 3. Hunting activity questions, by WMA and stakeholder group.

Hunting activity	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
	Percent			
Hunted in past 5 years				
Landowners	36.3[x]	40.3[x]	39.0[x]	17.0[y]
Importance of hunting- Most important recreational activity				
General hunters[a]	25.3	26.4	35.6	36.4
Woodcock hunters[b]	46.7	45.2	40.0	48.3
	Mean			
Years as a hunter				
General hunters[a]	36.4	34.1	37.0	33.0
Woodcock hunters[b]	39.1	38.1	38.8	39.2
Days hunted in past 12 months				
General hunters[a]	28.0[x]	26.1[x]	29.6[x]	21.8[y]
Woodcock hunters[b]	48.2[x]	43.1[x]	48.2[x]	32.3[y]

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

We asked several questions about the importance of the local WMA to the respondent because we hypothesized that respondents who had a stronger attachment to the local WMA would be more likely to be satisfied with their experiences at the WMA, and more supportive of habitat management actions that might improve their recreational experiences. We found that their local WMA meant a great deal to 68-86% of those who had visited it in the past 5 years (Table 4). Fewer agreed that the local WMA was the best place for what they liked to do (24-67%) and that they get more satisfaction out of visiting the local WMA compared with most other natural areas (24-55%).

Table 4. For those who have visited local WMA in past 5 years, measures of place attachment, by WMA and stakeholder group.

	Percent agreeing			
Place attachment	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Local WMA means a great deal to me				
Landowners	85.2	85.9	76.5	81.0
General hunters	78.4	83.1	79.2	71.0
Woodcock hunters	78.6	83.3	80.6	68.0*
Local WMA is the best place for what I like to do				
Landowners[a]	55.1[y]	66.7[z]	44.5[x]	49.4[x,y]
General hunters[b]	48.0	55.6	44.4	34.8
Woodcock hunters[b]	45.2	48.3	54.8	24.0*
I get more satisfaction out of visiting local WMA than most other natural areas				
Landowners[a]	48.3[x]	54.9[x]	31.6[y]	33.3[y]
General hunters[a]	42.4	45.3	38.9	31.9
Woodcock hunters[b]	23.8	33.3	51.6	24.0*

*n<30.
[a,b] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Beliefs about General WMA Management

Respondents were asked about their beliefs regarding woodland management as a general measure of their potential support for young forest management actions. We found that large majorities of landowners (80-84%), general hunters (84-88%), and almost all woodcock hunters (92-97%) agreed that harvesting trees is sometimes necessary for the ecological health of woodlands (Table 5). Almost all woodcock hunters (92-95%), somewhat fewer general hunters (81-85%), and fewer landowners (67-75%), but still large majorities in each group, agreed that harvesting trees from a woodland can improve habitat for wildlife. Few general hunters (14-21%) and even fewer woodcock hunters (6-13%) agreed with the statement that woodlands should be left untouched by humans. Landowners were more likely to agree with the statement, but still only a minority of them agreed (19-34%). This finding suggests that there is a segment—even if a minority--of landowners who are less likely to be supportive of any management actions taking place on the local WMA.

Table 5. Beliefs about woodland management, by WMA and stakeholder group.

Beliefs about woodland management	Percent agreeing			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Harvesting trees is sometimes necessary for the ecological health of woodlands				
Landowners[a]	82.4	81.5	83.6	80.0
General hunters[b]	87.8	88.2	85.6	84.1
Woodcock hunters[c]	97.0	93.2	96.9	91.8
Harvesting trees from a woodland can improve habitat for wildlife				
Landowners[a]	69.4	72.5	75.5	67.5
General hunters[b]	85.2	84.4	80.7	80.6
Woodcock hunters[c]	94.9	94.9	95.3	91.8
Woodlands should be left untouched by humans				
Landowners[a]	27.3	24.7	19.1	34.5
General hunters[b]	17.4	14.4	14.9	20.6
Woodcock hunters[c]	9.1	5.9	6.2	12.8

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Limiting use of WMAs to just hunting, fishing, and trapping was not favored by most landowners (83-88%). On the other hand, over one-quarter of general hunters (25-49%) and approximately one-third of woodcock hunters (29-46%) approve of limiting use of WMAs to consumptive recreational activities (Table 6). Generally stakeholder groups had similar opinions across WMAs, but sometimes respondents living near Cranberry Mountain WMA were an exception. For example, twice as many general hunters living near Cranberry Mountain WMA favored limiting use at the WMA to consumptive recreational activities compared with general hunters living near the other WMAs (49% vs. 25-27%). Using WMAs for wildlife viewing and birdwatching, and managing them to protect endangered species were favored by most landowners, general hunters, and woodcock hunters (60-85%). It should be noted that a few individuals held incompatible beliefs indicating that use should be limited to consumptive activities but at the same time open to wildlife observation and bird watching. Fewer respondents, but still over half of landowners at all WMAs, general hunters at three of four WMAs, and woodcock hunters at two of four WMAs thought that WMAs should be open for all kinds of recreation (35-62%).

Table 6. Beliefs about general management of WMAs, by WMA and stakeholder group.

	Percent agreeing			
Beliefs about general management of WMAs	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
WMAs should be open only for hunting, fishing, and trapping				
Landowners[a]	15.7	17.3	16.4	12.4
General hunters[b]	27.0[x]	24.9[x]	25.9[x]	49.4[y]
Woodcock hunters[c]	29.3	33.1	36.9	46.4
WMAs should be open for wildlife viewing and bird watching				
Landowners[a]	84.1	85.0	84.6	85.1
General hunters[b]	70.0[x]	73.3[y]	75.7[x]	59.7[x]
Woodcock hunters[b]	72.7[x,z]	79.7[y,z]	67.7[x]	61.8[x]
WMAs should be open for all kinds of recreation				
Landowners	61.0	62.7	52.8	51.5
General hunters	61.4	54.5	57.4	44.3
Woodcock hunters	52.5	53.4	47.7	35.5
WMAs should be managed to protect endangered species				
Landowners[a]	82.7	82.1	83.0	85.1
General hunters[a]	81.4	75.7	82.7	79.0
Woodcock hunters[b]	69.4	72.0	66.2	60.0

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Awareness and Use of Local WMA

Almost all survey respondents (landowners and both samples of hunters) had heard of WMAs (82-100%) (Table 7). In three of the four areas, almost all landowners and woodcock hunters (90-99%) and a large majority of general hunters (77-89%) had heard of the local WMA. All

three stakeholder groups living near Cranberry Mountain WMA were less likely to be aware of their local WMA (63-77%). Still the majority of survey respondents had heard of the areas.

The majority of those who had heard of the local WMA had visited it at some point (Table 7). Landowners and general hunters living near Connecticut Hill and High Tor were more likely to have visited in the past 5 years (and less likely to have never visited) than those living near Upper and Lower Lakes and Cranberry Mountain (53-77% vs. 36-56%). Woodcock hunters living near Connecticut Hill, High Tor, and Upper and Lower Lakes were more likely to have visited in the past 5 years (and less likely to have never visited) compared with woodcock hunters living near Cranberry Mountain (47-58% vs. 41%).

Many respondents, particularly woodcock hunters, had visited other WMAs besides their local one (Table 7). Over 50% of respondents in each stratum, except landowners living near Upper and Lower Lakes (44%), had visited a WMA other than their local one.

These findings taken together suggest that respondents to the survey are generally knowledgeable about WMAs. Most are aware of them. Many have visited their local WMA and perhaps other WMAs. Between one-third and two-thirds had visited their local WMA in the past 5 years.

Those who had visited their local WMA in the past 5 years were very likely to have participated in some type of wildlife-dependent recreation (i.e., hunting, fishing, trapping, nature observation/photography including birdwatching) at the local WMA (Table 8). As expected, large majorities of general hunters (79-84%) and woodcock hunters (73-100%) had used the local WMA for wildlife-dependent recreation. The majority of their visits (55-90%) were also for wildlife-dependent recreation (Table 9). Deer was the most popular species among general hunters (47-58%) (Appendix Table D-2). As expected, woodcock/grouse was very popular among woodcock hunters (47-73%), and a number of general hunters also hunted for woodcock/grouse (15-23%). Over 50% of landowners used the local WMA for wildlife-dependent recreation (Table 8), but only 35-51% of the total visits landowners made were for wildlife-dependent recreation (Table 9). Fewer hunters (general and woodcock) used the local WMA for non-wildlife dependent recreation (19-58%), but the range varied widely between WMAs (Table 8). Landowners were generally more likely to use the local WMA for this type of recreation (51-75%), and our estimate of total visits by this stakeholder group was more than twice the number of visits by hunters[5] at each WMA (Table 9). Hiking (including dog walking) was the most common activity for landowners (44-72%) (Appendix Table D-2). As we would expect, very few general hunters or woodcock hunters visited the local WMA in the past 5 years only for non-wildlife dependent recreation (0-11%) (Table 8). Landowners, however, were more likely to use the local WMA exclusively for non-wildlife dependent recreation (10-32%). Landowners were more likely to use Cranberry Mountain and High Tor exclusively for non-wildlife dependent recreation and less likely to use it for wildlife-dependent recreation than were landowners living near the other WMAs. Thus, although the management mandate favors wildlife-dependent recreation, these areas are being used by many people for non-wildlife dependent recreation.

[5] Part of this difference can be explained by the limited number of days per year that hunting is allowed.

Table 7. Awareness and use of WMAs, by WMA and stakeholder group.

	Percent			
Awareness and use of WMAs	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Heard of WMAs				
Landowners	95.6[x]	93.6[x]	93.6[x]	82.0[y]
General hunters	97.6	98.9	98.7	94.5
Woodcock hunters	100.0	96.8	97.1	92.2
Heard of local WMA				
Landowners[a]	98.7[x]	99.5[x]	90.1[y]	69.9[z]
General hunters[a]	88.6[x]	89.3[x]	77.1[y]	62.9[z]
Woodcock hunters[b]	98.0[x]	93.5[y]	93.9[y]	76.9[z]
If heard of local WMA, most recent visit				
Landowners[a]				
Past 5 years	66.7[x]	66.1[x]	46.6[y]	56.0[y]
Never	12.0	14.1	23.8	30.0
General hunters[b]				
Past 5 years	52.9[x]	60.8[x]	36.5[y]	49.3[y]
Never	19.4	25.0	35.1	32.9
Woodcock hunters[b]				
Past 5 years	47.3[x]	58.3[x]	57.4[x]	41.1[y]
Never	20.4	21.3	27.8	39.7
Visited other WMA				
Landowners[a]	59.2[x]	60.7[x]	44.0[y]	54.8[x]
General hunters[b]	66.5[x]	62.4[x]	52.7[y]	77.4[z]
Woodcock hunters[c]	92.5	90.2	88.6	89.7

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 8. Participation in wildlife-dependent and non-wildlife dependent recreational activities at local WMA in past 5 years, by WMA and stakeholder group.

	Percent			
Participation in past 5 years at local WMA	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Wildlife-dependent recreation				
Landowners[a]	64.8[x, y]	61.8[x,z]	72.2[y]	51.2[z]
General hunters[b]	79.5	78.9	84.2	80.0
Woodcock hunters[c]	93.3[x]	92.1[x]	100.0[y]	73.3[z]
Non-wildlife dependent recreation				
Landowners[a]	68.8[x]	75.3[x]	51.4[y]	72.6[x]
General hunters[b]	53.0[x]	58.5[x]	27.6[y]	50.7[x]
Woodcock hunters[c]	40.0[x]	50.8[x]	19.4[y]	36.7[x,y]
Only non-wildlife dependent recreation				
Landowners[a]	18.6[x]	25.9[y]	10.4[z]	32.1[y]
General hunters[b]	9.1	10.9	3.9	10.7
Woodcock hunters[c]	4.4	1.6	0.0	6.7

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 9. Estimated number of visits per year[a] for wildlife-dependent and non-wildlife dependent recreational activities and percent of total that is wildlife-dependent, by WMA and stakeholder group.

	Connecticut Hill		High Tor		Upper and Lower Lakes		Cranberry Mountain	
Activity	Est. # visits	% wildlife-dependent	Est. # visits	% wildlife-dependent	Est. # visits	% wildlife-dependent	Est. # visits	% wildlife-dependent
Wildlife-dependent recreation								
Landowners	5,392	34.8	5,964	37.8	3,140	50.0	1,949	35.1
General hunters	5,052	55.4	3,159	65.7	6,662	85.3	2,188	64.5
Woodcock hunters	454	79.9	1,403	75.3	877	89.8	407[b]	76.3[b]
Non-wildlife dependent recreation								
Landowners	10,085		9,811		3,082		3,599	
General hunters	4,070		1,648		1,151[b]		1,205	
Woodcock hunters	114[b]		460		100[b]		127[b]	

[a]Respondents reported total number of visits in past 5 years by activity. The estimated total number of visits per year was calculated by dividing total visits by 5 and multiplying by the population size for each strata listed in Table 1.
[b]n<30.

Satisfaction with Use of Local WMA

We asked those who had visited in the past 5 years how satisfied or dissatisfied they were with ten aspects of their visit. Most respondents in all three stakeholder groups were satisfied with the quality of the natural habitat (48-83%) (Table 10). General hunters and woodcock hunters at Connecticut Hill were less likely to be satisfied compared with hunters at the other three WMAs (48-66% vs. 67-80%). Forty-one percent of woodcock hunters at Connecticut Hill were dissatisfied. Similar results were found for satisfaction with "birds and other wildlife seen." Satisfaction with other aspects such as the availability of parking, maintenance of trails, and types of recreation opportunities available varied more by WMA than by stakeholder group, with the percent satisfied being lower for some groups at Connecticut Hill compared with the other WMAs. Landowners were more likely than the two hunter groups to be satisfied with the opportunity to use an area without interference from other users (67-71% vs. 44-71%). Over 30% of general hunters and woodcock hunters at Cranberry Mountain were dissatisfied with this. This finding highlights an often mentioned difference between hunters and non-hunters, in which hunters' desire exclusive use of an area while hunting, and non-hunters are less concerned about interactions with other users.

Satisfaction with the availability of maps and information either online or at the WMA was generally in the 40-50% range, but dissatisfaction was not high suggesting a number of people were neutral in their views on the subject (Table 10). Many people were neutral in their opinion on access for people with disabilities at the local WMA. Satisfaction with access was higher for those visiting Upper and Lower Lakes WMA (38-49%), presumably because the WMA provides accessible trails and facilities at the nature center.

Table 10. For those who have visited their local WMA in past 5 years, satisfaction with various aspects of the experience, by WMA and stakeholder group.

	Percent satisfied / dissatisfied			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Quality of the natural habitat				
Landowners[a]	75.8/10.0	77.0/9.1	83.0/5.9	74.7/10.1
General hunters[a]	66.1/17.7[x]	74.8/13.3[y]	78.9/7.0[y]	80.3/4.5[y]
Woodcock hunters[b]	47.6/40.5[x]	66.7/20.0[y]	77.4/22.6[y]	68.0/12.0[*,y]
Birds and other wildlife seen				
Landowners[a]	73.4/8.7	76.2/6.6	81.5/7.4	72.7/13.0
General hunters[a]	64.8/18.4[x]	74.4/14.3[y]	78.9/7.0[y]	68.7/10.4[x]
Woodcock hunters[b]	52.4/38.1[x]	66.1/15.3[y]	80.6/12.9[y,z]	56.0/28.0[*,x]
Availability of parking				
Landowners[a]	49.8/15.9[x]	72.5/8.2[y]	78.7/5.9[y]	65.0/20.0[x]
General hunters[b]	47.6/18.5[x]	72.8/8.1[y]	69.0/8.5[y]	52.2/22.4[x]
Woodcock hunters[a,b]	59.5/11.9	70.0/10.0	64.5/12.9	52.0/32.0[*]
Types of recreation opportunities available				
Landowners	58.1/15.3	62.0/12.4	64.9/9.7	62.3/9.1
General hunters	45.5/17.9[x]	64.7/10.5[y]	64.8/5.6[y]	69.2/3.1[y]
Woodcock hunters	60.0/12.5	78.0/5.1	77.4/6.5	68.0/12.0[*]
Opportunity to use area without interference from other users				
Landowners[a]	70.0/11.7	71.3/11.1	68.9/11.4	66.7/12.8
General hunters[b]	56.3/20.6	57.5/18.7	60.6/15.5	49.3/31.3
Woodcock hunters[b]	70.7/7.3[x]	63.3/18.3[x]	61.3/19.4[x]	44.0/36.0[*,y]

Table 10. (cont.)

	Percent satisfied / dissatisfied			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Maintenance of trails				
Landowners	47.2/16.2[x]	68.6/13.2[y]	71.6/9.0[y]	63.6/13.0[y]
General hunters	43.5/23.4[x]	68.5/7.7[y]	64.8/9.9[y]	70.8/7.7[y]
Woodcock hunters	57.1/9.5	62.7/3.4	51.6/3.2	72.0/8.0[*]
Rules/regulations that allow some activities and prohibit others				
Landowners	45.4/21.0[x]	57.2/12.8[y]	60.2/9.8[y]	51.9/9.1[y]
General hunters	42.3/21.1[x]	55.6/10.5[y]	57.1/8.6[y]	50.8/7.7[y]
Woodcock hunters	47.6/11.9	56.9/3.4	53.3/20.0	62.5/12.5[*]
Availability of maps and other information online				
Landowners	34.8/18.1[x]	49.2/15.1[y]	43.8/9.2[y]	53.5/19.7[y]
General hunters	43.3/22.5	50.0/10.0	46.4/11.6	44.6/12.3
Woodcock hunters	51.2/17.1	62.1/13.8	64.5/6.5	44.0/8.0[*]
Availability of maps and other information at the WMA				
Landowners	28.7/19.3[x]	47.1/16.0[y]	49.2/12.1[y,z]	48.7/22.4[x,z]
General hunters	35.0/28.3	52.3/13.8	40.0/24.3	36.9/18.5
Woodcock hunters	51.2/19.5	51.7/19.0	61.3/12.9	33.3/8.3[*]
Access for those with disabilities				
Landowners	17.6/12.7[x]	27.6/8.2[y]	40.8/7.2[z]	19.2/16.4[x,y]
General hunters	17.1/23.1[x]	29.5/5.4[y]	49.3/8.7[z]	27.0/6.3[y]
Woodcock hunters	16.7/11.9[x]	32.2/5.1[y]	37.9/3.4[y]	25.0/8.3[*,x,y]

[*] n<30.

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

We asked those who had hunted on the local WMA in the past 5 years about several elements of their hunting experience (Table 11). Landowners who were hunters and general hunters appeared similar in their levels of satisfaction. Members of these groups were more likely to be dissatisfied than satisfied with the number of game animals seen. In contrast, they were more likely to be satisfied than dissatisfied with the quality of the habitat for the species they wanted to hunt, being able to hunt in the spot they wanted to, and having the opportunity to hunt without encounters with other recreationists. Woodcock hunters were similar to landowners (who hunted) and general hunters except for the increased number who were dissatisfied with the quality of the habitat for the species they wanted to hunt (29-60%), especially at Connecticut Hill.

A set of questions on perceived changes in species populations was included in the questionnaire to establish a baseline that could be compared with people's perceptions after more young forest management actions have taken place. A number of survey respondents who had visited their local WMA in the past 5 years indicated they did not know how the population had changed for a given species (Table 12). This percentage was relatively low for deer (20-49%), but much higher for less common species such as grouse (39-61%) and woodcock (51-80%), except among woodcock hunters who were much more likely to have a perception of population change for grouse and woodcock. Among those who had an opinion about a population change, in almost all cases the mean change was negative; on average people thought there had been a decrease in the population over the past five years. General hunters were more likely than landowners to think there had been a decrease in the deer, turkey, and waterfowl populations across the four WMAs. Woodcock hunters who visited Connecticut Hill and High Tor were very likely to think the population of grouse and woodcock had declined over the past 5 years. Landowners and general hunters perceived the songbird population to have remained mostly unchanged over the past 5 years.

Table 11. For those who had hunted on the local WMA in the past 5 years, satisfaction with various elements of the hunting experience, by WMA and stakeholder group.

	Percent satisfied / dissatisfied			
Elements of the hunting experience	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Number of game animals seen				
Landowners	30.5/48.4	32.6/38.9	35.3/35.3	ins[1]
General hunters	33.3/44.8	29.2/44.8	41.8/29.1	30.2/47.2
Woodcock hunters	26.3/63.2[x]	24.1/53.7[x]	58.1/25.8[y]	ins
The quality of habitat for the species I wanted to hunt				
Landowners[a]	41.4/26.4[x]	56.5/15.2	56.3/20.8	ins
General hunters[a]	45.3/31.6[x]	55.8/15.8[y]	71.4/10.7[z]	56.6/9.4[y]
Woodcock hunters[b]	26.3/60.5[x]	38.9/37.0[x]	58.1/29.0[y]	ins
Being able to hunt the spot I wanted to				
Landowners	54.5/19.3[x]	39.3/28.1[y]	42.9/22.4[x,y]	ins
General hunters	47.9/27.1[x]	42.7/30.2[x]	52.7/20.0[x]	37.7/34.0[y]
Woodcock hunters	57.9/18.4	51.9/16.7	51.6/12.9	ins
Opportunity to hunt without encounters with other recreationists				
Landowners	46.6/22.7	31.5/38.2	38.8/30.6	ins
General hunters	47.9/31.3	32.3/36.5	42.9/23.2	24.5/52.8
Woodcock hunters	52.6/13.2	44.4/25.9	45.2/29.0	ins

[1] ins- insufficient sample size for analysis.
[a,b] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 12. For those who have visited local WMA in past 5 years, mean change[1] in the number of animals seen by species over the last 5 years, by WMA and stakeholder group.

	Connecticut Hill		High Tor		Upper and Lower Lakes		Cranberry Mountain	
Number of animals seen	Mean change	% DK[2]	Mean change	% DK[2]	Mean change	% DK[2]	Mean change	% DK[2]
Deer								
Landowners[a]	-.14	29.7	-.04	29.3	-.14	49.2	-.20	44.4
General hunters[b]	-.40	20.5	-.35	22.0	-.28	27.5	-.24	24.6
Woodcock hunters[b]	ins[3]	27.8	-.34	22.4	ins	33.3	ins	45.8[*]
Turkey								
Landowners[a]	-.15[x]	34.1	.02[y]	36.2	.08[y]	51.6	-.38[x]	52.8
General hunters[b]	-.43[x]	26.9	-.27[x]	26.9	0.0[y]	38.5	-.24[x,y]	28.1
Woodcock hunters[b]	ins	25.0	-.39	29.8	ins	46.7	ins	45.8
Grouse								
Landowners[a]	-.20	47.8	-.25	59.4	-.23	60.7	ins	63.4
General hunters[a]	-.40	39.5	-.27	43.4	-.26	42.4	-.47	50.8
Woodcock hunters[b]	-.67[x]	18.9	-.76[x]	25.5	-.23[y]	26.7	ins	41.7[*]
Woodcock								
Landowners	-.29	59.9	-.17	65.8	ins	80.2	ins	67.1
General hunters	-.46[x]	51.3	-.25[x,y]	62.2	-.17[y]	56.7	ins	52.5
Woodcock hunters	-.69[x]	23.7	-.73[x]	35.1	-.19[y]	30.0	-.31[**]	33.3
Waterfowl								
Landowners[a]	-.08[x]	46.6	.14[y]	46.7	.29[y]	43.4	ins	65.7
General hunters[b]	-.24[x]	58.0	.13[y]	48.8	-.16[x]	27.9	ins	58.3
Woodcock hunters	ins	58.3	ins	47.9	ins	16.7	ins	62.5[*]

Table 12. (cont.)

Number of animals seen	Connecticut Hill Mean change	Connecticut Hill % DK[2]	High Tor Mean change	High Tor % DK[2]	Upper and Lower Lakes Mean change	Upper and Lower Lakes % DK[2]	Cranberry Mountain Mean change	Cranberry Mountain % DK[2]
Song birds								
Landowners[a]	-.03	41.4	-.04	39.4	-.07	52.0	-.08	46.5
General hunters[b]	0.0	44.9	.06	39.4	.09	47.7	.05	37.3
Woodcock hunters	ins	42.9	ins	52.1	ins	80.0	ins	50.0*
Other small animals								
Landowners[a]	.03	29.9	.03	32.4	-.13	49.2	-.16	49.3
General hunters[a]	-.22	28.6	-.05	29.5	-.17	30.3	0.0	24.2
Woodcock hunters[b]	ins	40.5	-.40	24.5	ins	56.7	ins	29.2*

[1] Change was measured on a scale where decrease = -1, no change = 0 and increase = 1.
[2] Percent who don't know.
[3] ins- Insufficient sample size for analysis.
*n<30.
** n=16.
[a,b] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

We also inquired about overall satisfaction with respondents visits in the past 5 years. The majority of all stakeholder groups at all WMAs (53-74%), except woodcock hunters at Connecticut Hill (45%) were satisfied to some extent with their visits (Table 13). Woodcock hunters, in general, were less satisfied than general hunters, who were in turn less satisfied than landowners with their visits to their local WMAs. Very few people in any stakeholder group were very dissatisfied (0-9%).

Table 13. For those who have visited the local WMA in past 5 years, overall satisfaction with their visits, by WMA and stakeholder group.

	Percent			
Overall satisfaction	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Landowners[a]				
Very satisfied	33.2	40.2	43.0	41.0
Somewhat satisfied	36.2	34.4	25.9	21.8
Neutral	10.5	12.7	12.6	15.4
Somewhat dissatisfied	15.1	7.0	9.6	15.4
Very dissatisfied	5.0	5.7	8.9	6.4
General hunters[b]				
Very satisfied	18.0	22.5	20.5	16.7
Somewhat satisfied	37.8	44.4	45.3	44.4
Neutral	21.3	14.8	21.9	25.0
Somewhat dissatisfied	17.2	14.1	9.6	13.9
Very dissatisfied	5.7	4.2	2.7	0.0
Woodcock hunters[*,c]				
Very satisfied	7.5[x]	16.1[x,y]	31.0[y]	17.9[x,y]
Somewhat satisfied	37.5	37.1	34.6	35.6
Neutral	12.5	22.6	17.2	17.9
Somewhat dissatisfied	40.0	22.6	13.8	25.0
Very dissatisfied	2.5	1.6	3.4	3.6

[*]Sample size for Cranberry Mountain WMA woodcock hunters < 30.
[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Using regression analysis, which takes into account potential differences between stakeholder groups and WMAs, we found that place attachment was positively related to overall satisfaction with visits to the local WMA. The more important the local WMA was to the respondent, the more likely they were to be satisfied with their experience. We also found that hunters who were more avid, in that they believed hunting was a very important recreational activity to them, were less satisfied with their visits to the local WMA than those who were less avid. Among landowners, women were more likely to be satisfied than men. Additionally, when we examined

results for all respondents, we found that those who were more educated and those who were less conservative were more likely to be satisfied with their visits to the local WMA.

Awareness and Support of Young Forest Habitat Management on Local WMA

In the questionnaire we described DEC's young forest habitat management program in the following way, but did not specifically refer to the program as the YFI:

> *NYSDEC has begun a habitat management program to restore young forest habitat in the [local name] WMA (and other WMAs as well) as a way to improve food and cover for wildlife. Young forest contains tree seedlings, saplings, woody vines, and shrubs up to about 10 years old.*

We then asked if respondents were aware of any of the communication efforts DEC has undertaken to make people aware of the habitat management program. We present results on awareness of communication methods in Table 14 for two groups of respondents - those who were aware of the local WMA, and the subset of that group who had visited the WMA in the past 5 years. Those who had visited the local WMA were generally more likely to be aware of each potential method of communication than the larger group that included people who had not visited the local WMA but were aware of it. Information available on the DEC website was the source people were most likely to be aware of. One-quarter to one-third of landowners indicated they were aware that DEC had used its website to communicate about its habitat management program. More general hunters (35-48%) and woodcock hunters (40-52%), were aware of the use of the website as a way to communicate information. Over 40% of landowners and general hunters who had visited High Tor, Upper and Lower Lakes, and Cranberry Mountain in the past 5 years indicated they were aware of information kiosks at their local WMA letting people know about the habitat management program; fewer landowners and general hunters who visited Connecticut Hill (16-25%) were aware of information kiosks. Fewer people were aware of public meetings (12-31%) and emails from DEC (9-31%) as sources of habitat management information, except woodcock hunters who were somewhat more aware of emails from DEC (16-48%).

Table 14. For those who were aware of the local WMA, and for those who had visited the WMA in the past 5 years, the percent who were aware of the communication methods used by DEC to make people aware of the young forest habitat management program, by WMA and stakeholder group.

Communication methods aware of for young forest habitat management program	Percent							
	Connecticut Hill		High Tor		Upper and Lower Lakes		Cranberry Mountain	
	Aware of local WMA	Visited in past 5 years	Aware of local WMA	Visited in past 5 years	Aware of local WMA	Visited in past 5 years	Aware of local WMA	Visited in past 5 years
Information available on DEC website								
Landowners[aa,va]	25.7[ax]	29.3	35.7[ay]	43.3	24.8[ax]	27.2	25.0[ax]	31.3
General hunters [ab,vb]	34.6[ax]	41.8	34.9[ax]	40.7	42.9[ax,ay]	52.8	47.9[ay]	58.3
Woodcock hunters [ac,vb]	40.2	59.5	51.9	53.2	46.0	57.1	49.3	59.3
Information posted at kiosks at local WMA								
Landowners	17.6[ax]	24.8[vx]	39.1[ay]	51.8[vy,vz]	27.5[ay]	40.9[vz]	34.0[ay]	44.3[vz]
General hunters	18.5[ax]	15.7[vx]	32.5[ay]	44.4[vy]	28.4[ay]	45.9[vy]	28.4[ay]	45.1[vy]
Woodcock hunters	21.6	44.2	31.1	36.1	27.5	46.4	30.9	64.3
Public meetings								
Landowners	15.3	17.3	19.2	21.9	17.0	15.1	12.7	12.0
General hunters	13.4	17.5	14.9	16.8	16.7	16.0	12.1	14.1
Woodcock hunters	16.1	31.0	18.1	21.3	19.6	25.0	20.9	19.2
Emails from DEC								
Landowners[aa,va]	9.7	12.4	11.7	13.4	8.9	10.9	9.7	11.3
General hunters [ab,vb]	14.2[ax]	16.7	12.1[ax]	14.2	10.3[ax]	12.5	28.9[ay]	31.0
Woodcock hunters [ac,vc]	16.3[ax]	28.6	34.3[ay]	45.9	26.0[ax,ay]	32.1	39.7[ay]	48.0

[aa, ab, ac] For those aware of local WMA, stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[va, vb, vc] For those who had visited the local WMA in the past 5 years, WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[ax, ay] For those aware of local WMA, stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[vs, vy, vz] For those who had visited the local WMA in the past 5 years, WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Support for specific actions DEC could take to restore young forest habitat was generally high and widespread, with little variation between WMAs (Table 15). The proportion of people supporting or opposing a particular action did, however, vary somewhat by stakeholder group with woodcock hunters most likely to support each action and landowners least likely; general hunters were intermediate. Support was highest for planting native shrubs and trees in open fields to create young forest, with 78% to 90% of respondents supporting that action on their local WMA. There was very little opposition to this action (4-11%). Support was also high (66-94%), with little opposition (3-20%), for two other actions – using mulching or mowing machines to spur regrowth of shrubs, and cutting trees to make patches of new growth in forests. These actions were more likely to be supported by more avid hunters than less avid ones. Controlled burning to spur regrowth of trees and shrubs was supported by over 80% of woodcock hunters, but fewer landowners (51-61%). Twenty to twenty-eight percent of landowners opposed this action. Using herbicides to remove non-native and/or invasive plant species was supported by 39% to 63% of respondents. Avid hunters were more likely than less avid hunters to support this action. Two-fifths of landowners opposed this action taking place at their local WMA.

Some young forest habitat management actions had taken place in the years prior to our survey. We inquired if people who had visited their local WMA within that period recalled seeing any of the management activities listed in the previous question. We found that two-fifths of landowners and general hunters and somewhat more woodcock hunters who had visited Connecticut Hill and High Tor (47-61%) recalled seeing these young forest management activities (Table 16). One-quarter to one-half of visitors to Cranberry Mountain WMA indicated they had noticed the activities. Fewer landowners and general hunters at Upper and Lower Lakes recalled these activities (29-33%). Landowners who lived closer to Connecticut Hill and Upper and Lower Lakes (less than 5 miles) were more likely to have noticed the management actions than those living further away (55% vs. 40% for Connecticut Hill, 45% vs. 26% for Upper and Lower Lakes).

Table 15. Support for actions to restore young forest habitat, by WMA and stakeholder group.

Actions to restore young forest habitat	Percent support/oppose			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Planting native shrubs and trees in open fields to create young forest				
Landowners[a]	77.9/9.6[x]	79.3/8.0[x]	77.9/9.3[x]	85.6/5.6[y]
General hunters[a]	80.5/10.6	76.3/10.7	77.3/10.2	86.9/7.5
Woodcock hunters[b]	90.4/3.8[x]	84.0/8.0[y]	85.3/8.8[y]	85.5/10.3[y]
Using mulching or mowing machines to spur regrowth of shrubs				
Landowners[a]	68.1/12.3	70.4/11.3	70.5/6.3	74.6/9.9
General hunters[b]	80.4/6.1	77.5/6.3	71.7/9.0	81.2/7.6
Woodcock hunters[c]	88.5/2.9[x]	87.0/5.7[y]	92.6/1.5[x]	93.1/3.4[x]
Cutting trees to make patches of new growth in forests				
Landowners[a]	66.8/19.7	66.4/18.2	66.5/12.0	66.7/18.3
General hunters[b]	76.1/11.7	74.4/9.4	67.6/15.1	81.3/8.6
Woodcock hunters[c]	92.3/2.9	91.1/4.9	94.1/4.4	93.2/4.3
Controlled burning to spur regrowth of trees and shrubs				
Landowners[a]	51.4/28.2	58.6/20.4	55.9/18.3	60.8/23.1
General hunters[b]	76.8/12.2	72.3/13.3	65.9/15.0	69.8/12.6
Woodcock hunters[c]	86.5/3.8	84.7/6.5	86.8/8.8	83.8/10.3
Using herbicides to remove non-native and/or invasive plant species				
Landowners[a]	38.9/44.8	40.1/42.9	41.2/39.1	43.5/45.8
General hunters[b]	55.5/29.1	52.3/30.9	47.1/35.6	51.8/35.5
Woodcock hunters[c]	62.5/14.4	59.7/27.4	60.3/23.5	59.0/29.1

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 16. Of those who had visited the local WMA within the time specified*, the percent who had noticed young forest habitat management activities that had taken place on the local WMA, by WMA and stakeholder group.

Noticed young forest habitat management activities on local WMA in past x years	Percent			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Landowners[a]	45.4[x]	41.5[x]	29.5[y]	24.8[y]
General hunters[a]	41.3[x]	46.4[x]	32.7[y]	42.7[x]
Woodcock hunters[b]	60.5	47.3	60.0	50.0

*Number of years varied by local WMA

- Connecticut Hill- 3 years
- High Tor- 2 years
- Upper and Lower Lakes- 2 years
- Cranberry Mountain- 5 years

[a,b] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

We asked about people's perception of how the quality of various recreational experiences might change at their local WMA after young forest habitat management actions had taken place. Depending on the recreational experience being asked about, 28% to 49% of landowners indicated they did not know how management actions would impact the recreational experience. Fewer general hunters and woodcock hunters (8-31%) indicated they did not know what the impact would be. Among those stating a view, 5% or fewer thought management actions to restore young forests would make the quality of the recreational experience worse. Table 17 shows the percent who believed the impact of management actions would make the recreational experience "much better." For example, 39-49% of landowners, 45-56% of general hunters, and 64-72% of woodcock hunters believed the quality of deer hunting would be much better because of DEC's actions to restore young forest habitat. The views of each stakeholder group did not differ by WMA, except in one case where general hunters differed in the proportion who thought the quality of turkey hunting would be much better because of young forest management actions. For all types of hunting, except waterfowl hunting, woodcock hunters were more likely than general hunters to believe that the quality of the hunting experience would be much better because of young forest management actions; landowners were least like to believe this. Over 80% of woodcock hunters thought woodcock and grouse hunting would be much better because of these management actions. Around two-thirds (57-73%) also thought deer, turkey, and other small game hunting would be much better. Fewer respondents thought waterfowl hunting would be much better (28-43%); they were just as likely to believe there would be no change because of management actions (35-55%). Forty percent or more of all respondents thought the quality of bird watching and other wildlife observation experiences would improve because of young forest management actions.

Table 17. Of those with an opinion[1], the percent indicating the quality of various recreational experiences will be "much better" because of young forest management actions at the local WMA, by WMA and stakeholder group.

Impact of DEC actions to restore young forest habitat on	Percent indicating quality will be "much better"			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Deer hunting				
Landowners[a]	41.3	38.6	44.0	48.9
General hunters[b]	53.2	51.1	45.1	56.1
Woodcock hunters[c]	70.2	63.9	65.5	72.0
Turkey hunting				
Landowners[a]	44.2	39.6	43.3	47.8
General hunters[b]	56.8[x,z]	49.3[y,z]	42.3[y]	60.8[x]
Woodcock hunters[c]	63.7	57.3	61.1	66.7
Woodcock/Grouse hunting				
Landowners[a]	49.5	42.7	47.3	52.3
General hunters[b]	63.5	54.4	53.4	57.4
Woodcock hunters[c]	81.4	80.4	82.5	82.5
Waterfowl hunting				
Landowners	31.1	26.3	32.9	29.7
General hunters	40.6	32.0	30.6	36.8
Woodcock hunters	32.4	27.7	36.0	42.9
Other small game hunting				
Landowners[a]	41.7	39.4	49.4	45.3
General hunters[b]	55.7	49.3	45.3	56.6
Woodcock hunters[c]	71.0	60.0	71.4	73.4
Bird watching				
Landowners[a]	44.6	43.7	49.1	54.0
General hunters[a]	54.9	47.7	47.6	54.8
Woodcock hunters[b]	67.9	62.2	60.9	72.7
Observation of other wildlife				
Landowners[a]	44.0	41.4	50.7	56.0
General hunters[a]	54.2	46.4	47.9	56.2
Woodcock hunters[b]	65.9	64.4	58.8	70.0

[1]For landowners, 51-72% expressed an opinion depending on the recreational experience. For general and woodcock hunters, 69-92% expressed an opinion.

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

The overall level of support for DEC's effort to restore young forest habitat at the local WMA was high (Table 18). Three-quarters or more of the respondents from each WMA in each stakeholder group supported restoration efforts at least to some degree. Ten percent or less opposed DEC's efforts. Support was strongest among woodcock hunters (93-98%) and more muted among landowners (78-88%), with fewer strongly supporting DEC's efforts (41-54% for landowners vs. 75-88% for woodcock hunters). Those who felt the local WMA meant a great deal to them were more supportive, as were more avid hunters (based on the importance of hunting as a recreational activity). We did not find any significant relationships between level of support and awareness of the local WMA, visiting the local WMA within the past five years, or socio-demographic characteristics.

Distance from the WMA appears related to support for restoration of young forest habitat for landowners at all four WMAs, but the only statistically significant relationship was for landowners at Connecticut Hill. Landowners living less than five miles from the center point of the Connecticut Hill WMA were less likely to support restoration of young forest habitat compared with those living further away (mean level of support of 3.7 vs. 4.2 on a scale of 1=strongly oppose to 5=strongly support). Those living closer were also less supportive than those living further away for three management actions – cutting trees (3.5 vs. 3.8), controlled burning (3.0 vs. 3.5), and use of herbicides (2.6 vs. 3.0). We also previously reported that those living closer were more likely to be aware of recent management activity. These findings suggest that Connecticut Hill landowners may be different from those at other WMAs, perhaps because of the larger size of Connecticut Hill or its mix of private property and state land bringing landowners closer to the management actions taking place there.

Support for Other Management Actions on Local WMA

Respondents were asked about their support for other actions, not related to young forests that DEC might implement at the local WMA. Possible management actions we asked about differed by WMA depending on management plans for each WMA. Most hunters (general [82-84%] and woodcock hunters [80-86%]) and over 70% of landowners supported planting crops as food for wildlife and mowing to maintain grasslands on their local WMA (Table 19). There was no difference in level of support between WMAs. The addition of nearby land to the local WMA was supported by 71% to 89% of landowners and general hunters, with one notable exception. Fewer landowners and general hunters supported the addition of nearby land at Upper and Lower Lakes WMA (51-52%) and almost one-third (28-29%) opposed the action. Woodcock hunters were supportive of this action at all WMAs (85-92%). They were also supportive of adjusting water levels on small ponds to maintain wetlands and creating new wetlands (77-91%). Landowners and general hunters were less likely to be supportive of these actions, but still a majority of these stakeholder groups were supportive (55-71%).

Table 18. Overall support for restoration of young forest habitat at local WMA, by WMA and stakeholder group.

Overall support for restoration of young forest habitat at local WMA	Percent			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Landowners[a]				
Strongly support	41.1[x]	47.5[x]	46.1[x]	54.2[y]
Somewhat support	36.8	33.2	33.9	33.9
Neither oppose or support	12.0	12.2	15.7	5.9
Somewhat oppose	7.0	2.4	2.9	3.8
Strongly oppose	3.1	4.7	1.4	2.2
General hunters[b]				
Strongly support	57.7[x]	48.3[y]	49.8[y]	58.0[x]
Somewhat support	30.2	35.2	33.0	35.5
Neither oppose or support	9.1	11.7	14.1	5.3
Somewhat oppose	2.6	1.3	1.0	0.6
Strongly oppose	0.4	3.5	2.1	0.6
Woodcock hunters[c]				
Strongly support	88.3[x]	75.4[y]	75.5[y]	75.7[y]
Somewhat support	9.6	17.5	18.0	20.4
Neither oppose or support	2.1	2.6	4.9	3.9
Somewhat oppose	0.0	1.8	1.6	0.0
Strongly oppose	0.0	2.6	0.0	0.0

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

Table 19. Support for other (non-young forest) actions to manage habitat for wildlife, by WMA and stakeholder group.

Other actions to manage habitat for wildlife	Percent support/oppose			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Planting crops as food for wildlife				
Landowners[a]	72.5/11.7	70.1/11.3	NA[1]	NA
General hunters[b]	83.5/8.9	83.9/8.1	NA	NA
Woodcock hunters[b]	83.7/6.1	82.1/7.7	NA	NA
Mowing to maintain grasslands				
Landowners[a]	71.0/9.1	75.2/8.4	70.5/7.0	71.3/9.2
General hunters[b]	83.5/6.4	82.1/5.5	74.6/9.5	79.5/6.3
Woodcock hunters[c]	85.7/3.1	80.2/6.9	90.8/3.1	80.7/1.8
Adding nearby land to the local WMA				
Landowners[a]	70.9/11.5[x]	72.7/10.7[x]	50.7/28.2[y]	79.0/5.5[z]
General hunters[a]	75.5/10.5[x]	73.9/8.5[x]	52.2/29.4[y]	89.3/4.0[z]
Woodcock hunters[b]	91.8/0.0	89.7/2.6	84.6/7.7	87.2/0.0
Adjusting water levels on small ponds to maintain wetlands				
Landowners[a]	71.3/11.4	63.0/12.9	62.1/10.6	65.5/11.2
General hunters[a]	71.0/10.1[x]	58.1/10.2[y]	61.5/18.0[y]	71.0/8.0[x]
Woodcock hunters[b]	89.8/0.0[x]	82.1/6.0[y]	90.8/4.6[x,y]	77.1/4.6[y,z]
Creating new wetlands				
Landowners[a]	NA	56.0/19.8	NA	NA
General hunters[a]	NA	55.1/15.7	NA	NA
Woodcock hunters[b]	NA	79.7/7.6	NA	NA

[1] NA – Action not under consideration at local WMA.
[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.

DISCUSSION AND RECOMMENDATIONS

The majority of survey respondents had heard of their local WMA and visited it at some point. A majority of almost every stakeholder group had also visited a WMA other than the one they lived near. Landowner non-respondents to the survey, however, were slightly less aware of WMAs and less likely to have visited their local WMA, but the differences were small. Taken together, our findings suggest a high overall level of awareness of WMAs. These high levels of awareness, however, may or may not be correlated with in-depth knowledge about the WMAs.

We found a pattern of differences in recreational experiences across WMAs, but few differences between stakeholder groups at the same WMA. Users at each WMA pursued varying recreational activities depending on the natural amenities offered at each area. For example, waterfowl hunting was far more popular at Upper and Lower Lakes compared with Cranberry Mountain. Satisfaction with aspects of the recreational experience and amenities available also differed by WMA. Managers of these areas should examine the detailed findings for their area to determine ways to increase satisfaction in their users.

Overall satisfaction with the recreational experience at the local WMA appeared related to factors beyond the specific amenities at the WMA. For example, our hypothesis that those with a stronger attachment to the WMA would be more satisfied with their experiences at the WMA was supported by our results. We also found that more avid hunters were less satisfied with their experience than less avid hunters.

Support for DEC's management actions, specifically those focused on increasing young forest habitat, was high overall. The strength of that support, however, differed by stakeholder group as did support for specific actions and the potential impact of those actions on the recreational experience. Woodcock hunters appeared most supportive of management actions followed by general hunters and lastly landowners. Landowners, although less supportive than the other groups, had a majority who were supportive of most actions. These findings suggest that communication plans might focus on stakeholder groups with specific messages that address their concerns.

Communication efforts to date have focused on conducting local meetings, and providing information online and at the WMA. Respondents were most likely to be aware of communication through the DEC website.

We found that the WMA was an important place to most landowners living near it, they were more likely to be satisfied with their recreational experiences at the WMA than other users, and subsequently less strongly supportive of changes to their surrounding environment. They were more likely to be unsure of the impacts of management actions on different types of recreational experiences. Communication with this group may be the most challenging because of their strong attachment to the place and diversity in the types of recreational experiences they are seeking, which might not align with the primary goals of the WMA. These sentiments were summed up in several comments from landowners on the questionnaire:

> "I would think that a good relationship with the people who 'use' and visit the WMA often, whether they hunt or not, would be helpful."

> "I recently attended, in the fall, a meeting held by the DEC in Newfield. The purpose of the meeting was to inform the public about plans to enhance Connecticut Hill. With hopes up for a variety of interests, many people attended. We quickly became greatly disappointed to learn that this meeting was solely for the purpose of informing, then taking input on the plan to improve a percentage of the land on Connecticut Hill for the betterment of song birds and woodcock."

Landowners living near Connecticut Hill stand out from landowners living near the other WMAs. In particular those living within five miles of the center point of the WMA, who were more likely to have seen recent management actions, were less supportive of future management actions than landowners living further away. This difference based on distance from the WMA was not found at the other WMAs. Because Connecticut Hill is the largest of the WMAs with some irregular boundaries it is possible that most of the respondents living within five miles of the center point own land adjacent to or very close to the WMA. This group may benefit from further communication and engagement from DEC regarding the proposed management actions.

We found general hunters were more supportive of young forest management actions than landowners, presumably because they would potentially benefit more from an improved hunting experience. Indeed, 45-56% indicated they believed deer hunting would be "much better" because of actions to restore young forest. Avid hunters who were less satisfied with their recreational experiences also were more likely to be supportive of management actions – possibly because they want DEC to do something to improve hunting. These findings confirm several of our hypotheses about differences between avid hunters, less avid hunters, and landowners.

Woodcock hunters were an important subset of hunters for us to contact because they are seeking a species that young forest management actions are intended to benefit. These hunters clearly recognized the relationship between woodcock and young forest habitat. They felt populations of woodcock were declining, and were less satisfied than general hunters and landowners with the current situation. They were more supportive than general hunters and landowners of actions to increase young forest habitat, and they expect these management actions will positively impact their hunting experience. Woodcock hunters could be an important group to survey in the future because they will be more likely to use areas where young forest management has been implemented, and notice changes in their hunting experience because of management actions.

A number of questions were asked in these surveys to establish a baseline of information such that if a resurvey is done after more young forest management actions have taken place, changes in responses will be seen. For example, we would expect hunters to notice increases in populations of grouse and woodcock, and perhaps those who engage in nature observation would perceive increases in songbird populations. We would also expect satisfaction with the recreational experience to increase for those engaging in activities that will benefit from young forest management actions. Perceived changes in populations hopefully mirror biological

assessments of change, but regardless they inform people's beliefs about the success of management actions, and are therefore important to understand when communicating with users.

SYNTHESIS OF FINDINGS FROM THREE RESEARCH EFFORTS

This survey of landowners and hunters living near four WMAs is the last in a series of research efforts we undertook to provide DEC with information from key stakeholders regarding their awareness of WMAs and support for the YFI. Comparisons between the research efforts are possible because of several similarly worded questions. All three contained a question on awareness of WMAs, with 37% of downstate residents, 70% of upstate residents, 78% of small game hunters statewide, 82-96% of landowners living near a WMA, and 92-100% of hunters living near a WMA (general and woodcock samples) indicating they were aware of WMAs. The increasing levels of awareness from group to group was as expected. The relatively high level of awareness of upstate residents suggests they might be aware of WMAs as opportunities for non-hunting recreation. If the level of awareness of WMAs was increased among small game hunters, more small game hunters (perhaps as many as 11% of small game hunters) might be able to take advantage of the hunting opportunities that WMAs provide, especially now with the YFI underway.

Support for management to create habitat for wildlife on public lands was strong among the general public, with 92% indicating some level of support and 56% indicating it was very important to create habitat. Fewer people supported each of the specific management actions we asked about, but majorities still did – 72% supported adjusting water levels on small ponds to maintain wetlands, 71% supported mowing to maintain grasslands, and 65% supported cutting trees to make patches of new growth in forests. Landowners living near WMAs supported these same actions in very similar percentages - 62-71% supported adjusting water levels on small ponds to maintain wetlands, 70-75% supported mowing to maintain grasslands, and 66-67% supported cutting trees to make patches of new growth in forests. General hunters and woodcock hunters living near the WMAs were more supportive than landowners.

Small game hunters statewide supported young forest habitat management on WMAs in similar proportions to general hunters living near WMAs, with 58% of small game hunters and 48-58% of general hunters strongly supporting it. Woodcock hunters living near WMAs were more supportive, with 75-88% strongly supporting DEC's efforts to restore young forest habitat. The level of support, however, might vary when more management actions are undertaken in specific WMAs.

These survey findings taken together provide us, for the first time, with estimates of awareness of WMAs and support for certain wildlife-related management actions among a range of stakeholders from the general public to woodcock hunters living near WMAs in New York. These results form an extensive baseline of information, which could be compared with similar surveys conducted in the future after the results of management actions to increase young forest habitat have been more fully realized.

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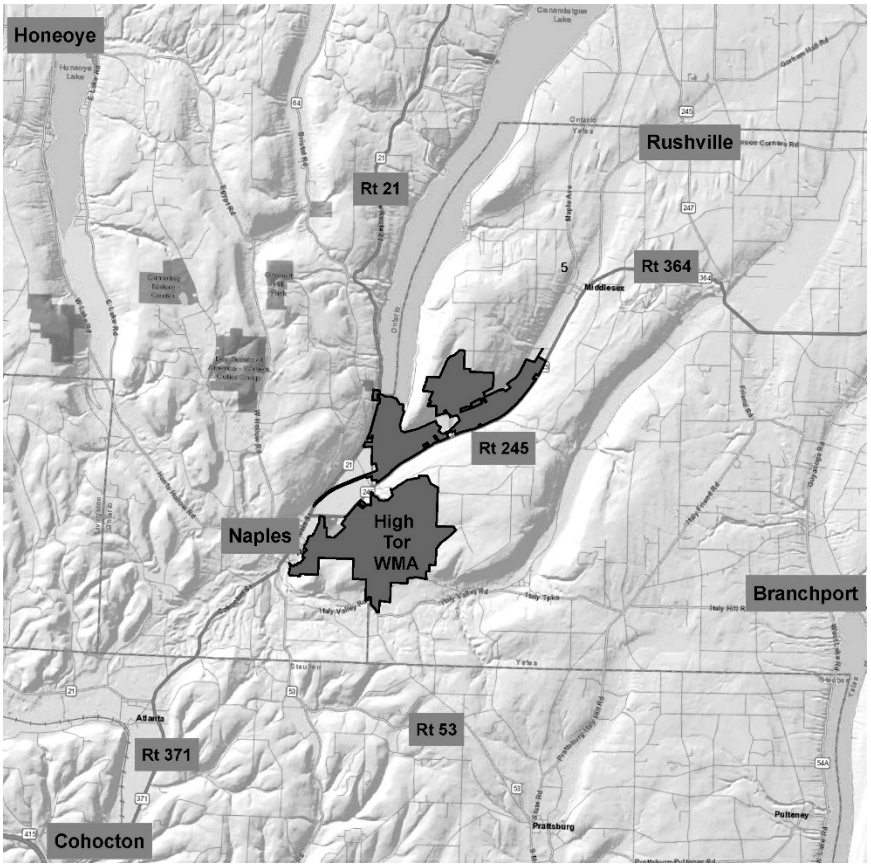
APPENDIX A: LANDOWNER QUESTIONNAIRE (HIGH TOR VERSION)

A Survey of Local Residents about Land Management on High Tor



Cornell University
Human Dimensions Research Unit

A Survey of Local Residents about Land Management on High Tor

Research conducted by the
Human Dimensions Research Unit
Department of Natural Resources
Cornell University

in cooperation with the
New York State Dept. of Environmental Conservation (NYSDEC)

The New York State Department of Environmental Conservation (NYSDEC) asked Cornell to survey local residents about their past and possible future interest in High Tor Wildlife Management Area. We would like to know whether you have visited High Tor in the past and how satisfied you have been with your experiences there. We are also interested in your opinions about High Tor and changes NYSDEC is making there to try to improve wildlife habitat for certain species.

Even if you have never visited High Tor we would still like to hear your views. We'd like to know whether any management actions that NYSDEC might take would change your interest in visiting the area.

Please complete this questionnaire as soon as you can, seal it with the white re-sealable label provided, and drop it in any mailbox; return postage has been paid. Your participation is voluntary, but we sincerely hope you will take just a few minutes to answer our questions. Your identity will be kept confidential and the information you give us will never be associated with your name.

THANK YOU FOR YOUR HELP!

1. **Have you ever heard of Wildlife Management Areas, which are run by the New York State Department of Environmental Conservation (NYSDEC), Division of Fish and Wildlife?**

   ☐ No ☐ Yes

2. **Have you heard of the area known as "High Tor," shown on the cover? It is managed by NYSDEC as a Wildlife Management Area (WMA).**

   ☐ No (SKIP TO QUESTION 10) ☐ Yes

3. **When did you last <u>visit</u> High Tor WMA?**

   ☐ In 2018 ☐ In 2015

   ☐ In 2017 ☐ In 2014

   ☐ In 2016 ☐ Before 2014

   ☐ Never (SKIP TO QUESTION 10)

4. **Have you ever done any of the following activities at High Tor WMA? And, in the <u>past 5 years</u>, how many times have you done them at the WMA?**

Hunting for:	Ever done? *(Check box.)*	Approximate # of times in **past 5 years**
Deer	☐	_____
Turkey	☐	_____
Woodcock/Grouse	☐	_____
Waterfowl	☐	_____
Other small game	☐	_____
Nature observation/photography, including birdwatching	☐	_____
Trapping	☐	_____
Fishing	☐	_____
Hiking (including dog walking)	☐	_____
Mountain biking	☐	_____
Cross country skiing	☐	_____
Other activity (please specify): _____	☐	_____

5. How satisfied or dissatisfied are you with the following at High Tor WMA: *(Check one box for each item.)*

	Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
Availability of parking	☐	☐	☐	☐	☐
Rules/regulations that allow some activities and prohibit others	☐	☐	☐	☐	☐
Access for those with disabilities	☐	☐	☐	☐	☐
Availability of maps and other information online	☐	☐	☐	☐	☐
Availability of maps and other information at the WMA	☐	☐	☐	☐	☐
Maintenance of trails	☐	☐	☐	☐	☐
Types of recreation opportunities available	☐	☐	☐	☐	☐
Opportunity to use area without interference from other users	☐	☐	☐	☐	☐
Birds and other wildlife seen	☐	☐	☐	☐	☐
Quality of the natural habitat	☐	☐	☐	☐	☐

6. How strongly do you agree or disagree with the following statements: *(Check one box for each statement.)*

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
High Tor WMA means a great deal to me	☐	☐	☐	☐	☐
High Tor WMA is the best place for what I like to do	☐	☐	☐	☐	☐
I get more satisfaction out of visiting High Tor WMA than most other natural areas	☐	☐	☐	☐	☐

IF YOU <u>DID NOT VISIT</u> HIGH TOR WMA IN THE PAST 5 YEARS, PLEASE SKIP TO QUESTION 10.

7. In your visits to High Tor WMA over the past five years, has there been an increase, decrease, or no change in the number of animals you have noticed of each of the following species? *(Check one box for each species.)*

	Increase	**No change**	**Decrease**	**Do not know**
Deer	☐	☐	☐	☐
Turkey	☐	☐	☐	☐
Woodcock	☐	☐	☐	☐
Grouse	☐	☐	☐	☐
Waterfowl (e.g., ducks, geese)	☐	☐	☐	☐
Song birds	☐	☐	☐	☐
Other small animals (e.g., rabbits, squirrels)	☐	☐	☐	☐

IF YOU <u>DID NOT HUNT</u> AT HIGH TOR WMA IN THE PAST 5 YEARS, PLEASE SKIP TO QUESTION 9.

8. How satisfied or dissatisfied were you with the following during a typical or average visit to hunt at High Tor WMA: *(Check one box for each item.)*

	Very Dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
Number of game animals seen	☐	☐	☐	☐	☐
The quality of habitat for the species I wanted to hunt	☐	☐	☐	☐	☐
Opportunity to hunt without encounters with other recreationists	☐	☐	☐	☐	☐
Being able to hunt the spot I wanted to	☐	☐	☐	☐	☐

9. <u>Overall,</u> how satisfied or dissatisfied have you been with the visits you made to High Tor WMA in the past 5 years?

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neutral
- ☐ Somewhat satisfied
- ☐ Very satisfied

10. NYSDEC has begun a habitat management program to restore young forest habitat in the High Tor WMA (and other WMAs as well) as a way to improve food and cover for wildlife. Young forest contains tree seedlings, saplings, woody vines, and shrubs up to about 10 years old.

We are interested in your opinions about this program, even if you were not aware of it before now.

Are you aware of any of the following things NYSDEC has done to let people know about its habitat management program at the High Tor WMA? *(Check one box for each activity.)*

Aware of:	**No**	**Yes**
Public meetings	☐	☐
Information posted at kiosks at High Tor WMA	☐	☐
Information available on the NYSDEC website	☐	☐
Emails from NYSDEC	☐	☐

11. How strongly would you support or oppose each of the following actions by NYSDEC to restore young forest habitat on the High Tor WMA? *(Check one box for each action.)*

	Strongly Oppose	Somewhat Oppose	Neither Oppose or Support	Somewhat Support	Strongly Support
Cutting trees to make patches of new growth in forests	☐	☐	☐	☐	☐
Planting native shrubs and trees in open fields to create young forest	☐	☐	☐	☐	☐
Using mulching or mowing machines to spur regrowth of shrubs	☐	☐	☐	☐	☐
Controlled burning to spur regrowth of trees and shrubs	☐	☐	☐	☐	☐
Using herbicides to remove non-native and/or invasive plant species	☐	☐	☐	☐	☐

12. In the past 2 years, have you noticed any of the management activities listed in Q11 taking place at High Tor WMA?

☐ No

☐ Yes

☐ I have not visited High Tor WMA in the past 2 years

13. Do you think NYSDEC's actions to restore young forest habitat will make the quality of the experience better or worse for each of the following activities on the High Tor WMA? *(Check one box for each activity.)*

Activities:	**Much worse**	**Slightly worse**	**No change**	**Slightly better**	**Much better**	**Do not know**
Deer hunting	☐	☐	☐	☐	☐	☐
Turkey hunting	☐	☐	☐	☐	☐	☐
Woodcock/Grouse hunting	☐	☐	☐	☐	☐	☐
Waterfowl hunting	☐	☐	☐	☐	☐	☐
Other small game hunting	☐	☐	☐	☐	☐	☐
Birdwatching	☐	☐	☐	☐	☐	☐
Observation of other wildlife	☐	☐	☐	☐	☐	☐

14. Overall, how strongly do you oppose or support NYSDEC's efforts to restore young forest habitat at the High Tor WMA?

☐ Strongly oppose

☐ Somewhat oppose

☐ Neither oppose or support

☐ Somewhat support

☐ Strongly support

☐ Don't know

15. How strongly would you support or oppose NYSDEC's use of each of the following actions (not related to young forests) to manage habitat for wildlife on the High Tor WMA? *(Check one box for each action.)*

	Strongly Oppose	Somewhat Oppose	Neither Oppose or Support	Somewhat Support	Strongly Support
Adjusting water levels on small ponds to maintain wetlands	☐	☐	☐	☐	☐
Creating new wetlands	☐	☐	☐	☐	☐
Adding nearby land to the WMA	☐	☐	☐	☐	☐
Mowing to maintain grasslands	☐	☐	☐	☐	☐
Planting crops as food for wildlife	☐	☐	☐	☐	☐

16. How strongly do you agree or disagree with the following statements: *(Check one box for each statement.)*

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Harvesting trees is sometimes necessary for the ecological health of woodlands	☐	☐	☐	☐	☐
Woodlands should be left untouched by humans	☐	☐	☐	☐	☐
Harvesting trees from a woodland can improve habitat for wildlife	☐	☐	☐	☐	☐
Wildlife Management Areas (WMAs) should be open only for hunting, fishing, and trapping	☐	☐	☐	☐	☐
WMAs should be open for wildlife viewing and bird watching	☐	☐	☐	☐	☐
WMAs should be open for all kinds of recreation	☐	☐	☐	☐	☐
WMAs should be managed to protect endangered species	☐	☐	☐	☐	☐

BACKGROUND INFORMATION

17. Have you visited any Wildlife Management Areas besides the High Tor WMA in New York?

- ☐ No
- ☐ Yes
- ☐ Not sure

18. In what year were you born: _____

19. What is your gender: *(Check one.)*

☐ Male ☐ Female

20. Have you gone hunting in the past 5 years?

- ☐ No
- ☐ Yes

21. What is the highest level of education you have completed?

- ☐ Less than high school
- ☐ High school diploma / G.E.D.
- ☐ Some college or technical school
- ☐ Associate's degree
- ☐ College undergraduate degree (e.g., B.A., B.S.)
- ☐ Graduate or professional degree (e.g., M.S., Ph.D., M.D., J.D.)

22. In general, do you think of yourself as…

- ☐ Very liberal
- ☐ Somewhat liberal
- ☐ Moderate/Middle of the road
- ☐ Somewhat conservative
- ☐ Very conservative

Please use the space below for any comments you wish to make.

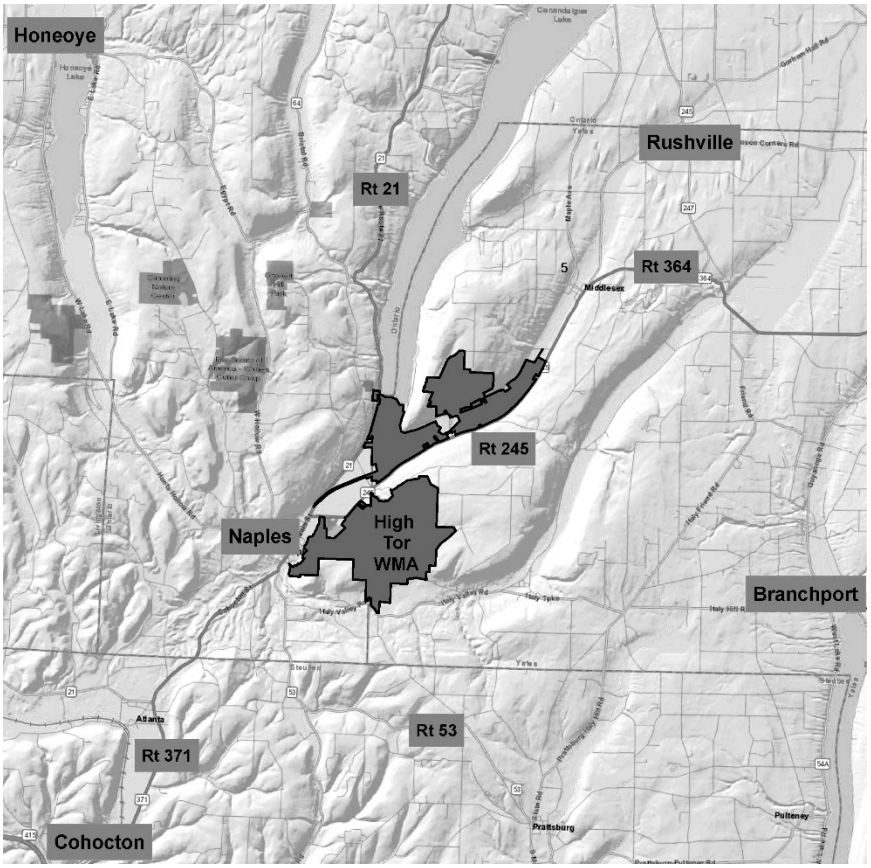
Thank you for your time and effort!

To return this questionnaire, simply seal it with the white removable seal, and drop it in the mail (return postage has been paid).

APPENDIX B: HUNTER QUESTIONNAIRE (HIGH TOR VERSION)

A Survey of Hunters about Public Land Management

(With a Focus on High Tor Wildlife Management Area)



Cornell University
Human Dimensions Research Unit

A Survey of Hunters about Public Land Management
(With a Focus on High Tor Wildlife Management Area)

Research conducted by the
Human Dimensions Research Unit
Department of Natural Resources
Cornell University

in cooperation with the
New York State Dept. of Environmental Conservation (NYSDEC)

The New York State Department of Environmental Conservation (NYSDEC) asked Cornell to survey hunters about their past and possible future interest in public lands and High Tor Wildlife Management Area in particular. We would like to know whether you have visited High Tor in the past and how satisfied you were with your experiences there. We are also interested in your opinions about High Tor and changes NYSDEC is making there to try to improve wildlife habitat for certain species.

Even if you have never visited High Tor we would still like to hear your views. We'd like to know whether any management actions that NYSDEC might take would change your interest in visiting the area.

Please complete this questionnaire as soon as you can, seal it with the white re-sealable label provided, and drop it in any mailbox; return postage has been paid. Your participation is voluntary, but we sincerely hope you will take just a few minutes to answer our questions. Your identity will be kept confidential and the information you give us will never be associated with your name.

THANK YOU FOR YOUR HELP!

3. **Have you ever heard of Wildlife Management Areas, which are run by the New York State Department of Environmental Conservation (NYSDEC), Division of Fish and Wildlife?**

   ☐ No ☐ Yes

4. **Have you heard of the area known as "High Tor," shown on the cover? It is managed by NYSDEC as a Wildlife Management Area (WMA).**

   ☐ No (SKIP TO QUESTION 10) ☐ Yes

3. **When did you last <u>visit</u> High Tor WMA?**

   ☐ In 2018 ☐ In 2015

   ☐ In 2017 ☐ In 2014

   ☐ In 2016 ☐ Before 2014

   ☐ Never (SKIP TO QUESTION 10)

4. **Have you ever done any of the following activities at High Tor WMA? And, in the <u>past 5 years</u>, how many times have you done them at the WMA?**

Hunting for:	Ever done? *(Check box.)*	Approximate # of times in **past 5 years**
Deer	☐	_____
Turkey	☐	_____
Woodcock/Grouse	☐	_____
Waterfowl	☐	_____
Other small game	☐	_____
Nature observation/photography, including birdwatching	☐	_____
Trapping	☐	_____
Fishing	☐	_____
Hiking (including dog walking)	☐	_____
Mountain biking	☐	_____
Cross country skiing	☐	_____
Other activity (please specify): _____	☐	_____

5. How satisfied or dissatisfied are you with the following at High Tor WMA: *(Check one box for each item.)*

	Very Dissatisfied	Somewhat Dissatisfied	Neutral	Somewhat Satisfied	Very Satisfied
Availability of parking	☐	☐	☐	☐	☐
Rules/regulations that allow some activities and prohibit others	☐	☐	☐	☐	☐
Access for those with disabilities	☐	☐	☐	☐	☐
Availability of maps and other information online	☐	☐	☐	☐	☐
Availability of maps and other information at the WMA	☐	☐	☐	☐	☐
Maintenance of trails	☐	☐	☐	☐	☐
Types of recreation opportunities available	☐	☐	☐	☐	☐
Opportunity to use area without interference from other users	☐	☐	☐	☐	☐
Birds and other wildlife seen	☐	☐	☐	☐	☐
Quality of the natural habitat	☐	☐	☐	☐	☐

6. How strongly do you agree or disagree with the following statements: *(Check one box for each statement.)*

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
High Tor WMA means a great deal to me	☐	☐	☐	☐	☐
High Tor WMA is the best place for what I like to do	☐	☐	☐	☐	☐
I get more satisfaction out of visiting High Tor WMA than most other natural areas	☐	☐	☐	☐	☐

IF YOU <u>DID NOT VISIT</u> HIGH TOR WMA IN THE PAST 5 YEARS, PLEASE SKIP TO QUESTION 10.

7. In your visits to High Tor WMA over the past five years, has there been an increase, decrease, or no change in the number of animals you have noticed of each of the following species? *(Check one box for each species.)*

	Increase	**No change**	**Decrease**	**Do not know**
Deer	☐	☐	☐	☐
Turkey	☐	☐	☐	☐
Woodcock	☐	☐	☐	☐
Grouse	☐	☐	☐	☐
Waterfowl	☐	☐	☐	☐
Song birds	☐	☐	☐	☐
Other small animals (e.g., rabbits, squirrels)	☐	☐	☐	☐

IF YOU <u>DID NOT HUNT</u> AT HIGH TOR WMA IN THE PAST 5 YEARS, PLEASE SKIP TO QUESTION 9.

8. How satisfied or dissatisfied were you with the following during a typical or average visit to hunt at High Tor WMA: *(Check one box for each item.)*

	Very Dissatisfied	**Somewhat Dissatisfied**	**Neutral**	**Somewhat Satisfied**	**Very Satisfied**
Number of game animals seen	☐	☐	☐	☐	☐
The quality of habitat for the species I wanted to hunt	☐	☐	☐	☐	☐
Opportunity to hunt without encounters with other recreationists	☐	☐	☐	☐	☐
Being able to hunt the spot I wanted to	☐	☐	☐	☐	☐

9. <u>Overall,</u> how satisfied or dissatisfied have you been with the visits you made to High Tor WMA in the past 5 years?

- ☐ Very dissatisfied
- ☐ Somewhat dissatisfied
- ☐ Neutral
- ☐ Somewhat satisfied
- ☐ Very satisfied

10. NYSDEC has begun a habitat management program to restore young forest habitat in the High Tor WMA (and other WMAs as well) as a way to improve food and cover for wildlife. Young forest contains tree seedlings, saplings, woody vines, and shrubs up to about 10 years old.

We are interested in your opinions about this program, even if you were not aware of it before now.

Are you aware of any of the following things NYSDEC has done to let people know about its habitat management program at the High Tor WMA? *(Check one box for each activity.)*

Aware of:	**No**	**Yes**
Public meetings	☐	☐
Information posted at kiosks at High Tor WMA	☐	☐
Information available on the NYSDEC website	☐	☐
Emails from NYSDEC	☐	☐

11. How strongly would you support or oppose each of the following actions by NYSDEC to restore young forest habitat on the High Tor WMA? *(Check one box for each action.)*

	Strongly Oppose	Somewhat Oppose	Neither Oppose or Support	Somewhat Support	Strongly Support
Cutting trees to make patches of new growth in forests	☐	☐	☐	☐	☐
Planting native shrubs and trees in open fields to create young forest	☐	☐	☐	☐	☐
Using mulching or mowing machines to spur regrowth of shrubs	☐	☐	☐	☐	☐
Controlled burning to spur regrowth of trees and shrubs	☐	☐	☐	☐	☐
Using herbicides to remove non-native and/or invasive plant species	☐	☐	☐	☐	☐

12. In the past 2 years, have you noticed any of the management activities listed in Q11 taking place at High Tor WMA?

☐ No

☐ Yes

☐ I have not visited High Tor WMA in the past 2 years

13. Do you think NYSDEC's actions to restore young forest habitat will make the quality of the experience better or worse for each of the following activities on the High Tor WMA? *(Check one box for each activity.)*

Activities:	**Much worse**	**Slightly worse**	**No change**	**Slightly better**	**Much better**	**Do not know**
Deer hunting	☐	☐	☐	☐	☐	☐
Turkey hunting	☐	☐	☐	☐	☐	☐
Woodcock/Grouse hunting	☐	☐	☐	☐	☐	☐
Waterfowl hunting	☐	☐	☐	☐	☐	☐
Other small game hunting	☐	☐	☐	☐	☐	☐
Birdwatching	☐	☐	☐	☐	☐	☐
Observation of other wildlife	☐	☐	☐	☐	☐	☐

14. Overall, how strongly do you oppose or support NYSDEC's efforts to restore young forest habitat at the High Tor WMA?

☐ Strongly oppose

☐ Somewhat oppose

☐ Neither oppose or support

☐ Somewhat support

☐ Strongly support

☐ Don't know

15. How strongly would you support or oppose NYSDEC's use of each of the following actions (not related to young forests) to manage habitat for wildlife on the High Tor WMA? *(Check one box for each action.)*

	Strongly Oppose	Somewhat Oppose	Neither Oppose or Support	Somewhat Support	Strongly Support
Adjusting water levels on small ponds to maintain wetlands	☐	☐	☐	☐	☐
Creating new wetlands	☐	☐	☐	☐	☐
Adding nearby land to the WMA	☐	☐	☐	☐	☐
Mowing to maintain grasslands	☐	☐	☐	☐	☐
Planting crops as food for wildlife	☐	☐	☐	☐	☐

16. How strongly do you agree or disagree with the following statements: *(Check one box for each statement.)*

	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
Harvesting trees is sometimes necessary for the ecological health of woodlands	☐	☐	☐	☐	☐
Woodlands should be left untouched by humans	☐	☐	☐	☐	☐
Harvesting trees from a woodland can improve habitat for wildlife	☐	☐	☐	☐	☐
Wildlife Management Areas (WMAs) should be open only for hunting, fishing, and trapping	☐	☐	☐	☐	☐
WMAs should be open for wildlife viewing and bird watching	☐	☐	☐	☐	☐
WMAs should be open for all kinds of recreation	☐	☐	☐	☐	☐
WMAs should be managed to protect endangered species	☐	☐	☐	☐	☐

BACKGROUND INFORMATION

17. Have you visited any Wildlife Management Areas besides the High Tor WMA in New York?

- ☐ No
- ☐ Yes
- ☐ Not sure

18. How many years have you been a hunter?

_____ years

19. How many total days did you hunt in the past 12 months?

_____ days

20. How important is hunting to you? *(Check one.)*

- ☐ It's my most important recreational activity
- ☐ It's more important than many of my recreational activities
- ☐ It's no more important than my other recreational activities
- ☐ It's less important than many of my recreational activities
- ☐ It's one of my least important recreational activities

21. What is the highest level of education you have completed?

- ☐ Less than high school
- ☐ High school diploma / G.E.D.
- ☐ Some college or technical school
- ☐ Associate's degree
- ☐ College undergraduate degree (e.g., B.A., B.S.)
- ☐ Graduate or professional degree (e.g., M.S., Ph.D., M.D., J.D.)

22. In general, do you think of yourself as…

- ☐ Very liberal
- ☐ Somewhat liberal
- ☐ Moderate/Middle of the road
- ☐ Somewhat conservative
- ☐ Very conservative

Please use the space below for any comments you wish to make.

Thank you for your time and effort!

To return this questionnaire, simply seal it with the white removable seal, and drop it in the mail (return postage has been paid).

APPENDIX C: NON-RESPONDENT TELEPHONE INTERVIEW

INTRO
Good (Morning, Afternoon, Evening):
My name is _____ and I work for Cornell University. May I speak to _____.

(IF INDIVIDUAL IS UNAVAILABLE, FIND OUT WHEN IT WOULD BE CONVENIENT TO CALL AGAIN.)

I'm calling about the yellow survey we sent you recently asking about your interest in public lands and {xxx} Wildlife Management Area in particular.

I know you may have been too busy to fill out the survey, but I wondered if you could spend about 5 minutes now with me answering a few key questions?

(Even if you have never visited {xxx} we would still like to hear your views.)
(IF NO, FIND OUT WHEN IT WOULD BE CONVENIENT TO CALL AGAIN.)

Before we begin, there are a few points I need to cover:

Your participation in this study is, of course, voluntary. If there is any question that you would prefer not to answer, just tell me and we will go on to the next question.

Your identity will be kept confidential and the information you give us will never be associated with your name.

1. First, have you ever heard of Wildlife Management Areas, which are run by the New York State Department of Environmental Conservation, sometimes abbreviated DEC?

____No
____Yes

2. Before we contacted you, had you heard of the area known as {xxxx}? It is managed by DEC as a Wildlife Management Area.

____No (SKIP TO Q5)
____Yes

3. Have you visited {xxx} Wildlife Management Area in the past 5 years (2014-2018)?

____No (SKIP TO Q5)
____Yes

4. Have you done any of the following activities at {xxx} Wildlife Management Area in the past 5 years:

a. Hunting for deer?

____No
____Yes

b. Hunting for woodcock or grouse?

____No
____Yes

c. Nature observation or photography, including birdwatching?

____No
____Yes

d. Hiking, including dog walking?

____No
____Yes

5. DEC has begun a habitat management program to restore young forest habitat in the {xxx} Wildlife Management Area as a way to improve food and cover for wildlife. Young forest contains tree seedlings, saplings, woody vines, and shrubs up to about 10 years old.

We are interested in your opinions about this program, even if you were not aware of it before now.

How strongly would you support or oppose each of the following actions by DEC to restore young forest habitat on the {xxx} Wildlife Management Area?

a. Cutting trees to make patches of new growth in forests.

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

b. Planting native shrubs and trees in open fields to create young forest.

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

c. Using mulching or mowing machines to spur regrowth of shrubs.

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

d. Controlled burning to spur regrowth of trees and shrubs.

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

e. Using herbicides to remove non-native and/or invasive plant species.

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

6. Overall, how strongly do you oppose or support DEC's efforts to restore young forest habitat at the {xxx} Wildlife Management Area?

_____ Strongly oppose
_____ Somewhat oppose
_____ Neither oppose or support
_____ Somewhat support
_____ Strongly support

7. One final question, in what year were you born? _____

Thank you very much for taking the time to talk with me.

END INTERVIEW

Record Gender: _____ Male _____ Female

APPENDIX D: ADDITIONAL TABLES

Appendix Table D-1. Tests for non-response bias.

	Percent			
	Landowners		Hunters	
Questions	Respondents	Non-respondents	Respondents	Non-respondents
Ever heard of WMAs				
No	8.8	13.5	2.9	3.0
Yes	91.2	86.5	97.1	97.0
	(x^2=4.5, df=1, p=0.03)		NS	
Ever heard of local WMA				
No	10.5	11.0	12.7	17.5
Yes	89.5	89.0	87.3	82.5
	NS		NS	
Visited local WMA in past 5 years				
No	40.7	55.6	50.0	48.5
Yes	59.3	44.4	50.0	51.5
	(x^2=14.0, df=1, p<0.001)		NS	
In past 5 years at local WMA:				
Hunted deer				
No	74.4	86.1	48.5	65.9
Yes	25.6	13.9	51.5	34.1
	(x^2=5.2, df=1, p=0.02)		(x^2=9.0, df=1, p=0.003)	
Hunted woodcock or grouse				
No	91.4	92.4	63.9	70.6
Yes	8.6	7.6	36.1	29.4
	NS		NS	
Observed nature, including birdwatching				
No	57.2	48.1	73.0	70.6
Yes	42.8	51.9	27.0	29.4
	NS		NS	

Appendix Table D-1. (cont.)

Questions	Percent			
	Landowners		Hunters	
	Respondents	Non-respondents	Respondents	Non-respondents
Hiking, including dog walking				
No	32.5	26.6	54.6	43.5
Yes	67.5	73.4	45.4	56.5
	NS		NS	
Gender				
Male	69.7	41.0	91.9	91.5
Female	30.3	59.0	8.1	8.5
	(x^2=64.1, df=1, p<0.001)		NS	
	Mean			
Support or oppose actions on local WMA*				
Cutting trees to make patches of new growth in forests	3.79	3.97	4.23	4.35
	(t=2.1, df=276, p=0.04)		NS	
Planting native shrubs and trees in open fields to create young forest	4.24	4.42	4.27	4.46
	(t=2.5, df=289, p=.01)		(t=2.5, df=281, p=0.01)	
Using mulching or mowing machines to spur regrowth of shrubs	3.97	3.99	4.26	4.20
	NS		NS	
Controlled burning to spur regrowth of trees and shrubs	3.53	3.67	4.08	3.95
	NS		NS	
Using herbicides to remove non-native and/or invasive plant species	2.93	2.84	3.39	3.27
	NS		NS	
Overall DEC efforts to restore young forest habitat	4.19	4.53	4.47	4.60
	(t=5.4, df=317, p<0.001)		(t=2.1, df=264, p=.04)	
Age	61.8	62.1	55.9	48.4
	NS		(t=6.3, df=255, p<0.001)	

*Support or opposition was measured on a scale from 1=strongly oppose to 5=strongly support.

Table D-2. For those who had visited the local WMA in the past 5 years, the percent who participated in recreational activities, by WMA and stakeholder group.

Specific recreational activity participation in past 5 years	Percent			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Hunted deer				
Landowners[a]	26.9[x]	27.4[x]	22.2[x]	11.9[y]
General hunters[b]	58.3	50.3	47.4	48.0
Woodcock hunters[c]	40.0[x]	44.4[x]	16.1[y]	20.0[y]
Hunted turkey				
Landowners[a]	13.4[x]	13.1[x]	4.9[y]	13.1[x]
General hunters[b]	28.8[x]	30.6[x]	11.8[y]	33.3[x]
Woodcock hunters[b]	28.9	36.5	16.1	30.0
Hunted woodcock/grouse				
Landowners[a]	11.9[x]	5.4[y]	10.4[x,y]	4.8[y]
General hunters[b]	23.5	16.3	21.1	14.7
Woodcock hunters[c]	73.3	71.4	64.5	46.7
Hunted other small game				
Landowners[a]	15.0	12.4	14.6	14.3
General hunters[b]	22.7[x]	29.3[x]	35.5[x]	42.7[y]
Woodcock hunters[b]	20.0[x]	49.2[y]	35.5[x,y]	53.3[y]
Hunted waterfowl				
Landowners[a]	0.8[x]	3.9[x]	7.6[y]	3.6[x]
General hunters[b]	3.0[x]	6.1[x]	30.3[y]	4.0[x]
Woodcock hunters[c]	20.0[x]	23.8[x]	71.0[y]	6.7[x]

Table D-2. (cont.)

Specific recreational activity participation in past 5 years	Percent			
	Connecticut Hill	High Tor	Upper and Lower Lakes	Cranberry Mountain
Nature observation / photography including bird watching				
Landowners[a]	39.5	39.0	45.1	31.0
General hunters[b]	28.0	26.5	30.3	21.3
Woodcock hunters[c]	33.3[x]	15.9[y]	16.1[x,y]	10.0[y]
Hiking (including dog walking)				
Landowners[a]	58.1[x]	71.8[y]	43.8[z]	69.0[x.y]
General hunters[b]	43.9[x]	54.4[x]	21.1[y]	49.3[x]
Woodcock hunters[c]	33.3[x]	44.4[x]	9.7[y]	30.0[x]

[a,b,c] Stakeholder groups without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.
[x,y,z] WMAs within a stakeholder group without a letter in common are significantly different from each other at $p < 0.05$ using Wald F test.