

Young Forest Initiative Monitoring Plan 2016 - 2025



Department of
Environmental
Conservation

ACKNOWLEDGEMENTS

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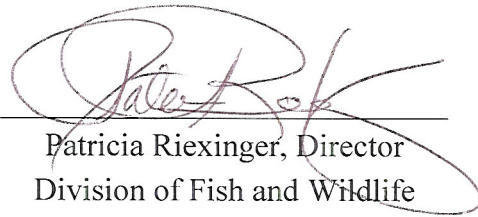
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**YOUNG FOREST INITIATIVE
MONITORING PLAN
2016-2025**

Approved by:



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Patricia Riexinger, Director
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4/28/16
Date

4/28/2016
Date

MISSION OF THE BUREAU OF WILDLIFE

To provide the people of New York the opportunity to enjoy all the benefits of the wildlife of the State, now and in the future. This shall be accomplished through scientifically sound management of wildlife species in a manner that is efficient, clearly described, consistent with law, and in harmony with public need.

GOALS OF THE BUREAU OF WILDLIFE

- GOAL 1. Ensure that populations of all wildlife in New York are of the appropriate size to meet all the demands placed on them.
- GOAL 2. Ensure that we meet the public desire for: information about wildlife and its conservation, use, and enjoyment; understanding the relationships among wildlife, humans, and the environment; and clearly listening to what the public tell us.
- GOAL 3. Ensure that we provide sustainable uses of New York's wildlife for an informed public.
- GOAL 4. Minimize the damage and nuisance caused by wildlife and wildlife uses.
- GOAL 5. Foster and maintain an organization that efficiently achieves our goals.

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SUMMARY

This Monitoring Plan provides a standardized approach to evaluate the effectiveness of habitat management conducted under the Young Forest Initiative (YFI) on Wildlife Management Areas (WMA). Major elements of this plan include:

WILDLIFE: Evaluating the response of YFI target species to habitat management and avoiding potential adverse impacts to non-target species entails:

- Pre-treatment assessments:
 - In-office screening of species occurrence data (*required*)
 - Field surveys for: (*may be required, depending on species status and results of desktop screening*)
 - Endangered (E) and Threatened (T) species (e.g., northern long-eared bat)
 - NY Species of Special Concern (SC)
 - NY Species of Greatest Conservation Need (SGCN)
 - YFI target species
- Post-treatment assessments, with four levels of increasing intensity:
 - American Woodcock Monitoring is the minimally sufficient monitoring effort at most WMAs (*required*)
 - YFI Target Species Monitoring:
 - New England cottontail, golden-winged warbler, whip-poor-will (*required*)
 - Other target species if included in a WMA's Habitat Management Plan (HMP) (*discretionary*)
 - Non-target Species Monitoring
 - For SGCN that may either benefit from or potentially be affected by forest management (*discretionary*)
 - Advanced Research and Monitoring
 - In-depth studies of young forest wildlife, typically at YFI demonstration areas and in collaboration with other organizations (*discretionary*)

VEGETATION: Evaluating the vegetation response to habitat management includes:

- Pre-treatment inventory:
 - Inventory of all forest stands selected for management (*required*)
 - Habitat inventory of the entire WMA (*discretionary*)
- Post-treatment evaluation:
 - A regeneration assessment at one, three, and five years post-treatment (*required*)
 - Photo documentation of regeneration (*required*)

ACREAGE: DEC will track the amount of young forest created on each WMA, and statewide on all WMAs included in YFI, annually (*required*).

OUTREACH AND PUBLIC PERCEPTION: DEC will collaborate with Cornell University's Human Dimensions Research Unit to evaluate WMA visitor satisfaction with and perception of young forest habitat management (*required*).

1. INTRODUCTION

1.1 BACKGROUND

As the stewards of more than 230,000 acres on Wildlife Management Areas (WMA), New York State Department of Environmental Conservation's (DEC) Division of Fish and Wildlife (DFW) is responsible for managing a diversity of habitats to support a diversity of wildlife. The WMA system was created in 1938 to protect wildlife habitat, enhance wildlife diversity and productivity, and promote wildlife-dependent recreation (e.g., hunting, trapping, bird watching).¹ Today, more than half of the acreage on WMAs is forested; however, declining trends of numerous at-risk and game species indicate there is not enough early successional or "young" forest to support healthy populations of wildlife that require this habitat. In 2015, DFW established the Young Forest Initiative (YFI) to increase the amount of young forest to at least 10% of the forested area on select WMAs to benefit young forest-dependent wildlife and facilitate wildlife-dependent recreation. A *DEC Strategic Plan for Implementing the Young Forest Initiative on Wildlife Management Areas 2015-2020* identifies 90 of the 133 properties administered by DFW's Bureau of Wildlife that are included in the YFI.²

A monitoring plan is necessary to assess the effectiveness of young forest habitat management for several key reasons. Wildlife monitoring documents changes in distribution and occupancy (e.g., detection/non-detection), population trends, and demographic parameters (e.g., productivity) for various species as a result of habitat management activities.³ Vegetation monitoring determines changes in the composition and structure of forest stands and overall forest health. Since the YFI is a long-term commitment to manage a disturbance-dependent habitat that is ephemeral by nature, monitoring wildlife and vegetation response to management over time will allow DEC's land managers to evaluate success and adjust treatments as necessary.

1.2 PURPOSE AND SCOPE

This Monitoring Plan provides the standard statewide approach for evaluating the effect of young forest habitat management on WMAs. Specific goals, provided below, focus on determining whether the desired wildlife responses, vegetation responses, acreage goals, and public perception towards and use of young forests have been achieved, and potential adverse impacts have been recognized and addressed. The plan establishes the scope and magnitude of monitoring, lists criteria for pre- and post-management assessments, identifies potential opportunities for collaboration on young forest research including citizen science, and provides a means to identify habitat management insufficiencies and areas for improvement. This plan builds upon the evaluation and monitoring elements of the YFI Strategic Plan and is complementary to WMA Habitat Management Plans (HMP).

¹ Public Use of Lands Managed by the Bureau of Wildlife. New York State Department of Environmental Conservation, Bureau of Wildlife, Albany, NY.

² Available online at <http://www.dec.ny.gov/outdoor/104218.html>.

³ Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds. General Technical Report PSW-GTR-144-www. U.S. Department of Agriculture, Pacific Southwest Research Station, Forest Service, Albany, CA.

2. MONITORING GOALS

- Evaluate the effectiveness of young forest management on WMAs by assessing YFI target species' use of young forest habitat.
- Evaluate the effectiveness of young forest management on WMAs by assessing regeneration of young forest habitat.
- Detect and avoid potential negative impacts of forest management on rare or sensitive species.
- Document progress towards reaching and/or maintaining the $\geq 10\%$ young forest acreage goal on each WMA.
- Gauge perception and satisfaction of WMA visitors towards young forest habitat management.
- Provide scientifically sound data to inform decisions and adapt habitat management as needed.
- Identify additional monitoring and research opportunities to gain a deeper understanding of species' use of young forests on select WMAs, typically in collaboration with conservation partners.

3. EVALUATING WILDLIFE RESPONSE

3.1 INTRODUCTION

The response of target wildlife to habitat management will serve as the primary indicator of the effectiveness of young forest habitat management. Over 50 Species of Greatest Conservation Need (SGCN) in New York⁴ and numerous common wildlife rely upon young forests for all or part of their life cycle and are expected to benefit from an increase in young forest habitat (Appendix A). Of these, eight were selected as YFI target species (Table 1). Biologists may identify more than one YFI target species for each WMA; target species and their habitat goals are described in each WMA's HMP. The breadth and depth of wildlife assessments depend on several factors, including:

- The presence of federal or state-listed Endangered (E) and Threatened (T) species, NY Species of Special Concern (SC), and/or SGCN that may potentially be affected by, or benefit from, forest management.
- YFI target species selected for the WMA, or treatment unit/forest stand ("project area") within the WMA, as identified in the HMP.

⁴ The 2015 New York State Wildlife Action Plan (SWAP) identifies 366 Species of Greatest Conservation Need (SGCN) including 167 High Priority SGCN. Available online at <http://www.dec.ny.gov/animals/7179.html>.

- Proximity of the WMA to existing focus areas for YFI target species (Appendix D) and focus areas for non-target, sensitive species such as grassland birds.
- The need to validate or develop Best Management Practices (BMPs) for target species.

Table 1. Target species of DEC’s Young Forest Initiative.

Species	New York Status
American woodcock (<i>Scolopax minor</i>)	SGCN
Eastern whip-poor-will (<i>Caprimulgus vociferus</i>)	SC and High Priority SGCN
Golden-winged warbler (<i>Vermivora chrysoptera</i>)	SC and High Priority SGCN
New England cottontail (<i>Sylvilagus transitionalis</i>)	SC and High Priority SGCN
Ruffed grouse (<i>Bonasa umbellus</i>)	SGCN
Snowshoe (varying) hare (<i>Lepus americanus</i>)	Game species
White-tailed deer (<i>Odocoileus virginianus</i>)	Game species
Wild turkey (<i>Meleagris gallopavo</i>)	Game species

3.2 GENERAL APPROACH

Pre- and post-treatment wildlife assessments will be coordinated by the regional YFI biologist under the direction of the Regional Wildlife Manager (RWM), with implementation support provided by partners, volunteers, and other DEC staff as needed. If there are multiple project areas within a WMA, the YFI biologist and RWM will determine which project areas to monitor. To the extent practicable, existing data will be evaluated and will be supplemented by field surveys following established protocols to satisfy monitoring requirements. A central office biologist will coordinate the statewide compilation of data for tracking and reporting purposes.

More advanced wildlife monitoring and research may be undertaken at select WMAs (such as YFI demonstration areas), but will typically occur only when a credible partnering organization can be identified to assume responsibility as a project partner and/or lead.

3.3 PRE-TREATMENT SITE ASSESSMENTS

3.3.1 Need

Pre-treatment site assessments for wildlife may be necessary in the following circumstances:

- To comply with legal requirements prior to any forest management activity, including: Endangered Species Act,⁵ Bald and Golden Eagle Protection Act,⁶ NY State Endangered Species Act (NYCRR Part 182),⁷ and National Environmental Policy Act (NEPA).⁸

⁵ Available online at <http://www.fws.gov/endangered/laws-policies/>.

⁶ Available online at <http://www.fws.gov/midwest/midwestbird/eaglepermits/bagepa.html>.

⁷ Available online at <http://www.dec.ny.gov/regs/2494.html>.

⁸ Available online at <http://www.epa.gov/nepa>.

- To detect and avoid potential adverse impacts to or determine ways to enhance habitat for known occurrences of E/T/SC species.
- To determine whether alternate methods or timing of management are required to avoid impacts, or whether alternate locations are required if impacts cannot be avoided.
- To identify knowledge gaps and collect baseline data for E/T/SC species, SGCN, and YFI target species, if not previously known and required to inform management.
 - For YFI target species, this may potentially be addressed during post-treatment monitoring by comparing species use of treated vs. untreated areas of similar habitat on the WMA.

3.3.2 Approach

3.3.2.1 Desktop Screening

Most pre-treatment assessment needs can be satisfied by an in-office screening of existing data sources. During the preparation of each WMA's HMP, biologists will screen each WMA (using ArcGIS) for occurrences of sensitive species, in order to:

- Identify known occurrences of E/T species present on the WMA, as well as any SC, SGCN, or YFI target species for which data are available in GIS layers.
- Identify suitable habitat where E/T/SC species may occur.
- Identify potential data insufficiencies.
- Determine whether pre-treatment field surveys are needed to avoid impacts to sensitive species.

Data sources may include: the NY Natural Heritage Program (NHP) Element Occurrence and/or Animal Screening layers, statewide atlas data (e.g., Breeding Bird Atlas [BBA]⁹ and Amphibian and Reptile Atlas¹⁰), or other sources that provide data relevant to individual WMAs (e.g., DEC wildlife surveys and monitoring, eBird¹¹). Species status assessments and monitoring recommendations in the 2015 NY State Wildlife Action Plan (SWAP) also provide a good reference for SGCN. A list of existing surveys is provided in Appendix B.

Since HMPs guide habitat management for a ten year period, biologists will also repeat the desktop screening once per project area as part of the annual grant compliance process to verify whether additional occurrences have been documented since the HMP was originally prepared.

3.3.2.2 Field Surveys

Field surveys may be necessary to further assess sensitive species that could be either positively or negatively affected by forest management, especially federal and state-listed species. The intent of pre-treatment assessments is to allow the biologist and forester to make informed decisions about the location and timing of habitat management treatments. However, the efficacy of desktop screening may be limited because current distribution and occurrence data for some YFI target species, SC species, and many SGCN are not available.

Pre-treatment field surveys may be necessary in the following circumstances:

⁹ Available online at <http://www.dec.ny.gov/animals/7312.html>.

¹⁰ Available online at <http://www.dec.ny.gov/animals/7140.html>.

¹¹ Available online at <http://ebird.org/content/ebird/>. © Audubon and Cornell Lab of Ornithology.

- If, after conducting the desktop screening, the RWM or Wildlife Diversity Section Head determines that additional information about E/T/SC species, High Priority SGCN, or SGCN known or likely to occur in suitable habitat on the WMA or project area is needed prior to conducting habitat management.
- To assess presence of Indiana bat (*Myotis sodalis*) and/or northern long-eared bat (*Myotis septentrionalis*) using acoustic surveys, if a project area is outside of known, occupied bat habitat (as identified in the Animal Screening Layer) and timber harvest is proposed outside of the cutting window (October 1st to March 31st) that was established to protect bats (*required*). Also recommended for tri-colored bat (*Perimyotis subflavus*).
 - Occupied habitat includes areas within a 1.5 mile radius buffer around summer roosts and a 5 mile buffer around hibernacula.
 - Acoustic surveys are not required for occupied habitat. In occupied habitat, the cutting of trees >3 inch dbh (potential roost trees) is restricted to November 1st to March 31st for areas associated with hibernacula or both hibernacula and summer records, and October 1st to March 31st for areas only associated with summer records.
- If baseline data are not already available for non-SGCN YFI target species on the WMA or project area and the RWM determines that such data is needed to inform management.

Field surveys to document species occurrences pre-treatment should be conducted within an appropriate timeframe to maximize detection, and typically after a HMP has been written but prior to trees actually being felled. Survey protocol recommendations for select species for which pre-treatment surveys may be needed are provided in Appendix C.

3.4 POST-TREATMENT ASSESSMENT AND MONITORING

3.4.1 Need

Post-treatment assessment and monitoring are required to determine if the wildlife habitat goals established in each WMA's HMP have been met. Wildlife monitoring is intended to:

- Document target species use (detection/non-detection) of young forest habitat.
- Estimate YFI target species trends in response to habitat management (e.g., index of abundance).
- Determine whether alternate methods or timing of management are needed to achieve the habitat conditions for the target species (i.e., adaptive management).
- At select locations and as resources allow, estimate demographic parameters (e.g., survival, productivity) of select YFI target species to determine if they are successfully using the young forest areas. Typically intended to be conducted at demonstration areas and in collaboration with a partnering organization.

3.4.2 Approach

To meet these needs, there are four levels of acceptable post-treatment monitoring, which vary in scope and intensity. These include: American Woodcock Monitoring, Target Species Monitoring, Non-target Species Monitoring, and Advanced Research and Monitoring (Table 2). Individual WMAs and project areas will have different monitoring needs; monitoring for all target species is not required at all project areas. In collaboration with YFI biologists, RWMs

will determine what, if any, of the discretionary monitoring will occur. In some cases, monitoring a population outside of the WMA or project area (i.e., a control site) may provide additional insight as to whether the management was beneficial.

Surveys will typically be initiated during the field season after a regeneration cut occurs, but a decision may be made to delay depending on several factors including site conditions, vegetation regrowth (regeneration), and habitat use and preference of the target species.

Table 2. Summary of the four levels of post-treatment wildlife assessments.

Monitoring Level	Required	Discretionary ^a	Coordination
American Woodcock Monitoring	A woodcock survey is the minimally sufficient wildlife monitoring effort. ^b	n/a	DEC YFI staff
Target Species Monitoring	Project areas on WMAs within a GWWA, EWPW, or NEC Focus Area (Appendix D).	Recommended for project areas where any YFI target species is identified as a target species in the HMP.	DEC YFI staff
Non-target Species Monitoring	n/a	Project areas where SGCN monitoring needs are identified.	DEC staff
Advanced Research and Monitoring	n/a	Demonstration areas where YFI-compatible research opportunities are identified.	DEC staff and other partners

^a Monitoring beyond the required elements will occur at the discretion of the RWM.

^b Due to their widespread distribution, AMWO will likely be a target species at many WMAs. Priority may be given to monitoring large project areas/WMAs and monitoring at all small project areas/WMAs may not be practical. Target Species Monitoring may replace AMWO Monitoring at the discretion of the RWM.

3.4.2.1 American Woodcock Monitoring

The Young Forest Project throughout the Northeast and Midwest considers American woodcock an indicator species for evaluating success of young forest habitat management.¹² Following this approach, YFI staff will use a modified version of the US Fish and Wildlife Service (USFWS) woodcock Singing-ground Survey (SGS) as the minimum standard for monitoring wildlife response to young forest habitat management (Table 3). A woodcock survey will be required at most WMAs included in YFI unless monitoring is planned for at least one other target young forest species. The RWM will determine how many survey routes are feasible each year; it may not be practical to survey all project areas or all WMAs. Priority may be given to large WMAs (>500 acres). New survey routes will be established following the SGS protocol for detecting peenting males, but adapting route placement so that routes are established through or adjacent to

¹² Information is available online at www.youngforest.org.

project (treatment) areas and control areas. Existing SGS routes that were established by the USFWS in 1968 may provide comparison to the managed areas.

3.4.2.2 Target Species Monitoring

In addition to the woodcock SGS, surveys may be conducted for other YFI target species following peer-reviewed protocols, including associated habitat measurements (Table 3, Appendix C). Each WMA’s HMP will establish which target species will be monitored; this may include more than one species. Three species (New England cottontail, golden-winged warbler and whip-poor-will) have a limited distribution in NY, and monitoring is required within Focus Areas (Appendix D).¹³ A chart illustrating survey timing is provided in Appendix E.

Table 3. YFI target species survey requirements and recommendations.

Target Species	Required	Discretionary	Protocol	Timing	Frequency
American Woodcock (AMWO)	A woodcock survey is the minimally sufficient wildlife monitoring effort. See Table 2 and AMWO section above.	n/a	Modified SGS, following the AMWO Monitoring Recommendations from the Northeast Upland Game Bird Technical Committee	<ul style="list-style-type: none"> • South, central and western NY: April 20th to May 10th • Northern NY: April 25th to May 15th 	One night per route. Annually (recommended) or in two to three year intervals.
Golden-winged Warbler (GWWA)	WMAs in a GWWA Focus Area (n=4; Figure D1)	<ul style="list-style-type: none"> • WMAs adjacent to a Focus Area. • Other locations where GWWA has been documented or potentially suitable habitat. 	GWWA Point Count Protocol	May 15 th to June 20 th	Annually. At least one survey per year.
New England Cottontail (NEC)	WMAs in a NEC Focus Area (n=4; Figure D2)	<ul style="list-style-type: none"> • WMAs adjacent to a Focus Area. • Other locations where NEC has been documented or potentially suitable habitat. 	Pellet sampling, following the Rangewide Monitoring of the New England Cottontail protocol	December to April (when suitable snow conditions exist)	Annually. Minimum of two surveys per year.
Eastern Whip-poor-will (EWPW)	WMAs in an EWPW Focus Area, if also identified in HMP (n=13; Figure D3)	<ul style="list-style-type: none"> • WMAs adjacent to a Focus Area. • Other locations where EWPW has been documented or potentially suitable habitat. 	Modified Regional (Northeast) Nightjar Survey Protocol	mid-April to late June or early July, during suitable lunar phase	Annually. One survey per year. If only one EWPW detected, a second survey ≥ one week later is recommended.

¹³ Bashakill and Indian River WMAs fall within both the EWPW and GWWA Focus Areas. The RWM may choose to monitor either one or both target species, depending upon goals established in the HMP.

Table 3. Continued

Target Species	Required	Discretionary	Protocol	Timing	Frequency
Ruffed Grouse (RUGR)	n/a	Project areas in any WMA where grouse is identified as a target species in the WMA's HMP.	Drumming surveys following the RUGR Monitoring Recommendations from the Northeast Upland Game Bird Technical Committee	April 15 th to May 15 th	Annually. Two survey replicates per year.
Snowshoe Hare (SSH)	n/a	Project areas in any WMA where SSH is identified as a target species in the HMP.	Pellet counts	December to April (when suitable snow conditions exist)	Annually
Eastern Wild Turkey (WITU)	n/a	Project areas in any WMA where WITU is listed as a target species in the HMP.	<ul style="list-style-type: none"> • Spring Gobbler Survey (recommended; gobbling WITU count included in the RUGR protocol). • August Brood Survey (optional). 	<ul style="list-style-type: none"> • April 15th to May 15th (gobbler survey) • August (brood survey) 	<p>Gobbler survey: Annually. Two survey replicates per year (concurrent with RUGR survey).</p> <p>Brood survey: opportunistic.</p>
White-tailed Deer (WTD) ¹⁴	n/a	<ul style="list-style-type: none"> • Browse impact surveys: Project areas in WMAs where browse impacts on regeneration are a concern. • Abundance surveys: optional for project areas in WMAs where deer is identified as a target species in the HMP. 	<ul style="list-style-type: none"> • Browse impacts: Regenerate! protocol • Abundance: pellet counts • Note: Deer exclosures may be installed in project areas with high deer density where over-herbivory may impact forest regeneration. 	Surveys must be timed appropriately depending upon the protocols. See Appendix C.	See Appendix C and E.

3.4.2.3 Non-target Species Monitoring

Additional monitoring for wildlife beyond the YFI target species may be beneficial or necessary at some locations. The need for this level of monitoring will be driven by presence of species of conservation concern that may either be positively or negatively affected by forest management, especially High Priority SGCN (i.e., avoid adverse impacts or document benefits to non-target

¹⁴ Deer benefit from young forest management, but also can negatively affect regeneration. Consequently, monitoring will typically focus on assessing effects on vegetation rather than assessing deer abundance, unless the HMP indicates that data on abundance and/or habitat use are required to inform habitat management for the WMA.

wildlife). This level of monitoring will typically be carried out by or in collaboration with DEC staff on other Bureau of Wildlife teams, often under existing survey and monitoring projects that are complementary to YFI.

Examples may include but are not limited to:

- Breeding bird surveys for SGCN songbirds and other forest birds such as Canada warbler (*Cardellina canadensis*, High Priority SGCN) and Cerulean warbler (*Setophaga cerulea*, SGCN).
- SGCN mammals (e.g., bats, moose).
- SGCN reptiles and amphibians.
- SGCN invertebrates.

Recommended protocols for select species are provided in Appendix C, Table C2.

3.4.2.4 Advanced Research and Monitoring

Building upon the basic surveys for YFI target species, additional monitoring or research questions may be developed at the discretion of the RWM. The intent of this level of monitoring is to provide an opportunity for deepening our understanding of wildlife use of habitat managed as young forest, and to further validate or adapt management activities as needed. In most cases, this will most likely occur at the WMA selected as the Region's demonstration area. These research and monitoring activities will often be developed and conducted in collaboration with other DEC Bureau of Wildlife Teams, conservation partners, and/or colleges and universities. Additionally, experienced volunteers may be recruited to assist trained personnel.

Examples may include but are not limited to:

- Comparing snowshoe hare survey methods (fecal pellet counts and snow track surveys) to determine which protocol optimizes both efficiency and detection in young forest habitat.
- Evaluating potential long-term benefits of forest management for bats.
- Estimating avian demographic parameters via the Monitoring Avian Productivity and Survivorship (MAPS) songbird banding program.
- Monitoring diversity and abundance of reptiles and amphibians, especially SGCN, in response to young forest management.
- Evaluating the value of young forests for pollinators and/or other SGCN invertebrates, including the feasibility of assessing young forest project areas for flowering plants.
- Other relevant research focusing on wildlife that commonly use young forest habitat (see Appendix A).

4. EVALUATING VEGETATION RESPONSE

4.1 INTRODUCTION

In order to provide suitable young forest habitat for the target wildlife, any forest area being managed must be carefully evaluated both before and after implementation of a timber cut. Site assessment and monitoring is required to:

- Determine if the desired vegetation (e.g., hardwoods, softwoods, or specific tree or shrub species) regenerates as expected.
- Identify hard or soft mast-producing trees as well as snags (“wildlife trees”) to retain post-treatment to enhance habitat for wildlife.
- If detected and treated, determine if undesirable vegetation such as invasive plants or interfering vegetation was successfully controlled.
- Identify and control other impediments to regeneration (e.g., impacts of deer herbivory).
- If native trees or shrubs were planted as a habitat enhancement for wildlife, determine whether they established successfully.

4.2 GENERAL APPROACH

For each project area, pre- and post-treatment vegetation monitoring will be coordinated by the regional YFI forester under the direction of the RWM, with implementation assistance provided by a forestry technician and/or other DEC staff as needed. To the extent practicable, assessments will use existing protocols and databases used by DEC Division of Lands and Forests. A central office forester will review silvicultural prescriptions and coordinate the compilation of data statewide for tracking and reporting purposes.

4.3 PRE-TREATMENT SITE ASSESSMENTS

4.3.1 Need

Pre-treatment site assessments are required to describe the existing forest stand structure and composition (i.e., species, age class), evaluate the presence of advanced regeneration and/or the potential for regeneration, evaluate the presence of interfering vegetation, identify sensitive areas to avoid, and determine the type of silvicultural treatment necessary to convert the existing forest vegetation to the desired young forest characteristics required by the target species (i.e., BMPs).

4.3.2 Approach

4.3.2.1 Habitat Inventory

Prior to initiation of any timber harvest or non-commercial forest management project on a WMA, the forester or forestry technician will inventory forest stands and/or treatment units in the project area. In some cases, this will occur as part of a comprehensive WMA habitat inventory conducted before the HMP is developed (an overview of forest stands is included in each WMA’s HMP). Inventories used for HMPs must be recent (within the past ten or fifteen years) and must be periodically updated (within every ten to fifteen years). Habitat inventory entails:

- Delineating the boundaries of habitat types and forest stands (natural forest, natural forest-seedling sapling, plantation, plantation-seedling sapling, shrubland, forested wetland, and grassland).
- Conducting a visual assessment of regeneration for the stand/treatment unit.
- Identifying Special Management Zones (SMZ; wetlands, streams, vernal pools, seeps, and other sensitive areas).
- Entering forest stand data into the Division of Lands and Forests' State Forest Inventory Database (SFID), where it is available for mapping and analysis.

Combined with the target species BMPs, the habitat inventory and visual assessment informs the silvicultural prescription for the project area. Foresters prepare silvicultural prescriptions prior to initiation of any commercial (timber sale) or non-commercial forest management.

4.3.2.2 Photo Point Monitoring

In addition to inventory, foresters will photograph the condition of the project area prior to management using a photo point monitoring technique. They will establish a location (indicated by GPS coordinates and a permanent marker such as rebar) for photographing each project area from the same position and cardinal direction. Photos are also required after management has occurred (see below). A Robel pole may be used in combination with photo point monitoring to document changes in vegetation height and density over time.

4.4 POST-TREATMENT ASSESSMENT AND MONITORING

4.4.1 Need

Following the conclusion of any commercial timber harvest or non-commercial habitat management project on a WMA, the YFI forester will make an assessment of the treated area. The assessment will determine:

- If the desired outcomes were achieved.
- If not, what post-treatment measures must be taken to promote the desired type and degree of vegetation regeneration.

4.4.2 Approach

*4.4.2.1 Regeneration Assessment Protocol*¹⁵

When conducting a regeneration cut, foresters will conduct assessments within one year of harvest completion, and three and five years after the harvest or until the forester determines adequate natural or artificial regeneration has been securely established and the target species BMPs have been sufficiently implemented (Table 4). Foresters will retain documentation in the sale file showing evidence of the success including inventory data and reference to appropriate silvicultural guides and/or species-specific BMP guides.

- If at any point following the harvest the forester determines the desired regeneration is either unsuccessful and/or different from the original intended species but the outcome does not pose a negative impact on ecology, habitat, soils, water quality, or any

¹⁵ Adapted from NYSDEC Division of Lands and Forests Program Policy ONR-DLF-3 / Clearcutting on State Forests, Part VIII: Standards (2011). Available online at <http://www.dec.ny.gov/lands/64567.html>.

combination of these or other forest values, the forester may consider the newly established stand a success. A memo indicating the successful change in stand development should be placed in the sale file and the stand regeneration assessment data in SFID should be updated.

- If at any point within the five years following the harvest the forester determines the desired regeneration is delayed, but the situation does not pose a negative impact on ecology, habitat, soils, water quality, or any combination of these or other forest values, the forester may defer making a decision about how to treat the stand. A memo indicating the decision is being deferred should be placed in the sale file and a regeneration assessment should be conducted in no more than two years.
- If at any point within the five years following the harvest the forester determines that the desired regeneration (either natural or artificial) is being outcompeted by undesirable vegetation (interfering vegetation) or is otherwise unsuccessful and has the potential of negatively impacting the ecology, habitat, soils, water quality, or any combination of these or other forest values, appropriate action with a treatment schedule to establish/encourage adequate desirable regeneration must be conducted and documented.
- If artificially regenerating a stand, species types should be documented in the stand prescription and should demonstrate the justification for the decision made.
- Artificial regeneration using non-native species (species not native to North America prior to European settlement) may be considered only if it is determined the non-native species does not have invasive properties (outcompetes native species in a natural state), has a New York invasive risk assessment of medium, low, or none, is more suited for the site due to soil and other properties, is resistant to wildlife impacts, can outcompete undesirable vegetation, is most appropriate to reach desired wildlife or ecological goals, and is available. Justification for the use of non-native species must be clearly defined within the stand prescription.

4.4.2.2 Photo Point Monitoring

In addition to the regeneration assessments, foresters will photograph all regenerating sites from the same location and cardinal direction (as established pre-treatment) to visually capture the progress of the habitat regeneration (Table 4). See the Pre-Treatment section above. Select photographs that document young forest changes over time may also be used to illustrate the condition of the regenerating habitat via an online, interactive map accessible to the public.

Table 4. Protocol, timing and frequency of YFI post-treatment vegetation assessments.

Survey	Required	Protocol	Timing	Frequency
Regeneration Assessment	All YFI project areas	DEC YFI's Regeneration Assessment	n/a	Years 1, 3, and 5 after cut or until forester determines adequate regeneration has been established.
Photo Point Monitoring	All YFI project areas	Photo Point Monitoring Handbook (Hall 2001)	The default season is summer for all sites. May be done seasonally (spring, summer, fall, winter) at select project areas if desired.	<ul style="list-style-type: none"> • Once pre-treatment, then once per year in years 1, 3, 5, and 10 (year 1 is the year a cut completed), typically concurrent with the regeneration assessment. • Demonstration areas: as above, plus once every ten years to document long-term effects.

5. PROGRESS TOWARDS YOUNG FOREST ACREAGE GOAL

5.1 INTRODUCTION

As part of each WMA's HMP, YFI biologists and foresters will determine the existing amount of young forest on each WMA prior to implementing any new forest management. This establishes the baseline from which to track progress towards the goal of converting at least 10% of the forested area of each WMA to young forest. Depending upon the target species BMPs, some treated areas may be maintained as young forest (e.g., for NEC or GWWA) while other areas will naturally succeed out of a young forest condition after approximately ten years post-treatment (e.g., for RUGR). The amount of time this takes depends on numerous site conditions (latitudinal and elevation variation across the state, soils, topography, climate, pre-treatment presence of advanced regeneration, etc). Stands that have aged out of a young forest condition will also be tracked in an effort to maintain the 10% goal long-term.

5.2 GENERAL APPROACH

The amount of new young forest acreage created will be tracked at three levels, annually:

- Individual WMAs: DEC regional YFI staff will submit annual Progress Report and Evaluations to Central Office including acreage of projects that are planned, in progress, or completed, as well as acreage of areas that have succeeded beyond young forest.
- Statewide: Central Office will summarize young forest acreage in an annual YFI report.
- Nationally: Regional staff will submit acres treated to the online Young Forest Project data tracker, managed by Wildlife Management Institute, to contribute to a landscape-level perspective on young forest acreage throughout the Northeast and Midwest.

6. OUTREACH AND PUBLIC PERCEPTION

DEC biologists and foresters are stewards of the wildlife and habitat resources on WMAs on behalf of the people of New York. Since people's understanding, attitudes, and perceptions towards young forest management are critical to the success of the YFI, outreach will be a major component of the program. The following outreach methods may be used to help raise awareness about habitat management for young forests:

- HMP public information sessions
- Young forest workshops and presentations
- Public interest articles (e.g., Conservationist, NY Hunting and Trapping Guide)
- New signs and updated kiosks at WMAs
- DEC's YFI webpage¹⁶

An assessment of WMA visitor's attitudes and perceptions towards YFI habitat management actions will be conducted in collaboration with Cornell University's Human Dimensions Research Unit via a social science research project.

¹⁶ Available online at <http://www.dec.ny.gov/outdoor/104218.html>.

7. DATA MANAGEMENT

A centralized database will be used to manage data generated at all stages of each young forest project, including planning, compliance, and pre- and post-treatment wildlife and vegetation assessments. Forestry data, including inventory and timber sale contracts, will be tracked in SFID. All original documents and data pertaining to inventory, prescription, compliance, Notice of Sale, contracts, treatment, wildlife monitoring, and regeneration assessment will be archived for each project area and will be stored in the Regional office. Digital copies will also be filed with Central Office. Monitoring data will be managed by Central Office YFI staff.

Coordination with non-DEC databases may include annual submissions of data to:

- Young Forest Project data tracker
- NY NHP, for occurrences of rare species
- Relevant coordinated regional monitoring efforts for select species or species groups (e.g., Nightjar Survey Network¹⁷ or Avian Knowledge Network¹⁸), as time permits.

¹⁷ Available online at <http://www.nightjars.org/>.

¹⁸ Available online at <http://www.avianknowledge.net/>.

APPENDIX A: YOUNG FOREST WILDLIFE

Wildlife that commonly use young forest and early successional habitat in New York ^a

Target species of DEC's Young Forest Initiative are indicated in bold type.

Common Name <i>Scientific Name</i>	NY Status	NY SGCN Status ^b	Habitat Preference and Use
BIRDS: ^c			
Alder flycatcher <i>Empidonax alnorum</i>			Wet thickets, especially with alder, maple, and birch.
American redstart <i>Setophaga ruticilla</i>			Moist, deciduous, second-growth woodlands with abundant shrubs. Breeding habitat is often near water, and includes alder and willow thickets, thickets in tree fall gaps within old-growth forest, fencerows, orchards, and mixed deciduous-coniferous woodlands.
American woodcock <i>Scolopax minor</i>		SGCN	Young, shrubby, deciduous forests, old fields, and mixed forest-agricultural areas. Display in forest openings and old fields in the springtime. Often use clearings for roosting. Use young forest in wet areas for nesting.
Black-billed cuckoo <i>Coccyzus erythrophthalmus</i>		SGCN	Woodlands and thickets, including aspen, poplar, birch, sugar maple, hickory, hawthorn, and willow.
Blue-winged warbler <i>Vermivora cyanoptera</i>		SGCN	Early to mid-successional habitats, especially abandoned farmland and forest clearings.
Brown thrasher <i>Toxostoma rufum</i>		High Priority SGCN	Shrubby old fields, pastures with scattered shrubs and hedgerows, and forest edges.
Canada warbler <i>Cardellina canadensis</i>		High Priority SGCN	Mixed forest openings especially near wetlands and streams.
Chestnut-sided warbler <i>Setophaga pensylvanica</i>			Early successional deciduous woods.
Common nighthawk <i>Chordeiles minor</i>	Special Concern	High Priority SGCN	Nest on ground in open areas such as gravel bars, forest clearings, and barrens. Also nest on gravel rooftops in urban areas.
Common yellowthroat <i>Geothlypis trichas</i>			A variety of habitats with thick, tangled vegetation. Most common in wet areas.
Eastern kingbird <i>Tyrannus tyrannus</i>			Fields with scattered shrubs and trees, in orchards, along forest edges, along watercourses, and in shrubs and saplings in shallow wetlands.
Eastern towhee <i>Pipilo erythrophthalmus</i>			Brush, tangles, thickets, and along forest edges. Pine-oak barrens, shrubby old fields, and regenerating forest cuts.

Common Name		NY SGCN Status	Habitat Preference and Use
<i>Scientific Name</i>	NY Status		
Field sparrow <i>Spizella pusilla</i>			“Old-field” specialists; need tall grass and brush that’s growing into saplings and shrubs, especially thorny shrubs like roses and briars, including regenerating forest.
Golden-winged warbler <i>Vermivora chrysoptera</i>	Special Concern	High Priority SGCN	Shrubby habitats such as regenerating clear cuts, wet thickets, and old fields reverting to shrubs and saplings.
Gray catbird <i>Dumetella carolinensis</i>			Dense thickets and tangles of shrubs, young trees, and vines along forest edges, old fields, streams, and fencerows.
Hooded warbler <i>Setophaga citrina</i>			Requires shrub understory, common in selectively logged deciduous forest appearing 1 to 5 years after harvest and in forests with shrub-sapling clearings due to natural openings in the canopy.
Indigo bunting <i>Passerina cyanea</i>			Weedy and brushy areas, especially where fields meet forests, and edges, hedgerows, overgrown patches, and brushy roadsides.
Kentucky warbler <i>Geothlypis formosa</i>		High Priority SGCN	Forest interior, needs dense understory in hardwood forests for nesting and fledging.
Magnolia warbler <i>Setophaga magnolia</i>			Nests in small, dense conifers, especially young spruce, also uses mature forest with dense understory.
Mourning warbler <i>Geothlypis philadelphia</i>			Disturbed second-growth forested areas, with moderately closed canopy and thick understory. Also in regenerating forest cuts.
Nashville warbler <i>Oreothlypis ruficapilla</i>			Second-growth deciduous or mixed forest with shrubby undergrowth.
Northern bobwhite (quail) <i>Colinus virginianus</i>		High Priority SGCN	Open pine forests, overgrown fields, shrubby areas, and grasslands.
Northern flicker <i>Colaptes auratus</i>			Open habitats near trees, including woodlands, edges, yards, and parks. Nests in natural tree cavities and bird nest boxes.
Olive-sided flycatcher <i>Contopus cooperi</i>		High Priority SGCN	Breeds in montane and northern coniferous forests, at forest edges and openings. Also in boreal forest habitats near streams, beaver ponds, and bogs.
Orchard oriole <i>Icterus spurius</i>			Open woodlands and areas of scattered trees, along river edges, in pastures with scattered trees, and in parks and orchards.
Prairie warbler <i>Setophaga discolor</i>		SGCN	Various shrubby habitats, including regenerating forests, open fields with scattered saplings or young trees including cedars.
Rose-breasted grosbeak <i>Pheucticus ludovicianus</i>			Most common in regenerating woodlands and often concentrate along forest edges.

Common Name <i>Scientific Name</i>	NY Status	NY SGCN Status	Habitat Preference and Use
Ruffed grouse <i>Bonasa umbellus</i>		SGCN	Mixed deciduous and coniferous forest interiors with scattered clearings. They also live along forested streams and in areas growing back from burning or logging.
Spruce grouse <i>Falciennis canadensis</i>	Endangered	High Priority SGCN	Boreal lowlands, in coniferous forest, including those dominated by dense stands of spruce, pine, or fir.
Tennessee warbler <i>Oreothlypis peregrina</i>		SPCN	Boreal lowlands, in open areas containing grasses, dense shrubs, and young deciduous trees.
Veery <i>Catharus fuscescens</i>			Deciduous woodland and forest with well-developed understory.
Whip-poor-will <i>Antrostomus vociferus</i>	Special Concern	High Priority SGCN	Dry deciduous or evergreen-deciduous forest, including pine-scrub oak and other barrens, with little or no underbrush, close to open areas.
White-eyed vireo <i>Vireo griseus</i>			Deciduous scrub, overgrown pastures, old fields, wood margins, streamside thickets.
White-throated sparrow <i>Zonotrichia albicollis</i>			Woods, at forest edges, in the regrowth that follows logging or forest fires, at pond and bog edges, and in copses near tree line.
Wild turkey <i>Meleagris gallopavo</i>			Open forests interspersed with young forest and clearings including agricultural land. Adults with poults forage in old fields and hayfields in summer and plowed fields in winter.
Willow flycatcher <i>Empidonax traillii</i>			Moist, shrubby areas, often with standing or running water, including emergent marshes with shrubs.
Yellow warbler <i>Setophaga petechia</i>			Shrubby thickets and woods, particularly along watercourses and in wetlands. Common trees include willows, alders, and cottonwoods.
Yellow-billed cuckoo <i>Coccyzus americanus</i>			Woodland patches with gaps and clearings.
Yellow-breasted chat <i>Icteria virens</i>	Special Concern	High Priority SGCN	Dense second-growth, riparian thickets, and brush.
MAMMALS: ^d			
Bobcat <i>Lynx rufus</i>			Large home ranges include a variety of habitats, but preferred prey species (lagomorphs) are young forest obligates.
Eastern coyote <i>Canis latrans</i>			Use young forest and shrubland habitat as day resting sites. Several young forest species are preferred prey (small mammals, lagomorphs).

Common Name		NY SGCN	
Scientific Name	NY Status	Status	Habitat Preference and Use
Eastern red bat <i>Lasiurus borealis</i>		SGCN	Found in a variety of forest habitats, forages in open areas.
Gray fox <i>Urocyon cinereoargenteus</i>			Deciduous forest, brushy and rocky areas. Old fields and farmland serve as foraging areas.
Indiana bat <i>Myotis sodalis</i>	Endangered ^e	High Priority SGCN	Found in a variety of forest habitats at elevations ≤1000 ft., forages in open areas. Summer roosts underneath bark of trees, etc. Hibernate in abandoned mines and natural caves.
Little brown bat <i>Myotis lucifugus</i>		High Priority SGCN	Found in a variety of forest habitats, forages in open areas. Summer roosts underneath bark of trees, etc. Hibernate in abandoned mines and natural caves.
Moose <i>Alces alces</i>		SGCN	Large home ranges with variety of habitats, but important foraging habitat includes young forest.
New England cottontail <i>Sylvilagus transitionalis</i>	Special Concern	High Priority SGCN	Young forest and old field habitats with dense shrub cover, including utility line right-of-ways. Also scrub-shrub wetlands, closed canopy forest with dense undergrowth of mountain laurel and blueberry, and coastal pine-oak habitats (the latter in New England states).
Red fox <i>Vulpes vulpes</i>			Mix of old fields, forest edges, and farmland.
Short-tailed weasel (ermine) <i>Mustela erminea</i>			Found in habitat ranging from grasslands to woodlands, but most common in open canopy areas with dense understory cover such as forest clearings or edges.
Snowshoe (varying) hare <i>Lepus americanus</i>			Habitat includes early successional habitats including a well-developed woody understory, especially young conifers, and open areas with herbaceous vegetation.
Southern red-backed vole <i>Clethrionomys gapperi</i>			Forested habitats. Eastern populations prefer habitat with dense shrubs and herbs.
White-tailed deer <i>Odocoileus virginianus</i>			Large home range includes a variety of habitats, dense shrubby areas provide important cover and browse.
REPTILES AND AMPHIBIANS:			
Blanding's turtle <i>Emydoidea blandingii</i>	Threatened	High Priority SGCN	Overwinters and forages in open or closed canopy wetlands, nests in a variety of sparsely vegetated open uplands with well drained soils.
Bog turtle <i>Glyptemys muhlenbergii</i>	Endangered ^f	High Priority SGCN	Open-canopy wet meadows, sedge meadows, and calcareous fens.

Common Name		NY SGCN	
Scientific Name	NY Status	Status	Habitat Preference and Use
Common ribbonsnake <i>Thamnophis sauritus sauritus</i>		SGCN	Semi-aquatic, often found near edges of ponds, streams, bogs, and fens.
Eastern fence lizard <i>Sceloporus undulatus</i>	Threatened	SGCN	Steep slopes with extensive open rocky area surrounded by mixed-deciduous, oak-dominated forests. Found only in Southern NY (Hudson Highlands).
Eastern hog-nosed snake <i>Heterodon platirhinos</i>	Special Concern	High Priority SGCN	Openly wooded upland hills, forest edged, fields, woodland meadows, pine barrens. Primarily feeds on amphibians.
Eastern massasauga <i>Sistrurus catenatus catenatus</i>	Endangered	High Priority SGCN	Wet meadows, bogs, and fens; also uses hardwood forest, old fields, and agricultural lands.
Eastern ratsnake <i>Pantherophis alleghaniensis</i>		SGCN	Mosaic of forest, woodland, and open field habitats.
Eastern spadefoot <i>Scaphiopus holbrookii</i>	Special Concern	SGCN	Open fields. Dry sandy soils or loose soils, pine barrens. Largely fossorial. Breeds in shallow pools following heavy summer rains.
Eastern wormsnake <i>Carphophis amoenus amoenus</i>	Special Concern	SGCN	Moist forests, edges, and sandy pine barrens. Often found under rocks, logs, bark slabs, and other forest litter. Largely fossorial.
Five-lined skink <i>Plestiodon fasciatus</i>			Closed and open canopy habitats, often along edges between dense forests and shrubby or herbaceous fields. Dense understory cover with rocks or woody debris.
Fowler's toad <i>Anaxyrus fowleri</i>		SGCN	Wooded areas, river valleys, and floodplains. Often burrows in the soil or uses fallen logs or other debris for cover.
Northern black racer <i>Coluber constrictor constrictor</i>		SGCN	Variety of open habitats, with little overstory canopy and plenty of woody and herbaceous understory cover. Associated with disturbed areas such as clear-cuts and burned areas.
Northern coal skink <i>Plestiodon anthracinus anthracinus</i>		SGCN	Open habitat with rock or log cover. Also moist forested areas near swamps.
Northern copperhead <i>Agkistrodon contortrix mokasen</i>		SGCN	Rocky slopes within hardwood forest.
Smooth green snake <i>Opheodrys vernalis</i>		SGCN	Old fields, wet meadows, shrub swamps, open woodlands, and clearings in forests.
Snapping turtle <i>Chelydra serpentina</i>		SGCN	Slow-moving, generally shallow waters with a muddy bottom. Nest in open upland areas with sandy or loamy soils.
Southeastern mud turtle <i>Kinosternon subrubrum subrubrum</i>	Endangered	High Priority SGCN	Shallow, quiet freshwater or brackish wetlands. Nest in nearby upland undeveloped sandy soils.
Southern leopard frog <i>Lithobates sphenoccephalus utricularius</i>	Special Concern	SPCN	Primarily found in open areas, including grasslands, wet meadows, grassy edges, shallow wetlands, and clear, slow-moving ditches.

Common Name		NY SGCN	
<i>Scientific Name</i>	NY Status	Status	Habitat Preference and Use
Spotted turtle <i>Clemmys guttata</i>	Special Concern	High Priority SGCN	Marshes, bogs, calcareous fens, shrub swamps, forested wetlands, and seasonal ponds. Also use adjacent open upland areas for nesting and may burrow in dense understory vegetation when traveling through uplands.
Timber rattlesnake <i>Crotalus horridus</i>	Threatened	High Priority SGCN	Mountainous or hilly deciduous or mixed deciduous- coniferous forests with rocky outcroppings, steep ledges, and talus slopes.
Western chorus frog <i>Pseudacris triseriata</i>		SGCN	Damp meadows and shallow wetlands with low shrubs, grasses, and sedges.
Wood turtle <i>Glyptemys insculpta</i>	Special Concern	High Priority SGCN	Riparian forest generalists. Overwinters in a variety of stream corridors, nests in open sandy to gravelly substrates. Forages in closed and open canopy sections of forest, need areas of dense, low vegetation for basking.
Woodland box turtle <i>Terrapene carolina carolina</i>	Special Concern	High Priority SGCN	Mainly terrestrial, overwinter in forests under soil, leaf litter, woody debris or old mammal burrows. Need early successional habitats with dense patches of shrubby or herbaceous vegetation for foraging, breeding, and basking.

INVERTEBRATES: ^s

A Geometrid moth <i>Euchlaena madusaria</i>		SPCN	Pitch pine-oak-heath woodlands, maritime heathlands, and dwarf pine plains. Larval host plants include oak (<i>Quercus</i> sp.) and lowbush blueberry.
A Hand-maid moth <i>Datana ranaeiceps</i>		SGCN	Feeds on staggerbush, which is a flowering shrub of filtered shade to full sun, forest edges, open pinelands - doesn't persist in a closed canopy, so fire or cutting would promote suitable habitat conditions.
Barrens buckmoth <i>Hemileuca maia maia</i>	Special Concern	SGCN	Scrub oak. As scrub oak is an understory to pitchpine forest, this could benefit from uneven age management of pine barrens.
Bay underwing <i>Catocala badia</i>		SGCN	Bayberry and waxy myrtle are understory to pitchpine forest, so uneven age management would benefit this species.
Blueberry gray <i>Glena cognataria</i>		SPCN	Blueberry-chestnut oak forest and pitch pine-oak-heath rocky summit; bogs and pine barrens; and is associated with extensive areas of lowbush blueberry barrens and bogs
Brown-bordered geometer <i>Eumacaria madopata</i>		SGCN	Edges and shrubby fields. In NY, feeds on beach cherry and Sesquehana cherry, also apples, plum and cherry.

Common Name		NY SGCN Status	Habitat Preference and Use
Scientific Name	NY Status		
Herodias/pine barrens underwing <i>Catocala herodias gerhardi</i>		SGCN	Scrub oak. As scrub oak is an understory to pitchpine forest, this could benefit from uneven age management of pine barrens.
Jair underwing <i>Catocala jair</i>	Special Concern	SGCN	Scrub oak. As scrub oak is an understory to pitchpine forest, this could benefit from uneven age management of pine barrens.
Melsheimer's sack bearer <i>Cicinnus melsheimeri</i>		SGCN	Scrub oak. As scrub oak is an understory to pitchpine forest, this could benefit from uneven age management of pine barrens.
Nine-spotted lady beetle <i>Coccinella novemnotata</i>		High Priority SGCN	Broad habitat: agriculture, fields, shrubby, woods, anyplace with abundant insects to prey on.
Noctuid moth sp. <i>Chytonix sensilis</i>		SGCN	Larva feed on fungus and can be found on leaf litter or woody debris. Feed on fungus on floor of pine barrens. Species would benefit where fire management is used as a tool for management of young forest.
Noctuid moth sp. <i>Eucoptocnemis fimbriaris</i>		SGCN	Species would benefit if grasses could grow in cut areas. Feeds on forbs in maritime grasslands, heathlands, barrens, woodlands. Need food plant identified to better know habitat.
Noctuid moth sp. <i>Agrotis obliqua</i>		SPCN	Boreal spruce-fir or quaking aspen forests. In NY, sandstone pavement barrens, dominated by jack pine and sparsely scattered with Ericaceous shrubs, mosses, lichens and ferns.
Noctuid moth sp. <i>Phoberia ingenua</i>		SPCN	Larvae use a variety of oak species as a host plant, including scrub oak. Pine oak barrens.
Northern metalmark <i>Calephelis borealis</i>		High Priority SGCN	Forest openings natural and otherwise, outcrops especially limestone or shale, cliffs, ledges, powerlines. Larval food roundleaf ragwort (as so far known) needs full or part sun. Nectar in open areas with lots of flowers.
Notodontid moth <i>Heterocampa varia</i>		SPCN	Dwarf pine barrens, dominated by <i>Pinus rigida</i> and <i>Quercus ilicifolia</i> . Larval food plant species consist primarily of scrub oak but can also be found on post oak and dwarf oak. Barrens and savannah.
Northern barrens tiger beetle <i>Cicindela patruela patruela</i>		High Priority SGCN	Dry, sandy coastal plain pine barrens, sand hills, and other pine or mixed pine-oak woodland or scrub.
Pine barrens zanclognatha <i>Zanclognatha martha</i>		SPCN	Uneven age management benefits barrens. Species habitat: barrens dominated by pitch pine and scrub oak. Most numerous where there is substantial leaf litter and a pine canopy.

Common Name		NY SGCN	
Scientific Name	NY Status	Status	Habitat Preference and Use
Pine pinion moth <i>Lithophane lepida lepida</i>	Endangered	SPCN	Inhabits early-successional communities dominated by pitch pine and scrub oak which benefit from uneven age management.
Pink sallow <i>Psectraglaea carnosia</i>		SGCN	Blueberry, scrub oak, chokeberry thought to be food. These are understory in pine barrens so uneven age management could benefit species.
Pin-striped slug moth <i>Monoleuca semifascia</i>		SPCN	Larval host plants include a variety of oak species and other woody plants. Larval host plants include oak, cherry, pecan, and persimmon.
Southern grizzled skipper <i>Pyrgus wyandot</i>	Endangered	High Priority SGCN	Pastures, relatively open oak woods, and powerlines on south to west facing shale slopes, always with abundant bare rock or soil. This species occurs in disturbed as well as natural habitats, including early and successional forest habitat. Food plant dwarf cinquefoil.
Stinging rose caterpillar moth <i>Parasa indetermina</i>		SPCN	Fire maintained dry coastal scrub, oak woodlands, barrens and grasslands. Native Rosaceae are the preferred larval food plants, this species has been reported to use numerous food plants including apple, cottonwood, dogwood, hickory, oaks, redbud, chestnut, cherry, plum, and sycamore.
Waxed sallow <i>Chaetagnalea cerata</i>		SGCN	Scrub oak. As scrub oak is an understory to pitchpine forest, this could benefit from uneven age management of pine barrens.
Well-marked cutworm <i>Abagrotis orbis</i>		SPCN	Thought to be a generalist feeding on such plant families as Rosaceae, Salicaceae, Aceraceae, and Vitaceae.

Summary of NY listed species and SGCN: Endangered (7), Threatened (3), Special Concern (14), High Priority SGCN (26), SGCN (30), and SPCN (12).

Species Table Notes:

^a List is adapted from Wildlife Management Institute (2012) “*Under Cover: Wildlife of Shrublands and Young Forest.*” This list for NY was developed by DEC Bureau of Wildlife’s Bird and Mammal Diversity Team, Reptile and Amphibian Diversity Team, Furbearer Team, and DEC’s Invertebrate biologist.

^b New York Species of Greatest Conservation Need (2015) categories include: Highest Priority, Species of Greatest Conservation Need (SGCN), and Species of Potential Conservation Need (SPCN).

^c Habitat descriptions for birds are adapted from Cornell University’s “*All About Birds*” website and the Second Atlas of Breeding Birds in New York State (2008).

^d Mammal species list is adapted from Fuller and DeStefano (2003) “*Relative importance of early-successional forests and shrubland habitats to mammals in the northeastern United States.*”

^e Federally endangered.

^f Federally threatened.

^g Invertebrate habitat descriptions are adapted from habitat descriptions in the New York SGCN Species Status Assessments (2015) and from Nature Serve (2013).

APPENDIX B: STATEWIDE DATA SOURCES

The following resources may be useful in relation to the YFI:

NY State Atlas Projects

- Breeding Bird Atlases (1980-1985 and 2000-2005)
 - Data available at <http://www.dec.ny.gov/animals/51030.html>
- Amphibian and Reptile Atlas Project “Herp Atlas” (1990-1999)
 - Data available at <http://www.dec.ny.gov/animals/7140.html>

Harvest Reporting

- Small Game Hunting Participation and Harvest Estimates
 - Annual survey of small game hunters to estimate hunting participation, effort, and take of ruffed grouse, rabbits, hare, and other small game species.
- Turkey Take
 - Spring Take- estimated annual take available at <http://www.dec.ny.gov/outdoor/30420.html>
 - Fall Take- estimated annual take available at <http://www.dec.ny.gov/outdoor/30412.html>
- Trapping Harvest Data
 - Annual Pelt Seal Summary reports for fisher, bobcat, marten, and otter are available at <http://www.dec.ny.gov/outdoor/93855.html>.

Annual Surveys

- Winter turkey routes
 - Provides an index of abundance to track changes in populations over time and space.
 - Approximately 70 road-based survey routes distributed throughout the state.
 - Routes are run twice annually by DEC staff in February.
- Woodcock SGS
 - Annual population status reports available at <https://www.fws.gov/birds/surveys-and-data/reports-and-publications/population-status.php>
 - Information and data available at https://migbirdapps.fws.gov/mbdc/databases/db_selection.html
- Breeding Bird Survey
 - Survey information and data available at <https://www.pwrc.usgs.gov/bbs/>

Citizen Science

- Ruffed Grouse Drumming Survey
 - Participation by spring turkey hunters
 - Currently have ±400 participants
 - Information and annual reports available at <http://www.dec.ny.gov/animals/48169.html>
- Grouse and Woodcock Hunting Log
 - Participation by grouse and/or woodcock hunters

- Currently have ±250 participants
- Information and annual reports available at <http://www.dec.ny.gov/animals/9351.html>
- Summer Wild Turkey Sighting Survey
 - Open participation during the month of August
 - Information and annual reports available at <http://www.dec.ny.gov/animals/48732.html>
- New England Cottontail Survey
 - Participation by rabbit hunters in the NEC focus area (Rensselaer, Columbia, Dutchess, Putnam, and Westchester counties)
 - Successful hunters submit skulls from harvested rabbits for ID
 - Information available at <http://www.dec.ny.gov/animals/67017.html>
- Furbearer Sighting Survey
 - Open participation year-round
 - Information available at <http://www.dec.ny.gov/animals/30770.html>
- Bowhunter Sighting Log
 - Participation by bowhunters
 - Records index for turkey, deer, and furbearers
 - Information and reports available at <http://www.dec.ny.gov/animals/7193.html>
- North America Amphibian Monitoring Program
 - Open participation
 - Organized by USGS Patuxent Wildlife Research Center
 - Information and data available at <https://www.pwrc.usgs.gov/naamp/>
- Christmas Bird Count
 - Open participation
 - Organized by Audubon since 1900
 - Data available at <https://www.audubon.org/conservation/science/christmas-bird-count>

APPENDIX C: MONITORING PROTOCOLS

Table C1. Protocols recommended for YFI target species and vegetation monitoring.

Species and Protocol	Reference
American woodcock Singing Ground Survey	Igo, W. K. and the Northeast Upland Game Bird Technical Committee. 2012. American Woodcock Monitoring Recommendations. SGS: https://migbirdapps.fws.gov/woodcock/trainingtooldocs.htm
Golden-winged warbler point counts	Cornell Lab of Ornithology's Golden-winged Warbler Monitoring Protocol. Available from http://gwwa.org .
New England cottontail pellet sampling	Shea, C., M. Eaton, S. Fuller, and A. Tur. 2016. Range-wide Monitoring of the New England Cottontail. 7 pp.
Whip-poor-will Northeast Nightjar Survey	Northeast Coordinated Bird Monitoring Partnership. 2015. Instructions for conducting nightjar surveys.
Ruffed grouse drumming survey	Igo, W. K. and the Northeast Upland Game Bird Technical Committee. 2012. Ruffed Grouse Monitoring Recommendations.
Snowshoe hare pellet counts	Adapted from Hodges, K. E. and L. S. Mills. 2008. Designing fecal pellet surveys for snowshoe hares. <i>Forest Ecology and Management</i> 256: 1918–1926.
White-tailed deer browse impacts	Regenerate! A Rapid Assessment Method for Evaluating Deer Impacts to Forest Vegetation. 2015. State University of NY College of Environmental Science and Forestry, Cornell University, and NY Department of Environmental Conservation.
White-tailed deer abundance	deCalesta, D. S. 2013. Reliability and precision of pellet-group counts for estimating landscape-level deer density. <i>Human–Wildlife Interactions</i> 7(1):60–68.
Wild turkey spring gobbler count	Concurrent with spring ruffed grouse survey protocol.
Wild turkey summer brood survey	Summer wild turkey survey: http://www.dec.ny.gov/animals/48732.html
Vegetation regeneration photo point monitoring	Hall, F. C. 2001. Photo point monitoring handbook: Part A - field procedures. General Technical Report PNW-GTR-526. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.

Table C2. Protocols recommended for non-target wildlife assessments, especially for Endangered (E) and Threatened (T) species, Species of Special Concern (SC), and Species of Greatest Conservation Need (SGCN). Federally listed species are indicated with an *. This list is not inclusive; survey and monitoring may be desirable for species beyond those listed here.

Species and NY Status	Where	Protocol	Timing	Frequency
<p><u>Passerines:</u></p> <p>Cerulean warbler (<i>Setophaga cerulea</i>, SC, SGCN)</p> <p>Canada warbler (<i>Cardellina canadensis</i>, High Priority SGCN)</p> <p>Other breeding birds</p>	<p>Breeding bird survey: Any young forest project area (survey may include both project area and control area).</p> <p>Priority songbirds (e.g., CERW, CAWA): Project areas that overlap with occupied Breeding Bird Atlas blocks (Probable or Confirmed) or other areas with known or potential habitat.</p>	<p>Avian point counts:</p> <ul style="list-style-type: none"> • Knutson, M. G., N. P. Danz, T. W. Sutherland, and B. R. Gray. 2008. Landbird Monitoring Protocol for the U.S. Fish and Wildlife Service, Midwest and Northeast Regions, Version 1. Biological Monitoring Team Technical Report BMT-2008-01. U.S. Fish and Wildlife Service, La Crosse, WI. 25 pp + Standard Operating Procedure #1, 2, 4, and 5. • Lambert, J. D., T. P. Hodgman, E. J. Laurent, G. L. Brewer, M. J. Iliff, and R. Dettmers. 2009. The Northeast Bird Monitoring Handbook. American Bird Conservancy. The Plains, Virginia. 32 pp. • Appalachian Mountain Joint Venture Cerulean warbler monitoring protocol (in prep). 	<p>May to June</p>	<p>Breeding bird survey: once every three years</p> <p>Species-specific: As needed</p>
<p>Bald eagle (<i>Haliaeetus leucocephalus</i>, T)</p>	<p>Project areas where forest management is planned near a known nest location or suitable habitat that may be occupied.</p>	<p>Nest searches. If resources allow, suspected new territories/nests may be confirmed during the annual aerial survey of eagle productivity.</p>	<p>late April to early May</p>	<p>Opportunistic</p>
<p><u>Woodland raptors:</u></p> <p>Northern goshawk (<i>Accipiter gentilis</i>, SC, SGCN)</p> <p>red-shouldered hawk (<i>Buteo lineatus</i>, SC, SGCN)</p>	<p>Project areas that overlap with occupied (Confirmed or Probable) Breeding Bird Atlas blocks, or other areas with known or potential woodland raptor territories.</p>	<p>Broadcast acoustical surveys:</p> <ul style="list-style-type: none"> • Woodbridge, B. and C. D. Hargis. 2006. Northern goshawk inventory and monitoring technical guide. Gen. Tech. Rep. WO-71. Washington, DC: U.S. Department of Agriculture, Forest Service. 80 p. 	<p>March to mid-August</p>	<p>One site assessment prior to treatment</p>
<p>Moose (<i>Alces alces</i>, SGCN)</p>	<p>Project areas in the Northern Zone and Saratoga, Washington, Rensselaer, Columbia and Dutchess Counties.</p>	<p>Presence/absence surveys based on sign or observation of individuals</p>	<p>Year-round</p>	<p>Opportunistic</p>

Table C2. *Continued*

Species and NY Status	Where	Protocol	Timing	Frequency
<p><u>Bats:</u></p> <p>Indiana bat (<i>Myotis sodalists</i>, E*)</p> <p>Northern long-eared bat (<i>Myotis septentrionalis</i>, T*)</p> <p>Tri-colored bat (<i>Perimyotis subflavus</i>, formerly eastern pipistrelle)</p>	<p>Indiana and northern long-eared bats: Any project area outside of known, occupied habitat and timber harvest is proposed outside of the recommended cutting window (Oct 1st – Mar 31st).</p>	<p>Presence/probable absence surveys following: U.S. Fish and Wildlife Service USFWS. 2015. Range-wide Indiana bat summer survey guidelines. 44 pp. Available from: http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2015IndianaBatSummerSurveyGuidelines01April2015.pdf</p>	<p>May 15th to August 15th</p>	<p>4 detector nights per 50 ha (123 ac).</p> <p>Survey results are valid for 5 years.</p>
<p><u>Reptiles and amphibians:</u></p> <p>Northern cricket frog (<i>Acris crepitans</i>, E)</p> <p>bog turtle (<i>Clemmys muhlenbergii</i>, E/T*)</p> <p>queen snake (<i>Regina septemvittata</i>, E)</p> <p>Eastern massasauga (<i>Sistrurus catenatus</i>, E)</p> <p>Blanding's turtle (<i>Emydoidea blandingii</i>, T)</p> <p>timber rattlesnake (<i>Crotalus horridus</i>, T)</p> <p>wood turtle (<i>Glyptemys insculpta</i>)</p>	<p>Project areas where forest management is planned within 500 feet of a vernal pool, permanent wetland, and/or other suitable habitat for these species.</p>	<ul style="list-style-type: none"> • Detection/non-detection surveys (e.g., cover board surveys, call surveys, trapping). • The North American Amphibian Monitoring Program protocol. • USGS MA Cooperative Fish and Wildlife Research Unit and the Northeast Blanding's Turtle Working Group. 2012. Coordinated Regional Monitoring Strategy for Blanding's Turtle in the Northeastern United States: Project Overview and Implementation Protocols. 11 pp. • Wood Turtle Population Assessment Protocol. 2015. Northeast Wood Turtle Working Group. 7 pp. 	<p>Surveys must be timed appropriately for the species/suite of species being surveyed.</p>	<p>See Timing.</p>

APPENDIX D: WMAs WITHIN AT-RISK SPECIES FOCUS AREAS

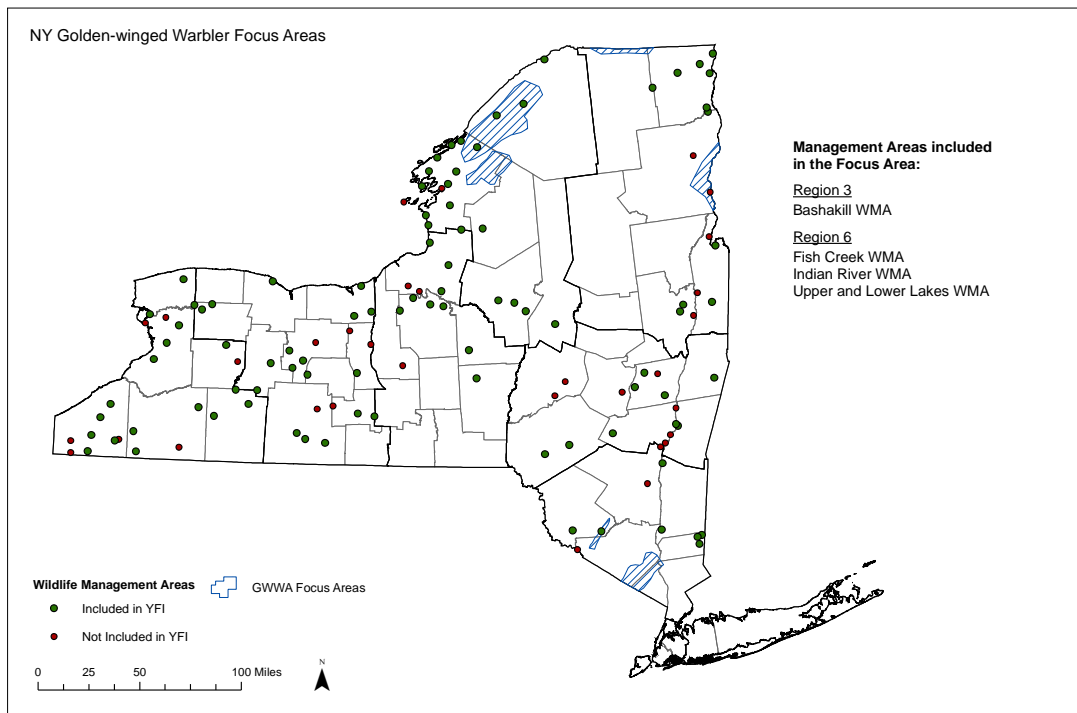


Figure D1. Golden-winged warbler focus areas in New York State.

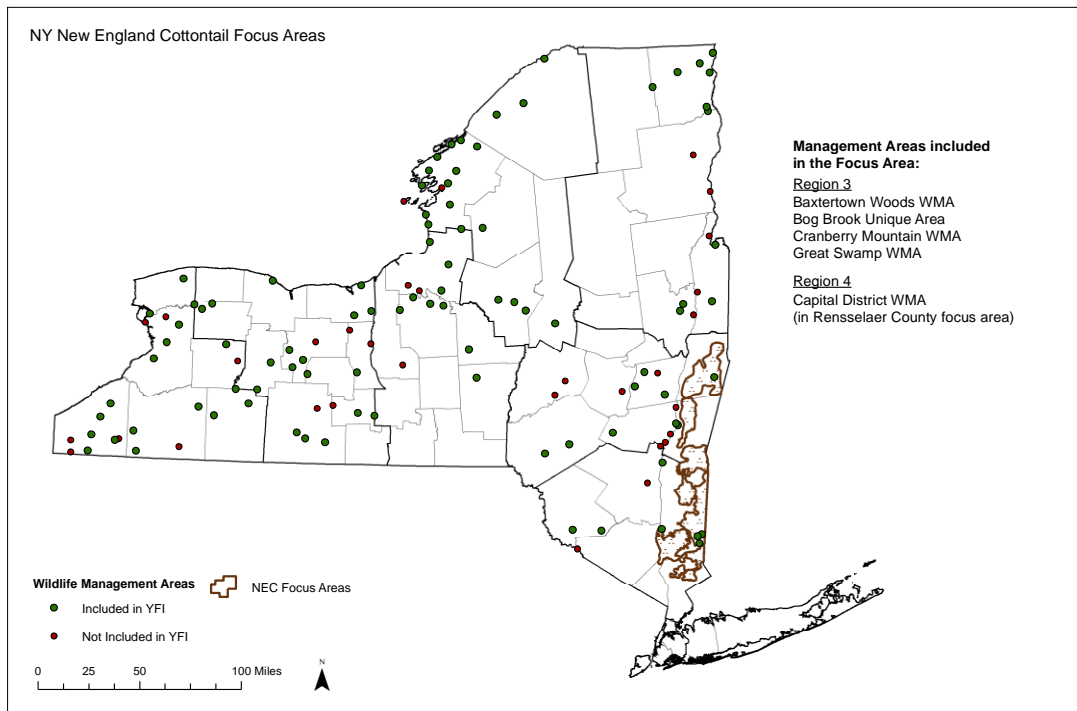


Figure D2. New England cottontail focus areas in New York State. Note that Rensselaer County and northern Columbia County currently do not appear to support NEC, and the NY NEC Land Management Team is currently considering removing them since these areas are not occupied.

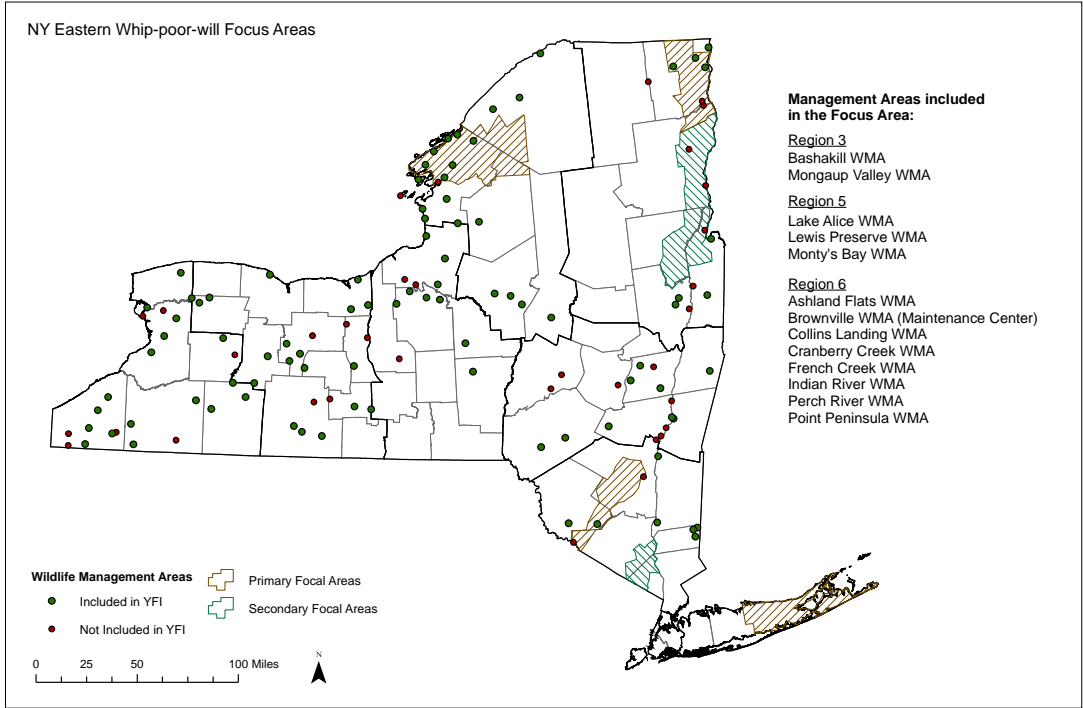


Figure D3. Whip-poor-will focus areas in New York State.

APPENDIX E. TARGET SPECIES SURVEY PERIODS

Table E1. Survey periods for protocols that may be used to determine target species response to young forest habitat management.

Target Species	Jan				Feb				Mar				Apr				May				June				July				Aug				Sept				Oct				Nov				Dec			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
AMWO																																																
GWWA																																																
NEC																																																
EWPW																																																
RUGR																																																
SSH																																																
WITU																																																
WTD																																																
	Game cameras (opportunistic)																																															
	Regenerate protocol (browse survey)																																															

* Survey period is after snow-melt but before spring green-up when pellet-groups are most viable, may vary by region.