Habitat Management Plan for Harwood Lake Multiple Use Area 2018 – 2027

Division of Fish and Wildlife
Bureau of Wildlife

NYS Department of Environmental Conservation
Region 9 Headquarters
270 Michigan Avenue
Buffalo, New York 14203-2999
(716) 851-7010

12/15/2017

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Prepared by:

Greg G. Ecker, Wildlife Biologist
Justin R. Kindt, Forester 1
Nicholas C. Brown, Forestry Technician II
Young Forest Initiative

Emilio E. Rende, Certified Wildlife Biologist
Land Management & Habitat Conservation Team

Reviewed and approved by:

Kenneth S. Baginski, Regional Wildlife Manager Bureau of Wildlife	January 3, 2018 Date
James F. Farquhar III, Chief Bureau of Wildlife	January 10, 2018 Date
Tony Wilkinson, Director Division of Fish and Wildlife	1/10/18 Date

Financial support for development of this Habitat Management Plan was provided by the Federal Aid in Wildlife and Sport Fish Restoration Program and non-federal funds administered by the New York State Department of Environmental Conservation including Habitat & Access Stamp funds.

TABLE OF CONTENTS

LIST OF FIGURES

SUMMARY

Harwood Lake Multiple Use Area (MUA) is comprised of approximately 302 acres and is located in the northeastern portion of Cattaraugus County along State Route 98 in the town of Farmersville. The MUA property was acquired under the Park and Recreation Land Acquisition Act between 1963 and 1968. The name of the lake is derived from the principle landowner, Lyle Harwood.

Harwood Lake (33.6 acres) was constructed as a cooperative venture by New York State and the federal government's Soil Conservation Service now known as the Natural Resources Conservation Services (NRCS) in the Department of Agriculture. The lake, part of the Ischua Creek Watershed Protection Plan, was filled in 1965 and stocked with fish in 1966. Harwood lake provides angling opportunities for both the soft water and hard water angler.

The management responsibilities of the area are shared between the Bureau of Fisheries and the Bureau of Wildlife. The Bureau of Fisheries administers the fishing access site, parking area, Harwood Lake and the dam. The Bureau of Wildlife administers the two parking areas south of the fishing access site and all of the upland habitat.

Habitat management goals for Harwood Lake MUA include:

- Manage approximately 4.4% of the MUA (16.1% of the total forested acreage) as young forest habitat to provide high stem density habitat for ruffed grouse, American woodcock, wild turkey and white-tailed deer;
- Manage 27.3% as natural forest;
- Manage 19.2% as grassland to provide habitat for grassland-dependent species;
- Manage 31.8% as early successional shrubland habitat;
- Maintain the integrity and water quality of Harwood Lake and the surrounding wetlands.

I. BACKGROUND AND INTRODUCTION

PURPOSE OF HABITAT MANAGEMENT PLANS

BACKGROUND

Active management of habitats to benefit wildlife populations is a fundamental concept of wildlife biology, and has been an important component of wildlife management in New York for decades. Beginning in 2015, NYS Department of Environmental Conservation (DEC) Division of Fish and Wildlife (DFW) initiated a holistic planning process for wildlife habitat management projects. Habitat Management Plans (HMPs) are being developed for WMAs and other properties administered by DFW Bureau of Wildlife, including select Multiple Use and Unique Areas. The goal of HMPs is to guide habitat management decision-making on those areas to benefit wildlife and facilitate wildlife-dependent recreation. HMPs guide management for a ten-

year time period, after which the plans and progress on implementation will be assessed and HMPs will be modified as needed.

HMPs serve as the overarching guidance for habitat management on WMA/MUAs. These plans incorporate management recommendations from Unit Management Plans (UMPs), existing WMA/MUA habitat management guidelines, NY Natural Heritage Program's WMA/MUA Biodiversity Inventory Reports, Bird Conservation Area guidelines, and other documents available for individual WMA/MUAs.

SCOPE AND INTENT

Primary purposes of this document:

- Provide the overall context of the habitat on the MUA and identify the target species for management;
- Identify habitat goals for MUA-specific target species, contemplating juxtaposition of all habitat types to guide the conservation and management of sensitive or unique species or ecological communities;
- Identify acreage-specific habitat goals for the MUA to guide management actions;
- Provide specific habitat management prescriptions that incorporate accepted best management practices;
- Establish a forest management plan to meet and maintain acreage goals for various forest successional stages;
- Address management limitations such as access challenges (e.g., topography); and
- Provide the foundation for evaluating the effectiveness of habitat management.

Within the next five years, this HMP will be integrated into a comprehensive MUA Management Plan that will include management provisions for facilitating compatible wildlife-dependent recreation, access, and facility development and maintenance.

Definitions are provided in Appendix A.

The effects of climate change and the need to facilitate wildlife adaptation under expected future conditions will be incorporated into the habitat management planning process and will be included in any actions that are recommended in the HMPs. For example, these may include concerns about invasive species, anticipated changes in stream hydrology, and the desirability for maintaining connectedness on and permeability of the landscape for species range adjustments.

This plan and the habitat management it recommends will be in compliance with the State Environmental Quality Review Act (SEQRA), 6NYCRR Part 617. See Appendix B. The recommended habitat management also requires review and authorization under the Endangered Species Act (ESA), National Environmental Policy Act (NEPA), and State Historic Preservation Act (SHPA), prior to implementation.

MUA OVERVIEW

LOCATION

Harwood Lake Multiple Use Area is located in DEC Region 9, Town of Farmersville, Cattaraugus County (Figure 1).

TOTAL AREA

302.6 acres

HABITAT INVENTORY

A habitat inventory of the MUA was conducted in 2016 and is proposed to be updated every ten to fifteen years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the MUA, and conditions in the surrounding landscape (see Landscape Context section below).

Table 1. Summary of current and desired habitat acreage on Harwood Lake MUA.

Habitat Type	Current Conditions (as of 2017)			Desired Conditions	
	Acres	Percent of MUA	Miles	Acres	Percent of MUA
Forest [a]	103.5	34.2%		82.5	Decrease to 27.3%[b]
Young forest	0	0%		13.3	Increase to 4.4%
Shrubland	88.6	29.3%		96.3	Increase to 31.8%
Grassland	58.2	19.2%		58.2	No change
Agricultural land	0	0%		0	No change
Wetland (natural) [c]	0	0%		0	No change
Wetland (impounded) [c]	12.5	4.1%		12.5	No change
Open water	35.0	11.6%		35.0	No change
Other (parking lot)	1.8	0.6%		1.8	No change
Roads	3.0	1.0%		3.0	No change
Rivers and streams	0	0	0	0	No change
Total Acres:	302.6	100%		302.6	

[a] Forest acreage includes all mature and intermediate age classes of natural forest, plantations, and forested wetlands. Young forest is reported separately. Definitions are provided in the Forest section of this plan.
[b] The forest management proposed in this plan aims to replace poor quality forest, promote regeneration of native species, and establish a healthy mature forest for the future. See Landscape Context and Forest sections.
[c] Wetland acreage does not include forested wetlands, since they are included in the Forest category.

ECOLOGICAL RESOURCES

Wildlife Overview: Wildlife present on Harwood Lake MUA include species commonly found on the West Appalachian Plateau region of southwestern New York such as:

- White-tailed deer, wild turkey, black bear, Eastern coyote

- Beaver, muskrat, raccoon, striped skunk, fisher
- Ruffed grouse, American woodcock, American crow, red-tailed hawk, pileated woodpecker
- Wood duck, mallard, Canada goose
- Eastern American toad, wood frog, spring peeper
- Eastern garter snake, northern water snake, snapping turtle, painted turtle

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or Special Concern (SC) species and/or SGCN may occur on the WMA (Table 2).[1] SGCN listed below include species that have been documented on or within the vicinity of the MUA that are likely to occur in suitable habitat on the MUA. Other SGCN may also be present on the MUA. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[2] NY Reptile and Amphibian Atlas,[3] DEC wildlife surveys and monitoring, and eBird.[4]

Table 2. Species of conservation concern that may be present on Harwood Lake MUA, including state and federal Endangered (E) and Threatened (T) species, state Species of Special Concern (SC), High Priority SGCN (HP), and SGCN (x).

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American kestrel			x
	American woodcock			x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Eastern meadowlark			HP
	Red-shouldered hawk		SC	x
	Ruffed grouse			x
	Scarlet tanager			x
	Sharp-shinned hawk		SC	
	Wood thrush			x
Mammals	None known			
Amphibians and reptiles	Smooth greensnake			x
	Snapping turtle			x
Fish	None known			
Invertebrates	None known			

[1] The 2015 New York State Wildlife Action Plan identifies 366 Species of Greatest Conservation Need (SGCN) including 167 High Priority SGCN. Available online at http://www.dec.ny.gov/animals/7179.html.
[2] Available online at http://www.dec.ny.gov/animals/7312.html.
[3] Available online at http://www.dec.ny.gov/animals/7140.html.
[4] Available online at http://ebird.org/content/ebird/about/. © Audubon and Cornell Lab of Ornithology.

Table 2. continued

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Plants	Shrubby St. John's-wort		T	
	Woodland rush		E	

Significant Ecological Communities:

There are 23 ecological communities located on Harwood Lake MUA as identified by the NY Natural Heritage Program, none of which are classified as significant, rare or unique (Figure 2). Additional information about ecological communities is available in the Harwood Lake MUA Biodiversity Inventory Final Report (1998) prepared by the NY Natural Heritage Program and in *Ecological Communities of New York State, Second Edition.*[5]

Soils:

Harwood Lake MUA soils are very deep loamy tills, with a fragipan layer about 10 to 22 inches deep, that are found on concave/flat landscapes of glaciated upland regions.[6] The major soil group of Harwood Lake MUA is a Volusia-Mardin-Lordstown group.

Special Management Zones:

Special Management Zones (SMZs) are areas adjacent to wetlands, perennial and intermittent streams, vernal pool depressions, spring seeps, ponds and lakes, recreational trails, and other land features requiring special consideration. SMZs on Harwood Lake MUA include:

- Several small, freshwater emergent wetlands and a freshwater forested/shrub wetland are shown on the National Wetlands Inventory (NWI; Figure 3). There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.
- One unnamed stream (a watercourse entirely within the MUA) or segments of streams (a stream that meanders in and out of the MUA) flow from the north into Harwood Lake and continues as the outflow from the lake heading southwest. This stream has a C classification with a C standard.[7]

Guidelines for habitat management projects within these areas are outlined in the Division of Lands and Forests *Rules for Establishment of Special Management Zones on State Forests and Wildlife Management Areas.*[8] Some habitat management activities may either be prohibited or restricted in order to protect these features. Any deviations from these guidelines will be addressed in the individual stand prescriptions.

[5] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological Communities of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/97703.html.

[6] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service. Available online.

[7] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.

[8] Available online at http://www.dec.ny.gov/outdoor/104218.html.

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features, the availability of habitats, and other conservation lands adjacent to Harwood Lake MUA (Figures 4 and 5). The landscape within a three-mile radius of the MUA is primarily privately-owned land including:

- Deciduous forest (59%)
- Cultivated crops (13%)
- Pasture/Hay (9%)
- Evergreen forest (7%)
- Mixed forest (5%)
- Shrub/Scrub (3%)
- Developed (2%)
- Grasslands/Herbaceous (1%)
- Wetlands (1% combining open water, emergent and woody wetlands)

Bear Creek State Forest (561 acres) is located 4.4 miles to the southwest of Harwood Lake and Crab Hollow State Forest (1,150 acres) is 5.1 miles to the southeast of Harwood Lake. Bush Hill State Forest is adjacent to Harwood Lake MUA and is comprised of 2,827 acres. The hardwood and softwood stands of these state forests are managed by the Division of Lands and Forest through a series of thinnings, selective cuts, and other management techniques which remove the lower quality trees and give more growing space to the best quality trees. The conifer stands of pine and spruce were planted in old farm fields by the Civilian Conservation Corp (CCC) to prevent soil erosion on abandoned farm land. They are usually managed by a series of partial harvest thinnings, which provide openings for sunlight to encourage natural regeneration of native hardwoods. The removal of the conifer overstory in the final harvest allows the hardwood seedlings to grow to maturity.

Hardwood stands are also thinned via selective cuts providing more growing space for residual trees, improving forest health and creating openings for seed germination and seedling growth. When regeneration is determined to be adequate the remaining overstory trees are then harvested. Removal of the overstory allows ample sunlight to reach the forest floor stimulating seedling growth.

The remaining property surrounding Harwood Lake MUA is in private ownership. The management goals typically used for hardwood and softwood stands on private property differ from the management goals for Harwood Lake

Mature Norway spruce plantation with aspen growing along stand edges.

Photo: Greg Ecker, DEC

MUA. Private landowners generally follow a high grading management or uneven-aged management strategy that is primarily income driven. This achieves an immediate economic gain with the harvest but does not create young forest as described in DEC's *Young Forest Initiative Strategic Plan*.[8] The goal at Harwood Lake is to create young forest habitat on the MUA using even-aged management (e.g., clearcuts) as the primary management technique to benefit the target species of the MUA. Due to the absence of young forest habitat in the surrounding landscape, a minimum of 10% of the forested acreage on the MUA will be maintained in a young forest stage.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Harwood Lake MUA to provide the following benefits:

- Maintain habitat characteristics that will benefit wildlife abundance and diversity within the New York landscape.
- Promote Best Management Practices for targeted wildlife and habitats.
- Provide opportunities for wildlife-dependent recreation such as trapping, hunting, and bird watching compatible with the ongoing habitat management practices and species management considerations.
- Improve habitat quality by reducing invasive species, if present and identified for treatment.

FOREST

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest.
Plantation: planted forested acres, generally planted in rows dominated by one or two species.
Forested wetland: wetland acres where forest or shrub vegetation accounts for greater than 50% of hydrophytic vegetative cover and the soil or substrate is periodically saturated or covered with water.
Young forest: young or regenerating forested acres, which are typically aged 0-10 years since a disturbance or regeneration cut, depending upon the site conditions. May include both natural forest and plantations.
Young forest (forested wetland): young, regenerating forested wetland acres.

Forest management on Harwood Lake MUA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015,

DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMA/MUAs to benefit wildlife that require this transitional, disturbance-dependent habitat.[9]

MANAGEMENT OBJECTIVES

- Increase young forest acreage from existing 0 acres to at least 13.3 acres to improve habitat for ruffed grouse, American woodcock, wild turkey, and white-tailed deer.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 103.5 forested acres on Harwood Lake MUA (Figure 6). The main forest type on the MUA is natural forest, mostly characterized by northern hardwood species. Most of the forested stands are in a pole timber size class. Softwood plantations are the second most common forest type on the property. The quality of each plantation varies across the MUA. For example, Stands 1 and 2 were old fields that were sporadically planted with softwood bucket mixes and contain groups of spruce and pine amongst patches of forbs, while Stand 8 is a traditional Norway spruce plantation.

Due to it relatively small size, Harwood Lake MUA consists of only one compartment. Forest conversion management includes approximately 7.7 acres of forest (plantation) being converted to shrubland, further detailed below in the shrubland management section. Table 3 provides a summary of the current and desired forest types for Harwood Lake MUA.

Table 3. Summary of the acreage and dominant overstory species for each forest type present on Harwood Lake MUA.

Forest Type	Acres (as of 2017)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	60.5	60.5	White ash, sugar maple, red maple
Plantation	43.0	22.0	Scotch pine, red pine, Norway spruce
Forested wetland	0	0	
Young forest	0	13.3	
Young forest (forested wetland)	0	0	
Total Forested Acres:	103.5	95.8	

Target species for young forest habitat management include ruffed grouse, American woodcock, wild turkey and white-tailed deer.

- **Ruffed Grouse Habitat Requirements:**
  - Drumming areas – Downed trees surrounded by small diameter woody cover.
  - Foraging – Open areas with dense overhead cover of young forest with good mast production.
  - Nesting – Young open forest stands or second growth woodlands.
  - Brood rearing – Herbaceous ground cover with a high midstory stem density.[10]

[9] Additional information about DEC's Young Forest Initiative and the YFI Strategic Plan is available online at http://www.dec.ny.gov/outdoor/104218.html.

[10] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.

- **American Woodcock Habitat Requirements:**
  - Singing/peenting ground – Open areas from 1 acre to over 100 acres usually in an abandoned field.
  - Daytime areas – Moist, rich soils with dense overhead cover of young alders, aspen, or birch.
  - Nesting – Young open, second growth woodlands.
  - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
  - Roosting – Open fields (minimum of 5 acres) and reverting farm fields.[11]
- **Wild Turkey Habitat Requirements (in Northern Hardwood Forests):**
  - Strutting areas – Open fields with short vegetation, <12 inches preferred, and mature hardwoods.
  - Nesting cover – Blowdowns and the bases of trees and stumps in open hardwoods and brushy cover in early successional habitats and field edges.
  - Brood rearing – Best brooding cover are fields with herbaceous vegetation from 12-18 inches preferred.
  - Foraging – The habitat required ranges from open old-field areas to mature forests:
    - Spring diet – Tubers and invertebrates.
    - Summer diet – Poult diets consist primarily of invertebrates. Adult diets consist of invertebrates and tubers, switching over to herbaceous vegetation and soft mast as summer progresses.
    - Fall diet – Hard and soft mast, seeds, and invertebrates.
    - Winter diet – Hard and soft mast, seeds (birch if available) and hardwood buds.
  - Winter cover – Mature conifer stands.
  - Roosting – Mature hardwoods and softwoods. Adults with poults tend to roost on the ground under large trees with a dense understory of young trees, shrubs, downed trees, rock outcrops, or brushy fields.[12, 13]
- **White-tailed Deer Habitat Requirements (in Northern Hardwood Forests):**
  - Fawning areas – Vary from open forest to hay fields to brushy cover.
  - Spring/summer diet – Primarily herbaceous vegetation (clover, *Rubus* sp., forbs, etc.), hardwood foliage, soft mast, and agricultural crops where available.
  - Fall diet – Hard mast, preferably acorns, hardwood foliage, and agricultural crops where available.
  - Winter diet – Hardwood buds, fallen leaves, hard mast and conifers, preferably white cedar.
  - Bedding cover – Varies from open hardwoods with laydowns to dense thickets of early succession shrublands or hard and softwood regeneration.[14]

[11] Sepik, G. F. et al. 1981. A Landowner's Guide to Woodcock Management in the Northeast, Moosehorn National Wildlife Refuge, USFWS. 25 pp.
[12] USDA – NRCS. 1999. Wild Turkey (*Meleagris gallopavo*) Fish and Wildlife Habitat Management Leaflet. 12 pp.
[13] Dickson, J. G. 1992. The Wild Turkey: Biology and Management. National Wild Turkey Federation and USDA Forest Service. Stackpole Books, PA. 480 pp.
[14] Halls, L. K., ed. 1984. White-tailed Deer: Ecology and Management. The Wildlife Management Institute. Stackpole Books, PA. 864 pp.

MANAGEMENT HISTORY

Very limited forest management has occurred on Harwood Lake MUA and no young forest habitat has been established. Plantation and other softwood plantings occurred in the 1960s. Some plantations have had rows removed over time; exact dates could not be confirmed.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management will result in 13.3 acres of young forest habitat or approximately 14% young forest cover of the total forested acres, as well as converting 7.7 acres of plantation to shrubland (see Shrubland sections), within ten years:

- **Management planned for 2018-2022** (Table 4, Figure 6):
  - Clearcut aspen patches as well as thin/hinge cut select softwood species in Stand 2 (3.5 acres).
  - Clearcut Norway spruce plantation (9.8 acres).
- **Management planned for 2023-2027** (Table 5, Figure 6):
  - Convert a portion of low quality plantation to shrubland, establishing Stand 1.1 (7.7 acres).

Table 4. Forest management schedule for the first five-year period of this HMP (2018-2022).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
2	3.5	Pole Timber	Plantation	Young Forest	Wildlife	Aspen regen/Softwood hinge cuts
8.2	9.8	Pole/Small Sawtimber	Plantation	Young Forest	Wildlife	Clearcut

Table 5. Forest management schedule for the second five-year period of this HMP (2023-2027).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
1	7.7	Variable	Plantation	Shrubland	Wildlife	Softwood hinge cuts

Stand locations and planned management actions are also summarized in Figure 6. Specific forest stand descriptions and detailed management prescriptions will be prepared for each proposed forest management area prior to implementation (see template, Appendix C). Briefly, habitat management for each of these stands will include the following:

Management for 2018-2022 (13.3 acres):

Plantation (13.3 acres)

Stand 2: This stand contains both hardwood and softwood species. The aspen will be clearcut and select softwood trees will be hinge cut or felled. The aspen will root sprout and likely expand its clone size. This should provide both cover habitat and foraging opportunities for target species.

Stand 8.2: Clearcutting this mature Norway spruce plantation will improve wildlife habitat on the MUA. Portions of the plantation appear to have been thinned from past management, while other sections have not. There is no regeneration present in the understory of the stand, however, it is adjacent to a recent harvest on state forest land where numerous pioneer species are established and should provide ample seed source for regeneration.

Management for 2023-2027 (7.7 acres):

Plantation (7.7 acres)

Stand 1: This stand is an old field that has been partially planted with a bucket mix of softwood species. Select softwood trees will be felled or hinge cut to convert the stand to shrubland habitat.

BEST MANAGEMENT PRACTICES

Forest management on all WMA/MUAs follows Best Management Practices to protect soil and water resources, promote quality wildlife habitat, and establish healthy forests (Table 6).

Table 6. Best Management Practices for forest management on WMA/MUAs.

Resource	Guidance Document [15]
Soils	*Rutting Guidelines for Timber Harvesting on Wildlife Management Areas*
Water quality	*NYS Forestry Best Management Practices for Water Quality*
Wildlife	*Retention Guidance on Wildlife Management Areas*
Plantations	*Plantation Management Guidance on Wildlife Management Areas*

Wildlife Considerations:

General wildlife surveys of the project locations will be conducted prior to any forest management. Management activities will be limited to ensure impacts to sensitive species will be avoided or kept to a minimum. Projects will take into account seasonal weather conditions, along with the breeding and nesting period of wildlife species found on the MUA.

A Northern long-eared bat survey has not yet been conducted following the U.S. Fish and Wildlife Service (USFWS) approved survey protocol. Forest management will not occur outside of Northern long-eared bat hibernation season unless a survey has been conducted and the results indicate probable absence.

Forest Health Considerations:

Undesirable species may outcompete desirable regeneration. A loss of function and diversity can occur when forest health declines from pests or other injurious agents. This could lead to fewer wildlife species being able to inhabit the area successfully, further contributing to the decline of health and diversity.

Forest management using sound silviculture helps encourage tree, stand, and forest resistance. A more resistant forest can lessen its susceptibility to the negative effects of injurious agents and

[15] All guidance documents referenced here are available online at http://www.dec.ny.gov/outdoor/104218.html.

limit the spreading of harmful pests potentially present on the MUA. This can lead to improved wildlife habitat for the target species and a healthier ecosystem.

Pre- and/or post-treatments are likely needed to ensure the successful regeneration of desirable species. Observed interfering and invasive vegetation includes honeysuckle, multiflora rose, weeds, and grasses.

White-tailed deer herbivory varies across Harwood Lake MUA. In areas where deer browse could pose a threat to desirable regeneration, deer enclosures (natural or artificial) may be constructed to protect regeneration.

Common forest pests, such as emerald ash borer (EAB), hemlock woolly adelgid (HWA), Asian longhorned beetle (ALB), and gypsy moth, have not been observed on the MUA. Harwood Lake MUA is located within an emerald ash borer quarantine zone, therefore additional regulations are currently applicable to all ash wood products.

Pre- and Post-Treatment Considerations:

Pre- and post-treatments occur at the stand level and aim to promote the regeneration of desired species. Primarily the establishment of desired regeneration is achieved by reducing competing vegetation, exposing mineral soil, and improving the seedbed.[16] Treatment actions are typically carried out through mechanical and/or chemical means. However, certain ecological situations may be best treated through prescribed burning. Anticipated mechanical treatments include brush/chainsaw cutting invasive/undesired species from the understory. Traditionally, chemical treatments involve herbicide application to reduce vegetative competition.

Pre- and post-treatment actions will be addressed in detail in the silvicultural prescriptions.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines in the *Young Forest Initiative Monitoring Plan*. The plan establishes statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three, and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Harwood Lake MUA, which may be assessed to determine response to management, include:

- American woodcock
- Ruffed grouse
- Wild turkey
- White-tailed deer

There will be two types of vegetative response surveys conducted following young forest management: ocular regeneration assessment and photo point records.

[16] Nyland, R.D. 2007. Silviculture: Concepts and Applications 2nd ed. Waveland Press.

SHRUBLAND

Shrublands are early successional habitats dominated by woody plants typically less than ten feet tall with scattered open patches of grasses and forbs that provide floristic diversity. Typically characterized by >50% cover of shrubs and <25% canopy cover of trees.

MANAGEMENT OBJECTIVES

- Manage approximately 96.3 acres of shrubland habitat (31.8% of the MUA), providing habitat for a variety of shrubland dependent species.
- Convert 7.7 acres of poor quality, mixed species plantation into shrubland.
- Maintain the shrubland via brush hogging every 3-5 years or as necessary.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently 88.6 acres of shrubland habitat exist on Harwood Lake MUA composed of viburnum (Northern arrowwood), alternate-leafed dogwood, gray-stemmed dogwood, red osier dogwood, alder, hawthorn, crab apple, tatarian honeysuckle, autumn olive, and shrubby St. John's- wort. These densely stemmed habitats provide foraging and escape cover for both young of year and adults of numerous wildlife species including the YFI target species:

- American woodcock
- Ruffed grouse
- Wild turkey
- White-tailed deer

Shrubland habitat on Harwood Lake MUA.
Photo: Greg Ecker, DEC

Other species benefitting from shrubland habitat include: black-billed cuckoo, cedar waxwing, yellow warbler, and cottontail rabbits.

MANAGEMENT HISTORY

The shrubland stands on Harwood Lake MUA have resulted from the abandonment of cropfields, hayfields and pasture. The soils have reduced fertility and even though classified as well drained to somewhat poorly drained, the soils contain pockets (mostly spring seeps) that lead to challenging growing conditions for many plant species. A project in stand 950 was initiated to create some linear herbaceous openings within the shrubland. Additionally, conifer strips were planted adjacent to the openings to provide thermal and escape cover.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2022** (Figure 6):
    - **Stand 950:** Brush hog irregular shaped openings adjacent and connected to the existing linear strips and maintain in an herbaceous and grassy stage in the eastern portion of this stand. Additional edge habitat will enhance this shrubland stand. Several aspen clones within the stand will be managed for ruffed grouse habitat, providing foraging areas of dense cover in addition to a winter food source of aspen buds and catkins. When managed, the clones will be cut during the winter season to encourage vigorous regeneration during the spring and summer growing season. Additional clump plantings of native conifer species will be strategically located adjacent to the aspen clones and herbaceous openings to provide escape and winter thermal cover. Scattered trees of preferred browse species will be hinge cut and allowed to grow near ground level providing another form of escape cover and food source for cottontail rabbits and white-tailed deer. Other poor quality tree species such as Scot's pine and elm will be cut down and arranged into brush piles. This management will be accomplished using chainsaws typically during the winter dormant season.
- **Management planned for 2023-2027** (Figure 6):
    - **Stand 1:** Convert a portion (7.7 acres) of this poor quality plantation into shrubland. Selected trees will be felled entirely or hinge cut and allowed to grow. This stand was an old field planted with a variety (bucket mix) of softwood species including Scot's pine, white pine, Norway spruce and white spruce. The trees have not responded favorably due to poor soil fertility and growing conditions. Several rows of Norway spruce adjacent to SR98 will be left to provide a windbreak. Most of the softwoods will be felled, cut up and stacked to form brush piles providing valuable escape cover for cottontail rabbits. Selected softwood and hardwood trees will be hinge cut and allowed to continue growing, forming living brush piles. The hinge cut hardwood trees will also provide browse for cottontail rabbits and white-tailed deer. Plantings of native mast producing species such as highbush cranberry, American hazelnut, witch hazel, and northern bayberry will enhance the variety of shrub species occurring on the MUA. This management will lead to the formation of a new stand numbered 1.1.
    - **Stand 950:** Implement management as described for this stand for 2018-2022 but in the western portion of the stand.

BEST MANAGEMENT PRACTICES

Timing of the management activities will be limited to ensure impacts to the habitat and wildlife are kept to a minimum. Projects will take into account seasonal weather conditions, along with the breeding and nesting period of wildlife species found on the MUA.

MANAGEMENT EVALUATION

These stands will be included in the American woodcock singing ground survey and the ruffed grouse drumming survey routes established on the MUA. Point counts of bird species pre- and post- management may occur to document presence or probable absence of shrubland species and species response to the proposed management. Details of the methodology and data collection can be found in the *Young Forest Initiative Monitoring Plan*.

GRASSLAND AND OTHER OPEN SPACE

Grasslands are open, grassy areas with a minimal amount of shrub and tree cover (<35%) that are maintained, or could be maintained, without significant brush cutting. Grasslands may include areas where hay is harvested by late season mowing once per year.

MANAGEMENT OBJECTIVES

- Maintain 58.2 acres of grasslands and open areas (19.2% of the MUA) to provide nesting and brood rearing habitat for a variety of wildlife species including wild turkey and Eastern meadowlarks. These areas will also provide hunting opportunities during the fall pheasant season from stocked pheasants.
- Strip mow larger fields on a two to three-year rotation to suppress encroachment of woody vegetation.
- Periodically lime and fertilize the grasslands to enhance annual production.
- Reseed grasslands/fields to reestablish desirable species.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

Currently, 58.2 acres of grasslands/fields exist on the MUA with the largest encompassing almost 40 acres (Stand 944). This field has approximately 2 acres of clover along the western edge with the remainder being comprised of goldenrod, asters, and an assortment of grasses and sedges. Stand 945 contains approximately 8.5 acres of switchgrass and two smaller fallow fields of about 1.5 acres each. A warm season grass seed mix was planted in these small fields, however, the planting failed. The remaining grassland acreage is comprised of several 2.5 (Stands 940 and 943) and 1.5 (Stands 941 and 942) acre fields respectively. Hunting opportunities on the MUA are enhanced by the annual fall stocking of adult ring-necked pheasants in and around the grasslands. The fields are prepped each year prior to the stocking which involves perimeter and strip mowing in the fields.

Grassland habitat in Stand 944 (40 acres).
Photo: Greg Ecker, DEC

Species that benefit from grassland best management practices include:

- Northern harrier
- Eastern meadowlark
- Bobolink
- Ring-necked pheasant

MANAGEMENT HISTORY

Nearly half of the property making up the MUA was farmed prior to acquisition in the 1960s. After acquisition by DEC, through permits and agricultural agreements, farming practices continued on various acreages. Due to poor growing conditions on the MUA several areas were primarily used for pasture and later hay production. Corn and small grain production were attempted on the more suitable portions of the MUA. The use of both lime and fertilizer were necessary due to poor soil fertility. Stand 944, which is almost 40 acres, was the last area to be used for agricultural production. Spring seeps are common along the gentle slopes above this stand which led to the need for drain tile installation and construction of a berm to redirect runoff. The cooperative agricultural agreements have recently ended. As mentioned earlier, this 40-acre field is prepped each year prior to pheasant stocking via mowing with a brush hog.

The switchgrass in Stand 945 was planted in the mid-1990s. Annual mowing at the end of May is conducted to suppress competing cool season vegetation. As part of the agricultural agreement, the stand was cut and bailed for hay several times in an effort to remove some of the vegetative material allowing the litter layer to decompose and prevent smothering of the root systems. Prescribed burning of the switchgrass would be more beneficial to managing this valuable cover type. Future habitat planning will involve pursuing this management practice on the MUA.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2022** (Figure 6):
    - **Stands 940-945:** Continue annual perimeter and strip mowing of the stands to suppress woody vegetation encroachment leaving areas of uncut vegetation in the fields for the release of adult pheasants for the fall pheasant season.
    - **Stand 945:** Continue annual spring mowing of switchgrass to suppress competition from cool season vegetation.
    - **Stand 945:** Prep and reseed the two 1.5 acre fields in this stand. A warm season grass seed mix will be planted and maintained. These fields contained undesirable species, requiring an attempt to reestablish desirable grassland species, however, germination of the selected seed mix was a failure. These fields will be pretreated, plowed, disked, and reseeded to warm grass species. The additional grassland acreage will provide brood foraging areas as well as nesting habitat for grassland dependent species.
    - **Stand 944:** Plow, disk and seed approximately 8 to10 acres in the northern portion of this fallow field to a warm season grass mix adjacent to the 2 acres of clover. This former agricultural field has remained fallow since the expiration of the cooperative agricultural agreement. Goldenrod appears to have the advantage over more desirable grassland species that benefit wildlife. A soil test will be conducted and analyzed before any management takes place. Approximately 8 to 10 acres of this stand will be pretreated, plowed, disked, and reseeded. Results

from the soil test will need to be taken into consideration when selecting the proper seed mix. This will provide additional brood foraging areas for wild turkey and grazing areas for white-tailed deer, both valuable habitat components.

- **Management planned for 2023-2027** (Figure 6):
  - **Stands 940-945:** Continue annual perimeter and strip mowing of the stands to provide areas of uncut vegetation in the fields for the release of adult pheasants for the fall pheasant season. Mowing will also prevent the encroachment of woody vegetation.
  - **Stand 945:** Continue annual spring mowing of switchgrass to suppress competition from cool season vegetation.
  - **Stand 944:** Pretreat, plow, disk, and seed approximately 8 to10 acres in the southern portion of this fallow field to a warm season grass mix adjacent to the acreage managed in 2018-2022. Results from conducting a soil test will need to be taken into consideration when selecting the proper seed mix. Evaluation of the success of the previous planting in this stand will need to be looked at prior to this management occurring. Alternative seed mixes may need to be considered. This will provide additional brood foraging areas for wild turkey and grazing areas for white-tailed deer, both valuable habitat components.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs and selected MUAs in NY. For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[17] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding grassland management and restoration techniques.

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity, and consider the needs of both breeding and wintering grassland bird species.
- Consider the surrounding landscape when making management decisions.
- Conduct baseline grassland bird surveys on newly acquired fields or fields targeted for management changes to determine species present.
- Increase field size by hedgerow removal, removing trees, etc. to benefit species that require large fields.
- Conduct invasive species control (glossy buckthorn, pale and black swallowwort, Canada thistle, Phragmites, etc.) to improve habitat quality.
- Consider a variety of factors, such as the targeted grassland bird species, pollinators, seed mix (warm versus cool season grasses, forbs, wildflower mixes, grass height and density), timing of planting, existing conditions, and vegetation removal techniques (including herbicide and intensive disking) in developing grassland planting or restoration projects.
- Utilize mowing, haying, burning, and grazing for maintaining grassland habitat, after evaluating the appropriateness of these methods relative to site conditions and

[17] Morgan, M. and M. Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under Contract #C005137. Audubon New York, Ithaca, NY.

management objectives. In particular, burning cool season grasses is not advisable in most situations in New York.

Timing of Management

- Fields over 25 acres (including all contiguous fields) or fields with a history of listed (federally listed and/or state E/T or SC) grassland bird species within the last 10 years, including fields of any size AND contiguous fields. Can also include nearby fields if deemed necessary:
    - Mowing or other management should be avoided between April 23 and August 15 unless at least one of the following criteria are met and the fields are assessed or surveyed to confirm there is no active nesting by E/T/SC grassland birds:
        - Management is to be done for long term benefits to the habitat/wildlife (such as invasive species management).
        - The fields are assessed or surveyed and there is no active nesting by E/T/SC grassland birds.
        - Nesting locations can be avoided, such as using spot treatment for invasive species, reducing any negative impact to the species of concern.
- Fields under 25 acres (including all contiguous fields) with no history of listed species:
    - Field can be managed/mowed within the period April 23 and August 15 if necessary to accomplish other goals and priorities that benefit other species that use the habitat. If early management is proposed, then the habitat requirements and nesting periods of other species should be considered (e.g., nesting waterfowl, American bittern, reptiles and amphibians).

Additional Mowing Guidelines

- Frequency of mowing, size of area mowed, and mowing techniques should be based on species present and current and desired habitat conditions.
- Block or spot mowing is preferred and strip mowing should be limited (especially in fields over 25 acres).
- Unmowed blocks should be in the shape of a square as opposed to long rectangles.
- When mowing, consider mowing from one side of the field to the other side or start in the center and mow outwards to avoid concentrating animals in the area yet to be mowed.
- In general, mow grass to a residual height of 6-12 inches.

MANAGEMENT EVALUATION

These stands will be included in the American woodcock singing ground survey and the ruffed grouse drumming survey routes established on the MUA. Point counts of bird species pre- and post-management may occur to document presence or absence of young forest and grassland species and species response to the proposed management.

AGRICULTURAL LAND

Agricultural lands on WMAs and selected MUAs include any acreage on which crops are grown, primarily areas that are under cooperative agreements or farming contracts, but also including wildlife food plots.

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

Harwood Lake MUA does not contain any stands that are managed as agricultural land. Future management plans do not include adding agricultural fields to the existing habitat.

MANAGEMENT HISTORY

Nearly half of the MUA was farmed prior to acquisition in the 1960s. After acquisition, farming practices were continued in various stands through permits and agricultural agreements. Several areas were primarily used for pasture and later hay production. Corn and small grain production were attempted on the more suitable portions of the MUA. The last of these agricultural agreements expired in 2015.

WETLANDS (NATURAL AND IMPOUNDED)

Natural wetlands are areas where the soil or substrate is periodically saturated or covered with water, including emergent (perennial herbaceous vegetation accounts for >50% of hydrophytic vegetative cover) and scrub-shrub wetlands (woody vegetation under 20 feet tall accounts for >50% of hydrophytic vegetative cover). Impounded wetlands are areas similar to natural wetlands, but where water is held back by a berm, road, or other structure. Forested wetlands are addressed in the Forest section above.

MANAGEMENT OBJECTIVES

- Maintain natural hydrology and water quality on the MUA.
- Maintain approximately 12 acres of natural wetlands, as it currently exists.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of dikes and town roads.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are approximately 12 acres of natural wetlands that have been created by beaver activity in the drainage that feeds Harwood Lake. The habitat is a combination of small, shallow water open areas, emergent aquatic vegetation and scrub shrub species.

The wetlands provide habitat for species such as:

- American woodcock
- Beaver, muskrat
- Migratory waterfowl
- Wood frog, spring peepers
- Snapping turtles, painted turtles and northern water snakes

MANAGEMENT HISTORY

Beaver activity in the drainage feeding Harwood Lake has flooded Bush Hill road in years with above normal precipitation and during storm events. DEC has issued the Farmersville Highway Department nuisance beaver permits to control beaver numbers and water levels. Occasionally beaver activity in the downstream portion of the Harwood Lake outlet has flooded the administrative road leading to the grassland fields from Route 98. Nuisance beaver permits have been issued to the Bureau of Wildlife for beaver and beaver dam removal.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2027** (Figure 6):
    - Continue routine inspection of beaver and muskrat activity.
    - Control beaver numbers on the MUA through trapping during the regular trapping season.
    - Issue nuisance beaver permits as warranted.

BEST MANAGEMENT PRACTICES

Timing of the management activities will be limited to ensure impacts to the habitat and wildlife are kept to a minimum. Projects will take into account seasonal weather conditions, along with the breeding and nesting period of wildlife species found on the MUA. Date restrictions for water level management or equipment in wetlands will be followed to protect hibernating amphibians and reptiles (October 1st – March 31st). Exceptions to the dates will be made when flooding and public safety are in jeopardy.

MANAGEMENT EVALUATION

None.

OPEN WATER (WATERBODIES AND WATERCOURSES)

Open water is defined as any area of open water, generally with less than 25% cover of vegetation or soil and typically named (e.g., Perch Lake, South Colwell Pond).

MANAGEMENT OBJECTIVES

- Maintain dikes, water control structures, and emergency spillways on the impoundments occurring on the MUA.
- Maintain the water quality of Harwood Lake.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of the dikes and water control structures.
- Protect water quality on all streams and segments of streams as management activities are conducted.

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

Harwood Lake was constructed in the mid-1960s as a joint venture by the state and the federal government's Soil Conservation Service as part of the Ischua Creek Small Water Protection Plan.

Several small ponds have been constructed on the WMA. The ponds are dug ponds with no water control structures. These areas provide aquatic habitat utilized by a variety of migratory waterfowl, reptile, and amphibian species.

Fishing access site for Harwood Lake
Photo: Greg Ecker, DEC

MANAGEMENT HISTORY

As mentioned earlier, Harwood Lake was constructed in the 1960s and was named after the principle landowner Lyle Harwood. The dug ponds already existed when DEC acquired the property and have not received any management.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2027** (Figure 6):
    - Routine monitoring by DEC staff for beaver and muskrat activity.

BEST MANAGEMENT PRACTICES

Timing of the management activities will be limited to ensure impacts to the habitat and wildlife are kept to a minimum. Projects will take into account seasonal weather conditions, along with the breeding and nesting period of wildlife species found on the MUA.

MANAGEMENT EVALUATION

None.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Harwood Lake MUA over the next ten years. Any substantive changes will be appended to this HMP annually or as needed (Appendix D).

Table 7. Summary of habitat management actions recommended for Harwood Lake MUA, 2018-2027. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Clear aspen and hinge cut spruce in Stand 2 to create young forest.	3.5	2018-2022
Forest	Clearcut Norway spruce plantation to create young forest in Stand 8.2.	9.8	2018-2022
Grassland	Replant the two small fields with warm season seed mix.	3.5	2018-2022
Grassland	Plant warm season grass strip in fallow field Stand 944 North.	16	2018-2022
Shrubland	Brush hog irregular shaped openings followed by conifer clump planting, select tree removal, and aspen management in Stand 950 East.	22	2018-2022
Grassland	Plant warm season grass strip in fallow field Stand 944 South.	16	2023-2027
Shrubland	Brush hog irregular shaped openings followed by conifer clump planting, select tree removal, and aspen management in Stand 950 West.	22	2023-2027
Shrubland	Convert low quality plantation to shrubland in Stand 1.1 from conifer hinge cuts.	7.7	2023-2027

III. FIGURES

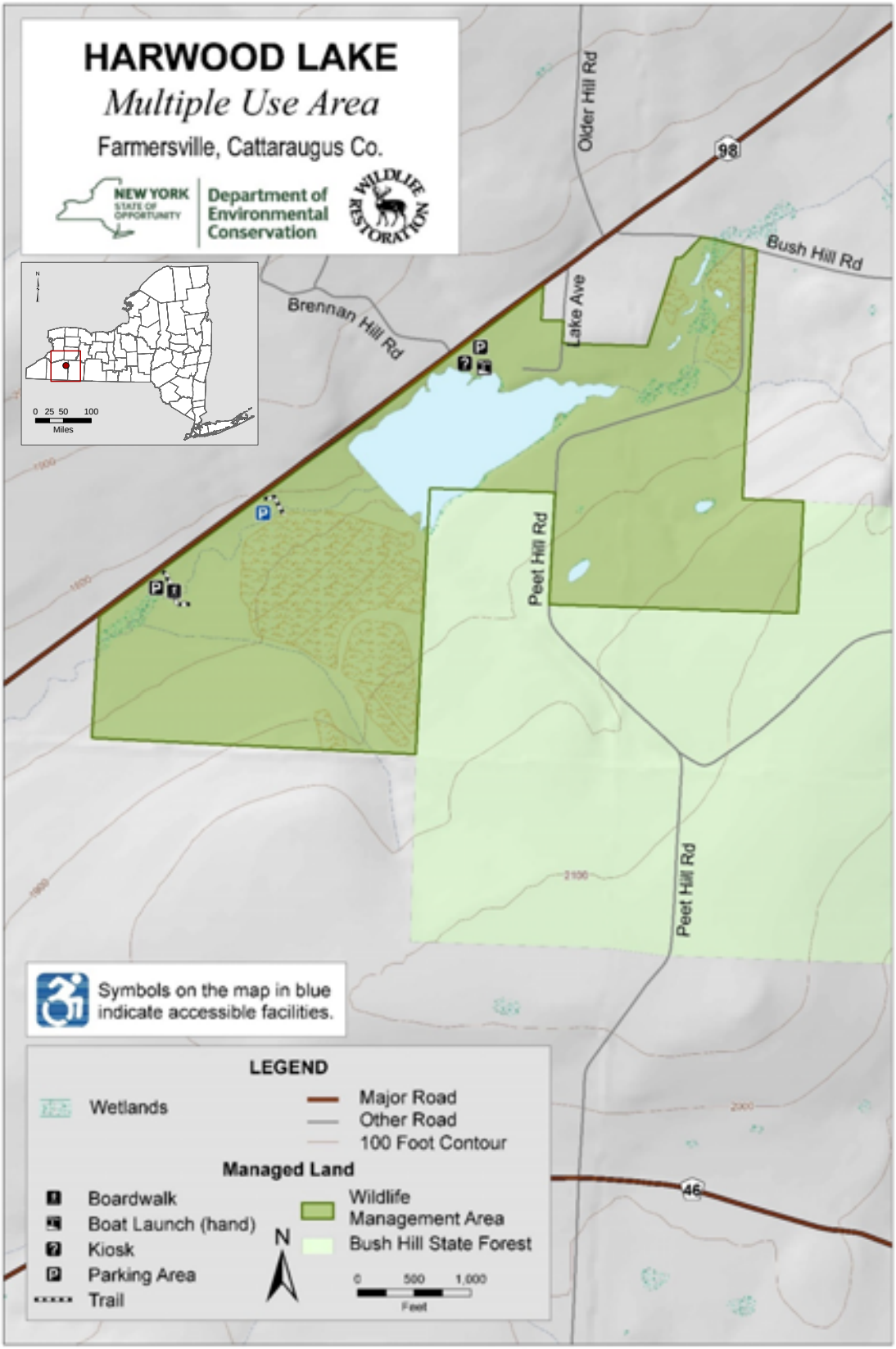

FIGURE 1. Location and access features at Harwood Lake MUA.

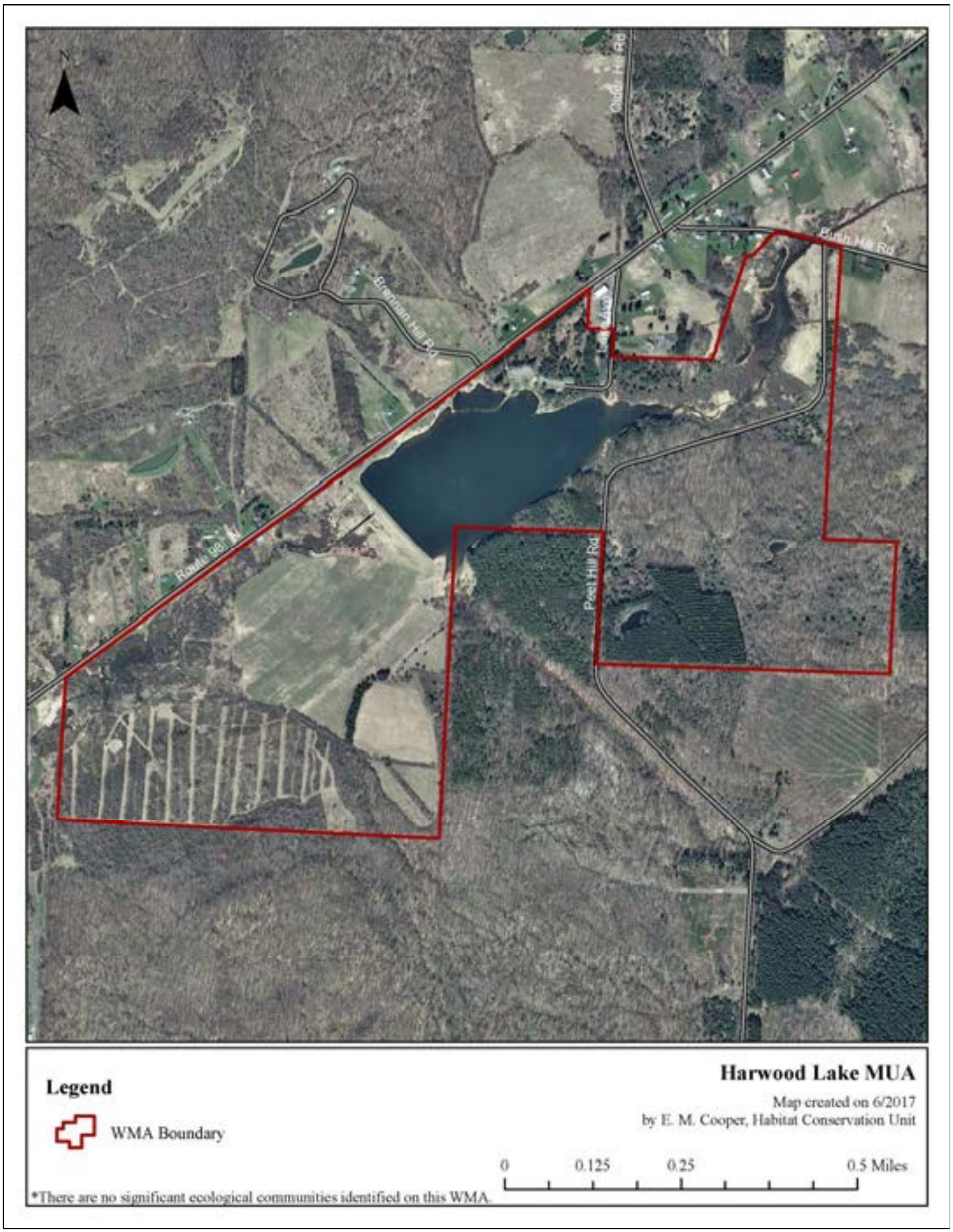

FIGURE 2. Significant ecological communities on Harwood Lake MUA. Data from the NY Natural Heritage Program.

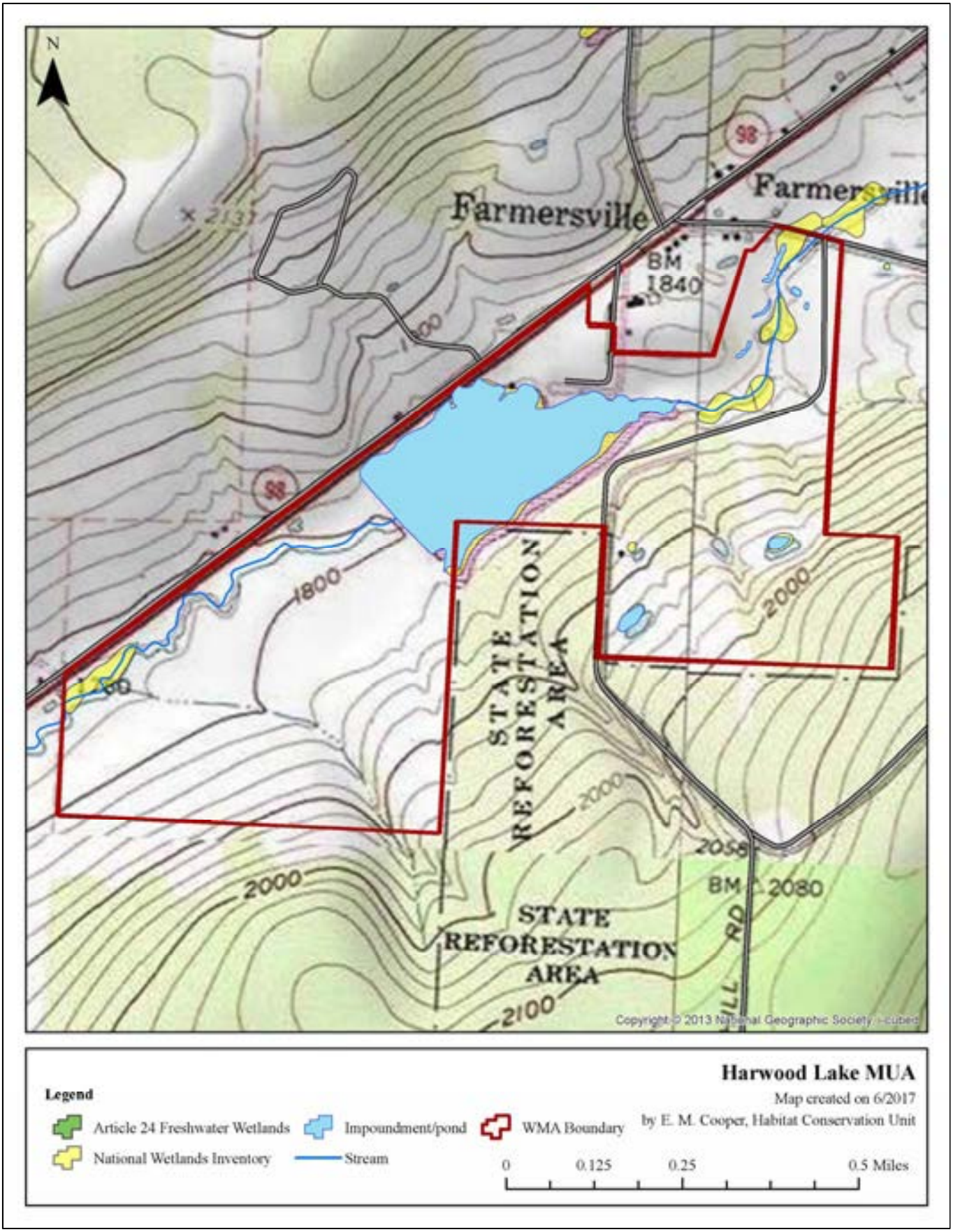

FIGURE 3. Wetlands, open water, and streams of Harwood Lake MUA Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

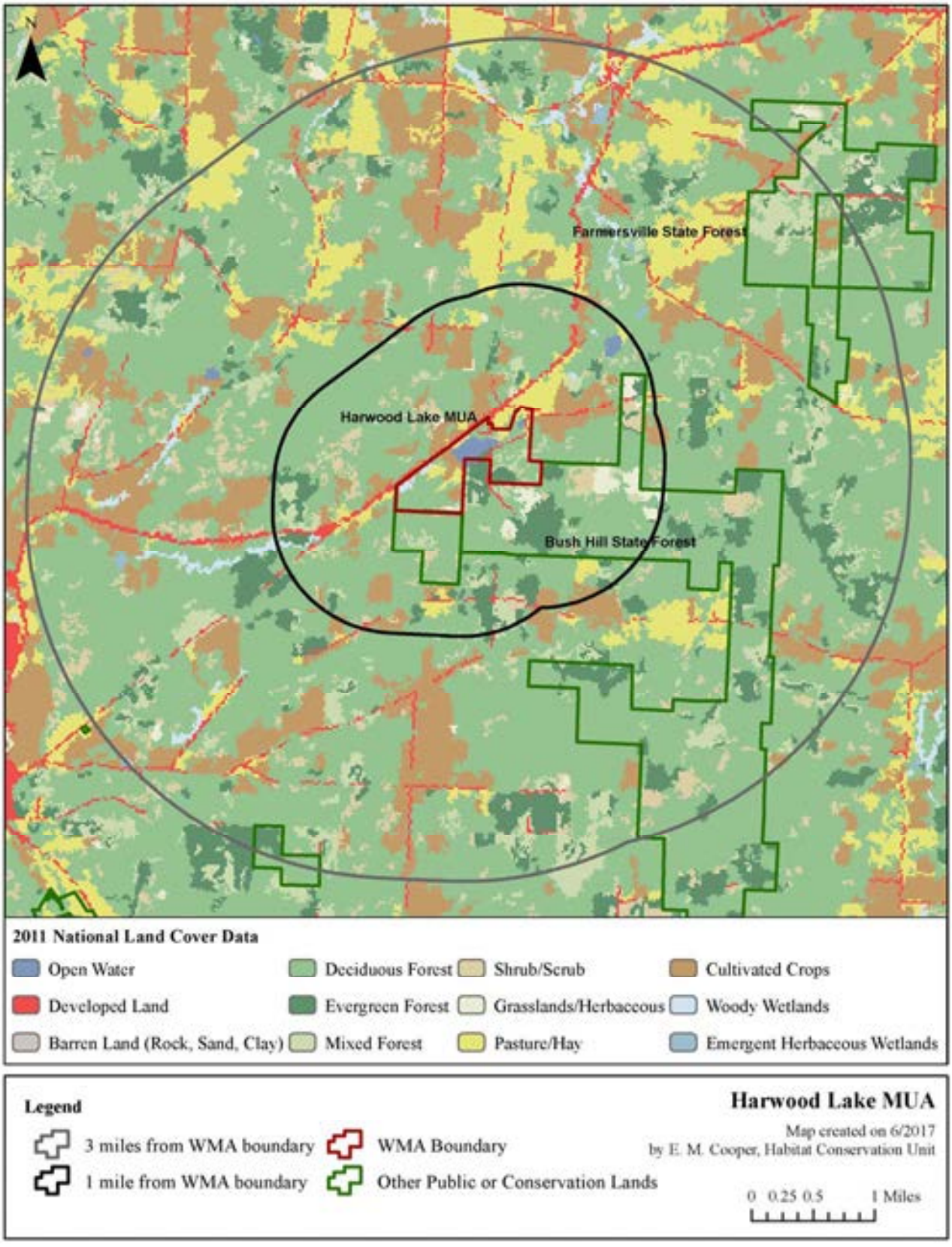

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Harwood Lake MUA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

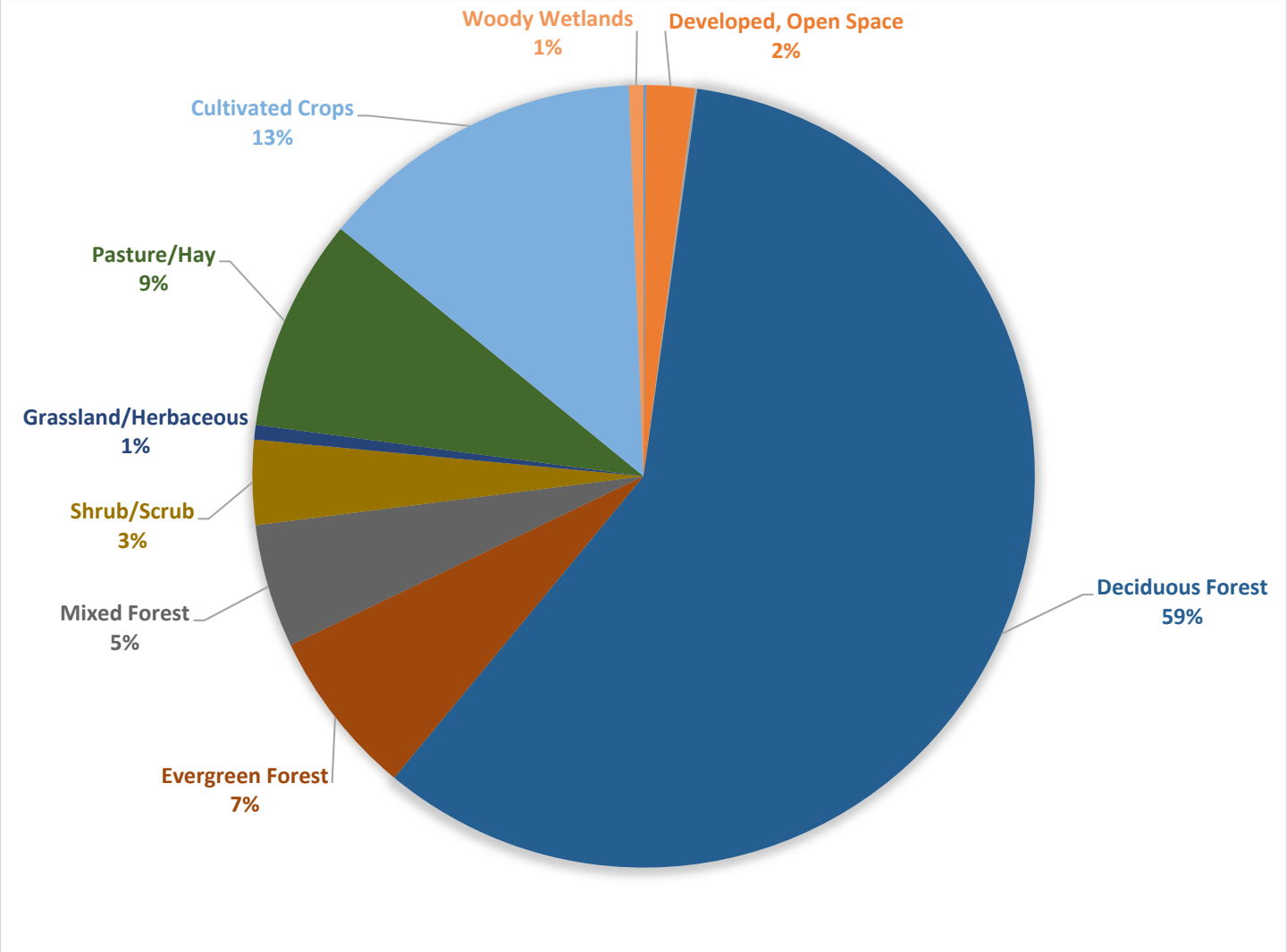

FIGURE 5. Percent cover of land cover types within three miles of Harwood Lake MUA.

Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

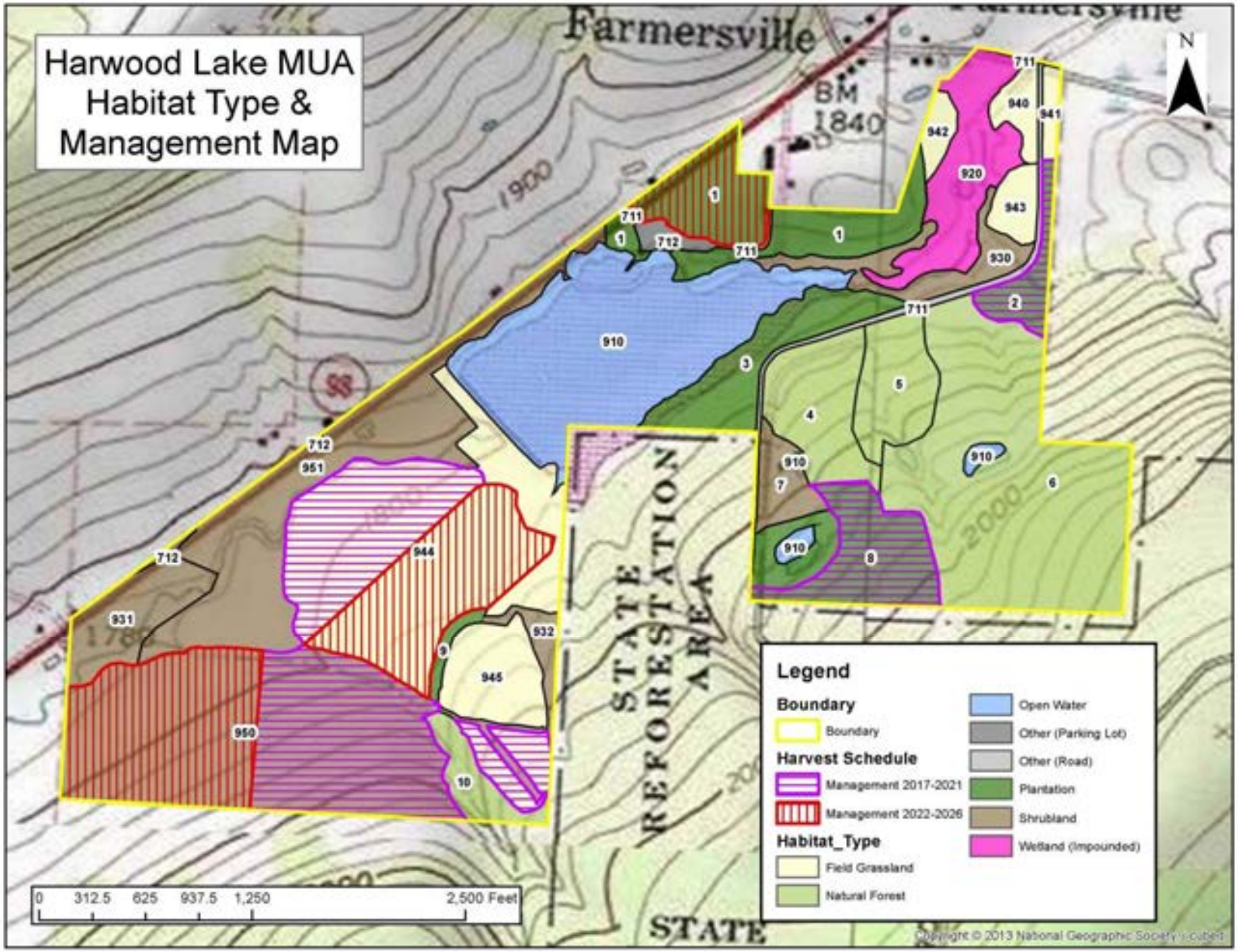

FIGURE 6. Habitat types and locations of proposed management on Harwood Lake MUA. Numbers indicate the stand number from habitat inventory.

IV. APPENDICES

APPENDIX A: DEFINITIONS

The following key words were used in the development of this Habitat Management Plan. Definitions are from The Dictionary of Forestry, Society of American Foresters, J. A. Helms, Editor, unless otherwise noted.

Best Management Practices: (BMP) A practice or combination of practices that are determined to be the most effective and practicable means of avoiding negative impacts of habitat management.

Biodiversity: The variety and abundance of life forms, processes, functions, and structures of plants, animals, and other living organisms, including the relative complexity of species, communities, gene pools, and ecosystems at multiple spatial scales.

Clearcut: A forest regeneration or harvest method that entails the cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration.

Community: An assemblage of plants and animals interacting with one another, occupying a habitat, and often modifying the habitat; a variable assemblage of plant and animal populations sharing a common environment and occurring repeatedly in the landscape. (NY Natural Heritage Program)

Endangered Species: Any species listed on the current state or federal endangered species list as being in danger of extinction throughout all or a significant portion of its range.

Forb: Any broad-leafed, herbaceous plant other than those in the Poaceae (Gramineae), Cyperaceae, and Juncaceae families (i.e., not grass-like).

Forest: An ecosystem characterized by a dense and extensive tree cover, often consisting of stands varying in characteristics such as species composition, structure, age class, and associated processes, and commonly including meadows, streams, fish, and wildlife.

Forest Health: The condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance.

Grassland Focus Area: Regions of NY that support key, residual populations of grassland birds. There are currently eight focus areas, within which there is a concentrated conservation effort for these species. (A Plan for Conserving Grassland Birds in New York, Audubon NY.)

Habitat: A place that provides seasonal or year round food, water, shelter, or other environmental conditions for an organism, community, or population of plants or animals.

Hardwood: A broad leaved, flowering tree belonging to the botanical group Angiospermae, such as red maple, yellow birch, American beech, black cherry, etc.

Impoundment: A pond caused by a dam across a stream and used for purposes such as water supply, water power, or wildlife habitat. (Edinger et al. 2002. Ecological Communities of New York State, Appendix B)

Landscape: A spatial mosaic of several ecosystems, landforms, and plant communities across a defined area irrespective of ownership or other artificial boundaries and repeated in similar form throughout.

Mast: The fruit of trees considered as food for wildlife. Hard mast is the fruits or nuts of trees such as oak, beech, walnut, and hickories. Soft mast is the fruits and berries from plants such as dogwood, viburnum, elderberry, huckleberry, hawthorn, grape, raspberry, and blackberry.

Multiple Use Area: Lands that were acquired by DEC to provide outdoor recreation and wherever possible the conservation and development of natural resources. As their name suggests, they are to be managed for a broader range of public use. (Public Use of Lands Managed by the Bureau of Wildlife)

Native: A plant or animal indigenous to a particular locality.

Old Growth Forest: Forest with an abundance of late successional tree species, at least 180 - 200 years of age in a contiguous forested landscape that has evolved and reproduced itself naturally, with the capacity for self-perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy, and a conspicuous absence of multiple stemmed trees. (Adapted from the NYS Strategic Plan for State Forest Management)

Pole: A tree of a size between a sapling (1" to 5" diameter at breast height) and a mature tree.

Regeneration Cut: A cutting procedure by which a new forest age class is created; the major methods are clearcutting, seed tree, shelterwood, selection, and coppice. The Young Forest Initiative includes these silvicultural treatments: clearcuts, seed tree cuts, and shelterwood cuts. Salvage (following a natural disturbance) will be considered based on the size and scope of the disturbance.

Seed Tree Method: A forest regeneration or harvest method that entails cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment.

Shelterwood Method: A forest regeneration or harvest method that entails the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment.

Shrubland: A community dominated by woody plants typically less than ten feet tall with scattered open patches of grasses and forbs that provide floristic diversity. Typically characterized by >50% cover of shrubs and <25% canopy cover of trees. (Adapted from Edinger et al. 2002. Ecological Communities of New York State, Appendix B)

Softwood: A coniferous tree belonging to the botanical group Gymnospermae, such as white pine, Eastern hemlock, balsam fir, red spruce, etc.

Special Management Zone: A vegetation strip or management zone extending from wetland boundaries, high-water marks on perennial and intermittent streams, vernal pool depression, spring seeps, ponds and lakes, and other land features requiring special consideration. (Adapted from DEC Division of Lands and Forests Management Rules for Establishment of Special Management Zones on State Forests)

State Rank of Significant Ecological Communities:

S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.
S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.
S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.
S4 = Apparently secure in New York State.
S5 = Demonstrably secure in New York State.
SH = Historically known from New York State, but not seen in the past 15 years.
SX = Apparently extirpated from New York State.
SE = Exotic, not native to New York State.
SR = State report only, no verified specimens known from New York State.
SU = Status unknown.

(Edinger et al. 2002. Ecological Communities of New York State, Appendix A)

Stand: In forestry, a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable and manageable unit. In this HMP, the term "stand" is also applied to other habitat types (e.g., grassland, shrubland) to describe an area composed of similar vegetation composition and structure, as delineated during the habitat inventory.

Stand Prescription: A planned series of treatments designed to change current stand structure to one that meets management goals. Note: the prescription normally considers ecological, economic, and societal constraints.

Target Species: A suite of high priority wildlife species of conservation interest that are being targeted to benefit from management of a particular habitat type.

Unique Area: Lands that were acquired by DEC for their special natural beauty, wilderness character, geological, ecological, or historical significance for inclusion in the state nature and historical preserve. The primary purpose of these lands is to protect the feature of significance that led to the land being acquired by the state. (Public Use of Lands Managed by the Bureau of Wildlife)

Upland: Sites with well-drained soils that are dry to mesic (never hydric). (Edinger et al. 2002. Ecological Communities of New York State, Appendix B)

Wetland: "Freshwater wetlands means lands and waters of the state as shown on the freshwater wetlands map which contain any or all of the following:

(a) lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation of the following types: wetland trees, wetland shrubs, emergent vegetation, rooted, floating-leaved vegetation, free-floating vegetation, wet meadow vegetation, bog mat vegetation, and submergent vegetation;
(b) lands and submerged lands containing remnants of any vegetation that is not aquatic or semi-aquatic that has died because of wet conditions over a sufficiently long period, provided that such wet conditions do not exceed a maximum seasonal water depth of six feet and provided further that such conditions can be expected to persist indefinitely, barring human intervention;
(c) lands and waters substantially enclosed by aquatic or semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b) the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b) the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation; and
(d) the waters overlying the areas set forth in (a) and (b) and the lands underlying."

(Refer to NYS Environmental Conservation Law, Article 24 § 24-0107 for full definition.)

Wildlife Management Area: Lands that were acquired by DEC primarily for the production and use of wildlife, including hunting and trapping. These areas provide and protect wildlife habitats that are particularly significant in their capacity to harbor rare, threatened or endangered species, host unusual concentrations of one or more wildlife species, provide an important resting and feeding area for migratory birds, provide important nesting or breeding area for one or more species of wildlife, or provide significant value for wildlife or human enjoyment of wildlife. (Public Use of Lands Managed by the Bureau of Wildlife)

Young Forest: Forests that result from a regeneration cut, typically having a dense understory where tree seedlings, saplings, woody vines, shrubs, and herbaceous vegetation grow together. Young forests are typically 0-10 years old. (Adapted from www.youngforest.org). It is acknowledged that "young forests" will differ in their character in different ecological areas of the state and that 0-10 years is a continuum into more mature forest types. (Refer to: A DEC Strategic Plan for Implementing the Young Forest Initiative on Wildlife Management Areas 2015-2020)

APPENDIX B. COMPLIANCE WITH STATE ENVIRONMENTAL QUALITY REVIEW

This plan identifies habitat management activities to be conducted on the Multiple Use Area. These activities were analyzed in the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* (PEIS), as updated and amended in 2017 by the *Supplemental Final Environmental Impact Statement* (SFEIS).[18] Any activity that exceeds the thresholds of, or was not analyzed in the 1979 PEIS as amended in 2017, will require individual, site-specific environmental review. Environmental assessment forms prepared as a result of this review will be posted on the Environmental Notice Bulletin (ENB).[19]

The activities recommended in this plan:

- Will not adversely affect threatened or endangered plants or animals or their habitat.
    - Prior to implementation of any activity, staff review the NY Natural Heritage Program's "Natural Heritage Element Occurrence" database and perform field surveys when necessary. If a protected species is encountered in a project area, staff may establish buffer zones around the occurrence, move the project area, follow time-of-year restrictions, or cancel the project.
- Will not induce or accelerate significant change in land use.
    - All lands and waters within the WMA system are permanently protected as wildlife habitat.
- Will not induce significant change in ambient air, soil, or water quality.
    - Activities are designed to protect air, soil, and water quality through careful project planning, use of appropriate Best Management Practices, and establishment of Special Management Zones around sensitive land and water features requiring special consideration.
- Will not conflict with established plans or policies of other state or federal agencies.
    - Activities will follow established plans or policies of other state and federal agencies, including all relevant U.S. Fish and Wildlife Service rules and regulations.
- Will not induce significant change in public attraction or use.
    - The WMA system is part of a long-term effort to establish permanent access to lands in New York State for the protection and promotion of its fish and wildlife resources. Proposed activities will continue to protect, promote, and maintain public access to WMAs and their wildlife resources.
- Will not significantly deviate from effects of natural processes which formed or maintain an area or result in areas of significantly different character or ecological processes.
    - Activities will be conducted in a manner that maintains, enhances, or mitigates ecological processes and/or natural disturbances as appropriate for each WMA and habitat type. Some activities, such as even-aged forest management, intentionally result in areas of different character and ecological processes; however, they are not considered significant because they are ephemeral or transitional and will not permanently alter the landscape.
- Will not affect important known historical or archeological sites.
    - Activities that may result in ground disturbance are reviewed by DEC's State Historic Preservation Officer (SHPO) and/or the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) to identify potential impacts to historical or archeological sites. Sensitive sites will be protected under the direction of DEC's SHPO and the OPRHP Archaeology Unit.
- Will not stimulate significant public controversy.
    - It is not anticipated that activities on WMAs will stimulate significant public controversy. A public comment period was held during development of both the PEIS and the SFEIS; no relevant comments in opposition of proposed management activities were received during the SFEIS public comment period. Staff also hold a public information session after completing each HMP, consider feedback from these sessions, and may adjust management as deemed appropriate. Kiosks, signs, webpages, articles, demonstration areas, and other outreach materials also raise awareness about habitat management activities.

[18] Available online at http://www.dec.ny.gov/regulations/28693.html.
[19] Available online at http://www.dec.ny.gov/enb/enb.html.

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

Region: **Wildlife Management Area:** **Stand number:** **Stand acreage:**

Species composition:

Basal area: **Trees per acre:** **Mean stand diameter:**

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

Acres to be treated: **Target basal area:**

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

-If even aged, specify treatment (i.e. shelterwood, seed tree, clearcut)

Clearcut acreage and configuration: (if applicable)

Natural Heritage /MHDB considerations and mitigation: (if applicable)

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

Species Composition: At a minimum, the three most common species found in the overstory should be included, assuming at least three species comprise the stand. Species that individually constitute less than 5% of the stand may be lumped together as "Other" or "Miscellaneous." For instance, if beech, hemlock and yellow birch each make up 3% of the stand, they may be lumped together as "Other – 9%."

Natural Heritage Element Occurrence layer review: List those species that the Natural Heritage Element Occurrence (EO) data layer indicates are or were known to be present in the stand, or could be affected by treatments to the stand. For instance, if a rare fish was indicated in a water body that is a short distance downstream of a creek that flows through the stand, it should be listed in the prescription.

SMZ layer review: The SMZ data layer includes Special Management Zones around all streams and wetlands, as well as vernal pools, spring seeps and recreation areas that staff have mapped and digitized. If any of these features are mapped incorrectly or are missing from current data layers, staff can correct their locations by editing their office layers.

Retention data: Include numbers of existing snags, cavity trees, Coarse Woody Material, Fine Woody Material, and legacy trees. Ocular estimates are acceptable.

Soil types and drainage: Specifically named soil types are useful, but not necessarily required. "Flat, sandy, well-drained hilltop" or "Steep, gravelly, moderately well-drained mid-slope" may be just as useful as "Hershiser-Koufax Sandy Silt Loam" in describing the soil conditions as they relate to management decisions. The important point is to note those characteristics that may limit equipment operation or establishment of regeneration. Soil type data is available for some counties on the Data Selector.

Interfering vegetation: Indicate the existing amount of interfering vegetation such as beech, striped maple, fern, etc. This may be quantified using mil-acre plots or by ocular estimate.

Technical guidance used: This may include stocking guides, articles found in technical journals, textbooks or other silviculture-related publications. Other sources of guidance may be acceptable as well.

Treatment purpose: As used here, "treatment purpose" and "management objective" (see below) are two different things. Also, "treatment purpose" is not what is to be done (i.e., "reduce basal area by 25%" or "remove every third row"), but rather is an explanation of why it is being done (i.e., "stimulate regeneration and increase growth of residual stand" or "regenerate current stand and convert to young forest").

Management objective: As used here, the term "management objective" is somewhat general. At a minimum, the prescription should indicate the desired future age structure and stand type. An entry as general as "Even aged hardwood" is acceptable, but regional staff may be more specific if they so choose. The management objective for a stand may be specified in the Habitat Management Plan (HMP) for the Wildlife Management Area in question. If the existing HMP does not specify the management objective regional staff should choose the management objective when the prescription is written.

Clearcut acreage and configuration: If the harvest involves one single clearcut, indicate the total contiguous area, in acres. If the harvest comprises more than one clearcut, indicate the total combined area of clearcuts, as well as the area of the largest clearcut.

Natural Heritage/MHDB considerations: Indicate what measures will be taken to protect those elements or features that were found in the review of the Natural Heritage Element Occurrence and Special Management Zone (not applicable yet) layers.

Retention considerations: Indicate whether or not existing levels meet the standards set forth in the Division's policy on Retention on State Forests, or whether they are expected to do so as a result of the proposed treatment. Also indicate if or how the treatment was adjusted in order to improve compliance with the policy standards.

Treatment description: The intended treatment should be clearly described. The amount of information necessary to accomplish this will vary greatly. For instance, in a row thinning of a pole timber sized plantation that had no SMZs or other special features, it may be sufficient to simply indicate "Remove two out of every six rows, taking two adjacent rows and leaving four rows between successive pairs being removed." An intermediate thinning in a sawtimber sized hardwood stand with a recreational trail, two streams and a known occurrence of an endangered plant community would require significantly more detail. One rule of thumb that could be used is to describe the treatment so that a qualified forestry professional could use it to assist in marking the harvest.

Additionally, since we are focused on creating young forests you should also address the presence/absence of advanced regeneration. If you are planning on clearcutting without advanced regeneration, address how you are going to mitigate that. For example, "This aspen stand will be clearcut and it is anticipated that future regeneration will be established through aspen root sprouting". Or, "This stand will be clearcut and replanted with Norway spruce to establish conifer cover."

Furthermore, if you are planning on conducting a shelterwood or seed tree cut, please indicate when you are planning on returning to the stand to conduct the final harvest (overstory removal).

APPENDIX D: AMENDMENTS

Any substantive changes to the habitat management described in this plan will be amended to the plan annually or as needed. Such changes may include: land acquisition, unforeseen natural disturbance, or any other change that alters the need for or the scope, method, or timing of management.