Habitat Management Plan
for
Cicero Swamp Wildlife Management Area
2016 – 2025

Division of Fish and Wildlife
Bureau of Wildlife

1285 Fisher Ave, Cortland, NY 13045

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Prepared by:

Kyle Olson, Seasonal Wildlife Technician
Thomas Cunningham, Wildlife Technician
Bonnie Parton, Wildlife Technician
Thomas Bell, State Wildlife Grants Biologist
Michael Putnam, Wildlife Biologist 1

Adam Perry, Wildlife Biologist 1
Adam Robedee, Forest Technician 2
Andrew Drake, Forester 1
Young Forest Initiative

Reviewed and approved by:

Steve Joule, Regional Wildlife Manager
Bureau of Wildlife

August 3, 2016
Date

James Farquhar, Chief
Bureau of Wildlife

August 26, 2016
Date

Douglas Stang, Assistant Director
Division of Fish and Wildlife

August 26, 2016
Date

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SUMMARY

Cicero Swamp Wildlife Management Area (WMA) is located in the northeastern portion of Onondaga County. It is low and wet with upland islands scattered throughout its 4,991 acres. Most of the wetland complex is dominated by sphagnum moss and rich soils supporting black spruce, tamarack, stunted white pine, and leatherleaf. Its unique habitat supports a variety of wildlife, including one of only two statewide populations of the endangered Eastern massasauga rattlesnake, along with many other species of birds, mammals, reptiles, amphibians, and insects.

Habitat management goals for Cicero Swamp WMA include:

- Manage 12% of the total forested area as young forest to provide American woodcock (AMWO) habitat.
- Increase shrubland habitat to 1% to provide habitat for shrubland obligate species.
- Decrease grassland habitat to 2% of the total WMA acreage.
- Decrease the WMA's forested acreage to 76% to provide habitat diversity.
- Maintain the remaining 9% of the WMA in its various habitats as they are now.
- Improve the existing shrub and grassland areas for the benefit of grassland nesting birds.
- Provide habitat for a variety of wildlife species and to permit wildlife-dependent recreational uses compatible with wildlife.

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 WMAs. These plans incorporate management recommendations from Unit Management Plans (UMPs), existing WMA habitat management guidelines, NY Natural Heritage Program's WMA Biodiversity Inventory Reports, Bird Conservation Area guidelines, and other documents available for individual WMAs.

SCOPE AND INTENT

Primary purposes of this document:

- Provide the overall context of the habitat on the WMA and identify the target species for management;
- Identify habitat goals for WMA-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 WMA 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 WMA 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.

WMA OVERVIEW

LOCATION

Cicero Swamp WMA is located in DEC Region 7, Town of Cicero in Onondaga County (Figure 1).

TOTAL AREA

4,991 acres

HABITAT INVENTORY

A habitat inventory of the WMA was conducted in 2015 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 WMA, and conditions in the surrounding landscape (see Landscape Context section below).

Table 1. Summary of current and desired habitat acreage on Cicero Swamp WMA.

Habitat Type	Current Conditions (as of 2015)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	4,417	89%		3,788	Decrease to 76%
Young forest	15	<1%		624	Increase to 12%
Shrubland	24	<1%		55	Increase to 1%
Grassland	125	3%		113	Decrease to 2%
Agricultural land	0	0%		0	No Change
Wetland (natural) [b]	306	6%		306	No Change
Wetland (impounded) [b]	54	1%		54	No Change
Open water	21	<1%		21	No Change
Other (parking lots, transmission line)	17	<1%		18	Increase by <1%
Roads	12	<1%	2	12	No Change
Rivers and streams			2		
Total Acres:	4,991	100%		4,991	

[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] Wetland acreage does not include forested wetlands, since they are included in the Forest category.

ECOLOGICAL RESOURCES

Wildlife Overview:

Wildlife present on Cicero Swamp WMA includes many species commonly found throughout central New York, such as:

- Beaver, muskrat, mink, coyote, white-tailed deer
- American woodcock, ruffed grouse, eastern wild turkey, mallard, wood duck, Virginia rail, pied-billed grebe, osprey
- Spotted turtle, eastern snapping turtle, painted turtle
- Spotted salamander, green frog

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or state Special Concern (SC) species and/or Species of Greatest Conservation Need (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 WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. 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 Cicero Swamp WMA, 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 [c]	American bittern		SC	HP
	American black duck			HP
	American kestrel			x
	American woodcock			x
	Bald eagle		T	HP
	Bay-breasted warbler			HP
	Black-billed cuckoo			x
	Black-throated blue warbler			x
	Blue-winged teal			x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Canada warbler			HP
	Cerulean warbler		SC	x
	Common nighthawk		SC	HP
	Cooper's hawk		SC	
	Eastern meadowlark			HP
	Golden-winged warbler		SC	HP
	Horned lark		SC	HP
	Least bittern		T	HP
	Long-eared owl			x
	Northern harrier		T	HP
	Northern pintail			x
	Olive-sided flycatcher			HP
	Osprey		SC	
	Red-shouldered hawk		SC	x
	Ruffed grouse			x
	Rusty blackbird			HP
	Scarlet tanager			x
	Sharp-shinned hawk		SC	
	Vesper sparrow		SC	HP

[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
	Whip-poor-will		SC	HP
	Wood thrush			x
	Yellow-breasted chat		SC	HP
Mammals	Tri-colored bat			HP
	Indiana bat (myotis)	E	E	HP
	Little brown bat (myotis)			HP
	Northern long-eared bat (myotis)	T	T	HP
Amphibians and reptiles	Blue-spotted salamander		SC	HP
	Common ribbonsnake			x
	Eastern massasauga rattlesnake		E	HP
	Eastern ratsnake			x
	Eastern snapping turtle			x
	Four-toed salamander			HP
	Northern coal skink			x
	Smooth greensnake			x
	Spotted turtle		SC	HP
	Wood turtle		SC	HP
Fish	No survey done to date			
Invertebrates	Bog Elfin (see explanation below)			
Plants	Large twayblade		E	
	Southern twayblade		E	
	Troublesome sedge		T	
	Ram's-head ladyslipper (h)		T	
	Cloud sedge (h)		E	

[C] Several listed bird species only utilize this WMA as migratory habitat and are considered as such in management plans.

(h) Historical- According to NY Natural Heritage this is a historical record and has not been recently found on the WMA.

Ram's-head ladyslipper was last found on Cicero Swamp WMA in 1902 and a survey in 1992 failed to find any occurrences on the WMA. Cloud sedge was last found on Cicero Swamp in 1949 and no surveys have been conducted since to determine its exact location, or if it is still present on the WMA.

Bog turtle was reported on the WMA in 1950, with several unverified reports in the 1960s-70s. The turtle was considered extirpated from the property in 1993 after routine surveys of the area by researchers and DEC staff for the preceding 15 years failed to document any occurrences.

NY Natural Heritage records Bog Elfin as possibly occurring on Cicero Swamp; it was last found in 1988. However, the species is now considered extirpated from New York and therefore is not listed as E/T/SC/SGCN.

Significant Ecological Communities:

There are several rare and significant natural communities located on Cicero Swamp WMA as identified by the NY Natural Heritage Program. The state rank reflects the rarity within NY, ranging from S1, considered the rarest, to S5, considered stable; definitions are provided in Appendix A. The following significant ecological communities occur on the WMA; community descriptions are from *Ecological Communities of New York State, Second Edition* [5] (Figures 3 and 4):

- **Silver Maple-Ash Swamp (S3)** - A hardwood basin swamp that occurs in poorly-drained depressions or in poorly-drained soils along the borders of large lakes or, less frequently, rivers. These sites are characterized by uniformly wet conditions with minimal seasonal fluctuations in water levels. The dominant trees are usually silver maple (*Acer saccharinum*) and green ash (*Fraxinus pennsylvanica*).
- **Black Spruce-Tamarack Bog (S3) -** A conifer forest that occurs in cool, poorly drained depressions. The characteristic trees are black spruce (*Picea mariana*) and tamarack (*Larix laricina*).
- **Red Maple-Hardwood Swamp (S4, S5)** - A hardwood swamp that occurs in poorly drained depressions, usually on inorganic soils with peat, if present, that is less than 20cm deep. This is a broadly defined community with many variants. In any one stand, red maple (*Acer rubrum*) is either the only canopy dominant, or it is codominant with one or more hardwoods.
- **Red Maple-Tamarack Peat Swamp (S2, S3) -** A mixed swamp that occurs on organic soils (peat or muck) in poorly drained depressions. The dominant trees are red maple (*Acer rubrum*) and tamarack (*Larix laricina*). These species usually form an open canopy with numerous small openings dominated by shrubs or sedges.

Additional information about significant ecological communities is available in the Cicero Swamp WMA Biodiversity Inventory Final Report (1993) prepared by the NY Natural Heritage Program.

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 Cicero Swamp WMA include:

- One wetland regulated by Article 24 of the Environmental Conservation Law and 99 additional wetlands shown on the National Wetlands Inventory (NWI; Figures 5 and 6). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated wetland boundary, known as the adjacent area. There may be forestry 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.

associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.

- Six streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). Streams designated as class C(T) or higher are regulated by Article 15 of the Environmental Conservation Law however, the highest stream classification on this property is C.[6] Water quality standards will be adhered to on all streams.

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.*[7] 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.

State Nature and Historic Preserve Trust:

In 1977, Cicero Swamp was 4,018 acres in size, compared to the 4,991 acres that it is today. In that year, the property was added to the State Nature and Historic Preserve Trust (SNHPT) which is outlined in the NYS Environmental Conservation Law, Article 45[8] as follows:

ECL 45-0117(3): "Lands dedicated to the preserve are declared to be put to their highest, best and most important use and are to be held for one or more of the following purposes:

1. *As natural areas for maintaining plants, animals and natural communities, including preservation of old-growth forests dedicated to the preserve specifically for that purpose;*
2. *As reservoirs of natural materials and ecological processes that contribute to the state's biological diversity;*
3. *As field laboratories for scientific research and education in the natural sciences, including the fields of biology, conservation, ecology, geology, natural history and paleontology;*
4. *As places of natural and historic interest and beauty which provide the public with passive recreational opportunities including, where appropriate, fishing, hunting and trapping, or commercial fishing opportunities that are compatible with protecting the ecological significance, historic features, and natural character of the area."*

Lands that are in the SNHPT are different from those lands that are part of the Adirondack and Catskill Parks. Allowed management activities include, but are not limited to, mowing, burning, wood product sales and boundary and sign maintenance.

Since Cicero Swamp was enrolled in the SNHPT there have been multiple, subsequent acquisitions bringing the total acreage today to 4,991 acres. However, those acquisitions are not part of the SNHPT as there was no provision in the 1977 law to automatically enroll future acquisitions into the SNHPT.

[6] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.
[7] Available online at http://www.dec.ny.gov/outdoor/104218.html.
[8] More information can be found online at: http://codes.findlaw.com/ny/environmental-conservation-law

Planned habitat management activities that would occur on parts of the property enrolled in the SNHPT would be conducted in accordance with the stipulations under NYS ECL Article 45 pertaining to the SNHPT.

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 Cicero Swamp WMA (Figure 7). The landscape within a three mile radius of the WMA is primarily privately-owned land including:

- Forest (28% combining evergreen, deciduous and mixed)
- Agriculture (21% combining cultivated crops and hay)
- Early successional (7% combining grasslands and shrublands)
- Wetlands (27% combining open water, emergent and woody wetlands)
- Developed areas (17%)

In addition there are four parks within the three mile radius of Cicero Swamp WMA. Central (25 acres), Gateway Community (39 acres), and Skyway Parks (11 acres) are owned by the Town of Cicero, and Maxwell Park (105 acres) is owned by the Town of Dewitt. All of the parks are managed for public recreation including ball fields, playgrounds, and picnic areas.

Nearly half of the surrounding landscape is comprised of forest and woody wetlands intermixed with grasslands, agricultural lands, and developed lands, with smaller amounts of open water, shrub/scrub and emergent herbaceous wetlands.

This is in contrast with Cicero Swamp WMA, which is comprised mainly of forested wetland with very little developed areas or grasslands/shrublands. Cicero Swamp WMA also contains much larger areas of contiguous forest, which is lacking in the surrounding landscape. With an ever changing surrounding landscape, the amount of young forest may change drastically over time as land uses change. By managing for young forest on Cicero Swamp, young forest will be provided as habitat to serve the immediate area around the WMA. As part of DFW's Young Forest Initiative (YFI) on WMAs, future habitat management plans for Cicero Swamp WMA will enhance young forest habitat across the landscape as well as maintain important contiguous forest habitat.

Further details on management of each habitat type can be found in the next section of this plan.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Cicero Swamp WMA 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 Cicero Swamp WMA 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 YFI to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat.[9]

MANAGEMENT OBJECTIVES

- Increase young forest cover from 15 acres (<1% of total forested area) to 624 acres (14% of total forested area, 12% of the WMA) over the next 10 years to improve habitat for young-forest dependent wildlife, specifically targeting American woodcock and Eastern massasauga rattlesnake.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

As shown in Table 1, nearly 90% of the total area of Cicero Swamp WMA is forested (4,432 acres). Of this habitat type, approximately 11% is composed of natural or plantation forest (503 acres), 88% is forested wetlands (3,914 acres) and less than 1% is young forest (15 acres). Compared to the surrounding landscape, Cicero Swamp has the largest contiguous area of forested wetlands in the immediate area (Figure 7). Table 3 provides a more detailed description of the types of forest found on Cicero Swamp WMA and the most common types of trees found in each.

[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.

Table 3. Summary of the acreage and dominant overstory species for each forest type present on Cicero Swamp WMA.

Forest Type	Acres (as of 2015)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	435	247	red maple, white ash, aspen
Plantation	68	22	red maple, Scotch pine, white pine
Forested wetland	3,914	3,518	red maple, yellow birch, white pine
Young forest	0	232	
Young forest (forested wetland)	15	393	
Total Forested Acres:	4,432	4,412	

There are 38 different types of soil on Cicero Swamp WMA, however, 65% of the total WMA area is composed of two types of muck soils, Carlisle and Palms. Muck soils are commonly found in marshes and swamps and are characterized by being very poorly drained with frequent periods of standing water on the surface. The remaining 35% of the WMA is composed of a wide variety of silt/sand/clay loams, most of which are poorly drained except for those located mostly along the outer edges of the WMA, which are moderate to well drained. Only approximately 7% of the total area of Cicero Swamp has soils that are classified as being moderately drained to well-drained. [10]

The lack of dry ground poses a significant challenge to actively managing this habitat type. There are virtually no roads or trails providing access to the interior parts of the property and the poorly drained ground will significantly limit the use of heavy machinery that is commonly used to conduct forest management. Consequently, there are only a few places where young forest habitat can be created through the use of a commercial timber harvest.

Target Species:

Although there are many species that will benefit from the creation, restoration, and maintenance of young forests, management of forested habitats on Cicero Swamp WMA will focus on providing habitat for the target species listed below:

- **American Woodcock** – With a more than 80% of the property being composed of poorly drained ground, forested wetlands and open wetlands, there is ample opportunity to manage for American woodcock. Combining moist ground for foraging and a mixture of mature and young forest habitats through timber management, a landscape will be created that provides the following requirements:
    - Singing/peenting ground – Open areas from 1 to >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.

[10] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=NY.

- Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
- Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields.[11]

Although not identified as a target species in the suite of high priority species of conservation interest for young forest management, due to the presence of Eastern Massasauga Rattlesnake on Cicero Swamp WMA, management of forested (and other) habitats will also focus on providing habitat for this state-endangered species:

- **Eastern Massasauga Rattlesnake** – This reptile requires young forest habitat for a significant portion of its life cycle and has been observed using the same habitat as the American woodcock on the property. We will endeavor to create a landscape that provides:
  - Hibernaculum – Wetland areas with abundant hummocks.
  - Basking habitat – Areas free of encroaching shrubs that provide extended periods of sunlight available to the gravid (pregnant) snakes to aid in gestation.
  - Foraging – Open fields that provide ample foraging opportunity for small rodents and other prey.

MANAGEMENT HISTORY

Few records still exist of past forest management on this property. The land was initially purchased in 1945. In 1957, in the area just east of Island Rd, (which today is the north end of stand A9) timber was cut for the purpose of creating game openings for grouse, deer, and hare. Pulpwood sales and thinnings were carried out in the same area from 1961-63. Also, between 1975 and 1986 there were six timber harvests from which a total of 5 cords of firewood, 250 fence posts, and 100 red pine cabin logs were sold.[12] However, records do not indicate where on Cicero Swamp WMA those 1975-86 sales occurred. There are no records of timber products being sold since 1986. Over the past 10 years, stand A39 has been clearcut to provide young forest and is the only place on the property currently classified as such habitat.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management strategy is proposed in order to reach, and possibly exceed, the YFI goal of establishing a minimum of 10% of the total forested area (4,432 acres) as young forest (443 acres) within ten years.The total number of acres in each stand is listed in Tables 4 and 5. Plans are to treat some stands multiple times over the next 10 years which is why some stands are listed in both tables. Adding up the acreage of each unique stand there are 1,035 acres where habitat management would be beneficial to the target species and other species associated with young forest habitat. With an abundance of options, it should provide further locations to create a diverse habitat in the future as forests regenerate and populations fluctuate following the initial 10 year period this plan covers. Some of the stands will have only parts of them treated during the time period this plan covers, so in the next 10 years it is planned to treat 629 acres out of the 1,035 acres initially identified. Achieving this proposed level of management is subject to:

[11] US Department of Agriculture, Natural Resources Conservation Service. 2010. American Woodcock: Habitat Best Management Practices for the Northeast by Scot J. Williamson. Wildlife Insight. Washington, DC.
[12] Cicero Wildlife Management Area Source Book, date of original creation unknown, NYS DEC Cortland Sub-Office, 1285 Fisher Ave, Cortland, NY.

changing timber markets, concerns over rare, threatened or endangered species, cultural/historical features found on the property, wet ground conditions, or changes in level of staff and funding support.

Given the current schedule, over the next 10 years, commercial harvesting will only achieve half of the 10% goal for young forest habitat. Non-commercial harvesting will be required for the remainder. Clear-cuts are planned for the benefit of the Eastern massasauga rattlesnake population over the next five years. Keeping a percentage of the habitat in a young shrub seral stage is critical for this species' existence.

The following management is proposed in order to reach the minimum goal of establishing 10% of the total forested acres as young forest within ten years. This also lists where forested areas are being converted to shrubland. This following is a breakdown of where the 629 treated acres are planned:

- **Management planned for 2016-2020** (Table 4, Figures 9 & 10):
    - Conduct a seed tree cut on stands B-2 and 3 and stands A-7, 11, 13, and 19, totaling approximately 189 acres.
    - Conduct a clear cut on stand B-6 to initially treat 2 acres. The remaining 3 acres can be treated on an "as-needed" basis determined by the rest of the stands' response to management.
    - Conduct patch clear cuts on stand A-34 to cut approximately 10-25 acres each year for a total of 190 acres over the next 10 year period.
    - Conduct patch clear cuts on stands A-27, 28 and 40 to create approximately 20 acres of shrubland. Only parts of these stands are being treated.
    - Conduct patch clear cuts on stands A-52, A-53 and B-4 to cut approximately 1-5 acres each year over the next 10 year period. All of those stands combined total 251 acres; however it is likely that only about 53 acres would be treated by year 2025.
- **Management planned for 2021-2025** (Table 5, Figures 9 & 10):
    - Conduct a seed tree cut on stand A-6 totaling approximately 4 acres.
    - Conduct a clear cut on stand B-6 to treat the remaining 3 acres.
    - Conduct patch clear cuts on stand A-5 to cut approximately 10-30 acres each year for a total of 149 acres by year 2025.
    - Continue patch clear cuts on stands A-34 to cut approximately 10-25 acres each year to reach the total of 190 acres by year 2025.
    - Conduct a clear cut on stand B-1 to cut approximately 19 acres.
    - Conduct patch clear cuts on stands A-52, A-53, and B-4 to cut approximately 1-5 acres each year over the next 10 year period. All of those stands combined total 251 acres; however, it is likely that only about 53 acres would be treated by year 2025.

Table 4. Forest management schedule for the first five-year period of this HMP (2016-2020).

Stand[a]	Acres[b]	Size Class[c]	Forest Type		Management Direction	Treatment Type[d]
			Current	Future		
A-7	23	Pole Timber 6”-11” DBH	Natural Forest: Swamp Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
A-11	7	Pole Timber 6”-11” DBH	Natural Forest: Black Locust	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
A-13	52	Pole Timber 6”-11” DBH	Natural Forest: Swamp Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
A-19	46	Small Sawtimber 12”-18” DBH	Natural Forest: Swamp Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
A-27	32	Pole Timber 6”-11” DBH	Natural Forest: Black Spruce, Red Maple, White Pine	Natural Forest: Seedling Sapling And Non-Forest: Shrubland	Even Aged	Patch Clear Cut
A-28	56	Seedling Sapling 1”-5” DBH	Forested Wetland: Northern Hardwood-White Pine	Forested Wetland: Seedling Sapling And Non-Forest: Shrubland	Even Aged	Patch Clear Cut
A-34	190	Small Sawtimber 12”-18” DBH	Forested Wetland: Swamp Hardwoods	Forested Wetland: Seedling Sapling	Even Aged	Patch Clear Cut
A-40	140	Pole Timber 6”-11” DBH	Forested Wetland: Red Maple, Black Spruce, Basswood	Forested Wetland: Red Maple, Black Spruce, Basswood And Forested Wetland: Seedling Sapling	Even Aged	Patch Clear Cut

Table 4. Continued

Stand[a]	Acres[b]	Size Class[c]	Forest Type		Management Direction	Treatment Type[d]
			Current	Future		
A-52	26	Pole Timber 6”-11” DBH	Natural Forest: Northern Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Patch Clear Cut
A-53	66	Pole Timber 6”-11” DBH	Natural Forest: Northern Hardwood-White Pine	Natural Forest: Seedling Sapling	Even Aged	Patch Clear Cut
B-2	39	Small Sawtimber 12”-18” DBH	Natural Forest: Northern Hardwood-Oak	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
B-3	22	Small Sawtimber 12”-18” DBH	Plantation: White Pine	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
B-4	159	Small Sawtimber 12”-18” DBH	Forested Wetland: Swamp Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
B-6	5	Small Sawtimber 12”-18” DBH	Plantation: White Pine, Red Pine, Norway Spruce	Natural Forest: Seedling Sapling	Even Aged	Clear Cut

a- The letter and number designation shows which compartment and stand number is to be treated.
b- The total number of acres in each stand is listed in the table. All numbers are rounded off to the nearest acre. Not all of the acres in each stand may necessarily be treated during the time period this plan covers.
c- DBH: diameter of the main tree stem at breast height or 4.5ft from the ground.
d- There may be instances where further analysis of a stand may warrant changing the treatment type prior to writing the prescription.

Table 5. Forest management schedule for the second five-year period of this HMP (2021-2025).

Stand[a]	Acres[b]	Size Class[c]	Forest Type		Management Direction	Treatment Type[d]
			Current	Future		
A-5	149	Small Sawtimber 12”-18” DBH	Forested Wetland: Swamp Hardwoods	Forested Wetland: Seedling Sapling	Even Aged	Patch Clear Cut
A-6	4	Pole Timber 6”-11” DBH	Forested Wetland: Northern Hardwood-White Pine	Forested Wetland: Seedling Sapling	Even Aged	Seed Tree

Table 5. Continued

Stand[a]	Acres[b]	Size Class[c]	Forest Type		Management Direction	Treatment Type[d]
			Current	Future		
A-34	190	Small Sawtimber 12”-18” DBH	Forested Wetland: Swamp Hardwoods	Forested Wetland: Seedling Sapling	Even Aged	Patch Clear Cut
A-52	26	Pole Timber 6”-11” DBH	Natural Forest: Northern Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Patch Clear Cut
A-53	66	Pole Timber 6”-11” DBH	Natural Forest: Northern Hardwood-White Pine	Natural Forest: Seedling Sapling	Even Aged	Patch Clear Cut
B-1	19	Pole Timber 6”-11” DBH	Plantation: Scotch Pine	Natural Forest, Seedling Sapling	Even Aged	Clear Cut
B-4	159	Small Sawtimber 12”-18” DBH	Forested Wetland: Swamp Hardwoods	Natural Forest: Seedling Sapling	Even Aged	Seed Tree
B-6	5	Small Sawtimber 12”-18” DBH	Plantation: White Pine, Red Pine, Norway Spruce	Natural Forest: Seedling Sapling	Even Aged	Clear Cut

a- The letter and number designation shows which compartment and stand number is to be treated.
b- The total number of acres in each stand is listed in the table. All numbers are rounded off to the nearest acre. Not all of the acres in each stand may necessarily be treated during the time period this plan covers.
c- DBH: diameter of the main tree stem at breast height or 4.5ft from the ground.
d- There may be instances where further analysis of a stand may warrant changing the treatment type prior to writing the prescription.

Stand locations and planned management actions are also summarized in Figures 9 and 10. Specific forest stand descriptions and detailed management prescriptions will be prepared for each proposed forest management area prior to implementation (see template, Appendix C). Total acres treated in the time period this plan covers are listed at the end of each line below. Briefly, habitat management for each of these stands will include the following:

- **Stand A-5**: This stand is mostly red maple with lesser amounts of yellow birch, black cherry, white ash, and white pine. A series of patch clear cuts will establish new hardwood seedling/sapling regeneration (149 acres).
- **Stand A-6**: This stand is a mix of red maple, white pine, and grey and yellow birch. By removing the majority of the trees and leaving a few of the best quality trees scattered throughout the stand, they will serve as a seed source for the next generation of trees (4 acres).

- **Stands A-7, 11, 13, and 19**: These stands are a mix of aspen; red, silver, and hard maples; elm, and hickory with a concentration of black locust in stand 11. Removing the majority of the trees and leaving a few of the best quality trees scattered throughout the stand will serve as a seed source for the next generation of trees. The intent is to encourage the regeneration of aspen. There is a fair amount of invasive honeysuckle and multiflora rose in the understory that might interfere with regeneration of desirable forest species. Those undesirable shrubs, along with the black locust, may require herbicide treatment either before or after the timber harvest to prevent interference with the establishment of desirable tree regeneration (128 acres).
- **Stands A-27, 28, and 40**: These stands are a mix of black spruce, red maple, white pine, grey birch, and basswood. Portions of these stands will be clear cut to create new shrubland (20 acres).
- **Stand A-34**: This stand is a mix of red maple, silver maple, aspen, white ash, and elm. A series of patch clear cuts conducted each year over the next ten years will encourage the regeneration of aspen (190 acres).
- **Stand A-52**: This stand is composed of red maple and yellow birch. A series of patch clear cuts will establish new hardwood seedling/sapling regeneration (13 acres).
- **Stand A-53**: This stand is composed of red maple, white pine, and yellow birch. A series of patch clear cuts will establish natural seedling/sapling regeneration (10 acres).
- **Stand B-1**: This stand is a Scotch pine plantation with a small amount of red maple and yellow birch. The ground in this stand is poorly drained and the Scotch pine is dying and breaking down as it is not well suited for growing in such conditions. Clear cutting the stand will serve to establish more desirable tree regeneration that is appropriate to the substrate (19 acres).
- **Stand B-2**: This stand is a mix of red oak, red maple, and white ash. Removing the majority of the trees and leaving a few of the best quality trees scattered throughout the stand will provide a seed source for the next generation of trees (39 acres).
- **Stand B-3**: This stand is mainly a white pine plantation, but there are also red maple, Norway spruce, and larch scattered throughout the stand. There are some white pine seedling/saplings growing in the understory but little other desirable tree regeneration. A similar treatment to that in stand B2 will be used in order to increase sunlight on the ground, thereby increasing growth in the existing white pine seedling/saplings and promoting the regeneration of more white pine (22 acres).
- **Stand B-4**: This stand is a mixture of red maple, elm, and white ash, with lesser amounts of hard maple, basswood, yellow birch, and black cherry. By conducting a series of patch clear cuts over the next ten years, new hardwood seedling/sapling regeneration can be established (30 acres).
- **Stand B-6**: This stand is a mixture of mature Norway spruce, white pine, and red pine. The Norway spruce is located in the patch closest to Route 298; the white and red pine are located in the eastern most portion of this stand. There is very little regeneration of trees in the understory due to the dense shade. Clear cutting the stand would be the best option to establish tree regeneration. A light thinning may not provide sufficient light exposure to encourage tree seedlings to grow, and a heavy thinning would put the remaining trees at higher risk of toppling from high wind events due to their shallow root systems and lack of support after removing neighboring trees. The west patch of spruce is

planned to be cut first as part of a commercial timber sale, and the eastern patches will be cut later as part of a non-commercial cut (5 acres).

BEST MANAGEMENT PRACTICES

Forest management on all WMAs 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 WMAs.

Resource	**Guidance Document** [13]
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:

In addition to the Eastern massasauga rattlesnake, both the Indiana bat and Northern long-eared bat are known to occur on the area. These two bat species are currently listed as endangered and threatened, respectively, by the U.S. Fish and Wildlife Service. Forest management prescriptions and operations will be carefully considered to protect these species. Whenever possible, dead or dying trees will be left to serve as snags/den trees for the benefit of wildlife.

Least bittern, bald eagle, and northern harrier are all listed as threatened in New York and may occur on the WMA. Least bittern utilize wetland emergent marsh habitat and will not be impacted by forest management in upland areas. When harvesting operations are to occur in wetland areas, seasonal restrictions will be stipulated limiting work to the winter months when this species is not using this habitat. Similarly, northern harriers that may occur on the WMA will not be impacted from forest management as this species uses non-forested areas. Bald eagles may visit the WMA, but at this time there is no known nest on the WMA and therefore, no impacts are expected.

Forest Health Considerations:

In stands where native and non-native vegetation has been identified as interfering with desirable regeneration, additional treatment of that interfering vegetation may be required to promote desired regeneration.

Pre- and Post-treatment Considerations:

Where invasive and other undesirable plant species are significantly abundant, pre-treatment mechanical cutting or herbicide application may be necessary. Post-treatment, if it is determined that deer browse is intense enough to prevent regeneration of desired tree species, fencing in of treatment areas may be necessary. Also, if it is concluded post-treatment that desired tree species are not regenerating in a high enough frequency, or that undesirable species are dominating the area and suppressing regeneration, then the stand may be re-treated. This may include mechanical and/or herbicidal control of undesirable species, removal of additional trees to

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

increase available sunlight, scarification of forest floor to stimulate seedling establishment, and/or the direct seeding of desired tree species. Pre- and post-treatment actions to promote the desired forest regeneration will be addressed in detail in the silvicultural prescriptions.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife response has been achieved, pre- and post-management assessments will be conducted in accordance with guidelines in the Young Forest Initiative Monitoring Plan.[14] The Monitoring 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 and again at three and five years post-treatment or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. American woodcock and Eastern massasauga rattlesnake are the target species on Cicero Swamp WMA. Surveys will be conducted to determine the response of these species to forest management. Annual monitoring of Eastern massasauga rattlesnake gravid female abundance is recommended to evaluate our management actions. Additionally, surveys for cerulean warbler and breeding songbird surveys may be conducted as management continues.

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. Shrublands are typically characterized by >50% cover of shrubs and <25% canopy cover of trees.

MANAGEMENT OBJECTIVES

- Increase the amount of shrubland habitat on the property to 55 acres for the benefit of American woodcock through a combination of natural succession and timber management.
- Maintain a minimum of 6 acres in an early-successional, shrub-type habitat for reptile species.
- Monitor for invasive species and treat as necessary with mechanical, or possibly when appropriate, chemical means.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT

Stands A950, B950, and B951 totaling 24 acres are the only places currently considered to be shrubland. These shrublands originated from grasslands and old agricultural fields not being maintained and naturally succeeding to a shrub-dominated community. These stands are mostly dense shrub thickets with clumps of trees.

These shrublands were not planted, but colonized naturally by nearby woody vegetation. This unfortunately included an abundance of non-native species, including: autumn olive, buckthorn, honeysuckle, and multiflora rose. Due to the invasive biology of these species, they quickly can establish in an unmaintained field and become dominant. Although these invasive species are

[14] May be found online at http://www.dec.ny.gov/outdoor/104218.html

dominant in most of these shrublands, native shrubs are present. Species of hawthorn, dogwood and viburnum can be found and provide a valuable soft mast resource for wildlife.

Shrublands contain unique food and cover options that differ from young forest and can often persist longer as a habitat type due to shrub thicket exclusion of tree growth. Shrublands provide habitat for many wildlife species, including several that also use young forests. Although young forest and shrubland provide habitat for similar species, both are needed to provide for the full range of disturbance-dependent wildlife species.

MANAGEMENT HISTORY

To date, there has been no significant management of the shrubland habitat on this property.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2020:**
  - Approximately 20 acres of trees will be cut in parts of stands A27, A28, and A40 to create additional shrubland on a rotational basis.
  - Monitor for invasive species.
- **Management planned for 2016-2025:**
  - Approximately 11 additional acres of shrubland are expected to be created over the next 10 years; old fields (stands A940 and A947) will be allowed to naturally succeed into shrubs and sapling trees.
  - Monitor for invasive species.

BEST MANAGEMENT PRACTICE

Cutting of brush and trees >3in DBH would be limited to November 1-March 31 to avoid potential negative impacts to Northern long-eared bats and Indiana bats. Whenever possible, management actions will be avoided during early spring-summer to minimize possible negative impacts to nesting and breeding wildlife.

MANAGEMENT EVALUATION

Wildlife response to management of shrubland, and other habitats, will be evaluated using breeding bird surveys and singing ground surveys for American woodcock specifically. Breeding bird surveys will be on a rotational basis and American woodcock surveys will be done annually. American woodcock surveys will target treated sites and be limited to those areas readily accessible in order to meet the survey protocol.

GRASSLAND

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.

The grassland areas at Cicero Swamp WMA consist of 8 fields ranging in size from 2 to 31 acres. While the majority of these fields are small and relatively unattractive for true grassland-dependant species, this WMA is part of the Cowaselon Creek Watershed Important Bird Area

(IBA).[15] This IBA provides habitat for many birds species most notably, cerulean warblers, upland sandpipers, and sharp-shined hawks.

MANAGEMENT OBJECTIVES

- Utilize a combination of prescribed fire, rotational mowing, and periodic re-seeding to maintain and improve grassland areas in stand A946 (31 acres) and A720 (17 acres).
- Let stands A940 (10 acres) and A947 (2 acres) revert to shrubland.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

There are currently 125 acres of grassland on Cicero Swamp WMA. The majority are located off of Island Rd. on the west end of the property. The plant community in one of these fields A940 (9.6 acres) will be allowed to succeed and will be managed as a shrubland. The larger fields on Island Road have been maintained with routine mowing and prescribed fire, when site conditions allow. These areas have been maintained as grasslands to provide forest openings and edge for songbird species and American woodcock during nesting and brood-rearing seasons. Time of year limitations and recent weather conditions in spring have made it difficult to maintain a steady routine of mowing or burning, but a fall burning option has been incorporated into the new management plan and should allow more possibilities. The larger fields have also served to provide some limited grassland bird habitat.

Species that benefit from grassland best management practices include:

- Bobolink
- Eastern meadowlark
- Northern harrier

Long Island field, Cicero Swamp WMA.

Photo: Region 7 Bureau of Wildlife, NYSDEC

[15] Information may be found at http://netapp.audubon.org/IBA/Site/2803

MANAGEMENT HISTORY

Stands A941-943 and A945 have been maintained by mowing every 1-3 years, and the portion of stand A943 east of Island Road was treated with prescribed fire 6 years ago. Stand A944 and the portion of A943 west of Island Road have previously been included in agricultural agreements; however, this agreement has expired and these areas are now reverting to grassland. Two additional stands, B950 and B951, were formally managed as agricultural fields under agricultural agreements; however, those agreements have since been discontinued and those stands have since reverted to shrubland.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2025** (Figures 9 & 10):
    - **Stands A941-A945**: These fields will be maintained via mowing and re-seeding (83 acres).
    - **Stand A943**: A prescribed fire management plan has been created for the portion of this stand that lies east of Island Road (approximately 31 acres). The plan is currently being renewed for another 10 year period. It is anticipated that this plan will be updated within the next 10 years to include stands A941-A946 (113 acres) and portions of A720 (up to 17 acres). Mowing may be used when fire is not an option due to weather or site conditions.
    - **Stands A946 and A970**: Utilize rotational mowing, and periodic re-seeding to maintain and improve grassland areas in stand A946 (31 acres) and A720 (17 acres).
    - Routine monitoring for invasive plant species and consider control if/when those species occur and become a threat to native vegetation.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs in NY. For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[16] 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.

[16] 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.

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

Timing of Management

- Fields known to support Eastern massasauga rattlesnakes will not be mowed or managed between April 15 and November 1.
- 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 or reptile 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

Future surveys will include American woodcock point counts to document any response to recent habitat management in or directly adjacent to the grasslands. Beyond American woodcock there currently are no plans to conduct surveys for other animals that utilize the grassland habitat at Cicero Swamp WMA.

AGRICULTURAL LAND

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

MANAGEMENT OBJECTIVES/HISTORY

There is currently no acreage on Cicero Swamp WMA that is managed as agricultural land and no plan to develop such habitat; however, approximately 80 – 100 acres was leased to a neighboring farmer from 1945-1966 for crop farming and benefiting pheasant production.[17] At one point, all of the former and current grassland fields were managed via agricultural agreements. This practice has since been abandoned, and these fields are reverting to the habitats previously described.

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 the current acreage and quality of wetlands and opportunistically increase these habitat types.
- Investigate the potential to rehabilitate the wetland impoundment east of Rt 298, stand B930 (5 acres).
- Actively manage the two wetland impoundments commonly referred to as the I-481 Impoundments, stand A911 (49 acres).

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

The wetlands on Cicero Swamp WMA are a mixture of shrubs, cattails, phragmites, and scattered trees (Figures 5 & 6). Unique to this WMA, is a 91 acre area located near the western

[17] Bradley, B.O., February 24, 1966. Personal Communication

edge of the WMA. Originally, this formerly open peatland was created by a fire in 1892 that smoldered for six months and consumed over a meter of peat in some locations.[18]
The largest wetland impoundments are located adjacent to Interstate 481 and are regulated through water control structures. These areas are specifically managed for waterfowl and migrating shorebirds.

Currently, 306 acres are managed as natural wetlands on Cicero Swamp WMA. There is one NYS regulated wetland that overlaps with the WMA as well as 99 wetlands mapped by the National Wetlands Inventory (NWI). NWI wetlands typically overlap with New York State regulated wetlands, and on Cicero Swamp WMA NWI wetland types are described as: 98% forested/shrub, 1% emergent, <1% freshwater pond, <1% riverine. Wetlands classified as freshwater ponds, lacustrine, and riverine are considered open water habitat types in this plan and are further discussed in that section.

Approximately 3,900 acres classified as forested/shrub are considered forested wetlands in this plan and are previously discussed in the forest management section.

The wetlands provide habitat for species such as:

- American woodcock
- Beaver, mink, muskrat, river otter, fisher
- Spotted turtle, eastern snapping turtle
- Migratory waterfowl
- Blue-spotted salamander, four-toed salamander

MANAGEMENT HISTORY

Impoundment creation was a major consideration for the acquisition of this property in the mid-1940s (Wildlife Management Area Reconnaissance, Cicero Swamp). At that time, the state was interested in potentially putting 3,000 of the 4,500 acres area under water. However, after additional surveys were completed, it was determined that this plan was not viable.[19] Instead, beginning in 1947 through 1948, the state blasted experimental potholes and ditches. Unfortunately, the water in those potholes and ditches was too acidic to support desirable plant growth for waterfowl forage and the experiment was discontinued.[20]

In 2003, a 192 acre parcel was transferred to the DEC from the NY Department of Transportation (NYSDOT). Approximately 49 acres of this parcel were used as a borrow site for the construction of the adjoining highway, Interstate 481. As a result of this road construction, the 49 acre borrow pit site eventually became a mitigation site, which today are the two impoundments that are designated as stand A911. Initially, NYSDOT installed a section of pipe under the Niagara Mohawk right-of-way (National Grid) along with two concrete drop box style water control structures. The structures and associated pipe enabled water movement from the southern impoundment into the northern impoundment and, if desired, out of the impoundments.

[18] LeBlanc, C. M. 1988. MS Thesis: Vegetation Dynamics in a Central New York Shrub-Carr.
[19] Bradley, B.O., February 24, 1966. Personal Communication.
[20] Westervelt, E.A. 1949 Final Report Waterfowl Development on Cicero and High Tor Game Management Areas, Federal Aid in Wildlife Restoration Act.

The water control structures fell into disrepair, and illegal vehicle access hampered the reclamation of this site as a wetland. In subsequent years, two other mitigation projects would be conducted within these two impoundments with the combined goal of restoring hydrology and the establishment of emergent vegetation.

These impoundments were created to mitigate wetland loss, and the intent was to provide a pair of regulated impoundments that would be available for migratory waterfowl and shorebirds and provide breeding habitat for amphibians. Yearly drawdowns have occurred to encourage emergent vegetation that can later provide a robust food source once the impoundments are re-flooded. The northern pool is routinely managed and the southern pool is used to stockpile water, which is used to re-flood the northern pool in the fall. Also, those impoundments have been drained in the past to allow for the application of pesticides to control invasive phragmites. In 2016, the northern pool will be drained once again for another pesticide treatment of phragmites (Figure 9).

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for** 2016-2020 (Figures 9 & 10):
    - Drain the northern pool of stand A911 and treat phragmites with pesticides. The pool is approximately 30 acres in size, but the entire pool will not require treatment.
    - Continue routine, regulated drawdowns to both promote good emergent vegetation and help control invasive plants.
    - Near the end of the administrative access road off of County Route 298 (Figure 1) there is a beaver dam that may need to be removed within in the next 10 years to facilitate easier access for habitat management in the far eastern corner of the property.
- **Management planned for 2021-2025** (Figure 9):
    - Continue routine regulated drawdowns to both promote good emergent vegetation and help control invasive plants.
    - Treat impoundments for invasive plants using biological and chemical means as needed, e.g., chemical herbicide, mechanical mowing and releasing Galerucella beetles.

BEST MANAGEMENT PRACTICES

Management activities within wetlands will take into consideration the timing of fish and wildlife breeding seasons and when possible, these periods of time will be avoided. Habitat management activities within a wetland or adjacent area will obtain all necessary permits. All activities will comply with the New York State Freshwater Wetlands Act (ECL Article 24) and Water Resources Law (ECL Article 15, Title 5).

MANAGEMENT EVALUATION

Current monitoring of wetland habitat at Cicero Swamp WMA is informal and data are often derived from staff observations and opportunistically and from hunter and trapper take. In addition, annual surveys for marsh birds, and waterfowl have been done on Cicero Swamp WMA to better understand species diversity and habitat use.

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 21 acres of existing open water habitat as it currently exists.
- Monitor and control invasive plants as needed.

Description of Existing Open Water Habitat and Target Species

There are 21 acres of open water on Cicero Swamp WMA consisting of both manmade and natural ponds, streams, channels, and potholes. Open water habitats consist of a series of small ponds created to improve habitat for amphibians, reptiles, and waterfowl.

Management History

Stand A910 is a mix of channels and pot holes created in 1961-62.

Implementation Plan and Anticipated Schedule

No management is planned in the next 10 years.

Best Management Practices

All activities will comply with the New York State Freshwater Wetlands Act (ECL Article 24) and Water Resources Law (ECL Article 15, Title 5).

Management Evaluation

Current monitoring of open water habitat use at Cicero Swamp WMA is informal and data are often derived opportunistically and from hunter and trapper take. In addition, annual surveys for marsh birds and waterfowl birds have been done on Cicero Swamp WMA to better understand species diversity and habitat use.

Habitat Management Summary

In summary, Table 7 lists the habitat management actions planned for Cicero Swamp WMA 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 Cicero Swamp WMA, 2016-2025. (Also see Figures 9 and 10.)

Habitat	Management Action	Acres	Timeframe
Forest	Seed tree cut in stands B2 & 3 and stands A7, 11, 13 & 19	189	2016-2020

Table 7. Continued

Habitat	Management Action	Acres	Timeframe
Forest	Clear cut stand B6	5	2016-2025
Forest	Patch clear cuts in stand A-34	190	2016-2025
Forest	Patch clear cuts in stands A-52 & 53 and B-4	50	2016-2025
Forest	Seed tree cut in stand A-6	4	2021-2025
Forest	Patch clear cuts in stand A-5	148	2021-2025
Forest	Clear cut stand B-1	19	2021-2025
Shrubland	Create new shrubland through patch clear cut of forest stands A-27, A-28, and A-40	20	2016-2020
Shrubland/ Grassland	Create new shrubland through passive management of stands A-940 and A947	12	2016-2025
Grassland	Maintain grassland habitat in stand A943 through a combination of prescribed fire, mowing and periodic re-seeding	44	2016-2025
Grassland	Maintain grassland habitat in stands A941-A945 through a combination of rotational mowing, and periodic re-seeding	83	2016-2025
Grassland	Use rotational mowing and periodic re-seeding to improve the quality of the grassland habitat in stands A-946 and A-720	48	2016-2025
Wetlands	Investigate the potential to rehabilitate stand B-930	5	2016-2025
Wetlands	Drain northern pool of stand A-911 and treat phragmites with pesticides	30	2016-2020
Wetlands	Continue routine regulated drawdowns in stand A-911 to both promote good emergent vegetation and help control invasive plants	49	2016-2025, as needed
Wetlands	Possibly remove beaver dam near the end of the administrative access road off of State Route 298		2016-2025
Wetlands	Treat impoundments for invasive plants using biological and chemical means		2016-2025, as needed

III. FIGURES

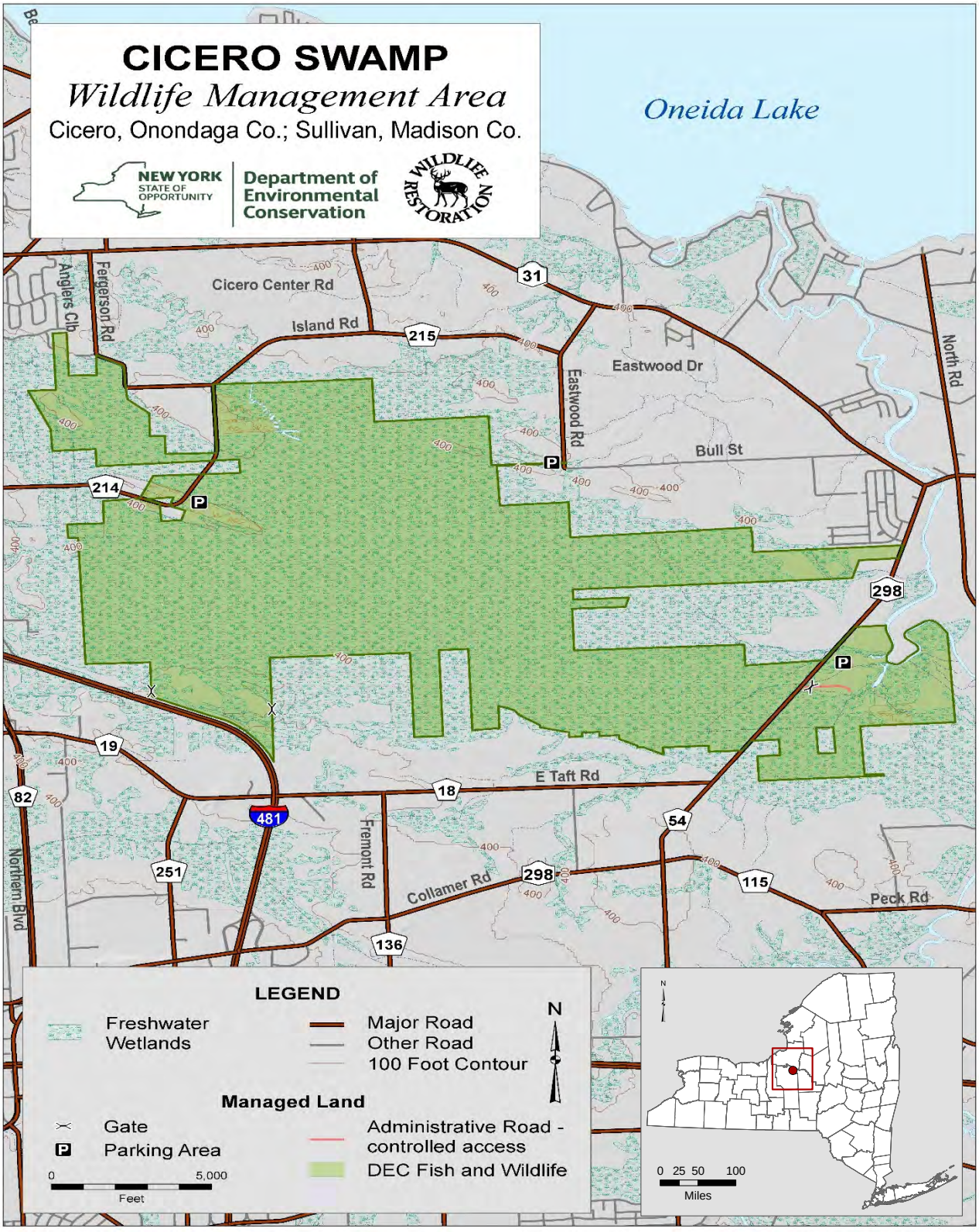

FIGURE 1. Location and access features at Cicero Swamp WMA.

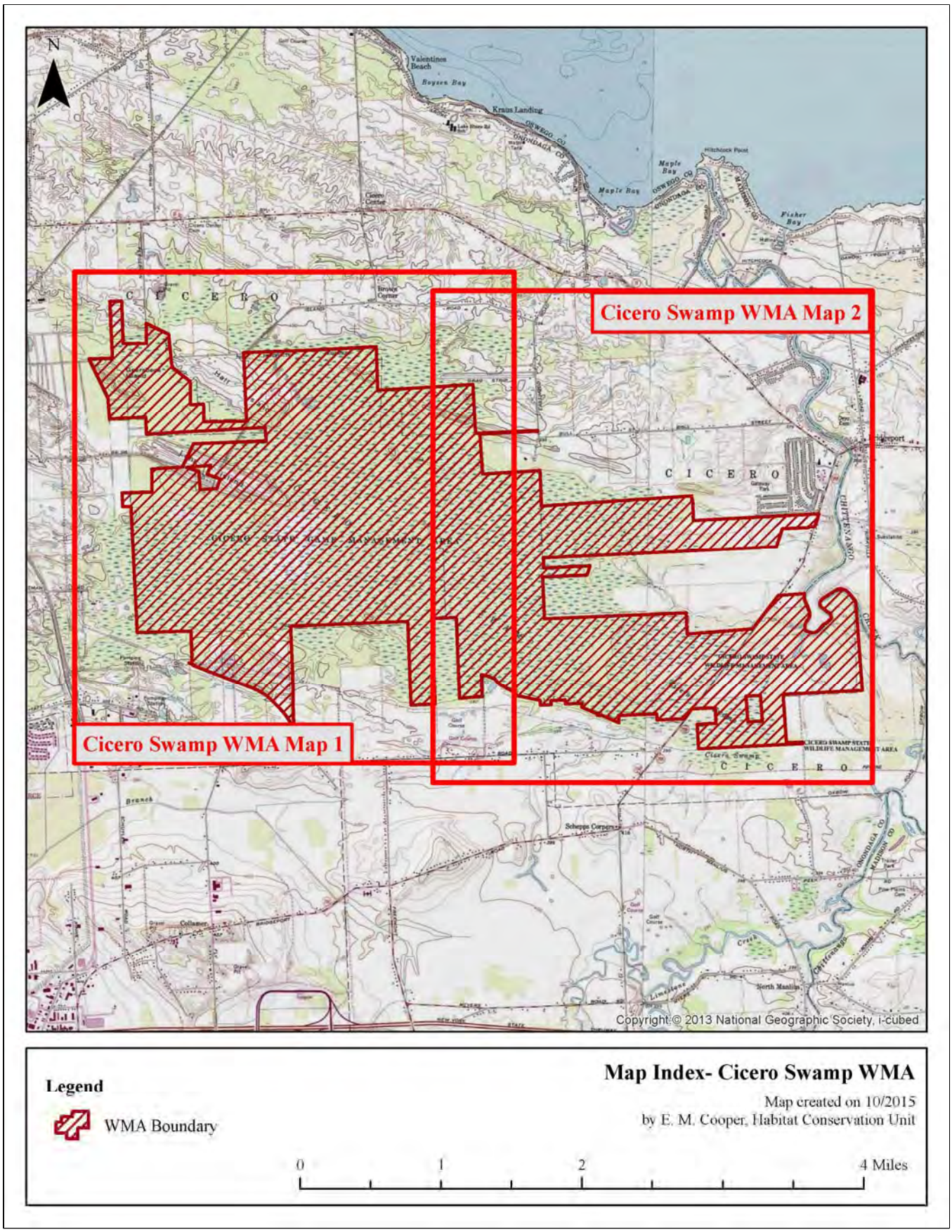

FIGURE 2. Map Index at Cicero Swamp WMA.

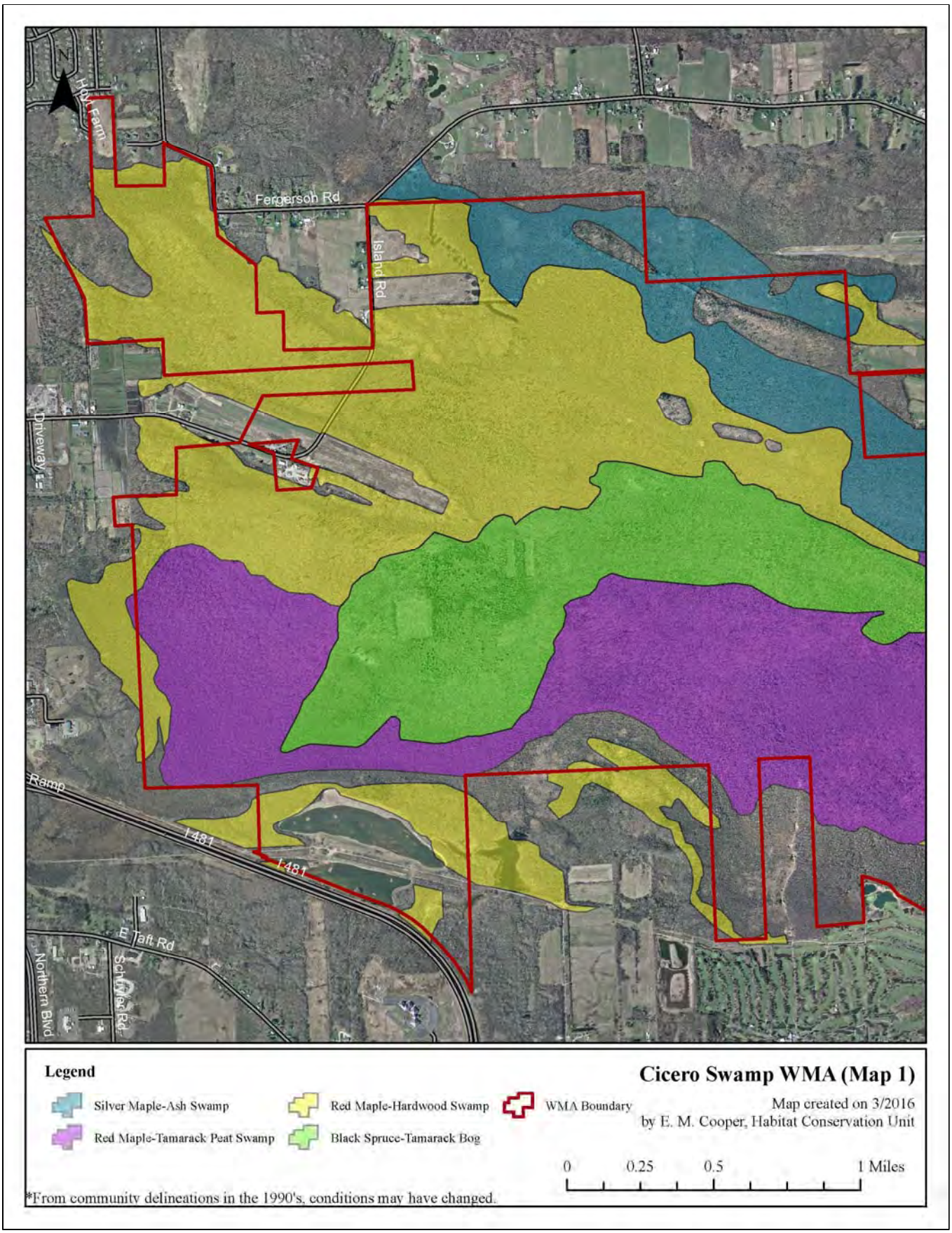

FIGURE 3. Significant ecological communities on Cicero Swamp WMA (Map 1).
Data from the NY Natural Heritage Program.

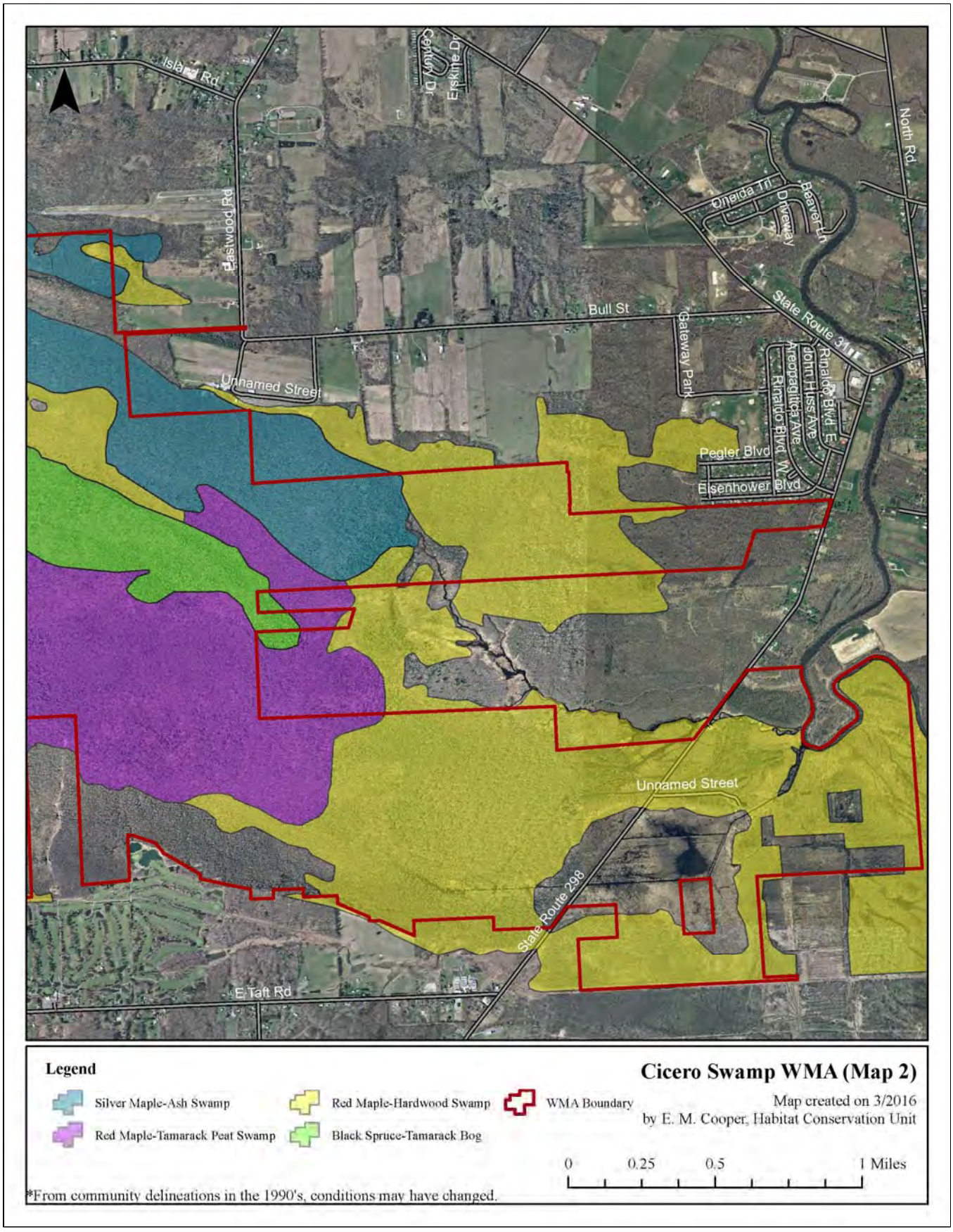

FIGURE 4. Significant ecological communities on Cicero Swamp WMA (Map 2).
Data from the NY Natural Heritage Program.

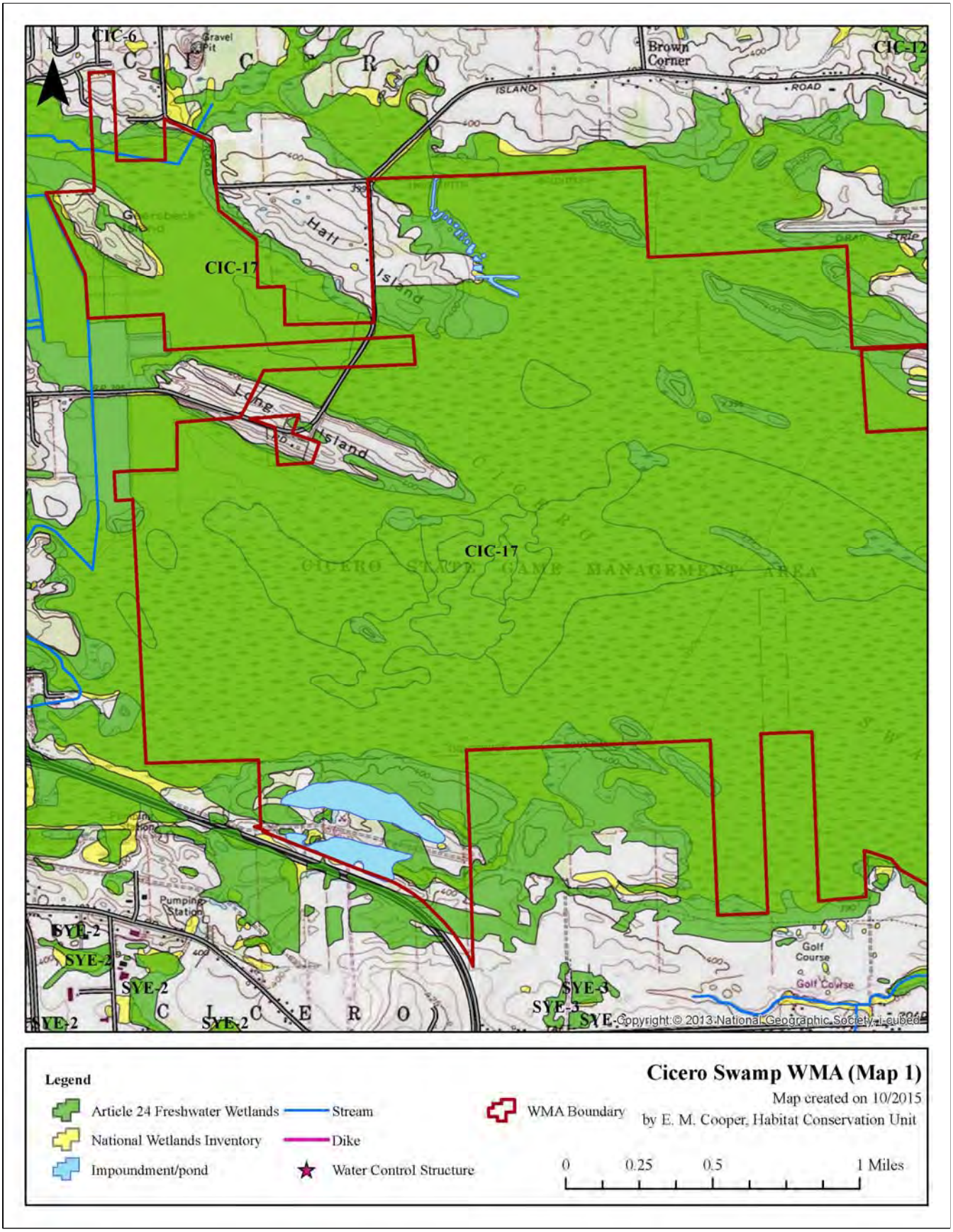

FIGURE 5. Wetlands, open water, and streams of Cicero Swamp WMA (Map 1). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

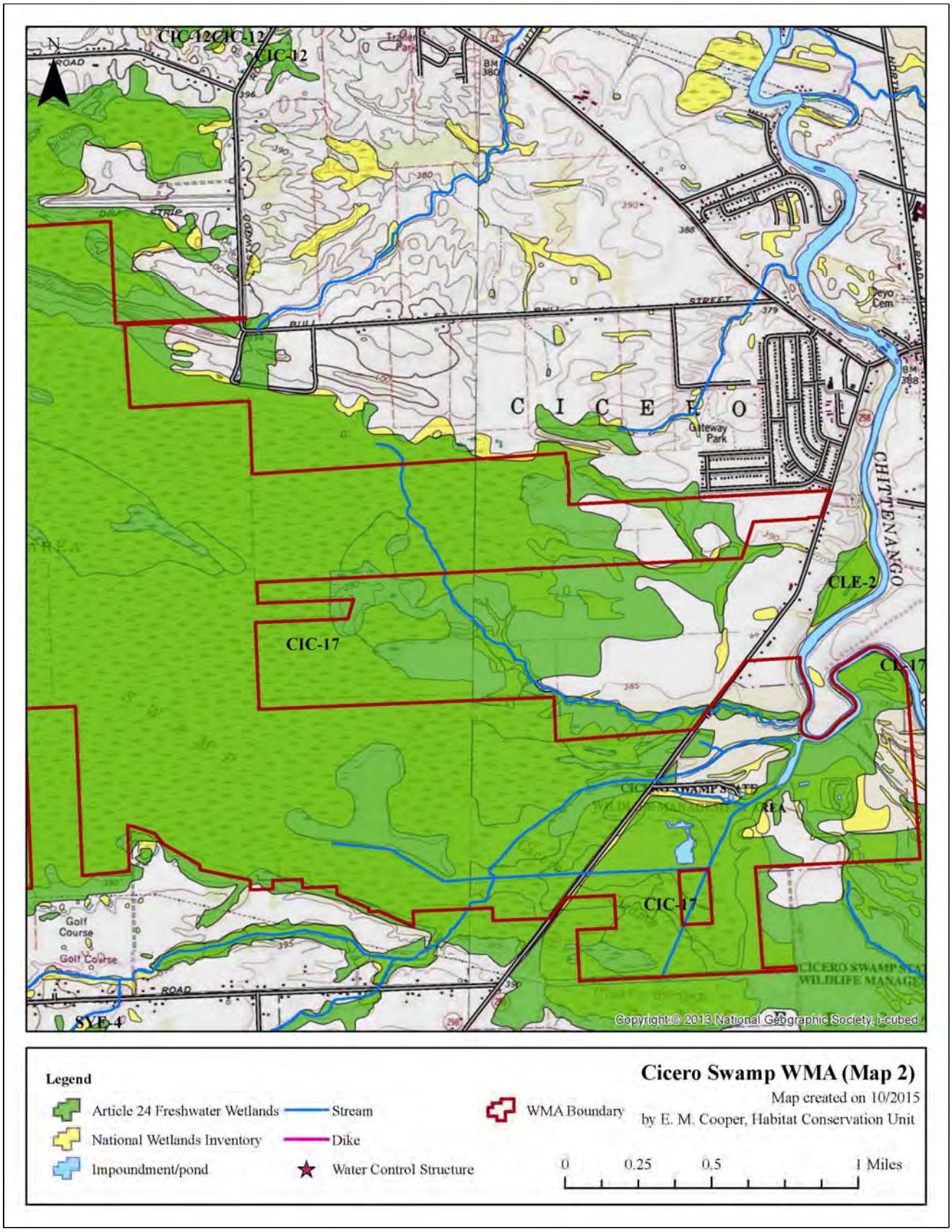

FIGURE 6. Wetlands, open water, and streams of Cicero Swamp WMA (Map 2). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

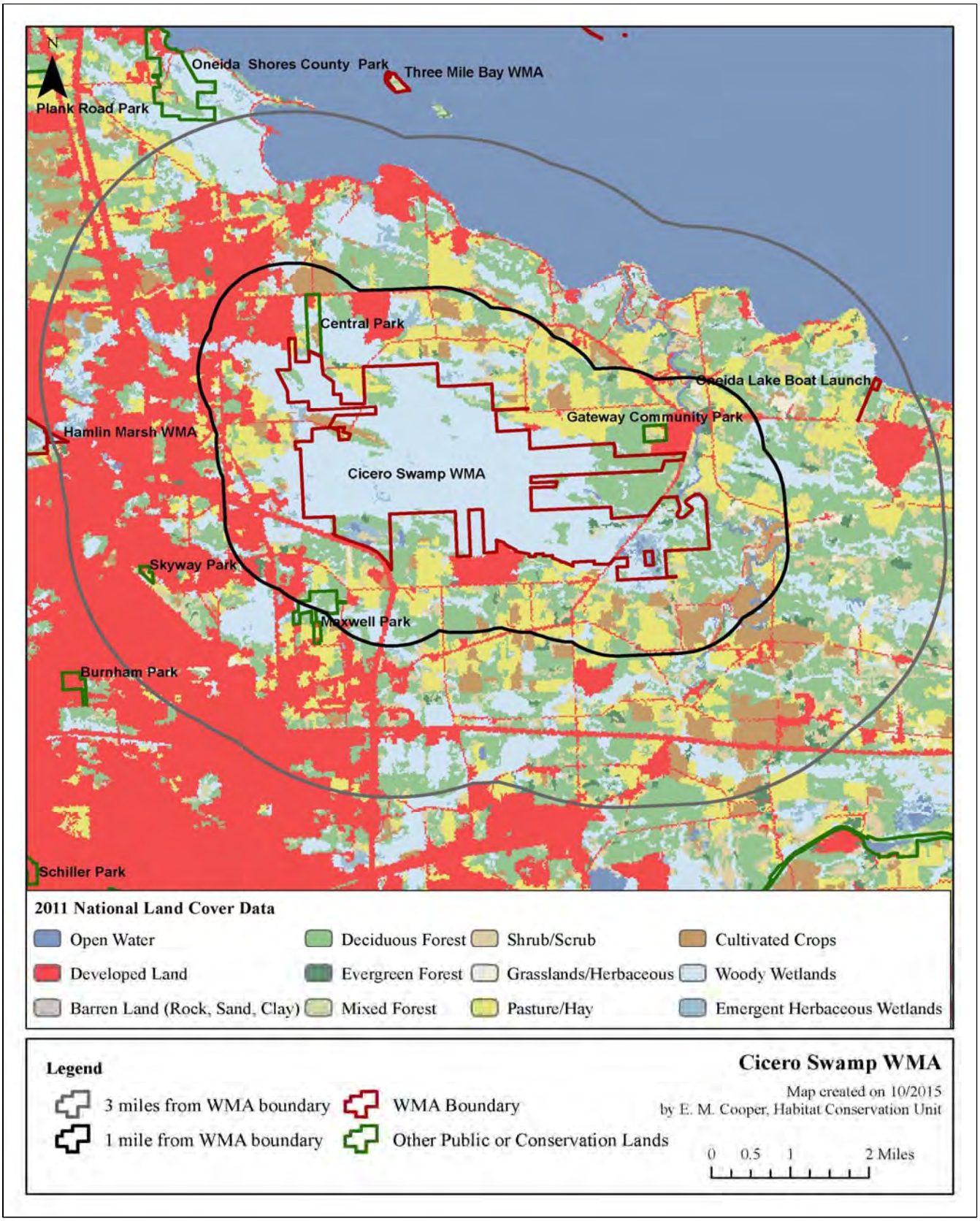

FIGURE 7. Land cover types and conservation lands in the landscape surrounding Cicero Swamp WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

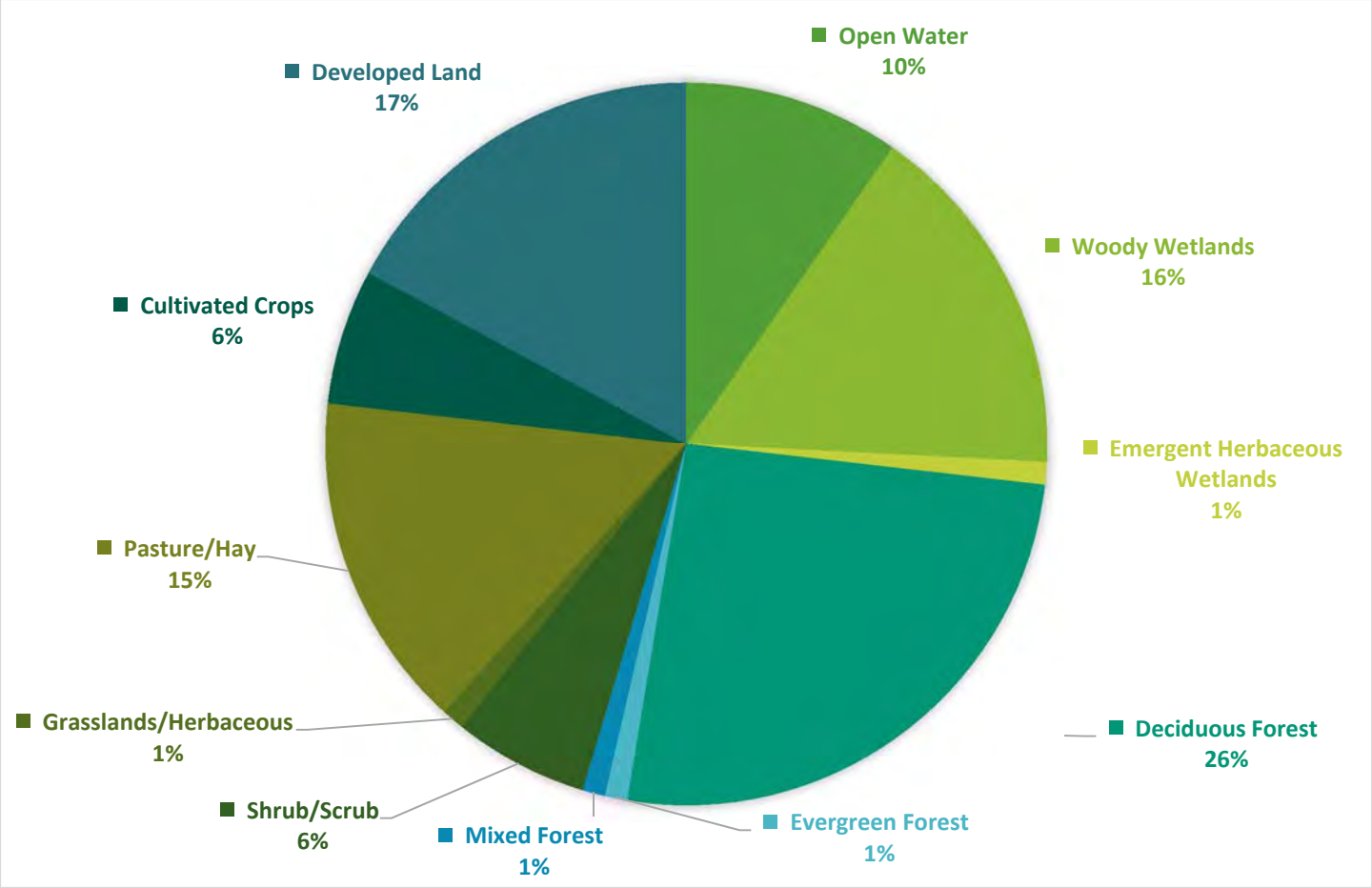

FIGURE 8. Percent cover of land cover types within three miles of Cicero Swamp WMA.

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.

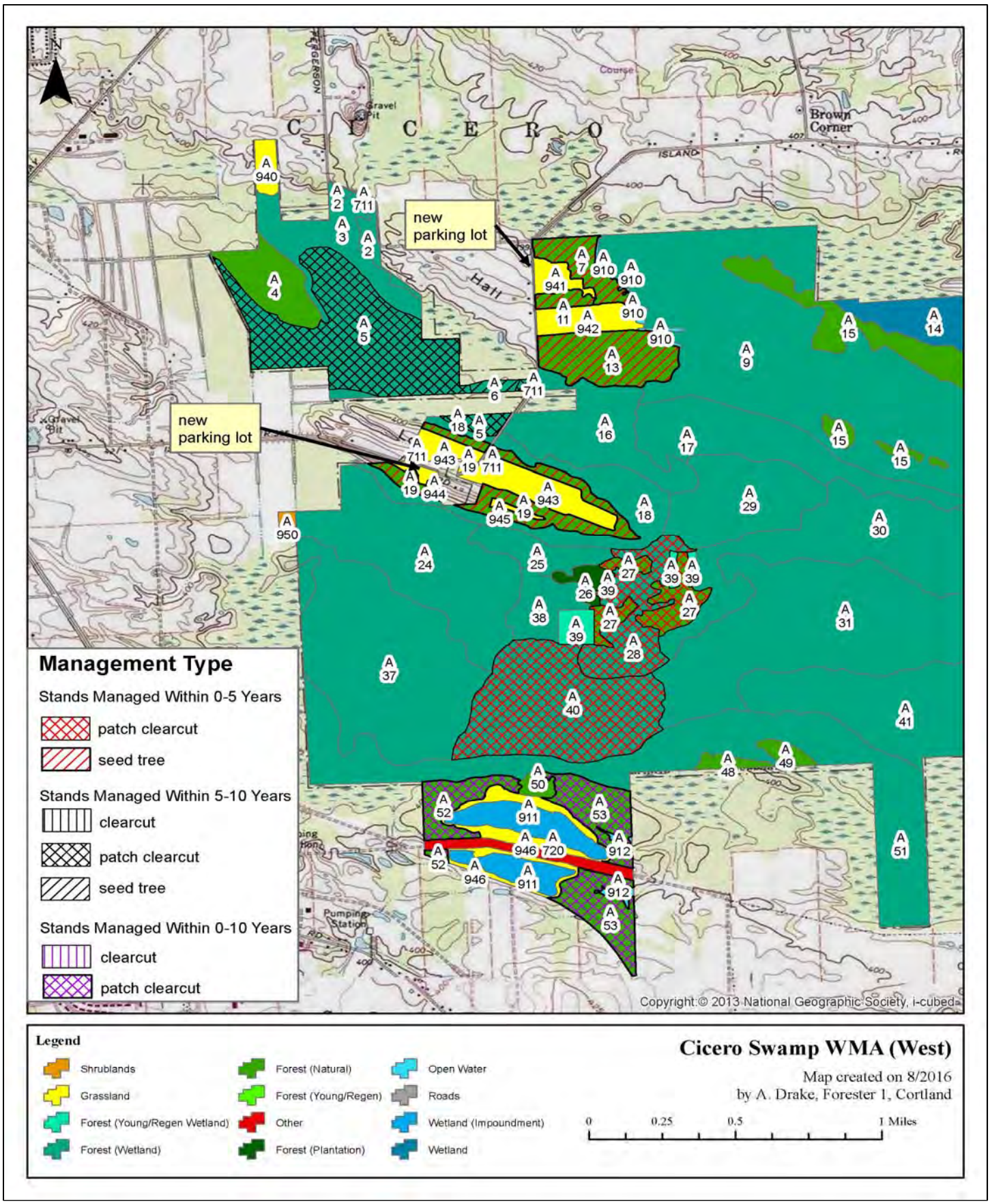

FIGURE 9. Habitat types and location(s) of proposed management on Cicero Swamp WMA (Map 1). Numbers indicate the stand number from habitat inventory.

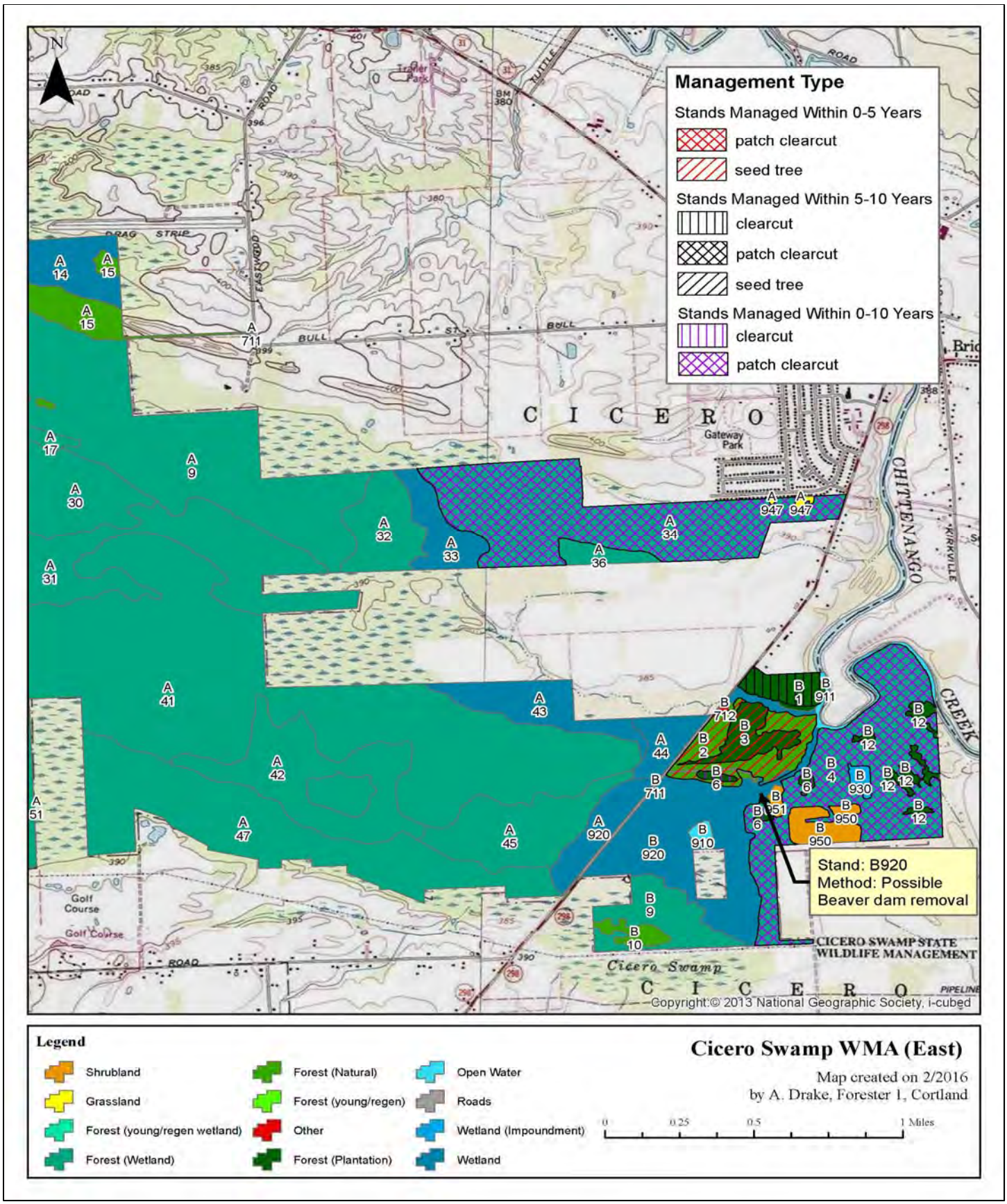

FIGURE 10. Habitat types and location(s) of proposed management on Cicero Swamp WMA (Map 2). Numbers indicate the stand number from habitat inventory.

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. STATEMENT OF CONFORMITY WITH SEQRA

Habitat Management Plans will be in compliance with the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* by following the criteria for site specific assessments included in this Programmatic Environmental Impact Statement (EIS) and by discussing further in Appendix B, Statement of Conformity with the State Environmental Quality Review Act (SEQRA). Appendix B will be included in each plan, thereby satisfying overall compliance with 6 NYCRR Part 617, the State Environmental Quality Review. If any of these criteria are exceeded an additional site specific environmental review will be required.

Most activities recommended in this HMP are a continuation of habitat management that DEC routinely conducts under the Programmatic EIS. Beginning in 2015, DEC's Young Forest Initiative (YFI) will considerably increase forest management on Wildlife Management Areas (WMA); YFI's conformity with SEQRA is specifically addressed below. The overarching goal of the YFI is to restore and maintain young forest habitat on WMAs in order to address the declining amount of young forest habitat in the state and provide habitat for key species of conservation interest, including both at-risk and game species. The habitat management activities to be carried out under the YFI are in compliance with the above referenced document and these management activities:

- Will not adversely affect threatened or endangered plants or animals or their habitat.
    - Careful review of the NY Natural Heritage Program's "Natural Heritage Element Occurrence" database in conjunction with a field survey when necessary prior to management activities taking place allows field staff to assess the presence or absence of threatened and endangered species. Appropriate actions will be taken if a threatened or endangered plant or animal is encountered in the project area including, but not limited to: establishing adequate buffer zones around known occurrences, moving the project area, or aborting the project altogether.
- Will not induce or accelerate significant change in land use.
    - The forestland affected by the YFI will be regenerated and remain forested land, therefore no land use change will take place.
- Will not induce significant change in ambient air, soil, or water quality.
    - All projects carried out under the YFI will protect air, soil and water quality through careful project planning, use of appropriate NYS Best Management Practices for Water Quality, 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.
    - YFI projects will follow established plans or policies of other state and federal agencies. Additionally, all YFI projects will be in compliance with all relevant US Fish and Wildlife Service rules and regulations.
- Will not induce significant change in public attraction or use.
    - The WMA program 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. Projects carried out under the YFI 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 area.
    - Habitat management projects under the YFI will be carried out primarily through even-aged forest management. Even-aged silvicultural systems are designed to mimic natural disturbances, such as flooding, wildfire, insect and disease outbreaks and storm damage often found in nature.
- Will not result in areas of significantly different character or ecological processes.
    - The even-aged silvicultural techniques that will be employed for habitat management projects under the YFI intentionally result in areas of different character and ecological processes. However, they are not considered significant as they are ephemeral or transitional and will not permanently alter the landscape.
- Will not affect important known historical or archeological sites.
    - Each YFI project will be reviewed by DEC's State Historic Preservation Officer (SHPO) as well as the Office of Parks, Recreation and Historic Preservation (OPRHP) to determine whether

project sites may potentially affect any historical or archeological sites. In addition, thorough field review prior to management activities taking place allows field staff to assess the presence or absence of any apparent historical or archeological sites that may not be found during the review process. Should known important historical or archeological sites present themselves necessary actions will be taken to protect these resources under the direction of DEC's SHPO and the OPRHP Archaeology Unit staff.

- Will not involve the application of herbicides, pesticides or other such chemicals.
    - YFI projects may involve the judicious use of pesticides which may be necessary to control invasive species, to protect rare and endangered plants from competition, or to control vegetation interfering with forest regeneration. If projects do require the use of herbicides or pesticides an additional site-specific environmental review will be required.
- Will not stimulate significant public controversy.
    - It is not anticipated that YFI projects will stimulate significant public controversy. A significant amount of public outreach and notification will be conducted on an on-going basis as well as prior to projects being implemented on the ground including, but not limited to: public information sessions regarding the Habitat Management Plans for each WMA, signage installation at project sites informing the public of the scope and purpose of the project, establishment of one demonstration area in each region to showcase YFI management techniques to the public, periodic informational articles published in local media outlets and the development of a public YFI website. The YFI has one full time position dedicated to facilitating the program's public outreach and communication efforts.

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.

FY 16-17 (4/1/16 - 3/31/17)