Habitat Management Plan
for
Lake Shore Marshes Wildlife Management Area
2017 - 2026

Division of Fish and Wildlife
Bureau of Wildlife
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SUMMARY

Lake Shore Marshes Wildlife Management Area (WMA) is located in northeastern Wayne County in the townships of Huron, Sodus, and Wolcott. The WMA is composed of eight units, bounded on the north by Lake Ontario, and contains over 6,000 acres. The majority of the WMA was purchased in the early 1960s for the protection and enhancement of the wetlands complex. Wetland types unique to the Great Lakes are present here and include barrier beach, drowned river mouth, and protected embayment, which provide diverse habitats important to many species of fish and wildlife. The WMA provides valuable public access to wildlife resources and affords multiple recreational opportunities including hunting, fishing, trapping, and wildlife observation. Popular game species, such as waterfowl, white-tailed deer, and wild turkey, are plentiful on the WMA. Several threatened or special concern species and Species of Greatest Conservation Need (SGCN) use the various habitats on the WMA for breeding, migratory stopover, and/or wintering. The WMA is especially important to migrating waterfowl, raptors, and songbirds due its proximity to Lake Ontario. The entire WMA is designated as a New York State Bird Conservation Area[1] and the majority of the wetlands are designated as Significant Coastal Fish and Wildlife Habitat.[2] Habitat management on the WMA originally focused on enhancing waterfowl production; however, current objectives primarily aim to maintain a diversity of wetland and upland habitats that benefit a wide range of resident and migrating wildlife species.

Habitat management goals for Lake Shore Marshes WMA include:

- Managing approximately 5% as young forest (at least 10% of forested area) to promote American woodcock, ruffed grouse, and other young forest wildlife;
- Maintaining approximately 46% as intermediate and mature forest to provide diversity in forest habitats and promote associated wildlife, such as scarlet tanager and wood thrush;
- Maintaining approximately 2% as early-successional shrubland to provide dense cover and soft mast for associated wildlife;
- Maintaining approximately 3% as grasslands to provide waterfowl nesting habitat and diverse food and cover for forest wildlife;
- Temporarily managing approximately 1% as agricultural lands as a means to reseed and restore grassland habitat quality;
- Managing approximately 5% as wetland impoundments that provide diverse habitats that benefit wetland-dependent species; and
- Maintaining approximately 36% as natural wetlands and open water that benefit wildlife for breeding and/or migratory stopover.

[1] Information about Bird Conservation Areas is available online at http://www.dec.ny.gov/animals/25341.html.
[2] Information about Significant Coastal Fish and Wildlife Habitats is available online at https://www.dos.ny.gov/opd/programs/consistency/scfwhabitats.html.

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, considering juxtaposition of all habitat types to guide the conservation and management of popular game species and 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 storm intensity, 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

Lake Shore Marshes WMA is located in Region 8, Towns of Huron, Sodus, and Wolcott, Wayne County (Figures 1 through 4, Image 1).

Image 1: Location of Lake Shore Marshes WMA

Total Area

6,430 acres

Units (West to East)

Shaker Tract (486 acres)
South Sodus Bay (686 acres)
Root Swamp (284 acres)
East Bay (1,207 acres)
Beaver Creek (1,263 acres)
Port Bay (627 acres)
Red Creek (788 acres)
Black Creek (1,089 acres)

Habitat Inventory

A habitat inventory of the WMA was completed in 2017 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. Property boundaries should be resurveyed to improve accuracy of WMA and habitat type acreages. 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 Lake Shore Marshes WMA.

Habitat Type [a]	Current Conditions (as of 2017)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [b]	3,112	49%		2,916	Decrease to 46%
Young forest	133	2%		329	Increase to 5%
Shrubland	140	2%		128	2%
Grassland	263	4%		202	Decrease to 3%
Agricultural land	0	0%		73	Increase to 1%
Wetland (natural)	1,868	29%		1,868	No change
Wetland (impounded)	337	5%		337	No change
Barrier bar	46	1%		46	No change
Open water	470	7%		470	No change
Other (roads and parking)	61	1%	13	61	No change
Rivers and streams			34		No change
Total Acres:	6,430	100%		6,430	

[a] Descriptions of habitat types are provided within the corresponding habitat type sections of this plan.

[b] 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.

ECOLOGICAL RESOURCES

Wildlife Overview:

Lake Shore Marshes WMA is a large complex of diverse upland and wetland habitats. Wetland habitats include emergent and submergent marsh, scrub-shrub swamp, and forested wetlands. The majority of open water habitat is found within the bays and where low-gradient warm water streams bisect wetlands. Uplands of the WMA are generally situated adjacent to the wetland basins and are composed of hardwood and conifer forests, grasslands, and early-successional shrublands. The WMA is a designated Bird Conservation Area due to the large concentrations of waterfowl and other migratory birds that stopover annually, and the great diversity of species that breed here, including several that are rare or imperiled. Species diversity and abundance varies widely throughout the year, being largely influenced by seasonal migrations.

Species commonly occurring on the WMA include:

- Waterfowl (e.g., American wigeon, Canada goose, gadwall, green-winged teal, hooded merganser, mallard, northern pintail, ring-necked duck, tundra swan, wood duck)
- Marshbirds, shorebirds, and wading birds (e.g., bitterns, egrets, herons, rails, sandpipers)
- Raptors (e.g., bald eagle, northern harrier, osprey, and red-tailed hawk)
- Songbirds (e.g., American robin, common grackle, gray catbird, marsh wren, purple martin, red-winged blackbird, song sparrow, tree swallow, yellow warbler)
- Amphibians and reptiles (e.g., green frog, leopard frog, spring peeper, common garter snake, northern water snake, milk snake, painted turtle, snapping turtle)
- Furbearers (e.g., beaver, mink, muskrat, otter)
- Upland mammals (e.g., cottontail, coyote, fox, opossum, raccoon, white-tailed deer)

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or Special Concern (SC) species and/or SGCN may occur on the WMA (Table 2).[3] 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,[4] NY Reptile and Amphibian Atlas,[5] DEC wildlife surveys and monitoring, and eBird.[6]

Table 2. Species of conservation concern that may be present on Lake Shore Marshes 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	American bittern		SC	x
	American black duck			HP
	American kestrel			x
	American woodcock			x
	Bald eagle		T	x
	Black-billed cuckoo			x
	Black-throated blue warbler			x
	Black tern		E	HP
	Blue-winged teal			x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Canada warbler			HP
	Cerulean warbler		SC	x
	Common loon		SC	x
	Eastern meadowlark			HP
	Golden-winged warbler		SC	HP
	Grasshopper sparrow		SC	HP
	Horned lark		SC	HP
	Least bittern		T	x
	Northern harrier		T	x
	Osprey		SC	
	Pied-billed grebe		T	x
	Red-headed woodpecker		SC	HP
	Ruffed grouse			x
	Scarlet tanager			x
	Sedge wren		T	HP
	Sharp-shinned hawk		SC	
	Upland sandpiper		T	HP

[3] 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.
[4] Available online at http://www.dec.ny.gov/animals/7312.html.
[5] Available online at http://www.dec.ny.gov/animals/7140.html.
[6] 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
	Vesper sparrow		SC	HP
	Wood thrush			x
Mammals	None known to occur			
Amphibians and reptiles	Common mudpuppy			x
	Eastern musk turtle			HP
	Eastern ribbonsnake			x
	Eastern spiny softshell		SC	HP
	Jefferson salamander		SC	
	Northern map turtle			x
	Snapping turtle			x
	Spotted turtle		SC	HP
	Western chorus frog			x
	Wood turtle		SC	HP
Fish	Blackchin shiner			x
	Pugnose shiner		E	x
	Western pirate perch			x
Invertebrates	Paper pondshell			x
Plants	Frank's sedge		E	
	Hooker's orchid		E	
	Nodding pogonia		T	

Significant Ecological Communities:

There are four rare and significant natural communities located on Lake Shore Marshes 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* [7] (Figures 5 through 9):

- **Dwarf Shrub Bog** (S3) - an ombotrophic or weakly minerotrophic peatland dominated by low-growing, evergreen, ericaceous shrubs and peat mosses (*Sphagnum* spp.). The surface of the peatland is typically a mosaic of hummock/hollow microtopography. The hummocks tend to have a higher abundance of shrubs than the hollows; these bogs have more than 50% cover of low-growing shrubs. Water is usually nutrient-poor and acidic.
- **Great Lakes Aquatic Bed** (S3) - the aquatic community of the protected shoals of the

[7] 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.

Great Lakes or Lake Champlain. They occur in quiet bays that are protected from extreme wave action by islands, shoals or barrier bars, and typically support large areas of "weeds" or aquatic macrophytes. These bays may freeze over in winter and become inversely stratified (coldest water at the surface). They are warm, mesotrophic, and alkaline. Substrate can vary among sand, silt, muck, and rock. Two variants are known: classical "aquatic beds" with abundant macrophytes and sparsely-vegetated or unvegetated bays.

- **Shallow Emergent Marsh** (S5) - a marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat), that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh; water depths may range from 15 cm to 2 m (6 in to 3.3 ft) during flood stages, but the water level usually drops by mid to late summer and the substrate is exposed during an average year. This is a very broadly defined type that includes several distinct variants and many intermediates. Shallow emergent marshes are very common and quite variable. They may be codominated by a mixture of species, or have a single dominant species.
- **Silver Maple-Ash Swamp** (S3) - a hardwood basin swamp that typically occurs in poorly-drained depressions or along the borders of large lakes, and less frequently in poorly drained soils along rivers. These sites are characterized by uniformly wet conditions with minimal seasonal fluctuations in water levels.

Additional information about significant ecological communities is available in the Lake Shore Marshes WMA Biodiversity Inventory Final Report (1996) prepared by the NY Natural Heritage Program. The comprehensive report of biodiversity inventory on WMAs in New York (1998) lists Lake Shore Marshes WMA as a management area with particular importance for biodiversity protection because of the high number of significant ecological communities and imperiled animal and plant species.

Topography and Soils:

Elevations of land on Lake Shore Marshes WMA ranges from approximately 245 feet above sea level to 400 feet. In general, each unit consists of a wetland basin fed by streams draining the surrounding uplands. Numerous drumlin formations with steep slopes on their northern ends abut the marshes. The drumlins and elevated areas run predominantly in a north-south direction and range from steep-sided ridges to gently sloping flats. Along Lake Ontario are gravel and sand beaches, and in several areas eroded bluffs of glacial till rise steeply from shore.

Nearly half of WMA soils are inundated and support various wetland types. Upland soils are predominantly of Collamer-Williamson associations, consisting of lake-laid silty loams with small amounts of clay in the subsoil. The soils are deep lake deposits that are moderately well drained, with a hardpan level to strongly sloping.

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 Lake Shore Marshes WMA include:

- Ten wetlands regulated by Article 24 of the Environmental Conservation Law and 163 wetlands shown on the National Wetlands Inventory (NWI; Figures 10 through 14).

State-regulated wetlands are protected by a buffer zone (regulated adjacent area), of 100 feet from the delineated wetland boundary. There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.

- Approximately 32 miles of streams and 10 miles of shoreline (Figures 10 through 14). Waters classified as C(T) and B are present on the WMA and are regulated by Article 15 of the Environmental Conservation Law. Water quality standards will be adhered to on all streams. [8]
- The majority of the WMA falls within the Great Lakes Coastal Management Area boundary. Habitat management on the WMA will adhere to the policies outlined by the New York State Coastal Management Program. [9]

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.*[10] 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 forest stand prescriptions.

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 Lake Shore Marshes WMA (Figures 15 and 16). The landscape within a three mile buffer of the WMA is primarily privately-owned land including:

- Open water (33%)
- Forest, including deciduous, evergreen, and mixed (28%)
- Pasture/hay, grassland, and orchards (20%)
- Cultivated crops (7%)
- Wetland, including woody and emergent (6%)
- Developed (5%)
- Early-successional shrubland (1%)

Four other conservation lands are near Lake Shore Marshes WMA (Figure 15). This includes:

- Alasa Farms Conservation Easement (627 acres) – forest, streams, crops, orchard.
- Chimney Bluffs State Park (450 acres) – diverse forest, grassland, bluffs, shore.
- Fair Haven Beach State Park (1,090 acres) – marsh, forest, open water, shore.
- Huckleberry Swamp (79 acres) – emergent, shrub, and forested wetlands.

[8] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.
[9] Information about the New York State Coastal Management Program is available online at https://www.dos.ny.gov/opd/programs/WFRevitalization/coastmgmtprog.html.
[10] Available online at http://www.dec.ny.gov/outdoor/104218.html.

Being located on the south shore of Lake Ontario, the WMA is an important stopover for migrating birds in spring and fall.[11] Before and after birds cross this large body of open water, they concentrate in areas of good habitat to rest, eat, and wait for appropriate conditions to continue traveling. For example, nearly 4,000 individuals, composed of 12 raptor species, were observed flying over the Red Creek unit on a single day during spring migration. It is an important goal to maintain the high value of migratory stopover habitat on the WMA.

The landscape surrounding the WMA, excluding Lake Ontario, is predominantly agriculture and forest. However, the current forest age structure in the region provides limited benefits to species requiring a young forest component. Young forest habitat and several associated wildlife species have steeply declined in the northeast over recent decades due to maturing forests caused by a lack of natural and human-caused forest disturbances. Thus a goal of this plan is to manage the WMA to afford a greater component of this limited habitat type while retaining the forested character of the greater landscape.

Bays and wetlands of the WMA are influenced by the waters of Lake Ontario, and the regulation of lake levels by the International Joint Commission will continue to impact them.[12] A more natural fluctuation of lake levels is needed to restore and maintain the diversity of wetlands within these lake shore marshes. Effective habitat management in these marshes will require consideration of lake level fluctuations, and future efforts to provide diverse wetland vegetation and habitats may require impoundment construction and active water level manipulation.

There is potential for wind energy development in the landscape surrounding the WMA. Habitat management objectives on the WMA will need to consider the impacts these developments would have to wildlife populations utilizing the WMA, as well as to habitats available on the landscape.

II. Management Strategies by Habitat Type

DEC will continue active management of wildlife habitats on Lake Shore Marshes 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.

[11] France, K. E. 2012. Lake Ontario Migratory Bird Stopover Project. Prepared by The Nature Conservancy in partnership with Audubon NY and NY Natural Heritage Program.
[12] Information about the International Joint Commission and the regulation of Lake Ontario water levels is available online at http://ijc.org/en_/islrbc/Regulating_Lake_Ontario-St._Lawrence_River.

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. This includes floodplain and riparian forest stands.
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 Lake Shore Marshes 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 Young Forest Initiative (YFI) to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat. [13]

MANAGEMENT OBJECTIVES

- Increase young forest from 133 to 334 acres (10% of WMA forested acreage) to improve habitat for young forest-dependent species. Future management should maintain at least 10% of WMA forested acreage as young forest in perpetuity.
- Maintain 2,911 acres (90% of WMA forested acreage) in an intermediate or mature age class to provide a diversity of forest habitats to benefit associated wildlife, especially the dense understory and fruiting shrubs important to migrating songbirds.
- Encourage regeneration of native hardwoods and conifers (e.g., black cherry, red oak, sugar maple, and hemlock) to increase availability of mast and cover for wildlife.
- Release apple trees in historic orchards to provide a soft mast food source for wildlife.
- Control non-native invasive vegetation to maintain forest biodiversity.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 3,245 acres of forest covering approximately 51% of Lake Shore Marshes WMA (Figures 17 through 21). Table 3 provides a summary of the forested areas, including the most common tree species present in each.

All eight units of the WMA contain forest, which is generally found along the wetlands and streams of each unit, and includes both forested wetlands and upland forest. Forest stands here vary in composition, including lowland flooded forest, mature upland timber, intermediate forests reverted from fields and orchards, and young forest resulting from recent timber harvest activity and shrubland succession. Forest cover on the WMA is mostly fragmented, interspersed

[13] 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.

among open wetlands and private agriculture lands. However, large blocks (100+ acres) and connective corridors do occur on the WMA, and in some cases WMA forests are contiguous to large private forests.

Dominant forest communities include climax northern hardwoods, successional northern hardwoods, oak-hickory, and silver maple-ash swamp. Conifers are a minor component on the WMA, with hemlock present in several hardwood stands, and a few pine and spruce plantations throughout the WMA. Soils on the WMA are quite fertile and have the potential to grow trees quickly and to large sizes (Photo 1). For example, the WMA contains exceptional examples of large black cherry trees grown faster than typical.

A diversity of forest habitats exists here and provides habitat for a wide range of wildlife. The forested wetlands provide breeding habitat for species such as spotted salamander and wood duck. Forests at the edge of marshes provide roosting trees for egrets, herons, and kingfishers, and nesting trees for bald eagle. Large blocks of mature forest provide interior habitat required by species such as scarlet tanager and wood thrush. Young forests provide required habitat to several declining species, such as blue-winged warbler, ruffed grouse, and wood turtle, and also provide abundant food and cover important to numerous species throughout the year, including those often associated with mature forest. Various common species, such as deer, fox, raccoon, and weasel utilize the entire range of forested conditions on the WMA. Additionally, the forests of the WMA are exceptionally important as stopover habitat for migrating raptors and songbirds.

Photo 1: Some stands on the WMA contain massive trees that provide unique habitat.

Photo: Mike Palermo, NYSDEC

Table 3. Summary of the acreage and dominant overstory species for each forest type present on Lake Shore Marshes WMA.

Forest Type	Acres (as of 2017)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	2,576	2,380	Cherry, beech, hemlock, red and sugar maple, red oak, tulip poplar
Plantation (mature/intermediate)	85	85	Red pine and Norway spruce
Forested wetland (mature/intermediate)	451	451	Cottonwood, green ash, red and silver maple, sycamore
Young forest	133	329	Ash, aspen, black cherry, red and sugar maple, tulip poplar
Young forest (forested wetland)	0	0	Currently not present on WMA
Total Forested Acres:	3,245	3,245	

Target Species:

Due to the predominance of intermediate and mature forest, and low proportion of young forest here, there has been a decline of wildlife species dependent upon young forests. Target species for forest habitat management at Lake Shore Marshes WMA are American woodcock, golden-winged warbler, and ruffed grouse. These are all Species of Greatest Conservation Need (SGCN) and have declining populations.

Photo 2: An example of the habitat structure used by golden-winged warblers on the Red Creek unit.

Photo: Mike Palermo, NYSDEC

These species rely on areas of young forest adjacent to mature forest for nesting, foraging, and cover and will benefit from management that creates the following habitat conditions:

- American woodcock:
  - Singing/peenting ground – Open areas from 1 to >100 acres, usually in an abandoned field.
  - Foraging areas – Moist, rich soils with dense overhead cover of young trees.
  - Nesting – Young, open, second growth woodlands.
  - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
  - Roosting – Open fields (minimum of 5 acres) or reverting farm fields.[14]
- Golden-winged warbler:
  - Singing ground – Open patches (5 to 25 acres) with scattered trees (Photo 2).
  - Nesting – Fields or patches (5 to 25 acres) that are heavily vegetated with herbaceous cover with a moderate density of shrubs near a forest edge.
  - Brood rearing – Similar to nesting except also including clumps of younger trees.
  - Foraging – Open areas with herbaceous vegetation that supports insects. [15]
- Ruffed grouse:
  - Drumming areas – Downed trees surrounded by small diameter woody cover with high stem density.
  - Foraging areas – Open areas with dense overhead cover of young forest with good mast production and catkins. Aspen is an especially important food source.
  - Nesting – Young, open forest stands or second growth woodlands.
  - Brood rearing – Herbaceous ground cover with a high midstory stem density.[16, 17]

[14] 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.
[15] Golden-winged Warbler Working Group. 2013. Best Management Practices for Golden-winged Warbler Habitats in the Great Lakes Region. www.gwwa.org.
[16] Dessecker, D. R., G. W. Norman, and S. J. Williamson. 2006. Ruffed Grouse Conservation Plan. Association of Fish & Wildlife Agencies: Resident Game Bird Working Group. 94 pp.
[17] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.

Management actions to create young forest will also benefit several other SGCN known to occur on the WMA, including black-billed cuckoo, blue-winged warbler, brown thrasher, Canada warbler, and wood turtle. SGCN dependent upon young forest habitat have been experiencing significant declines for decades and habitat loss is a primary cause (e.g., brown thrasher has declined 41% since 1966).[18] More common wildlife species, such as bobcat, white-tailed deer, and wild turkey are expected to benefit as well from the abundant food and cover found in young forests. A variety of pollinator species, such as bees and butterflies, are also expected to benefit from the abundance of flowering plants in young forests. Pollination is critical to the reproduction of wild and cultivated plants and providing habitat to sustain these pollinator populations is important both ecologically and economically.[19]

It is important to note that young forest habitat is also important to many species typically associated with mature forest. The abundant and diverse food (e.g., berries, catkins, and insects) present in young forests attract juvenile interior nesting bird species, such as black-throated blue warbler, during critical growth periods as well as juveniles and adults preparing for energy intensive migrations.

Mature forest on the WMA currently provides abundant habitat for numerous wildlife species, including several SGCN, such as scarlet tanager and wood thrush. Over time, managing at least 10% of forest acreage as young forest, through the rotation of even-aged management throughout the WMA, will ensure a diversity of forest age classes in perpetuity, including the mature forest these species require.

MANAGEMENT HISTORY

Acquisition of Lake Shore Marshes WMA began in 1960 and was mostly complete by 1980. The most significant addition since then is the Shaker Tract unit, acquired in 2016. Historically, prior to DEC ownership, much of the upland areas of the WMA were cleared of forest and used for crops and orchards. Current forest cover on the WMA originates from forest stands that were never completely cleared, conifer plantations, and fields and orchards that were abandoned and reverted to forest.

Timber harvests on the property began in the early 1970s, and the first comprehensive forest inventory occurred in the mid-1980s. Forest management during the 1980s and 1990s intended to perpetuate northern hardwood and oak stands, promote grouse through aspen regeneration and apple tree release, improve existing and establish additional conifer plantations, and protect stands with difficult access or ecological value.

The most recent forest management activities on the WMA occurred from 2004 to 2008 when nearly 800 acres were harvested to salvage damaged timber from an ice storm in 2003. The primary intention of these harvests was to remove damaged trees to prevent the establishment and spread of forest health issues, such as fungal infection, insect infestation, and invasive vegetation. Wildlife greatly benefited from the forest habitat diversity created by these harvests.

[18] USGS Breeding Bird Survey data. This can be viewed at https://www.mbr-pwrc.usgs.gov/bbs/bbs.html.
[19] The NYS Pollinator Protection Plan can be viewed at http://www.dec.ny.gov/animals/279.html.

No forest management has occurred since these salvage harvests were completed in 2008. Young forest currently present on the WMA is the result of past timber harvests and the reversion of old fields; however, this will soon age to an intermediate forest structure and decline in habitat value for wildlife dependent upon young forests.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management is proposed during the timeframe of this plan:

- **Management planned for 2017-2021** (Table 4):
  - Clearcut harvest of Stands C05 and G24 (35 acres)
  - Seed tree harvest of Stand G39 (47 acres)
  - Overstory removal of Stand C01 (40 acres)
  - Shelterwood harvest of Stand D24 (20 acres)
  - Thinning harvest of Stands D47.2, G10, G12, and G13 (43 acres)
  - Timber stand improvement of Stands C29, D25, D47.1, and H08 (36 acres)
- **Management planned for 2022-2026** (Table 5):
  - Clearcut harvest of Stands F03, F11, and F12 (10 acres)
  - Seed tree harvest of Stand B25 (60 acres) and convert 12 acres to grassland
  - Seed tree harvest of Stands A01, A02, D01, and F44 (101 acres)

Even though 12 acres of Stand B25 are planned to be converted to grassland, the total forest acreage of the WMA will remain the same (3,245 acres) because 12 acres of shrubland are planned to revert to young forest within the next few years (see Shrubland section for details).

Table 4. Forest management schedule for the first five-year period of this HMP (2017-2021).

Stand	Acres	Size Class	Forest Type		Treatment Type	Figure / Page
			Current	Future		
C01	40	Medium Saw Timber 18”-23” DBH	Northern Hardwoods	Young Forest	Overstory Removal	Fig. 18, Pg. 54
C05	15	Small Saw Timber 12”-17” DBH	Pioneer Hardwoods	Young Forest	Clearcut	Fig. 18, Pg. 54
C29	8	Seedling/Sapling <5” DBH	Young Forest	Young Forest	Timber Stand Improvement	Fig. 18, Pg. 54
D24	20	Pole Timber 6”-11” DBH	Northern Hardwoods	Northern Hardwoods	Shelterwood	Fig. 19, Pg. 55
D25	6	Seedling/Sapling <5” DBH	Young Forest	Young Forest	Timber Stand Improvement	Fig. 19, Pg. 55
D47.1	6	Seedling/Sapling <5” DBH	Young Forest	Young Forest	Timber Stand Improvement	Fig. 19, Pg. 55
D47.2	8	Seedling/Sapling <5” DBH	Young Forest	Northern Hardwoods	Thinning	Fig. 19, Pg. 55
G10	15	Medium Saw Timber 18”-23” DBH	Northern Hardwoods	Northern Hardwoods	Thinning	Fig. 21, Pg. 57
G12	13	Medium Saw Timber 18”-23” DBH	Northern Hardwoods	Northern Hardwoods	Thinning	Fig. 21, Pg. 57
G13	7	Medium Saw Timber 18”-23” DBH	Northern Hardwoods	Northern Hardwoods	Thinning	Fig. 21, Pg. 57
G24	20	Pole Timber 6”-11” DBH	Pioneer Hardwoods	Young Forest	Clearcut	Fig. 21, Pg. 57

Table 4. Continued

Stand	Acres	Size Class	Forest Type		Treatment Type	Figure / Page
			Current	Future		
G39	47	Pole Timber 6”-11” DBH	Northern Hardwoods	Young Forest	Seed Tree	Fig. 21, Pg. 57
H08	16	Seedling/Sapling <5” DBH	Young Forest	Young Forest	Timber Stand Improvement	Fig. 17, Pg. 53

Table 5. Forest management schedule for the second five-year period of this HMP (2022-2026).

Stand	Acres	Size Class	Forest Type		Treatment Type	Figure / Page
			Current	Future		
A01	2	Small Saw Timber 12”-17” DBH	Northern Hardwoods	Young Forest	Seed Tree	Fig. 18, Pg. 54
A02	22	Small Saw Timber 12”-17” DBH	Northern Hardwoods	Young Forest	Seed Tree	Fig. 18, Pg. 54
B25	60	Small Saw Timber 12”-17” DBH	Pioneer Hardwoods	Young Forest / Grassland	Seed Tree / convert 12 acres to grassland	Fig. 17, Pg. 53
D01	12	Pole Timber 6”-11” DBH	Pioneer Hardwoods	Young Forest	Seed Tree	Fig. 19, Pg. 55
F03	3	Pole Timber 6”-11” DBH	Pioneer Hardwoods	Young Forest	Clearcut	Fig. 20, Pg. 56
F11	3	Small Saw Timber 12”-17” DBH	Pioneer Hardwoods	Young Forest	Clearcut	Fig. 20, Pg. 56
F12	4	Small Saw Timber 12”-17” DBH	Black Locust	Young Forest	Clearcut	Fig. 20, Pg. 56
F44	65	Pole Timber 6”-11” DBH	Pioneer Hardwoods	Young Forest	Seed Tree	Fig. 20, Pg. 56

Stand locations and planned management actions are also summarized in Figures 17 through 21. Specific forest stand descriptions and detailed management prescriptions will be prepared for each proposed forest management area prior to implementation (see template, Appendix C). Briefly, habitat management for each of these stands will include the following:

- **Stands A01 and A02 (24 acres):** These stands were partially cut during salvage harvests completed in 2008 and are composed of sawtimber size sugar maple, red oak, and tulip poplar. A seed tree harvest will create favorable conditions for stand regeneration and young forest establishment. Treatment of undesirable regeneration may be necessary.
- **Stand C01 (40 acres):** This stand was partially cut during previous salvage harvests and is mostly composed of sawtimber size sugar maple, with some red oak and ash. There is currently adequate advanced regeneration of sugar maple for an overstory removal. This harvest will establish young forest habitat.
- **Stands C05, F03, F11, F12, and G24 (45 acres):** These stands contain pole and sawtimber size pioneer and northern hardwood species. Each stand is challenged with low stocking levels and invasive shrubs interfering with tree seedling establishment. A clearcut along with mechanical and herbicide control of invasive species will promote the establishment and regeneration of tree species that prefer abundant sunlight, such as

aspen and black cherry. These harvests will create favorable conditions for young forest establishment.

- **Stand B25 (60 acres):** This stand is composed of sawtimber size cottonwood, aspen, and sparse northern hardwoods. The understory is dominated by invasive shrubs. The northern 12 acres of this stand will be converted to grassland to expand the adjacent grassland (Stand B942). A seed tree harvest of the remaining 48 acres of this stand will be used to control invasive species, promote aspen regeneration, and will create favorable conditions for young forest establishment.
- **Stands D01, F44 and G39 (124 acres):** These stands originated from old fields and apple orchards not being maintained and reverting to forest. They are currently of pole timber size and composed of apple trees, pioneer hardwoods, and both native and invasive shrubs. A seed tree harvest will be used to release apple trees, control invasive shrubs, and promote desirable native trees. These harvests will create favorable conditions for young forest establishment.
- **Stands C29, D25, D47.1, and H08 (36 acres):** These stands currently provide young forest habitat and originated from old fields and orchards reverting to forest. Timber stand improvement (TSI) is scheduled to control invasive vegetation, release apple trees, and promote desireable native trees. Harvest activity will knock back succession in these stands, providing continued young forest habitat over the next ten years.
- **Stand D24 (20 acres):** This stand was partially cut during the salvage harvests completed in 2008. A shelterwood harvest will stimulate desirable understory regeneration, preparing the stand to be converted to young forest in the ten years following this plan.
- **Stand D47.2 (8 acres):** This stand currently provides young forest habitat and originated from an old apple orchard reverting to forest. A thinning harvest in this stand will release remaining apple trees while retaining most sapling and pole trees. This stand will likely age from young forest to intermediate forest in the next few years as retained sapling and pole trees continue to mature.
- **Stands G10, G12, and G13 (35 acres):** These stands contain mature northern hardwood sawtimber. A thinning harvest is planned to introduce diversity to forest structure and stimulate understory development. These stands are anticipated to be managed as uneven-aged mature forests in the future.

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** [20]
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*

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

Wildlife Considerations:

Sensitive species known to be present on or near Lake Shore Marshes WMA that warrant special consideration include:

- *Bald eagle*. Eagles are known to nest near Lake Shore Marshes WMA. Forest management will avoid disturbing any nesting should it occur within or adjacent to a stand with proposed timber harvest actions. This may include delaying nearby harvest actions until after the breeding season and/or the establishment of a forested buffer around the nest.
- *Cerulean warbler.* A point-count survey to detect presence will be utilized in suitable habitat prior to a timber harvest. If detected, the harvest may be conducted outside the breeding season or may avoid the occupied habitat.
- *Forest raptors*. Pre-timber harvest surveys will be conducted in suitable habitat and if nesting is documented, harvest activities nearby may be adjusted to occur outside the breeding season and nest buffers may be established.
- *Indiana, northern long-eared, and tri-colored bats*. There are no known occurrences of these species on the WMA. However, surveys will occur in suitable habitat prior to timber harvest activities to detect presence or probable absence, or harvests will take place in winter to avoid potential impacts.
- *Jefferson salamander*. These salamanders breed in vernal pools and then spend the majority of their adult lives in the surrounding uplands. Forest management should avoid disturbing vernal pools and adjacent upland forest.

Due to the sensitivity of endangered, threatened, and special concern species, and SGCN, special management guidelines may be implemented if additional species become known to occur in or within close proximity to the forest stand to be harvested.

Forest Health Considerations:

Forest pests, diseases, and invasive vegetation are an ongoing problem for habitat management. When pests or diseases attack forests in high numbers and cause decline and mortality, habitat values can shift to the detriment of many resident wildlife species. Likewise, as invasive plants invade an area, outcompeting and dominating native vegetation, a lower diversity plant community is created. This decrease in habitat values means less wildlife may be able to utilize the area. All efforts to manage habitats on Lake Shore Marshes WMA must consider these forest pests, diseases, and invasive species and ensure that measures are taken to control their presence or prevent their establishment.

Infestations of introduced insects such as emerald ash borer (EAB), gypsy moth, hemlock wooly adelgid (HWA), pear thrips, and pine shoot beetle are of present concern and bear persistent monitoring. Gypsy moth and pear thrips densities fluctuate and occasionally can reach outbreak levels where complete defoliation of host trees can occur. Gypsy moth most commonly attacks oak and aspen species while pear thrips favors sugar maple. EAB and HWA have not yet been detected on the WMA; however, they are present nearby. EAB infests ash trees and HWA infests hemlock trees, and both cause mortality of host trees within a few years.

Native insect species such as fall cankerworms are cyclic in population and may impact vegetation through defoliation at some time in the future as they have in the past. Cankerworms feed on a wide-range of species including: ash, basswood, beech, black cherry, maples, and oaks.

Oak wilt is a fungal disease that can infect and kill oak trees. The disease was identified in Ontario County in 2016 and although oaks are not a major component of forests on the WMA, they are dominant in some stands. Oak wilt primarily spreads in two ways: 1) through root connections with adjacent trees, and 2) from beetles that spread spores to open wounds on other trees. Current recommendations for treating affected areas include removing infected trees and severing root connections to reduce the chance of spread. Monitoring of oak stands and seasonal timber harvest restrictions may be needed if oak wilt begins to spread throughout the region.

Invasive plants that are known to be on or near the forested areas of the WMA include: autumn olive, buckthorn, garlic mustard, giant hogweed, honeysuckle, knotweed, multiflora rose, Norway maple, swallow-wort, and wisteria.

Pre- and Post-treatment Considerations:

Regeneration of a forest stand requires suitable conditions to ensure that desired species will succeed. Non-native invasive vegetation and undesirable native plants (e.g., beech, ironwood, poison ivy, striped maple, and wild grape) are present in many stands here and have the potential to interfere with forest regeneration. Although these native species have many beneficial qualities, they are considered undesirable in this context because they have the potential to decline forest health and interfere with forest regeneration. If invasives or other undesirable species become significantly abundant, pre-treatment herbicide application may be necessary.

Deer herbivory is an issue at Lake Shore Marshes WMA. Efforts to promote deer hunting on the WMA to manage the local deer herd at desired levels will continue and could be expanded. The high fertility of soils on the WMA is expected to produce seedlings that grow above deer browse height before regeneration is suppressed. If it is determined that herbivory is intense enough to prevent regeneration of desired tree species, installation of tree shelters in treatment areas may be necessary.

If it is determined 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 increase available sunlight, scarification of forest floor to stimulate seedling establishment, and/or the direct planting 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 responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines established in the Young Forest Initiative Monitoring Plan.[21]

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

The Monitoring Plan provides statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three and five years after the harvest, or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Lake Shore Marshes WMA, which will be assessed to determine response to management, include American woodcock, golden-winged warbler, and ruffed grouse.

Monitoring of these species will include woodcock singing-ground surveys, golden-winged warbler point count and playback surveys, and ruffed grouse drumming surveys to determine habitat use and abundance in response to forest management. The establishment of periodic bird point counts and amphibian and reptile surveys in all forest types would be beneficial to better understand species diversity and use.

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

MANAGEMENT OBJECTIVES

- Maintain approximately 128 acres of shrubland habitat to provide dense cover, abundant soft mast, and an interspersion of grass and wildflowers that benefit associated wildlife.
- Control invasive vegetation and promote dominance of native shrub species.
- Allow 12 acres of shrubland to revert to young forest.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

There are 140 acres of shrubland on Lake Shore Marshes WMA (Figures 17 through 21). Shrubland exists on several units of the WMA, ranging from a fringe between grassland and wetland, to small patches of just a few acres, to a large contiguous block of 108 acres on the Shaker Tract unit (Photo 3).

Photo 3: This large shrubland on the Shaker Tract unit provides important habitat to numerous species.

Photo: Michael Palermo, NYSDEC

Many of these shrublands originated from grasslands, old agricultural fields, and orchards not being maintained and naturally succeeding to a shrub-dominated plant community. These stands vary from sparse shrubs and grasses to extensive and dense shrub thickets with scattered trees.

Native shrubs found in these areas include species of dogwood, hawthorn, sumac, and viburnum, which provide valuable dense cover and soft-mast for wildlife. Non-native shrub species, such as autumn olive, buckthorn, honeysuckle, and multiflora rose, are established in most of these shrublands, as well, and in some areas are dominant.

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

Target species for shrubland management on Lake Shore Marshes WMA are:

- American woodcock
- Golden-winged warbler

Both of these species use shrubland for nesting and foraging, and much of their habitat requirements overlap. Particular differences include the golden-winged warbler's need for scattered perch trees and the woodcock's need for herbaceous openings for singing and courtship. Managing shrublands on the WMA targeting these species is expected to benefit numerous other species as well, including other SGCN, such as black-billed cuckoo, blue-winged warbler, brown thrasher, ruffed grouse, and wood turtle, and several popular game species including cottontail rabbit, white-tailed deer, and wild turkey.

MANAGEMENT HISTORY

Past DEC management of Lake Shore Marshes WMA has included the maintenance of shrubland areas and the planting of wildlife food and cover shrubs. Shrubs were often planted along woodland edges to enhance the transition zone between habitat types. Once considered benign and beneficial, non-native species were sometimes included in these plantings. This was likely a significant source of some invasive shrub species that have become established here.

The majority of shrubland acreage on the WMA was established through natural reversion of grasslands and old agricultural fields. Several of these areas have been periodically maintained with a brush hog or other forestry equipment, including efforts to control invasive species.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figures 17 through 21):
    - Throughout shrubland stands, perform maintenance actions as needed.
        - Brush cutting using a rotary mower or forestry cutter should be utilized to stimulate dense shrub regrowth and to maintain an interspersion of openings and travel corridors.
        - Young trees that would eventually dominate and shade out shrubs should be selectively cut; stumps should be removed or cut low to facilitate future maintenance. Small stands of trees may be left as islands.
        - When and where feasible prescribed fire may be utilized.

- Throughout shrubland stands, promote the dominance of native shrub species.
    - Control of invasive vegetation will be accomplished through mechanical removal, prescribed fire, and/or herbicide application. Native shrubs may be planted to replace invasives.
    - Habitat type conversion to grassland for a few years may be necessary to effectively control invasives. Either the converted stand or another area of grassland would then be planted or allowed to revert to a native shrubland to maintain acreage of each habitat type.
- Allow 12 acres of shrubland (Stands B952, B953, and D952) to revert to forest.
    - These shrublands contain an abundance of trees that are expected to become dominant in the near future and will provide valuable young forest habitat. Access to maintain these stands as shrubland would be difficult due to terrain and/or crossing private property.

BEST MANAGEMENT PRACTICES

In order to minimize disturbance to shrubland wildlife during management activities, brush-cutting and tree removal, if possible, should be done outside the bird nesting and brood rearing part of the year (April 15 to August 15). However, management may occur within this timeframe if it is to be done for long term benefits to the habitat/wildlife, such as invasive species management. It is often most effective to cut well-established invasive shrubs between flowering and fruit set to prevent seed production and dispersal.

MANAGEMENT EVALUATION

Current monitoring of shrubland habitat at Lake Shore Marshes WMA is informal and data are often derived opportunistically, and will be continued. Shrubland areas will be included in the American woodcock and golden-winged warbler surveys previously discussed in the Forest section above. However, the establishment of periodic bird point counts, and other wildlife surveys, would be beneficial to better understand species diversity and habitat use.

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.

MANAGEMENT OBJECTIVES

- Maintain approximately 263 acres as grassland habitat to encourage favorable herbaceous species and prevent reversion to shrubland and forest.
- Convert approximately 12 acres of forest to grassland.
- Temporarily (1 to 5 years) convert approximately 73 acres of grassland to agricultural lands as a means to control woody plant growth and restore grassland quality.
- Identify and control invasive plant species to prevent their dominance in fields.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

There are currently 263 acres of grassland habitat on Lake Shore Marshes WMA (Figures 17 through 21, Photo 4). This is composed of several small fields, ranging from 4 to 21 acres, which are generally adjacent to wetlands or surrounded by forest.

Grasslands on the WMA are composed mostly of cool season grasses and forbs, with several fields containing warm-season grasses from recent replanting. Several fields currently contain an abundance of undesirable woody plant growth and control should continue to prevent reversion to shrubland.

Photo 4: Grassland located adjacent to wetland provides important breeding habitat for waterfowl, such as mallards.

Imagery ©2017 Google, Map data ©2017 Google

Maintenance of these fields as grassland is intended to benefit a diversity of wildlife species that inhabit the surrounding wetlands and forest. Grasslands adjacent to wetlands provide important nesting habitat for waterfowl, such as mallard and blue-winged teal, and foraging habitat for northern harrier and other wintering raptors. Grasslands adjacent to forest provide habitat for upland animals, such as deer (fawning) and turkey (brood rearing). Pollinators, such as bees and butterflies, and various other insects, thrive in grasslands and provide an important high-protein food for grouse chicks, turkey poults, and songbirds.

Grasslands on the WMA are generally too small to provide significant breeding habitat for grassland-dependent songbird species (e.g., bobolink and meadowlark) which typically require large patches of grassland (>25 acres) with low edge-to-area ratios in an open landscape. However, these grasslands can provide critical migratory stopover habitat before and after these birds cross Lake Ontario.

In an effort to promote hunting opportunities, the ring-necked pheasant has been stocked in grasslands on the WMA annually since 1978. Pheasant, and several other wildlife species, benefit from the abundant seeds and herbaceous cover that often persists in grasslands throughout the winter.

Target species for grassland management on Lake Shore Marshes WMA are:

- Breeding waterfowl (e.g., mallard and blue-winged teal)
- Northern harrier and red-tailed hawk
- Pheasant, white-tailed deer, and wild turkey
- Bees, butterflies, and other pollinators

MANAGEMENT HISTORY

Historically, most of the fields at Lake Shore Marshes WMA were used for agriculture. Under DEC management, fields were routinely maintained to prevent reversion to shrubland and forest. Maintenance actions have included mowing, agricultural practices, herbicide application, spreading of soil amendments, and reseeding to herbaceous plants of higher food and cover value to wildlife.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figures 17 through 21):
    - Throughout all grassland stands, routinely perform maintenance actions.
        - Mow fields every 1-3 years to prevent establishment of woody vegetation.
            - Mowing of fields heavily invaded by woody plants may be most effective if conducted in early spring and again before senescence.
        - Incorporate prescribed burning in those fields with a warm-season grass component. Burning will control undesirable woody vegetation growth and promote warm-season grasses which are known to have a high food and cover value for wildlife.
        - Control invasive vegetation mechanically, biologically, and/or with herbicide.
        - Consider opportunities to incorporate rotational livestock grazing as a means to control invasive vegetation and maintain grasslands.
        - As needed: lime, fertilize, disk, and replant grasslands. Promote native herbaceous species by following best management practices.
    - Expand grassland Stand B942 (from 16 acres to 28 acres).
        - A timber harvest is planned in forest Stand B25 to improve forest habitat, as this occurs, bulldoze and seed to grass 12 acres adjacent to grassland Stand B942.
    - Temporarily (1 to 5 years) convert approximately 73 acres of grassland to agricultural lands.
        - During the first five-year period of this HMP (2017-2021) restore Stands C940, D941, D943 and D945 (40 acres).
        - During the second five-year period of this HMP (2022-2026) restore Stands F940, F942, and F943 (33 acres).
        - These grasslands will be temporarily converted to agricultural lands as a mechanism to control woody vegetation and reseed desired herbaceous plants to improve overall grassland habitat quality.

BEST MANAGEMENT PRACTICES

Due to the small, fragmented nature of grasslands on Lake Shore Marshes WMA and the related lack of important grassland bird habitat, best management practices followed here intend to enhance habitat value for waterfowl and forest wildlife using grasslands. For detailed information regarding grassland bird habitat and management recommendations see *A Plan for Conserving Grassland Birds in New York*.[22]

[22] 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.

General Management Recommendations

- Conduct invasive species control (e.g., buckthorn, Canada thistle, hogweed, honeysuckle, multiflora rose, Phragmites, swallow-wort, etc.) to improve habitat quality.
- Consider a variety of factors, such as the targeted wildlife 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, disking, 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 of any size (including all contiguous fields) with no history of listed species:
    - Mowing and other management actions should be avoided between April 23 and August 15.
    - Fields can be managed/mowed within the period April 23 and August 15 if necessary to:
        - Control the growth of woody or invasive vegetation in fields where grassland habitat value is degraded.
        - Ensure that suitable grass cover will be present to provide important winter habitat for wildlife.
    - If early management is proposed, then the habitat requirements and nesting periods of other species should be considered (e.g., nesting waterfowl, 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 can be accomplished in a wandering style. Strip mowing should be limited.
- 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

Current monitoring of grassland habitat use at Lake Shore Marshes WMA is informal and data are often derived opportunistically, and will be continued. However, the establishment of periodic breeding bird surveys would be beneficial to better understand species diversity and habitat use. Monitoring of invasive vegetation control efforts will be necessary to ensure success and prevent future spread.

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

- Temporarily convert up to 73 acres of grasslands to agricultural lands to control succession and restore grassland habitat quality.

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

There is currently no acreage on Lake Shore Marshes WMA that is managed as agricultural land. As discussed in the Grasslands section, plans for grassland restoration include the use of agricultural activities to control woody plant growth and reseed grasslands with desirable herbaceous vegetation.

Over a few years, the repeated tilling associated with cultivated crops disrupts root systems and depletes the seed bank of woody vegetation and other undesirable plants. This provides a clean slate for seeding desired herbaceous plants to establish a grassland of improved habitat value. The temporary presence of row crops and grains also have habitat value, including high-quality forage for deer, waterfowl, pheasants, and turkey. Hunters also value being able to hunt agricultural land habitat types on public land. This is particularly true regarding field hunting for geese, as nearly all public land waterfowl hunting is limited to marshes or open water.

Species that benefit from temporary agricultural habitats on the WMA include:

- Waterfowl
- White-tailed deer
- Wild turkey

MANAGEMENT HISTORY

Cooperative agreements involving agricultural activities began being used as a management tool on Lake Shore Marshes WMA in the late 1970s; however, they have not been implemented for at least a decade. These agreements generally contained a planting schedule that rotated among corn, hay, and soy beans.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2021** (Figures 18 and 19):
    - Temporarily convert grassland Stands C940, D941, D943, and D945 (approximately 40 acres) to agricultural lands to restore grassland habitat quality.
        - Control woody plant growth through repeated tilling and crop planting, with the reseeding of desired vegetation at the expiration of the contract.
- **Management planned for 2022-2026** (Figure 20):
    - Temporarily convert grassland Stands F940, F942, and F943 (approximately 33 acres) to agricultural lands to restore grassland habitat quality.
        - Control woody plant growth through repeated tilling and crop planting, with the reseeding of desired vegetation at the expiration of the contract.

BEST MANAGEMENT PRACTICES

Agricultural activities involve mowing, tilling, and the use of pesticides, which have potential to impact wildlife and the environment, therefore guidelines will be provided within contracts to minimize impacts. For Lake Shore Marshes WMA this will include: soil conservation practices, buffers between cropland and water bodies, review of planned pesticide use, no fall plowing without a winter cover crop, and no harvest of hay, alfalfa, or other grasses prior to July 15.

MANAGEMENT EVALUATION

Annual agricultural activities, such as timing of mowing and crops planted, will be tracked. Fields will be monitored for control of invasive plants to prevent spread to adjacent areas, or in preparation for rotating agricultural fields to grassland.

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 and enhance 1,868 acres of natural emergent, scrub-shrub, and open water wetlands. Enhancement includes possible expansion of level-ditching and potholes.
- Manage 337 acres of impounded wetlands to provide diverse habitats that benefit wetland-dependent wildlife such as waterfowl, black terns, and muskrat.
- Maintain integrity of impoundment dikes and water control structures.
- Identify and control invasive plant species.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 1,868 acres of natural wetlands, 337 acres of impounded wetlands, and 470 acres of open water managed on Lake Shore Marshes WMA (Figures 17 through 21). Approximately 41% of the WMA is wetland (not including forested wetlands) or open water habitat and is found on all eight units.

Natural wetlands on the WMA generally border bays and slow moving creeks. As these creeks near Lake Ontario, they fill shallow basins between drumlins, providing favorable conditions for wetland vegetation. Aquatic ecosystems unique to the Great Lakes occur on the WMA and include barrier beach, drowned river mouth, and protected embayment, which provide diverse wetland habitats important to many species of fish and wildlife, including open water, emergent and submergent marsh, shrub swamp, and wet meadow. Open water is generally limited to the bays and creek channels, and the majority of wetlands are solid cattail marsh, much of which is a thick mat floating over two to ten feet of water. Resident beaver and muskrat naturally introduce minor changes in wetlands here as they manipulate their habitat. Excavated ditches and potholes

are present on the Beaver Creek, East Bay, Red Creek, and South Sodus Bay units to increase interspersion of open water in these extensive cattail marshes and provide spawning habitat for migratory fish, such as northern pike.

The WMA contains 3 miles (approximately 46 acres) of gravel and sand barrier bars that separate Lake Ontario from the bays and wetland basins (Photo 5). The barrier bar on Port Bay is managed as a fishing access site and contains a concrete ramp and parking area. There is a permanently maintained channel in the Port Bay barrier bar and a seasonally maintained channel in the East Bay barrier bar. DEC issues permits to maintain these channels to the respective bay improvement associations to allow boat traffic between the bays and the lake. The East Bay permit requires the channel be plugged each fall to mimic natural conditions. The other barrier bars of the WMA function naturally, occasionally breaching during high water seasons or severe weather events. At times when these barrier bars are stable and without a breach, they have an impounding effect holding bay and wetland water levels higher than Lake Ontario.

Photo 5: Barrier bars on the WMA provide unique habitat composed of gravel beaches and riparian vegetation.

Imagery ©2017 Google, TerraMetrics, Map data ©2017 Google

Man-made impounded wetlands on the WMA include several small ponds and potholes (generally less than 1 acre) and three large marshes: Cottrell Marsh (70 acres), Nanny Marsh (200 acres, Photo 6), and an unnamed marsh on the Red Creek unit (15 acres). Cottrell Marsh provides hemi-marsh and scrub-shrub wetland habitat with a high amount of submerged timber, Nanny Marsh provides an expansive area of scrub-shrub wetland with patches of hemi-marsh and a wooded island, and the Red Creek impoundment provides mostly submergent marsh with standing dead timber. A dike is also present on the Port Bay unit, east of the Clapper and West Port Bay roads intersection; however, it does not function at impounding water and is surrounded by a solid cattail marsh.

Mute swans are a non-native, invasive species and are present on the WMA. Mute swan foraging can significantly reduce the density of submerged aquatic vegetation, degrading habitat important to several fish and wildlife species. Mute swans are also aggressive, especially during the breeding season, and can displace native wildlife from available habitat. Efforts to remove mute swans from the wild need to continue.[23]

Non-native invasive plant species (e.g., water chestnut, hybrid cattail, and Phragmites) are present in several wetlands on the WMA, and in some areas are negatively affecting habitat values for native wildlife. Hybrid cattail is especially challenging on the WMA as it outcompetes native plants and grows in dense stands with roots that form thick, impenetrable

[23] Information about mute swan management in NY is available at: http://www.dec.ny.gov/animals/7076.html.

mats that reduces the connectivity and value of wetlands for fish and wildlife. Efforts to control aquatic invasive plants is challenging, often requiring multiple treatments. Past control efforts have shown temporary effectiveness and need to be repeated and expanded.

Target species for wetland management on Lake Shore Marshes WMA are:

- Migrating and breeding waterfowl
- Furbearers (beaver, mink, muskrat, and otter)
- Marshbirds (American and least bitterns, pied-billed grebe, sora, and Virginia rail)
- Spiny softshell turtle and black tern

In some cases, habitat requirements of these species overlap, while some species have specific requirements or factors that limit their numbers that must be addressed. For example, the level ditching in several of the cattail marshes on the WMA provides secluded brood-rearing and courtship sites for waterfowl, they allow muskrats access to the interior of dense cattail stands, and they increase the availability of open water adjacent to cover for marshbird foraging. Limiting factors for the softshell turtle are basking and nesting sites, which require management to ensure continued habitat suitability and protection from predators. The black tern, last observed nesting on the WMA in 1994, could possibly benefit from an increase in the local muskrat population, as the terns will use the openings or "eat-outs" created by muskrats in cattail stands and sometimes nest on muskrat food piles.

Management targeting these species, as well as the overall continued protection of these wetlands, will also benefit numerous species of amphibians, reptiles, and invertebrates that also use these habitats. This includes many common species and several SGCN, including common mudpuppy, eastern ribbonsnake, western chorus frog, and map, musk, snapping, spotted, and wood turtles.

MANAGEMENT HISTORY

Historically, the bays and wetland basins of Lake Shore Marshes WMA were influenced by the natural fluctuations of Lake Ontario water levels and related formation and breaching of barrier bars. This variation of water levels over time created a diversity of wetland habitats through periodic disturbances of drying, inundation, and scouring.

Outflows of Lake Ontario have been regulated since 1958 by the Moses-Saunders power dam near Massena, NY, stabilizing water level fluctuations and reducing the natural disturbances that developed the wetlands of Lake Shore Marshes WMA. Higher water levels in summer have favored cattail dominance. Likewise, lowered lake levels

Photo 6: The control structure at Nanny Marsh allows water levels to be adjusted to manage wetland habitat.

Imagery ©2017 Google, Map data ©2017 Google

during winter months has negatively impacted muskrat overwintering habitat and thus decreased their numbers on the WMA. The decline of natural disturbances and muskrat numbers have both contributed to the invasion of hybrid cattail and the development of dense cattail stands.

Lake Shore Marshes WMA was acquired to protect vulnerable wetland resources along Lake Ontario in Wayne County. DEC management of wetlands here has focused on maintaining and improving habitat value for waterfowl, furbearers, and other wetland-related wildlife. Several ponds and marshes were constructed, such as Cottrell Marsh in the late 1970s. A control structure was installed where Nanny Marsh flows under East Bay Road in 1982 to allow for water level manipulation. Potholes and level ditches were created in the mid-1990s on the northern edge of Nanny Marsh. Canada goose goslings were released during the late 1970s and early 1980s, and the species now flourishes here. In the mid-1990s, spiny softshell nesting and basking habitat was restored on the Root Swamp unit. Invasive plant control has been ongoing since WMA acquisition, including large public events to mechanically control water chestnut.

The most recent significant wetland management activity on the WMA was the excavation of level ditching and potholes on both the Beaver Creek and Red Creek units in 2014, and on the South Sodus Bay unit in 2017. These efforts were performed in partnership with Ducks Unlimited and The Nature Conservancy.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figures 17 through 21):
    - Maintain integrity of existing impoundments in accordance with Dam Safety Inspection and Management Plans (currently being developed).
        - Mow dikes annually to prevent establishment of woody vegetation.
        - Inspect dams and spillways annually and repair as needed.
        - Inspect water control structures; repair and replace as needed.
        - Install a water control structure and rehabilitate the dike on the Red Creek unit impoundment.
    - Manage impoundments for wetland habitat diversity.
        - Adjust water levels in Cottrell and Nanny Marshes as needed to maintain a balance of hemi-marsh and scrub-shrub wetland habitats.
    - Reinforce the east side of the barrier bar on Port Bay in cooperation with Wayne County Soil and Water Conservation District (Figure 19).
        - Stones may be added to slow wave action (lake side) and trees and shrubs may be planted (bay side). Sand beach will be retained to protect turtle nesting habitat.
    - Maintain spiny softshell nesting and basking sites as needed.
    - Monitor for invasive vegetation and control mechanically, biologically, and/or with herbicide (e.g., cattail, Phragmites, water chestnut, etc.).
    - Monitor for mute swans and control as needed to remove mute swans from the WMA. Implementation is pending finalization of the New York State Mute Swan Management Plan.
    - Expand potholes and level ditching as needed to provide openings in emergent vegetation.
    - Consider additional wetland projects that will benefit wetland-dependent species as opportunities and funding arise.

BEST MANAGEMENT PRACTICES

Management activities within wetlands will take into consideration the timing of wildlife breeding and hibernation seasons and when practicable these periods of time will be avoided. All necessary permits will be obtained and associated public review will be welcomed.

MANAGEMENT EVALUATION

Current monitoring of wetland habitat use at Lake Shore Marshes WMA includes surveys to document black tern nesting (South Sodus Bay), secretive marshbird presence (Nanny Marsh and East Bay), the presence of invasive mute swan (throughout WMA), and spiny softshell nesting. These surveys should continue and could be expanded. The establishment of periodic surveys for additional species would be beneficial to better understand species diversity and 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 is typically named (e.g., Lake Ontario, Hudson River, Sodus Bay).

MANAGEMENT OBJECTIVES

- Maintain approximately 470 acres of open water habitat.
- Maintain the high-quality of waters found on the WMA.

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

The bays and creeks on Lake Shore Marshes WMA provide approximately 470 acres of open water habitat (Figures 17 through 21, Photo 7). Open water areas are managed as part of the greater wetland complex and habitat management is discussed in the Wetland section above. Open water receives less direct habitat management than the adjacent freshwater marshes; the most notable management action in open water is invasive vegetation control.

Photo 7: The Port Bay unit contains portions of Port Bay and Wolcott Creek.

Imagery ©2017 Google, Map data ©2017 Google

Approximately 32 miles of streams occur on the WMA, composed of Beaver Creek, Black Creek, Mudge Creek, Red Creek, Sodus Creek, Third Creek, Wolcott Creek, and their tributaries. The WMA contains approximately 4.5 miles of Lake Ontario shoreline and approximately 4 miles of shore along Sodus Bay, East Bay, and Port Bay.

The bays and creeks generally contain common warmwater fish species, and seasonally contain trout and salmon. Pugnose shiner (state endangered) has been found in Sodus Bay, blackchin shiner (SGCN) has been found in both Sodus Bay and East

Bay, and western pirate perch (SGCN) has been found in East Bay. Sodus Creek has seasonal spawning runs of stocked Lake Ontario salmonids, including chinook salmon, coho salmon, and rainbow trout (steelhead). Nine species of freshwater mussels have been observed in nearby creeks, including paper pondshell, which is an SGCN.

Target species for open water management on Lake Shore Marshes WMA are:

- Migrating and breeding waterfowl
- Fish (trout, salmon, and warm water species)

MANAGEMENT HISTORY

Open water resources on Lake Shore Marshes WMA have been influenced by the regulation of Lake Ontario water levels and the breaching of barrier bars. DEC management of open water on the WMA has been minimal and includes invasive plant control and permitting barrier bar breaches and channel maintenance. Wetland habitat management on the WMA, previously discussed, has likely benefited the health of bays connected to the WMA. For example, although designed to improve fish and wildlife habitat, excavated level ditching restores hydrology through cattail marshes, which slows water flow and may reduce nutrient and sediment transportation into the bays.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figures 17 through 21):
    - Maintain and improve the high-quality of waters found on the WMA.
        - All habitat management activities on the WMA will adhere to the Environmental Conservation Law and follow best management practices.

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

Bays and creeks on and near the WMA are surveyed approximately every 5 years to assess the fish community and the success of stocked walleye fingerlings.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Lake Shore Marshes 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 Lake Shore Marshes WMA, 2017-2026. (Also see Figures 17 through 21)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut harvest of Stands C05 and G24	35	2017-2021
Forest	Seed tree harvest of Stand G39	47	2017-2021
Forest	Overstory removal harvest of Stand C01	40	2017-2021
Forest	Shelterwood harvest of Stand D24	20	2017-2021
Forest	Thinning harvest of Stands D47.2, G10, G12, and G13	43	2017-2021
Forest	Timber stand improvement of Stands C29, D25, D47.1, and H08	36	2017-2021
Forest	Clearcut harvest of Stands F03, F11, and F12	10	2022-2026
Forest	Convert 12 acres to grassland, and seed tree harvest 48 acres of Stand B25	60	2022-2026
Forest	Seed tree harvest of Stands A01, A02, D01, and F44	101	2022-2026
Forest	Monitor and control invasive species	≤ 3,245	2017-2026, ongoing
Shrubland	Maintain shrubland acreage by cutting trees, brush cutting and potentially prescribed fire	≤ 128	2017-2026, as needed
Shrubland	Promote dominance of native shrubs by controlling invasive shrub species	≤ 128	2017-2026, ongoing
Shrubland	Allow Stands B952, B953, and D952 to revert to forest	12	2017-2026
Grassland	Maintain grassland acreage by mowing and potentially prescribed fire	≤ 263	Annual, biennial, or triennial

Table 7. Continued

Habitat	Management Action	Acres	Timeframe
Grassland	Expand Stand B942 by 12 acres	12	2022-2026
Grassland	Improve grassland quality (e.g., lime, fertilize, disk, and/or reseed)	≤ 263	2017-2026, as needed
Grassland	Monitor and control invasive species	≤ 263	2017-2026, ongoing
Agricultural Lands	Temporarily convert grassland Stands C940, D941, D943, and D945 to agricultural lands to restore quality of grassland habitat	≤ 40	2017-2021
Agricultural Lands	Temporarily convert grassland Stands F940, F942, and F943 to agricultural lands to restore quality of grassland habitat	≤ 33	2022-2026
Wetlands	Maintain impounded wetland dikes and control structures (e.g., inspect, mow, and repair)	2,725ft	Annually
Wetlands	Add control structure and rehabilitate dike on unnamed impoundment on Red Creek unit, east of Larkin Road		2017-2026
Wetlands	Reinforce east side of barrier bar on Port Bay	4	2017-2026
Wetlands / Open Water	Maintain level-ditching and marsh potholes	13,430ft	2017-2026, as needed
Wetlands / Open Water	Monitor and control invasive species	≤ 2,675	2017-2026, ongoing

III. FIGURES

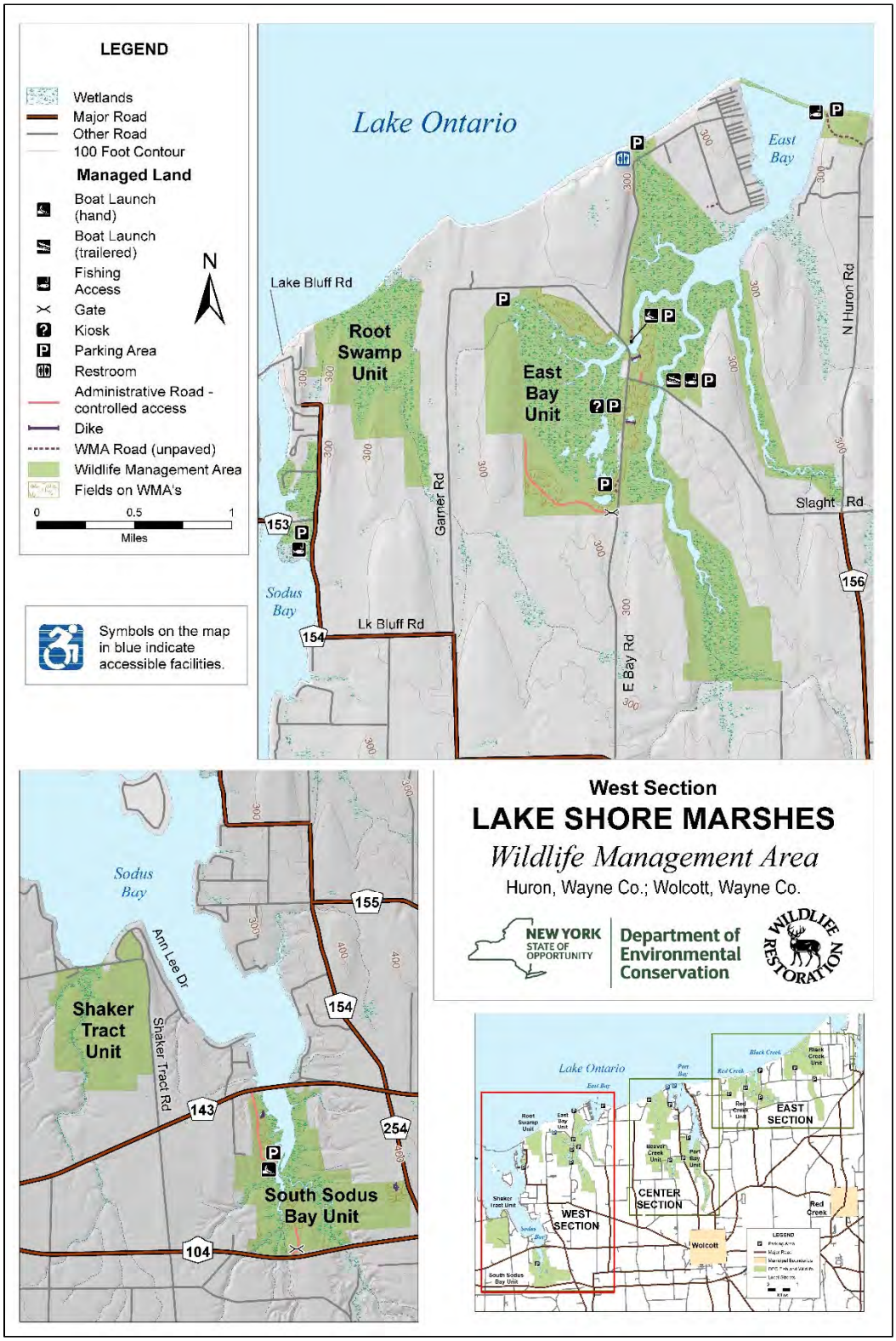

FIGURE 1. Location and access features at Lake Shore Marshes WMA (West).

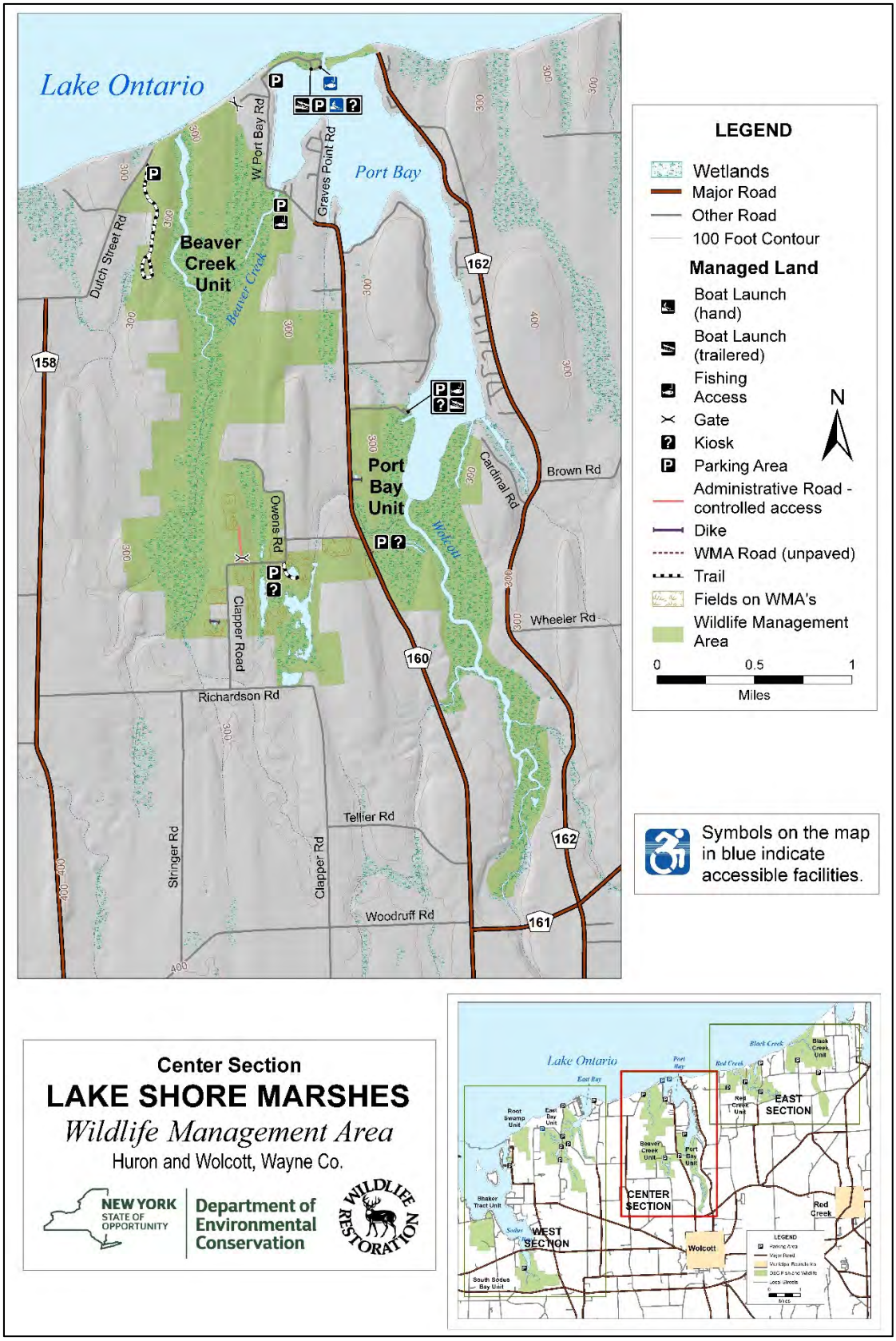

FIGURE 2. Location and access features at Lake Shore Marshes WMA (Center).

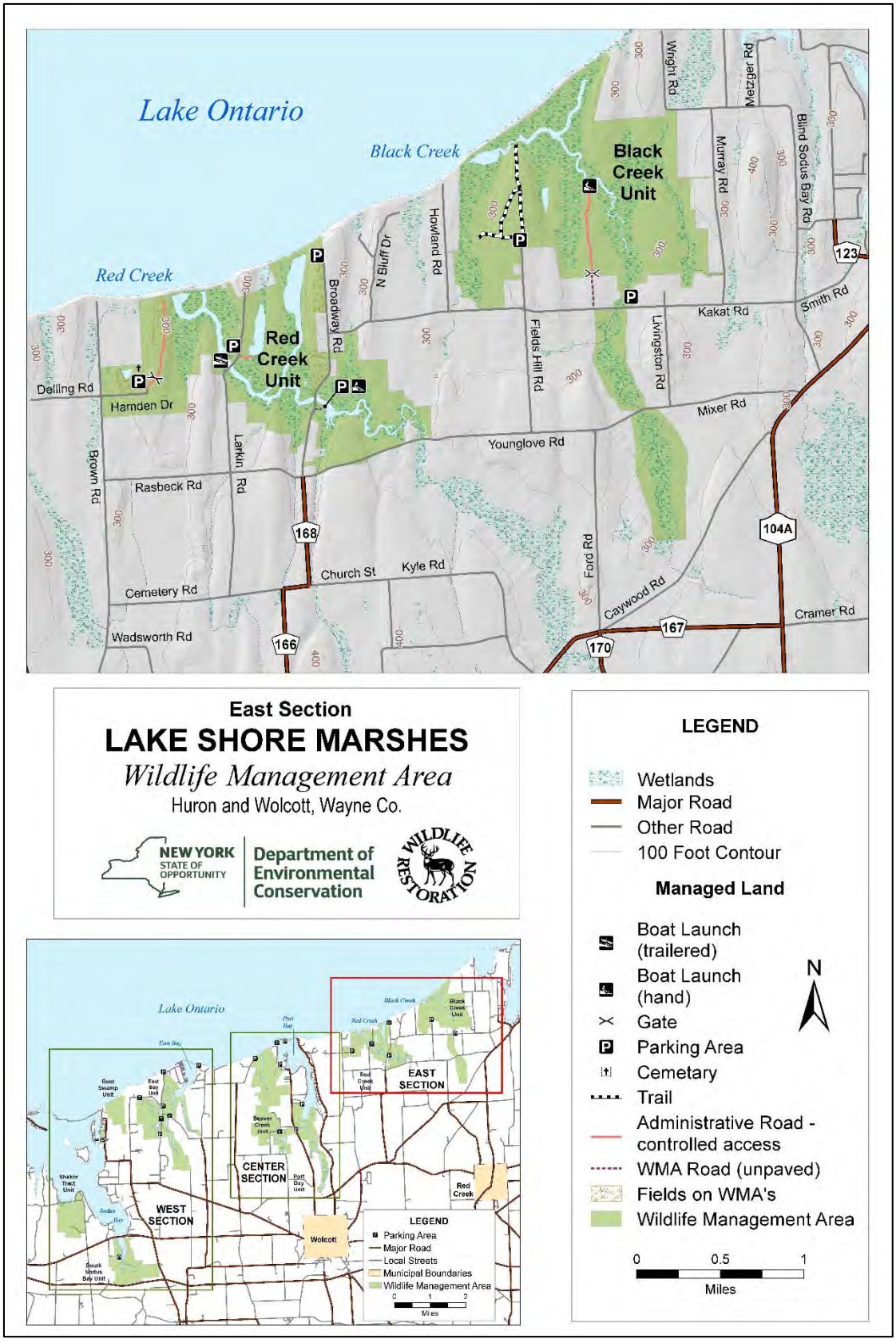

FIGURE 3. Location and access features at Lake Shore Marshes WMA (East).

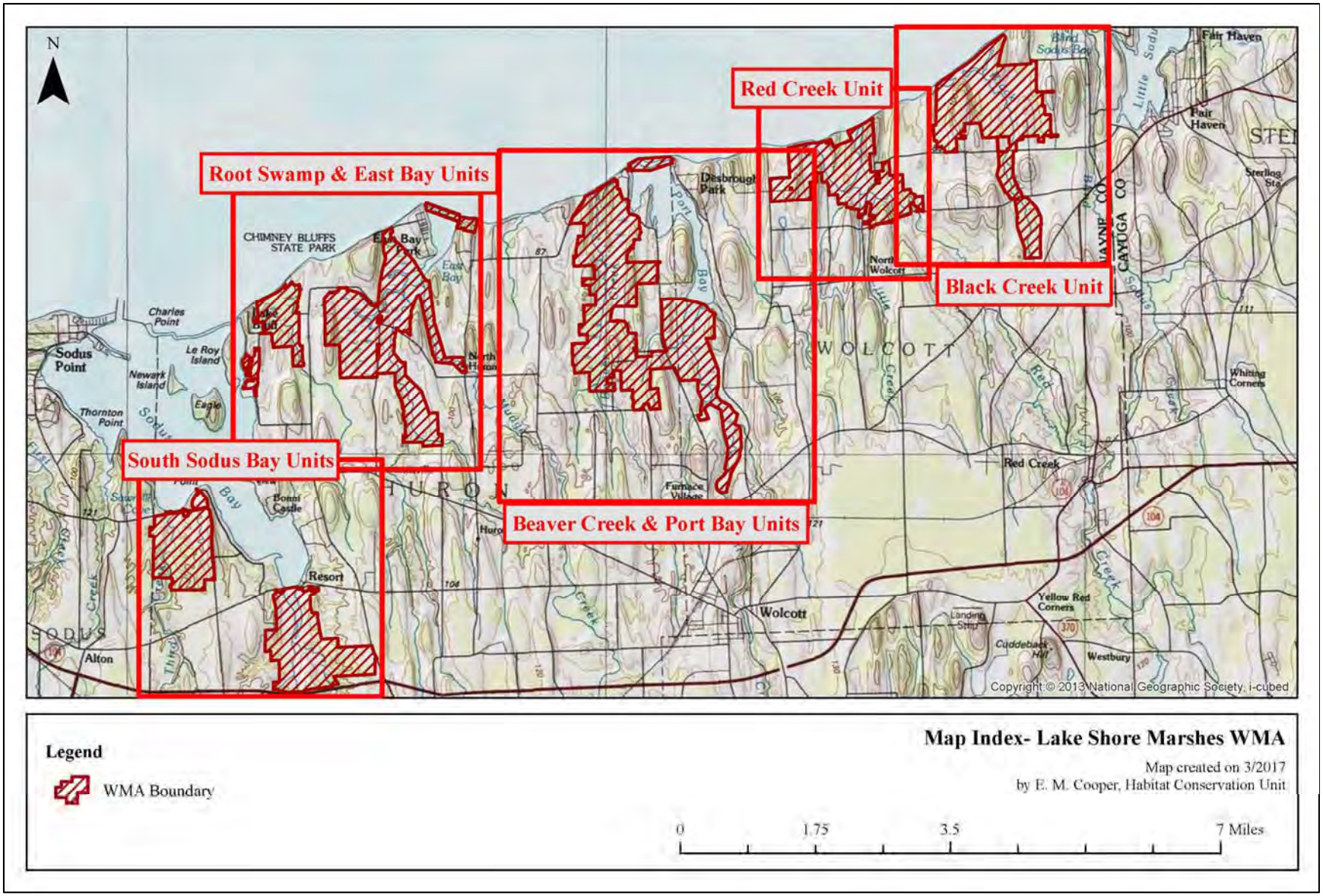

FIGURE 4. Lake Shore Marshes WMA map index. Corresponding figures: Shaker Tract and South Sodus Bay (Figures 5, 10, and 17), Root Swamp and East Bay (Figures 6, 11, and 18), Beaver Creek and Port Bay (Figures 7, 12, and 19), Red Creek (Figures 8, 13, and 20), and Black Creek (Figures 9, 14, and 21).

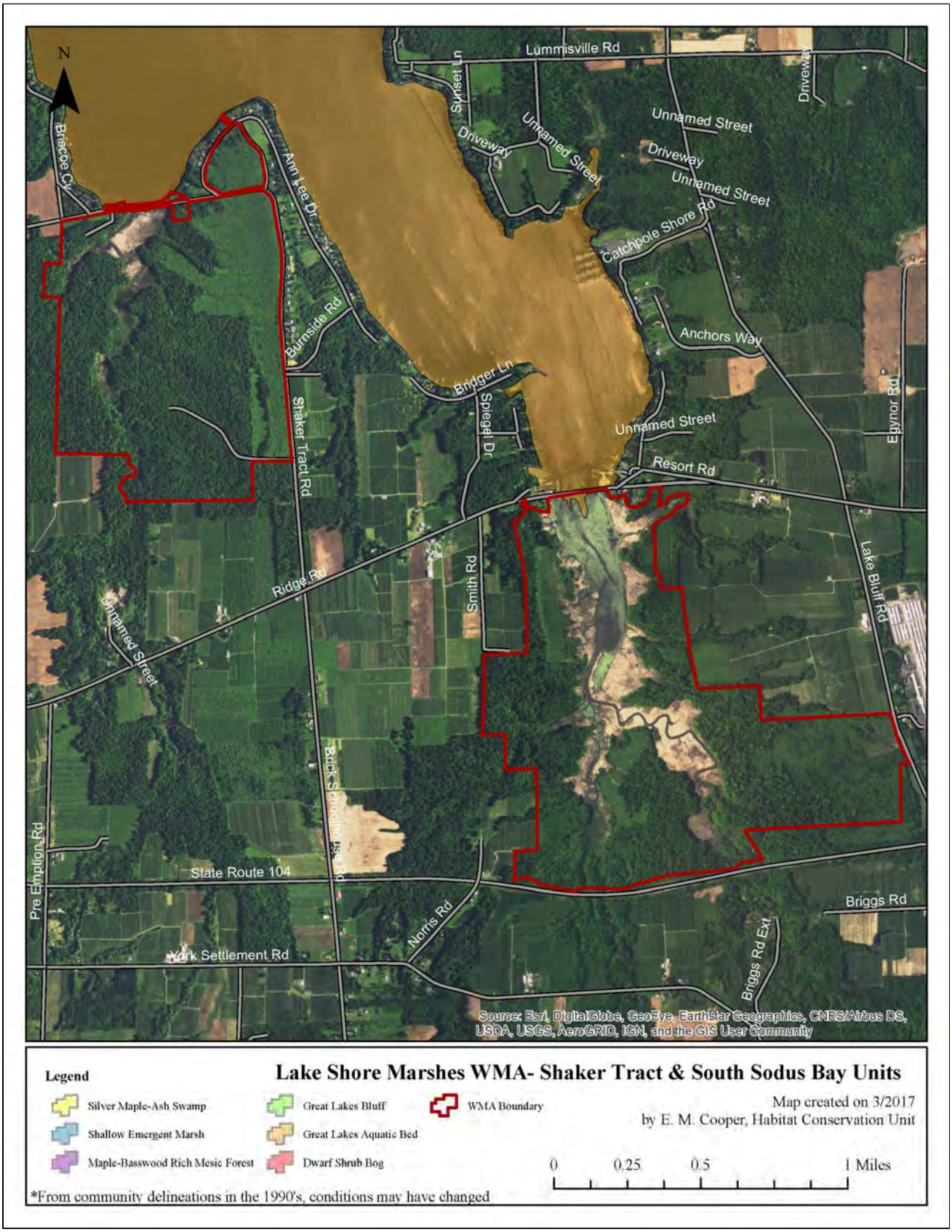

FIGURE 5. Significant ecological communities on Lake Shore Marshes WMA (Shaker Tract & South Sodus Bay Units). Data from the NY Natural Heritage Program.

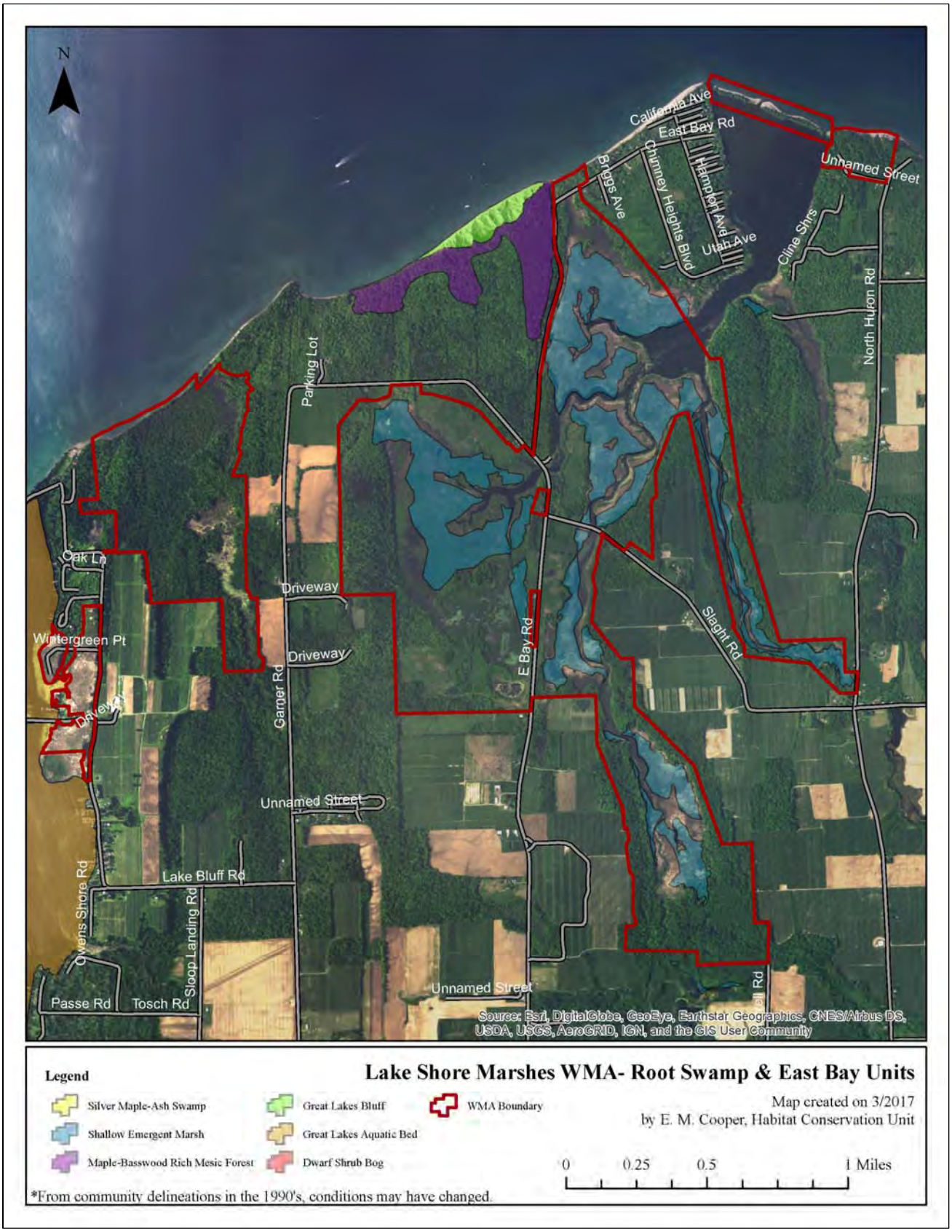

FIGURE 6. Significant ecological communities on Lake Shore Marshes WMA (Root Swamp & East Bay Units). Data from the NY Natural Heritage Program.

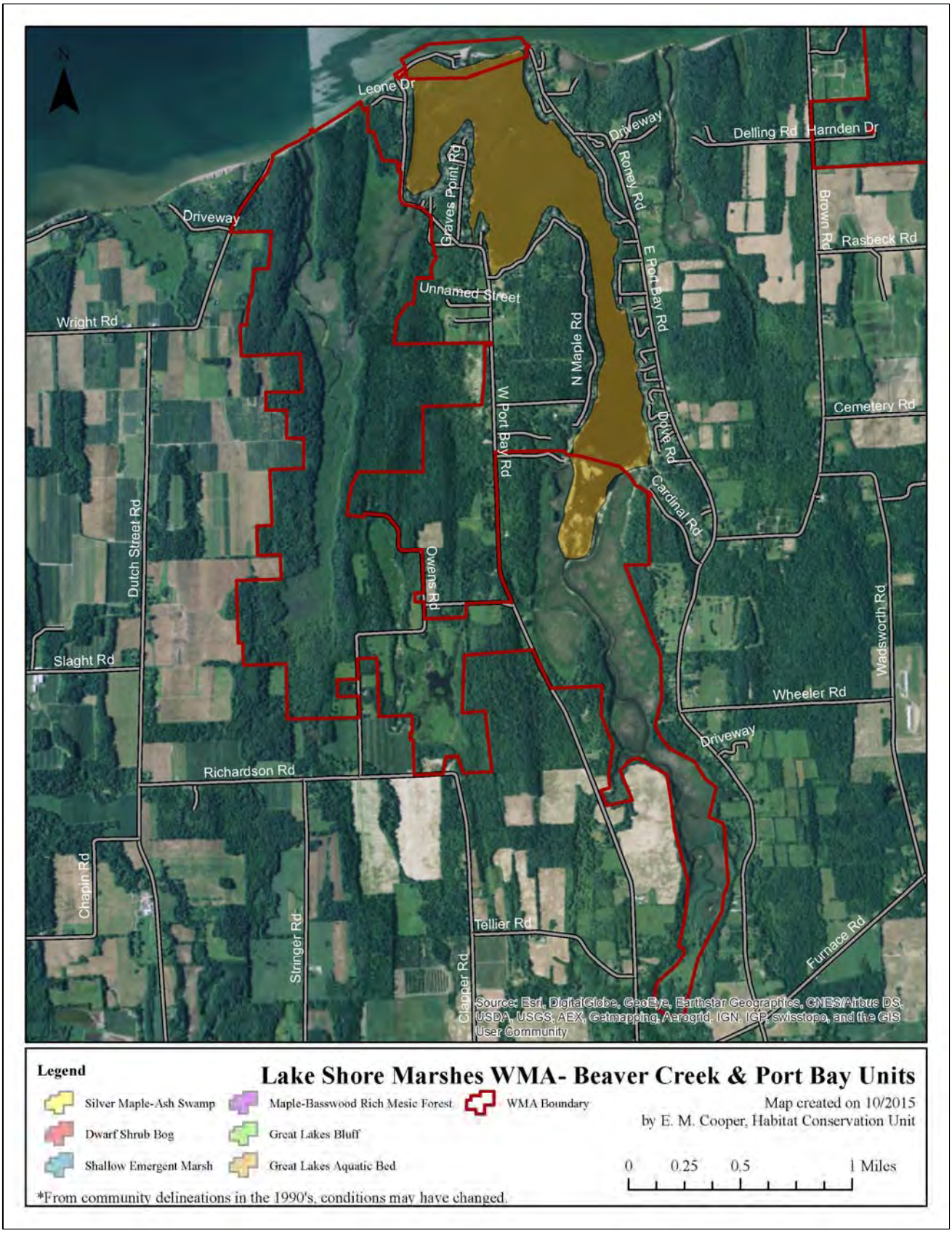

FIGURE 7. Significant ecological communities on Lake Shore Marshes WMA (Beaver Creek & Port Bay Units). Data from the NY Natural Heritage Program.

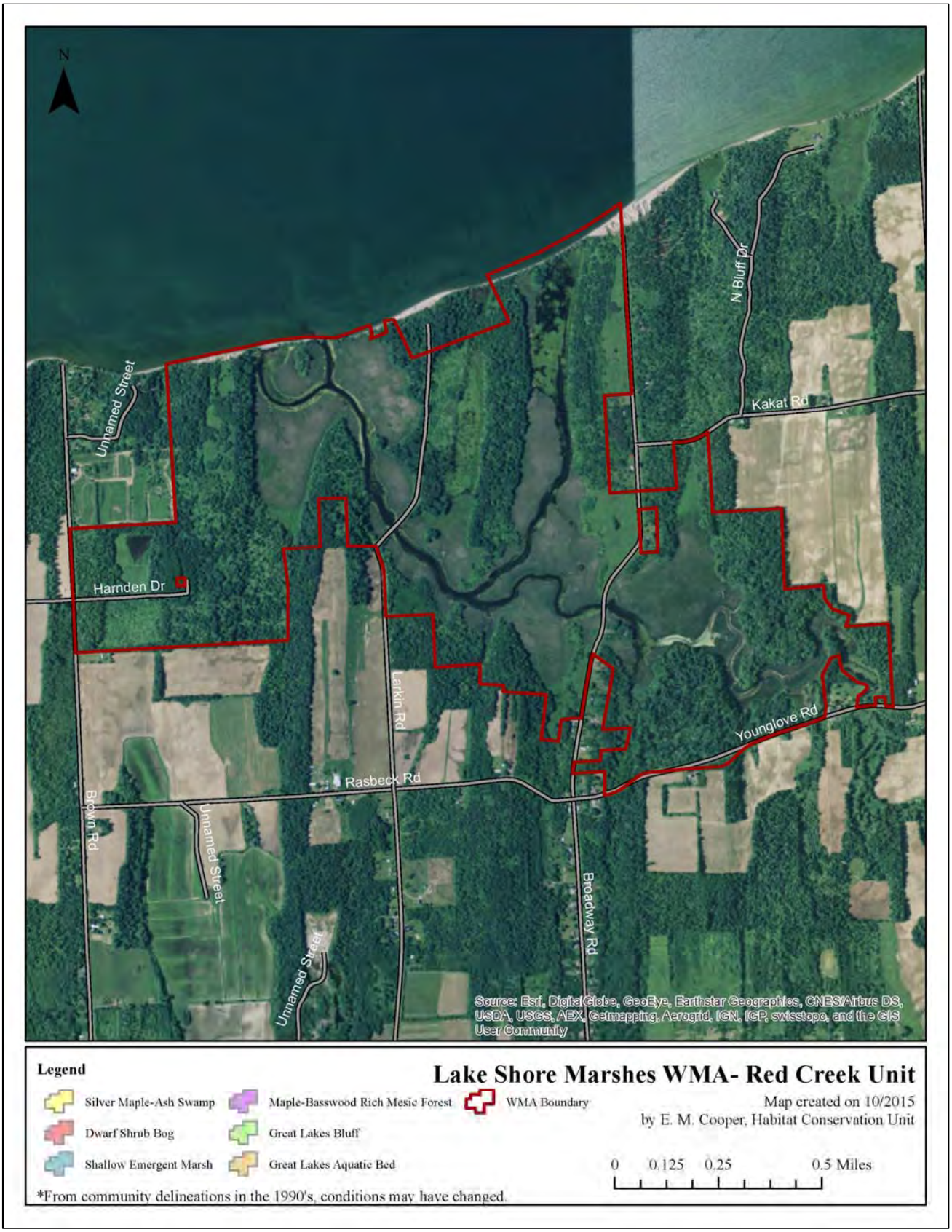

FIGURE 8. Significant ecological communities on Lake Shore Marshes WMA (Red Creek Unit). Data from the NY Natural Heritage Program.

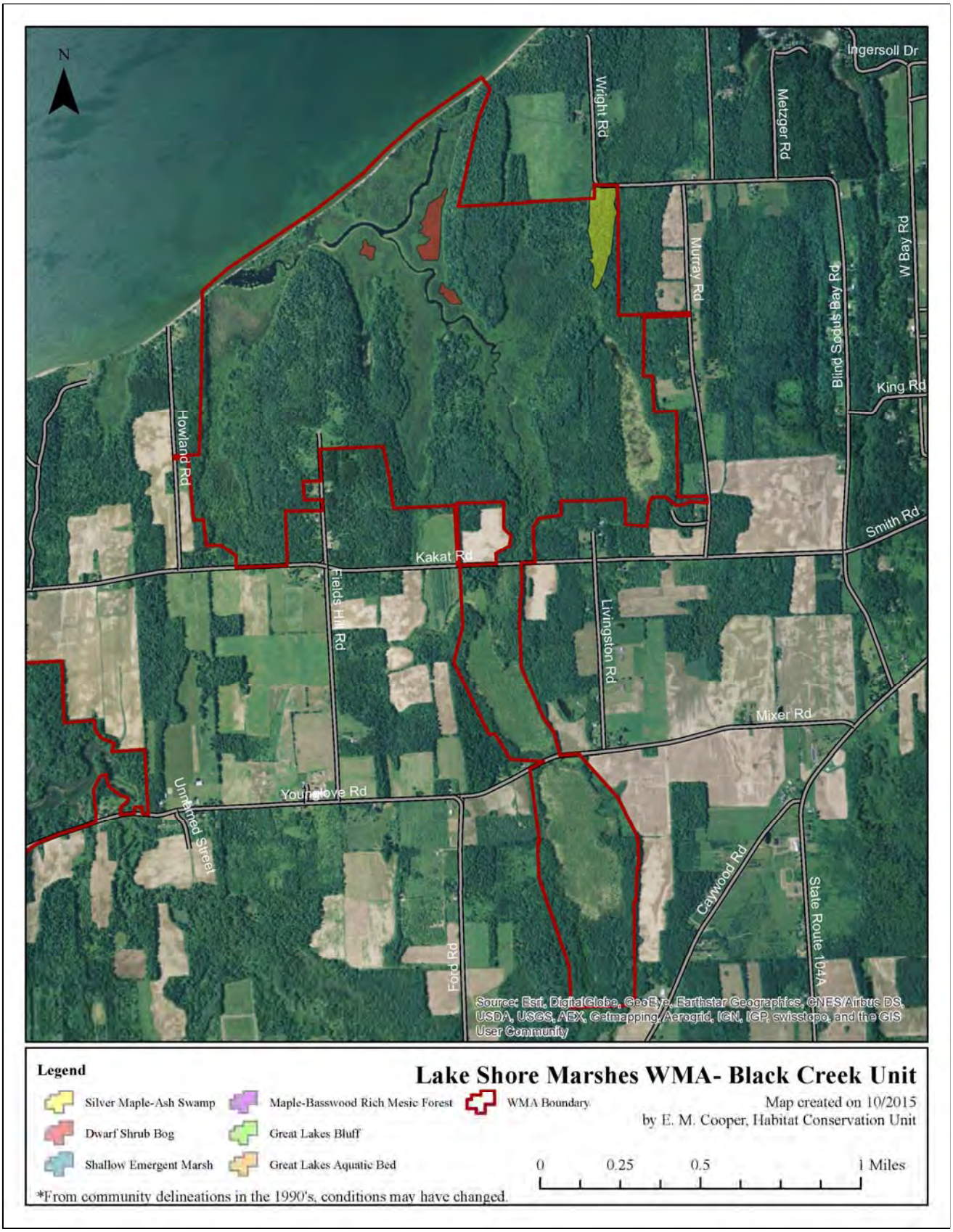

FIGURE 9. Significant ecological communities on Lake Shore Marshes WMA (Black Creek Unit). Data from the NY Natural Heritage Program.

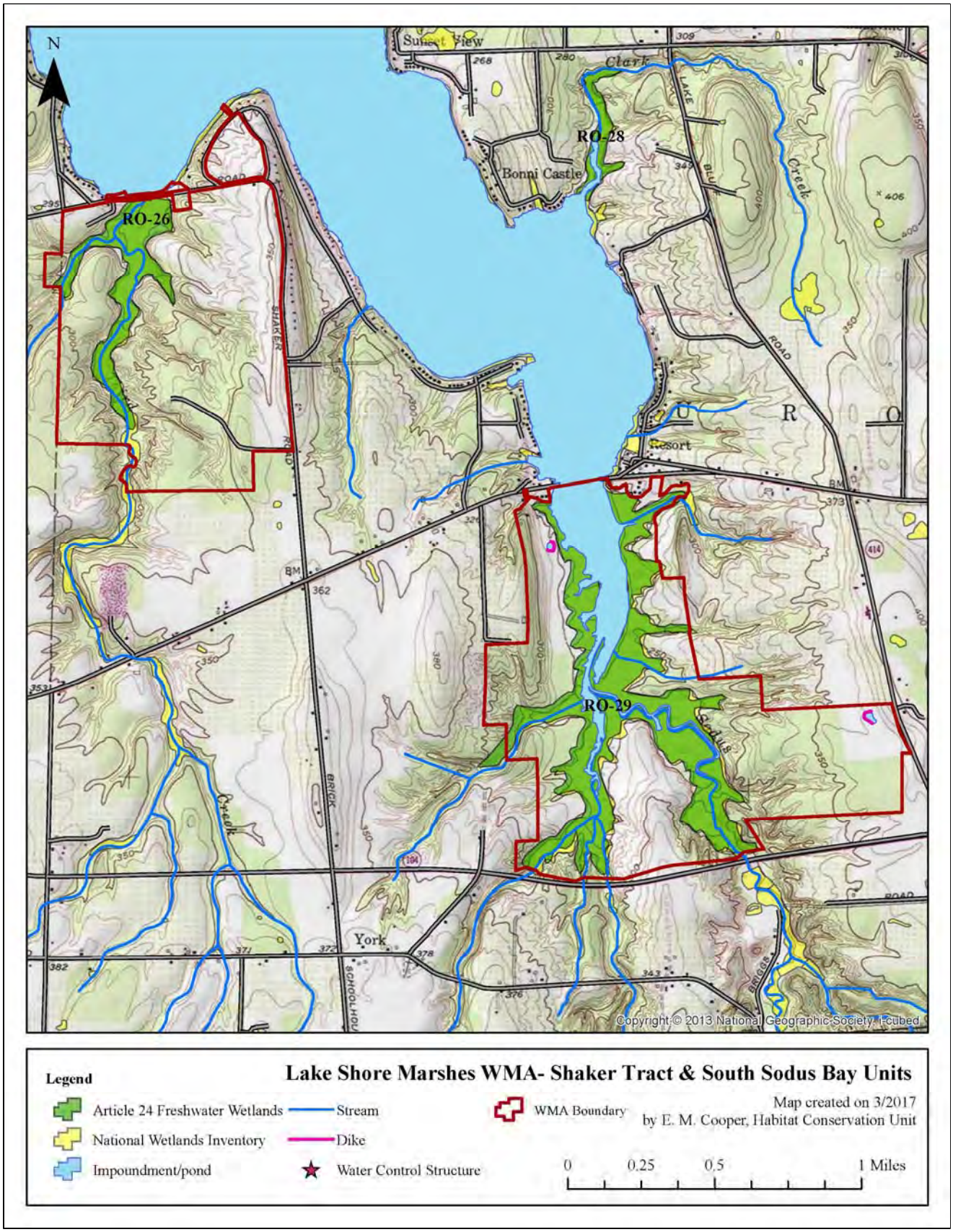

FIGURE 10. Wetlands, open water, and streams of Lake Shore Marshes WMA (Shaker Tract & South Sodus Bay Units). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

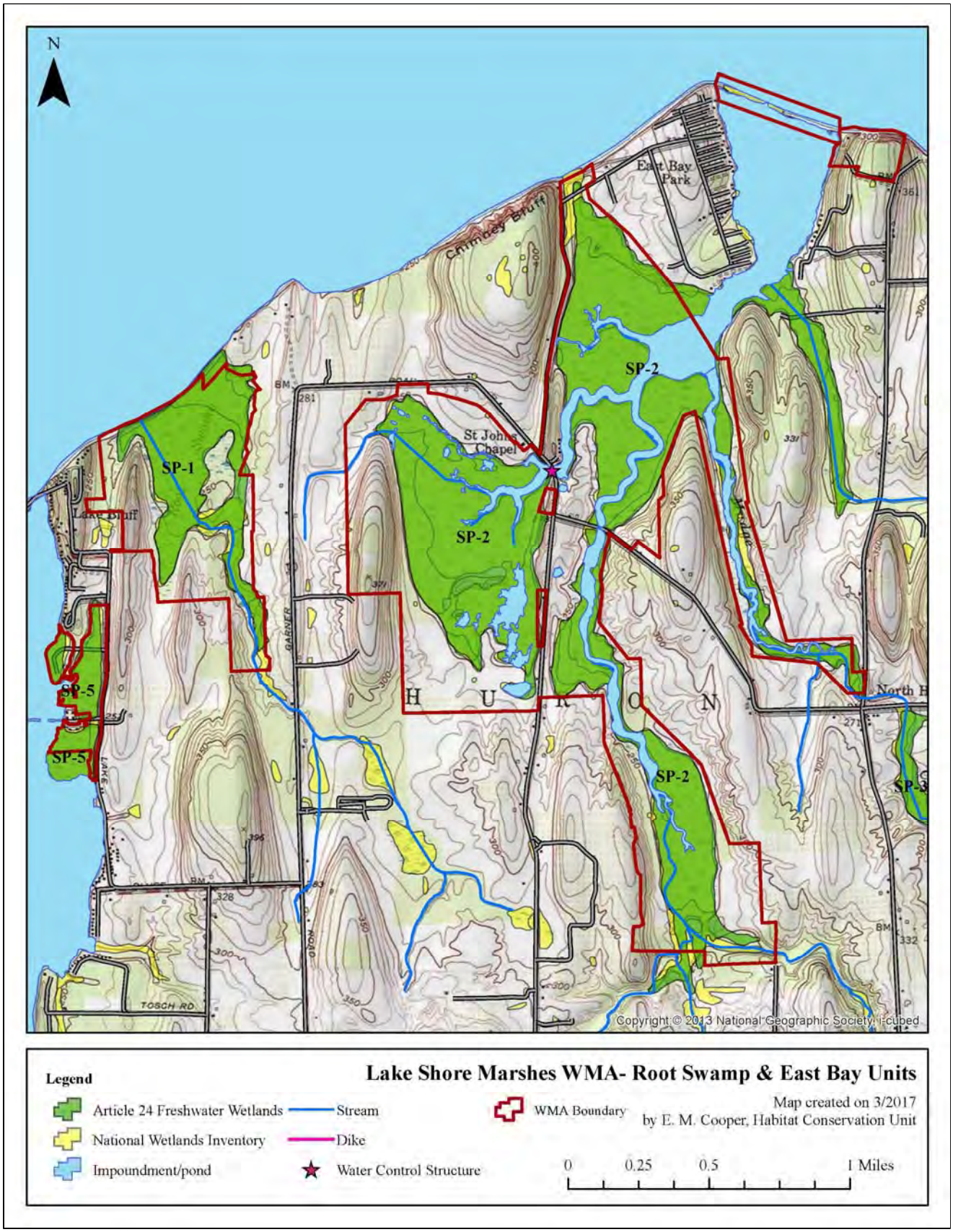

FIGURE 11. Wetlands, open water, and streams of Lake Shore Marshes WMA (Root Swamp & East Bay Units). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

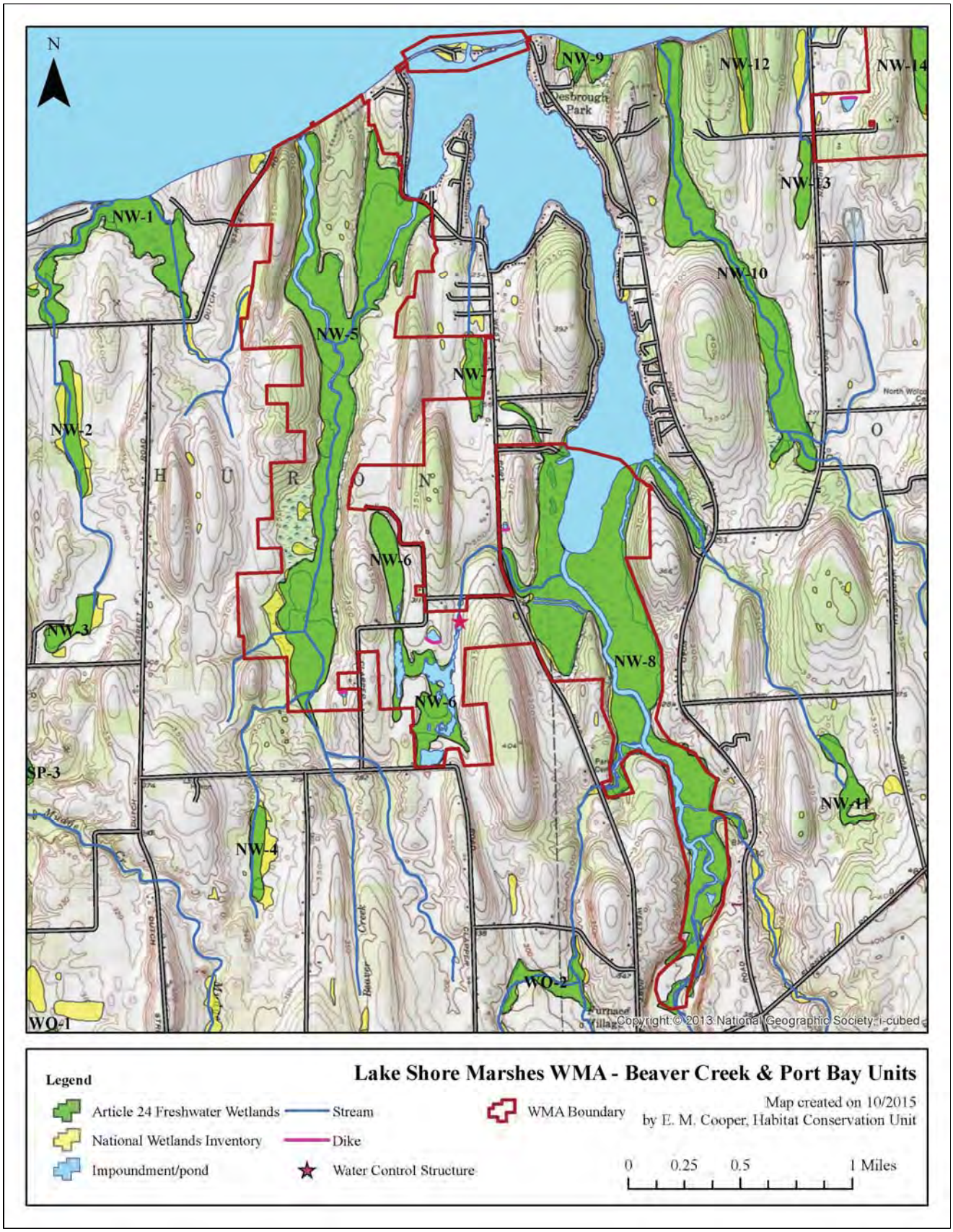

FIGURE 12. Wetlands, open water, and streams of Lake Shore Marshes WMA (Beaver Creek & Port Bay Units). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

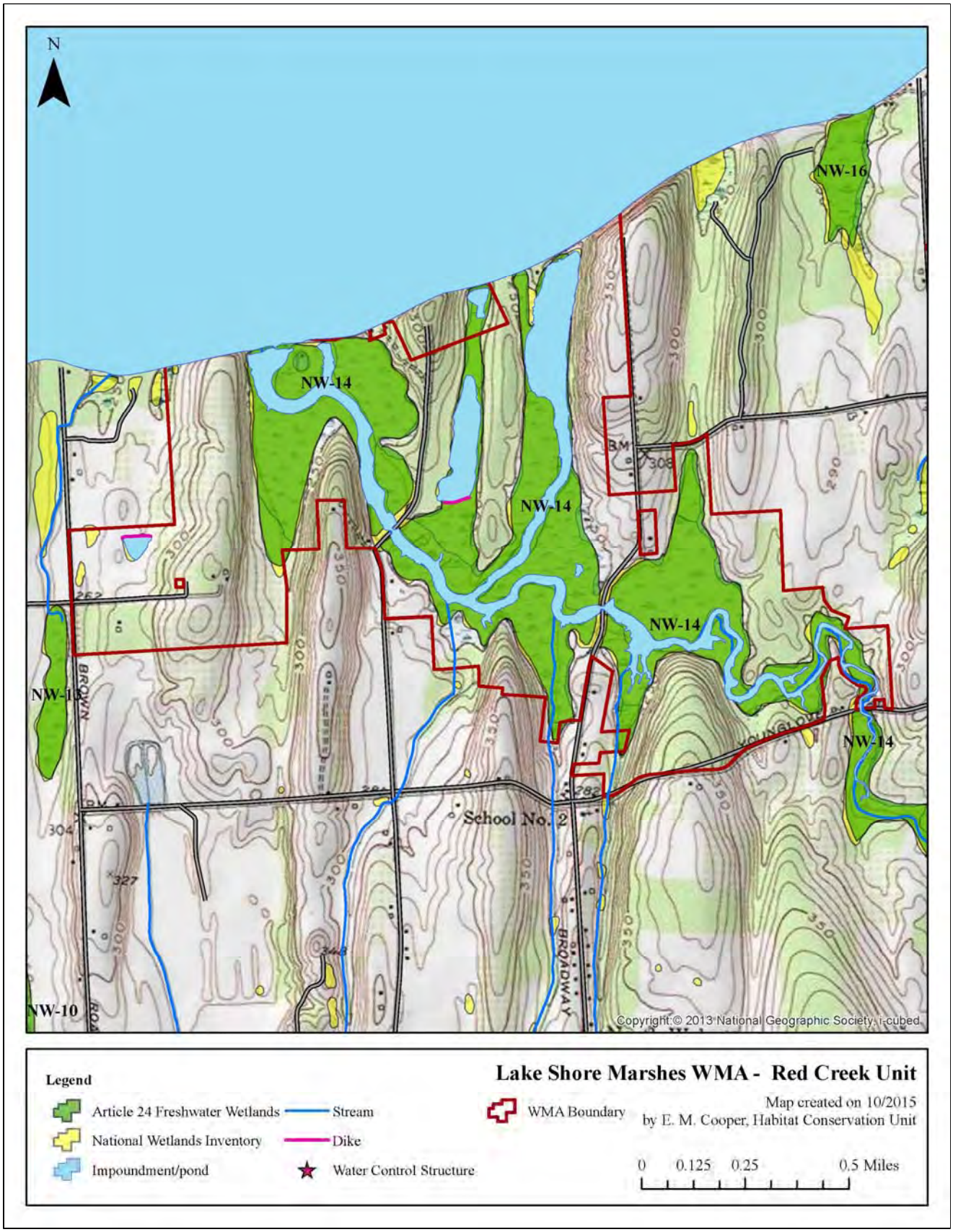

FIGURE 13. Wetlands, open water, and streams of Lake Shore Marshes WMA (Red Creek Unit). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

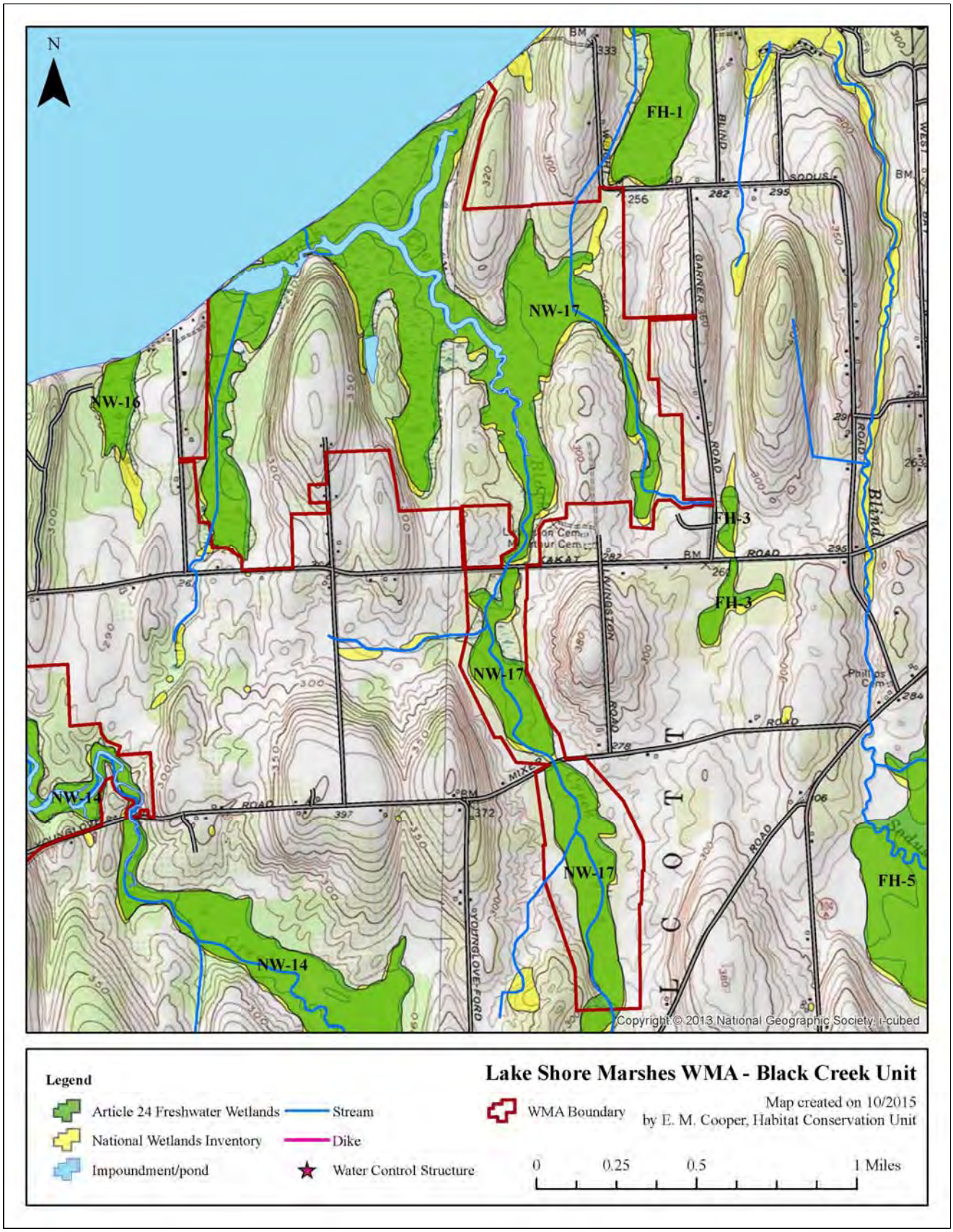

FIGURE 14. Wetlands, open water, and streams of Lake Shore Marshes WMA (Black Creek Unit). Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

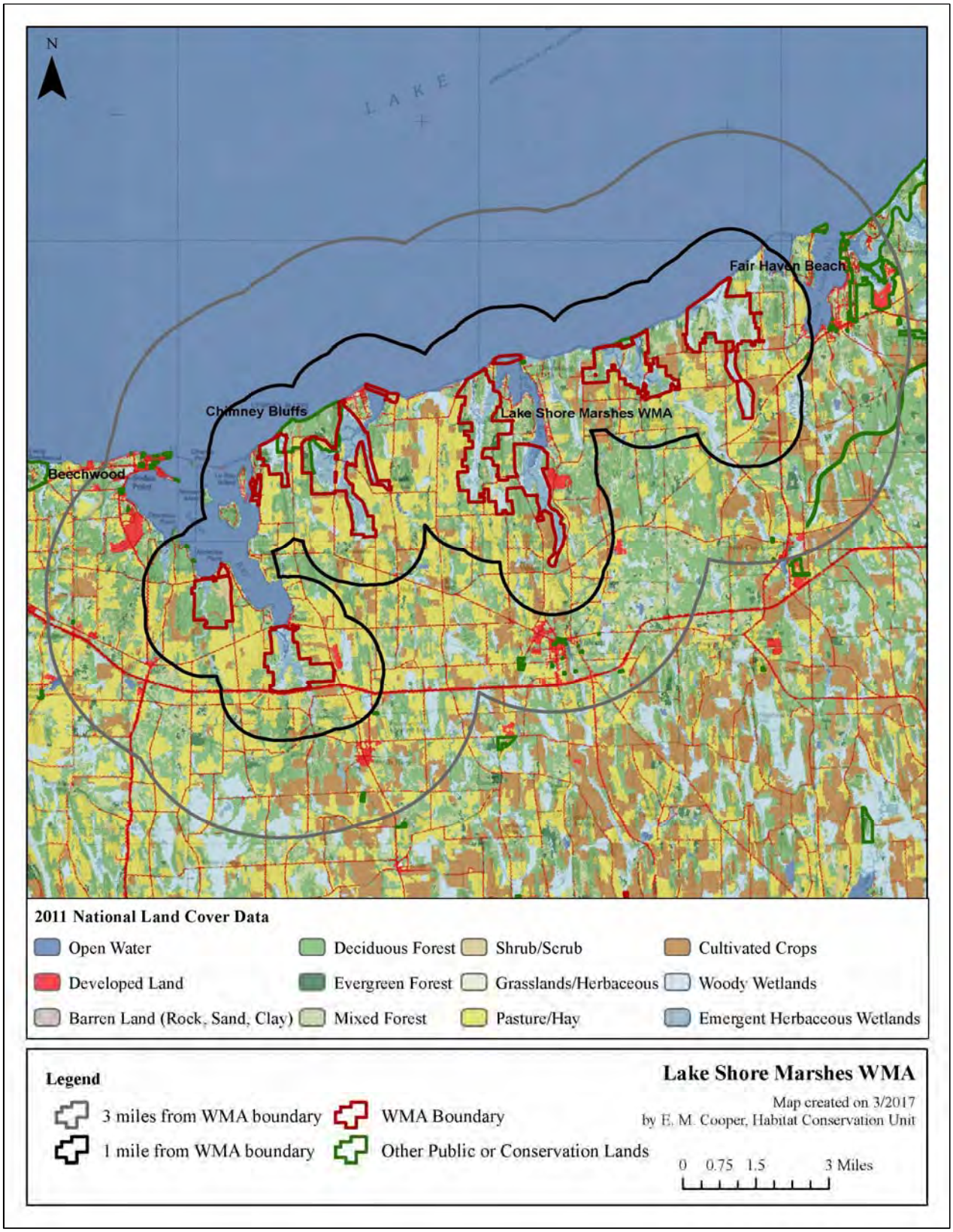

FIGURE 15. Land cover types and conservation lands in the landscape surrounding Lake Shore Marshes WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

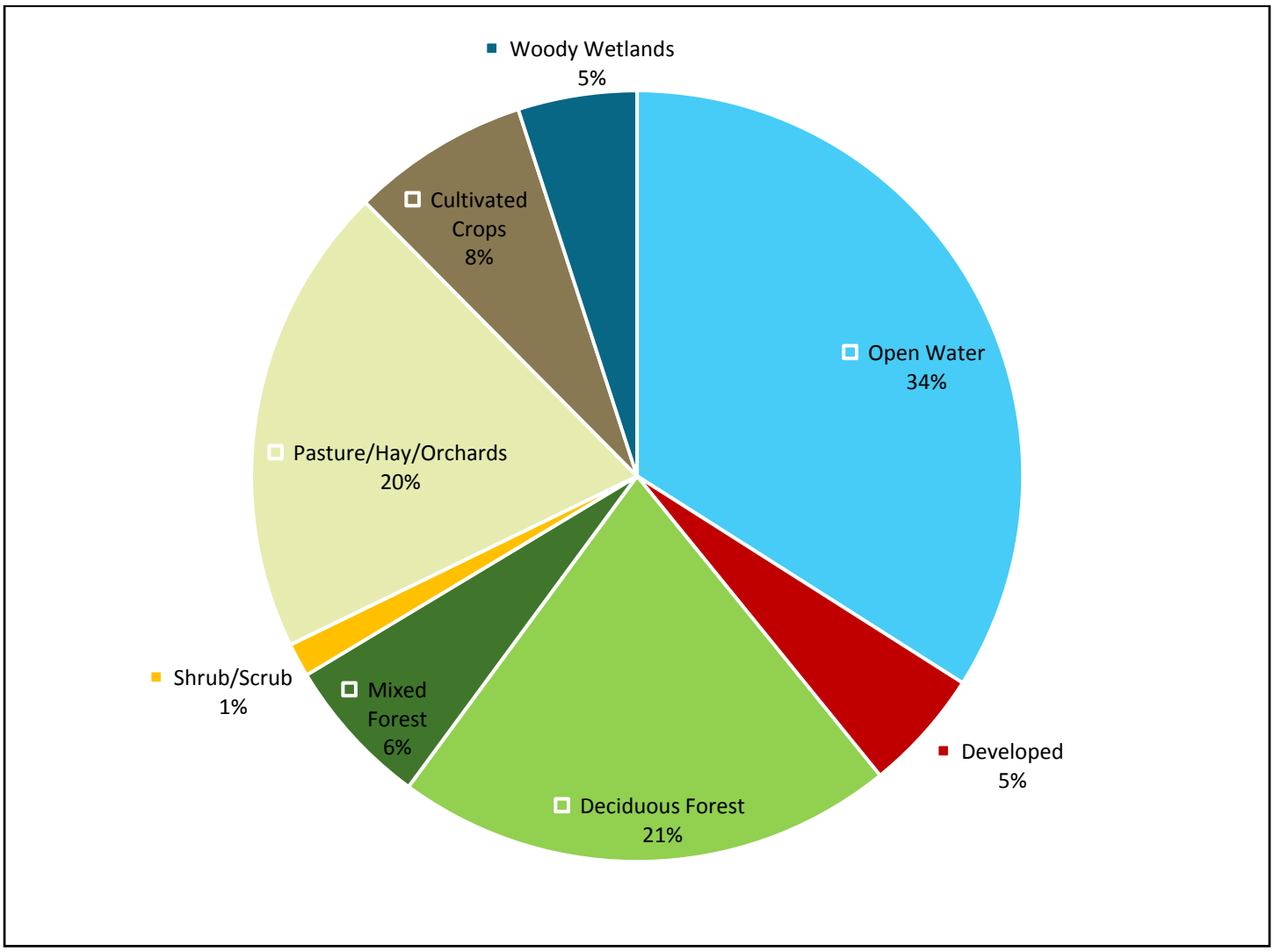

FIGURE 16. Percent cover of land cover types within three miles of Lake Shore Marshes WMA.

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.

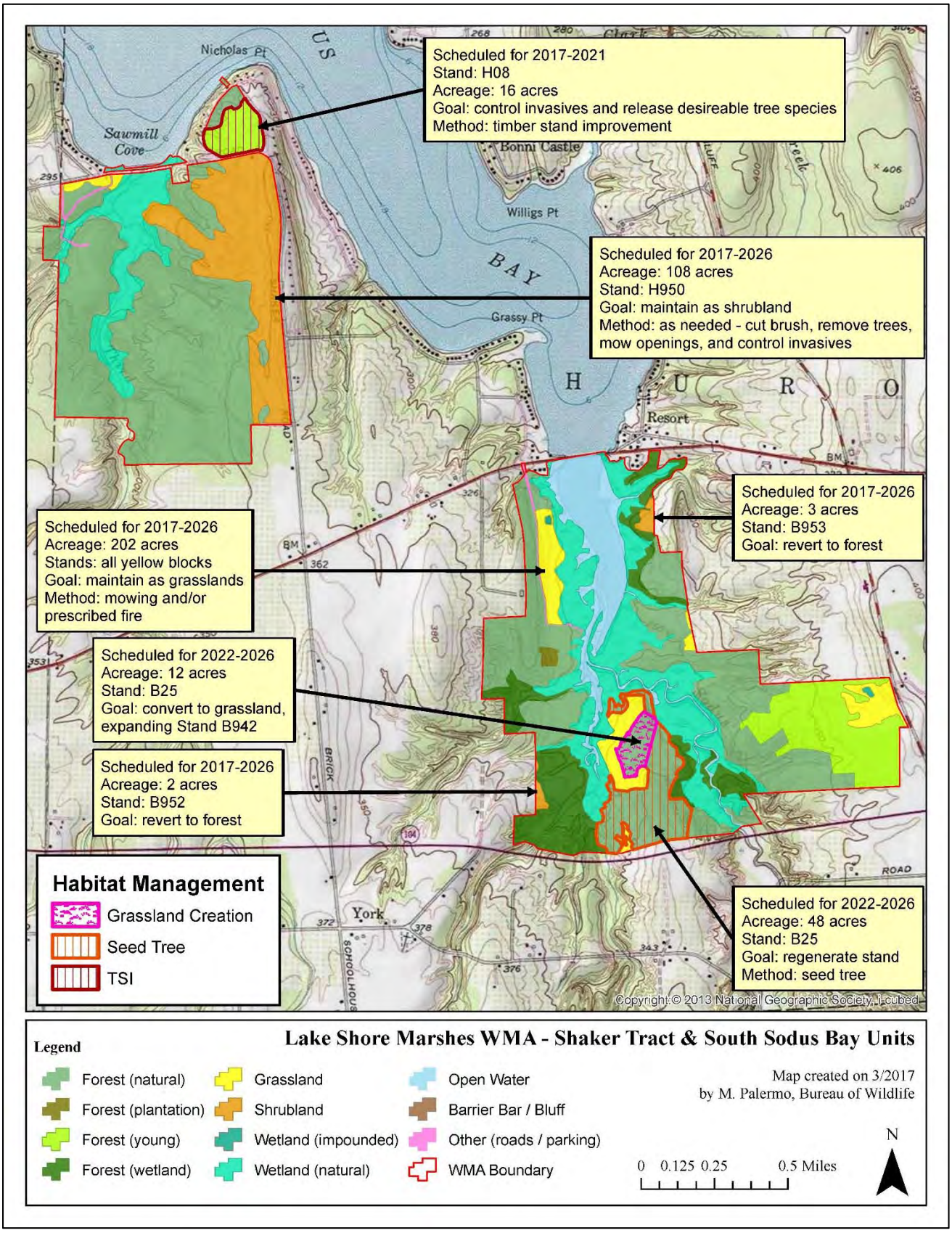

FIGURE 17. Habitat types and locations of proposed management on Lake Shore Marshes WMA (Shaker Tract & South Sodus Bay Units).

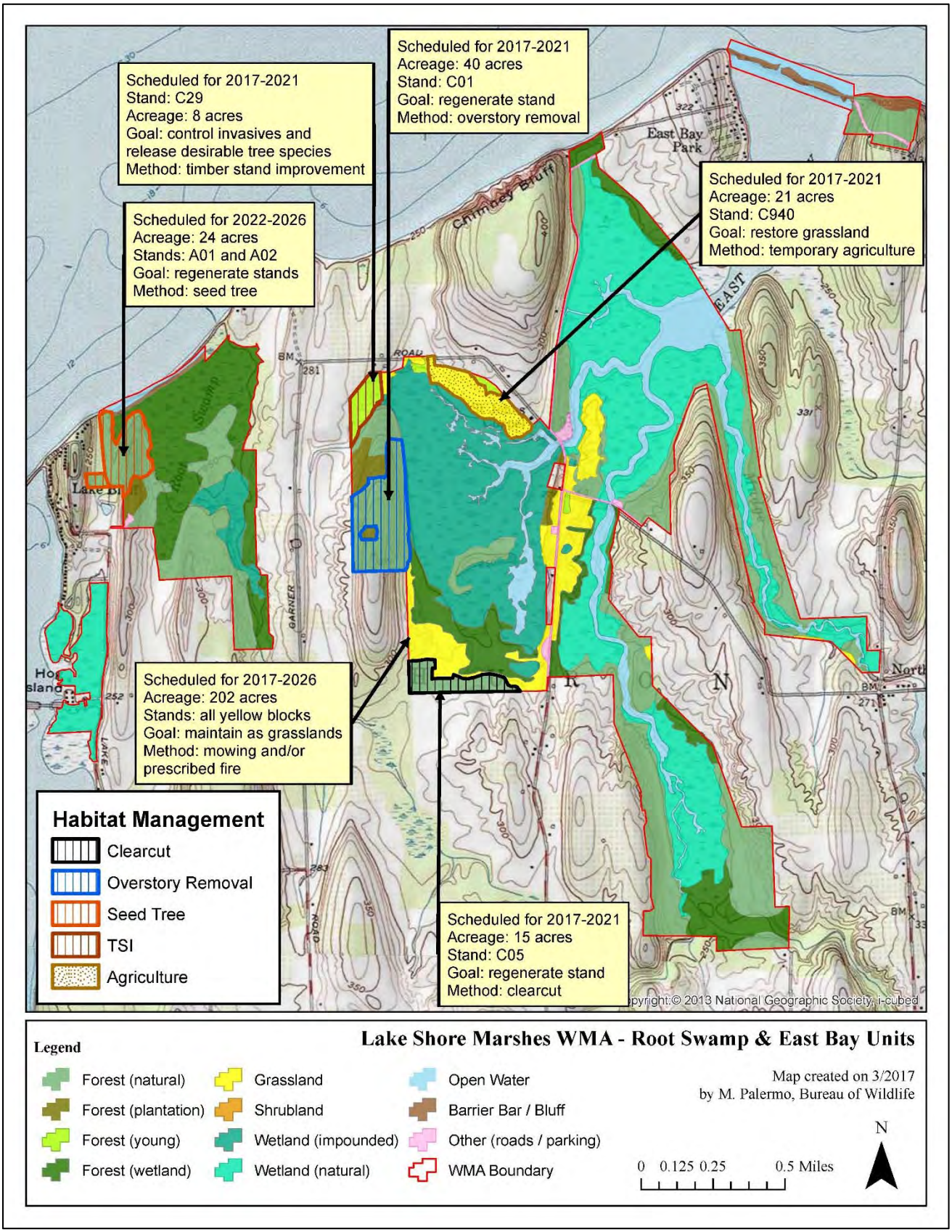

FIGURE 18. Habitat types and locations of proposed management on Lake Shore Marshes WMA (Root Swamp & East Bay Units).

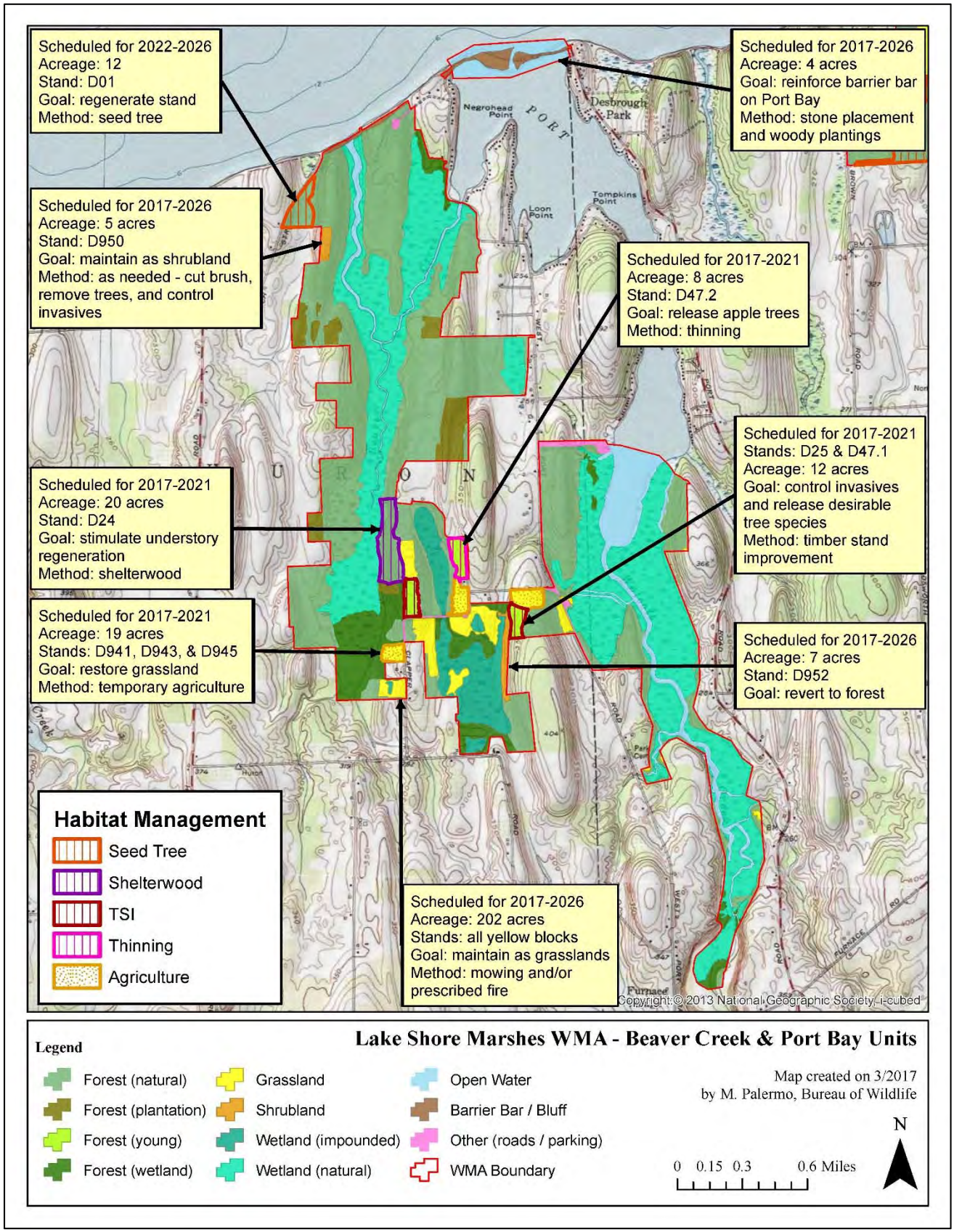

FIGURE 19. Habitat types and location(s) of proposed management on Lake Shore Marshes WMA (Beaver Creek & Port Bay Units).

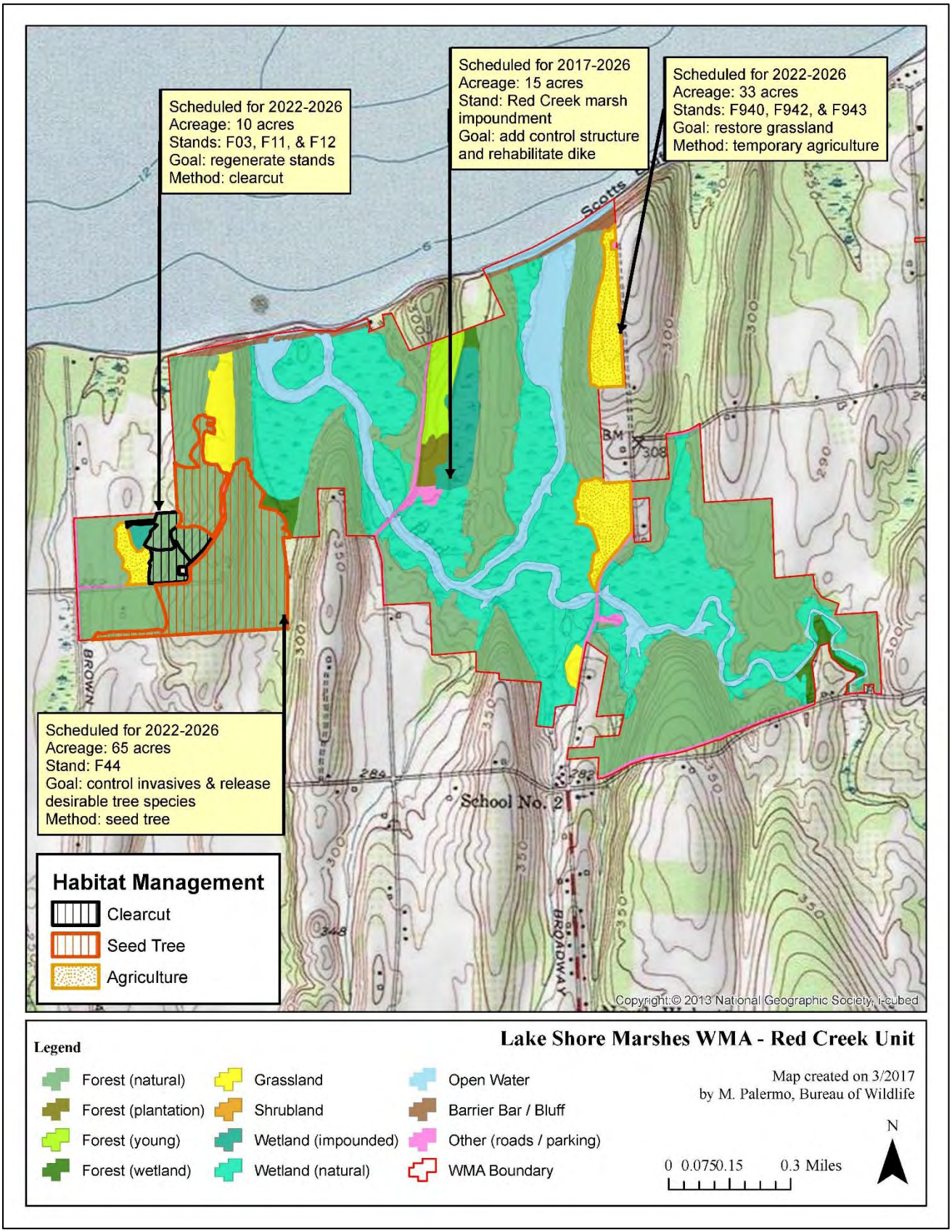

FIGURE 20. Habitat types and locations of proposed management on Lake Shore Marshes WMA (Red Creek Unit).

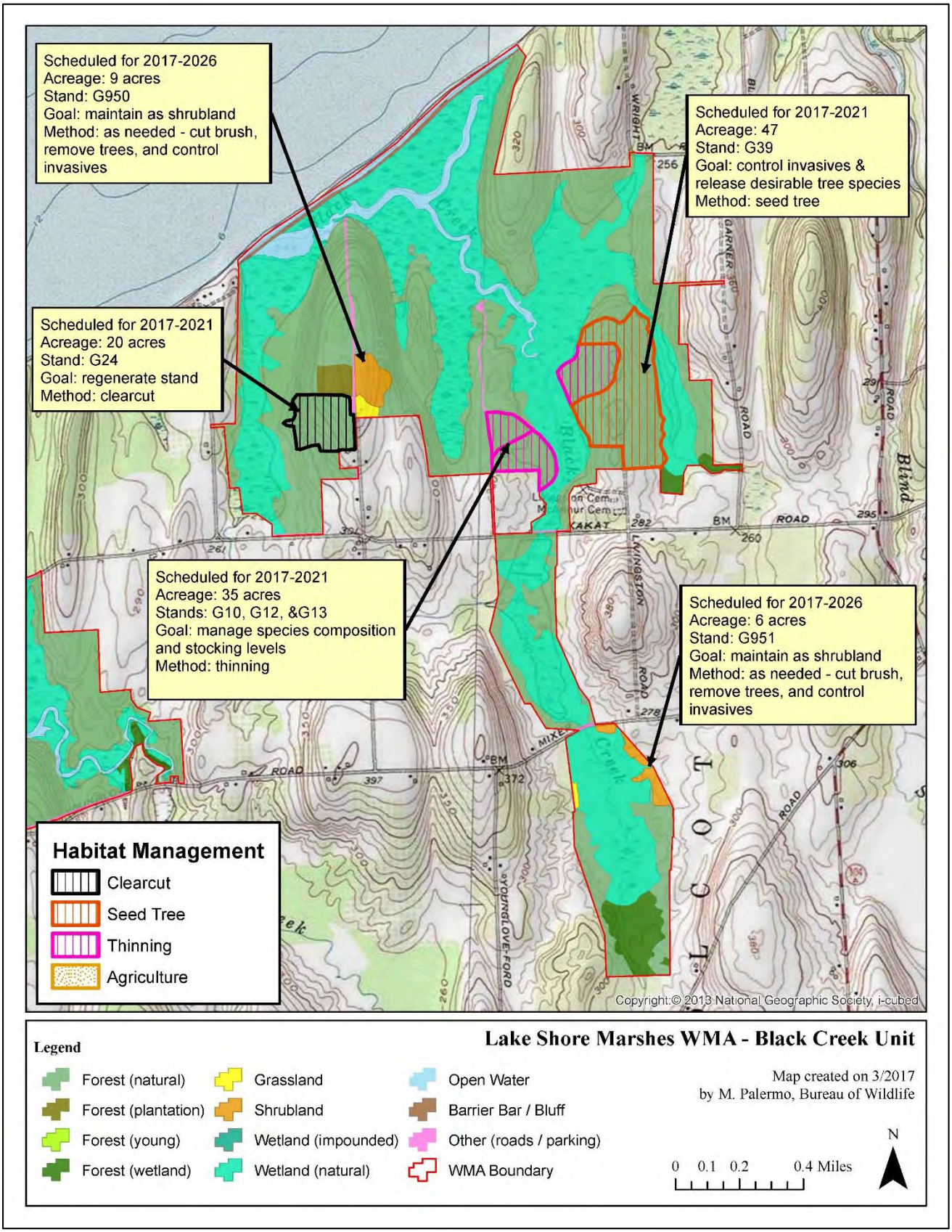

FIGURE 21. Habitat types and locations of proposed management on Lake Shore Marshes WMA (Black Creek Unit).

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.

Barrier Bar: A narrow bar of sand or gravel at the mouth of an embayment or stream that was deposited by nearshore currents and provides protection from lake wave action. (Adapted from Albert et al. 2005. Hydrogeomorphic classification for Great Lakes Coastal Wetlands)

Barrier Beach Wetland: These wetlands form where a barrier bar separates a bay from the larger lake. Lake water may enter during storm overwash or seep through the porous sand or gravel barrier separating the two water bodies. (Adapted from Albert et al. 2005. Hydrogeomorphic classification for Great Lakes Coastal Wetlands)

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)

Drowned River Mouth Wetland: These are river or creek mouths that are often separated from their associated Great Lake by a barrier bar, resulting in distinctive differences in water chemistry between the two. These wetlands are protected from the direct energy of waves but are subject to stream currents that can reverse in response to lake-level changes. (Adapted from Albert et al. 2005. Hydrogeomorphic classification for Great Lakes Coastal Wetlands)

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.

Level Ditching: The excavation of ditches and small potholes through a near-dry marsh bed with the spoil deposited as flattened ridges between channels or piled as islands. Ditching is established to improve cover-water ratios in dense vegetation, which can increase the quality of brood-rearing and courtship habitat for waterfowl as well as increase furbearer production and aquatic plant growth. (Adapted from Baldassarre and Bolen, 2006. Waterfowl Ecology and Management)

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.

Protected Embayment Wetland: These wetlands are bays that are connected to a lake but generally protected from direct wave action. They may contain a barrier bar with a maintained channel that allows water-levels to be directly influenced by changes in lake-levels. (Adapted from Albert et al. 2005. Hydrogeomorphic classification for Great Lakes Coastal Wetlands)

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. For example, young forest target species at Lake Shore Marshes WMA include: American woodcock, golden-winged warbler, and ruffed grouse.

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.