Habitat Management Plan
for
Catharine Creek Wildlife Management Area
2022 - 2031


Photo: Mike Palermo

Division of Fish and Wildlife
Bureau of Wildlife
6274 East Avon-Lima Road, Avon, New York 14414

May 20, 2022

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Prepared by:

Michael Palermo, Biologist 1 (Wildlife)
Emily Bonk, Forester 1
John Mahoney, Forestry Technician 1
Forest Management Program

Scott Smith, Biologist 1 (Wildlife)
Kelly Raab, Fish & Wildlife Technician 2
Catharine Creek WMA Managers

Heidi Kennedy, Biologist 1 (Wildlife)
Land Management & Habitat Conservation Team

Reviewed and approved by:

Michael Wasilco, Regional Wildlife Manager
Bureau of Wildlife — Date: 5/24/2022

James F. Farquhar III, Chief
Bureau of Wildlife — Date: 6/15/2022

Jacqueline Lendrum, Director
Division of Fish and Wildlife — Date: 6/22/22

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

TABLE OF CONTENTS

LIST OF FIGURES

SUMMARY

Catharine Creek Wildlife Management Area (WMA) is located in the Towns of Dix and Montour, Schuyler County, and consists of 784 acres. The WMA is less than one mile south of Seneca Lake and contains most of a large headwater wetland known as the Queen Catharine Marsh, named after Catharine Montour. Most of the WMA was acquired between 1978 and 1984, with other large additions occurring in 2009, 2018, and 2022.

The extent and hydrology of this marsh have been greatly altered since the early 1800s, but it continues to provide valuable wildlife habitat important to many species. The site is designated an Important Bird Area by the Audubon Society, a Bird Conservation Area by New York State, and a Critical Environmental Area by Schuyler County.[1,2,3] The WMA is especially important as a stopover site for migrating waterfowl and other waterbirds and supports the breeding of several at-risk marshbird species.

The majority of wetland on the WMA is an emergent marsh (71%) composed mostly of cattail, burreed, and open water, but there is also a component of forested wetland (12%). Only about 15% of the WMA is considered upland and consists mostly of grassland fields and a few hardwood forest stands, although some of these fields are seasonally wet.

DEC management has focused on protecting the wetland resource and enhancing wetland habitat values. Over 6 miles of level ditching and multiple potholes have been excavated to improve interspersion of vegetation and open water and provide increased cover, feeding, and resting areas for migratory birds. Action to control non-native, invasive plants has occurred on the WMA, continues to be a challenge, and ongoing efforts are needed.

This plan elaborates on habitat objectives from the Great Divide Unit Management Plan (UMP).[4] Catharine Creek WMA is primarily managed to provide and enhance wildlife habitats, especially wetlands. The WMA is between the villages of Watkins Glen and Montour Falls and provides valuable wildlife-related recreation opportunities, such as hunting, trapping, and bird watching.

Habitat management goals for Catharine Creek WMA include:

- Maintaining and enhancing wetlands to provide high-value habitat that benefits migratory and resident wildlife, such as waterfowl, marshbirds, and furbearers (71% of the WMA);
- Maintaining and enhancing mature forest to benefit associated wildlife, such as wood duck and various songbirds (10% of the WMA);
- Encouraging the establishment of healthy young forest to benefit associated wildlife species and provide for the future forest (5% of the WMA);
- Maintaining grassland fields to provide valuable food and cover throughout the year (12% of WMA); and
- Maintaining access features (2% of WMA).

[1] Information about Important Bird Areas is available online at https://www.audubon.org/important-bird-areas.
[2] Information about Bird Conservation Areas is available online at https://www.dec.ny.gov/animals/25341.html.
[3] Information about Critical Environmental Areas is available online at https://www.dec.ny.gov/permits/6184.html.
[4] Information of DEC Unit Management Plans is available online at https://www.dec.ny.gov/lands/4979.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, contemplating juxtaposition of all habitat types to guide the conservation and management of sensitive or unique species or ecological communities;
- Identify acreage-specific habitat goals for the WMA to guide management actions;
- Provide specific habitat management prescriptions that incorporate accepted best management practices;
- Establish a forest management plan to meet and maintain acreage goals for various forest successional stages;
- Address management limitations such as access challenges (e.g., topography); and
- Provide the foundation for evaluating the effectiveness of habitat management.

The Great Divide UMP was approved in March 2006 and addressed management needs and activities for a 10-year period. A revision of this UMP is currently being drafted (as of the writing of this HMP) and will address habitat objectives and actions, as well as management provisions for facilitating compatible wildlife-dependent recreation, access, and facility development and maintenance.

The effects of climate change and the need to facilitate habitat adaptability and resilience under projected future conditions will be considered during the habitat management planning process and in any actions that are recommended in HMPs. Changing conditions that may affect habitat composition include warmer temperatures, milder winters, longer growing seasons, increased pressure from invasive species, more frequent intense storms, and moisture stress. It is also important to consider landscape-level effects to maintain the connectedness of habitats to allow range adjustments of both plant and wildlife species.

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. Definitions are provided in Appendix A.

WMA Overview

Location

Catharine Creek WMA is in DEC Region 8, Towns of Dix and Montour, in Schuyler County (Image 1).

Total Area

784 acres

Habitat Inventory

A habitat inventory of the WMA was conducted in 2015 and will be updated every ten to fifteen years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions.

Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the WMA, and conditions in the surrounding landscape (see Landscape Context section below).

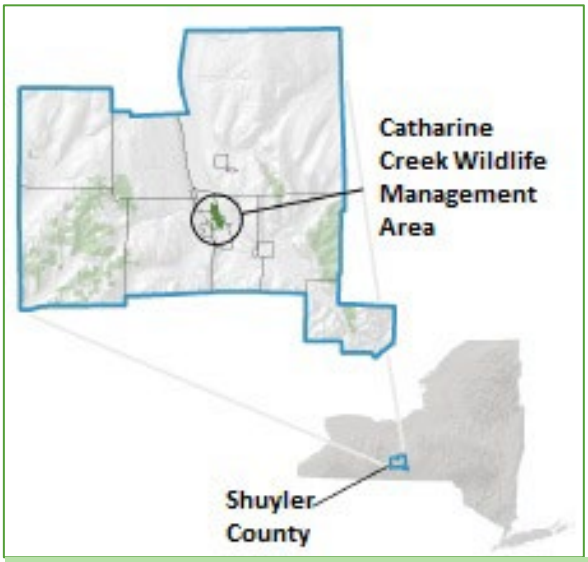

Image 1: Location of Catharine Creek WMA

Table 1. Summary of current and desired habitat acreage on Catharine Creek WMA.

Habitat Type	Current Conditions (as of 2015)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Wetland (natural)	395	51%		395	51%
Wetland (impounded)	154	20%		154	20%
Forest [a]	114	14%		78	10%
Young forest	0	0%		40	5%
Shrubland	0	0%		0	0%
Grassland	102	13%		98	12%
Agricultural land	0	0%		0	0%
Roads and parking	15	2%	4.3	15	2%
Streams	4	<1%	3.6	4	<1%
Total Acres:	784 [b]	100%		784 [b]	

[a] Forest acreage includes all mature and intermediate age classes of natural forest, plantations, and forested wetlands. Young forest is reported separately. Definitions are provided in the Forest section of this plan.

[b] Included in this total is a 141-acre addition that is pending final approval. This transaction is expected to be completed in 2022 and this acreage is considered part of the WMA in this HMP.

ECOLOGICAL RESOURCES

Wildlife Overview:

Catharine Creek WMA is primarily wetland and wildlife species occurring here are generally those associated with emergent and forested wetlands. A diversity of bird, mammal, amphibian, reptile, and invertebrate species are often present. A notable abundance of migrating waterfowl occurs seasonally as they use the marsh for resting and feeding. Several rare or at-risk species are present, and some popular game species are common, particularly waterfowl and furbearers.

Species diversity and abundance on the WMA varies throughout the year, being largely influenced by seasonal migrations. Common or notable species occurring here include:

- Small and big game (e.g., cottontail rabbit, gray squirrel, white-tailed deer, wild turkey)
- Furbearers (e.g., beaver, coyote, fox, mink, muskrat, opossum, otter, raccoon, weasel)
- Small mammals (e.g., meadow vole, star-nosed mole, deer mouse, big brown bat)
- Waterfowl (e.g., American black duck, American wigeon, blue-winged teal, Canada goose, gadwall, green-winged teal, mallard, northern shoveler, wood duck)
- Marshbirds e.g., American and least bitterns, pied-billed grebe, sora, Virginia rail)
- Shorebirds (e.g., greater and lesser yellowlegs, least and semipalmated sandpipers)
- Wading birds (e.g., green and great blue herons, great egret)
- Songbirds (e.g., barn and tree swallows, bobolink, common grackle, common yellowthroat, marsh wren, red-winged blackbird, swamp sparrow, yellow warbler)
- Raptors (e.g., bald eagle, northern harrier, osprey, red-tailed hawk)
- Amphibians (e.g., American toad, bull frog, green frog, leopard frog, spring peeper)
- Reptiles (e.g., common garter snake, northern water snake, painted turtle, snapping turtle)
- Fish (e.g., brown and rainbow trout, bullhead, smallmouth and largemouth bass, sunfish)

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or Special Concern (SC) species and/or Species of Greatest Conservation Need (SGCN) may occur on the WMA (Table 2). [5] Species listed below have been documented on or within the vicinity of the WMA and are likely to occur in suitable habitat on the WMA at least part of the year. Other species of conservation concern may also be present. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[6] NY Reptile and Amphibian Atlas,[7] DEC wildlife surveys and monitoring, and eBird.[8]

Table 2. Species of conservation concern that may be present on Catharine Creek 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
Birds	American bittern		SC	x
	American black duck			HP
	American kestrel			x
	American woodcock			x
	Bald eagle		T	x
	Black-billed cuckoo			x
	Black-crowned night-heron			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
	Common nighthawk		SC	HP
	Cooper's hawk		SC	
	Great egret			x
	Least bittern		T	x
	Louisiana waterthrush			x
	Northern harrier		T	x
	Northern pintail			x
	Osprey		SC	
	Pied-billed grebe		T	x
	Prairie warbler			x
	Ruddy duck			x
	Red-shouldered hawk		SC	x
	Ruffed grouse			x
	Rusty blackbird			HP

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

Table 2. Continued

Species Group	Species	Federal Status	NY Status	NY SGCN
	Sandhill crane [a]			
	Scarlet tanager			x
	Semipalmated sandpiper			HP
	Sharp-shinned hawk		SC	
	Wood thrush			x
Mammals	None known to occur			
Amphibians and reptiles	Eastern long-tailed salamander		SC	HP
	Jefferson salamander		SC	
	Snapping turtle			x
	Smooth greensnake			x
	Spotted turtle		SC	HP
	Wood turtle		SC	HP
Fish	Comely shiner			HP
Invertebrates	Paper pondshell			x
Plants	Clustered sedge		T	
	Leiberg's panic grass (Leiberg's rosette grass)		E	
	Marsh horsetail		T	
	Nodding onion		T	
	Northern wild comfrey		E	
	Yellow giant hyssop		T	

[a] Although not a listed species or SGCN, the sandhill crane is a rare breeder in New York and has been documented nesting on the WMA.

Significant Ecological Communities:

There are two significant natural communities located on Catharine Creek 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 occurs on the WMA; community descriptions are from *Ecological Communities of New York State, Second Edition* [9] (Figure 2):

- **Floodplain Forest** (S2S3) - typically a hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring and high areas are flooded irregularly. Some sites may be quite dry by late summer whereas other sites may be flooded again in late summer or early autumn (these floods are caused by heavy precipitation associated with tropical storms). This is a broadly defined community; floodplain forests are quite variable and may be very diverse.

[9] Available online at https://www.nynhp.org/ecological-communities/.

- **Silver Maple–Ash Swamp** (S3) - a hardwood basin swamp that typically occurs in poorly drained depressions or along the border 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 ecological communities is available in the Catharine Creek WMA Biodiversity Inventory Final Report (1998) prepared by the NY Natural Heritage Program.

Soils and Topography:

Soils on Catharine Creek WMA are of the following types:

- Aquepts and Saprists (49%)
- Wallkill Silt Loam (29%)
- Wayland Soils Complex (10%)
- Teel Silt Loam (7%)
- Chenango Channery Silt Loam (3%)
- Lordstown-Arnot Complex (1%)

Most of the soils on the WMA are dominated by swamp deposits consisting of peat, muck, and organic rich silts and clays that were deposited in topographically low areas associated with Seneca Lake. The WMA also includes a substantial amount of lacustrine silts and clays at the southern end of the property that were deposited in association with a proglacial lake. These lacustrine sediments extend to the north beneath the swamp deposits.

Elevations of land on the WMA ranges from 445 feet above sea level to 515 feet; however, most of the WMA is very flat. A small, narrow strip along Rock Cabin Road is where most of the elevation change occurs and the terrain is steep to very steep hillside.

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. Approximately 729 acres of SMZs (93% of the WMA) are on Catharine Creek WMA, including:

- One wetland (MF-1) regulated by Article 24 of the Environmental Conservation Law and 38 wetlands shown on the National Wetlands Inventory (NWI; Figure 3). State-regulated wetlands are protected by a buffer zone of 100 feet (regulated adjacent area).
- Approximately 3.6 miles of streams, including sections of Catharine Creek, Johns Creek, Seneca Lake Inlet, L'Hommedieu Creek, and smaller tributaries (Figure 3). Of these, 2.9 miles are classified as either C(T) or C(TS) and are regulated by Article 15 of the Environmental Conservation Law. Water quality standards will be adhered to on all streams. [10]

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*

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

Wildlife Management Areas.[11] Some habitat management activities may either be prohibited or restricted in order to protect these features. Any deviations from these guidelines will be addressed in the individual stand prescriptions.

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features, habitat availability, and other conservation lands near the WMA (Figures 4 and 5).

The landscape within 3 miles is primarily composed of these cover types:

- Forest, combining deciduous, evergreen, and mixed (43%)
- Pasture/hay and grassland (29%)
- Cultivated crops (7%)
- Developed (10%)
- Early-successional shrubland (2%)
- Wetland, combining emergent and woody (3%)
- Open water (6%)

Other conservation lands within 3 miles cover approximately 6% of the surrounding landscape:

- Gahada Gehn Yod Preserve, Finger Lakes Land Trust (10 acres) – forest, steep hillside.
- Havana Glen Park (30 acres) – waterfalls, forest, and campground.
- Private conservation easements (790 acres) – agricultural land, fields, and forest.
- W.W. Clute Memorial Park (12 acres) – lake shore and developed park facilities.
- Watkins Glen State Park (791 acres) – waterfalls, cliffs, forest, and recreational facilities.

Catharine Creek WMA is situated on the bottom of a valley at the south end of Seneca Lake. To the north and south are the villages of Watkins Glen and Montour Falls. To the east and west are steep forested hillsides that gradually level off and become a patchwork of forest and farmland. Through the center of the valley flows the barge canal, and most of the valley bottom is either wetland or floodplain. Much of the floodplain off the WMA is owned by state or local government and is actively managed for flood control; therefore, these parcels are not considered conservation lands in this plan. Only 3% of the landscape within 3 miles of the WMA is wetland (both emergent and woody), furthering the importance of this marsh to associated wildlife.

Most of this WMA is part of an Important Bird Area that includes all of the Queen Catharine Marsh. Important Bird Areas are designated to identify, monitor, and protect the most important places for birds, including both public and private lands. The WMA is designated a Bird Conservation Area by New York State, and a Critical Environmental Area by Schuyler County. The reason for Critical Environmental Area designation is the protection of plants and wildlife, particularly unique vegetative communities, rare plants, and breeding threatened bird species.

Part of the WMA includes a former rail bed (1.4 miles) that is maintained by the New York State Office of Parks, Recreation, and Historic Preservation under a memorandum of understanding.

[11] Available online at https://www.dec.ny.gov/outdoor/104218.html.

This is a section of the Catharine Valley Trail, which is a multi-use trail from Horseheads to Watkins Glen.

Catharine Creek WMA is within a nexus of forest linkage zones spanning across Schuyler and neighboring counties that connect several forest matrix blocks. Forest matrix blocks are large, unfragmented examples of the dominant forest communities throughout the state. Linkage zones describe corridors between a pair of forest blocks that maintain connectivity for the populations of plants and animals of these forests. More information regarding forest matrix blocks can be found within the *Strategic Plan for State Forest Management*. [12]

Approximately 43% of the landscape surrounding the WMA is forested and is generally located on steeper slopes and in gullies. Most of this is composed of a mature forest structure (poletimber or sawtimber) and only 2% of the surrounding landscape is shrubland or young forest. Young forest habitat and several associated wildlife species have steeply declined in the northeast over recent decades due to maturing forests and a lack of natural and human-caused forest disturbances. Establishing young forest on the WMA would benefit associated wildlife and the landscape.

II. Management Strategies by Habitat Type

DEC will continue active management of wildlife habitats on Catharine Creek 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.

Wetlands (Natural and Impounded)

Wetland acreage includes ponds, emergent marsh, and scrub-shrub wetlands, and is categorized as natural or impounded. Forested wetlands, including vernal pools, are addressed in the Forest section of this plan.

Natural wetland: includes areas where the soil or substrate is periodically saturated or covered by water, the vegetative community is predominantly composed of hydrophytes, and hydrologic processes are not greatly altered by human construction.
Impounded wetland: are areas similar to natural wetlands, but where water is held back by a berm, road, or other human-made structure.

[12] The Strategic Plan for State Forest Management is available online at https://www.dec.ny.gov/lands/64567.html.

MANAGEMENT OBJECTIVES

- Maintain 549 acres of wetland that provide habitats beneficial for furbearers, waterfowl and marshbirds.
- Identify and control invasive plant species to maintain and enhance biodiversity.
- Consider opportunities to improve open water interspersion and water level management capabilities.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are approximately 395 acres of natural wetlands and 154 acres of impounded wetlands on Catharine Creek WMA (Figures 3 and 6, Photo 1). This acreage primarily consists of two large expanses of emergent marsh located both east and west of the barge canal, with some minor areas of shrub swamp.

The wetland receives its water supply from the surrounding hillsides and a number of small tributary streams to Catharine Creek. The majority of Catharine Creek waters pass through the wetland via the barge canal. It is only during periods of high water that Catharine Creek contributes significantly to water levels in the wetland.

The composition of emergent marsh varies throughout the WMA. West of the barge canal the marsh is mostly an unbroken expanse of dense cattails with a few potholes (Photo 2). East of the barge canal the marsh contains smaller blocks of cattails broken up by an extensive network of level ditches, surrounding a large open water area. Water levels in the marsh are largely influenced by Seneca Lake water levels and fluctuate throughout the year; sometimes there is expansive open water, and at other times much of the marsh is mostly drained.

Photo 1: Extensive emergent marsh is present on the WMA and provides important habitat to resident and migrating wildlife.

Photo: Adam Crawford, Family Adventures in New York State

This variety of marsh conditions provides a diversity of habitats for wildlife to utilize. Potholes and other small pockets of open water surrounded by cattails provide secluded areas needed by some wildlife for courtship and breeding. An interspersion of open water among emergent vegetation provides greater edge for various wildlife to forage for food and find cover. When the large open area is inundated, it provides a site for large numbers of migrating waterfowl to congregate and rest. When water levels are low, the open area becomes a mudflat where shorebirds find ideal foraging conditions and annual plants establish. The abundant seeds produced by these annual plants then become important food for waterfowl once the area is inundated again.

This marsh historically was dynamic, with diverse, continuously changing conditions; however, human alterations have significantly changed how this wetland functions. Generally, over a century of hydrologic changes shifted the marsh toward becoming a dense, unbroken expanse of cattails, which led to the extensive level ditching and pothole projects of the 1980s and 1990s; an effort to enhance habitats by creating a better interspersion of open water among the cattails. Since then, change has continued in the marsh, as is evidenced by the large open area that has slowly increased in size over the past couple decades (coinciding with a decrease of emergent vegetation available to wildlife).

Photo 2: West of the barge canal the marsh is dominated by cattails with little open water interspersion.

Photo: Mike Palermo, DEC

This increase of open water was largely influenced by overabundant common carp feeding on cattails and subsequent wave action of a larger open water area causing erosion. Recent periods of drought (2016 & 2020) have helped reduce the pressure from carp here and should allow a better interspersion of emergent vegetation to develop. The potential for carp to alter the marsh condition requires future monitoring and unless periodic droughts continue to occur, active carp control may be necessary to maintain an emergent wetland condition that is most beneficial to target wildlife species. Opportunities should be explored to improve DEC's ability to manage water levels within the marsh to better influence habitat composition and quality (Figure 7).

Photo 3: Monocultures of common reed degrade wetland habitat values for wildlife. Control of this plant on the WMA is a priority.

Photo: Leslie J. Mehrhoff, University of Connecticut, Bugwood.org

Although cattails are the dominant emergent vegetation in the marsh, other common species include bulrush, bur-reed, common reed, and reed canarygrass. Both common reed (also known as Phragmites) and reed canarygrass

are non-native, invasive species that can degrade habitat values by outcompeting native plants and forming dense stands (Photo 3). Reed canarygrass is widespread on the WMA and large monocultures are present; effective control options are limited. Patches of common reed are less abundant but are at concerning levels and control needs to remain a priority to reduce extent and prevent further spread. Other invasive plant species that are known to be present and may require control actions to prevent habitat degradation include creeping jenny, flowering rush, purple loosestrife, and yellow iris. There are also non-native, invasive crayfish present on the WMA that warrant further monitoring and may include two species, the red swamp crayfish and white river crayfish.

The abundance of emergent wetland here and the scarcity of it within the surrounding landscape is what makes it so valuable to wildlife, providing important habitat to a variety of resident and migrating species throughout the year. Thousands of migrating waterfowl and other wetland birds stop on the WMA each fall and spring to rest and refuel before they continue travelling. Several at-risk species are known to breed in the marsh, including pied-billed grebe and American bittern. The marsh is also known for high numbers of furbearers, such as mink and beaver, that can be found year-round; however, current muskrat numbers are low due to recent droughts. Habitat management improvements should be explored to resolve this issue.

Table 3. Target species for wetland management on Catharine Creek WMA.

Target Group	Example Species	Beneficial Habitat Structure
Furbearers	Beaver, mink, muskrat, otter	A diversity of wetland types that support preferred foods: beaver (woody plant material), muskrat (cattails), mink (small mammals).
Migrating Waterfowl	American black duck, blue and green-winged teal, Canada goose, canvasback, mallard, and pintail	Secluded areas in emergent marsh for courtship and pair bonding. Flooded early successional marsh for food in fall and spring. Large open water areas for resting and roosting.
Breeding Marshbirds	American bittern, pied-billed grebe, and sandhill crane	Diverse emergent marsh with varying levels of water depth and vegetation height and density to provide a variety of different conditions.

MANAGEMENT HISTORY

Historically, the valley that contains the WMA was inhabited by the Seneca Nation, who utilized the wetland extensively for food and other resources. European settlement of the valley began in the late 1700s, and led to significant alteration of the wetlands, including the construction of the Chemung Barge Canal in 1839 (connected Seneca Lake to the Chemung River), and the Pennsylvania Railroad in 1878, both of which bisected the wetland. Farming in the marsh was common when water levels were low and active draining and ditching continued into the early 1900s. In 1916 a dam was constructed at the north end of Seneca Lake which stabilized water levels and greatly reduced fluctuations within the marsh, essentially putting an end to the low water conditions that were favorable for farming.

Most of the WMA was acquired by DEC between 1978 and 1984 to protect the wetland from development pressure and further degradation, with other large additions occurring in 2009 and 2018 (a 141-acre addition from the Finger Lakes Land Trust is currently pending and is expected to be completed in 2022; this is considered part of the WMA in this plan). By the time DEC began acquisition, the marsh had been greatly altered from its pre-settlement condition. Over 50 years of reduced water level fluctuation promoted the formation of a dense cattail marsh with very little open water interspersion, limiting use by waterfowl and furbearers.

Photo 4: Extensive ditching and pothole excavation has occurred here to improve open water interspersion within the marsh.

Photo: Michael Palermo, DEC

In 1988, 5 miles of level ditching and 10 potholes were excavated on the WMA to improve open water interspersion and maximize waterfowl and furbearer production (Photo 4). In 1995, an additional mile of level ditching and 8 potholes were excavated. In 2019, 120-acres of marsh on the west side of the WMA were improved with a new water-control structure and berm (on the parcel currently pending DEC acquisition), providing staff the ability to manage water levels to influence habitat conditions.

Recent management of wetland habitat here has focused on invasive plant control. The extent of purple loosestrife was greatly reduced through the release of a biological control insect (*Galerucella spp.* beetles). Herbicides have been applied to control and reduce the extent of both knotweed and common reed (*Phragmites*).

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2022-2031** (Figures 6 and 7):
  - Monitor for invasive vegetation to document current extent and to detect additional species and infestations.
    - As needed, control invasive vegetation mechanically, biologically, and/or with herbicide to reduce extent and suppress spread.
    - Common reed and knotweed are priorities.
  - Maintain existing level-ditching and marsh potholes to prevent sedimentation and encroachment of emergent vegetation.
    - As needed, excavate ditches and potholes.
  - As needed, control carp and resident Canada geese to prevent negative impacts to other wildlife and habitat quality.

- Consider opportunities to improve open water interspersion and water level management capabilities and implement actions where practical.
    - Attempt to improve interspersion in the marsh west of the barge canal by manipulating water levels using existing control structures and encouraging muskrat occupancy. If this is not effective, excavation of level ditches and potholes may be necessary.
    - Explore the feasibility of constructing water control structures and berms within the large marsh east of the barge canal to manage water levels.
        - There are three potential locations: (1) at the outlet by the lake, (2) on an existing berm near the middle of the marsh, and (3) just south of Airport Road.
        - Elevation surveys and cooperation with some adjacent landowners would be needed.

BEST MANAGEMENT PRACTICES

Management activities within wetlands will take into consideration the timing of wildlife breeding seasons and when practicable these periods of time will be avoided. Wetland management will follow guidelines established in the General Permit GP-0-20-005: Habitat Management by NYSDEC, and any necessary additional permits, such as additional Article 24 permits and pesticide permits.

MANAGEMENT EVALUATION

Monitoring of wetland habitat use at Catharine Creek WMA is not routine and data are often derived opportunistically. Breeding marshbirds surveys have occurred occasionally and should continue. The establishment of additional periodic surveys for amphibian, reptile, fish, and bird presence would be beneficial to better understand species diversity and use.

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 vegetation accounts for greater than 50% of hydrophytic vegetative cover and the soil or substrate is periodically saturated or inundated.
Young forest: young or regenerating forested acres, typically 0-20 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 Catharine Creek 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

- Maintain 78 acres as mature forest to benefit associated wildlife.
- Increase young forest from 0 to 40 acres (34% of WMA forested acreage) to improve stand quality and provide habitat for young forest-dependent species.
- Encourage the regeneration of desirable native tree and shrub species to replace ash-dominated stands that are declining.
- Reduce the spread and extent of non-native, invasive plants to improve forest diversity.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 114 acres of forest covering approximately 14% of Catharine Creek WMA (Figure 6). Table 4 provides a summary of forest types, including the most common tree species.

This forest acreage is composed of fragmented blocks that are generally located either along the original stream channel of Catharine Creek, at the higher edges of the marsh, or in areas where fields were abandoned 60 to 90 years ago. Approximately 82% of this is forested wetland composed of black willow, ash, cottonwood, and red/silver maples (Photo 5). Much of these stands are floodplain forest, while a smaller acreage is considered silver-maple ash swamp. Upland forest is a lesser component (18%) of the overall forest, occurring in just a few locations and is mostly composed of black walnut, cottonwood, black locust, and hackberry. A small walnut/butternut plantation is also present.

Most of the forest on this WMA can be considered degraded by invasive plants (Photo 6). In many of the forested wetland stands, the understory is dominated by either reed canarygrass in the wetter locations, or honeysuckle and privet in the slightly drier locations. Some of the upland forest understories are in a little better shape but still have high numbers of garlic mustard, buckthorn, honeysuckle, privet, and bittersweet. Tree-of-heaven is also established and spreading in parts of the WMA, including forest, fields, and marsh edges.

Photo 5: Forested wetland stands on the WMA are generally dominated by large black willows, cottonwood, and ash. In some stands the understory is dense reed canarygrass.

Photo: Michael Palermo, DEC

[13] Additional information about DEC's Young Forest Initiative and the Strategic Plan for Forest Management on WMAs is available online at https://www.dec.ny.gov/outdoor/104218.html.

The ash component on the WMA is severely declined with extensive mortality from the invasive emerald ash borer (EAB) and is too far gone to salvage. Two forested wetland stands (A-2 and A-6) are heavily dominated by ash and will be significantly impacted by this loss. In a healthy forest, this loss of canopy would encourage the establishment of a young forest, which is a beneficial habitat type to many wildlife species that depend upon it. However, the understories of these ash stands are dominated by invasive plants, which likely will interfere with the establishment of young trees. Corrective actions to restore these forests are needed to ensure desirable trees replace the ash and prevent regression to an invasive thicket. There are biological control insects currently on the landscape that parasitize EAB; it is uncertain how effective they will be over time, but it is possible that ash regeneration after this wave of mortality may be able to persist.

Photo 6: The understories of most stands on the WMA are dominated by non-native, invasive plants. Shown here is a dense thicket of honeysuckle and privet beneath cottonwoods.

Photo: Michael Palermo, DEC

Although degraded, these forests do currently provide habitat that is valuable and important to multiple wildlife species. Wood ducks nest in trees with cavities and then move their broods to nearby open water after they hatch. A variety of songbirds are present during both migration and the breeding season, including swamp sparrow, gray catbird, and yellow warbler. Wild turkey use this forest throughout the year and white-tailed deer are quite common. American woodcock nest in the dense understories and forage in moist forested wetlands. The young forest that is expected to establish as the ash component is lost will also support numerous species that are declining throughout New York. Young forest is lacking from the surrounding landscape and will be a beneficial addition to the WMA as long as it is composed of desirable tree species.

Table 4. Summary of the acreage and dominant overstory species for each forest type.

Forest Type	Acres (as of 2015)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	21	21	Black walnut, black locust, oak, cottonwood, hackberry, boxelder
Plantation	2	2	Black walnut, butternut
Forested wetland (mature/intermediate)	91	55	Black willow, ash, cottonwood, red maple, silver maple, sycamore
Young forest	0	4	Currently not present on WMA
Young forest (forested wetland)	0	36	Currently not present on WMA
Total Forested Acres:	114	118 [a]	

[a] Change in total forested acres is due to the planned reversion of grassland to forest (4 acres).

Table 5. Target species for forest management on Catharine Creek WMA.

Target Species	Beneficial Habitat Structure
American woodcock	*Nesting*: Stands of an acre or more with woody stem density of at least 6,000 stems per acre, on mostly dry soil.
	Foraging: Moist, rich soils with dense overhead cover and abundant invertebrates, especially earthworms.
	Singing ground: Open areas, such as fields or recent clearcuts near nesting and foraging habitat.
Wood duck	*Nesting*: snags or live trees with cavities near accessible water.
	Brood-rearing: wetland or other waterbody with abundant aquatic invertebrates.

MANAGEMENT HISTORY

Most of the forests on the WMA originated from fields that were abandoned in the past 60 to 90 years, or in parts of the marsh that became drier once the canal was constructed. Forest on the WMA that was present historically was heavily logged in the 1800s. Some of the willow stands currently present may have originated from willow farms that were cultivated in the late 1800s. There are no records of DEC performing any previous forest management on this WMA.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2022-2031** (Figure 6):
    - Encourage the establishment of young forest in Stands A-2 and A-6 (36 acres) by planting seedlings to replace the declining ash component.
        - Planting tree and shrub species not favored as deer browse (e.g., alder, blackgum, river birch, silky dogwood, spicebush, sycamore, and tulip tree) is preferred to avoid time-consuming upkeep of abundant protective features (e.g., tubes, cages).
        - A small number of protective features could be installed to protect plantings of tree species with particularly high wildlife value (e.g., swamp white oak).
        - Where necessary and feasible, invasive shrubs should be cleared and treated with herbicide to facilitate planting.
        - Documentation of any ash trees that appear to be resistant to emerald ash borer should occur.
    - Monitor for non-native, invasive vegetation and pests throughout all forest stands and where practicable, control mechanically, biologically, and/or with pesticide.
        - Control non-native, invasive vegetation in Stands A-1 and A-5 (14 acres).
        - Treatment actions in other stands should be prioritized in areas that already contain desirable native plants and lower numbers of invasives.
        - Tree-of-heaven should be controlled throughout the WMA.

Table 6. Forest management scheduled for this HMP (2022-2031).

Stand	Acres	Size Class	Forest Type		Treatment Type
			Current	Future	
A-1	6	Small Saw Timber 12"-17" DBH	Other – Cottonwood, Locust, Boxelder	Other – cottonwood, black locust, boxelder	Control Invasives
A-2	16	Pole Timber 6"-11" DBH	Swamp Hardwood	Young Forest (Forested Wetland)	Plant Seedlings
A-5	8	Small Saw Timber 12"-17" DBH	Other – Walnut, Hackberry, Oak	Other – Walnut, Hackberry, Oak	Control Invasives
A-6	20	Pole Timber 6"-11" DBH	Swamp Hardwood	Young Forest (Forested Wetland)	Plant Seedlings

Most of the young forest planned to establish on the WMA during the time frame of this HMP is due to mortality of ash-dominated stands infested with the emerald ash borer (36 acres). Without direct action to plant desirable tree and shrub seedlings, these stands may not become young forest and could rather transition into honeysuckle/privet thickets or reed canarygrass meadows. Targeted invasive control could also occur at planting sites to promote success. The other 4 acres of young forest to be established will occur by allowing two small field sections to revert.

Understory invasive control is planned in Stands A-1 and A-5 because these stands currently are not significantly degraded by invasive plants and contain enough persisting native understory vegetation to be worthwhile. Long-term, widespread suppression of invasive plants in all forests on this WMA would require resources (i.e., staff time, funding, effort) at such high levels that would likely be prohibitive, and potentially would not be successful due to the abundance of invasives nearby that would continue to be a seed source. Invasive plant control here is therefore focused on ensuring a new generation of trees replace the dying ash component, and to improve and maintain the few areas that are not overly degraded by invasives.

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 7).

Table 7. Best Management Practices for forest management on WMAs.

Resource	Guidance Document [14]
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*

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

Wildlife Considerations:

Sensitive wildlife that may occur on or near the WMA that warrant special consideration include:

- *Bald eagle*. Eagles are known to nest on Catharine Creek WMA. Forest management here will avoid disturbing any nesting should it occur within or adjacent to a stand with proposed management. This may include delaying nearby actions until after the breeding season and/or the establishment of a buffer around the nest.

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 a forest stand to be treated.

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 the WMA must consider these forest pests, diseases, and invasive species and ensure that measures are taken to control their presence or prevent their establishment. One way to protect against future forest health issues is to promote species diversity, so when a pest or disease outbreak occurs, it only impacts part of a forest.

Photo 7: Emerald ash borer has caused severe decline of ash trees on this WMA.

Photo: David Cappaert, Bugwood.org

Infestations of non-native insects such as emerald ash borer (EAB, Photo 7), spongy moth, and pear thrips are of present concern and bear persistent monitoring. Spongy moth (formerly gypsy moth) and pear thrips densities fluctuate and can reach outbreak levels where complete defoliation can occur. Spongy moth most commonly attacks oak and aspen while pear thrips favors sugar maple. EAB has been present on the WMA for several years and is causing significant decline and mortality of the ash component. There are no effective control measures to protect ash forests at the moment, so planned actions are instead focused on ensuring native trees replace the lost ash, rather than invasive plants.

Spotted lanternfly is a non-native invasive insect that has not yet been detected on the WMA but is spreading nearby and should be watched for. It primarily feeds on tree-of-heaven but can also feed on a wide variety of plants such as grapevine, hops, maples, walnut, fruit trees and others. Controlling tree-of-heaven on the WMA could slow the spread of this pest to the WMA and reduce potential future abundance.

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

Oak wilt is a fungal disease that can infect and kill oak trees and has been found at multiple sites in nearby Ontario County. Oak wilt primarily spreads in two ways: 1) through root connections with adjacent oak trees, and 2) from *Nitidulid* beetles that spread spores to open wounds on other oak trees. Treatment includes removing infected trees and severing root connections to reduce the chance of spread. Monitoring of oak trees may be necessary if oak wilt begins to spread throughout the region.

Photo 8: Non-native bush honeysuckle (*Lonicera spp.*) is widespread on the WMA and has degraded understory habitats in many forest stands.

Photo: Michael Palermo, DEC

Invasive plants are a significant problem in forests on the WMA. Species that are known to be in or near the forested areas of the WMA include: autumn olive, common buckthorn, common reed, garlic mustard, honeysuckle (Photo 8), knotweed, multiflora rose, oriental bittersweet, privet, reed canarygrass, and tree-of-heaven.

MANAGEMENT EVALUATION

Tree plantings will be monitored annually until seedlings grow above deer browse height (5 to 6 feet) to determine which species are growing adequately and if there are any concerns. If some species establish poorly or are being suppressed by deer browsing, then additional plantings may occur using species determined to be doing well from prior plantings.

Stands where invasive plants are controlled will be monitored over time to determine the effectiveness of the treatment and needs for follow-up actions.

SHRUBLAND

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

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

There is no shrubland habitat on the WMA or any plan to develop such habitat.

GRASSLAND

Grasslands are open areas dominated by grasses and forbs, with less than 25% woody vegetation. Ideally, the forb component should not exceed 25% by area. Grasslands may contain shrubs and other woody vegetation, but not to the point beyond which maintenance would require significant brush cutting (i.e., not suitable for brush-hogging). Grasslands may include areas where hay is harvested by late season mowing once per year.

MANAGEMENT OBJECTIVES

- Maintain grasslands to prevent reversion to shrubland and forest.
- Encourage a diversity of grasses and forbs beneficial to target species.
- Allow 4 acres of grassland to revert to young forest.
- Identify and control invasive plant species to prevent their dominance in fields.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

There are currently 102 acres of grassland habitat on Catharine Creek WMA (Figure 6, Photo 9). These are concentrated on the southern half of the WMA and are mostly composed of small fields that range in size from 1 to 12 acres; however, one large field (32 acres) occurs between North Seneca Street and North L'Hommedieu Street.

Habitat condition and quality varies widely among these fields, including warm-season grasses, cool-season grasses, and some fields that are mostly forbs (e.g., legumes and wildflowers). Some fields are overgrown with shrub and tree seedlings and need maintenance. Some fields are well-drained and dry most of the year, while others are seasonally wet. Some fields are used by grassland-dependent songbirds, such as bobolink, while other fields are instead more valuable to song sparrows, red-winged blackbirds, and white-tailed deer.

Photo 9: Fields on the WMA provide valuable diversity to the surrounding wetland and forest habitats, supporting a variety of wildlife, including cottontail, deer, turkey, and numerous songbirds.

Photo: Michael Palermo, DEC

Grassland-dependent birds typically require large patches (25+ acres) of grassland, with low perimeter-to-area ratios in an open landscape. Only one field on the WMA is that large, but a few smaller fields here are contiguous with expansive emergent marsh, which seems to provide more functional field habitat for these species than is typical, especially bobolink and northern harrier.

Fields on the WMA (Photo 10) are either adjacent to forest or wetland, which can influence some of the wildlife that use them. Grassland adjacent to wetland provides important nesting habitat for waterfowl, such as mallard. The dense cover provided by tall grass near forest provides valuable hiding cover for fawns. Grassland near forest stands that have dense understories are valuable as woodcock singing grounds. Pollinators (e.g., bees and butterflies) and various other insects also thrive in these herbaceous areas, which provide an important high-protein food for a variety of wildlife; this is especially important for turkey brood rearing.

Photo 10: This field adjacent to thick forest provides the ideal habitat for a male woodcock's singing ground.

Photo: Michael Palermo, DEC

Reed canary grass (RCG) is a non-native, invasive grass that is present in many fields here and has degraded some habitat values. In drier fields on the WMA, RCG is typically a minor component of the plant community; however, in wetter fields it has established large monocultures. Control of RCG is difficult, especially large infestations; however, actions should occur on the WMA to limit its spread and attempt to convert some areas back to native grasses.

Table 8. Target species for grassland management on Catharine Creek WMA.

Target Group	Example Species	Beneficial Habitat Structure
Upland game	Eastern cottontail, white-tailed deer, and wild turkey	A diversity of grasses and forbs that provide variable food and cover throughout the year. Abundant insects are important for turkey poults.
Grassland-dependent birds	Bobolink, northern harrier	Large grassland patches in an open landscape. A diversity of grass types with varying height and density, provide for a greater range of species use.
Pollinators	Bees, butterflies, and moths	Abundant and diverse native wildflowers that bloom consistently throughout spring, summer, and fall. Alternating annual mowing regimes.

MANAGEMENT HISTORY

The fields on the WMA were once agricultural lands, either originating from forestland that was cleared or wetland that was drained or filled. One field was even formerly used as a small airfield. Since DEC acquisition, management has maintained these fields through routine mowing and planting to favorable species.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2022-2031** (Figure 6):
    - Throughout all grassland stands, routinely perform maintenance actions.
        - Mow fields every 1-3 years to prevent establishment of woody vegetation.
            - Mowing fields heavily invaded by woody plants may be most effective if conducted in early spring and again before senescence.
        - Consider opportunities to incorporate rotational livestock grazing as a means to control undesirable vegetation.
        - When resources are available, utilize prescribed fire where appropriate.
            - Controlled burning of fields would favor native warm-season grasses and control undesirable invasive vegetation.
        - As needed: lime, fertilize, disk, and/or reseed grasslands.
            - Consider opportunities to cooperate with New York State Canal Corporation to spread dredge spoil from the barge canal onto fields to improve soil fertility and facilitate replanting efforts.
    - Allow 4 acres of grassland to revert to young forest.
        - This will occur in two 2-acre blocks located in Fields A-943 and A-944. Both of these blocks are currently being encroached upon by young trees. Tree and shrub planting may occur.
    - Throughout all grassland stands, control invasive vegetation.
        - Depending on the species, invasive vegetation can be controlled mechanically, biologically, and/or with herbicide.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs in NY. For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[15] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding management and restoration techniques.

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity and consider the needs of both breeding and wintering grassland bird species.
- Consider the surrounding landscape when making management decisions.
- Conduct baseline grassland bird surveys on newly acquired fields or fields targeted for management changes to determine which species are present.
- Increase field size by hedgerow removal, removing trees, etc. to benefit species that require large open fields.
- Control invasive plant species (glossy buckthorn, pale and black swallowwort, Canada thistle, Phragmites, etc.) to improve habitat quality.
- When developing grassland planting or habitat restoration projects, consider the targeted grassland bird species, pollinators, seed mix (warm versus cool season grasses, forbs, wildflower mixes, grass height and density), timing of planting, existing site conditions, and vegetation removal techniques (including herbicide and intensive disking).

[15] 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.

- Utilize mowing, haying, burning, and grazing for maintaining grassland habitat, after evaluating the appropriateness of these methods relative to site conditions and management objectives.

Timing of Management

- Fields over 25 acres (including all contiguous fields) and fields of any size with a history of listed (federally and/or state E/T/SC) grassland bird species within the last 10 years:
    - Avoid mowing or conducting other management between April 23 and August 15, unless the field(s)/area(s) targeted for management are first assessed or surveyed to confirm there is no active nesting by E/T/SC grassland birds and the proposed management will provide long-term benefits to the habitat/wildlife (such as invasive species management). In some cases, if nesting locations can be avoided, such as using spot treatment for invasive species, work can be done as long as any negative impacts to the species of concern are eliminated.
- Fields under 25 acres (including all contiguous fields) with no history of listed species:
    - Fields can be managed/mowed between April 23 and August 15 if necessary to accomplish other goals and priorities that benefit other species that use the habitat. If early management is proposed, then the habitat requirements and nesting periods of other species should be considered (e.g., nesting waterfowl, American bittern, reptiles, and amphibians).
- Wintering Restrictions: Avoid mowing and other management from November 1 to March 1 within fields over 25 acres (including all contiguous fields) and fields with a history of listed wintering raptors (regardless of field size). If management to improve habitat is planned during this time, conduct pre-treatment winter raptor surveys using established protocols to confirm there is no use by listed wintering raptors (short-eared owl and northern harrier). Other activities that cause excessive disturbance such as motorized vehicle operation or other loud noises should be avoided from November 1 to March 1, inclusive, for the protection of wintering raptors.

Additional Mowing Guidelines

- Frequency of mowing, size of area mowed, and mowing techniques should be based on species present and current and desired habitat conditions.
- Block or spot mowing is preferred, and strip mowing should be limited (especially in fields over 25 acres). In some cases, spot/wander mowing can be done to leave cover while targeting problem areas.
- 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 on the WMA is informal and data are often derived opportunistically, and will be continued. However, the establishment of periodic grassland 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.

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

There is currently no acreage on Catharine Creek WMA that is managed as agricultural land. Utilizing temporary agriculture (3 to 5 years) as a means to replant and restore grassland fields may be considered; however, there are no actions currently planned.

STREAMS

Streams are defined as any watercourse on the WMA, including both year-round and intermittent flows. This includes the aquatic habitat associated with the stream channel but does not include the wetland habitat that may occur within the floodplain or riparian zone of a watercourse. For management purposes and habitat acreage calculations, some streams are lumped within surrounding habitat stands (e.g., an intermittent stream that flows through a forest stand is included in that stand's acreage calculation).

MANAGEMENT OBJECTIVES

- Maintain the condition and quality of streams on the WMA.

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

Approximately 4 acres and 3.6 miles of streams occur on Catharine Creek WMA (Figures 3 and 6), including sections of Catharine Creek (Photo 11), Johns Creek, Seneca Lake Inlet, and smaller tributaries. The existing maintained barge canal flows along but not on the WMA.

Catharine Creek flows from south to north, and within the Village of Montour Falls it enters the old barge canal and related flood diversion channels onto the WMA (this stretch is also called L'Hommedieu Creek). Some of this flow feeds into the Seneca Lake Inlet, which is the historic stream channel that flowed through the valley and into the lake, but most of the flow ends up in the barge canal.

Photo 11: Catharine Creek flows through and along the southern part of the WMA, and then into the barge canal.

Photo: Michael Palermo, DEC

Many of the streams on the WMA are greatly altered. Some were

excavated or straightened to divert water flows or facilitate boat traffic. Some of the natural meandering channels, such as the Seneca Lake Inlet, still persist but at greatly reduced flows than historic levels.

Catharine Creek supports an important recreational rainbow trout fishery. The stream and its tributaries serve as a vital spawning and nursery area for rainbow trout. Spring spawning runs of rainbow trout draw thousands of anglers to the area annually.

Table 9. Target species for stream management on Catharine Creek WMA.

Target Group	Example Species	Beneficial Habitat Structure
Freshwater mussels	Paper pondshell	Unpolluted, unfragmented waterways with undisturbed substrate and low rates of sedimentation.
Fish	Brown and rainbow trout	Cool, clean water with in-stream rocky and woody structure.

MANAGEMENT HISTORY

Under DEC ownership, management of streams on the WMA has been minimal. DEC management has used best management practices to prevent erosion and sedimentation of these streams during other activities. Some invasive plant control has occurred on the banks of streams.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2022-2031** (Figure 6):
    - Maintain the condition and quality of streams on the WMA.
        - All habitat management activities on the WMA will adhere to the Environmental Conservation Law and follow best management practices.
    - Monitor for and control aquatic and riparian invasive vegetation.
        - Control may include mechanical, biological, and herbicidal methods.

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). Guidelines for special management zones will be adhered to.

MANAGEMENT EVALUATION

Surveys for fish in Catharine Creek and nearby streams are conducted by DEC and will be continued. Periodic surveys of freshwater mussels would be beneficial to better understand species diversity and distribution.

HABITAT MANAGEMENT SUMMARY

In summary, Table 10 lists the habitat management actions planned for Catharine Creek WMA over the next ten years. Any substantive changes will be appended to this HMP annually or as needed (Appendix D).

Table 10. Summary of habitat management actions recommended for Catharine Creek WMA, 2022-2031 (Also see Figures 6 and 7).

Habitat	Management Action	Acres	Timeframe
Wetland	Monitor for and control invasive vegetation (e.g., common reed, tree-of-heaven)	≤ 549	2022-2031, ongoing
Wetland	Maintain level ditching and potholes		2022-2031, as needed
Wetland	Manage water levels in marsh west of barge canal	154	2022-2031, ongoing
Forest	Plant tree and shrub seedlings to replace declining ash overstory in Stands A-2 and A-6	36	2022-2031
Forest	Control non-native, invasive vegetation in Stands A-1 and A-5	14	2022-2031, ongoing
Grassland	Allow 4 acres of Fields A-943 and A-944 to revert to forest	4	2022-2031
Grassland	Maintain grassland acreage with mowing and potentially prescribed fire	≤ 98	Annual, biennial, or triennial
Grassland	Improve grassland quality (e.g., lime, fertilize, disk, and/or reseed)	≤ 98	2022-2031, as needed
Grassland	Monitor and control invasive vegetation (e.g., encroaching tree-of-heaven)	≤ 98	2022-2031, ongoing
Stream	Follow BMPs for water quality		2022-2031, as needed
Stream	Monitor and control invasive vegetation (e.g., knotweed)	4	2022-2031, ongoing

III. FIGURES

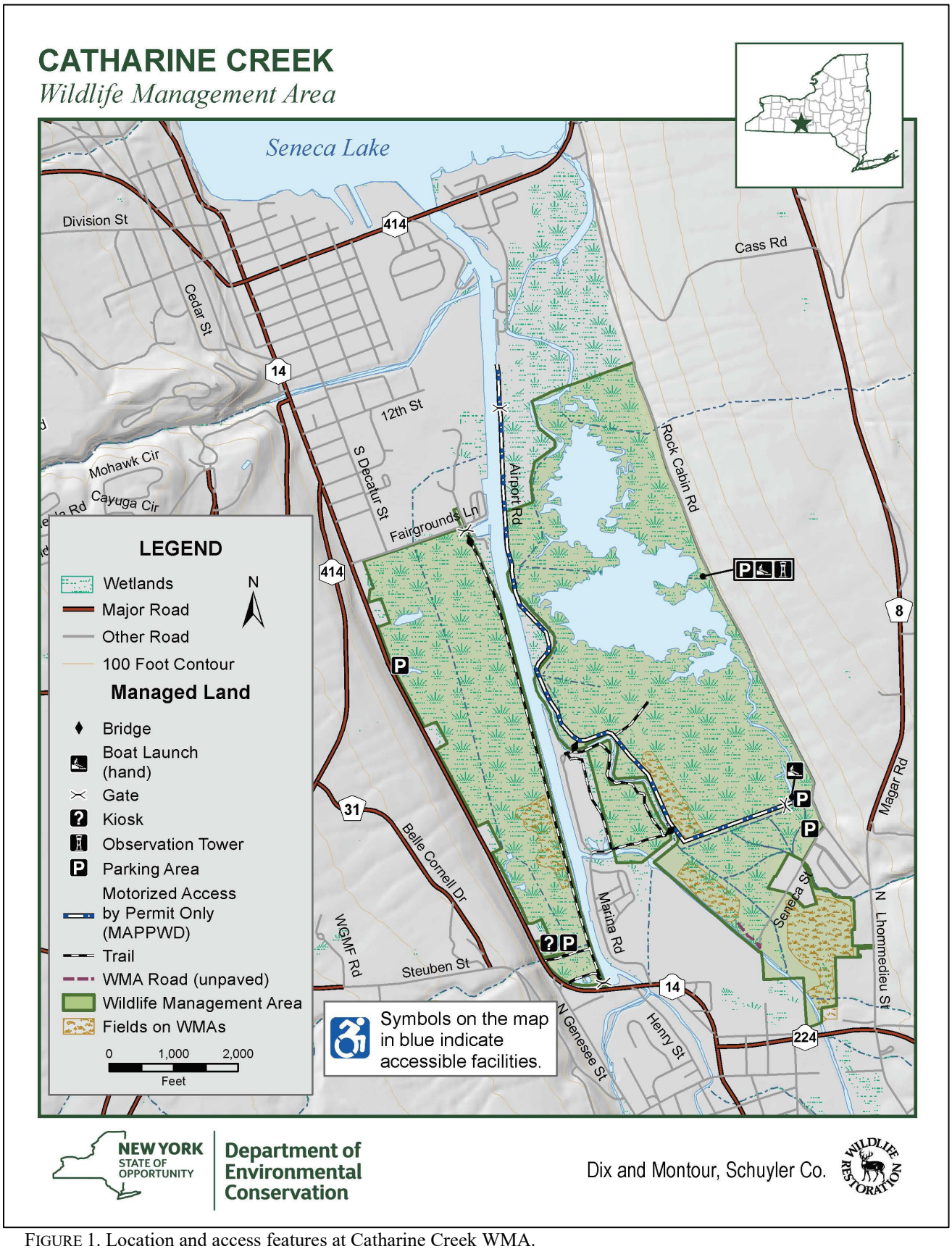

FIGURE 1. Location and access features at Catharine Creek WMA.

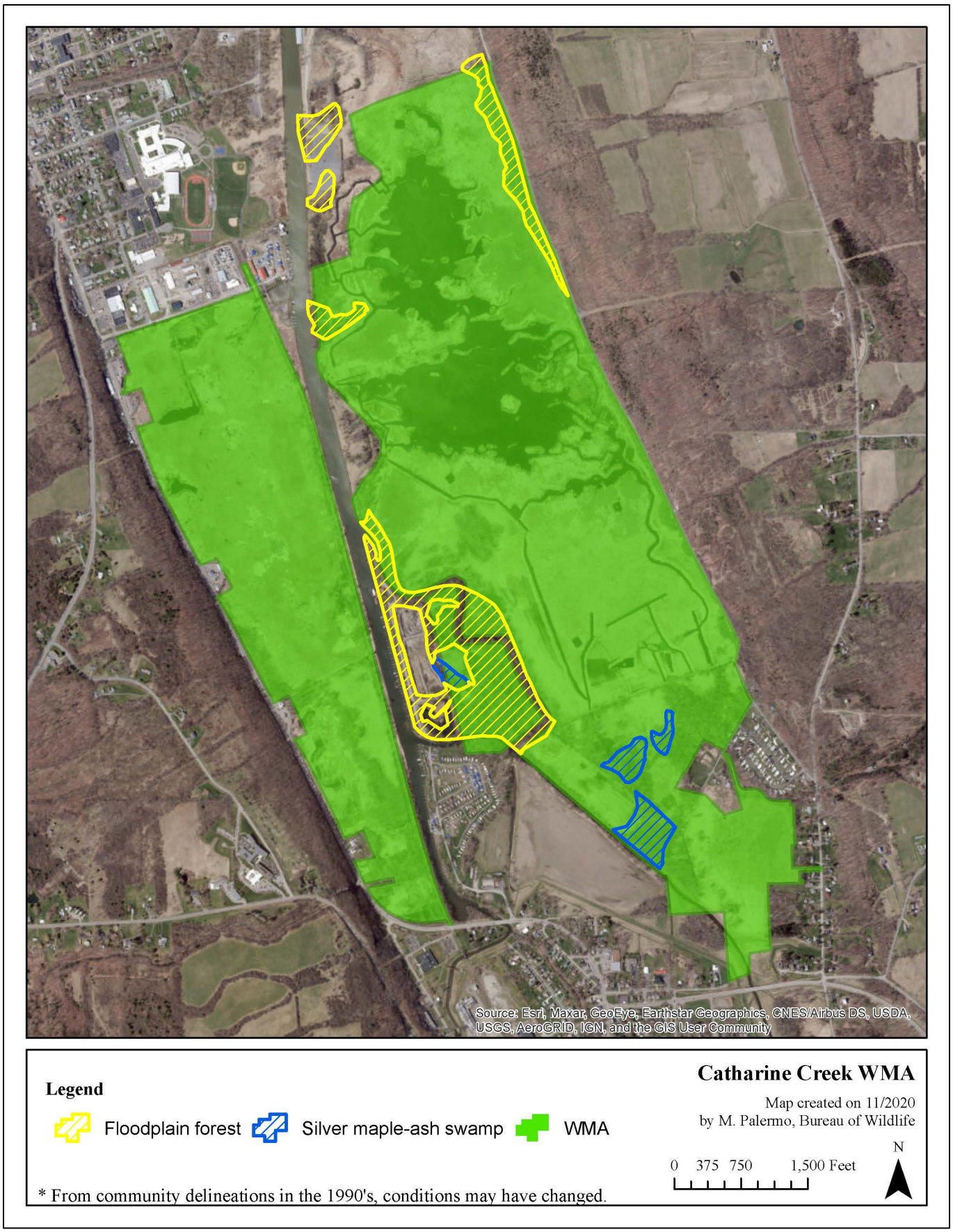

FIGURE 2. Significant ecological communities on Catharine Creek WMA. Data from the NY Natural Heritage Program.

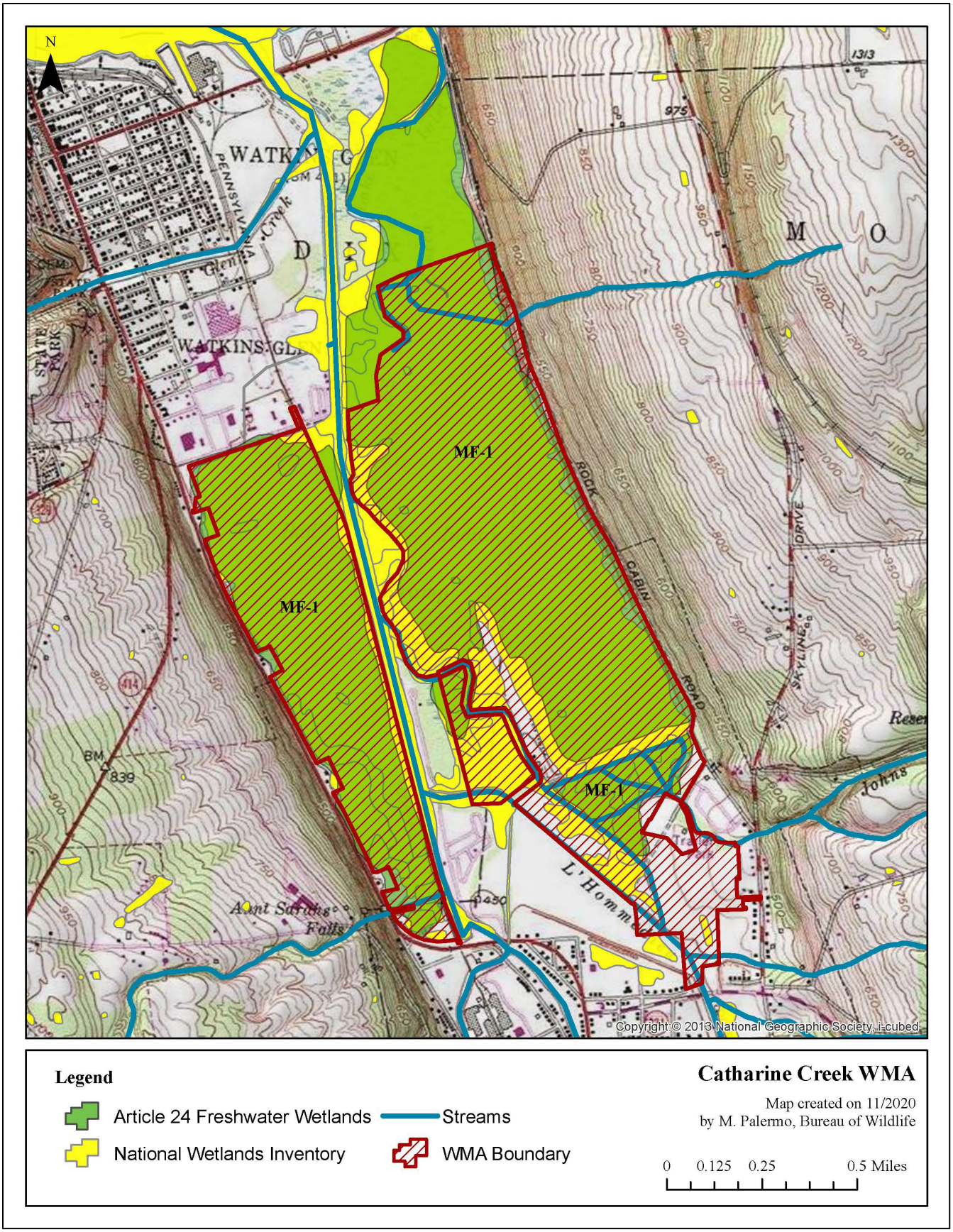

FIGURE 3. Wetlands, open water, and streams of Catharine Creek WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

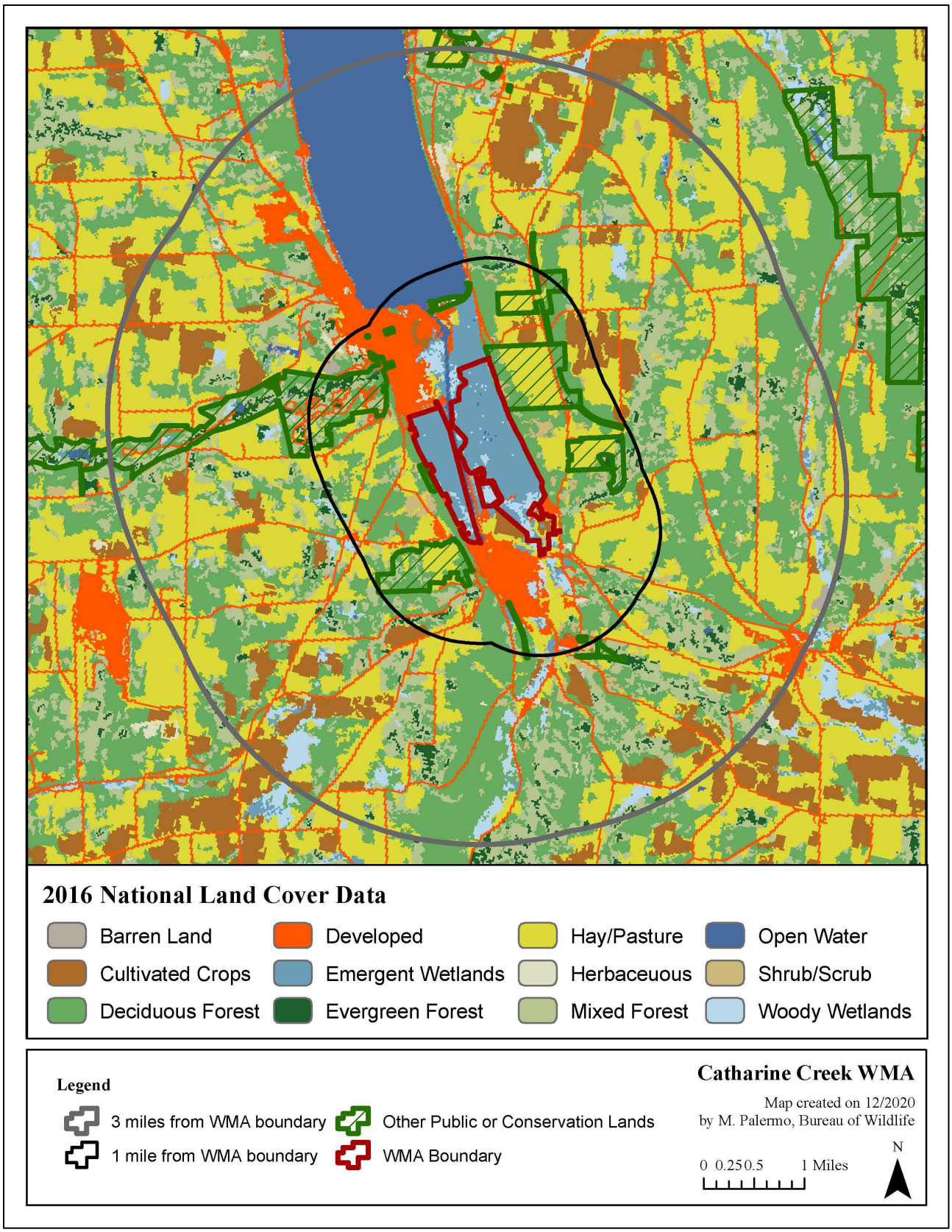

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Catharine Creek WMA. Conservation lands are from the NY Protected Areas Database available online at https://www.nypad.org/. Land cover types are from the 2016 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2019-nlcd2019-legend.

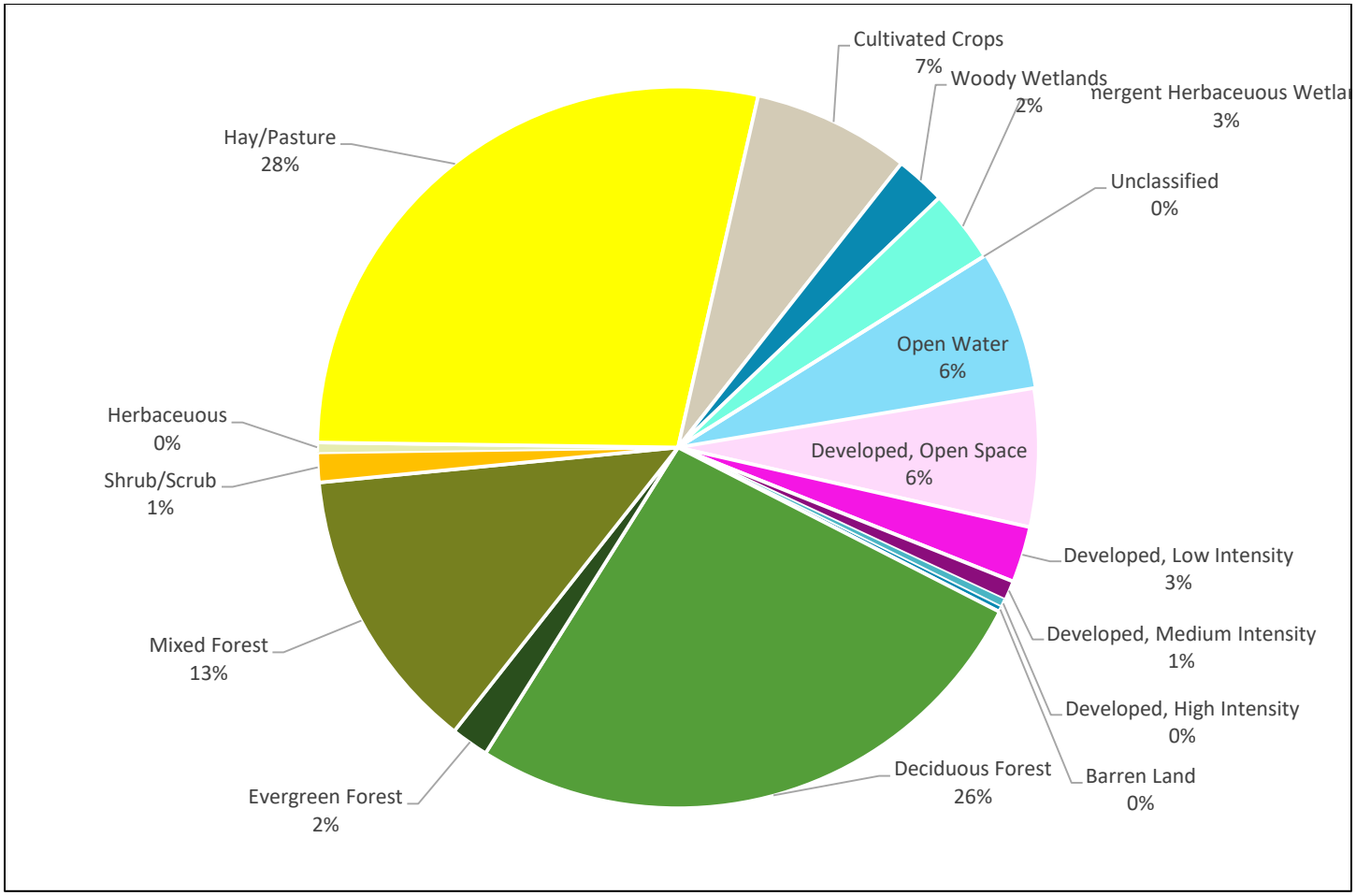

FIGURE 5. Percent cover of land cover types within three miles of Catharine Creek WMA.

Land cover types are from the 2016 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2019-nlcd2019-legend.

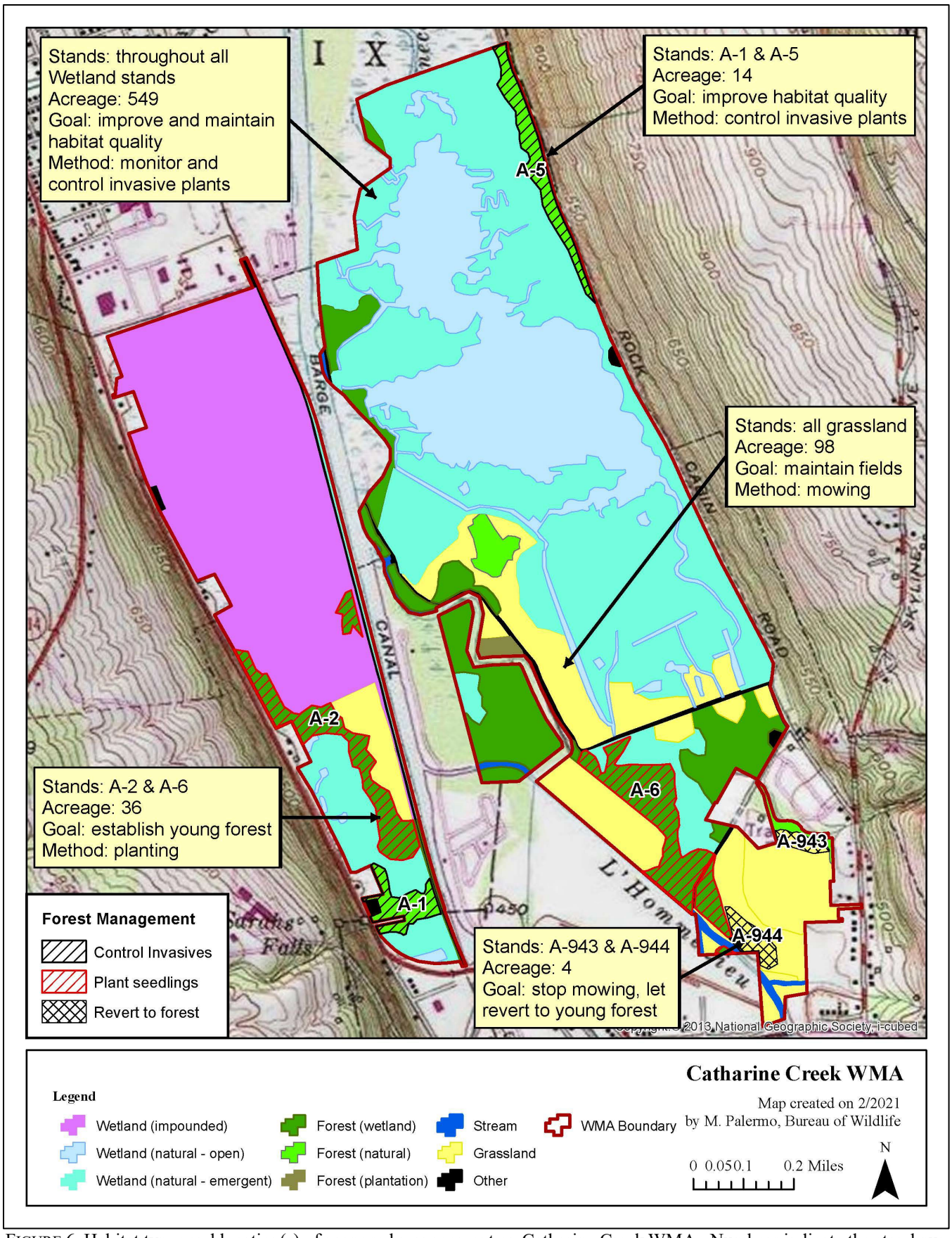

FIGURE 6. Habitat types and location(s) of proposed management on Catharine Creek WMA. Numbers indicate the stand number from habitat inventory.

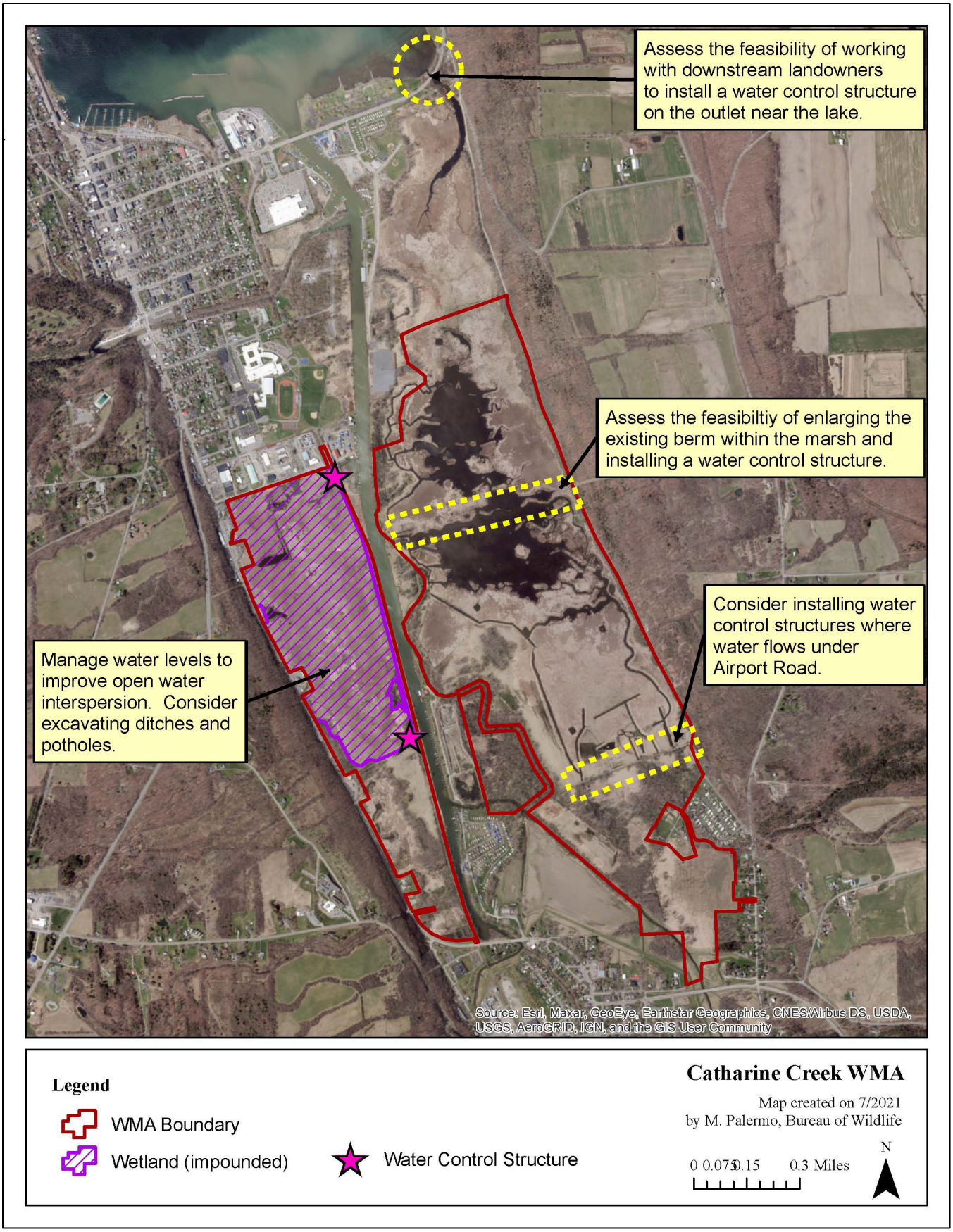

FIGURE 7. Locations of planned wetland management actions on Catharine Creek WMA.

IV. APPENDICES

APPENDIX A: DEFINITIONS

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

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

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

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

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

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

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

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

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

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

Grassland Bird Conservation Center: A landscape of at least 25,000 acres that meets at least two of the following three criteria: (1) >7,500 acres of grassland [i.e., >25% of the landscape is currently in some form of grassland habitat], (2) a grassland "anchor" field that meets specific criteria, and/or (3) at least 1,000 acres of grasslands already managed under BMPs for grassland birds (NYSDEC Strategy for Grassland Bird Habitat Management and Conservation 2021-2026).

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. 2014. Ecological Communities of New York State, Appendix B)

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

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

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

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

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

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

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

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

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

Shrubland: A community dominated by woody plants typically less than ten feet tall with scattered open patches of grasses and forbs that provide floristic diversity. Typically characterized by >50% cover of shrubs and <25% canopy cover of trees. (Adapted from Edinger et al. 2014. 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. 2014. 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, wetland target species at Catharine Creek WMA include: migrating waterfowl, breeding marshbirds, and furbearers.

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. 2014. 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 are generally 0-20 years following a disturbance and composed of seedling-sapling sized trees (<5" DBH). Includes the stand initiation and beginning of stem exclusion phases of stand development. Old fields with woody encroachment and shrublands offer similar habitat structure as seedling-sapling stands for many of the target species.

APPENDIX B. COMPLIANCE WITH STATE ENVIRONMENTAL QUALITY REVIEW

This plan identifies habitat management activities to be conducted on the Wildlife Management Area. These activities were analyzed in the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* (PEIS), as updated and amended in 2017 by the *Supplemental Final Environmental Impact Statement* (SFEIS).[16] Any activity that exceeds the thresholds of, or was not analyzed in the 1979 PEIS as amended in 2017, will require individual, site-specific environmental review. Environmental assessment forms prepared as a result of this review will be posted on the Environmental Notice Bulletin (ENB).[17]

The activities recommended in this plan:

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

[16] Available online at https://www.dec.ny.gov/regulations/28693.html.
[17] Available online at https://www.dec.ny.gov/enb/enb.html.

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

Treatment description: The intended treatment should be clearly described. The amount of information necessary to accomplish this will vary greatly. For instance, in a row thinning of a poletimber 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.