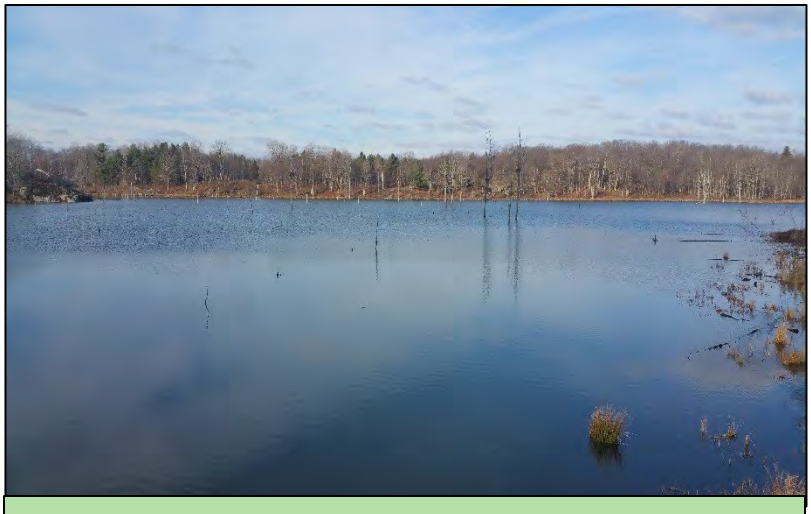
Habitat Management Plan
for
Fish Creek Wildlife Management Area
2020 - 2029



Wetland at Fish Creek WMA.

Photo: NYSDEC

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TABLE OF CONTENTS

SUMMARY 3
I. BACKGROUND AND INTRODUCTION 4
PURPOSE OF HABITAT MANAGEMENT PLANS 4
WMA OVERVIEW 5
LANDSCAPE CONTEXT 9
II. MANAGEMENT STRATEGIES BY HABITAT TYPE 10
FOREST 10
SHRUBLAND 22
GRASSLAND 23
AGRICULTURAL LAND 24
WETLANDS (NATURAL AND IMPOUNDED) 25
OPEN WATER (WATERBODIES AND WATERCOURSES) 26
HABITAT MANAGEMENT SUMMARY 27
III. FIGURES 28
IV. APPENDICES 38
APPENDIX A: DEFINITIONS 38
APPENDIX B. STATEMENT OF CONFORMITY WITH SEQRA 41
APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS 42
APPENDIX D: AMENDMENTS 45

LIST OF FIGURES

FIGURE 1. Location and access features at Fish Creek WMA. 28
FIGURE 2. Significant ecological communities on Fish Creek WMA. 29
FIGURE 3. Wetlands, open water, and streams of Fish Creek WMA.. 30
FIGURE 4. Land cover types and conservation lands in the landscape surrounding Fish Creek WMA.. 31
FIGURE 5. Percent cover of land cover types within three miles of Fish Creek WMA. 32
FIGURE 6. Habitat types and location(s) of proposed management on Fish Creek WMA Map 1 33
FIGURE 7. Habitat types and location(s) of proposed management on Fish Creek WMA Map 2 34
FIGURE 8. Habitat types and location(s) of proposed management on Fish Creek WMA Map 3 35
FIGURE 9. Mowing areas at Fish Creek WMA. Map 1 of 2 36
FIGURE 10. Mowing areas at Fish Creek WMA. Map 2 of 2 37

SUMMARY

Fish Creek Wildlife Management Area (WMA) was purchased between the 1960s and 1980s by the NYS Department of Environmental Conservation (DEC) using Bond Act funds, of which portions of those funds were reimbursed through federal Pittman-Robertson funds. The purpose for acquiring the WMA was freshwater wetland protection and waterfowl habitat enhancement. Some of the original goals for the WMA were to perpetuate wildlife of all kinds, maximize waterfowl and marsh bird nesting and foraging habitat, and provide recreational opportunities on the WMA. These wetlands in St. Lawrence County provide important habitat for marsh birds, waterfowl, and aquatic furbearers. Recreational opportunities on the area include hunting, fishing, trapping, bird watching, and other non-bird wildlife observation.

The WMA is part of the Indian River Lakes riverine system and is located on an important waterfowl migration route between eastern Canada and the Atlantic Coast. Formed through glaciation, Fish Creek WMA consists of a natural wetland complex surrounded by sections of steep, rocky outcroppings of granite. The WMA's outer boundaries are diverse habitats ranging from agricultural fields and shrublands to coniferous and deciduous forests. Fish Creek, which runs through the WMA, drains through a narrow, steep ravine into the village of Pope Mills.

The village of Pope Mills, located at the southwestern end of the WMA, originated with the construction of the first mill at that location in 1818 by Timothy Pope. A wooden dam created a mill pond which was reportedly 7 miles in length. The first mills were sawmills and gristmills. Subsequently, a carding mill and flour mill flourished here with the greatest period of activity occurring prior to the Civil War. In 1862, the wooden dam broke and flooded the village. After this event, a stone dam was constructed, later to be dismantled by the DEC upon purchase of the property. This section of the river, where the dam once stood, was historically one of the largest walleye spawning runs in northern New York. In 1878, a law was passed to protect spawning walleye on Fish Creek. Enforcement actions have been ongoing in the spring of each year, since that date. Nevertheless, the once-abundant walleye has nearly disappeared and been replaced by crappie and yellow perch[1].

Fish Creek WMA is managed for both upland and wetland habitats. Key habitat management goals include:

- Retaining 33% of WMA as wetland and open water to provide habitat for migratory waterfowl, marsh birds, amphibians, reptiles, and aquatic furbearers;
- Retaining 54% as mature forest to provide habitat for woodland raptors and other forest dependent species;
- Managing 7% as grassland/shrubland habitat to provide diversity of habitats within the WMA; and,

[1] 1988 Fish Creek Management Plan and Schiavone (1981) Decline of the walleye population in Black Lake, New York Fish and Game Journal 28 (1): 68-72.

- Managing 5% of the WMA (9% of the forested acres) as young forest (0-10 years) to promote habitat for a suite of species including Golden-winged Warbler, Whip-poor-will, American Woodcock, Ruffed Grouse, and snowshoe hare.

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 DEC Division of Fish and Wildlife (DFW) initiated a holistic planning process for wildlife habitat management projects. Habitat Management Plans (HMP) are being developed for WMAs and other properties administered by DFW Bureau of Wildlife, including select Multiple Use and Unique Areas. The goal of HMPs is to guide habitat management decision-making on those areas to benefit wildlife and facilitate wildlife-dependent recreation. HMPs guide management for a ten-year time period, after which the plans and progress on implementation will be assessed and HMPs will be modified as needed.

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

SCOPE AND INTENT

Primary purposes of this document:

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

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

Definitions are provided in Appendix A.

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

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

WMA Overview

Location

Fish Creek WMA is located in DEC Region 6, Towns of Macomb and Depeyster, St. Lawrence County (Figure 1). Fish Creek WMA is in western St. Lawrence County, 8 miles west of the city of Ogdensburg and one mile south of Black Lake, adjacent to the village of Pope Mills.

Total Area

4,537 acres

Habitat Inventory

A habitat inventory of the WMA was conducted in 2016 and is proposed to be updated every 10 to 15 years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the WMA, and conditions in the surrounding landscape (see Landscape Context section below).

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

Habitat Type	Current Conditions (as of 2016)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	2,697	59%		2,456	Decrease to 54%
Young forest	0	0%		241	Increase to 5%
Shrubland	118	3%		134	Slight increase
Grassland	195	4%		179	Slight decrease
Agricultural land	0	0%		0	No change
Wetland (natural) [b]	1,476	33%		1,476	No change
Wetland (impounded) [b]	0	0%		0	No change
Open water	37	<1%		37	No change
Other (easements)	0	0%		0	No change
Roads	14	< 1%		14	No change
Rivers and streams					No change
Total Acres:	4,537	100%		4,537	

[a] Forest acreage includes all mature and intermediate age classes of natural forest, plantations, and forested wetlands. Young forest is reported separately. Definitions are provided in the Forest section of this plan.
[b] Wetland acreage does not include forested wetlands, since they are included in the Forest category.

ECOLOGICAL RESOURCES

Wildlife Overview:

Wildlife present on Fish Creek WMA includes many species commonly found throughout northern New York and the St. Lawrence River Valley, such as:

- Beaver, muskrat, river otter
- American Woodcock, Ruffed Grouse, marsh birds, waterfowl, Golden-winged Warbler
- White-tailed deer, varying (snowshoe) hare, cottontail rabbit, Wild Turkey
- Midland painted turtle, snapping turtle, wood turtle, Blanding's turtle
- Bullfrog, northern leopard frog, green frog, eastern American toad, spring peeper
- Northern water snake, garter snake

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). [2] SGCN listed below include species that have been documented on or within the vicinity of the WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. Data sources include: the NY Natural Heritage Program, NY Breeding

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

Bird Atlases,[3] NY Reptile and Amphibian Atlas,[4] DEC wildlife surveys and monitoring, and eBird.[5]

Table 2. Species of conservation concern that may be present on Fish 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 Status
Birds	American Bittern		SC	x
	Black-billed Cuckoo			x
	Black-crowned Night-heron			x
	Bobolink			HP
	Brown Thrasher			HP
	Golden-winged Warbler		SC	HP
	Least Bittern		T	x
	Pied-billed Grebe		T	x
	Ruffed Grouse			x
	Scarlet Tanager			x
	Sedge Wren		T	HP
	Wood Thrush			x
Mammals	None			
Amphibians and reptiles	Blue-spotted salamander			HP
	Smooth green snake			x
	Snapping turtle			x
	Western chorus frog			x
	Wood turtle		SC	HP
	Blanding's turtle		T	HP
Fish	None			
Invertebrates	None			
Plants	None			

Significant Ecological Communities:

There are no significant natural communities located on Fish Creek WMA as identified by the NY Natural Heritage Program; definitions are provided in Appendix A (Figure 2).

[3] Available online at http://www.dec.ny.gov/animals/7312.html.
[4] Available online at http://www.dec.ny.gov/animals/7140.html.
[5] Available online at http://ebird.org/content/ebird/about/. © Audubon and Cornell Lab of Ornithology.

Additional information about significant ecological communities is available in the Fish Creek WMA Biodiversity Inventory Final Report (1993) prepared by the New York Natural Heritage Program.

Special Management Zones:

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

Old well at Fish Creek WMA.

Photo: NYSDEC

- Three wetlands regulated by Article 24 of the Environmental Conservation Law and several additional wetlands shown on the National Wetlands Inventory (NWI; Figure 3). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated wetland boundary, known as the adjacent area. There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually to determine impacts.
- Eight streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). The highest stream classification is Class C therefore no streams are regulated by Article 15 of the Environmental Conservation Law, but water quality standards will be adhered to. [6]

Guidelines for habitat management projects within these areas are outlined in the Division of Lands and Forests *Rules for Establishment of Special Management Zones on State Forests and Wildlife Management Areas.*[7] Some habitat management activities may either be prohibited or restricted in order to protect these features. Any deviations from these guidelines will be addressed in the individual stand prescriptions.

Soils:

The soil across much of Fish Creek WMA is shallow and poorly to moderately drained. Soil groups include Adjidaumo silty clay, Guff silty clay loam, Insula gravelly fine sandy loam, Insula-Rock outcrop complex, Matoon silty clay, Muskellunge silty clay loam, and Quetico-Rock outcrop on the majority of the WMA. [8] Much of the topography is characterized as gently sloping/rolling hills (0 to 8 percent slopes) with rock outcrops. Due to the soil types and depth, tree growth and health is slow to average on most of the WMA.

[6] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.
[7] Available online at http://www.dec.ny.gov/outdoor/104218.html.
[8] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=NY.

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features and the availability of habitats adjacent to Fish Creek WMA (Figures 4 and 5). The landscape within a three-mile radius of the WMA is primarily privately-owned land including:

- Pasture/hay and grasslands (28%)
- Deciduous forest (21%)
- Wetlands (20% combining emergent and woody wetlands)
- Open Water (15%)
- Cultivated crops (8%)
- Development (3%)
- Evergreen forest (2%)
- Early successional shrubland (2%)
- Mixed forest (1%)

Currently, the forested landscape on Fish Creek WMA does not include any young forest, significantly less than DFW's Young Forest Initiative (YFI) goal of managing at least 10% of the forested landscape on most WMAs as young forest.[9] The habitat types on the WMA consist of:

- Forest (59%)
- Wetland and open water (33%)
- Shrubland/grassland (7%)

The surrounding landscape has limited quality forest and an abundance of open and wetland habitat, so the forest management proposed in this plan aims to replace poor quality forest, promote regeneration of native species, and establish a healthy mature forest for the future. The young forest goal will be achieved through improving existing forest and restoring shrublands dominated by invasive honeysuckle and buckthorn. This will benefit wildlife and provide recreational opportunities.

Nearby conservation lands include:

- Five state forests, managed under the St. Lawrence Rock Ridge UMP which can be found at http://www.dec.ny.gov/lands/4979.html, are located to the south and southwest of the WMA. The state forests are as follows:
  - Beaver Creek State Forest (3,693 acres),
  - Hickory Lake State Forest (580 acres),
  - Pleasant Lake State Forest (962 acres),
  - Lonesome Bay State Forest (1,121 acres), and
  - South Hammond State Forest (2,085 acres).
- Upper and Lower Lakes WMA (8,727 acres) is located to the northeast of Fish Creek WMA. The habitat management plan for Upper and Lower Lakes WMA can be found at http://www.dec.ny.gov/outdoor/9325.html.

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

- Jacques Cartier State Park (461 acres) is located to the northwest of the WMA and is managed by NYS Office of Parks, Recreation, and Historic Preservation.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Fish 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, if present and identified for treatment.

FOREST

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest.

Plantation: planted forested acres, generally planted in rows dominated by one or two species.

Forested wetland: wetland acres where hydrophytic forest or shrub vegetation accounts for greater than 50% of vegetative cover and the soil or substrate is periodically saturated or covered with water.

Rock outcrop at Fish Creek WMA, potential whip-poor-will location.

Photo: NYSDEC

Young forest: young or regenerating forested acres, which are typically 0-10 years since a disturbance or regeneration cut, depending upon the site conditions. May include both natural forest and plantations.

Young forest (forested wetland): young, regenerating forested wetland acres.

Forest management on Fish 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 YFI to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat.

MANAGEMENT OBJECTIVES

- Increase young forest from zero to 241 acres (9% of the forested area) to improve habitat for young forest-dependent wildlife, targeting Golden-winged Warbler, Whip-poor-will, American Woodcock, Ruffed Grouse, and varying (snowshoe) hare. In combination with the 134 acres of shrublands, this would provide 375 acres (13% of the combined forest and shrubland area) of habitat suitable for young forest-dependent wildlife.
    - Increase three-tiered (vertical) edge habitat and clumped resting trees for Golden-winged Warblers and Whip-poor-wills.
    - Improve American Woodcock nesting and peenting habitat by patch clearcutting.
    - Increase Ruffed Grouse foraging, nesting, and drumming habitat by utilizing seed tree and shelterwood cuts that incorporate a collection of coarse woody debris and fine woody material.
    - Improve varying (snowshoe) hare habitat through shelterwood cuts aimed at regenerating softwoods.
    - Manipulate ridge tops and create forest openings for Whip-poor-wills where feasible.
- Improve the health and structure of the forest by completing 16 acres of thinnings, in addition to the management outlined above, for Cerulean Warbler habitat.
- Treat invasive shrubs within the project areas to provide growing space for regeneration.

The above objectives will also benefit many forest raptors such as Rough-legged Hawk, Red-tailed Hawk, Northern Hawk Owl, and Cooper's Hawk. Some other birds such as Downy Woodpecker, Hairy Woodpecker, and Pileated Woodpecker may also benefit from these objectives.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 2,697 forested acres on Fish Creek WMA. The forested habitat is made up of natural forest (1,844 acres), plantation (209 acres), and forested wetland (644 acres). Table 3 provides a summary of the forested areas, including the most common species found in each.

The forested acres on Fish Creek WMA are located primarily around the outside edges of the area, surrounding the wetlands which make up the center of the WMA. The rocky, hilly topography mixed with wetlands and low-lying areas make many parts of the WMA inaccessible at this time, except by foot, which will be a limiting factor for managing the forest.

Natural forest represents the majority of the forest on the WMA (68% of the forested acres) and contains a wide variety of tree species; maple, white pine, ironwood, oak, and hickory are the most common, but other significant species include black cherry, aspen, ash, elm, hemlock, basswood, and cedar. The size of the trees varies from seedlings and saplings to poletimber and small sawtimber. Along the field and shrubland edges it is common to find early successional trees such as aspen and birch. Some of the forest stands are well stocked, with an open

understory and limited regeneration due to moderate deer browse combined with shade from the thick canopy cover. Other stands have fewer trees, likely due in part to the shallow, rocky soils. The sparse overstory trees in these stands are often oak, maple, ironwood, white pine, or cedar, with shrubs, grasses, and forbs in the understory interspersed with areas of exposed rock. Tree growth is slow, regeneration is limited, and invasive plants are a particular problem in these stands.

The forested wetlands, which make up 24% of the forest, are primarily silver maple and red maple, although some areas also have ash and elm. Little forest management is planned in the forested wetlands in order to protect the soil and water quality and important wildlife habitat.

Plantations account for about 8% of the forest. Most of the plantations are white pine, but there is a mixed white pine/white spruce plantation along the eastern edge of the WMA. The understory in the plantations varies: some are fairly open because they have never been thinned and there are few gaps in the canopy, others have a mix of ash, elm, maple, cherry, and invasive honeysuckle and buckthorn.

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

Forest Type	**Acres (as of 2016)**	**Desired Acres**	**Overstory species**
Natural forest (mature/intermediate)	1,844	1,603	maple, white pine, ironwood, oak, elm
Plantation	209	209	white pine, white spruce
Forested wetland	644	644	silver and red maple, ash, elm
Young forest	0	241	
Young forest (forested wetland)	0	0	
Total Forested Acres:	2,697	2,697	

Young forest is an important habitat type that is lacking on Fish Creek WMA, and as such, the creation of young forest is one of the primary objectives of the management activities in this plan. Target species for young forest management at Fish Creek WMA include Golden-winged Warbler, American Woodcock, Whip-poor-will, Ruffed Grouse, and varying (snowshoe) hare. A few of the many other species that would benefit include Brown Thrasher, Canada Warbler, Yellow-breasted Chat, and woodland salamanders and reptiles. These species rely on forest and young forest areas for nesting, foraging, and cover and will benefit from management that creates the following habitat requirements:

- **Golden-winged Warbler:**
  - Singing ground – Open patches from 5 to 25 acres, usually in a patch with maple, oak, or hickory trees to perch on in the opening.
  - Nesting – Fields or patches from 5 to 25 acres that are heavily vegetated with herbaceous cover with a moderate density of shrubs near a mature forest edge.
  - Brood rearing – Similar to nesting except also including clumps of younger trees.

- Foraging – Open areas with herbaceous vegetation that support insects and spiders.[10] Males use mature forest during the breeding season.[11]
- Post-fledging – Mature forest. [12]

- **Eastern Whip-poor-will:**
  - General – Large home ranges with both forested and open areas in close proximity. Suitable sites provide this landscape configuration and are typically near known, occupied areas especially within Focus Areas.
  - Nesting – Forested habitat with well-drained soils and adjacent to open areas. Often pine or pine/hardwood forests, especially pitch pine barrens; rarely hardwood forests or stands with closed canopy or dense shrub layer. Soils critical since the clutch of 2 eggs is placed directly in leaf litter on forest floor.
  - Foraging – Open habitat (e.g., fields, gravel or sand pits, regenerating forest clearcuts, powerlines) adjacent to mature forest, due to increased prey (Lepidopterans) availability and/or increased lunar illumination. Within regenerating stands, disproportionately use areas within 100m of mature forest edge and typically avoid interior of large clearcuts.
  - Roosting – Daytime roosts directly on ground or on low branch in forest/young forest. [13, 14]

- **American Woodcock:**
  - Singing/Peenting Ground – Open areas from 1 acre to >100 acres usually in an abandoned field.
  - Foraging – Moist, rich soils with dense overhead cover of young alders, aspen, or birch.
  - Nesting – Young open, second growth woodlands.
  - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
  - Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields. [15]
- **Ruffed Grouse:**
  - Drumming areas – Downed trees surrounded by small diameter woody cover.
  - Foraging – Open areas with dense overhead cover of young forest with good mast production.
  - Nesting – Young open forest stands or second growth woodlands.
  - Brood rearing – Herbaceous ground cover with a high midstory stem density. [16]

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[10] Golden-winged Warbler Working Group. 2013. Best Management Practices for Golden-winged Warbler Habitats in the Great Lakes Region. Available online at http://gwwa.org.

[11] Streby, H. M., J. P. Loegering, and D. E. Andersen. 2012. Spot mapping underestimates territory size and use of mature forest by breeding male Golden-winged Warblers. Wildlife Society Bulletin 36:40–46.

[12] Streby, H. M., S. M. Peterson, G. R. Kramer, and D. E. Andersen. 2015. Post-independence fledgling ecology in a migratory songbird: implications for breeding-grounds conservation. Animal Conservation. 18:228-235

[13] Hunt, P. 2014. Best Management Practices for the Eastern Whip-poor-will in New Hampshire. New Hampshire Audubon, Concord, NH. 13 pp.

[14] Wilson, M. D., and B. D. Watts. 2008. Landscape configuration effects on distribution and abundance on whip-poor-wills. The Wilson Journal of Ornithology. 120(4): 778-783.

[15] Sepik, G. F. et al. 1981. A Landowner's Guide to Woodcock Management in the Northeast, Moosehorn National Wildlife Refuge, USFWS. 25 pp.

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

- **Varying (snowshoe) Hare:**
  - Protective cover – Well-developed woody understory and densely covered fields of herbaceous vegetation and dense thickets. Ideally, dense stands of conifer (8-16 feet) for daytime sanctuary from visual predators
  - Foraging – Summer needs are met through herbaceous vegetation in areas with dense cover while winter needs include taller shrubs and young trees that are not covered by snow. Woody browse is critical during the winter months. Young conifer stands (16-50 feet) offer dense thermal cover, food, and travel corridors between resting and feeding areas. [17]

The forest management in this plan will also focus on creating or restoring quality intermediate and mature forests that provide important habitat for wildlife, including food (mast) and shelter. A few of the most beneficial mast-producing trees on the WMA include oak, hickory, cherry, and apples. Large hardwoods, particularly maple, oak, and basswood, often contain cavities which provide shelter and nesting habitat for wildlife. Softwood trees are important nesting sites for hawks and owls and provide winter cover for deer and other wildlife. A key characteristic of mature forests is a multi-layered structure which is important for songbirds. Many of the existing mature forest stands will be retained as is, but shelterwoods, thinnings, and invasive species control measures have been planned for several areas to improve the overall forest health and increase the wildlife habitat value. Target species for mature forest habitat management on Fish Creek WMA include:

- Hooded Merganser
- Wood Duck
- Cerulean Warbler
- Forest raptors
- Fishers

MANAGEMENT HISTORY

Little is known about the forest management that took place prior to DEC acquisition of the property. Stone walls, barbed wire fences, large hedgerow trees, old foundations, abandoned farm equipment, old household dumps, and the remnants of farm lanes throughout the forested stands all indicate that much of the area was farmed in the past and the forests grew after farming ceased. Records show that DEC implemented several timber and firewood sales throughout the 1970's, 80's, and 90's. Little forest management has occurred since that time.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The focus of forest management on Fish Creek WMA is to create young forest and to improve or restore healthy intermediate and mature forest, to benefit a variety of wildlife species.

The following management is proposed for the next 10 years with a young forest acreage goal of reaching approximately 241 acres:

[17] Gilbart, M. 2012. Under Cover: Wildlife of Shrublands and Young Forest. Wildlife Management Institute. Cabot VT. 87 pp.

- **Management planned for 2020-2024** (Table 4, Figures 6, 7, & 8):
    - **Stands A-47, 48.1, and 49.3 (108 acres) –** Mix of seed tree, shelterwood, and patch clearcuts to improve hardwood forest and provide young forest habitat.
    - **Stands A-61 and 80.2 (16 acres,** *not part of young forest acreage**) –** Thinning to improve forest health and structure.
    - **Stands A-76.1, 86, and 89 (25 acres) –** Shelterwood harvests to encourage pine regeneration while retaining softwood cover.
- **Management planned for 2025-2029** (Table 5, Figures 6, 7, & 8):
    - **Stand A-4.1 (20 acres)** – Combination of seed tree and shelterwood harvests to improve forest health and increase hardwood regeneration.
    - **Stand A-36 (6 acres)** – Seed tree harvest and patch clearcut with reserves, to provide young forest habitat.
    - **Stands A-55, 57, and 58 (49 acres) -** Mix of seed tree, shelterwood, and patch clearcuts to improve hardwood forest and provide young forest habitat.
    - **Stands A-68 and 69 (23 acres)** – Mix of seed tree, shelterwood, and patch clearcuts to improve forest health, increase structural diversity, and create young forest habitat.
    - **Stand A-127 (10 acres)** – Shelterwood harvest to improve forest health and structure while increasing regeneration.

Table 4. Forest management schedule for the first five-year period of this HMP (2020-2024).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-47	25	Small Saw Timber 12”-17” DBH	Northern Hardwood	Multi-aged Northern Hardwoods	Wildlife	Seed Tree/ Shelterwood
A-48.1	70	Pole Timber 6”-11” DBH	Northern Hardwood	Multi-aged Northern Hardwoods	Wildlife	Shelterwood and Patch Clearcuts
A-49.3	13	Seedling – Sapling < 6” DBH	Pioneer Hardwood	Seedling-Sapling-Natural	Wildlife	Clearcut
A-61	6	Pole Timber 6”-11” DBH	White Pine /Spruce Plantation	White Pine /Spruce Plantation	Wildlife	Thinning
A-76.1	3	Pole Timber 6”-11” DBH	Northern Hardwood /White Pine	Multi-aged White Pine	Wildlife	Shelterwood
A-80.2	10	Pole Timber 6”-11” DBH	Northern Hardwood /White Pine	Northern Hardwood /White Pine	Wildlife	Thinning
A-86	6	Pole Timber 6”-11” DBH	White Pine - Plantation	Multi-aged White Pine	Wildlife	Shelterwood
A-89	16	Pole Timber 6”-11” DBH	White Pine - Plantation	Multi-aged White Pine	Wildlife	Shelterwood

Table 5. Forest management schedule for the second five-year period of this HMP (2025-2029).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-4.1	20	Pole Timber 6”-11” DBH	Northern Hardwood	Multi-aged Northern Hardwoods	Wildlife	Seed Tree/ Shelterwood
A-36	6	Small Saw Timber 12”-17” DBH	Transitional Hardwood	Seedling-Sapling-Natural	Wildlife	Seed Tree/ Patch Clearcut
A-55	17	Pole Timber 6”-11” DBH	Pioneer Hardwood	Seedling-Sapling-Natural	Wildlife	Seed Tree/ Shelterwood
A-57	23	Pole Timber 6”-11” DBH	Northern Hardwood	Multi-aged Northern Hardwood	Wildlife	Shelterwood
A-58	9	Pole Timber 6”-11” DBH	Pioneer Hardwood	Seedling-Sapling-Natural	Wildlife	Seed Tree/ Shelterwood/ Patch Clearcut
A-68	15	Pole Timber 6”-11” DBH	Pioneer Hardwood	Seedling-Sapling-Natural	Wildlife	Seed Tree/ Patch Clearcut
A-69	8	Pole Timber 6”-11” DBH	Northern Hardwood	Multi-aged Northern Hardwood	Wildlife	Seed Tree/ Shelterwood
A-127	10	Pole Timber 6”-11” DBH	Transitional Hardwood	Multi-aged Transitional Hardwoods	Wildlife	Shelterwood

Due to the variable nature of the forest habitat on Fish Creek WMA the management planned for several of the stands will involve more than one treatment type, as noted in Tables 4 and 5 and in the following stand descriptions. For example, Stand A-69 will have seed tree harvests and shelterwood harvests in different sections of the stand. The purpose for this is to do what is most fitting in each part of the stand, in order to achieve the desired habitat conditions while improving the health and productivity of the forest.

Seed tree harvests will be located in areas where there are a few scattered desirable overstory trees, such as healthy oak and black cherry, and a significant quantity of cull trees and/or undesirable understory species. Management in these sections will focus on removing undesirable species and providing growing space for intermediate to intolerant species (such as oak, cherry, and aspen). The open canopy will allow for regeneration while the scattered residual trees will provide mast and shelter for wildlife and a seed source for regeneration. The seed tree harvests are anticipated to benefit species such as Ruffed Grouse, American Woodcock, and Golden-winged Warblers.

Shelterwood harvests will be located in sections where there are more desirable overstory trees and fewer cull trees. In these locations, more canopy cover will be retained to favor intermediate to shade tolerant species (such as some softwoods, oaks, and maples). This type of treatment

will initiate regeneration while retaining a few mature forest features that are important for wildlife. Management is expected to benefit species which depend on both young forest and mature forest, such as Cerulean Warblers, Whip-poor-wills, and snowshoe hare.

Patch clearcuts will be located in parts of the stands where there are either pockets of aspen or few to no desirable overstory trees. The patch clearcuts will provide significant sunlight to the forest floor, which will favor intolerant regeneration such as aspen, birch, and black cherry. Cutting the pockets of aspen will initiate vigorous aspen root sprouting, which will provide dense regeneration, particularly beneficial to Ruffed Grouse.

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

Management Planned for 2020-2024:

Bishop Road forest and shrubland restoration (Stands A-47, 48.1, and 49.3; 108 acres):

- **Stand A-47** is a mixed northern hardwood forest with a significant quantity of ironwood, elm, and poor quality trees. The planned management will be a blend of seed tree and shelterwood cuts, with the goal of improving forest health/structure and creating habitat suitable for American Woodcock and Ruffed Grouse.
- **Stand A-48.1** is a mix of northern hardwoods and shrubs on hilly terrain with scattered rock outcrops, which may limit access for management in some parts of the stand. A shelterwood harvest is planned to encourage oak, hickory, and pine regeneration. Patch clearcuts will occur where there are clumps of aspen, to encourage aspen root sprouting. Some areas are dominated by invasive shrubs and have very few trees; the invasive species will be treated and native species may be planted if it is determined that there is not likely to be adequate natural regeneration. The management outcome is anticipated to be a mosaic of reserve trees, forest regeneration, rocky openings, and shrubs, which is expected to provide habitat suitable for Golden-winged Warblers, Eastern Whip-poor-wills, Ruffed Grouse, and other species that depend on patchy forest cover.
- **Stand A-49.3** is a brushy stand filled with honeysuckle and buckthorn, with a few scattered trees. A clearcut with reserves is planned, where the invasive shrubs will be cut and treated. In order to create the 3-tiered structure important to Golden-winged Warbler habitat, the few existing healthy trees will be left standing and small groups of native trees and shrubs will be planted around them.

Pine plantation renewal (Stands A-61, 76.1, 80.2, 86, and 89; 25 acres young forest and 16 acres thinning):

- **Stand A-61** is a softwood plantation; half white spruce and half white pine. The plantation is overstocked and could benefit from a thinning, although many of the trees have poor form and poor health. The understory is fairly open, with patches of hardwood regeneration and shrubs. A thinning is planned, which is expected to be a traditional third-row thinning with a few additional trees removed within the uncut rows, in order to favor the healthier spruce and pine. Softwood regeneration would be preferred in order to maintain the softwood cover; however, cherry regeneration is doing well in some areas

and may outcompete the softwood regeneration, which will still produce beneficial wildlife habitat.

- **Stands A-76.1, 86, & 89** are primarily white pine with a few hardwoods such as maple, elm, black cherry, and oak. The white pine is overstocked in some areas and regeneration is patchy due to the closed canopy, deer browse, and competing vegetation. A shelterwood harvest is planned, with the goal of encouraging white pine regeneration to provide habitat for snowshoe hare and Ruffed Grouse while retaining a portion of the softwood canopy to provide thermal cover. The invasive shrubs in the understory must be treated before the trees are cut so they do not outcompete the desirable regeneration. The shelterwood harvest will avoid the rock outcrops and low-lying areas as much as possible, except where managing these areas would benefit the target wildlife species. While much of Stands 86 and 89 will be treated, only a few acres of Stand 76.1 (the small section on the western side of the access road) will be treated at this time.
- **Stand A-80.2** is mixed northern hardwoods and white pine. This stand appears to have been managed in the past and does not require immediate attention. However, the stand could benefit from a light thinning that removes cull trees and provides growing space for the remaining trees. A thinning may also increase the vertical structure of the forest, which will benefit forest-dependent wildlife. It is recommended that this stand be evaluated when Stands A-76.1, 86, & 89 are marked, and that a thinning be considered at that time in combination with treating the other stands.

Management Planned for 2025-2029

Route 58 field edges (Stand A-4.1, 20 acres):

- **Stand A-4.1** is a hardwood stand with an abundance of sapling and poletimber sized trees in the understory and scattered small sawtimber and large, old trees in the overstory. Access for management will be challenging in parts of the stand due to the hilly, rocky terrain mixed with low-lying areas. The planned treatment will involve a mix of shelterwood harvests and seed tree harvests. The goal is to regenerate hardwoods and improve the health and productivity of the residual forest. The planned management will help shift the species composition away from ironwood and maple and towards oak and hickory and will increase the multi-tiered structure of the forest, which is beneficial to many forest-dwelling species.

Bishop Road hardwood restoration (Stand A-36, 6 acres):

- **Stand A-36** is a transitional hardwood forest with a mix of maple, oak, hickory, and a variety of other species. A seed tree harvest is planned for the part of the stand near the parking area. Healthy oak, hickory, maple, and pine will be favored as reserve trees. A patch clearcut will occur a little further into the stand and will remove most of the trees but will keep a few of the larger trees as a seed source, as cavity trees, and for structural diversity. Both of the planned management techniques are intended to improve habitat for wildlife by initiating dense tree regeneration while providing growing space for existing mast-producing trees, which will provide important habitat for a range of forest dependent species including Cerulean Warblers and various woodpeckers.

Factory Road forest and shrublands (Stands A-55, 57, and 58; 49 acres):

- **Stand A-55** is a transitional hardwood forest with oak, hickory, maple, aspen, apples, and pine and areas of thick honeysuckle, buckthorn, and dogwood. The canopy cover is highly variable across the stand. Due to rocky, hilly terrain mixed with low-lying wet

areas, management will be restricted to the more accessible sections. The patchy nature of the stand lends itself to a mix of management techniques. In the shrubby areas and the areas with few desirable overstory trees, a seed tree harvest will be conducted by removing the invasive brush and retaining the few healthy trees. In the sections that have a greater number of desirable trees, a shelterwood harvest will be used to remove the cull trees and provide growing space for regeneration. Oak, hickory, and apples will be favored for retention. The planned management will improve the habitat for Ruffed Grouse, American Woodcock, and Golden-winged Warblers.

- **Stand A-57** is a well-stocked stand of pole- and small-sawtimber sized mixed hardwoods. A shelterwood harvest will be used to remove poor quality trees or undesirable species and provide growing space for mast-producing oak and hickory.
- **Stand A-58** is a mix of upland hardwoods, aspen, and swamp hardwoods. Only about half of the stand will be treated due to wetlands and rock outcrops in the remainder of the stand. A mix of shelterwood and seed tree harvests is planned in the manageable area, with mast-producing hardwoods such oak, hickory, and apple as the preferred species for retention. Patch clearcuts will be cut where there are clumps of aspen, in order to encourage dense aspen regeneration which will provide important habitat for Ruffed Grouse. The anticipated hardwood regeneration in close proximity to the wetland will also provide foraging habitat for American Woodcock.

Route 184 access (Stands A-68 and 69; 23 acres*):

**Management in these stands is dependent on establishing an access lane from Route 184.*

- **Stand A-68** is a mosaic of exposed rock, wet pockets, shrubs, small rough-looking hardwoods (mostly red maple, with some ironwood, oak, ash, birch, and aspen), and groups of softwoods (primarily cedar, white pine, and pitch pine). This stand currently provides good "patchiness" that is suitable for species such as Ruffed Grouse and American Woodcock. The proposed management would focus on increasing this patchiness by removing cull trees in small sections or strips, which could be considered seed tree harvests or patch clearcuts. This would maintain the suitability of the habitat for grouse and woodcock while improving the habitat for Golden-winged Warblers. Due to the quantity of invasive shrubs (primarily honeysuckle) herbicide treatment or other control measures should be part of the proposed management.
- **Stand A-69** is a diverse northern hardwood forest on rocky ground with areas of steep terrain. Due to the inaccessible nature of the steeper slopes, these sections will not be treated. In addition, parts of the stand contain fair quality hardwoods and hemlock which do not require management at this time. However, a few sections could benefit from mixed seed tree and shelterwood harvests. The planned management, in combination with the existing hardwoods and hemlock, is expected to benefit species which depend on both young forest and mature forest.

Bishop Road field edges (Stand A-127; 10 acres):

- **Stand A-127** is a transitional hardwood forest with a healthy oak component, patches of aspen, and areas of sugar maple. However, ironwood dominates the understory in much of the stand and limits other regeneration. A shelterwood harvest is recommended to remove many of the ironwood, beech, and cull trees to provide growing space for the oak and to initiate regeneration of species such as oak and hickory. This will provide suitable habitat for Ruffed Grouse, along with a range of other wildlife, while improving the health of the forest and promoting structural diversity within the stand.

BEST MANAGEMENT PRACTICES

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

Table 6. Best Management Practices for forest management on WMAs.

Resource	**Guidance Document** [18]
Soils	*Rutting Guidelines for Timber Harvesting on Wildlife Management Areas*
Water quality	*NYS Forestry Best Management Practices for Water Quality*
Wildlife	*Retention Guidance on Wildlife Management Areas*
Plantations	*Plantation Management Guidance on Wildlife Management Areas*

Wildlife Considerations:

Sensitive species known to be present on or near Fish Creek WMA that warrant special consideration include:

- Bald Eagle: Eagles are known to nest on and near Fish Creek WMA. Any forest management planned for areas near known eagle nests will be conducted according to the Bald Eagle Management Plan.
- Migrating and breeding waterfowl and marsh birds: Wood Ducks and Hooded Mergansers nest in tree cavities near or in wetlands. Trees that contain suitable nesting cavities should be retained whenever possible.
- Bats: Due to the possibility of Indiana and northern long-eared bats being in the area, tree selection for cuts and the timing of cuts will be evaluated and BMP's will be implemented as needed to protect these species.

Other wildlife considerations:

- Retain healthy mast-producing trees for foraging wildlife species.
- Retain legacy trees, which provide cavities and coarse woody debris - important habitat features that require a significant amount of time to develop.
- Plant patches of softwoods for winter cover or mast-producing trees and shrubs for food.
- Manage rock outcrops for Whip-poor-wills and forest reptiles.
- Buffer active nesting locations of forest raptors such as hawks and owls, and retain skidder trails as hunting corridors for the forest raptors.

Forest Health Considerations:

The forests on Fish Creek WMA are in moderate health. Thick brush, and shallow, poorly drained or rocky soils limit growth and regeneration in many parts of the WMA. While deer browse may not be a significant factor at this time, the deer are having an impact on the forest regeneration by selectively browsing - choosing to eat the native plants before the less palatable invasive shrubs. Combined effects from various factors such as insect and disease outbreaks, drought, deer browse, and shallow soils combined with strong winds can have a significant impact on the forest health. For example, recent outbreaks of forest tent caterpillars combined with drought conditions a few years ago caused early defoliation of many of the trees on the

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

WMA. This reduces the growth and productivity of the trees and, if severe enough, can cause the trees to die. Other forest health concerns include invasive insect and plant species.

One significant invasive insect to watch for is the emerald ash borer (EAB). While EAB has not been recorded on the WMA, it is gradually spreading throughout the state. EAB is an invasive beetle that feeds on and kills all species of ash trees and significant ash mortality is expected if the beetle reaches the WMA. At that time, some ash trees may be removed from the WMA, particularly if deemed a hazard to infrastructure or adjacent private property. As of this writing, the nearest recorded EAB occurrence is near Morristown, NY, within 6 miles of the WMA.

Several species of invasive plants are well established on the WMA. Buckthorn and honeysuckle dominate the understory in many of the forest stands and shrublands, preventing more desirable species from growing. They create a perpetual thicket that, while it provides some of the structure young forest species desire, is not as species-diverse nor as nutritionally beneficial as native shrublands and young forests. Much of the planned forest management will incorporate herbicide treatments or other measures to help control the invasive plants within the project areas.

Pre- and Post-treatment Considerations:

Mechanical or chemical methods will be used to treat and control invasive species and interfering brush in the managed stands, as directed by the YFI team, WMA land manager, or regional wildlife manager. Patches of trees or native shrubs may be planted following the planned management. The plantings will increase species diversity and help establish desirable regeneration that can compete with the over-abundant invasive plants. Pre- and post-treatment actions to promote the desired forest regeneration will be addressed in detail in the silvicultural prescriptions.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife response(s) have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines established in the *Young Forest Initiative Monitoring Plan: 2016-2025*.[19] The Monitoring Plan establishes statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three, and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Fish Creek WMA, which may be assessed to determine response to management, include:

- American Woodcock
- Golden-winged Warbler
- Ruffed Grouse
- Varying (snowshoe) hare

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

SHRUBLAND

Shrublands are early successional habitats dominated by woody plants typically less than 10 feet tall with scattered open patches of grasses and forbs that provide floristic diversity. Shrublands are typically characterized by >50% cover of shrubs and <25% canopy cover of trees.

MANAGEMENT OBJECTIVES

- Maintain 118 acres of existing shrubland habitat for shrubland obligate species and other wildlife including pheasants, which are stocked on the area in the fall.
- Increase shrublands by 16 acres (to a total of 134 acres) to benefit Golden-winged Warblers.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

There are 118 acres of shrublands on Fish Creek WMA that consist of grey-stemmed dogwood, red-osier dogwood, alder, buckthorn, honeysuckle, and willow. Incorporating early successional shrublands contiguous to open areas will benefit a suite of wildlife including several of the YFI target species:

- Golden-winged Warbler
- American Woodcock
- Whip-poor-will

MANAGEMENT HISTORY

None found as of this writing.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2020-2024** (Figures 6, 7, and 8; Table 7):
    - Increase shrublands by 16 acres by discontinuing mowing in parts of Stands A-49.1 and 125.1 to allow patches of shrubs and small trees to grow.
    - Assess Stand A-99 for potential shrubland clearcut or meandering paths to diversify the old age of the shrubland.
    - Remove or thin invasive species where access is available in Stands A-4.2, 4.3, 63, 88, and 118 to allow patches of shrubs and small trees to grow, as needed.
- **Management planned for 2025- 2029** (Figures 6, 7, and 8; Table 7):
    - Discontinue mowing parts of Stands A-49.1 and A-125.1 to allow patches of shrubs and small trees to grow.
    - Remove thick brush and control invasive species in Stands A-4.2, 4.3, 63, 88, and 118 where necessary to meet objectives and improve Golden-winged Warbler habitat.
    - Monitor Stand A-99 and adjust management of clearcut or meandering paths to better diversify the stand.

BEST MANAGEMENT PRACTICES

Timing restrictions will be implemented to protect nesting birds such as the Golden-winged Warbler, which will also protect other breeding species.

MANAGEMENT EVALUATION

Continue with current Golden-winged Warbler point counts and add future American Woodcock surveys (pre- and post- treatment) to document responses to habitat management for shrublands and young forest.

GRASSLAND

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

MANAGEMENT OBJECTIVES

- Create and maintain a three-tiered edge from the early successional habitats to the mature forest areas to benefit Golden-winged Warbler, Whip-poor-will, American Woodcock, and Ruffed Grouse.
- Maintain and enhance 179 acres of the existing grassland fields by mowing or prescribed burning annually. Avoid strip mowing to provide quality grassland bird habitat for breeding, nesting, and wintering species.
- Convert 16 acres of grassland habitat to shrubland habitat.
- Provide nesting habitat and cover for waterfowl.
- Monitor fields for invasive species and control where feasible.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

There are 195 acres of grasslands within Fish Creek WMA. Grasslands adjacent to wetlands provide important nesting and foraging habitat for waterfowl and marsh birds, while larger grasslands are managed to benefit grassland nesting songbirds. Grasslands also provide suitable habitat for Ring-necked Pheasants, which are stocked on the area in the fall and provide an additional gamebird hunting opportunity. Many of the grasslands transition abruptly into other habitat types through a hard edge which may need to be structurally feathered into a three-tiered edge to promote more Golden-winged Warbler habitat (Figure 6, 7, and 8). Grassland management will restore and maintain habitat that will be used by migratory birds for nesting. Grassland management may also improve habitat for pollinators (insects).

Species that benefit from grassland best management practices include:

- Golden-winged Warbler
- Various waterfowl
- Northern Harrier
- Ring-necked Pheasant

MANAGEMENT HISTORY

Past management focused on the maintenance of grassland habitat through cooperative agreements and mechanical mowing/brush-hogging (Figures 7 and 8). Mowing normally occurs during August to avoid interference with nesting birds.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2020-2029** (Figures 6, 7, 8, 9 & 10):
    - Continue mowing 179 acres of grassland fields (Stands A-2.1, 49.1, 116, 125.1, and 126) on an annual rotation as required to provide suitable habitat and access.
    - Stop mowing in parts of Stands A-49.1 and 125.1 to allow brush and small trees to grow to create approximately 16 acres of shrubland habitat.
    - Continue management through mechanical mowing/brush-hogging or prescribed fire.
    - Create 20 acres of feathered edge habitat for Golden-winged Warbler by reduced mowing in Stand A-71 along the boundary of Stand A-68.

BEST MANAGEMENT PRACTICES

For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[20] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding grassland management and restoration techniques.

General Management Recommendations

- Northern Harrier– Management of fields to occur after mid-August to prevent impacts to nesting.

MANAGEMENT EVALUATION

Future surveys may include Golden-winged Warbler point counts (pre- and post- treatment) to document any response to recent habitat management for grasslands and shrublands.

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 HABITAT

There is no acreage on Fish Creek WMA that is managed as agricultural land and no plan to develop or implement such habitat, unless agricultural management is necessary to maintain existing grassland habitats.

MANAGEMENT HISTORY

- Stand A-2: 10 acres – agreement for hay (Expired 2005)
- Stand A-49: 11 acres – agreement for hay (Expired 2005)
- Between 1989 and 1997, 206 acres of the WMA were managed through cooperative agreements for cropland, hay, and pasture.

[18] 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.

WETLANDS (NATURAL AND IMPOUNDED)

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

MANAGEMENT OBJECTIVES

- Maintain 1,513 acres of emergent, scrub-shrub, and open water wetlands as they currently exist.
- Maintain 644 acres of forested wetlands as they currently exist.
- Provide habitat for wetland-dependent wildlife such as waterfowl, muskrat, and beaver creating cover and forage for these wetland species.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 1,513 acres of wetlands and open water within Fish Creek WMA. There are also 644 acres of forested wetlands; see the Forest section. The wetlands provide important habitat for many wildlife species. The main wetland is realistically the flood plain area of Fish Creek which meanders throughout the wetland. There are two other smaller wetlands within the WMA, of which one contains open water often visited by migratory waterfowl (Figure 3). The wetlands are diverse and provide habitat for species such as:

Wetland with wildlife trees at Fish Creek WMA.

Photo: NYSDEC

- American Bittern, Sedge Wren, Black-crowned Night Heron, Osprey, Bald Eagle, Marsh Wren, Virginia Rail
- Beaver, muskrat
- Blanding's turtle, midland painted turtle
- Bullfrog, northern leopard frog, eastern American toad, spring peeper
- Migratory waterfowl

MANAGEMENT HISTORY

Historically the wetlands were only under management when the dam at Pope Mills was in operation. Since that time the water levels within the wetlands are controlled only by nature and current beaver activity within the flood plain of Fish Creek.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2020-2029:**
  - Create four to six potholes connected via channels (approximately 0.5 miles) within the monotypic areas of vegetation to diversify the wetland complex and allow for better access throughout the areas. Coordination with Ducks Unlimited and other partners to help with final designs and funding for this project.

BEST MANAGEMENT PRACTICES

Date restrictions for equipment in the wetlands or within the adjacent area of the wetlands will be followed to protect species such as Blanding's turtles.

MANAGEMENT EVALUATION

Monitor for invasive species and productivity of the wetlands.

OPEN WATER (WATERBODIES AND WATERCOURSES)

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

DESCRIPTION OF EXISTING OPEN WATER HABITAT

There are currently 37 acres inventoried as open water habitat within Fish Creek WMA (Figure 3). This acreage is part of the wetland complex and has been included in the wetland acreage and management, covered in the wetlands section above.

HABITAT MANAGEMENT SUMMARY

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

Table 7. Summary of habitat management actions recommended for Fish Creek WMA, 2020-2029. (Also see Figure 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Mix of seed tree, shelterwood, and patch clearcut harvests in Stands A-47, 48.1, and 49.3.	108	2020-2024
Forest	Timber stand improvement thinning in Stands A-61 and 80.2.	16	2020-2024
Forest	Shelterwood harvests in Stands A-76.1, 86, and 89.	25	2020-2024
Forest	Mix of seed tree, shelterwood, and patch clearcut harvests in Stands A-4.1, 36, 55, 57, 58, 68, and 69.	98	2025-2029
Forest	Shelterwood harvest in Stand A-127.	10	2025-2029
Shrubland	Thin several stands of heavy shrubs or brush. Stands A-4.2, 4.3, 63, 88, and 118	60	2020-2029, as needed
Shrubland	Thin/clearcut Stand A-99 of heavy shrubs or brush.	16	2020-2029
Shrubland/ Grassland	Stop mowing in parts of Stands A-49.1 and A-125.1 to allow patches of shrubs and small trees to grow.	16	2020
Grassland	Continue mowing grassland fields on an annual rotation and add a prescribed fire component. Stands A-2.1, 49.1, 116, 125.1, and 126	± 195	Annual
Grassland	Create feathered edges for Golden-winged Warbler on boundary of Stands A-71 and 68.	20	2020-2029
Wetland	Create 4-6 potholes connected via channels (~0.5 miles) within the monotypic areas of vegetation.	TBD	2020-2029

III. FIGURES

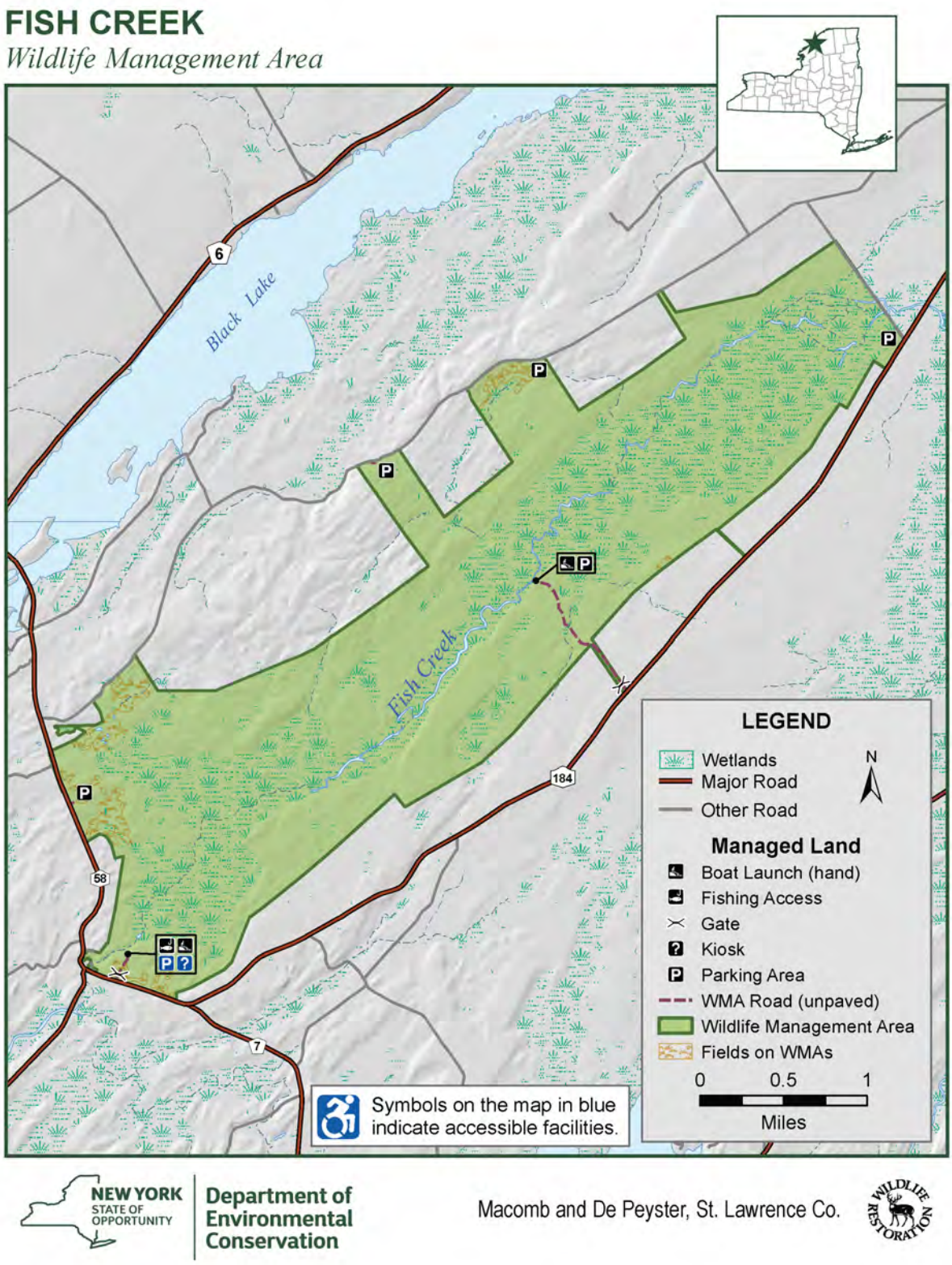

FIGURE 1. Location and access features at Fish Creek WMA.

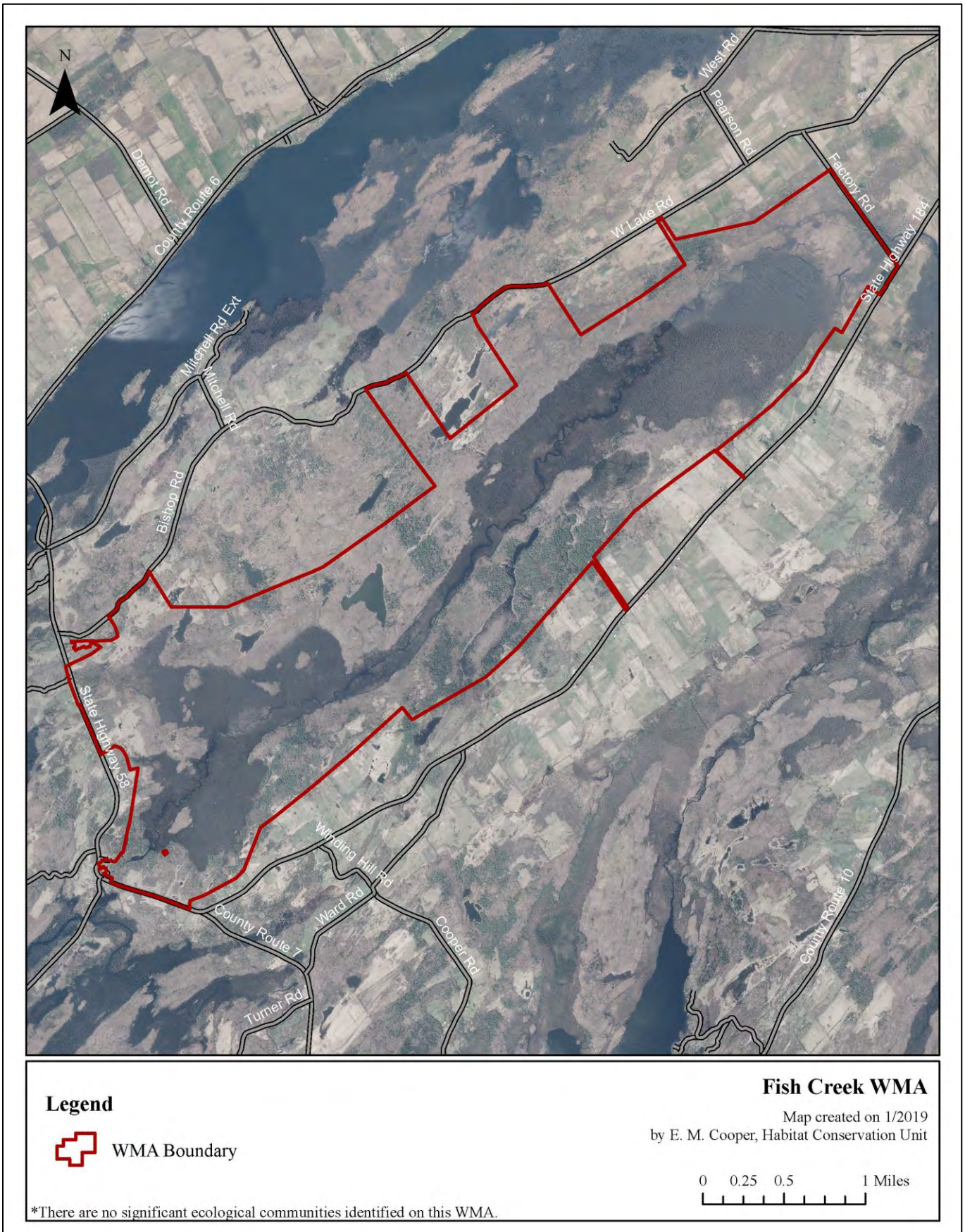

FIGURE 2. Significant ecological communities on Fish Creek WMA. Data from the NY Natural Heritage Program.

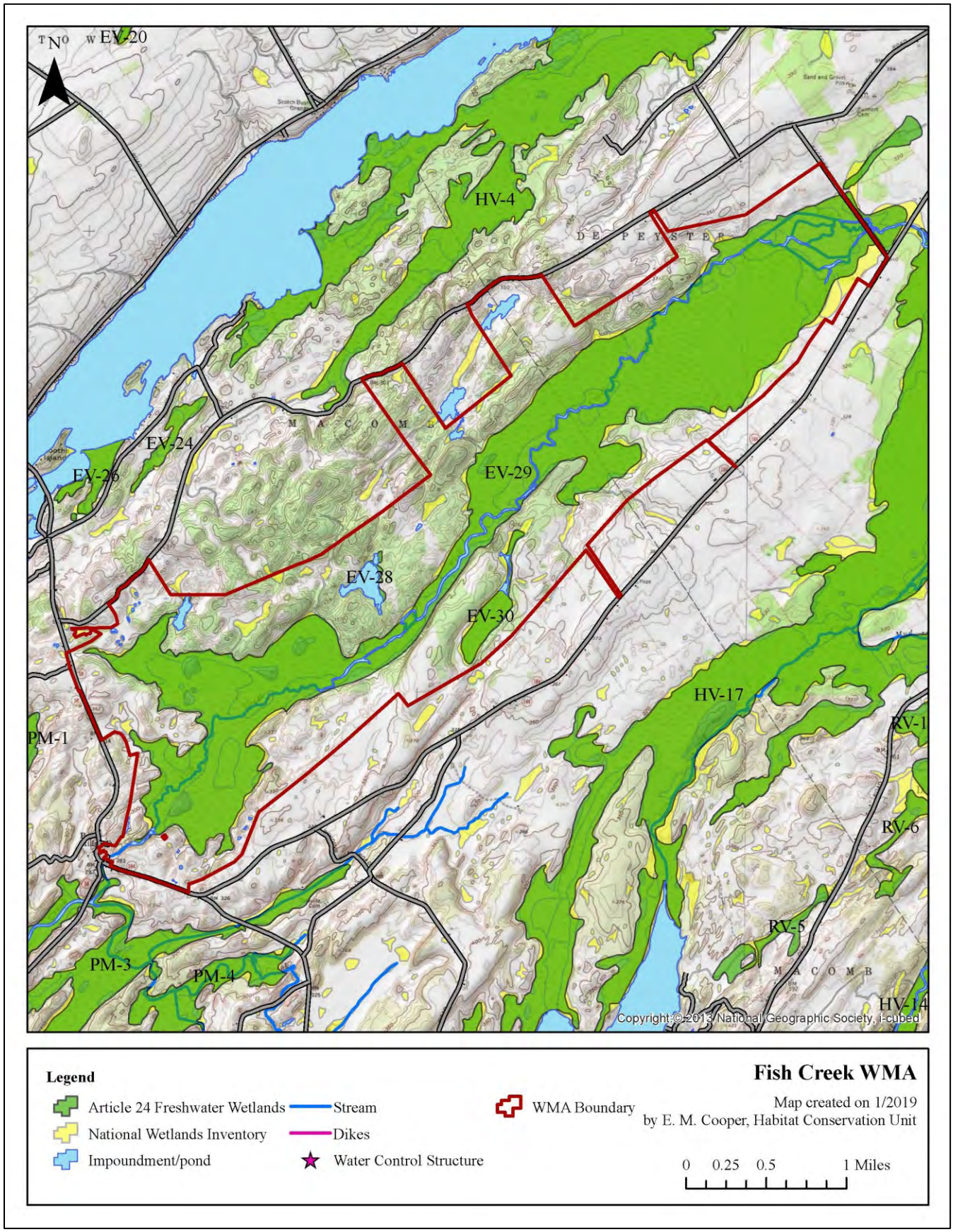

FIGURE 3. Wetlands, open water, and streams of Fish Creek WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

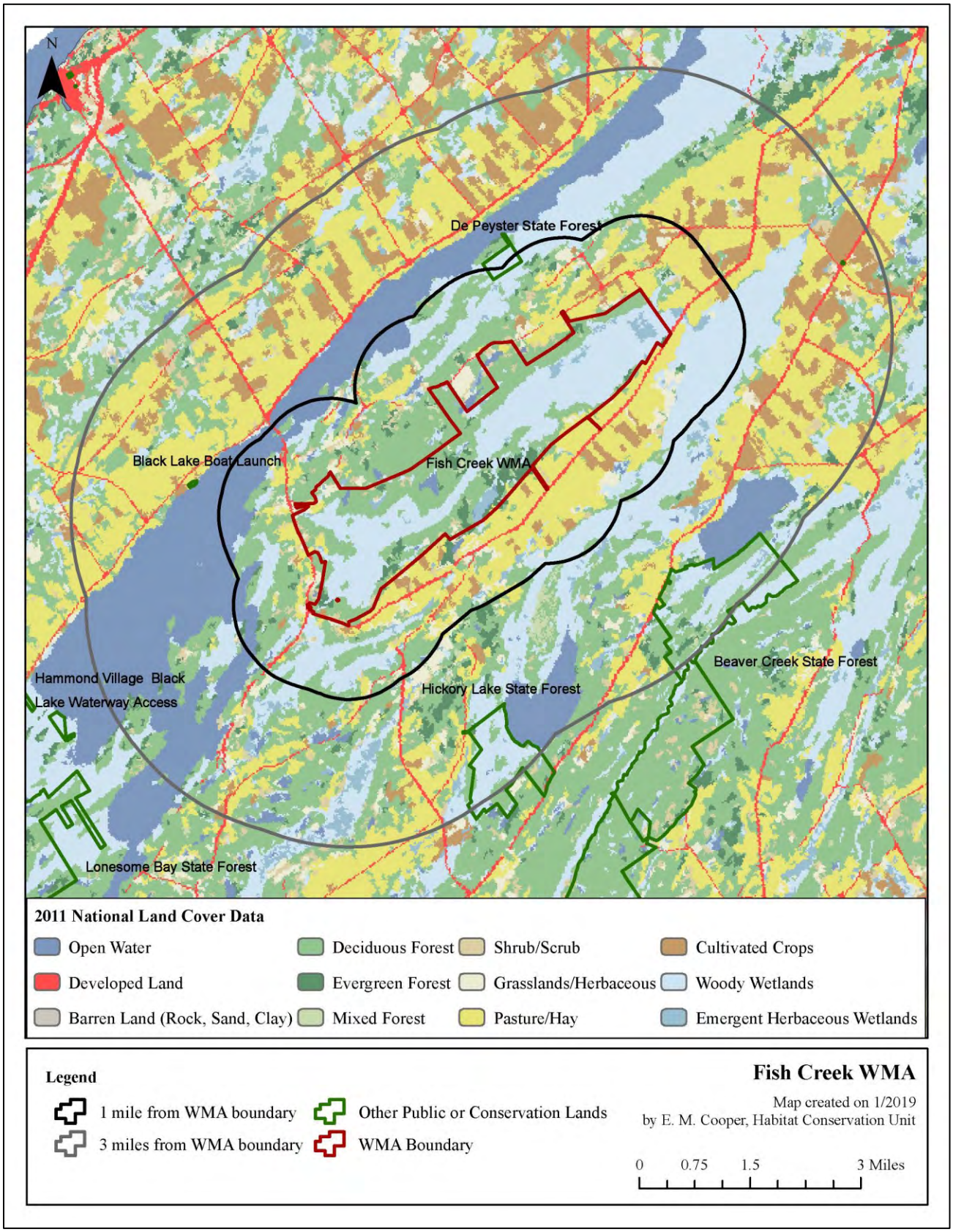

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Fish Creek WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2016-nlcd2016-legend.

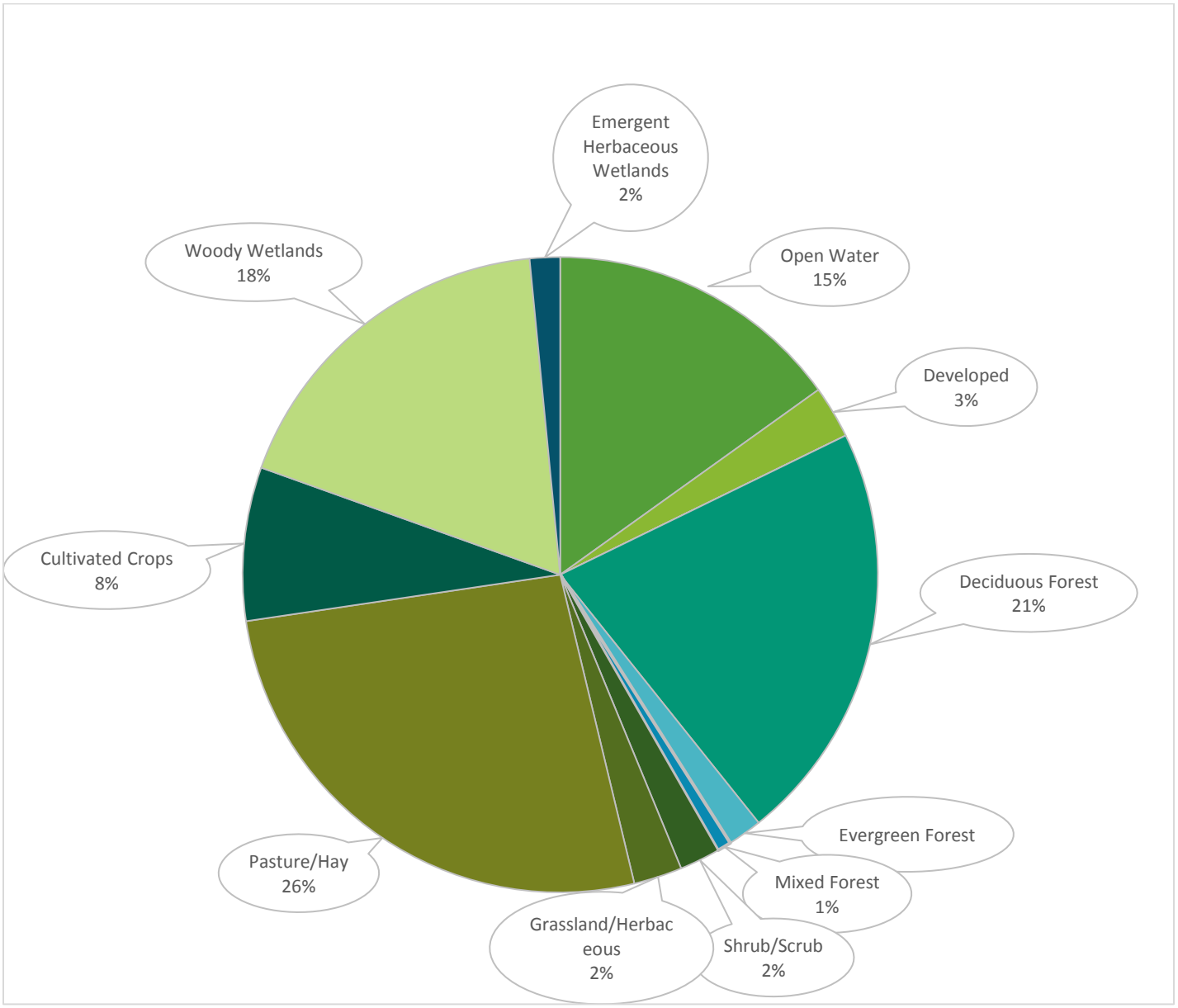

FIGURE 5. Percent cover of land cover types within three miles of Fish Creek WMA.

Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2016-nlcd2016-legend.

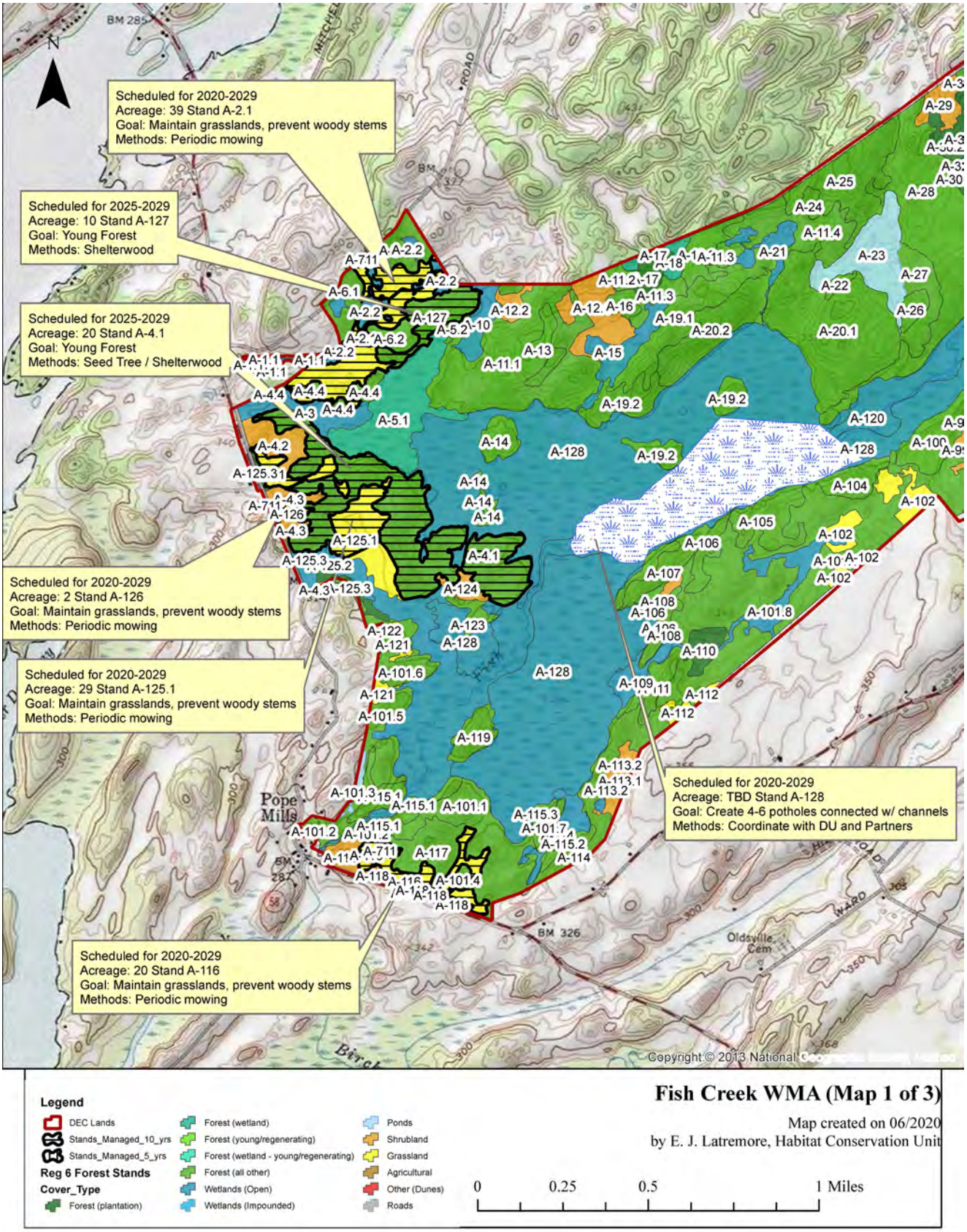

FIGURE 6. Habitat types and location(s) of proposed management on Fish Creek WMA. Numbers indicate the stand number from habitat inventory. Map 1 of 3

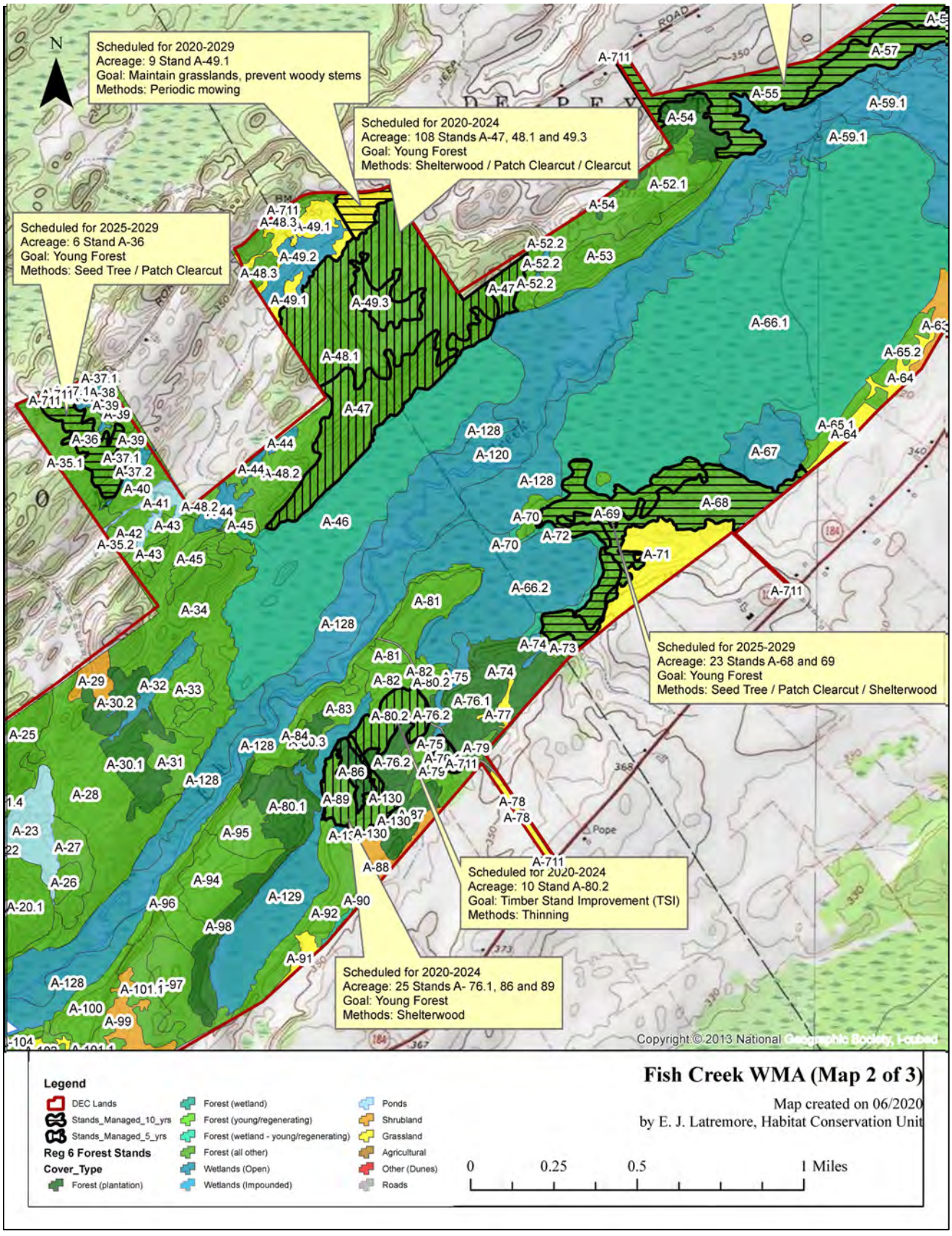

FIGURE 7. Habitat types and location(s) of proposed management on Fish Creek WMA. Numbers indicate the stand number from habitat inventory. Map 2 of 3

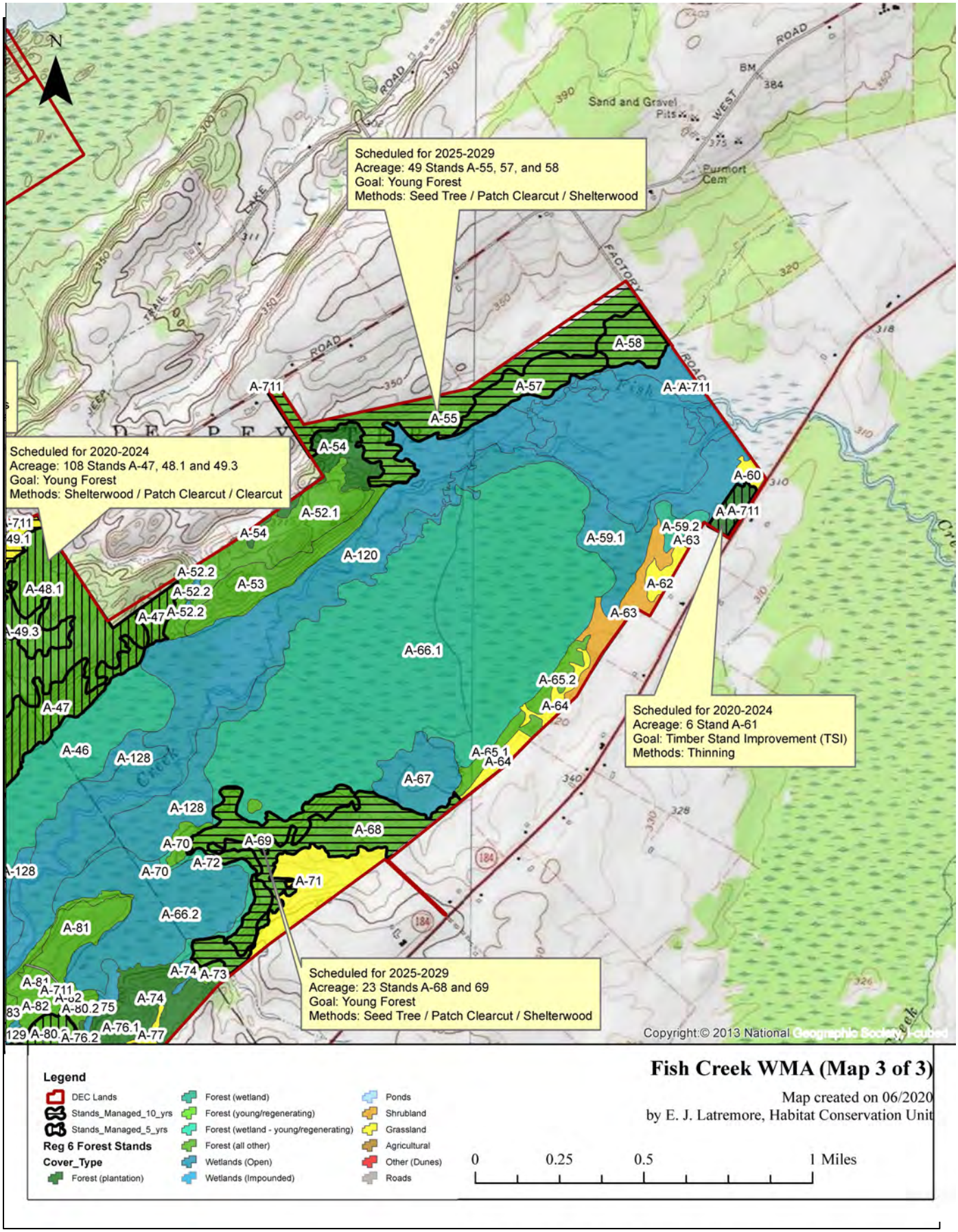

FIGURE 8. Habitat types and location(s) of proposed management on Fish Creek WMA. Numbers indicate the stand number from habitat inventory. Map 3 of 3

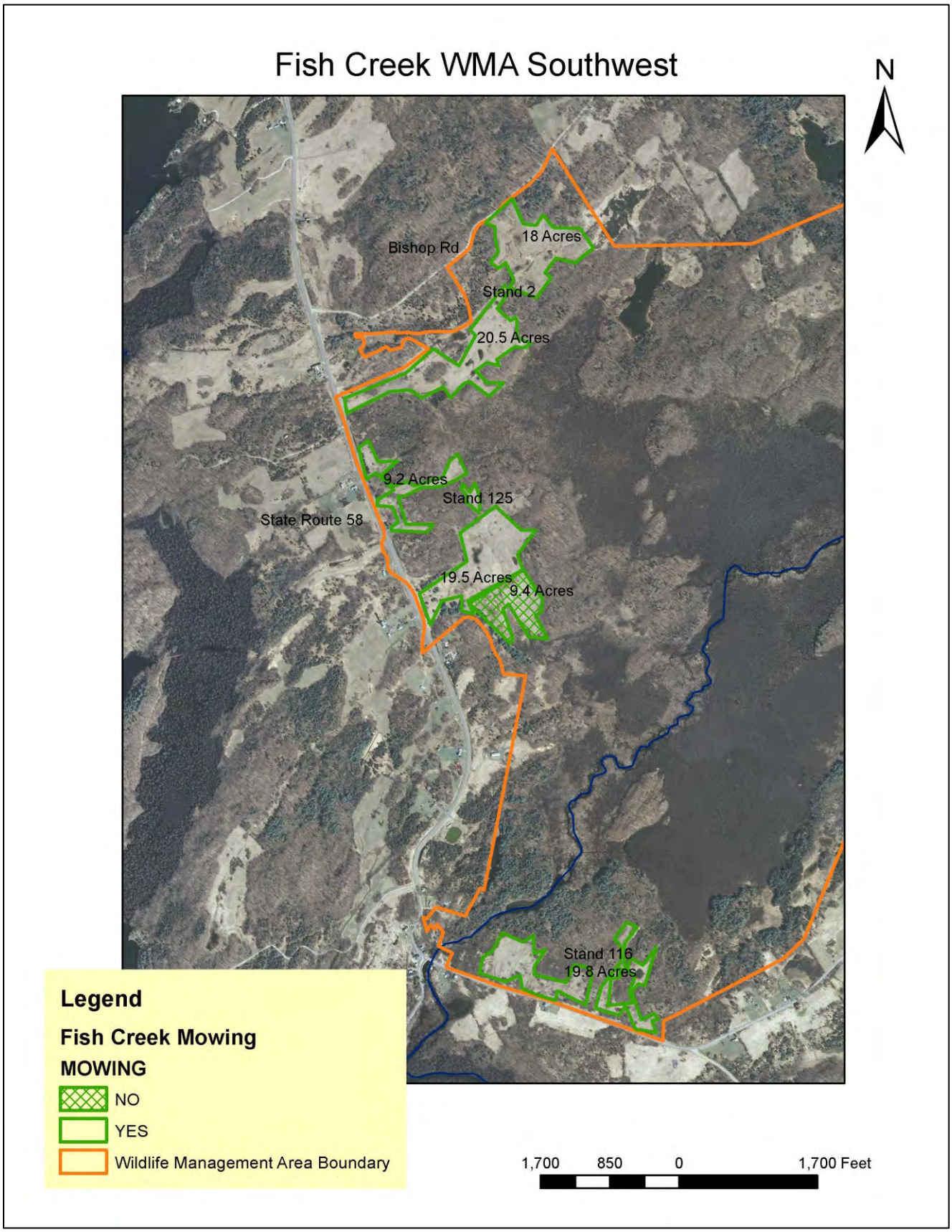

FIGURE 9. Mowing areas at Fish Creek WMA. Map 1 of 2

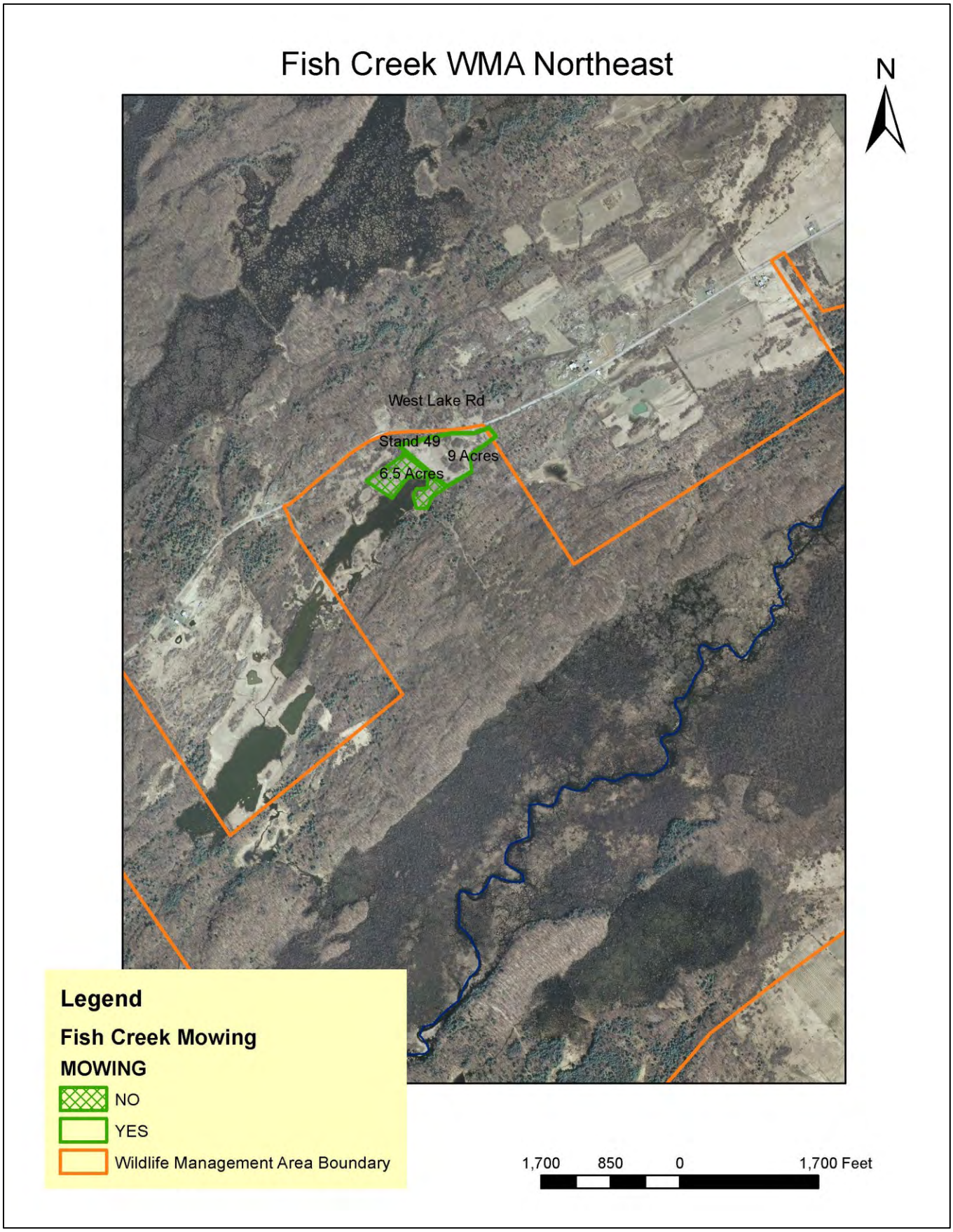

FIGURE 10. Mowing areas at Fish Creek WMA. Map 2 of 2

IV. APPENDICES

APPENDIX A: DEFINITIONS

The following key words were used in the development of this Habitat Management Plan. Definitions are adapted 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 (including technological, economical, and institutional considerations) of avoiding negative impacts of habitat management.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

State Rank of Significant Ecological Communities:

S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.
S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.
S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.
S4 = Apparently secure in New York State.
S5 = Demonstrably secure in New York State.
SH = Historically known from New York State, but not seen in the past 15 years.

SX = Apparently extirpated from New York State.
SE = Exotic, not native to New York State.
SR = State report only, no verified specimens known from New York State.
SU = Status unknown.
(Edinger et al. 2002. Ecological Communities of New York State, Appendix A)

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

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

Target Species: A suite of high priority wildlife species of conservation interest that are being targeted to benefit from management of a particular habitat type. For example, young forest target species at Fish Creek WMA include: Golden-winged Warbler, American Woodcock, Wild Turkey, and Ruffed Grouse.

Unique Area: Lands that were acquired by DEC for their special natural beauty, wilderness character, geological, ecological, or historical significance for inclusion in the state nature and historical preserve (ECL 51-0703.4). The primary purpose of these lands is to protect the feature of significance that led to the land being acquired by the state. (Public Use of Lands Managed by the Bureau of Wildlife)

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

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

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

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

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

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

APPENDIX B: STATEMENT OF CONFORMITY WITH SEQRA

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).[21] 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).[22]

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 upon completion of each HMP, consider comments gathered during 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.

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

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX D: AMENDMENTS

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