Habitat Management Plan
for
Carlton Hill Multiple Use Area
2019 – 2028

Division of Fish and Wildlife
Bureau of Wildlife

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SUMMARY

Carlton Hill Multiple Use Area (MUA) is comprised of 2,500 acres and is a mixture of grasslands, agriculture, shrubland and forest. The MUA is located in the northeastern portion of Wyoming County in the Town of Middlebury, approximately 3 miles north of the Village of Warsaw. Acquisition of the properties that make up Carlton Hill began in 1961 and was made possible by the 1960 Park and Recreation Bond Act.

Historically, agriculture was the primary land use in this area, with many of the farms being abandoned in the 1920s and 1930s due to poor soils and harsh growing conditions. A 1933 map shows seven parcels of land on "the hill" being owned by banks in Western New York following foreclosure. This resulted in the main road through the MUA being known as and named "Bank Street."

Since acquisition, portions of the MUA have followed natural succession; agricultural fields to grasslands to shrubland and then forested. A large portion of the forested acreage is in the intermediate age class, a result of slow growth rates due to soil infertility. In 2006, Carlton Hill was designated a New York State Bird Conservation Area[1]. Today, grassland management centers around a core area located off Casselberry Road.

The Sulphur Spring Hill Cooperative hunting area, adjacent to Carlton Hill, was established in 1981 through the Fish and Wildlife Management Act. The Co-op provides additional acreage for hunting opportunities. The boundary of the Co-op changes periodically and will be posted accordingly. A map of this area can be viewed on the DEC website.

Habitat management goals for Carlton Hill MUA include:

- Manage approximately 9.3% of the MUA as grassland to provide habitat for grassland dependent species, some identified as Species of Greatest Conservation Need (SGCN) and provide release areas for ring-necked pheasants for hunting;
- Manage 9.9% of the MUA in agriculture through cooperative agreements as an avenue to reestablish warm and cool season grasses and provide wildlife foraging opportunities for a variety of species;
- Manage 8.3% as shrubland habitat;
- Manage 3.7% of the MUA (5.5% of the total forested acreage) in young forest habitat to provide high stem density habitat for ruffed grouse, American woodcock, wild turkey, and white-tailed deer;
- Manage 63.4% as intermediate and mature forest, including forested wetland;
- Manage 2.4% as natural and impounded wetlands;
- Manage 1.3% as open water, maintaining water control structures and dikes on small marshes and ponds, providing aquatic habitat for waterfowl.

[1] Bird Conservation Area information is available online at http://www.dec.ny.gov/animals/25341.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 Wildlife Management Areas (WMAs)/MUAs 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/MUAs. These plans incorporate management recommendations from Unit Management Plans (UMPs), existing WMA/MUA habitat management guidelines, NY Natural Heritage Program's WMA/MUA Biodiversity Inventory Reports, Bird Conservation Area guidelines, and other documents available for individual WMAs/MUAs.

SCOPE AND INTENT

Primary purposes of this document:

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

Within the next 5 years, this HMP will be integrated into a comprehensive MUA Management Plan that will include management provisions for facilitating compatible wildlife-dependent recreation, access, and facility development and maintenance. Definitions are provided in Appendix A.

The effects of climate change and the need to facilitate wildlife adaptation under expected future conditions will be incorporated into the habitat management planning process and will be

included in any actions that are recommended in the HMPs. For example, these may include concerns about invasive species, anticipated changes in stream hydrology, and the desirability for maintaining connectedness on and permeability of the landscape for species range adjustments.

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

MUA Overview

Location

Carlton Hill Multiple Use Area is located in DEC Region 9, Town of Middlebury, Wyoming County (Figure 1).

Total Area

2,500 acres

Habitat Inventory

A habitat inventory of the MUA was conducted in 2014 and is proposed to be updated every ten to fifteen years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the MUA, and conditions in the surrounding landscape (see Landscape Context section below).

Table 1. Summary of current and desired habitat acreage on Carlton Hill MUA.

Habitat Type	Current Conditions (as of 2019)			Desired Conditions	
	Acres	Percent of MUA	Miles	Acres	Percent of MUA
Forest [a]	1705.4	68.4%		1584.9	Decrease to 63.4%[b]
Young forest	0.0	0.0%		92.1	Increase to 3.7%
Shrubland	180.4	7.2%		208.8	Increase to 8.3%
Grassland	232.5	9.3%		232.5	No change
Agricultural land	246.4	9.9%		246.4	No change
Wetland (natural) [c]	41.0	1.6%		41.0	No change
Wetland (impounded) [c]	20.6	0.8%		20.6	No change
Open water	31.7	1.3%		31.7	No change
Other (Facilities)	2.5	.1%		2.5	No change
Other (Utilities)	12.3	0.5%		12.3	No change
Roads	27.2	0.9%		27.2	No change
Rivers and streams			5.53		No change
Total Acres:	2,500	100%		2,500	

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

ECOLOGICAL RESOURCES

Wildlife Overview:

Wildlife present on Carlton Hill MUA include species commonly found on the North Appalachian Hills region of western New York such as:

- White-tailed deer, red fox, eastern coyote, wild turkey
- Beaver, raccoon, striped skunk, fisher
- Ruffed grouse, American woodcock, American crow, common raven, blue jay
- Wood duck, mallard, Canada goose
- Eastern American toad, spring peeper, wood frog
- Snapping turtle, wood turtle, painted turtle, Eastern 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 SGCN may occur on the MUA (Table 2).[2] SGCN listed below include species that have been documented on or within the vicinity of the MUA that are likely to occur in suitable habitat on the MUA. Other SGCN may also be present on the MUA. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[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 Carlton Hill MUA, including state and federal Endangered (E) and Threatened (T) species, state Species of Special Concern (SC), High Priority SGCN (HP), and SGCN (x).

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds				
	American kestrel			x
	American woodcock			x
	Black-billed cuckoo			x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Canada warbler			HP
	Cooper's hawk		SC	
	Eastern meadowlark			HP
	Grasshopper sparrow		SC	HP

[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.
[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.

Table 2 continued				
Species Group	**Species**	**Federal Status**	**NY Status**	**NY SGCN Status**
	Henslow's sparrow		T	HP
	Horned lark		SC	HP
	Long-eared owl			x
	Louisiana waterthrush			x
	Northern harrier		T	x
	Osprey		SC	
	Pied-billed grebe		T	x
	Red-headed woodpecker		SC	
	Red-shouldered hawk		SC	x
	Ruffed grouse			x
	Scarlet tanager			x
	Sharp-shinned hawk		SC	
	Vesper sparrow		SC	HP
	Wood thrush			x
	Yellow-breasted chat		SC	HP
Mammals	None known			
Amphibians and reptiles	Blue-spotted salamander			HP
	Snapping turtle			x
	Western chorus frog			x
Fish	None known			
Invertebrates	None known			
Plants	None known			

Significant Ecological Communities:

There are 24 ecological communities present on Carlton Hill MUA, including one significant natural community 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 community occurs on the MUA; community descriptions are from *Ecological Communities of New York State, Second Edition* [6] (Figures 2 and 3):

- 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

[6] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological Communities of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/29384.html.

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.

Additional information about significant ecological communities is available in the Carlton Hill MUA Biodiversity Inventory Final Report (1997) prepared by the NY Natural Heritage Program.

Soils:

Carlton Hill MUA spans over three primary soil group associations, each formed in glacial tills and commonly found in upland areas. The two predominant soil group types on the property are Nunda and Fremont, in roughly equal amounts[7]. These are both deep soils with varying drainage qualities and differing pH levels. The MUA also contains Manlius soil groups to a lesser extent along the western and southern edges of the property, which is typically deep and well drained with very low lime levels.

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 Carlton Hill MUA include:

- Six wetlands regulated by Article 24 of the Environmental Conservation Law and several additional smaller emergent and forested/shrub wetlands shown on the National Wetlands Inventory (NWI; Figures 4 and 5). The NWI maps show additional acreage around each of the state regulated wetlands due to a difference in mapping criteria. 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 for determination of impacts.
- 12 streams (a watercourse entirely within the WMA/MUA) or segments of streams (a stream that meanders in and out of the MUA). Both Middlebury Brook (including 3 tributaries) and the Little Tonawanda (including 7 tributaries) have a Class A stream classification.[8] Class A designation is assigned to waters used as a source of drinking water.
- Vernal pools exist on the MUA. Management activities will follow SMZ rules established for WMAs/MUAs.

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.*[9] 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.

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[7]Soil Survey of Wyoming County, New York, United States Department of Agriculture Soil Conservation Service. April 1974.

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

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

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features, the availability of habitats, and other conservation lands adjacent to Carlton Hill MUA (Figures 6 and 7). The landscape within a three mile radius of the MUA is primarily privately-owned land including:

- Pasture/Hay (32%)
- Deciduous forest (24%)
- Cultivated crops (22.4%)
- Wetlands (6.8%)
- Shrub/Scrub (5.2%)
- Mixed forest (3.9%)
- Developed (3.7%)
- Evergreen forest (0.9%)
- Open water (0.5%)
- Barren land (0.3%)
- Grasslands (0.3%)

When analyzing the NLCD data, approximately 55% of the surrounding habitat consists of non forested habitat with forested habitat comprising roughly 28%. Carlton Hill MUA consists of approximately 68% forested and 19% non-forested. After comparing both sets of data the primary goals of this HMP will be to manage for grasslands, intermediate and mature forest habitat types. The young forest goal will be to maintain 3.7% of the MUA in a young forest stage. This is below the 10% minimum as set forth by the DEC's *Young Forest Initiative Strategic Plan*[10] but can be supported for the following reasons:

- Carlton Hill has been designated a Bird Conservation Area and is used by several SGCN that depend on grassland habitat, therefore, grassland management will be a priority of the HMP.
- Over 55% of the surrounding land cover is pasture/hay, cultivated crops, grasslands and barren land. Managing for forest habitat (mature), specifically hard mast species on Carlton Hill, will be beneficial to species requiring this habitat type that is lacking in the surrounding landscape.
- Most of the acreage on Carlton Hill was cleared for farming. Growth rates have not been very good due to poor soil conditions. Many of the stands are in the intermediate age class and will not be ready for commercial sale at this time or in the next ten years covered by this HMP.
- A number of the forested stands are access challenged due to topography, wetlands or private property. Mature trees are found in steep drainages or are inaccessible due to wet soils between the access and the mature trees.

Two other publicly owned properties exist adjacent to or near Carlton Hill MUA. Wyoming County owns 86.5 acres south of Fox Road along the eastern boundary line of stands 940 and 46. A shelterwood cut was conducted in 2016 on this parcel. The second property is 0.5 miles northeast of Carlton Hill just into Genesee County. Known as the Genesee County Park, the

property encompasses 430 acres composed primarily of northern hardwoods, conifer plantations and forested wetlands. The management goal of the County Park is to regenerate northern hardwoods using uneven aged management.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

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

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

FOREST

Forested acreage includes the following forest types:

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

Forest management on Carlton Hill MUA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMA/MUAs to benefit wildlife that require this transitional, disturbance-dependent habitat. [10]

[10] 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.

MANAGEMENT OBJECTIVES

- Increase young forest acreage from an existing 0 acres to approximately 92.1 acres for habitat improvement of young forest target species, ruffed grouse, and American woodcock.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 1705.4 forested acres on Carlton Hill MUA (Figure 8). The most predominant forest type on the MUA is natural forest, primarily characterized by northern hardwood species. Most forested stands are in an intermediate size class.

Due to its large size, Carlton Hill MUA has been divided into two compartments for management purposes. Table 3 provides a summary of the current and desired forest types for Carlton Hill MUA.

Photo 1. Natural forest stand at Carlton Hill MUA. NYSDEC

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

Forest Type	Acres (as of 2019)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	1389.7	1330.8	sugar maple, white ash
Plantation	291.9	230.3	Norway spruce, red pine, larch
Forested wetland	23.8	23.8	willow, aspen
Young forest	0	92.1	
Young forest (forested wetland)	0	0	
Total Forested Acres:	1705.4	1677.0[a]	

[a] Change in total forest acres is due to the planned conversion of forest to shrubland (28.4 acres).

Target species for young forest habitat management include ruffed grouse and American woodcock. These species rely on areas of young forest adjacent to mature forest for nesting, foraging, and cover and will benefit from management that creates the following:

- **Ruffed Grouse Habitat Requirements:**
  - Drumming areas – Downed trees surrounded by small diameter woody cover.
  - Foraging – Open areas with dense overhead cover of young forest with good mast production.
  - Nesting – Young open forest stands or second growth woodlands.

- Brood rearing – Herbaceous ground cover with a high midstory stem density.[11]

- **American Woodcock Habitat Requirements:**
  - Singing/Peenting Ground – Open areas from 1 acre to over 100 acres usually in an abandoned field.
  - Daytime areas – Moist, rich soils w/ dense overhead cover of young alders, aspen, or birch.
  - Nesting – Young open, second growth woodlands.
  - Brood rearing – Similar to nesting except there needs to be bare ground and dense ground cover.
  - Roosting – Open fields (min. of 5 acres) or blueberry fields and reverting farm fields.[12]

MANAGEMENT HISTORY

Very limited forest management has occurred on Carlton Hill MUA and no specific young forest habitat has been established.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management will result in roughly 92.1 acres of young forest habitat or approximately 5.5% young forest cover of the total forested acres, within ten years:

- **Management planned for 2019-2023** (Table 4, Figure 8):
  - Clearcut entire failed white spruce planting in Compartment B Stand 48 (2.6 acres).
  - Clearcut half of each Norway spruce plantation in Compartment A Stand 37 (19.8 acres) and Compartment B Stand 62 (8.5 acres) (Total 28.3 acres).
  - Shelterwood cut of transitional hardwoods in Compartment B Stand 56 (15 acres).
  - Clearcut and conversion of sapling northern hardwoods to shrubland habitat within Compartment A Stand 48 (10.4 acres).
  - Patch clearcut and apple tree release within a larch plantation located in Compartment B Stand 9 (5 acres).
  - Clearcut half of the pioneer hardwoods in Compartment A Stand 45 (7.3 acres).

- **Management planned for 2024-2028** (Table 5, Figure 8):
  - Clearcut and convert Northern hardwoods to shrubland over two separate stages within Compartment A Stand 54, four years apart. First stage (8 acres) and second stage (10 acres) (Total 18 acres).
  - Clearcut second halves of Norway spruce plantations in Compartment A Stand 37 (19.8 acres) and Compartment B Stand 62 (8.5 acres) (Total 28.3 acres).
  - Shelterwood cut of transitional hardwoods in Compartment B Stand 49 (5.6 acres).

[11] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.
[12] Sepik, G. F. et al. 1981. A Landowner's Guide to Woodcock Management in the Northeast, Moosehorn National Wildlife Refuge, USFWS. 25 pp.

Table 4. Forest management schedule for the first five-year period of this HMP (2019-2023).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
B-48	2.6	Poletimber	Plantation*	Young Forest	Wildlife	Clearcut
A-37	19.8	Poletimber	Plantation	Young Forest	Wildlife	Clearcut
B-62	8.5	Poletimber	Plantation	Young Forest	Wildlife	Clearcut
B-56	15	Small Sawtimber	Transition Hardwoods	Young Forest	Wildlife & T-EA	Shelterwood
A-48	10.4	Seedling - Sapling	Northern Hardwoods	Shrubland	Wildlife	Clearcut
B-9	5.0	Small Sawtimber	Plantation	Young Forest	Wildlife	Apple tree release
A-45	7.3	Poletimber	Pioneer Hardwoods	Young Forest	Wildlife	Clearcut

*Originally planted as a white spruce plantation but was unsuccessful in establishment.

Table 5. Forest management schedule for the second five-year period of this HMP (2024-2028).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-54	18.0	Poletimber	Northern Hardwoods	Shrubland	Wildlife	Clearcut
A-37	19.8	Poletimber	Plantation	Young Forest	Wildlife	Clearcut
B-62	8.5	Poletimber	Plantation	Young Forest	Wildlife	Clearcut
B-49	5.6	Poletimber	Transition Hardwoods	Young Forest	Wildlife & T-EA	Shelterwood

Stand locations and planned management actions are also summarized in Figure 8. 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:

<u>Management for 2019-2023 (68.6 acres):</u>

Plantations (35.9 acres)

- **Compartment A Stand 37**

This is a roadside Norway spruce plantation totaling in 39.6 acres. It has been determined this softwood stand no longer serves the sought after functions that much younger softwood stands provide for young forest wildlife.

Therefore, the plan calls for half of the stand to be clearcut in the first five years resulting in 19.8 acres of young forest. The stand consists of 6 separate blocks of spruce plantings, roughly laid out in two columns running North and South with each column containing three blocks. The first cut will remove three blocks of spruce in total in an alternating arrangement, meaning the first and last block of the first column and the center block of the second column. The areas between the spruce blocks consist of aspen clumps among other hardwood regeneration, mainly white ash. Grasses and other herbaceous vegetation are also present and dominate these areas. Segments of recreational hiking and horse trails are present within the stand and will need to be addressed prior to management activities.

- **Compartment B Stand 9**

This is a larch plantation totaling in 28.4 acres. The stand extends along a hill with a very steep gradient until it reaches the top, flattening out and ending at a neighboring field. Proposed management would occur on the flat area abutting the field, where a mix of larch, aspen, apple, and other hardwoods (black cherry) are found. Activities would aim to clearcut the larch, aspen, and most other hardwoods while creating openings to release the apple trees, resulting in approximately 5 acres of young forest habitat. This would ideally result in dense aspen sprouting with ample opportunity for wildlife to forage soft mast provided by the apple and select reserve black cherry left standing throughout the stand.

- **Compartment B Stand 48**

This was a 2.6 acre white spruce plantation, that has failed since its original planting and been overtaken with aspen saplings and poles. The stand will be regenerated from a clearcut, specifically during winter, to promote thick aspen root sprouting. The square shaped stand is bordered by a variety of habitat types, two different softwood plantations (Norway spruce and red pine), a transitional hardwood stand, and a grassland. Given its location relative to other cover types it should provide ideal young forest habitat, totaling in 2.6 acres, following its proposed management.

- **Compartment B Stand 62**

This is another Norway spruce plantation found on the property totaling in approximately 17 acres. This stand has also grown out of its ideal young forest wildlife structure and therefore half of the stand will be clearcut resulting in 8.5 acres of young forest habitat. The stand does contain a small element of hardwood species composition, specifically white ash and black cherry, which will contribute as a seed source for future regeneration. The northeastern reaches of the stand border a pond, which will result in certain SMZ guidelines being acted upon in order for management activities to occur soundly.

Hardwoods (32.7 acres)

- **Compartment A Stand 45**

  This is a pioneer hardwood stand consisting mostly of aspen across 14.6 acres. A few other hardwood species, such as white ash, sugar maple, and black cherry, are also scattered throughout the stand. Half of the stand will be clearcut in the first five years of the management plan resulting in approximately 7.3 acres of young forest habitat. The second half of the stand will be cut no sooner than 10 years after the first cut, which will place it in a later HMP schedule. This stand should be cut during the winter months to maximize the aspen sprouting potential.

- **Compartment A Stand 48**

  This northern hardwood stand is almost exclusively white ash in the sapling or pole size classes and covers 10.4 acres. This stand will be cleared and maintained as shrubland habitat moving forward. Management details and direction are further outlined in the Shrubland section of the HMP.

- **Compartment B Stand 56**

  This is a 26.1 acre transitional hardwood stand. Roughly half of the stand, where the highest density of red oak is located, will undergo a shelterwood cut. This management will result in approximately 15 acres of young forest habitat, while promoting the recruitment of oak regeneration. It is recommended the hillside where the shelterwood will occur undergo a pretreatment to address the presence of interfering vegetation, such as American beech and ironwood, that could inhibit the establishment of future regeneration. The stand also displays sign of heavy deer browse throughout which needs to be addressed in order to accomplish a successful shelterwood treatment.

<u>Management for 2024-2028 (51.9 acres):</u>

Plantations (28.3 acres)

- **Compartment A Stand 37**

  The remaining three Norway spruce blocks will be clearcut in the second five years of the HMP. This will result in another 19.8 acres of young forest habitat.

- **Compartment B Stand 62**

The remaining half of B-62 will be clearcut in the second five years of the plan, adding another 8.5 acres of young forest habitat to the MUA.

Hardwoods (23.6 acres)

- **Compartment A Stand 54**

This is a large hillside of natural forest spanning 58.2 acres of northern hardwood species. The stand will undergo two separate patch clearcuts, totaling in about 18 acres, both within the second five-year window of the HMP. These cuts are aimed to convert the existing natural forest area to shrubland. The understory of the treatment areas is dominated by honeysuckle and multiflora rose, so a pretreatment removal is recommended. The area is also heavily impacted by deer browse. The newly established shrubland should increase the connectivity of the two nearby fields as well as expand the footprint of early successional habitat in the area.

- **Compartment B Stand 49**

This is a transition hardwood stand totaling in 5.6 acres. It contains relatively high amounts of sugar maple and red oak, which will both be targeted as regeneration species. The stand will undergo a shelterwood treatment, focusing on leaving oaks for mast and seed source in addition to providing shade for the sugar maple found in the understory. The residual overstory will likely remain uncut in perpetuity as the new age class grows over time. The early stages of this stand's succession will provide ideal young forest habitat given its proximity to grassland and recently treated aspen in a failed plantation (B-48).

BEST MANAGEMENT PRACTICES

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

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

Resource	Guidance Document [13]
Soils	*Rutting Guidelines for Timber Harvesting on Wildlife Management Areas*
Water quality	*NYS Forestry Best Management Practices for Water Quality*
Wildlife	*Retention Guidance on Wildlife Management Areas*
Plantations	*Plantation Management Guidance on Wildlife Management Areas*

Wildlife Considerations:

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

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

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

Forest Health Considerations:

Forest management using sound silviculture helps encourage tree, stand, and forest resilience. This can lead to improved wildlife habitat for the target species and a healthier ecosystem. A more resilient forest is less likely to succumb to the adverse effects of injurious agents and limit the spread of harmful pests that may already be present on the MUA. A loss of function and diversity can occur when forest health declines from pests or other damaging agents. This could lead to fewer wildlife species inhabiting an area successfully, further compounding the decline of health and diversity.

Undesirable vegetation is any vegetation deemed to inhibit the successful establishment and growth of more sought after vegetation, either based on wildlife or timber values. It can possess traits that allow it to readily outcompete desirable regeneration. Pre- and/or post-treatments are likely needed to ensure the successful regeneration of desirable species. Observed interfering or invasive vegetation includes blue beech, American beech, hawthorn, buckthorn, ironwood, honeysuckle, multiflora rose, wild cucumber, various weeds, ferns, and grasses.

White-tailed deer herbivory varies across Carlton Hill MUA, but has been observed at extremely high rates and is thus problematic in some forested stands. In areas where deer browse could pose a threat to desirable regeneration deer enclosures (natural or artificial) may be constructed to protect regeneration.

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

Pre- and Post-Treatment Considerations:

Pre- and post-treatments occur at the stand level and aim to promote the regeneration of desired species. The establishment of desired regeneration is primarily achieved by reducing competing vegetation, exposing mineral soil, and improving the seedbed.[14] Additionally, deer browse also greatly impacts the success of desired regeneration. Treatment actions are typically carried out through mechanical and/or chemical means. It should be noted that certain ecological situations are best treated through a prescribed burning regimen.

Mechanical treatments will most commonly include the use of brush saws or chainsaws to cut out invasive or undesired species from the understory. Chemical treatments will involve the use of herbicides to reduce vegetative competition. Pre- and post-treatment actions will be addressed further in the silvicultural prescriptions.

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

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 in the Young Forest Initiative Monitoring Plan. 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 Carlton Hill MUA, which may be assessed to determine response to management, include:

- American woodcock
- Ruffed grouse

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

SHRUBLAND

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

MANAGEMENT OBJECTIVES

- Manage approximately 208.8 acres as shrubland habitat (8.3% of the MUA), providing habitat for a variety of shrubland dependent species.
- Convert 28.4 acres of poor quality regeneration and subcanopy invasive species to shrubland.
- Maintain the shrubland via brush hogging every 3-5 years or as necessary. Invasive species monitoring will be conducted annually. Treatment of invasive species will occur as deemed necessary. Future plantings of softmast shrubs will be considered.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently 180.4 acres of shrubland exist on Carlton Hill MUA composed of crab apple, wild apple honeysuckle, grey-stemmed dogwood, red osier dogwood, multi-flora rose and sumac. These densely-stemmed habitats provide foraging and escape cover for both young of year and adults of numerous wildlife species including the YFI target species:

- American woodcock
- Ruffed grouse

Other species benefitting from this habitat type include: brown thrasher, black-billed cuckoo, ring-necked pheasant and cottontail rabbits.

MANAGEMENT HISTORY

Shrubland management on Carlton Hill MUA has been limited due to the high maintenance costs. Shrubland stands were allowed to naturally succeed into seedling/sapling, intermediate

age classes and eventually sawtimber with minimal shrubland maintenance being conducted. Fortunately, maintaining this valuable cover type is planned for in this HMP.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2023** (Figure 8):
    - **Compartment A Stand 48:** A forestry cutter will be used to convert approximately 10.4 acres of poor forest regeneration to shrubland. Once established the shrubland will be maintained every 3-5 years with a brush hog.

Habitat management will include the following:

- **Compartment A Stand 48:** This stand was an open field that is in an early successional stage containing a mix of poor quality seedling/sapling size trees and shrubs. The stand is comprised mainly of white ash with some sugar maple and red oak. Quality red oak saplings will be evaluated and may be left for future hard mast production depending on the location within the stand. The thick stem density will provide valuable foraging and escape cover and is juxtaposed to winter thermal cover and open grassland. Future plantings of softmast shrubs will be considered.

- **Management planned for 2024-2028** (Figure 8):
    - **Compartment A Stand 54:** Approximately 18 acres of poor forest regeneration and an understory of invasive species will be treated and removed via chainsaws and a forestry cutter. Invasive species surveys will be conducted routinely followed by additional treatments if necessary. Once established the shrubland will be maintained every 3-5 years with a brush hog.

Habitat management will include the following:

- **Compartment A Stand 54:** Approximately 18 acres of natural forest will be converted to shrubland, forming two new stands. Currently this stand contains a mix of poor quality pole size white ash and red maple with an understory of honeysuckle and multiflora rose, both invasive species. The somewhat poorly drained soils have hindered growth rates and have influenced tree quality. Invasive species will be treated prior to any management activity and will be monitored and treated as necessary. The perimeters of the new stands will be irregular, providing additional edge habitat, foraging areas and a shrub corridor between grassy open fields. Future plantings of softmast shrubs will be considered.

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

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

GRASSLAND AND OTHER OPEN SPACE

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

MANAGEMENT OBJECTIVES

- Maintain 232.5 acres of grassland and open areas (9.3 % of the MUA) to provide nesting and brooding habitat for a variety of wildlife species including bobolinks, wild turkey and Eastern meadowlarks. These areas will also provide hunting opportunities during the fall pheasant season from stocked ring-necked pheasants.
- Maintain grasslands and smaller fields on a two year rotation to suppress encroachment of woody vegetation.
- Periodically lime and fertilize the grasslands to enhance annual growth.
- Reseed grasslands/fields to reestablish desirable species.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

Currently there are 232.5 acres of grasslands and smaller grassy fields. Six individual fields in very close proximity to one another, form the core grassland bird habitat on the MUA. The acreage is located along Casselberry Road with approximately 50 acres in the shape of an "L" to the south and around 10 acres to the north of the road. Observations of the following species of greatest conservation need; Northern harrier, Henslow's sparrow, grasshopper sparrow and bobolink led to the MUA being designated a Bird Conservation Area in 2006. Although, confirmed breeding of several of these species has not occurred recently, the important habitat components exist. Habitat management in these stands should follow the best management practices for grassland birds.

Agricultural practices are used to facilitate grassland establishment. After several growing seasons of plowing, disking, fertilizing and herbicide use growing corn, undesirable species root systems are broken up and seed banks are depleted. This benefits the establishment of the desired grassland species by removing potential competition. Several fields on the MUA have been planted with a warm season grass mix following agricultural treatment to improve grassland habitat. Little blue stem, big blue stem, Indian grass and switchgrass provide cover and food in the form of seeds. Switchgrass provides valuable winter cover by remaining erect during snow events. It remains sturdy, bending rather than matting down from a snow load, providing tunnels utilized by wildlife as travel lanes and escape cover. Additionally, other fields are seeded with a cool season grass mix containing orchard grass, Timothy, birdsfoot trefoil and clover providing early spring foraging opportunities for wildlife.

Hunting opportunities on the MUA are enhanced by the annual fall stocking of adult ring-necked pheasants in and around the grasslands. The fields are prepped each year prior to the stocking which involves perimeter and strip mowing.

Species that benefit from grassland best management practices include:

- Henslow's sparrow

- Grasshopper sparrow
- Eastern meadowlark
- Bobolink

MANAGEMENT HISTORY

Carlton Hill MUA consisted of abandoned farmland used for crops and pasture. Under DEC management, grassland fields and agricultural fields have been rotated. As fields develop undesirable species, agricultural practices were used to assist in the reestablishment of warm and cool season grasses. The fields are then maintained through mowing on a two year rotation schedule. When necessary these fields are limed and fertilized. Cooperative agreements exist with local chapters of Pheasants Forever and the National Wild Turkey Federation to assist in grassland development and maintenance.

Annual mowing at the end of May is conducted to suppress competing cool season vegetation in the switchgrass stands. A disadvantage of mowing is the buildup of litter in the stand which may lead to smothering of the root systems. Prescribed burning of the switchgrass would be more beneficial to managing this valuable cover type. Future habitat planning will involve pursuing this management practice on the MUA.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Figure 8):
    - Continue field maintenance following a two year mowing rotation schedule.
    - Continue annual perimeter and strip mowing to prep fields for fall pheasant stocking.
    - Grassland fields determined to contain undesirable species will be converted to agriculture crops for a period of 2-3 years. This will destroy root systems and deplete the weed seed bank. Fields will be reseeded to warm or cool season grasses.
    - Fields will be periodically limed and fertilized.
    - Continue annual spring mowing of switchgrass to suppress competition from cool season vegetation.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs/MUAs 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 grassland management and restoration techniques.

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity, and consider the needs of both breeding and wintering grassland bird species.
- Consider the surrounding landscape when making management decisions.

[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.

- Conduct baseline grassland bird surveys on newly acquired fields or fields targeted for management changes to determine species present.
- Increase field size by hedgerow removal, removing trees, etc. to benefit species that require large fields.
- Conduct invasive species control (glossy buckthorn, pale and black swallowwort, Canada thistle, Phragmites, etc.) to improve habitat quality.
- Consider a variety of factors, such as the targeted grassland bird species, pollinators, seed mix (warm versus cool season grasses, forbs, wildflower mixes, grass height and density), timing of planting, existing conditions, and vegetation removal techniques (including herbicide and intensive disking) in developing grassland planting or restoration projects.
- Utilize mowing, haying, burning, and grazing for maintaining grassland habitat, after evaluating the appropriateness of these methods relative to site conditions and management objectives. In particular, burning cool season grasses is not advisable in most situations in New York.

Timing of Management

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

Additional Mowing Guidelines

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

- In general, mow grass to a residual height of 6-12 inches.

Management Evaluation

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

Agricultural Land

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

Management Objectives

- Continue to utilize cooperative agreements with Pheasants Forever and the National Wild Turkey Federation in food plot establishment for wildlife.
- Continue to utilize agriculture practices for grassland reestablishment.
- Continue cooperative agricultural agreements with local farmers.

Description of Existing Agricultural Lands and Target Species

Currently, the main agricultural crop is corn. Portions of these fields are left unharvested to provide an additional food supply and cover for wildlife. Food plots planted by Pheasants Forever and the National Wild Turkey Federation consist of corn, sorghum, millet, alfalfa, clover, and buckwheat.

Agricultural practices are used to facilitate grassland establishment. After several growing seasons of plowing, disking, fertilizing and herbicide use growing corn, undesirable species root systems are broken up and seed banks are depleted. This benefits the establishment of the desired grassland species by removing potential competition.

Species benefitting from agricultural management include:

- Wild turkey
- White-tailed deer
- Ring-necked pheasant

Management History

Much of the MUA was cleared for farming activities in the 1920s and 1930s. Farming activities continued on the more productive areas. After acquisition, cooperative agricultural agreements with local farmers were used to keep fields in production of grain crops and hay. Included in the agreements was a requirement to leave a percentage of the crop for wildlife. Agriculture has also been used as a method to reestablish grasslands, a practice that will continue.

Implementation Plan and Anticipated Schedule

- **Management planned for 2019-2028** (Figure 8):

- Continue wildlife food plot plantings. Acreages may vary annually.
- Continue on a rotational basis prepping fields for grassland reestablishment with agricultural methods.
- Warm and cool season grass mixes will be planted when fields are determined to be suitable for reestablishment.

Photo 2. Warm season grass planting.
NYSDEC

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

Fields will be monitored to determine when agricultural activities have met the requirements for grassland seeding. The seedings will be monitored for germination, invasive species and weed species.

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 41 acres of natural wetland as it currently exists.
- Maintain 20.6 acres of impounded wetlands.
- Maintain natural hydrology and water quality on the MUA.
- Maintain water control structures and dikes on small ponds and impounded wetlands occurring on the MUA.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of dikes and water control structures.
- Repair dikes, emergency spillways and water control structures as needed.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 41 acres of natural wetlands and 20.6 acres of impounded wetlands (totaling 61.6 acres) on Carlton Hill MUA (Figures 4 and 5). The wetland acreage is a combination of small, shallow water areas, emergent aquatic vegetation and scrub-shrub species.

The wetlands provide habitat for species such as:

- American woodcock
- Beaver, muskrat
- Migratory waterfowl
- Wood frog, spring peepers
- Snapping turtle, painted turtle

MANAGEMENT HISTORY

Upgrades to the dikes and water control structures on several of the smaller impoundments have been completed in recent years. Several other rehab projects are being planned and will be completed as funding becomes available. Mowing of the pond dikes is completed annually by the Division of Operations following the MUA work plan.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Figure 8):
    - Continue annual routine maintenance of dikes and water control structures and emergency spillways.
    - Continue annual inspection of dikes for muskrat and beaver damage.
    - Reconstruct dikes and replace water control devices as necessary.

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

None.

OPEN WATER (WATERBODIES AND WATERCOURSES)

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

MANAGEMENT OBJECTIVES

- Maintain dikes, water control structures and emergency spillways on small ponds occurring on the MUA.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of dikes and water control structures.

- Construct new ponds as funding becomes available.
- Protect water quality on all streams and segments of stream as management activities are conducted.

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

A number of small ponds have been constructed on the management area. Several of the ponds are dug ponds with no water control structures. The larger ponds consist of a dike, water control structure, and emergency spillway. These areas provide aquatic habitat utilized by a variety of migratory waterfowl, reptile, and amphibian species.

MANAGEMENT HISTORY

A number of ponds have been constructed since 1961 when the DEC acquired the MUA from the federal government. Upgrades to the dikes and water control structures on several of the smaller impoundments have been completed in recent years. Several other rehab projects are being planned and will be completed as funding becomes available. Plans to construct new ponds, enhance existing vernal pools and construct additional vernal pools will be initiated as funding becomes available.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for** 2019-2028 (Figure 8):
    - Routine maintenance on all dikes and water control structures including yearly inspections, annual mowing of the dikes, and monitoring of beaver and muskrat activity.
    - Several dike rehab projects as funding becomes available.
    - Construct new ponds and vernal pools as funding becomes available.

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

None.

HABITAT MANAGEMENT SUMMARY

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

Table 7. Summary of habitat management actions recommended for Carlton Hill MUA, 2019-2028. (Also see Figure 8.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut failed white spruce plantation in Compartment B Stand 48 to create young forest.	2.6	2019-2023
Forest	Clearcut half of Norway spruce plantations in Compartment A Stand 37 and Compartment B Stand 62.	28.3	2019-2023
Forest	Shelterwood cut transition hardwoods in Compartment B Stand 56 to create young forest.	15	2019-2023
Forest	Clearcut and apple tree release portion of a larch plantation in Compartment B Stand 9 to create young forest.	5	2019-2023
Forest	Clearcut half of pioneer hardwoods in Compartment A Stand 45 to create young forest.	7.3	2019-2023
Shrubland	Clearcut northern hardwoods in Compartment A Stand 48 to create shrubland.	10.4	2019-2023
Forest	Clearcut remaining half of Norway spruce plantations in Compartment A Stand 37 and Compartment B Stand 62 to	28.3	2024-2028
Forest	Shelterwood cut transition hardwoods in Compartment B Stand 49 to create young forest.	5.6	2024-2028
Shrubland	Clearcut northern hardwoods in Compartment A Stand 54 to create shrubland.	18	2024-2028
Shrubland	Brush hogging every 3-5 years or as deemed necessary.	-	2019-2028
Grassland	Field maintenance on a 2-year mowing rotation.	-	2019-2028

III. FIGURES

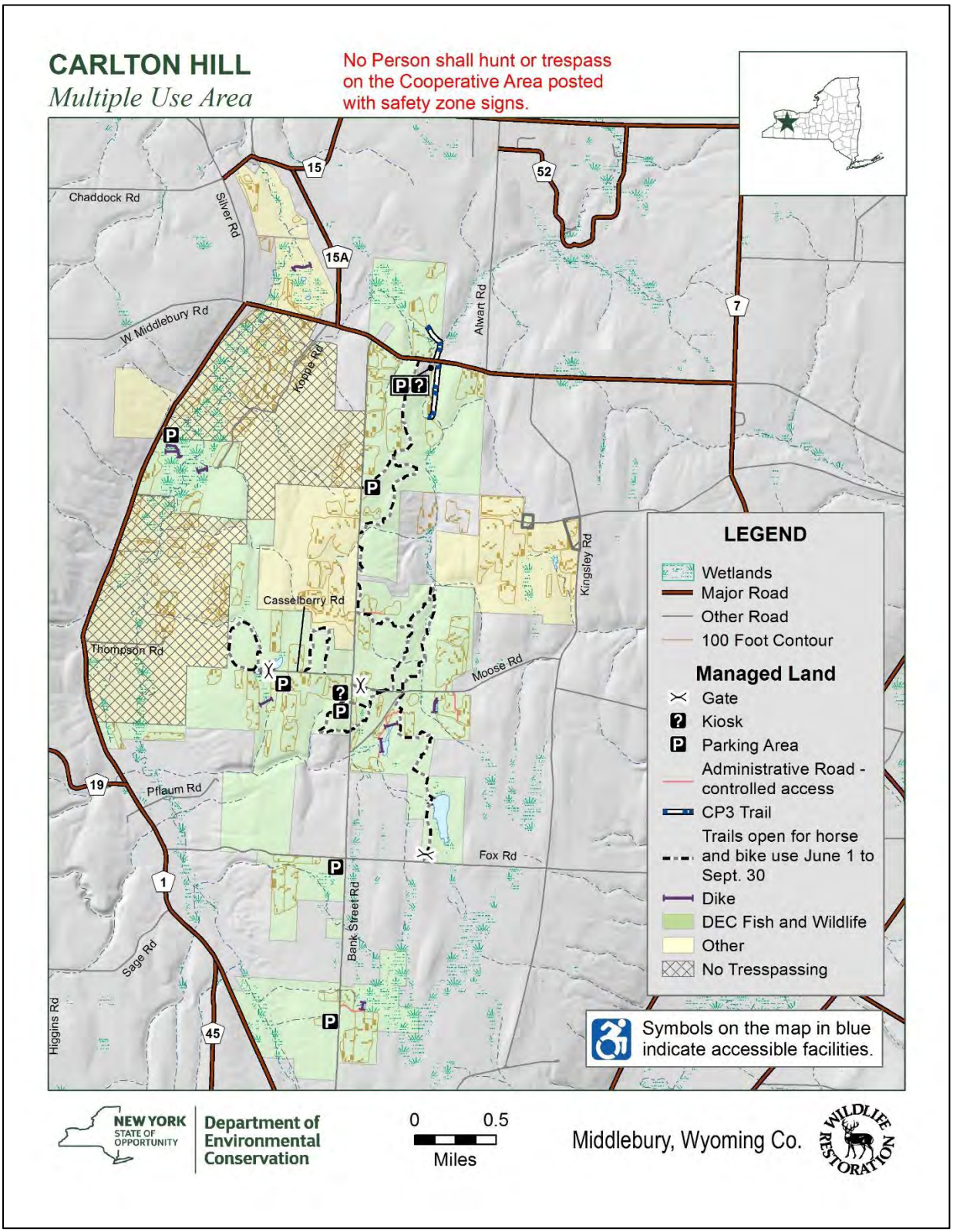

FIGURE 1. Location and access features at Carlton Hill MUA.

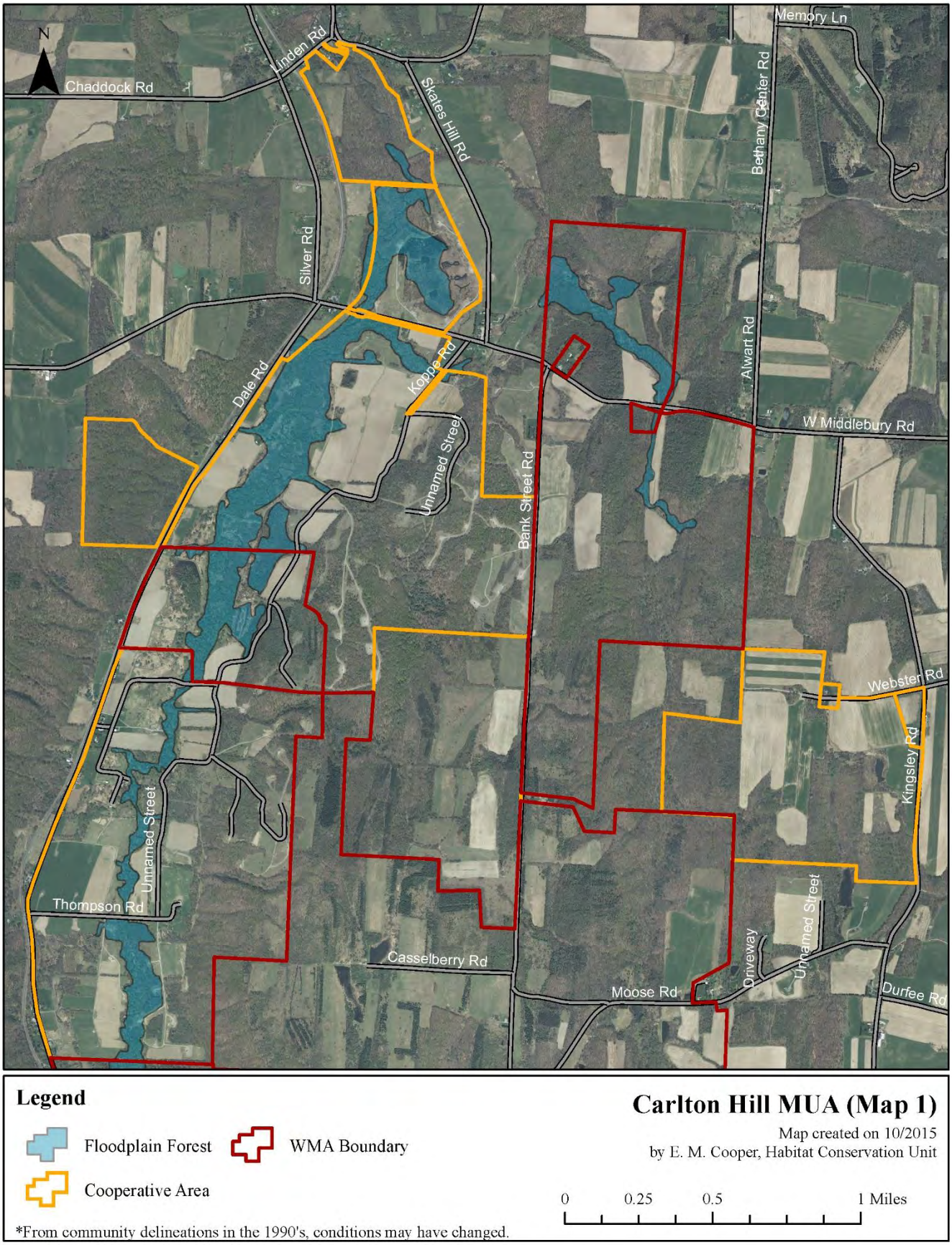

FIGURE 2. Significant ecological communities on Carlton Hill MUA North. Data from the NY Natural Heritage Program.

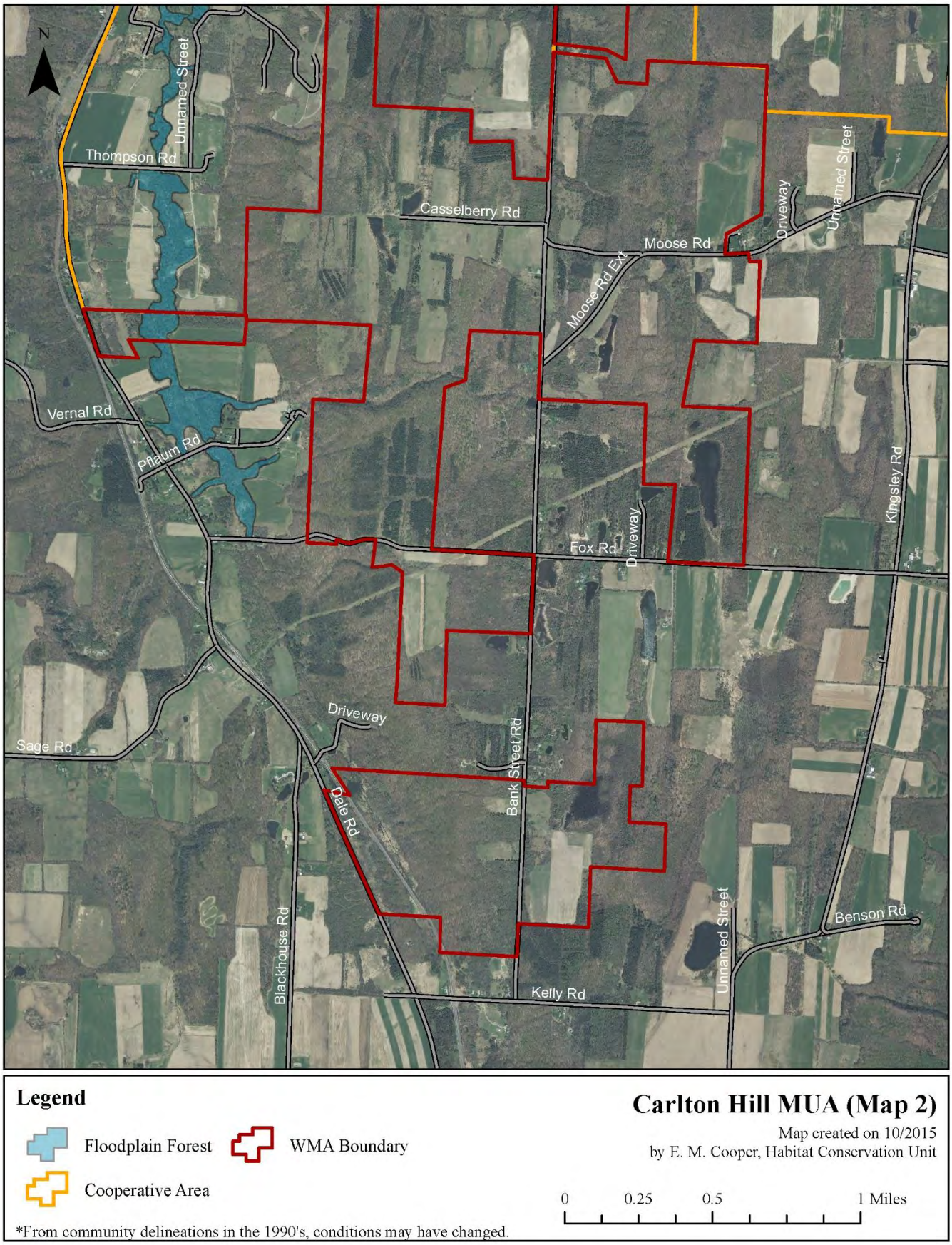

FIGURE 3. Significant ecological communities on Carlton Hill MUA South. Data from the NY Natural Heritage Program.

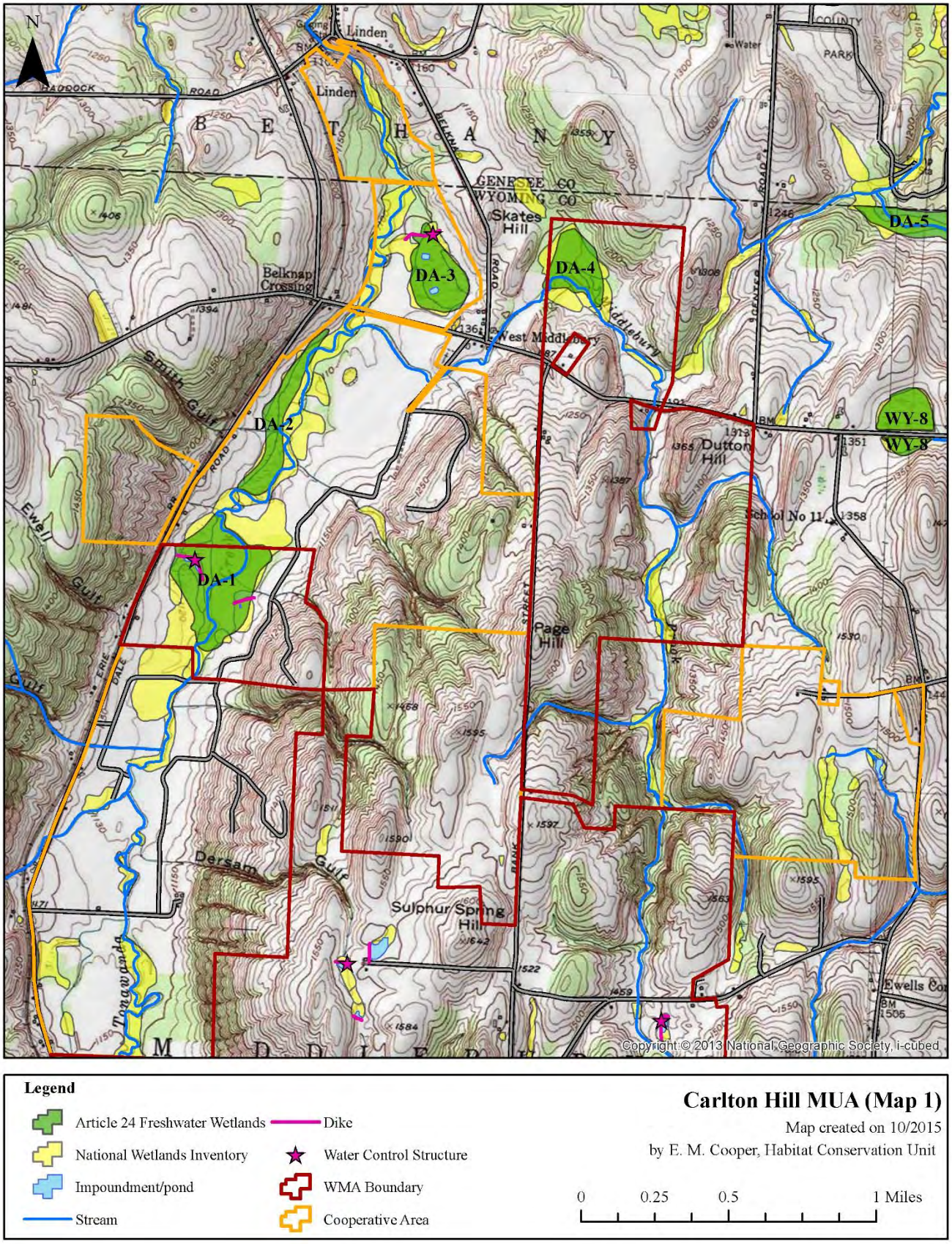

FIGURE 4. Wetlands, open water, and streams of Carlton Hill MUA North. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

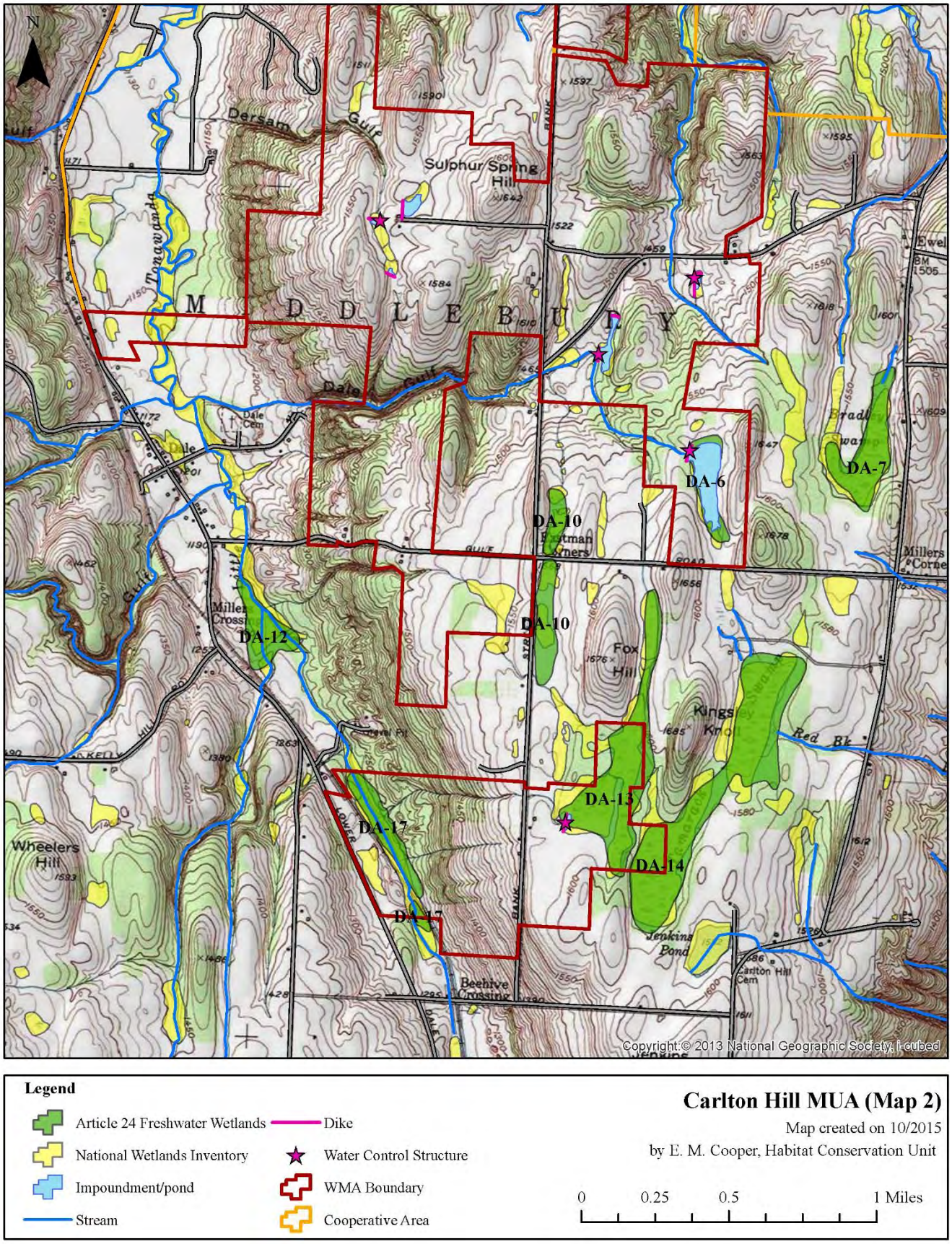

FIGURE 5. Wetlands, open water, and streams of Carlton Hill MUA South. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

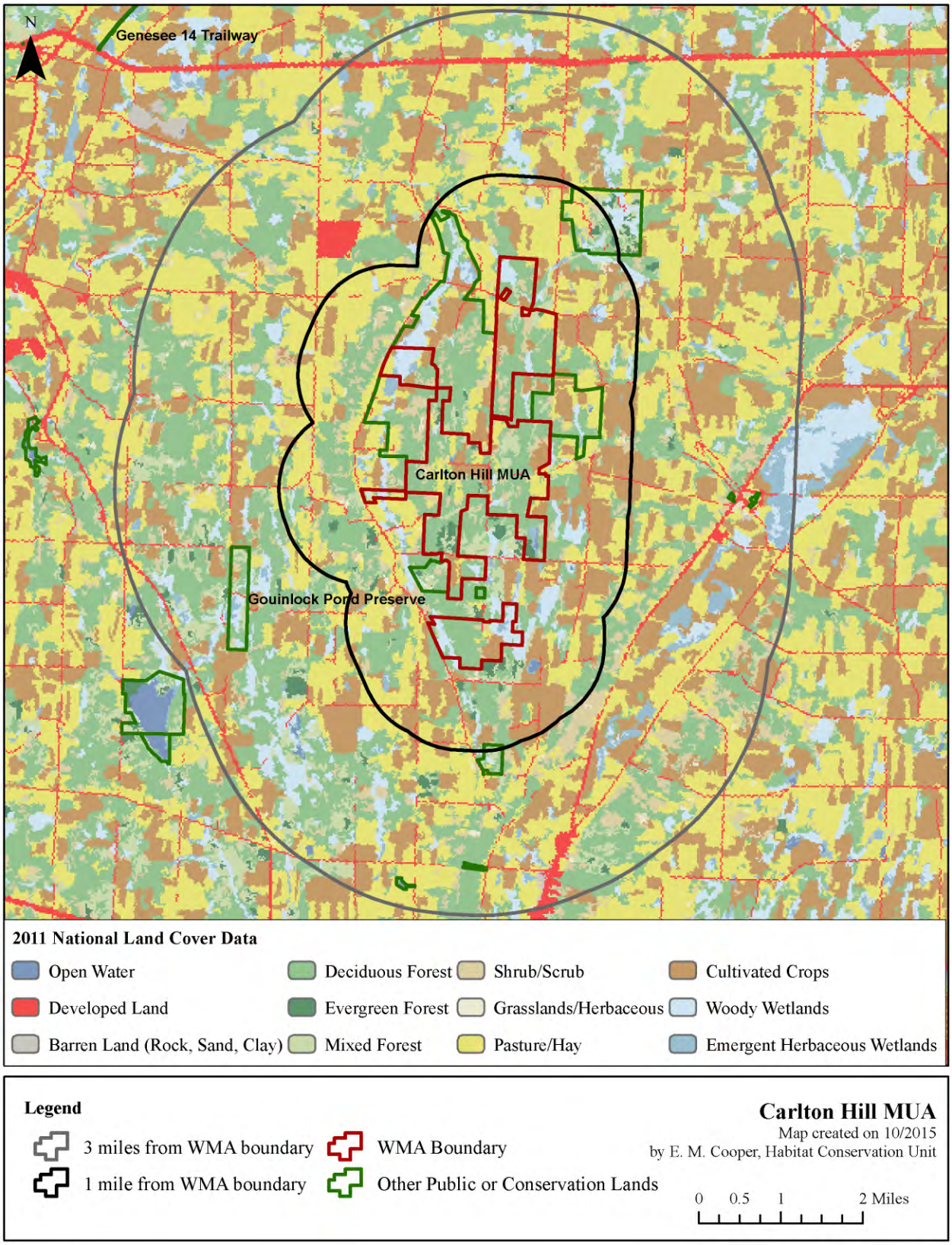

FIGURE 6. Land cover types and conservation lands in the landscape surrounding Carlton Hill MUA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA/MUA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend.

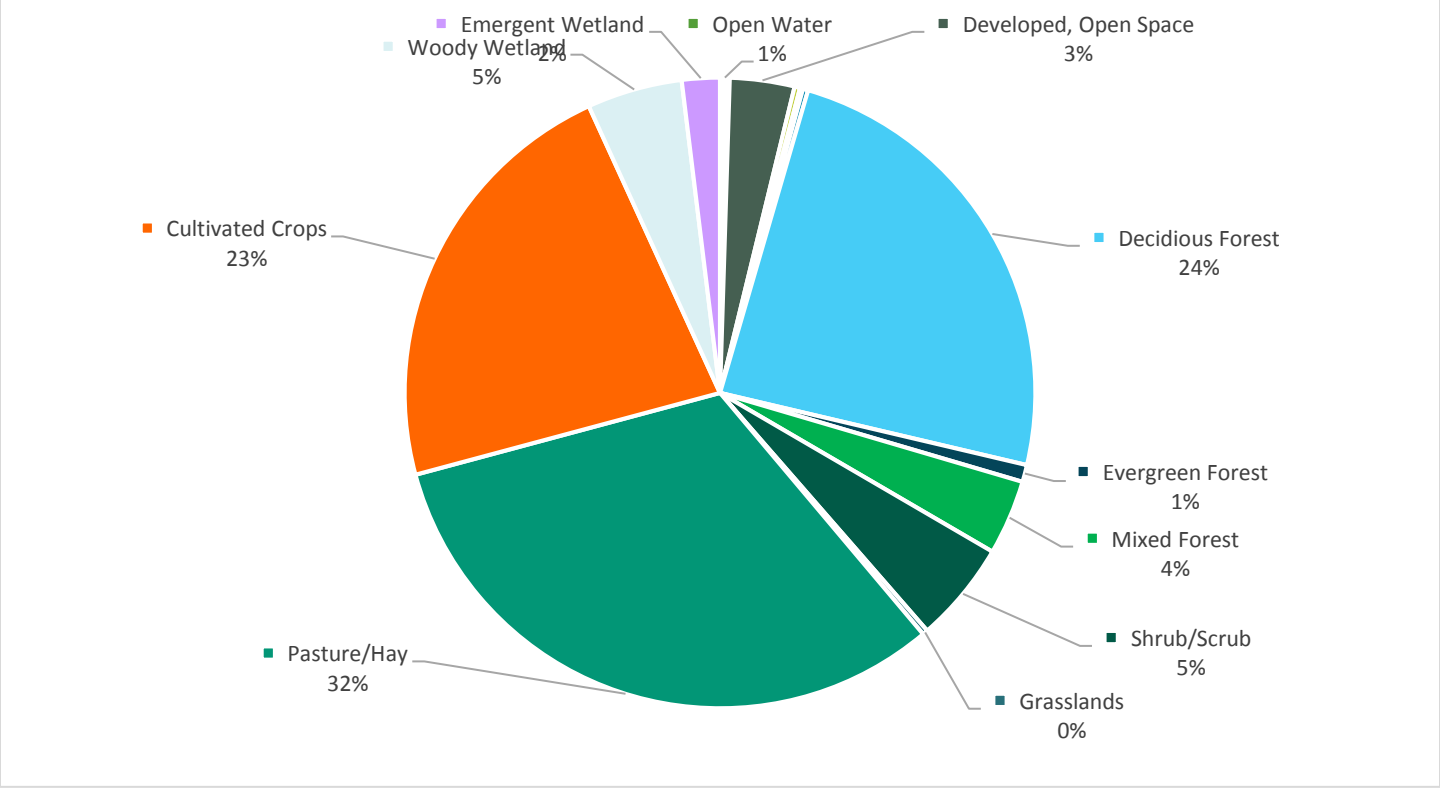

FIGURE 7. Percent cover of land cover types within three miles of Carlton Hill MUA.

Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA/MUA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend.

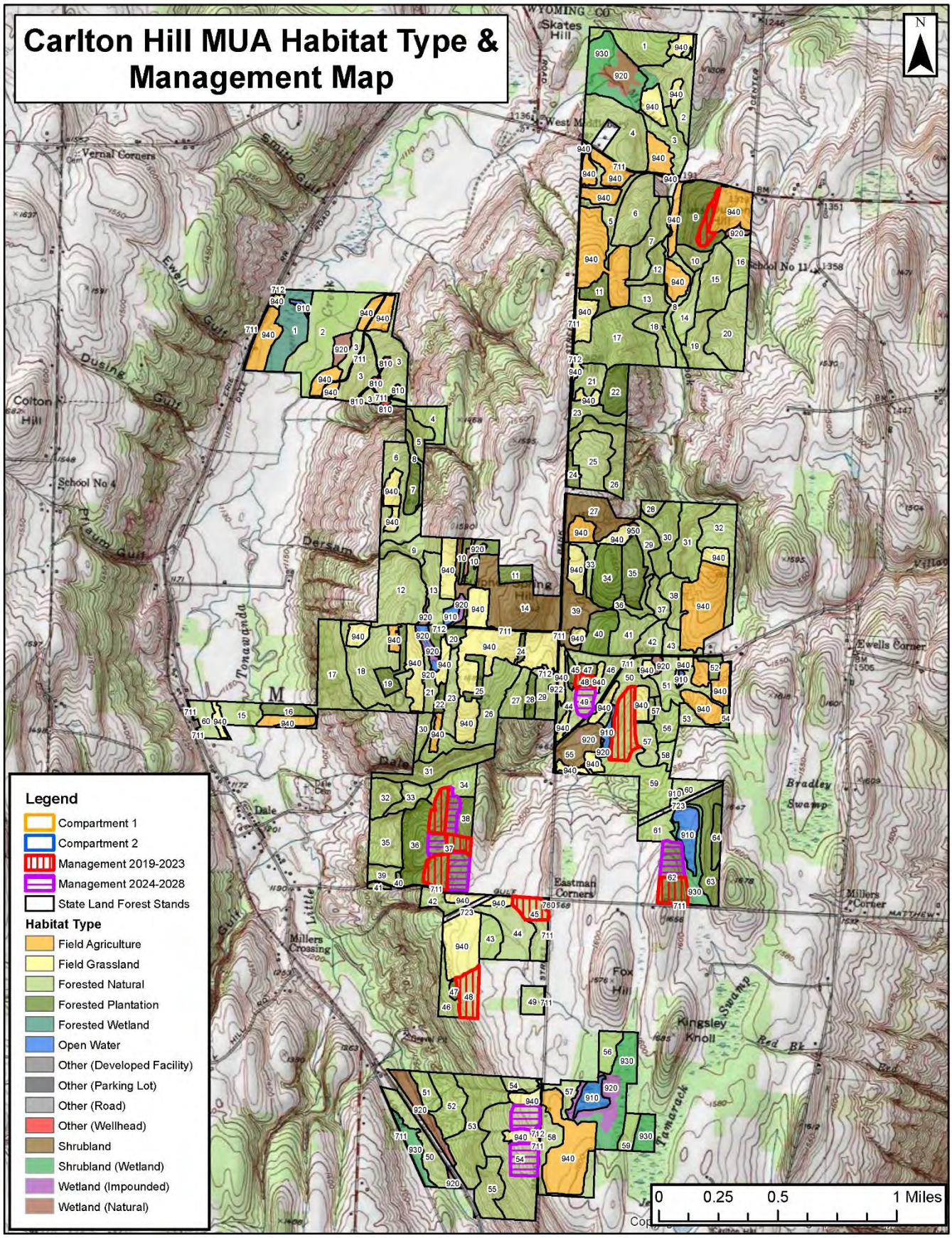

FIGURE 8. Habitat types and location(s) of proposed management on Carlton Hill MUA. Numbers indicate the stand number from habitat inventory.

IV. APPENDICES

APPENDIX A: DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

State Rank of Significant Ecological Communities:

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX B. COMPLIANCE WITH STATE ENVIRONMENTAL QUALITY REVIEW

This plan identifies habitat management activities to be conducted on the 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 http://www.dec.ny.gov/regulations/28693.html.
[17] 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.