Habitat Management Plan
for
Keeney Swamp Wildlife Management Area
2018 – 2027

Division of Fish and Wildlife
Bureau of Wildlife

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SUMMARY

Keeney Swamp Wildlife Management Area (WMA) is comprised of approximately 708 acres and is located in the northeastern portion of Allegany County, town of Birdsall, with frontage on County Route (CR) 15A and CR 15B. The WMA was purchased in the 1970s with wetland acquisition funds provided by the 1972 Environmental Bond Act and is primarily managed for waterfowl. "Keeney Swamp" was named after Fred Keeney, who operated a sawmill and owned substantial acreage in the area.

Much of the land known as Keeney Swamp was drained for agricultural uses in the 1800s. However, by the late 1960s many of the farms failed and were abandoned. Beaver activity helped reclaim a substantial portion of the wetland habitat that had been drained for farming. In 2001, DEC initiated a wetland restoration and enhancement project to improve wetland habitats of emergent, submergent and open water cover types. A 105-acre impoundment was constructed utilizing an abandoned road as a base for the dike. An inline water control structure and sheet piling weir and spillway are used to manage water levels on the WMA (Photo 1).

Photo 1. Water control structure being installed for wetland restoration project.

Photo: DEC Region 9

Keeney Swamp State Forest (2,399 acres) borders the WMA on three sides and separates the property into two parcels. The WMA and the State Forest provide wetland habitat utilized by a variety of waterfowl, shorebirds, and wading birds during breeding seasons and migration. Additionally, a variety of songbirds utilize the shrub/scrub habitat. In 2006, the two areas were designated a Bird Conservation Area (BCA).

Habitat management goals for Keeney Swamp WMA include:

- Manage approximately 2.4% of the WMA (approximately 11% of the total forested acreage) as young forest habitat to provide high stem density habitat for ruffed grouse and American woodcock;
- Manage 19.5% as forested habitat, including forested wetland;
- Manage 29.7% as shrubland habitat;
- Manage 4.3% as grassland/open area habitat for grassland species;
- Manage 35.2% as natural and impounded wetland habitat for migratory waterfowl, shorebirds, and wading birds; and
- Manage 6.8% as open water habitat.

I. BACKGROUND AND INTRODUCTION

PURPOSE OF HABITAT MANAGEMENT PLANS

BACKGROUND

Active management of habitats to benefit wildlife populations is a fundamental concept of wildlife biology, and has been an important component of wildlife management in New York for decades. Beginning in 2015, NYS Department of Environmental Conservation (DEC) Division of Fish and Wildlife (DFW) initiated a holistic planning process for wildlife habitat management projects. Habitat Management Plans (HMPs) are being developed for WMAs and other properties administered by DFW Bureau of Wildlife, including select Multiple Use and Unique Areas. The goal of HMPs is to guide habitat management decision-making on those areas to benefit wildlife and facilitate wildlife-dependent recreation. HMPs guide management for a ten-year time period, after which the plans and progress on implementation will be assessed and HMPs will be modified as needed.

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

SCOPE AND INTENT

Primary purposes of this document:

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

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

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

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

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

WMA OVERVIEW

LOCATION

Keeney Swamp WMA is located in DEC Region 9, Town of Birdsall, Allegany County (Figure 1).

TOTAL AREA

708.4 acres

HABITAT INVENTORY

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

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

Habitat Type	Current Conditions (as of 2018)		Desired Conditions	
	Acres	Percent of WMA	Acres	Percent of WMA
Forest [a]	155.3	21.9%	138.3	Decrease to 19.5% [b]
Young forest	0	0.0%	17.0	Increase to 2.4%
Shrubland	213.5	30.1%	210.5	Decrease to 29.7%
Grassland	27.0	3.8%	30.0	Increase to 4.2%
Agricultural land	0	0%	0	No change
Wetland (natural) [c]	10.5	1.5%	10.5	No change
Wetland (impounded) [c]	238.6	33.7%	238.6	No change
Open water	47.9	6.8%	47.9	No change
Other (parking lot)	1.7	>1.0%	1.7	No change
Roads	13.9	2.0%	13.9	No change
Rivers and streams	0	0%	0	No change
Total Acres:	708.4	100%	708.4	

[a] Mature and intermediate age classes of natural forest, plantations, and forested wetlands. See Forest section.
[b] 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 Keeney Swamp WMA include species commonly found on the Appalachian Plateau region of southwestern New York such as:

- White-tailed deer, wild turkey, black bear, Eastern coyote
- Beaver, muskrat, raccoon, striped skunk
- Ruffed grouse, American woodcock, American crow, red-tailed hawk, pileated woodpecker, osprey
- Wood duck, mallard, hooded merganser, Canada goose
- Eastern American toad, wood frog, spring peeper
- Eastern garter snake, northern water snake, snapping turtle, painted turtle

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).[1] SGCN listed below include species that have been documented on or within the vicinity of the WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[2] NY Reptile and Amphibian Atlas,[3] DEC wildlife surveys and monitoring, and eBird.[4]

Table 2. Species of conservation concern that may be present on Keeney Swamp WMA, including state and federal Endangered (E) and Threatened (T) species, state Species of Special Concern (SC), High Priority SGCN (HP), and SGCN (x).

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American black duck			HP
	American kestrel			x
	Bald eagle		T	x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Canada warbler			HP
	Common loon		SC	x
	Eastern meadowlark			HP
	Northern harrier		T	x
	Osprey		SC	
	Pied-billed grebe		T	x
	Red-headed woodpecker		SC	HP
	Red-shouldered hawk		SC	x

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

Table 2. Continued

Species Group	Species	Federal Status	NY Status	NY SGCN Status
	Ruffed grouse			x
	Scarlet tanager			x
	Upland sandpiper		T	HP
	Vesper sparrow		SC	HP
	Wood thrush			x
Mammals	None known			
Amphibians and reptiles	Western chorus frog			x
	Snapping turtle			x
	Smooth green snake			x
Fish	None known			
Invertebrates	None known			
Plants	None known			

Significant Ecological Communities:

There are ten ecological communities located on Keeney Swamp WMA as identified by the NY Natural Heritage Program, none of which are classified as significant, rare, or unique (Figure 2). Additional information about ecological communities is available in the Keeney Swamp WMA Biodiversity Inventory Final Report (1998) prepared by the NY Natural Heritage Program and in *Ecological Communities of New York State, Second Edition*.[5]

Soils:

Keeney Swamp WMA soils are typically very deep and found on glacial lake plains, with somewhat to very poor drainage. They have been formed in clayey lacustrine sediments and water deposited materials. The major soil group the property is Rhinebeck-Madalin-Lakemont group. The outer perimeters of the property consist of a Volusia-Mardin-Lordstown group.[6]

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 Keeney Swamp WMA include:

- One large wetland (BI-12, 1,458 acres; Photo 2) regulated by Article 24 of the Environmental Conservation Law and several additional forested/shrub wetlands are

[5] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological Communities of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/97703.html.

[6] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service.

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 for determination of impacts.

Photo 2. Portion of wetland BI-12 on Keeney Swamp WMA.
Photo: DEC Region 9

- Four streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA) are regulated by Article 15 of the Environmental Conservation Law. The highest stream classification is Black Creek with a classification of C.[7] Waters with this classification are best suited for supporting a fishery and non-contact activities.

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

LANDSCAPE CONTEXT

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

- Deciduous forest (53%)
- Evergreen forest (13%)
- Pasture/hay and cultivated crops (20%)
- Wetlands (6% combining open water (<1%), emergent, and woody wetlands)
- Mixed forest (5%)
- Shrub/scrub (2%)
- Developed (1%)

[7] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.
[8] Available online at http://www.dec.ny.gov/outdoor/104218.html.

- Grassland/herbaceous (< 1%)

Keeney Swamp WMA has ten State Forests and one WMA within a five-mile radius, including Ossian State Forest and Rattlesnake Hill WMA which are administered by DEC Region 8. Nine of the State Forests within five miles of Keeney Swamp WMA are administered by DEC Region 9 Division of Lands and Forests and encompass a little over 16,000 acres. Keeney Swamp State Forest is adjacent to Keeney Swamp WMA.

The hardwood and softwood stands of these State Forests are managed through a series of thinnings, selective cuts, and other management techniques which remove the lower quality trees and give more growing space to the best quality trees. The conifer stands of pine and spruce were planted in old farm fields by the Civilian Conservation Corp (CCC) to prevent soil erosion on abandoned farm land. They are usually managed by a series of partial harvest thinnings, which provide openings for sunlight to encourage natural regeneration of native hardwoods. The removal of the conifer overstory in the final harvest allows the hardwood seedlings to grow to maturity. Hardwood stands are also thinned via selective cuts to provide more growing space for residual trees, improving forest health and creating openings for seed germination and seedling growth. When foresters determine that regeneration is adequate, the remaining overstory trees are then harvested. Removal of the overstory allows ample sunlight to reach the forest floor stimulating seedling growth.

The remaining property surrounding Keeney Swamp WMA is in private ownership. The management goals typically used for hardwood and softwood stands on private property differ from the management goals for Keeney Swamp WMA. Private landowners generally follow a high grading management or uneven-aged management strategy that is primarily income driven. This achieves an immediate economic gain with the harvest but does not create young forest as described in DEC's *Young Forest Initiative Strategic Plan*. A goal at Keeney Swamp is to create young forest habitat on the WMA using even-aged management (e.g., clearcuts) as the primary management technique to benefit the target species of the WMA. Due to the absence of young forest habitat in the surrounding landscape, a minimum of 10% of the forested acreage on the WMA will be maintained in a young forest stage.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Keeney Swamp WMA to provide the following benefits:

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

FOREST

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest (Photo 3).
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 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.

Photo 3. Natural forest stand at Keeney Swamp WMA.

Photo: DEC Region 9

Forest management on Keeney Swamp WMA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMA/MUAs to benefit wildlife that require this transitional, disturbance-dependent habitat.[9]

MANAGEMENT OBJECTIVE

- Increase young forest acreage from an existing 0 acres to approximately 17 acres for habitat improvement benefitting young forest target species, ruffed grouse and American woodcock.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 155.3 forested acres on Keeney Swamp WMA (Figure 6). The most predominant forest type on the WMA is natural forest, primarily characterized by northern hardwood species,

[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.

pioneer species, or a mix of the two. Most of the forested stands are in a pole - small sawtimber size class. Table 3 summarizes the current and desired forest types for Keeney Swamp WMA.

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

Forest Type	Acres (as of 2018)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	133.7	122.5	red maple, aspen, sugar maple
Plantation	12.7	6.9	Scotch pine, red pine
Forested wetland	8.9	8.9	red maple
Young forest	0	17.0	
Young forest (forested wetland)	0	0	
Total Forested Acres:	155.3	155.3	

Target species for young forest management are 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.[10]
- **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 with 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 (minimum 5 acres) and reverting farm fields.[11]

MANAGEMENT HISTORY

Very limited forest management has occurred on Keeney Swamp WMA and no specific young forest habitat has been established.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management will result in about 17 acres of young forest habitat or approximately 11% young forest cover of the total forested acres, within ten years:

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

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

- **Management planned for 2018-2022** (Table 4, Figure 6):
  - Clearcut the western portion of Stand 27 (3.6 acres).
  - Clearcut entire mixed species plantation of Stand 5.2 (5.8 acres).
- **Management planned for 2023-2027** (Table 5, Figure 6):
  - Cut multiple strips in Stand 5.1 (< 1 acre).
  - Clearcut an opening within Stands 18 and 19 (7.2 acres).

Table 4. Forest management schedule for the first five-year period of this HMP (2018-2022).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
27	3.6	Small sawtimber	Pioneer Hardwood	Young Forest	Wildlife	Clearcut
5.2	5.8	Small sawtimber	Plantation	Young Forest	Wildlife	Clearcut

Table 5. Forest management schedule for the second five-year period of this HMP (2023-2027).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
5.1	< 1	Pole timber	Pioneer Hardwood	Young Forest	Wildlife	Strip cuts
18 & 19	7.2	Pole timber	Pioneer Hardwood	Young Forest	Wildlife	Clearcut

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 for 2018-2022 (9.4 acres):

Hardwood Mix (3.6 acres)

Stand 27: This stand contains aspen, black cherry, red maple, as well as sugar maple and American beech. Desirable regeneration varies throughout the stand. Most trees will be removed to increase stem density and favor aspen regeneration.

Plantation (5.8 acres)

Stand 5.2: This stand has been planted with various softwood species, such as Austrian pine, Scotch pine, and white pine. It also contains patches of aspen and maple throughout. A clearcut will result in a dense understory with better foraging opportunities for wildlife, and will hasten the transition to a hardwood forest.

Management for 2023-2027 (7.6 acres):

Pioneer Hardwoods (< 1 acre)

Stand 5.1: This stand is made up of mostly aspen, cherry, and blue beech. It also contains Norway spruce saplings irregularly distributed in the understory, likely blown in from a

neighboring plantation located upwind of the stand. This stand borders an alder wetland along one boundary. Strips will be cut perpendicular to the shared boundary throughout the stand leading into the alder cover. The softwood regeneration will be avoided to retain ideal thermal cover.

Pioneer Hardwoods (7.2 acres)

Stands 18 & 19: These stands contain ample amounts of mature aspen as well as other hardwood species and some sporadic white pines. An amoeba shaped clearing involving mostly aspen from both stands will be created to induce aspen sprouting.

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 [12]
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 WMA.

In order to protect listed bat species (such as northern long-eared bat), biologists will conduct a survey following the U.S. Fish and Wildlife Service (USFWS) approved protocol to determine probable presence or absence of bat species. If protected bats are found, forest management will be restricted to October 1st through March 31st. If protected bats are not found, forest management may occur at any time of year when suitable timber harvesting conditions exist.

Forest Health Considerations:

Undesirable species may outcompete desirable regeneration. A loss of function and diversity can occur when forest health declines from pests or other injurious agents. This could lead to fewer wildlife species inhabiting an area successfully, further contributing to the decline of health and diversity.

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 negative effects of injurious agents and limit the spreading of harmful pests that may already be present on the WMA.

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

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, weeds, and grasses.

White-tailed deer herbivory varies across Keeney Swamp WMA. In areas where deer browse could pose a threat to desirable regeneration, deer exclosures (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 WMA. Keeney Swamp WMA 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. Primarily, the establishment of desired regeneration is achieved by reducing competing vegetation, exposing mineral soil, and improving the seedbed.[13] Treatment actions are typically carried out through mechanical and/or chemical means. However, certain ecological situations may be best treated through prescribed burning.

Mechanical treatments will most commonly include the use of a brush saw or chainsaw to cut down 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 in detail in the silvicultural prescriptions.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines in the *Young Forest Initiative Monitoring Plan*. The 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 Keeney Swamp WMA, 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.

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

SHRUBLAND

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

MANAGEMENT OBJECTIVES

- Manage approximately 210.5 acres of shrubland habitat (29.7% of the WMA), providing habitat for a variety of songbirds and mammals that are dependent on this habitat type.
- Incorporate brush-hogged strips to provide openings for woodcock.
- Maintain portions of the shrubland via brush hogging every three to five years or as necessary.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently, 213.5 acres of shrubland habitat exist on Keeney Swamp WMA, composed of alder, crab apple, red osier dogwood, silky dogwood, tatarian honeysuckle and wild apple. 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:

- Ruffed grouse
- American woodcock

Other species that benefit from shrublands include: black-billed cuckoo, Canada warbler, willow flycatchers, and cottontail rabbits.

MANAGEMENT HISTORY

The shrubland stands on Keeney Swamp WMA have resulted from the abandonment of agricultural operations and relatively poor growing conditions. The poorly drained soils, beaver impoundments, and wetland restoration support shrublands preferring damp conditions but severely limit the establishment of tree species. Several projects were initiated in the early 2000s to establish more grass areas within the shrub stands. Areas were brush hogged and have been routinely mowed to maintain forbs and grasses.

Photo 4. Shrubland habitat on Keeney Swamp WMA.

Photo: DEC Region 9

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2022** (Figure 6):
  - **Stand 10**: Brush hog additional irregular shaped openings within the stand and continue to remove shrubs around

productive apple trees. Additionally, several linear strips will be added approaching stand 930. Remove any individual overstory trees within the stand. This conversion will be less than 2 acres.
    - **Stand 17**: Brush hog several amoeba shaped openings within this stand. Additionally, several linear stripes will be added approaching the boundary of stand 934 as permitted by soil conditions. Remove any trees within this stand. This conversion will be less than 2 acres.
    - Brush hog shrubland stands every three to five years or as necessary to maintain habitat.
- **Management planned for 2023-2027** (Figure 6):
    - Brush hog shrubland stands every three to five years or as necessary to maintain habitat.

Habitat management will include the following:

- **Stands 10 and 17:** The irregular stand perimeters will increase valuable edge habitat. The additional open, grassy areas will provide needed brood foraging areas. These open areas support insect populations, an important protein source required by many bird species. Trees removed from the stand will be used to create brush piles for cottontail rabbits and other mammals. The linear strips approaching stands 930 and 934 will provide foraging areas for woodcock. Additionally, apple trees will be daylighted to reduce competition and increase sunlight to the trees.

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 WMA.

MANAGEMENT EVALUATION

These stands will be included in the American woodcock singing ground survey and the ruffed grouse drumming survey routes established on the WMA. 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 approximately 30 acres of grassland fields (approximately 4.2% of the WMA) and open areas to provide nesting and brood rearing habitat for a wide range of wildlife including wild turkey.
- Convert approximately 3 acres of shrubland to grassland habitat.

- Routinely mow grassy areas to suppress encroachment of woody vegetation.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

Currently there are 27 acres of grassy fields and open areas on the WMA. Although, the overall acreage is relatively small, there are grassland-dependent species on or in the vicinity of the WMA. The fields provide nesting, brood rearing, and escape cover for a variety of grassland-dependent species as well as game bird species and fawning areas for white-tailed deer.

Species that benefit from grassland best management practices include:

- Bobolink
- Eastern meadowlark

MANAGEMENT HISTORY

DEC Division of Operations maintains the grasslands following an annual mowing schedule provided by the Bureau of Wildlife. Field perimeters are mowed annually to prevent encroachment of woody vegetation from surrounding stands.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2022** (Figure 6):
  - **Stands 10 and 17:** Continue annual mowing of the stands.
  - **Stands 10 and 17:** Brush hog a portion of each stand to convert to grasslands/ fields (approximately 3 acres total).
- **Management planned for 2023-2027** (Figure 6):
  - **Stands 10 and 17:** Continue annual mowing of the stands.

Habitat management will include the following:

- **Stands 10 and 17:** The irregular stand perimeters will increase valuable edge habitat. The additional open, grassy areas will provide needed brood foraging areas.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs in NY. For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[14] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding grassland management and restoration techniques.

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity, and consider the needs of both breeding and wintering grassland bird species.
- Consider the surrounding landscape when making management decisions.
- Conduct baseline grassland bird surveys on newly acquired fields or fields targeted for management changes to determine species present.

[14] 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.

- 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 mowing from one side of the field to the other side or start in the center and mow outwards to avoid concentrating animals in the area yet to be mowed.
- In general, mow grass to a residual height of 6-12 inches.

MANAGEMENT EVALUATION

These stands will be included in the American woodcock singing ground survey and the ruffed grouse drumming survey routes established on the WMA. 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 include any acreage on which crops are grown, primarily areas that are under cooperative agreements or farming contracts, but also including wildlife food plots.

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

Keeney Swamp WMA does not contain any stands that are managed as agricultural land. Future management plans do not include adding agricultural fields to the existing habitat.

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 natural hydrology and water quality on the WMA.
- Maintain approximately 10.5 acres of natural wetland as it currently exists.
- Maintain approximately 238.6 acres of impounded wetlands utilizing seasonal drawdowns to enhance habitat value.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of dikes and both town and administrative roads.

Photo 5. Emergent aquatic vegetation within the impoundment.

Photo: DEC Region 9

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 10.5 acres of natural wetlands and 238.6 acres of impounded wetlands (totaling 249.1 acres) on Keeney Swamp WMA. The wetlands provide habitat for species such as:

- American woodcock
- Beaver, muskrat, mink
- Migratory waterfowl, shorebirds
- Spring peeper, bull frog, leopard frog
- Snapping turtle, painted turtle, northern water snake

MANAGEMENT HISTORY

Historical management of the wetland habitat has been influenced by beavers constructing dams in the Black Creek drainage (Photo 6). As food supplies diminish, the beavers would move up and down the drainage and flood new areas. Most of Keeney Swamp had been drained for agricultural purposes in the 1800s. Around 1990, four of the largest beaver impoundments failed over an eighteen-month period. This resulted in a net loss of approximately 300 acres of shallow water impoundment. By the late 1990s, this loss of habitat had decreased the diversity and abundance of many wildlife species, particularly waterbirds. DEC received requests from birding groups and sportsmen to restore the wetland habitat.

Photo 6. Beaver activity on the WMA.

Photo: DEC Region 9

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2027** (Figure 6):
  - Continue routine inspections of beaver and muskrat activity.
  - Control beaver numbers on the WMA through trapping during the regular trapping season.
  - Issue nuisance beaver permits as warranted.

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 WMA. Date restrictions for water level management or equipment in wetlands will be followed to protect hibernating amphibians and reptiles (October 1st – March 31st). Exceptions to the dates will be made when flooding and public safety are in jeopardy.

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 the impoundments occurring on the WMA.
- Manage beaver and muskrat occupancy at levels that will not jeopardize the integrity of the dikes and water control structures.
- Protect water quality on all streams and segments of streams as management activities are conducted.
- Continue annual monitoring of the osprey pole and nesting platform.

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

Approximately 48 acres of open water exist on the WMA. The wetland restoration project in 2001 created around 44 acres of open water just south of CR 15A. This pool provides angling opportunities for a variety of panfish and bullheads. An osprey platform was installed as part of the project and is currently active. A second pond is the result of beaver activity and is located on the eastern side of the WMA off CR 15B along an old railroad grade.

MANAGEMENT HISTORY

In 2001, DEC initiated a wetland restoration and enhancement project to improve wetland habitat consisting of emergent, submergent and open water cover types. A 105-acre impoundment (approximately 44 acres of open water) was constructed utilizing an existing abandoned road as a base for the dike. Water levels are controlled by an inline control structure (agridrain) and a heavy sheet piling weir and spillway. Impoundments are periodically drawn down to facilitate establishment of emergent plant species desirable for nesting and migratory waterfowl and wading bird species.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2018-2027** (Figure 6):
    - Routine monitoring by Wildlife staff for beaver and muskrat activity.
    - Routine monitoring by Wildlife staff of the weir, water control structure, and spillway.

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 WMA.

MANAGEMENT EVALUATION

None.

HABITAT MANAGEMENT SUMMARY

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

Table 7. Summary of habitat management actions recommended for Keeney Swamp WMA, 2018-2027. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Clear western portion of Stand 27 to create young forest.	3.6	2018-2022
Forest	Clear stand of mixed softwood species to create young forest.	5.8	2018-2022
Shrubland	Brush hog irregular openings and linear strips in Stand 10.	< 2	2018-2022
Shrubland	Brush hog irregular openings and linear strips in Stand 17.	< 2	2018-2022
Grassland	Brush hog a portion of each stand to convert to grasslands/fields.	~3	2018-2022
Forest	Clear multiple strips of pioneer hardwoods in Stand 5.1 to create young forest.	< 1	2023-2027
Forest	Clear amoeba shaped opening in Stands 18 and 19 to create young forest.	7.2	2023-2027
Shrubland	Shrubland stands will be brush hogged to maintain shrubland habitat every 3-5 years or as necessary.	N/A	2018-2027
Grassland	Annual mowing.	30	2018-2027

III. FIGURES

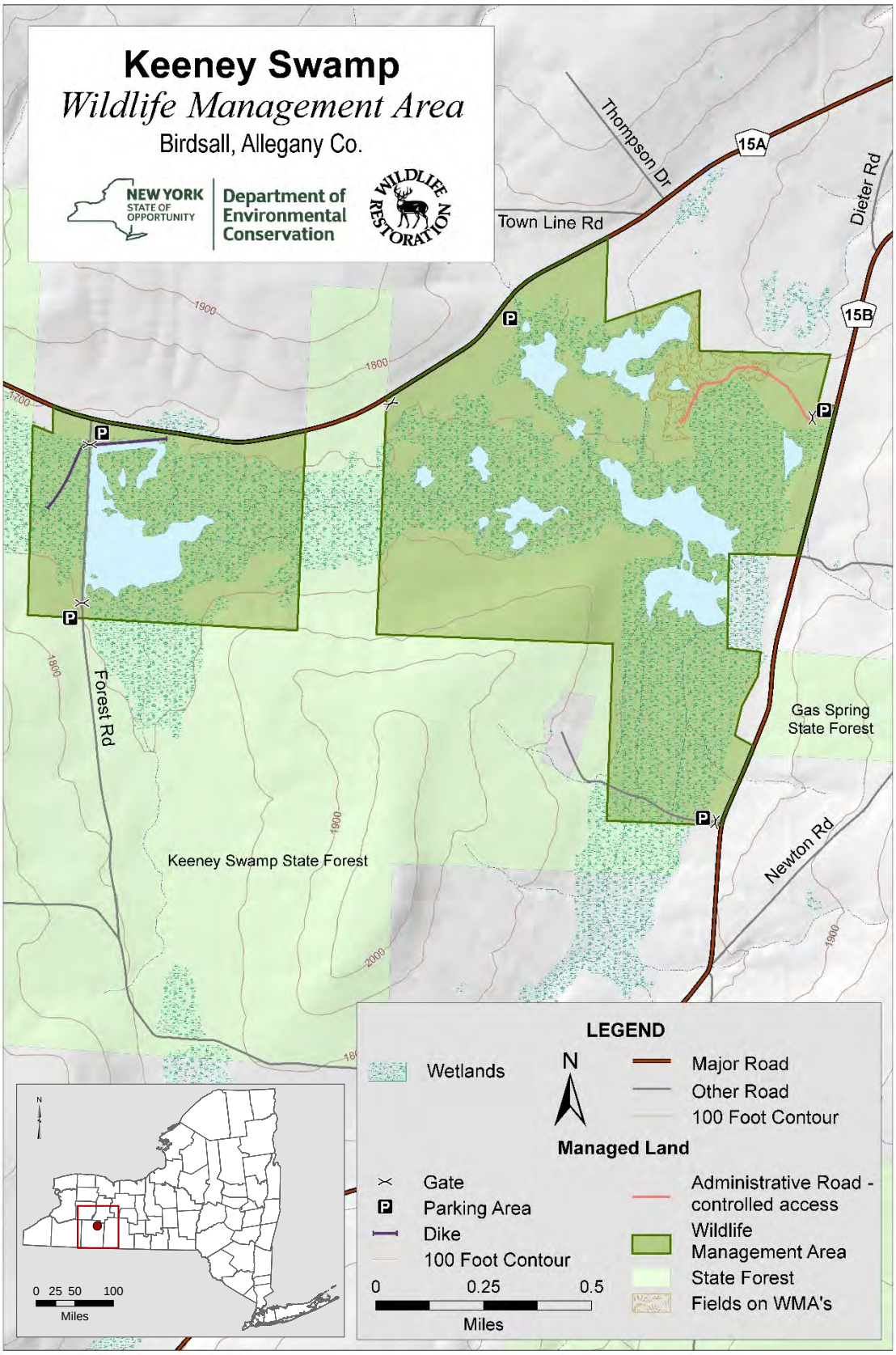

FIGURE 1. Location and access features at Keeney Swamp WMA.

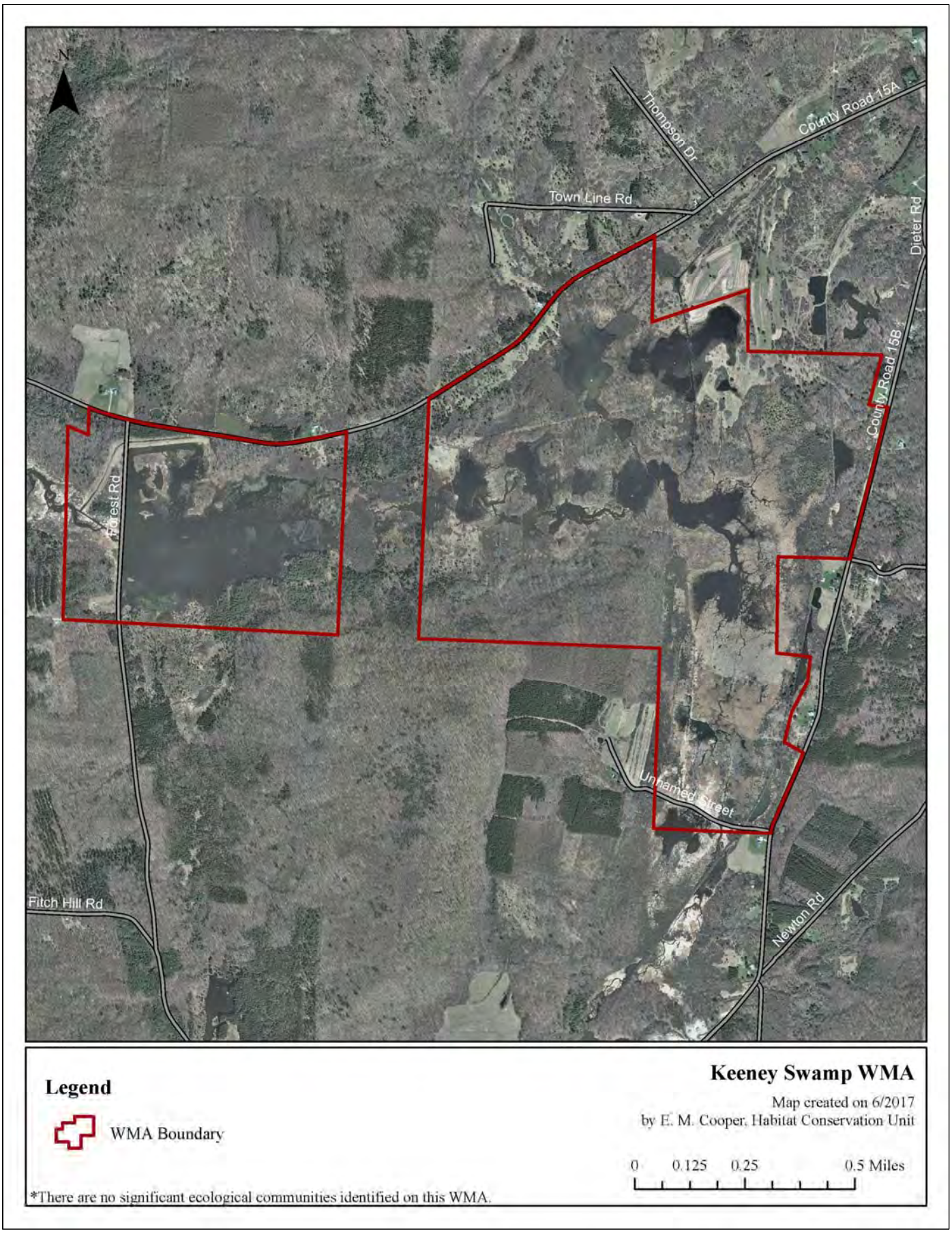

FIGURE 2. Significant ecological communities on Keeney Swamp WMA. Data from the NY Natural Heritage Program.

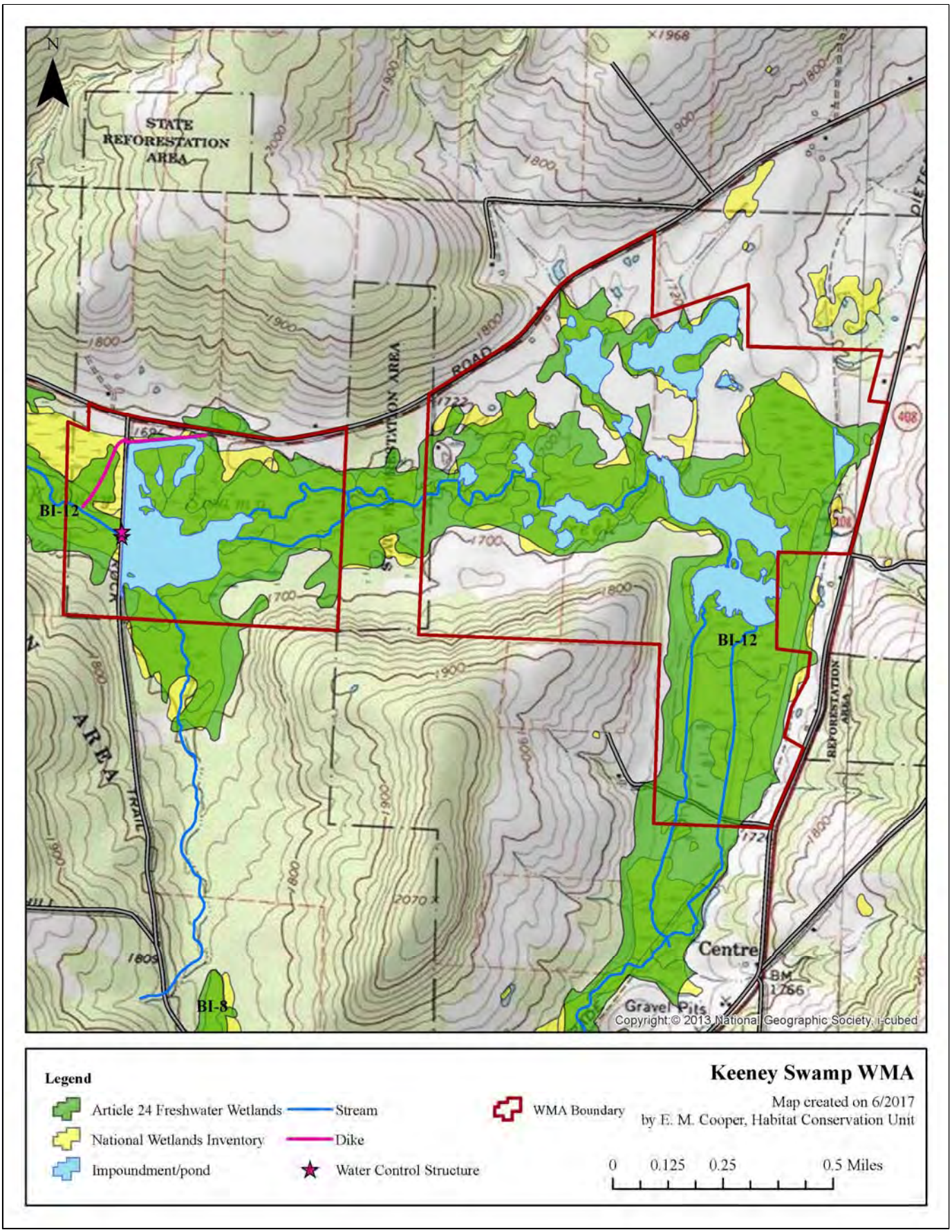

FIGURE 3. Wetlands, open water, and streams of Keeney Swamp WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

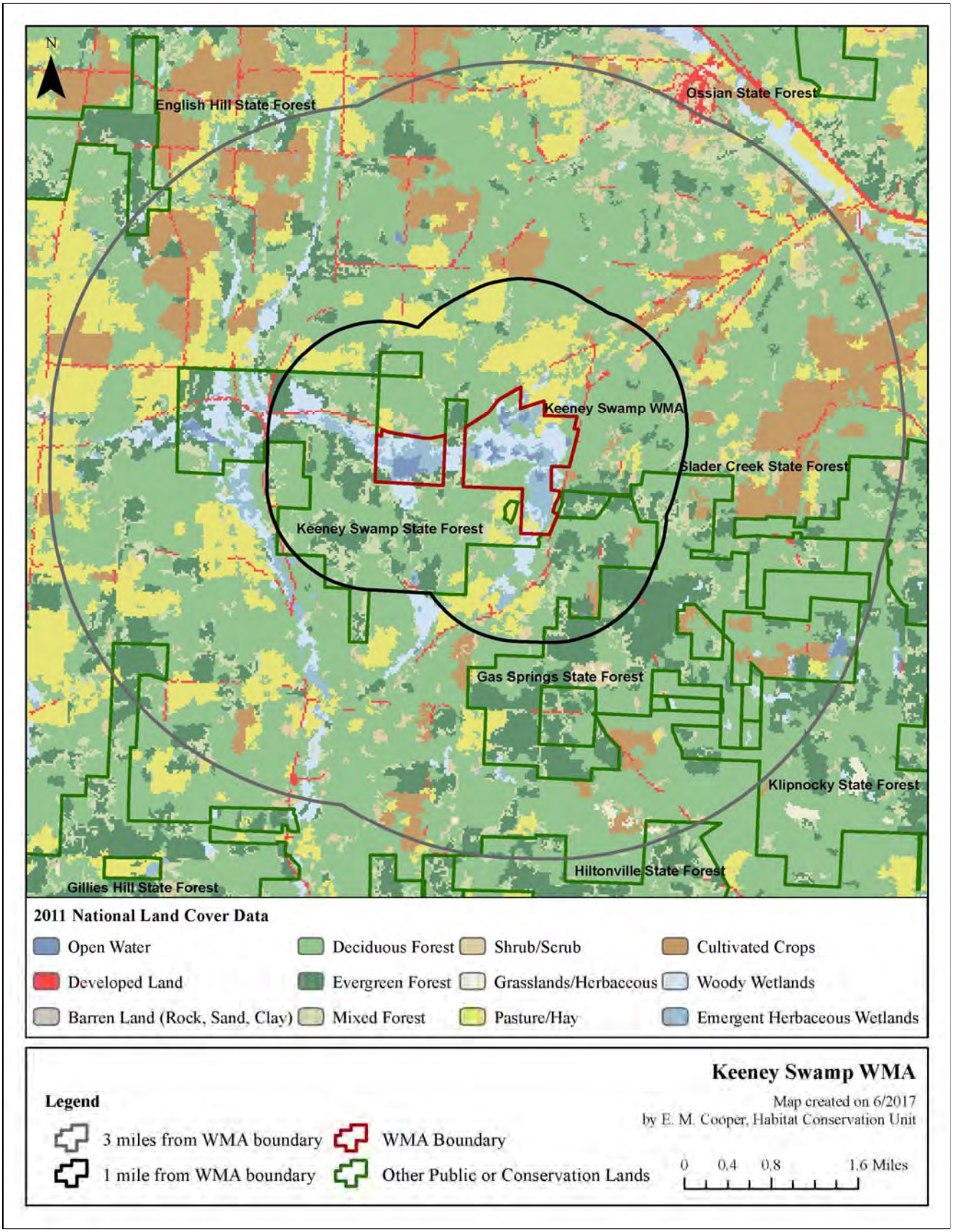

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Keeney Swamp WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

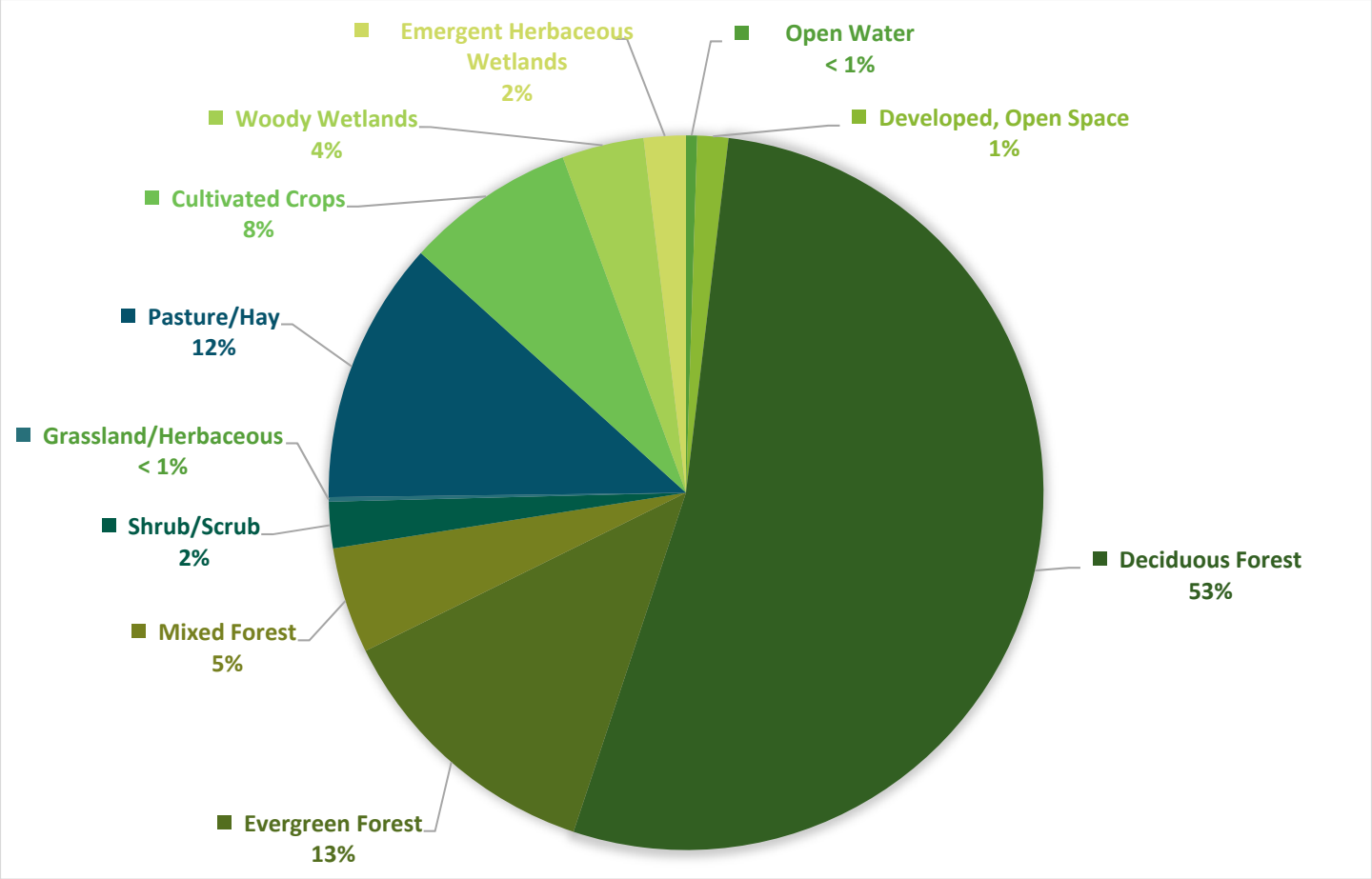

FIGURE 5. Percent cover of land cover types within three miles of Keeney Swamp WMA.

Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

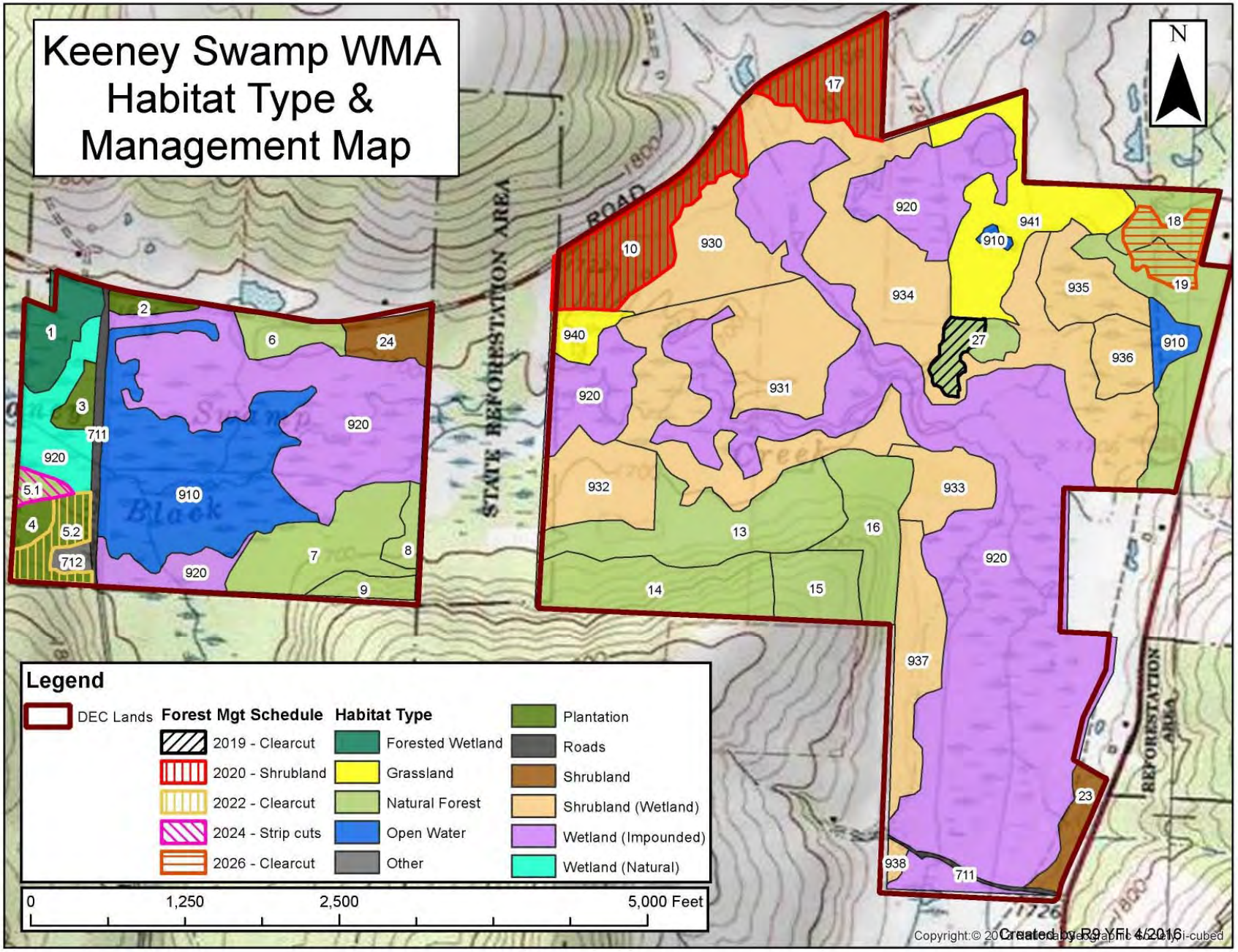

FIGURE 6. Habitat types and locations of proposed management on Keeney Swamp WMA. Numbers indicate the stand number from habitat inventory.

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).[15] 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).[16]

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.

[15] Available online at http://www.dec.ny.gov/regulations/28693.html.
[16] 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.