Habitat Management Plan for
Canadaway Creek Wildlife Management Area
2017 – 2026

Division of Fish and Wildlife
Bureau of Wildlife

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SUMMARY

Canadaway Creek Wildlife Management Area (WMA) is comprised of 2,190 acres and is located on the Chautauqua ridge east of Lake Erie and the lake plain. Lake Erie has a significant influence on weather conditions encountered in the county and on the WMA. Chautauqua County on average receives approximately 207 inches of snow with some years approaching 300 inches.[1] This attributes to a longer, harsher winter season but at the same time provides abundant moisture for vegetation during the growing season.

The U.S. Department of Agriculture began land acquisition in the 1930s under the Bankhead-Jones Farm Tenant Act. The acreage that is now the WMA remained under federal control until 1961 when title was deeded to the State of New York. Mineral rights, however, were retained by the federal government. Three active gas wells exist on the WMA and are managed by the Bureau of Land Management. By 1964 an additional 165 acres was acquired under the Park and Recreation Land Acquisition Act. In 2000 a 4.1 acre parcel was acquired to connect Compartment A and B thus forming a continuous boundary. NYS Department of Environmental Conservation (DEC) Bureau of Wildlife utilizes two buildings on the WMA for storage of equipment and supplies needed for habitat management activities.

From the early 1940s through the mid-1950s numerous conifer plantations were established. Since then forest management of hard and softwood stands occurred at different levels. The primary management techniques used were selective cuts and clearcuts, with the most recent occurring in 2013. The removal of forest products has led to the improvement of existing roads and the construction of several new roads further improving public access to the WMA. Other non-forest management activities have included annual grassland maintenance and mowing of abandoned pasture/cultivated fields. Food producing shrubs, grains, and legumes have been planted as well as some conifer seedlings for wildlife cover. Additionally, numerous water features such as marshes, potholes, and ponds have been developed.

A management plan was written for the area in 1971 which guided habitat management on the WMA until the late 1980s. In 1988 Canadaway Creek WMA was included in the Boutwell Hill Unit Management Plan (UMP). Boutwell Hill State Forest located 1.5 miles to the south is comprised of 2,944 acres. A regional decision has been made to have Canadaway Creek separated from the Boutwell Hill UMP and have the new Habitat Management Plan (HMP) become the document guiding any future management on the WMA.

One of the principal management objectives for Canadaway Creek WMA is to maintain high quality habitat for ruffed grouse following a forestry and habitat management plan. This will provide wildlife-related recreational opportunities and serve to protect and maintain special wildlife habitats that exist on the area. Other game species such as wild turkey and white-tailed deer will also benefit from this habitat management along with a variety of songbirds and other wildlife species.

[1] Chautauqua County Division of Transportation. Historical Snowfall in Chautauqua County. http://chautauqua.ny.us/DocumentCenter/Home/View/363

Habitat management goals for Canadaway Creek include:

- Manage approximately 11.7% of the WMA (13% 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 66% as natural forest;
- Manage 3.5% of the WMA as grassland to provide habitat for a variety of grassland-dependent species;
- Manage 2.5% as early successional shrubland habitat;
- Manage approximately 2% as open water and stream habitat, maintaining water control structures, pond dikes, and water quality;
- Manage approximately 1.0% of the WMA as natural and impounded wetlands.

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, DEC's Division of Fish and Wildlife (DFW) initiated a holistic planning process for wildlife habitat management projects. 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 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 State Historic Preservation Act (SHPA), prior to implementation.

WMA Overview

Location

Canadaway Creek Wildlife Management Area is located in DEC Region 9, Town of Arkwright, Chautauqua County (Figure 1).

Total Area

2,190 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 below).

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

Habitat Type	Current Conditions (as of 2016)		Desired Conditions	
	Acres	Percent of WMA	Acres	Percent of WMA
Forest [a]	1,954.7	89.3%	1,711.6	Decrease to 78.2% [b]
Young forest	58.8	2.7%	256.8	Increase to 11.7%
Shrubland	51.2	2.3%	55.7	Increase to 2.5%
Grassland	35.3	1.6%	75.9	Increase to 3.5%
Agricultural land	0	0%	0	No change
Wetland (natural) [c]	6.0	0.3%	6.0	No change
Wetland (impounded) [c]	9.3	0.4%	9.3	No change
Open water	5.1	0.2%	5.1	No change
Other (buildings and well pads)	6.2	0.3%	6.2	No change
Roads	26.9	1.2%	31.9	No change
Rivers and streams	36.5	1.7%	36.5	No change
Total Acres:	2,190	100%	2,190	

[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 Canadaway Creek WMA include species commonly found on the West Appalachian Plateau region of southwestern New York such as:

- White-tailed deer, wild turkey, black bear, Eastern coyote
- Beaver, raccoon, fisher, Virginia opossum
- Ruffed grouse, American woodcock, American crow, red-tailed hawk, pileated woodpecker
- Wood duck, mallard, Canada goose
- Eastern American toad, wood frog, northern 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).[2] SGCN listed below include species that have been documented on or within the vicinity of the WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[3] NY Reptile and Amphibian Atlas,[4] and DEC wildlife surveys and monitoring.

[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.

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

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American woodcock			x
	Black-billed cuckoo			x
	Blue-winged warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Eastern meadowlark			HP
	Grasshopper sparrow		SC	HP
	Northern harrier		T	x
	Osprey		SC	
	Pied-billed grebe		T	x
	Prairie warbler			x
	Red-shouldered hawk		SC	x
	Ruffed grouse			x
	Scarlet tanager			x
	Vesper sparrow		SC	HP
	Wood thrush			x
Mammals	None known			
Amphibians and reptiles	Snapping turtle			x
Fish	Brook trout			x
Invertebrates	None known			
Plants	None known			

Significant Ecological Communities:

There are 32 ecological communities on Canadaway Creek WMA as identified by the NY Natural Heritage Program, none of which are classified as significant or unique (Figure 2). Additional information about ecological communities is available in the Canadaway Creek WMA Biodiversity Inventory Final Report (1998) prepared by the NY Natural Heritage Program and in *Ecological Communities of New York State, Second Edition.*[5]

[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.

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 Canadaway Creek WMA include:

- Several small freshwater forested/shrub wetlands shown on the National Wetlands Inventory (NWI; Figure 3). There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.
- 11 streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). Streams are regulated by Article 15 of the Environmental Conservation Law. The highest stream classification on the WMA is Canadaway Creek with a classification of B with a B standard indicating suitability for swimming and other contact recreation, but not drinking water. Clinton Brook, Ackles Brook, Markham Brook and four unnamed tributaries to Canadaway Creek have classifications of C with a T standard indicating that it may support a trout population.[6]
- A number of natural vernal pools exist on the WMA. Management activities will follow SMZ rules established for WMAs.

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

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 Canadaway Creek WMA (Figures 4 and 5). The landscape within a three mile radius of the WMA is primarily privately-owned land including:

- Deciduous forest (53.4%)
- Cultivated crops (13.0%)
- Pasture/Hay (12.7%)
- Evergreen forest (6.0%)
- Wetlands (4.6% combining open water, emergent and woody wetlands)
- Shrub/Scrub (4.0%)
- Developed (2.9%)
- Mixed forest (1.7%)
- Grasslands/Herbaceous (1.6%)
- Barren land (0.1% Rock/Sand/Clay)

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

Chautauqua County owns 204 acres that are contiguous to the WMA and another 50 acres approximately three quarters of a mile to the west. These parcels are administered by the Chautauqua County Parks Department and managed primarily for timber production using selective cuts. Boutwell Hill State Forest is approximately 1.5 miles to the south southeast of the WMA and is composed of 2,944 acres. The hardwood and softwood stands of these state forests are managed by the Division of Lands and Forest 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 management goals typically used for hardwood and softwood stands on private property differ from the management goals for Canadaway Creek 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*.[8] The goal at Canadaway Creek 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 WMA will be maintained in a young forest stage.

II. Management Strategies by Habitat Type

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

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

Forest

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest.
Plantation: planted forested acres, generally planted in rows dominated by one or two species.

[8] 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.

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.

A recent softwood operation showing early successional regeneration and reserve hardwood trees.

Photo: Greg Ecker, NYS DEC

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

MANAGEMENT OBJECTIVES

- Increase young forest acreage from existing 58.8 acres to at least 256.8 acres to improve habitat for ruffed grouse, American woodcock, white-tailed deer, and wild turkey.
- Convert approximately 20 acres of softwood plantations to natural hardwood stands.
- Avoid management that alters habitat type in areas containing natural hemlock along drainages (approximately 300 acres).

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 2,013 forested acres on Canadaway Creek WMA (Figure 6). The main forest type on the WMA is natural forest, mostly characterized by northern hardwood species. As of this writing, most of the natural hardwood stands are in the small saw timber size class. Naturally occurring softwood species include white pine and Eastern hemlock. Canadaway Creek WMA contains many steep sloped drainages which could affect timber harvest operations and locations. Most stands located on the steep drainage slopes of Canadaway Creek and its tributaries are Eastern hemlock. Plantations are the second most abundant forest type on the property composed of softwood species that are typically either red pine or Norway spruce but also include plantations of larch, white spruce, or Scots pine. Additionally, there are hardwood plantations of red oak on the property.

Due to its large size Canadaway Creek WMA has been divided into four compartments, A – D. Approximately 45 acres of forest (natural and/or plantation) will be converted to shrubland and

grassland, further detailed below in each respective management section. Table 3 provides a summary of the current and desired forest types for Canadaway Creek WMA.

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

Forest Type	Acres (as of 2016)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	1,657.6	1,446.3	sugar maple, black cherry, red maple
Plantation	297.1	265.3	red pine, Norway spruce, larch
Forested wetland	0	0	
Young forest	58.8	256.8	
Young forest (forested wetland)	0	0	
Total Forested Acres:	2,013.5	1,968.4	

Canadaway Creek WMA soils are very deep glacial tills, without a fragipan layer, that are found on upland areas and valley sides. The soil formed over a bedrock of shale, siltstone, and sandstone. The major soil group of Canadaway Creek WMA is a Busti-Chautauqua-Chadakoin group. All three soil series are medium textured with varying drainage properties; Busti being somewhat poorly drained, Chautauqua being moderately well drained, and Chadakoin being well drained. The very southern reaches of the WMA may also include a Fremont-Schuyler soil group.[9, 10]

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

- **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 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.

[9] Puglia, P. S. 1996. Soil Survey of Chautauqua County, New York. USDA Soil Conservation Service.
[10] Fay, M. L. et al. 1998. Boutwell Hill Unit Management Plan. NYS Department of Environmental Conservation.
[11] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.

    - Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields.[12]
- **Wild Turkey Habitat Requirements (in Northern Hardwood Forests):**
    - Strutting areas – Open fields with short vegetation, <12 inches preferred, and mature hardwoods.
    - Nesting cover – Blowdowns and the bases of trees and stumps in open hardwoods and brushy cover in early successional habitats and field edges.
    - Brood rearing – Best brooding cover are fields with herbaceous vegetation from 12-18 inches preferred.
    - Foraging – The habitat required ranges from open old-field areas to mature forests:
        - Spring diet – Tubers and invertebrates.
        - Summer diet – Poult diets consist primarily of invertebrates. Adult diets consist of invertebrates and tubers, switching over to herbaceous vegetation and soft mast as summer progresses.
        - Fall diet – Hard and soft mast, seeds, and invertebrates.
        - Winter diet – Hard and soft mast, seeds (birch if available) and hardwood buds.
    - Winter cover – Mature conifer stands.
    - Roosting – Mature hardwoods and softwoods. Adults with poults tend to roost on the ground under large trees with a dense understory of young trees, shrubs, downed trees, rock outcrops, or brushy fields.[13, 14]
- **White-tailed Deer Habitat Requirements (in Northern Hardwood Forests):**
    - Fawning areas – Vary from open forest to hay fields to brushy cover.
    - Spring/summer diet – Primarily herbaceous vegetation (clover, *Rubus* sp., forbs, etc.), hardwood foliage, soft mast, and agricultural crops where available.
    - Fall diet – Hard mast, preferably acorns, hardwood foliage, and agricultural crops where available.
    - Winter diet – Hardwood buds, fallen leaves, hard mast and conifers, preferably white cedar.
    - Bedding cover – Varies from open hardwoods with laydowns to dense thickets of early succession shrublands or hard and softwood regeneration.[15]

MANAGEMENT HISTORY

Canadaway Creek WMA management began in the 1960s when it was deeded to the State of New York from the federal government. As stated in the Boutwell Hill UMP[16] major activities of the property included wildlife habitat management, reforestation, and public access

[12] Sepik, G. F. et al. 1981. A Landowner's Guide to Woodcock Management in the Northeast, Moosehorn National Wildlife Refuge, USFWS. 25 pp.
[13] USDA – NRCS. 1999. Wild Turkey (*Meleagris gallopavo*) Fish and Wildlife Habitat Management Leaflet. 12 pp.
[14] Dickson, J. G. 1992. The Wild Turkey: Biology and Management. National Wild Turkey Federation and USDA Forest Service. Stackpole Books, PA. 480 pp.
[15] Halls, L. K., ed. 1984. White-tailed Deer: Ecology and Management. The Wildlife Management Institute. Stackpole Books, PA. 864 pp.
[16] Fay, M. L. et al. 1998. Boutwell Hill Unit Management Plan. NYS Department of Environmental Conservation.

development. Time periods for Canadaway Creek management were presented in the Boutwell Hill UMP and listed as follows:

> *1960-1970: Reforestation, wildlife habitat improvements, and public access development.*
>
> *1970-1980: Wildlife habitat improvements and minor sales.*
>
> *1980-1990: Forest product sales as a tool for habitat management.*
>
> *1990-2000: Unit management planning, boundary line survey, and continued habitat management through forest product sales.*

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

Past even-aged management on Canadaway Creek WMA has established approximately 58.8 acres of young forest habitat.

The following management is proposed to cut 301.9 forested acres of which 256.8 acres will be managed as young forest (13% young forest of the total forested acres), as well as 40.6 acres of grassland and 4.5 acres of shrubland (see Grassland and Shrubland sections), within ten years:

- **Management planned for 2017-2021** (Table 4, Figure 6):
  - Natural hardwood clearcut in Compartment D Stands 2.2, 11, 19, 20 (36.1 acres).
  - Norway spruce plantation clearcut in Compartment B Stands 44, 52, 60, 65, where the south half of stands 52 and 60 will be cut along with all of stands 44 and 65 (19.4 acres).
  - Natural hardwood clearcut in Compartment A Stands 2 and 3, where 7.3 acres within stand 2 will be converted to grassland and the remaining will regrow as young forest (34.5 acres).
  - Natural hardwood clearcut in Compartment C Stands 25 and 39, where the south half of stand 25 will be treated and the north half of stand 39 will be treated (27.1 acres).
  - Natural hardwood clearcut to be converted to grassland in Compartment B Stands 7, 10*, and 17 where the north half of each stand will be treated (22 acres).
    *An aspen clone exists within Stand 10 that will be treated to regenerate as young forest within its existing foot print (2 acres).
- **Management planned for 2022-2026** (Table 5, Figure 6):
  - Natural hardwood clearcut in Compartment A Stand 9 and plantation clearcuts in Compartment A Stands 4, 10, and 11 that will all be converted to grassland habitat (11.3 acres).
  - Norway spruce plantation clearcut in Compartment A Stand 6, where only the north half of the stand will be treated and managed as shrubland (4.5 acres).
  - Natural hardwood clearcut in Compartment D Stands 2.3, 3.1, and 3.3 where only the south half of stand 3.1 will be treated (65.3 acres).
  - Natural hardwood clearcut in Compartment D Stands 4.2, 9.2, 10, and 11.4 (33.2 acres).
  - Natural hardwood clearcut in Compartment C Stand 53.1 (46.5 acres).

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
D-2.2	15.2	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-11	12.1	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-19	4.5	Pole timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-20	4.3	Pole timber	Northern hardwood	Young forest	Wildlife	Clearcut
B-44	7.8	Small saw timber	Norway spruce	Young forest	Wildlife	Clearcut
B-52	3.4	Small saw timber	Norway spruce	Young forest	Wildlife	Clearcut
B-60	2.5	Small saw timber	Norway spruce	Young forest	Wildlife	Clearcut
B-65	5.7	Small saw timber	Norway spruce	Young forest	Wildlife	Clearcut
A-2	20.3	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
A-3	14.2	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
C-25	16	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
C-39	11.1	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
B-7	6	Pole timber	Northern hardwood	Grassland	Wildlife	Clearcut
B-10	13.3	Pole timber	Northern hardwood	Grassland	Wildlife	Clearcut
B-10	2	Pole timber	Pioneer hardwood	Young forest	Wildlife	Clearcut
B-17	2.7	Pole timber	Northern hardwood	Grassland	Wildlife	Clearcut

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-4	4.3	Pole timber	Plantation mix	Grassland	Wildlife	Clearcut
A-6	4.5	Small saw timber	Norway spruce	Shrubland	Wildlife	Clearcut
A-9	3.4	Pole timber	Northern hardwood	Grassland	Wildlife	Clearcut
A-10	1.7	Pole timber	Scotch pine	Grassland	Wildlife	Clearcut

Table 5. *Continued*

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-11	1.9	Pole timber	White spruce	Grassland	Wildlife	Clearcut
D-2.3	15.6	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-3.1	28.3	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-3.3	21.4	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-4.2	6.9	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-9.2	6.2	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-10	9.1	Small saw timber	Northern hardwood	Young forest	Wildlife	Clearcut
D-11.4	11	Pole timber	Northern hardwood	Young forest	Wildlife	Clearcut
C-53.1	46.5	Small saw timber	Northern 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 2017-2021 (141.1 acres):

Northern Hardwoods (121.7 acres):

- **Compartment D Stands 2.2, 11.2, 19, and 20**
- **Compartment A Stands 2 and 3**
- **Compartment C Stands 25 and 39**
- **Compartment B Stands 7, 10, and 17**

Clearcuts totaling in 121.7 acres of northern hardwoods will create 92.4 acres of young forest and 29.3 acres of grassland over the first five year period. These stands are comprised of northern hardwood species such as sugar maple, red maple, and white ash. They also contain black cherry and some red oak. The northern half of stands 7, 10*, and 17 (22 acres) as well as a portion of 2 (7.3 acres) will be converted to grasslands, while the remaining stands will be established as young forest. Regeneration consists of primarily northern hardwoods and stands should readily regenerate desired species. Interfering vegetation does exist including patches of ferns and American beech throughout the stands. Also few instances of barberry have been observed. Undesired vegetation may require treatment to limit the potential of spreading and inhibiting preferred regeneration. Special consideration will only be given to retaining trees with obvious wildlife use or exceptional phenotypes, for mast or seed source.

*An aspen clone exists within Stand 10 that will be treated to regenerate as young forest within its existing footprint (2 acres).

Norway Spruce Plantations (19.4 acres):

- **Compartment B Stands 44, 52, 60, and 65**

These Norway spruce plantations will be clearcut to create young forest habitat for the target species listed above. These stands are located near natural hardwood stands which should provide ample sources of regeneration. Due to the intended management and desired outcome it is likely no residual trees will be retained in these stands.

Management for 2022-2026 (160.8 acres):

Northern Hardwoods (148.4 acres)

- **Compartment A Stand 9**
- **Compartment D Stands 2.3, 3.1, and 3.3**
- **Compartment D Stands 4.2, 9.2, 10, and 11.4**
- **Compartment C Stand 53.1**

These northern hardwood stands will be clearcut over the second five year period in order to create 145 acres of young forest and 3.4 acres of grassland. All of Stand 9 will be converted to grasslands, while the remaining northern hardwood stands will be managed as young forest. Most of the stands have adequate regeneration, however, some exhibit signs of deer browse as well as interfering beech and fern vegetation. Stand treatments will be considered should regeneration surveys indicate a strong presence of undesired vegetation. Special consideration will only be given to retaining trees with obvious wildlife use or exceptional phenotypes, for mast or seed source.

Plantations (12.4 acres)

- **Compartment A Stands 4, 6, 10, and 11**

These stands of various softwood plantations will be clearcut to create 7.9 acres of grasslands and 4.5 acres of shrublands. More specifically, Stand 4 is a mix of Norway spruce and red pine that will be converted to grassland. Stand 6 was once a pure Norway spruce plantation but has had rows removed in previous treatments, resulting in a second age class of hardwood/shrub regeneration. This stand's wildlife value will be improved as shrubland habitat. Stands 10 and 11 are composed of mainly Scots pine and white spruce respectively, and both will be converted to grassland. This conversion will help expand upon an existing grassland nearby. Due to the intended management and desired outcome it is likely no residual trees will be established in these stands.

BEST MANAGEMENT PRACTICES

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

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

Resource	**Guidance Document** [17]
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.

A Northern long-eared bat survey will be conducted during the summer of 2017 following the U. S. Fish and Wildlife Service (USFWS) approved survey protocol. If Northern long-eared bats are detected, cutting of trees > 3" dbh will not take place April 1st through September 30th in order to avoid negative impacts to the species. However, should the survey determine the probable absence of the species in a project area, forest management activity could occur year round. Ideal roost trees will be retained in project areas when applicable.

Forest Health Considerations:

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 being able to inhabit the area successfully, further contributing to the decline of health and diversity. Forest management through sound silviculture helps encourage tree, stand, and forest resistance. This can reduce the susceptibility of forests to the negative effects of injurious agents and limit the spreading of harmful agents already present on the WMA.[18] A healthy, more diverse forest is likely to occur from a more resistant forest structure thereby improving wildlife habitat for the target species.

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. As of 2016, Canadaway Creek WMA falls within an emerald ash borer quarantine area, so additional regulations will be applied to management operations further detailed in future timber sale packages.

Deer browsing intensity varies throughout the WMA. In areas where deer browse could pose a threat to advancing desirable regeneration deer enclosures may be constructed to protect regeneration.

In stands with an understory dominated by interfering, invasive or undesirable, vegetation pre/post treatments should be applied in order to aid in the establishment of desired species. Interfering species present on Canadaway Creek WMA include: American beech, Japanese barberry, honeysuckle, ferns and grasses.

[17] All guidance documents referenced here are available online at http://www.dec.ny.gov/outdoor/104218.html.
[18] Nyland, R.D. 2007. Silviculture: Concepts and Applications 2nd ed. Waveland Press.

Pre- and Post-treatment Considerations:

The main goal of pre- and post-treatment applications are to encourage the regeneration of desired forest species. They are carried out through mechanical or chemical actions. However, certain ecological situations may be best treated through prescribed burning. Actions of pre- and post-treatments occur at the stand level and can achieve multiple tasks. Primarily, treatments function to control invasive and/or interfering vegetation. Mechanical treatments can also expose mineral soil and improve the seedbed.[19]

Anticipated mechanical treatments include brush/chain saw cutting while foreseen chemical treatments involve herbicide application. Also, post treatment planting of native shrub/tree species may be warranted to provide specific habitat needs for target wildlife species.

Pre- and post-treatment actions to promote the desired forest regeneration will be addressed in detail in the silvicultural prescriptions.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines 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 Canadaway Creek WMA, which may be assessed to determine response to management, include:

- American woodcock
- Ruffed grouse
- Wild turkey
- White-tailed deer

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

MANAGEMENT OBJECTIVES

- Manage approximately 55.7 acres of shrubland habitat (2.5% of the WMA), providing habitat for a variety of shrubland dependent species.

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

- Convert 4.5 acres of poor quality northern hardwood regeneration/plantation into shrubland.
- Maintain the shrubland via brush hogging every 3-5 years or as necessary.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently 51.2 acres of shrublands exist on Canadaway Creek WMA composed mainly of honeysuckle, wild apple, grey-stemmed dogwood, red osier dogwood, alder, crab apple 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
- Wild turkey
- White-tailed deer

Other species benefiting from shrubland habitat management include: black-billed cuckoo, brown thrasher, blue-winged warbler and gray fox.

MANAGEMENT HISTORY

There has not been any shrubland management on the WMA. The shrubland that exists is a result of the natural succession of old, abandoned fields.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2021** (Figure 6):
    - **Compartment B Stand 40:** Two, 100 foot wide curvilinear strips will be cut from the southern boundary of stand 42 to the south boundary line of the WMA. A forestry cutter will be used to initiate the strips followed by brush hogging every 3 to 5 years.
    - **Compartment B Stand 47.2:** Amoeba or irregular shaped openings will be cut in the sparse shrub area of the stand. A forestry cutter will be used initially followed by brush hogging every 3 to 5 years.

  Habitat management will include the following:
    - **Compartment B Stand 40:** This stand is poorly drained and was once an open field currently in a sparse early succession phase. Poor soil conditions have prevented favorable regeneration. The curvilinear strips will provide added edge habitat for species foraging in the stand such as American woodcock. Other strips may be created depending on growth rates in this stand.
    - **Compartment B Stand 47.2:** A mix of seedling/sapling size trees and shrubs exist in this stand. This stand was also an open field that is in an early successional stage. Scattered apple trees will be avoided, day lighted and pruned as necessary to encourage soft mast production. An amoeba or irregular shape opening will be cut in the sparsely vegetated area of the stand. Again, the added edge will be beneficial as escape cover for foraging wildlife. Other strips may be created depending on growth rates in this stand. Treatment of multiflora rose in this stand may be necessary for control of this invasive species.

- **Management planned for 2022-2026** (Figure 6):
    - **Compartment A Stand 6:** Convert the northern half of the stand to shrubland (4.5 acres) via a clearcut. Brush hogging every 3 to 5 years will be used to maintain the stand in a shrubland stage.
    - **Compartment B Stand 46:** Three 100 foot wide curvilinear strips will be cut in a north/south orientation. A forestry cutter will be used initially followed by brush hogging every 3 to 5 years.
    - **Compartment B Stand 49:** Three 100 foot wide strips will be cut in a north/south orientation. A forestry cutter will be used initially followed by brush hogging every 3 to 5 years.

Habitat management will include the following:

- **Compartment A Stand 6:** This stand is an old plantation with somewhat poor drainage comprised of Norway spruce, red maple and apple. The Norway spruce has undergone row thinning resulting in poor quality regeneration. The northern half of the stand will be converted to shrublands via an initial clearcut and stump removal followed by brush hogging every 3-5 years. Apple trees of good quality will be left and pruned to enhance soft mast production.
- **Compartment B Stand 46:** This stand contains remnants of an old apple orchard and small openings interspersed throughout. Many of the apple trees are in desperate need of pruning and day lighting. Pruning and removal of competing vegetation will encourage soft mast production providing a food source for wild turkey and white-tailed deer. The meandering strips will provide critical edge habitat for foraging wildlife. Other strips may be created depending on growth rates in this stand.
- **Compartment B Stand 49:** This was an old field that has been allowed to succeed unmanaged. Somewhat poorly drained soils have inhibited growth in this stand. Pockets of aspen and scattered apple trees will be managed. Apple trees will be pruned and day lighted enhancing soft mast production. Aspen pockets will be evaluated for ruffed grouse habitat and may be manipulated to enhance wildlife value. The meandering strips and soil conditions favor foraging areas for woodcock. Other strips may be created depending on growth rates in this stand.

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. Grassland management will restore and maintain habitat that will be used by migratory birds as well as contribute to the goal of building self-sustaining grassland bird populations.

MANAGEMENT OBJECTIVES

- Maintain 75.9 acres of grassland fields and open areas to provide nesting and brood rearing habitat for a variety of wildlife species including wild turkey and Eastern meadowlarks.
- Convert 40.6 acres of forest to grassland habitat.
- Strip mow larger fields on a two or three 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 approximately 35.3 acres of grassland fields and open areas on the WMA. All of these grassland/fields are less than 25 acres in size. Although less than 25 acres, these open grassy fields are an important habitat component for many species including the target species 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. These are also important fawning and grazing areas for white-tailed deer.

Species that benefit from grassland best management practices include:

- American woodcock
- Wild turkey
- Eastern bluebird
- American kestrel

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. Strip mowing on a two or three year rotation prevents the establishment of woody vegetation.

Annually mowed field.

Photo: Emilio Rende, NYS DEC

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2021** (Figure 6):
    - **Compartment A Stand 2:** Convert 7.3 acres of this stand from natural forest to grassland via a clearcut. This will generate a new stand.
    - **Compartment B Stands 7, 10, and 17:** Convert 6 acres of Stand 7, 13.3 acres of Stand 10, and 2.7 acres of Stand 17 to grasslands via a clearcut. This will generate three new stands.

  Habitat management will include the following:
    - **Compartment A Stand 2:** Historically a portion of this stand was an old field evident by the existence of a large, wolfy sugar maple hedgerow and scattered forest openings. A 1996 shelterwood cut was conducted in this stand. The entire stand will be clearcut followed by stump removal, grading, and seeding in the 7.3 acre portion to be converted to grassland. This will add to the grassland habitat in the adjacent stand. Once established, the field will be maintained through an annual perimeter and strip mowing schedule. This will provide additional brood foraging areas for wild turkey and grazing areas for white-tailed deer, both valuable habitat components.
    - **Compartment B Stands 7, 10 and 17:** A significant portion of these three stands were once an old field with somewhat poor drainage conditions. The stands will be clearcut followed by stump removal, grading, and seeding. Annual perimeter and strip mowing will prevent woody vegetation encroachment into the stands. This will provide grassland/field habitat that is lacking on the WMA.

- **Management planned for 2021-2026** (Figure 6):
    - **Compartment A Stands 4, 9, 10 and 11:** Convert the entire combined acreage of the four stands to grassland via a clearcut.

  Habitat management will include the following:
    - **Compartment A Stands 4, 9, 10 and 11:** Poor quality conifer plantings exist in Stands 4, 10 and 11. Many of the conifers are of small diameter, dead or dying. Stand 9, a pole stand, will also be converted. Conversion of these stands will produce a combined 11.3 acres of grassland. When combining the acreages of current stands and stands receiving habitat manipulation a total of approximately 24 acres will exist in this compartment.

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*.[20] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding grassland management and restoration techniques.

[20] Morgan, M. and M. Burger. 2008. A Plan for Conserving Grassland Birds in New York: Final Report to the New York State Department of Environmental Conservation under Contract #C005137. Audubon New York, Ithaca, NY.

General Management Recommendations

- 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.
- 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

Canadaway Creek 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 6 acres of natural wetland as it currently exists.
- Maintain 9.3 acres of impounded wetlands.
- Maintain natural hydrology and water quality on the WMA.
- Maintain water control structures and dikes on small ponds and impounded wetlands occurring on the WMA.
- 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

Canadaway Creek WMA contains 6 acres of natural wetlands and 9.3 acres of impounded wetlands (totaling 15.3 acres; Figures 5). The wetland acreage is a combination of small, shallow open 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

Mowing of the pond dikes is completed annually by the Division of Operations following the WMA work plan. Several other rehabilitation projects are being planned and will be completed as funding becomes available.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026:**
    - Continue annual routine maintenance of dikes, emergency spillways and water control structures.
    - 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 WMA. 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 WMA.
- 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. Many of the ponds are dug ponds with no water control structures. Several of 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 and provide angling opportunities.

There are approximately 11 streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). Canadaway Creek, the main stream flowing through the WMA, has a classification of B with a B standard indicating suitability for swimming and other contact recreation, but not drinking water. Clinton Brook, Ackles Brook, Markham Brook and four unnamed tributaries to Canadaway Creek have classifications of C with a T standard indicating that it may support a trout population.[21] Most of these watercourses provide angling opportunities for trout.

MANAGEMENT HISTORY

A habitat improvement project on approximately 600 feet of Canadaway Creek was completed in 1999 - 2000. The project included realigning a portion of the stream away from a high eroding bank that was contributing a significant sediment load to the stream and habitat enhancement to improve the carrying capacity in the stream. Rip rap bank stabilization, stream bank plantings and two grade stabilizers were included in the project. Canadaway Creek is stocked annually with approximately 250 yearling brook trout and 50 two-year old brown trout.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026**:
    - Routine maintenance on all dikes and water control structures including yearly inspections, annual mowing of the dikes, and monitoring of beaver and muskrat activity.
    - Repair pond dikes 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 WMA.

MANAGEMENT EVALUATION

None.

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

HABITAT MANAGEMENT SUMMARY

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

Table 7. Summary of habitat management actions recommended for Canadaway Creek WMA, 2017-2026. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Natural hardwood clearcut in Compartment D Stands 2.2, 11, 19, and 20.	36.1	2017-2021
Forest	Norway spruce plantation clearcut in Compartment B Stands 44, 52, 60, and 65.	19.4	2017-2021
Forest	Natural hardwood clearcut in Compartment A Stands 2 and 3, where 7 acres will be converted to grassland and the remaining will regrow as young forest.	34.5	2017-2021
Forest	Natural hardwood clearcut in Compartment C Stands 25 and 39, where the south half of stand 25 will be treated and the north half of stand 39 will be treated.	27.1	2017-2021
Forest	Natural hardwood clearcut to be converted to grassland in Compartment B Stands 7, 10*, and 17 where the north half of each stand will be treated. *An aspen clone exists within Stand 10 that will be treated to regenerate as young forest within its existing foot print.	24	2017-2021
Shrubland	Strip cuts in Compartment B Stands 40 and 47.2 to regenerate as shrubland.	25.6	2017-2021
Forest	Plantation clearcuts in Compartment A Stands 4, 6, 10, and 11 that will all be converted to grassland and shrubland habitat.	15.8	2022-2026
Forest	Natural hardwood clearcut in Compartment D Stands 2.3, 3.1, and 3.3 where only the south half of stand 3.1 will be treated.	65.3	2022-2026
Forest	Natural hardwood clearcut in Compartment D Stands 4.2, 9.2, 10, and 11.4 to create young forest.	33.2	2022-2026
Forest	Natural hardwood clearcut in Compartment C Stand 53.1 to create young forest.	46.5	2022-2026
Shrubland	Strip cuts in Compartment B Stands 46 and 49 to regenerate as shrubland.	12.4	2022-2026
Grassland	Annual mowing	30	2017-2026

III. FIGURES

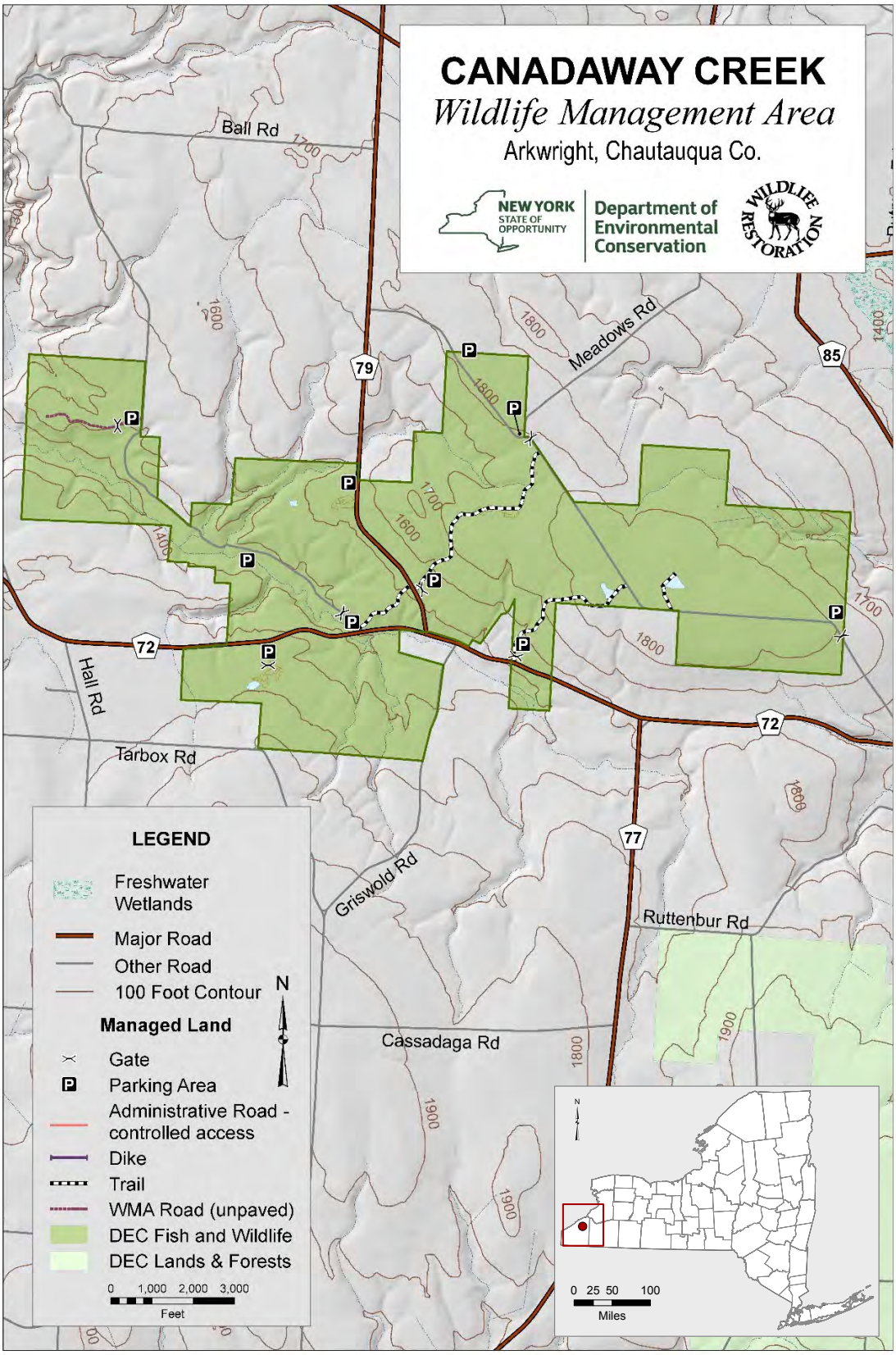

FIGURE 1. Location and access features at Canadaway Creek WMA.

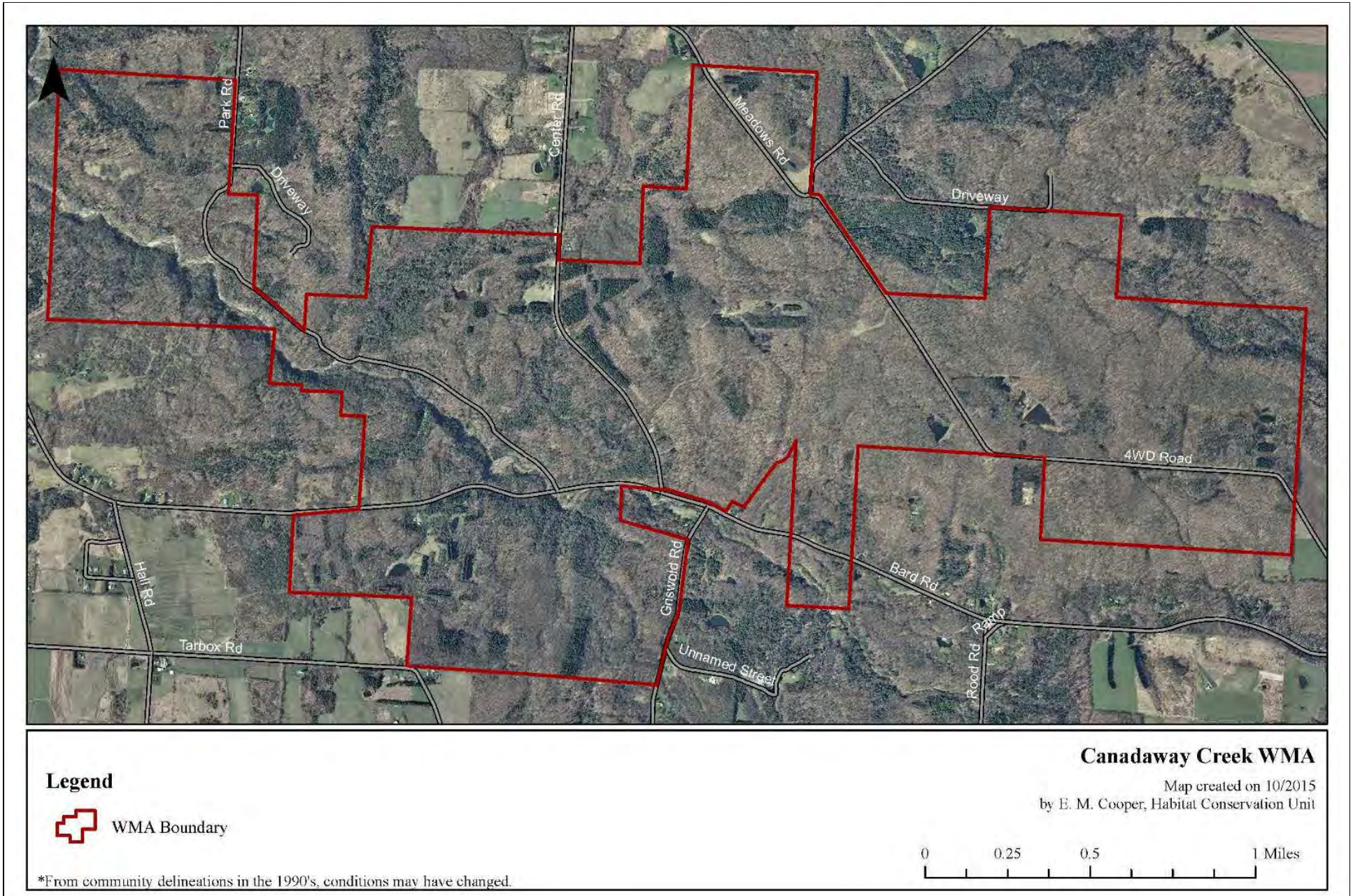

FIGURE 2. There are no significant ecological communities on Canadaway Creek WMA. Data from the NY Natural Heritage Program.

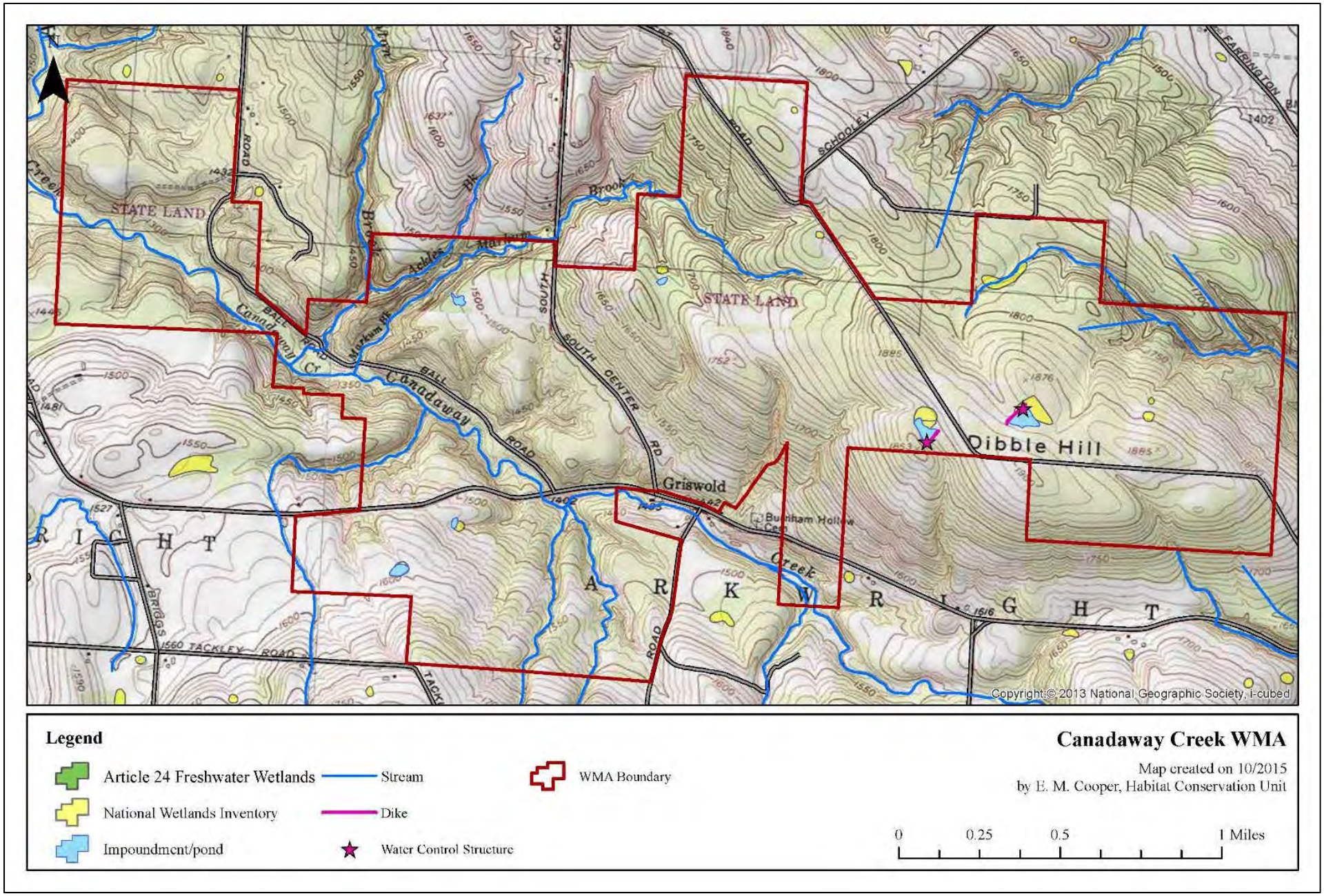

FIGURE 3. Wetlands, open water, and streams of Canadaway Creek WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

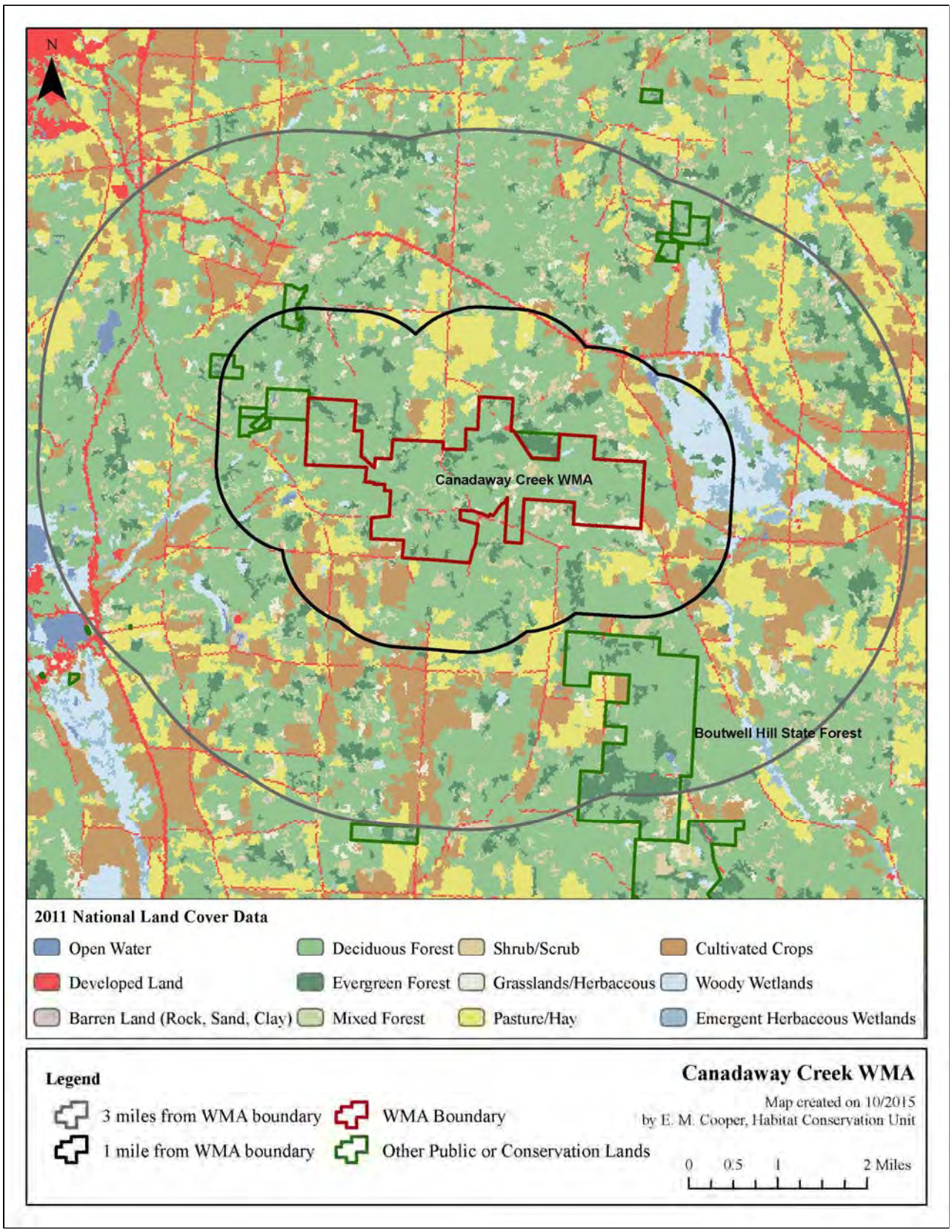

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Canadaway Creek WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types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

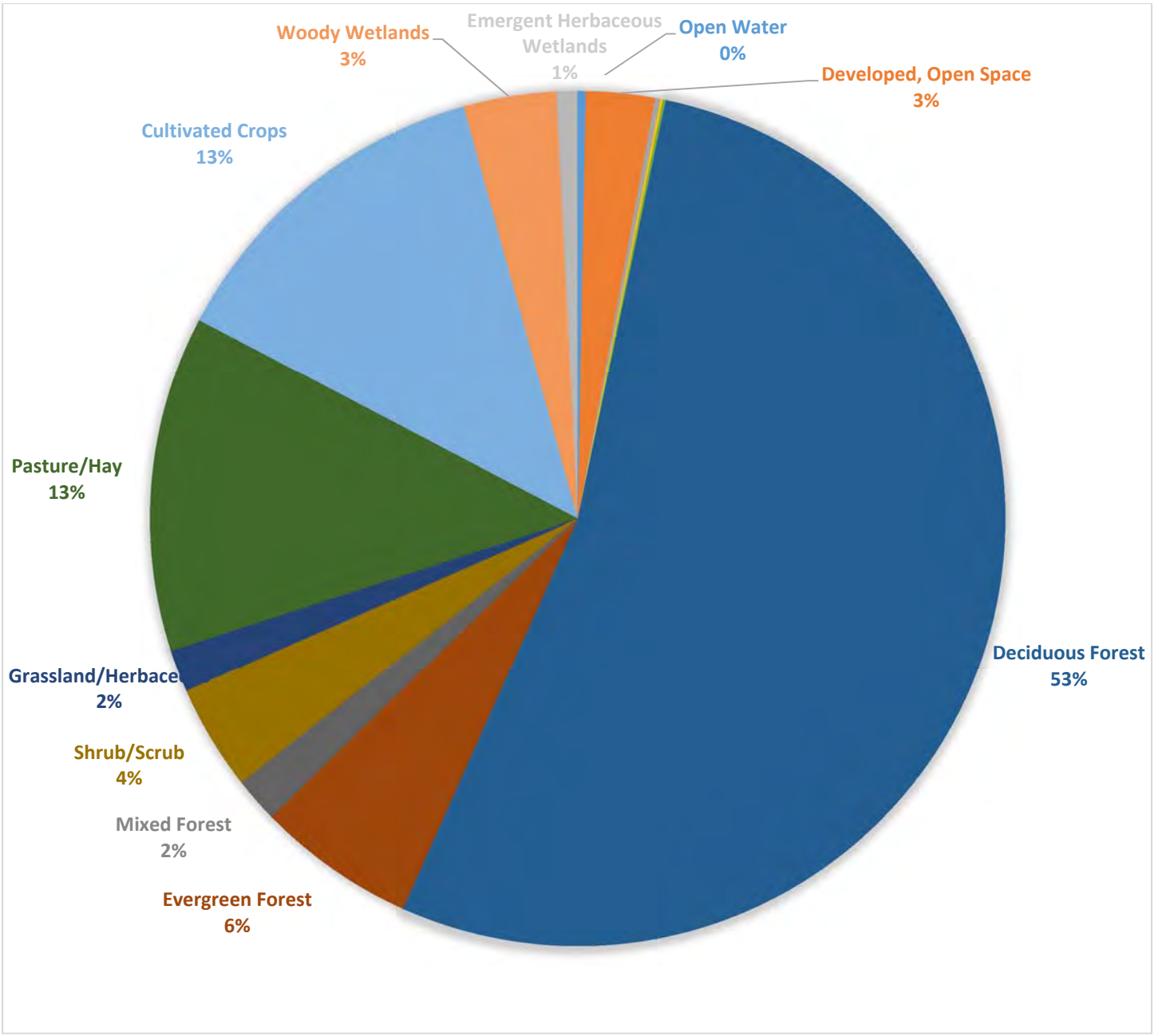

FIGURE 5. Percent cover of land cover types within three miles of Canadaway Creek WMA.

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

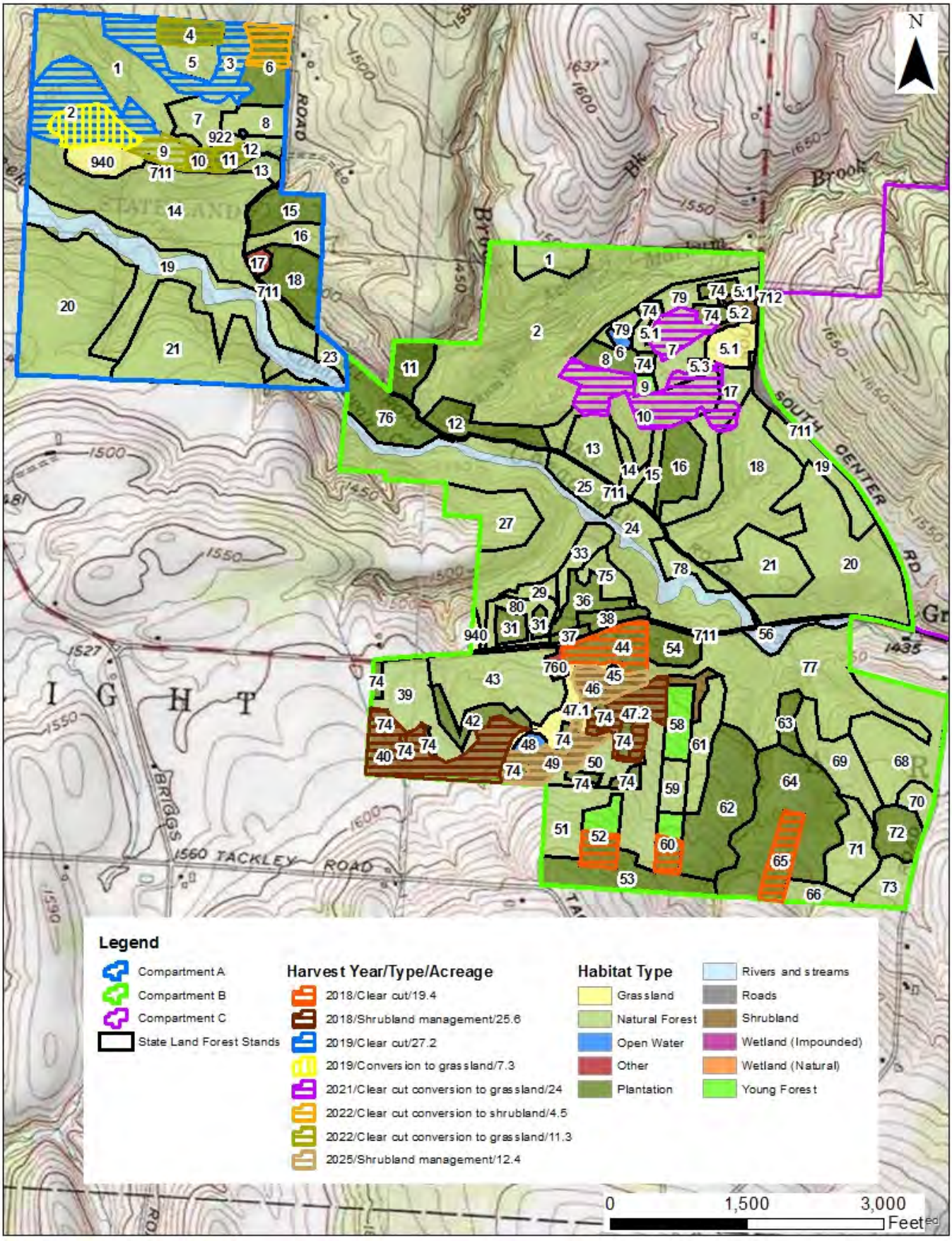

FIGURE 6A. Habitat types and locations of proposed management on Canadaway Creek WMA, Compartments A and B. Numbers indicate the stand number from habitat inventory.

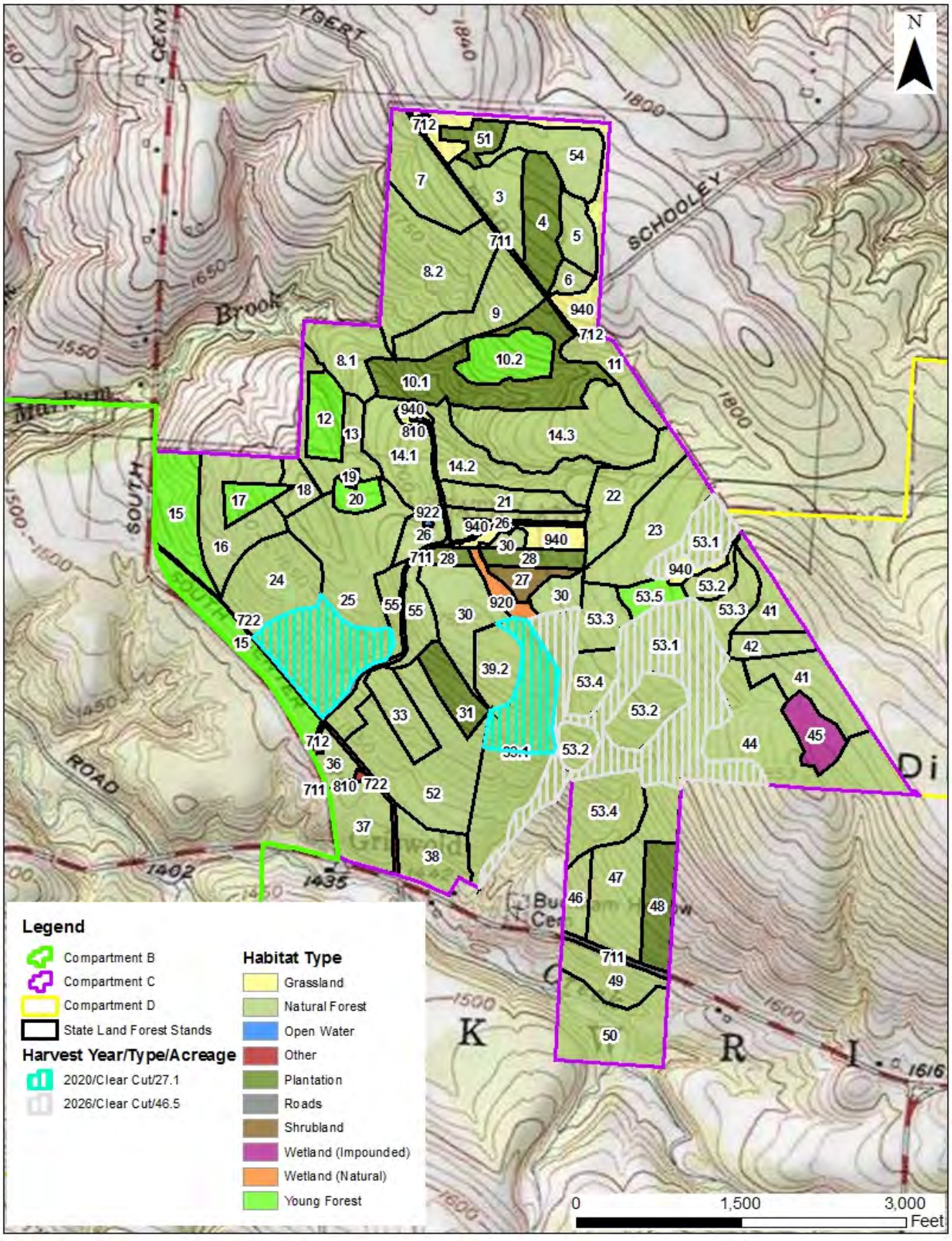

FIGURE 6B. Habitat types and locations of proposed management on Canadaway Creek WMA, Compartment C. Numbers indicate the stand number from habitat inventory.

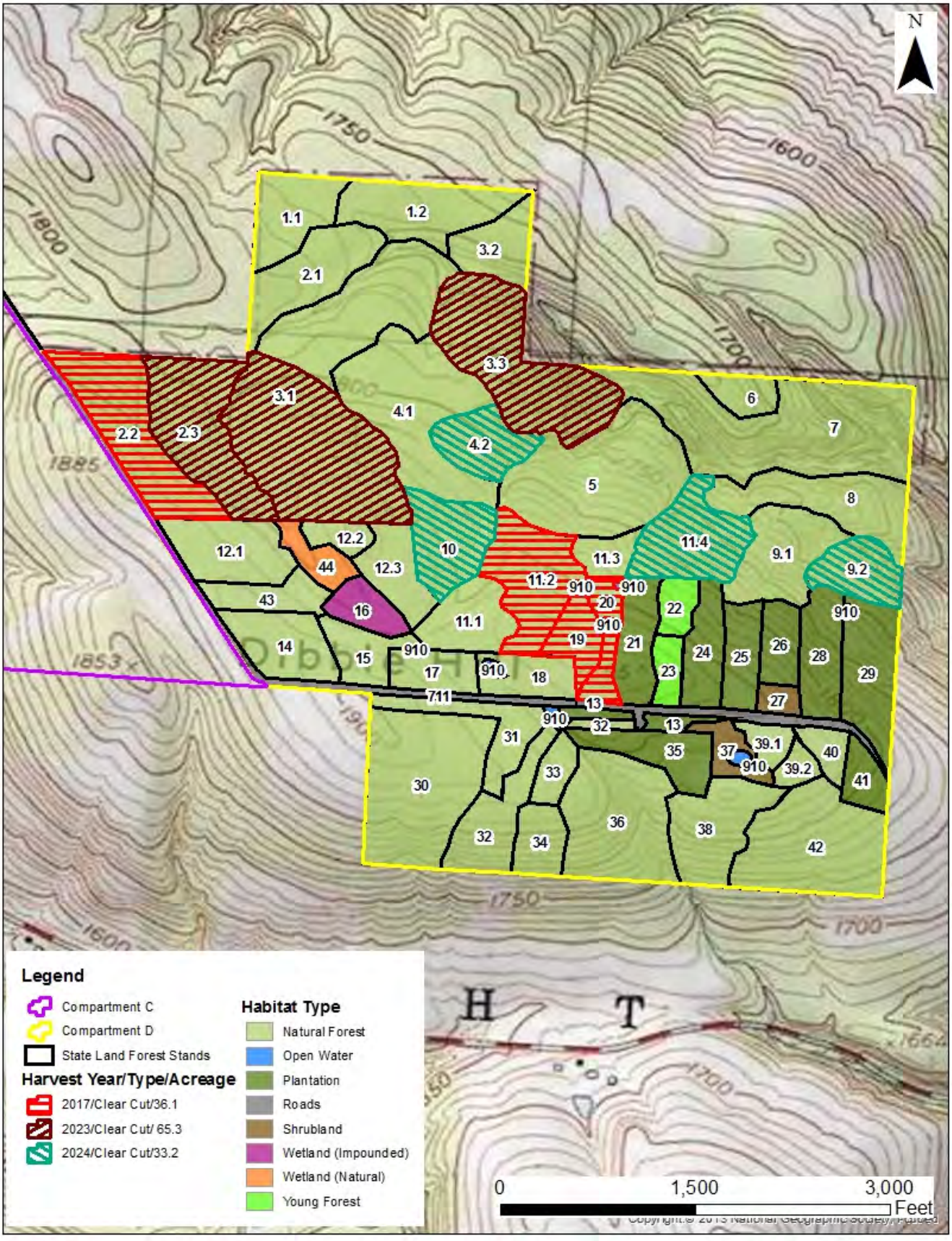

FIGURE 6C. Habitat types and locations of proposed management on Canadaway Creek WMA, Compartment D. Numbers indicate the stand number from habitat inventory.

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. STATEMENT OF CONFORMITY WITH SEQRA

Habitat Management Plans will be in compliance with the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* by following the criteria for site specific assessments included in this Programmatic Environmental Impact Statement (EIS) and by discussing further in Appendix B, Statement of Conformity with the State Environmental Quality Review Act (SEQRA). Appendix B will be included in each plan, thereby satisfying overall compliance with 6 NYCRR Part 617, the State Environmental Quality Review. If any of these criteria are exceeded an additional site specific environmental review will be required.

Most activities recommended in this HMP are a continuation of habitat management that DEC routinely conducts under the Programmatic EIS. Beginning in 2015, DEC's Young Forest Initiative (YFI) will considerably increase forest management on Wildlife Management Areas (WMA); YFI's conformity with SEQRA is specifically addressed below. The overarching goal of the YFI is to restore and maintain young forest habitat on WMAs in order to address the declining amount of young forest habitat in the state and provide habitat for key species of conservation interest, including both at-risk and game species. The habitat management activities to be carried out under the YFI are in compliance with the above referenced document and these management activities:

- Will not adversely affect threatened or endangered plants or animals or their habitat.
    - Careful review of the NY Natural Heritage Program's "Natural Heritage Element Occurrence" database in conjunction with a field survey when necessary prior to management activities taking place allows field staff to assess the presence or absence of threatened and endangered species. Appropriate actions will be taken if a threatened or endangered plant or animal is encountered in the project area including, but not limited to: establishing adequate buffer zones around known occurrences, moving the project area, or aborting the project altogether.
- Will not induce or accelerate significant change in land use.
    - The forestland affected by the YFI will be regenerated and remain forested land, therefore no land use change will take place.
- Will not induce significant change in ambient air, soil, or water quality.
    - All projects carried out under the YFI will protect air, soil and water quality through careful project planning, use of appropriate NYS Best Management Practices for Water Quality, and establishment of Special Management Zones around sensitive land and water features requiring special consideration.
- Will not conflict with established plans or policies of other state or federal agencies.
    - YFI projects will follow established plans or policies of other state and federal agencies. Additionally, all YFI projects will be in compliance with all relevant US Fish and Wildlife Service rules and regulations.
- Will not induce significant change in public attraction or use.
    - The WMA program is part of a long term effort to establish permanent access to lands in New York State for the protection and promotion of its fish and wildlife resources. Projects carried out under the YFI will continue to protect, promote and maintain public access to WMAs and their wildlife resources.
- Will not significantly deviate from effects of natural processes which formed or maintain area.
    - Habitat management projects under the YFI will be carried out primarily through even-aged forest management. Even-aged silvicultural systems are designed to mimic natural disturbances, such as flooding, wildfire, insect and disease outbreaks and storm damage often found in nature.
- Will not result in areas of significantly different character or ecological processes.
    - The even-aged silvicultural techniques that will be employed for habitat management projects under the YFI intentionally result in areas of different character and ecological processes. However, they are not considered significant as they are ephemeral or transitional and will not permanently alter the landscape.
- Will not affect important known historical or archeological sites.
    - Each YFI project will be reviewed by DEC's State Historic Preservation Officer (SHPO) as well as the Office of Parks, Recreation and Historic Preservation (OPRHP) to determine whether

project sites may potentially affect any historical or archeological sites. In addition, thorough field review prior to management activities taking place allows field staff to assess the presence or absence of any apparent historical or archeological sites that may not be found during the review process. Should known important historical or archeological sites present themselves necessary actions will be taken to protect these resources under the direction of DEC's SHPO and the OPRHP Archaeology Unit staff.

- Will not involve the application of herbicides, pesticides or other such chemicals.
    - YFI projects may involve the judicious use of pesticides which may be necessary to control invasive species, to protect rare and endangered plants from competition, or to control vegetation interfering with forest regeneration. If projects do require the use of herbicides or pesticides an additional site-specific environmental review will be required.
- Will not stimulate significant public controversy.
    - It is not anticipated that YFI projects will stimulate significant public controversy. A significant amount of public outreach and notification will be conducted on an on-going basis as well as prior to projects being implemented on the ground including, but not limited to: public information sessions regarding the Habitat Management Plans for each WMA, signage installation at project sites informing the public of the scope and purpose of the project, establishment of one demonstration area in each region to showcase YFI management techniques to the public, periodic informational articles published in local media outlets and the development of a public YFI website. The YFI has one full time position dedicated to facilitating the program's public outreach and communication efforts.

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX D: AMENDMENTS

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

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