Habitat Management Plan
for
Cranberry Mountain Wildlife Management Area
2016 - 2025

Division of Fish and Wildlife
Bureau of Wildlife

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SUMMARY

Cranberry Mountain Wildlife Management Area (WMA) was purchased in the early 1960s for the purpose of providing public lands for wildlife-dependent recreation, primarily hunting, trapping, and fishing. The WMA was originally part of a hunting cooperative and served as a game species habitat management demonstration area. To this day it is still a popular destination for small and big-game hunters. As part of the Hudson Highlands, federal Highland Conservation Act[1] funding was used to purchase an additional 600 acres from 2011-2013. Natural and managed habitats at Cranberry Mountain include mature forest, maintained fields, shrublands, man-made impoundments, emergent marshes, and wetlands. However, upland forest is by far the dominant cover type, occupying over 95% of the WMA. An important species at Cranberry Mountain is the New England cottontail, which is listed in New York as a species of Special Concern (SC). The WMA falls within a New England Cottontail Focus Area[2] and therefore management on the WMA will focus primarily on creating and maintaining habitats for this species, which will entail the creation of large tracts of young forest and shrublands to provide new habitat and connect existing habitats. This type of management will also benefit a host of other important game species including white-tailed deer and wild turkey.

Habitat management goals for Cranberry Mountain WMA include:

- Create 155 acres (14% of total WMA acreage) of young forest habitat to provide food and cover for New England cottontail, American woodcock, white-tailed deer and wild turkey.
- Create and maintain 35 acres of permanent shrublands (3% of total WMA acreage) to provide habitat for New England cottontails.
- Create and maintain 35 acres of fields/permanent wildlife openings (3% of total WMA acreage) to provide habitat for New England cottontails, American woodcock, white-tailed deer, and wild turkey.
- Maintain 854 acres (79% of total WMA acreage) as mature oak forest to provide habitat for white-tailed deer, wild turkey, and interior forest nesting raptors.

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

[1] Highland Conservation Act available online at http://na.fs.fed.us/highlands/con_act/index.shtm.
[2] Focus areas available online at http://newenglandcottontail.org/content/focus-areas-guide-cottontail-comeback.

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 5 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

Cranberry Mountain Wildlife Management Area is located in Region 3, Town of Patterson, Putnam County (Figure 1).

TOTAL AREA

1,085 acres

HABITAT INVENTORY

A habitat inventory of the WMA was conducted in 2015 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 Cranberry Mountain WMA.

Habitat Type	Current Conditions (as of 2015)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	1,048	97%		854	Decrease to 79%
Young forest	0	0%		155	Increase to 14%
Shrubland	15	1%		35	Increase to 3%
Grasslands	16	1%		35	Increase to 3%
Wetlands (natural) [b]	0	0%		0	No change
Wetlands (impounded) [b]	6	<1%		6	No change
Open water	0	0%		0	No change
Roads			1.5		No change
Rivers and streams			2.8		No change
Total Acres:	1,085	100%		1,085	100%

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

ECOLOGICAL RESOURCES

Soils:

Soil groups found at Cranberry Mountain WMA include Charlton Loam, Charlton-Chatfield Complex, Chatfield-Hollis Complex, Hollis-rock Outcrop, Ridgebury Loam, and Sutton Loam. Soils at lower elevations are deeper and range from moderately well drained (Sutton Loam) to somewhat poorly drained (Ridgebury Loam). As elevations increase, soils become shallower

and well drained, with the shallowest, excessively drained soils (Hollis Rock Outcrop) found on the high ridge top running north/south at the western edge of the property. [3]

Significant Ecological Communities:

There is one rare and significant natural community located on Cranberry Mountain WMA, as identified by the NY Natural Heritage Program. The state rank reflects the rarity within NY, ranging from S1, considered the rarest, to S5, considered stable; definitions are provided in Appendix A. The following significant ecological community occurs on the WMA; the community description is from *Ecological Communities of New York State, Second Edition* [4] (Figure 2):

- **Pitch pine-oak-heath rocky summit (S3S4):** A community that occurs on warm, dry, rocky ridgetops and summits where the bedrock is non-calcareous (such as quartzite, sandstone, or schist), and the soils are more or less acidic. The vegetation may be sparse or patchy, with numerous rock outcrops. This community is broadly defined and includes examples that may lack pines and are dominated by scrub oak and/or heath shrubs apparently related to fire regime. Oak-heath summits without pitch pine are more common in the Hudson Highlands (S. Barbour *pers. comm.*). This community is often surrounded by chestnut oak forest.

Additional information about significant ecological communities is available in the Cranberry Mountain WMA Biodiversity Inventory Final Report (1997) prepared by the New York Natural Heritage Program.

Wildlife Overview:

Cranberry Mountain WMA provides habitat for a number of bird and mammal species typical to a northern hardwood forest. In addition, the WMA is home to the New England cottontail. As New York's only native cottontail, this species only occurs east of the Hudson River in New York. New England cottontail populations have been declining in recent history, and efforts are being made to restore early successional habitat to enhance those remaining populations. Bird and mammal species that can be found on the WMA include, but are not limited to:

- American woodcock, black bear, bobcat, coyote, Eastern cottontail, red fox, white-tailed deer, wild turkey
- New England cottontail
- Red-shouldered hawk, red-tailed hawk, Cooper's hawk
- Scarlet tanager, veery, black-throated green warbler

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or state Special Concern (SC) species and/or Species of Greatest Conservation Need (SGCN) may occur on the WMA

[3] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=NY.
[4] 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.

(Table 2).[5] 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,[6] NY Reptile and Amphibian Atlas,[7] DEC wildlife surveys and monitoring, and eBird.[8]

Table 2. Species of conservation concern that may be present on Cranberry Mountain 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**
Mammals	Indiana bat	E	E	HP
	Little brown bat			HP
	New England cottontail		SC	HP
	Northern long-eared bat	T	T	HP
Birds	American woodcock			x
	Black-throated blue warbler			x
	Blue-winged warbler			x
	Cooper's hawk		SC	
	Red-shouldered hawk		SC	x
	Scarlet tanager			x
	Wood thrush			x
Amphibians and reptiles	None known			
Fish	Brook trout (wild)			x
Invertebrates	None known			
Plants	Northern dwarf huckleberry		E	

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 Cranberry Mountain WMA include:

- 3 wetlands regulated by Article 24 of the Environmental Conservation Law and several additional wetlands shown on the National Wetlands Inventory (NWI; Figure 3). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated

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

wetland boundary, known as the adjacent area. However, there are no planned forestry prescriptions associated with forested wetlands or adjacent areas.

- 2 streams (a watercourse entirely within the WMA) or segments of streams (a steam that meanders in and out of the WMA). The highest stream classification is C(TS), which indicates that the stream supports trout spawning.[9] Although timber harvest will occur in areas adjacent to these streams, there will be a protection buffer of 100 feet on either side of the streams within which timber harvest will not occur.

Although there are parts of three regulated wetlands at Cranberry Mountain WMA, the wetland acreage is limited to a finger of the Great Swamp (identified as DP-22) that extends along Haviland Hollow Brook, a small portion of the 28 acre wetland BR-5 associated with Little Pond, and a small portion of the 38 acre wetland complex BR-3. In addition to the three State regulated wetlands, there are six man-made impoundments that range in size from one quarter to three acres that were constructed during the late 1960s under the Pittman-Robertson (P-R) "muskrat marsh" program (Figure 3). They provide small pockets of shallow open water, emergent marsh, and wooded swamp habitat. The WMA also contains all or segments of two streams, Haviland Hollow Brook (Class C) and Gutter Brook [Class C(TS)].

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.*[10] 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 and the availability of habitats and other conservation lands adjacent to Cranberry Mountain WMA (Figures 4 and 5). The landscape within a three mile radius of the WMA is primarily privately-owned land including:

- Northern deciduous forest (59%)
- Developed, open space (10%)
- Low to high intensity development (4%)
- Wooded wetlands (11%)
- Pasture/hay (9%)
- Evergreen forest (2%)
- Mixed forest (1%)

A substantial amount of protected open space (undeveloped land) is located in the vicinity of the WMA including Wonder Lake State Park (957 acres), Putnam County conservation lands (1,031 acres), and Great Swamp WMA (444 acres). Very little active habitat or forest management occurs on these lands, with the exception of some invasive plant removal and field maintenance

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

at the Great Swamp WMA. However, to the north and adjacent to Cranberry Mountain, there is a 295 acre private property that is currently being managed for wildlife habitat, with an emphasis on deer, turkey, and New England cottontail. Prior to 2015, the property was predominantly an even-aged mixed hardwood forest. In 2015, 25 of the 295 acres were treated with a combination of clearcuts and thinnings varying from 30-50% crown retention. Brush piles were constructed in much of the treatment area. A portion of the clearcuts will be maintained as field openings with herbaceous vegetation, with the remainder left to convert to young forest. This type of habitat work is consistent with the management described in this plan for Cranberry Mountain WMA to benefit New England cottontails. In addition, management on the WMA will provide a direct connectivity between existing New England cottontail habitats on the WMA and the neighboring private property's newly created habitats.

New York is also one of six states (Connecticut, Maine, Massachusetts, New Hampshire, New York, and Rhode Island) involved in major efforts to manage for and restore New England cottontail habitats and populations, primarily through the creation of early successional/young forest habitats. These efforts included the designation of New England cottontail focus areas based on historical records and current population information, within which efforts to restore populations will be concentrated. Within New York there are seven focus areas (Rensselaer, Northern Columbia, Southern Columbia, Dutchess, Harlem-Housatonic, West Putnam, and Westchester) across five counties east of the Hudson River. Cranberry Mountain WMA falls within the Harlem-Housatonic Focus Area.

II. Management Strategies by Habitat Type

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

- Maintain habitat diversity that will benefit wildlife abundance and diversity.
- 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.

Forest

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest.
Plantation: planted forested acres, generally planted in rows dominated by one or two species.
Forested wetland: wetland acres where forest or shrub vegetation accounts for greater than 50% of hydrophytic vegetative cover and the soil or substrate is periodically saturated or covered with water.

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

This forest management plan establishes an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat.[11]

MANAGEMENT OBJECTIVES

- Create 155 acres of young forest (14% of total WMA acreage) to provide food and cover for New England cottontail, American woodcock, white-tailed deer and wild turkey.
- Retain approximately 854 acres (79% of total WMA acreage) of mature oak forest to provide hard mast for white-tailed deer and wild turkey, nesting habitat for forest nesting raptors, and roosting habitat for Indiana bat, Northern long-eared bat, and wild turkey.
- Reduce interference from competing non-native, invasive vegetation through controlled burning, mechanical removal, native plantings, and/or herbicide application.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

The WMA is located in a landscape characterized by limited active agricultural use, significant pockets of suburban development, and mature, largely unmanaged forests where topography and other natural features have precluded other land uses. The WMA itself is predominantly upland forest of mixed-aged, deciduous hardwoods in the pole timber and saw timber size classes (Figure 6). Hardwood forest types include Appalachian oak-hickory, chestnut oak-red oak, northern hardwoods, and intergrades of the three types. Thus, the overstory across most of the landscape is dominated by oak, with mature hemlock becoming a significant component along drainages and on some north facing slopes (Table 3).

Following trends in the Hudson Valley region, and Northeastern hardwood forests in general, there is a prevailing paucity of quality regeneration in any size class on the WMA. Only a small number of tree species of wildlife or economic value such as northern red oak and sugar maple are found in the suppressed to intermediate canopy positions, whereas black birch in the sapling to pole size classes is relatively abundant in these canopy positions. Seedlings and small saplings of desirable tree species are generally lacking; the limited number of oak seedlings and saplings correlate positively with increasing elevation. The most well-represented understory species at the WMA is likely witch-hazel, a non-commercially valuable understory species that never develops into a canopy dominant and is of limited value to wildlife.

Young/early successional forest, a forest habitat that is lacking on the landscape at the WMA and surrounding area, provides critical components of the life history requirements for this WMA's young forest target species (wild turkey, white-tailed deer, New England cottontail, and American woodcock), as well as a host of other species. Even-aged management within a forest

[11] 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.

complex of both young and mature forest stands provides a diversity of habitat types that further benefit the young forest target species. Young forest vegetation (tree and shrub species) provide year-round food for deer, turkey, and New England cottontail. In addition, the structure provided by young forest habitat provides cover for all four target species, most importantly during the fawning period for deer, nesting periods for turkey and woodcock, and overwinter and dispersal periods for New England cottontail. The mature oak forests at the WMA provide hard mast (acorns) for the fall and winter diets of deer and turkey, an open forest floor for woodcock foraging, and roosting habitat for turkey year-round. A mature hemlock stand on the property may provide some benefit to target species for overwinter cover as well, although improvement of that stand in the form of regenerating hemlock may be more beneficial.

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

Forest Type	**Acres (as of** 2015**)**	**Desired Acres**	**Overstory Species**
Natural forest (mature/intermediate)	981	787	Northern red oak, chestnut oak, white oak, black oak, hemlock
Forested wetland	67	67	Red maple
Young forest	0	155	Oak species
Total Forested Acres:	1,048	1,009	

Target Species:

- New England cottontail:
  - General - Large (≥25 acres) patches of thickets, young forests, shrub swamps, or other dense shrubby areas, within 0.5 to 2 miles of other suitable habitat patches. Woody cover 3-15 ft high and stem density of >20,000 stems per acre.
  - Protective cover – Thick, regenerating deciduous trees and shrubs preferred for escape and thermal cover, also will use low-hanging conifer branches. Conifers provide winter cover.
  - Foraging – As above, but also use small patches of grass and other herbaceous plants within thickets. Typically will not move very far (>16 ft) from dense woody vegetation.
  - Nesting – Nest placed directly on ground in well-drained areas, typically in shrubs or in forbs on the forest floor. [12, 13]

- American woodcock:
  - Singing/peenting ground – Open areas from 1 to >100 acres, usually in an abandoned field.
  - Daytime areas – Moist, rich soils with dense overhead cover of young alders, aspen or birch.

[12] New England Cottontail Regional Technical Committee. 2013. Best Management Practices: How to Make and Manage Habitat for the New England Cottontail, A Regional Land Manager's Guide. 28 pp.
[13] Arbuthnot, M. 2008. A Landowner's Guide to New England Cottontail Habitat Management. Environmental Defense Fund. 37 pp.

    - Nesting – Young, open, second growth woodlands.
    - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
    - Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields. [14]

- White-tailed deer:
    - Fawning areas – Vary from open forest to hay fields to brushy cover.
    - Spring/Summer diet – Primarily herbaceous vegetation (clover, Rubus, 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 – Honeysuckle, 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]

- Wild turkey:
    - Strutting areas – Open fields with short vegetation and mature hardwoods.
    - Nesting cover – Blowdowns and the bases of trees and stumps (overhead cover preferred) in open hardwoods and herbaceous and brushy cover greater than 10 inches in height in forest openings and field edges.
    - Brood rearing – Best brooding cover are fields with herbaceous vegetation from 12-18 inches preferred.
    - 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. [16]

MANAGEMENT HISTORY

Approximately 40% of the WMA has been in state ownership since the mid-1960s and has an interesting management history, undergoing significant manipulation over the past five decades including conversion of forest to fields, experimental plantings of exotic species, and timber harvests; remnants and reminders of which can still be seen. Acquisition of the remainder of the WMA has occurred since 2010. This area is exclusively forested and displays evidence of selective timber harvesting that likely occurred at regular intervals prior to the time of state

[14] US Department of Agriculture, Natural Resources Conservation Service. 2010. American Woodcock: Habitat Best Management Practices for the Northeast by Scot J. Williamson. Wildlife Insight. Washington, DC.
[15] Mattfield, G. F. 1984. Northern Hardwood and Spruce/Fir Forests. Pages 305-330 in L. K. Halls, editor. White-tailed Deer: Ecology and Management. Stackpole Books, Mechanicsburg, USA.
[16] Porter, W. F. 1992. Habitat Requirements. Pages 202-213 in J. G. Dickson, editor. The Wild Turkey: Biology and Management. Stackpole Books, Mechanicsburg, USA.

acquisition. Over the last 10 years, efforts have been made to remove invasive vegetation on the WMA, including mile-a-minute and autumn olive. Most recently, efforts to improve New England cottontail habitat in 2013 by converting 10 acres of transitional forest to permanent shrubland (Figure 6).

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

Inventory Status:

Completed in 2015.

Implementation and Schedule:

The following management is proposed in order to reach the goal of 153 acres of young forest within ten years:

- **Management planned for 2016-2020** (Table 4, Figure 6):
  - Conduct a clearcut/seedtree cut in 100% of mature hardwood stands 01001 (9.5 acres), 01002 (29.9 acres), 01005 (8.1 acres), and 01007 (13.7 acres) to create young forest with 7 acres of permanent wildlife openings/fields.
  - Partially cut mature hardwood stands 01003 (14.9 acres), 01006 (89.4 acres), 01008 (2.1 acres), and 01009 (4.5 acres) using a clearcut/seedtree cut to create young forest with 10 acres of permanent wildlife openings/fields.
  - Conduct an overstory reduction in the entirety of mature hardwood stand 01015 (17.4 acres) to create permanent shrubland.
- **There are no timber harvests planned for 2021-2025**.

Table 4. Forest management schedule for the first five-year period of this HMP (2016-2020).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
01001	9.5	Small sawtimber	Northern hardwood	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01002	29.9	Small sawtimber	Oak forest (Northern red)	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01003	14.9	Small sawtimber	Oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01005	8.1	Small sawtimber	Oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01006	89.4	Small sawtimber	Oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01007	13.7	Large pole timber	Chestnut oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01008	2.1	Sawtimber/pole timber	Hemlock/chestnut oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01009	4.5	Pole timber	Oak forest	Young forest w/ wildlife openings	Wildlife	Clearcut/seedtree cut
01015	17.4	Sawtimber	Oak forest	Shrubland w/ wildlife opening	Wildlife	Overstory reduction to 20-25% canopy closure

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:

- **Stands 01001, 01002, 01003, 01005, 01006, 01007, 01008, 01009:** Stands 01002, 01003, 01005, 01006, and 01007 are dominated by oak at varying elevations. Northern red oak are typically more common on northern/northeastern slopes (stand 01002), while chestnut oak tend to dominate at higher elevations. Size classes range from pole to sawtimber, but generally decline as elevation increases and shallow rocky soils become more prominent. Stand 01001 is comprised of a variety of Northern hardwood species in various size classes from saplings to sawtimber. Stand 01008 is an east facing slope, dominated by mature Eastern hemlock and pole timber sized chestnut oak. Stand 01009 is an uneven-aged stand primarily composed of red oak and chestnut oak with much of the basal area in smaller size classes and low numbers above the small pole size class. All of these stands will be either all or partially clearcut/seed tree cut in a commercial timber harvest to create 155 acres of young/regenerating forest and 17 acres of permanent wildlife openings. This large cut is primarily to benefit New England cottontails with the intent of connecting existing habitats and providing continuity over a larger landscape to increase survival, especially during dispersal.
- **Stand 01015** (17.4 acres): This stand is adjacent to existing shrubland habitat and will undergo an overstory reduction resulting in 20-25% canopy closure to create 15.4 acres of permanent shrubland and 2 acres of permanent woodland opening.

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 5).

Table 5. 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:

Considerations will be taken to avoid negative impacts on Indiana bat and Northern long-eared bat, as well as nesting raptors. Although not year-round residents, it is likely that both Indiana and Northern long-eared bats use habitats on Cranberry Mountain WMA for summer feeding and roosting. Thus, timber harvest will be restricted to the period of December 1st - March 31st. Cutting during this time period however, could impact raptor nest sites as red-shouldered hawks will often re-use nests from the previous year. In light of this, raptor call back surveys will be conducted during the early nesting period of the spring prior to any timber harvest activity in order to identify nesting trees/areas so that these areas can be avoided during timber harvest

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

activities. A buffer of approximately 100 feet will be designated around any know nests within which no trees will be harvested.

Forest Health Considerations:

There are a number of invasive plant species at Cranberry Mountain WMA, including multiflora rose, mile-a-minute, Oriental bittersweet, autumn olive, Japanese barberry and hay-scented fern. Although these species currently occupy habitats on the WMA and may interfere with the establishment of native shrubs, tree regeneration and herbaceous vegetation, there is evidence that New England cottontails utilize multiflora rose and Japanese barberry for both food and cover. Insect pest species may include the emerald ash borer and the hemlock wooly adelgid. These pests typically target mature trees and should not limit regeneration from existing stock. White-tailed deer herbivory will be monitored using browse impact survey techniques starting in the spring of 2016. Browse impact surveys will be combined with a pellet count survey to serve as an index to deer populations on the WMA. Tools such as the DEC Deer Management Assistance Program (DMAP) could be considered as a tool to lower deer populations if it is decided that the current white-tailed deer population could limit the success of the objectives laid out in this plan.

Pre- and Post-treatment Considerations:

Pre- and post-treatment actions to promote the desired forest regeneration will be addressed in detail in the silvicultural prescriptions prepared for each project area. It is not likely that any control measures will be used to combat multiflora rose or Japanese barberry establishment since New England cottontails utilize both for food and cover. However, plantings of native shrubs such as dogwoods, buttonbush, spice bush, and willows in lowland and wet areas, and gray dogwood, high bush cranberry, Eastern ninebark, and *Rubus* sp. in the uplands could promote their establishment over invasive species. Control of autumn olive, mile-a-minute, Oriental bittersweet, and hay-scented fern could be accomplished through mechanical removal, herbicide, and/or fire if necessary.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife response 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.[18] 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 it is determined that adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI target species selected for Cranberry Mountain WMA, which may be assessed to determine response to management, include:

- New England cottontail
- American woodcock
- White-tailed deer
- Wild turkey

[18] DEC's Young Forest Initiative Monitoring Plan is available online at http://www.dec.ny.gov/outdoor/104218.html

Surveys will also be conducted for additional species that are not target species within the Young Forest Initiative, but species for which potential impacts should be avoided. These species include Indiana bat, northern long-eared bat, and forest nesting raptors, primarily red-shouldered hawk and sharp-shinned hawk. Surveys for both bat species will be conducted from May 15 to August 15, prior to harvest activities. Surveys for forest nesting raptors will occur during the spring prior to commencement of timber harvest activities.

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

- Maintain 15 acres of upland shrubland (5 acres naturally occurring, 10 acres created in 2013) to provide long-term habitat for New England cottontail.
- Increase shrubland acreage to 3% of total WMA acreage (35 acres total, 20 acres of new shrubland) by 2025 to benefit New England cottontail and other early-successional wildlife species.
- Enhance shrubland habitats at the WMA by encouraging native shrub species and controlling invasive species where practical and appropriate.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Naturally-occurring upland shrub-dominated communities are, at present, a minor habitat feature at the WMA and consist of three small isolated patches of scrub oak/mountain laurel thicket, totaling 5 acres, at higher elevations where soil and topographic characteristics favor these shrub communities over tree-dominated habitats. Additionally, 10 acres of shrubland were created in early 2013 through a whole tree mastication treatment of two areas that previously supported low-quality forest stands.

Aside from these areas, most of the WMA's field edges and hedgerows are shrub-dominated. While not accounted in the habitat inventory for this plan, these narrow strips function as shrubland habitat for a variety of species.

Target Species:

Species that will benefit from shrubland management include:

- New England cottontail
- American woodcock
- White-tailed deer
- Wild turkey
- Eastern towhee
- Field sparrow
- Bobcat

MANAGEMENT HISTORY

The only recent active shrubland management that has occurred on the WMA is the creation of 10 acres of shrubland that occurred in early 2013 through a whole tree mastication treatment performed by a forestry cutter. The treatment reduced canopy cover within the managed area to approximately 20% with the goal of rejuvenating shrub development. The natural shrub response was also supplemented through the planting of native shrub species propagated by DEC's Saratoga Tree Nursery.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016 - 2025** (Figure 6):
  - Treat all shrublands as needed with either a brush hog, forestry cutter, or by hand to remove undesirable vegetation and replace mature shrub species with a younger, denser shrub layer.
  - Conduct overstory thinning in stand 01015 to convert 15.4 acres of forest to permanent shrubland in 2016.

BEST MANAGEMENT PRACTICES

Any maintenance of shrublands will occur from September 1 through October 31 in order to minimize interference with New England cottontail and songbird breeding, and to avoid disturbance of over-wintering New England cottontails. During this time of year soils should be dry enough to minimize ground disturbance as well. When possible, mowing of shrublands will be done with low-impact machinery to further minimize ground disturbance.

MANAGEMENT EVALUATION

Monitoring efforts for New England cottontail began in 2010 and will continue on an annual basis through pellet collection in order to document use and abundance in all shrubland and adjacent forested habitats. Shrubland vegetation will also be monitored annually to drive management decisions as to whether invasive control or plantings are necessary to achieve the desired species composition.

GRASSLAND

Grasslands are open, grassy areas with a minimal amount of shrub and tree cover (<35%) that are maintained, or could be maintained, without significant brush cutting.

MANAGEMENT OBJECTIVES

- Maintain 16 acres of existing field and meadow habitat to provide habitat for meadow dependent wildlife such as eastern bluebird and American kestrel, contribute to landscape diversity and improve opportunities for public wildlife-dependent recreation.
- Enhance the quality of existing fields by creating a diversity of field cover types through planting of native warm season grasses (NWSG) to improve wildlife cover; annual and perennial herbaceous species such as clovers, small grains, and brassicas to improve forage resources; and native wildflowers to support pollinator populations.

- Increase field acreage to 5% of total WMA acreage (54 acres total, 38 acres of new field) through post-timber harvesting creation of small woodland openings (0.5 to 3 acres).
- Monitor fields for invasive species and control/eradicate where feasible.

DESCRIPTION OF EXISTING FIELD HABITAT AND TARGET SPECIES

There are 16 acres of field habitat on Cranberry Mountain WMA. These fields are clustered in a single field complex in the northeast corner of the WMA. The largest field is 11 acres with several smaller fields (~2.5 acres each) separated from the larger field by hedgerows. Because of the limited acreage and isolation from other suitable habitat, the WMA's fields do not support grassland nesting birds. Additionally, the WMA is far from any state-identified grassland bird focus areas, suggesting that the area will never be an important location for breeding grassland birds. However, while not providing ecologically meaningful grassland habitat, these fields provide a variety of other wildlife benefits. Meadow dependent breeding birds such as eastern bluebird, tree swallow, and American kestrel nest on or near the WMA. Many other wildlife species also use these fields for various life history requirements during the course of the year including American woodcock (courtship display), white-tailed deer (foraging, fawning), wild turkey (courtship display, poult and adult foraging), New England cottontail (foraging), migrating songbirds and raptors (foraging), and eastern box turtles (foraging, basking, and mate seeking).

The fields at the WMA also provide an important focal point for public wildlife-dependent recreation, especially hunting. DEC stocks propagated ring-necked pheasants on the WMA, and hunter attention for this species is generally concentrated on the area's field habitat. Additionally, because of the seasonal importance of fields for other popular game species including white-tailed deer, turkey, and cottontail, much hunter effort for these species also focuses on the WMA's field habitat.

Target Species:

Species that will benefit from field management include:

- New England cottontail
- American woodcock
- White-tailed deer
- Wild turkey
- American kestrel
- Ring-necked pheasant
- Eastern box turtle

MANAGEMENT HISTORY

Field management at Cranberry Mountain has generally focused on control and elimination of woody vegetation encroachment through rotational mowing. Mowing at the site undoubtedly predates DEC's ownership (1965) and it's likely that the WMA's fields were in agricultural production for decades prior to state acquisition. At present, the WMA does not have any current cooperative agricultural agreements, and mowing is completed by DEC staff. Fields are mowed on a three-year rotation with both whole field and strip mowing with retention of approximately 33 – 66% cover, which has generally been more popular with area users (hunters). Mowing is not conducted between April 15th and August 1st to minimize impacts to ground-

nesting birds and other young wildlife (deer fawns, rabbit nests, etc.).

In addition to mowing, DEC has undertaken several planting projects to improve the wildlife cover and forage resources and experience for recreational hunters visiting the area. In the early to mid-2000s, corn and other annual small grains were planted on the WMA to provide forage and cover resources and facilitate conversion of some of the field acreage to perennial species. Over the last 15 years, NWSG planting efforts have focused on regionally-appropriate cultivars of little and big bluestem, Indiangrass, and switchgrass over approximately 65% of the WMA's field acreage. Presently, NWSG making up 90% of the vegetative cover in most planted fields. Planting of NWSG at the WMA has utilized conventional tillage techniques including plowing, disking, removal of rocks, drill or broadcast seeding, and post-seeding cultipacking. In the future, the option of herbicide application and no-till planting will be considered for NWSG establishment on the WMA.

In 2008, mile-a-minute (*Persicaria perfoliata*), an invasive vine native to Asia, was first noted in the WMA's fields. As part of a control process, DEC staff removed several dense, brushy hedgerows in 2009 that were overgrown with mile-a-minute. During the growing season of 2009, an attempt at manual control (hand pulling) was undertaken but the mile-a-minute quickly exceeded control capacity. In 2010 and 2011, a biocontrol agent, a weevil (*Rhinocominus latipes*), was released in attempt to slow the spread of mile-a-minute on the WMA.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2025** (Figure 6):
    - Continue mowing WMA fields on a three-year rotation to prevent the encroachment of woody vegetation. Annual strip mowing will be favored when feasible; fields will be divided into strips with one-third of these being mowed each year.
    - Replant existing NWSG areas when coverage of these species declines below 50%. Planting may utilize conventional or no-till techniques and will favor local cultivars. Native wildflowers will constitute about 20% of any NWSG seed mix used on the WMA to support and encourage pollinator species.
    - Convert approximately half of the non-NWSG-dominated acreage (2.5 acres) to herbaceous openings where perennial forage species such as clovers, alfalfa, or bird's foot trefoil are planted to provide forage resources for game and non-game wildlife. These openings may require soil amendment (liming) prior to planting and will require additional mowing (twice per year) to remain productive.
    - Consider developing a burning prescription for NWSG-dominated areas of the field complex.
    - Create 19 acres of new fields in the form of small woodland openings. These fields will be created following commercial timber harvesting operations; i.e. after harvest in areas that are commercially clearcut, 0.5 to 3-acre patches with suitable slope (<5%), aspect, and drainage will be selected for stump and rock removal, grading, and planting with perennial forage species. Where possible, these woodland openings will incorporate already disturbed areas such as log landings. These openings will complement management completed for young forest target species such as New England cottontail, American woodcock, white-tailed deer,

and wild turkey that use herbaceous opening to meet life history requirements.

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*.[19] 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.
- 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.

[19] 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.

- 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 doing so 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

No routine monitoring of field-dependent wildlife is planned at Cranberry Mountain WMA. Because several young forest target species on the WMA will opportunistically use field habitats when available and adjacent to other suitable habitat, monitoring for these species completed under the auspices of the YFI will assess, to some degree, population trends and usage of field habitats by these species. DEC will monitor vegetative cover in fields on the WMA to assess the need for replanting. These assessments will be annual and qualitative.

Annual monitoring of both the weevil population used to manage mile-a-minute, and the abundance and cover of mile-a-minute are conducted by the Lower Hudson Valley Partnership for Regional Invasive Species Management (PRISM) and DEC staff.

AGRICULTURAL LAND

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

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

There is currently no agricultural land on Cranberry Mountain WMA and no plan to develop such 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 existing man-made impoundments by preventing the growth of woody vegetation on impoundment dikes and as necessary, maintaining the control structures.
- Minimize ground disturbance impacts on natural wetlands by restricting active management requiring equipment entry (e.g. woody vegetation removal) to frozen conditions whenever feasible.
- Monitor wetland habitats for invasive species and control/eradicate where feasible.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

As discussed in the Special Management Zones section, Cranberry Mountain WMA has 67 acres of natural wetland (split between 3 separate state-regulated wetlands) and 6 small, man-made impoundments, totaling 6 acres (Figure 3). Additionally, the WMA contains several seasonal woodland wetlands (vernal pools) that provide important breeding habitat for amphibians. The wetlands contain forested swamp, scrub/shrub, emergent marsh, and open water wetland habitats. The wetlands are diverse and provide habitat for species such as:

- American woodcock
- Beaver
- Migratory waterfowl
- Muskrat

MANAGEMENT HISTORY

Unlike many WMAs in the state, Cranberry Mountain was not acquired specifically to protect or provide public access to a significant natural wetland. However, following acquisition of the original part of the WMA in the mid-1960s, the state almost immediately dedicated resources to create 6 small wetland impoundments ranging from 0.1 to 2.5 acres under the P-R "Muskrat Marsh" program. These impoundments were constructed to improve both habitat diversity as well as opportunities for public hunting and trapping and continue to fulfill these functions. The earthen dams that form these wetlands are mowed and cleared of woody vegetation when necessary. The control structures, which consist of poured concrete boxes with removable boards to allow manipulation of water levels, are likely the original structures and are in need of replacement and are not currently used to manipulate water levels.

The other wetlands are located on the most recently acquired portion of the WMA (south of Haviland Hollow Road) and are naturally occurring with no active management ongoing or planned.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2025:**
    - Continue routine maintenance on earthen dams and control structures so that they function to impound water.

- Chemically control 0.2 acres of phragmites (common reed) at the largest impoundment with herbicide and backpack sprayers in 2016. Conduct additional follow-up treatments as needed in successive years and evaluate the need for replanting with native species such as cattail.

BEST MANAGEMENT PRACTICES

Herbicide treatment of phragmites will occur in the fall, when plants are at peak height and most actively drawing nutrients.

MANAGEMENT EVALUATION

Annually survey wetland areas for invasive species including phragmites, purple loosestrife, and other significant wetland invasives.

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).

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

There is no open water habitat on the WMA nor any plan to develop such habitat.

HABITAT MANAGEMENT SUMMARY

In summary, Table 6 lists the habitat management actions planned for Cranberry Mountain WMA over the next ten years. Any substantive changes will be appended to this HMP annually or as needed (Appendix D).

Table 6 Summary of habitat management actions recommended for Cranberry Mountain WMA, 2016-2025. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut/seedtree cut stands 01001, 01002, 01003, 01005, 01006, 01007, 01008, 01009 to create young forest with 38 acres of permanent wildlife openings.	172	2016-2020
Forest	Reduce overstory by 65% in stand 01015 to create permanent shrubland	18	2016-2020
Shrubland	Treat all shrublands as needed with brush hog, forestry cutter, or by hand to remove undesirable vegetation and replace mature shrubs with young denser shrubs	35	2021-2025
Fields	Plant forbs (e.g. clover), warm and cool season grasses, promote establishment of native herbaceous vegetation and mow as needed.	35	2016-2025

III. FIGURES

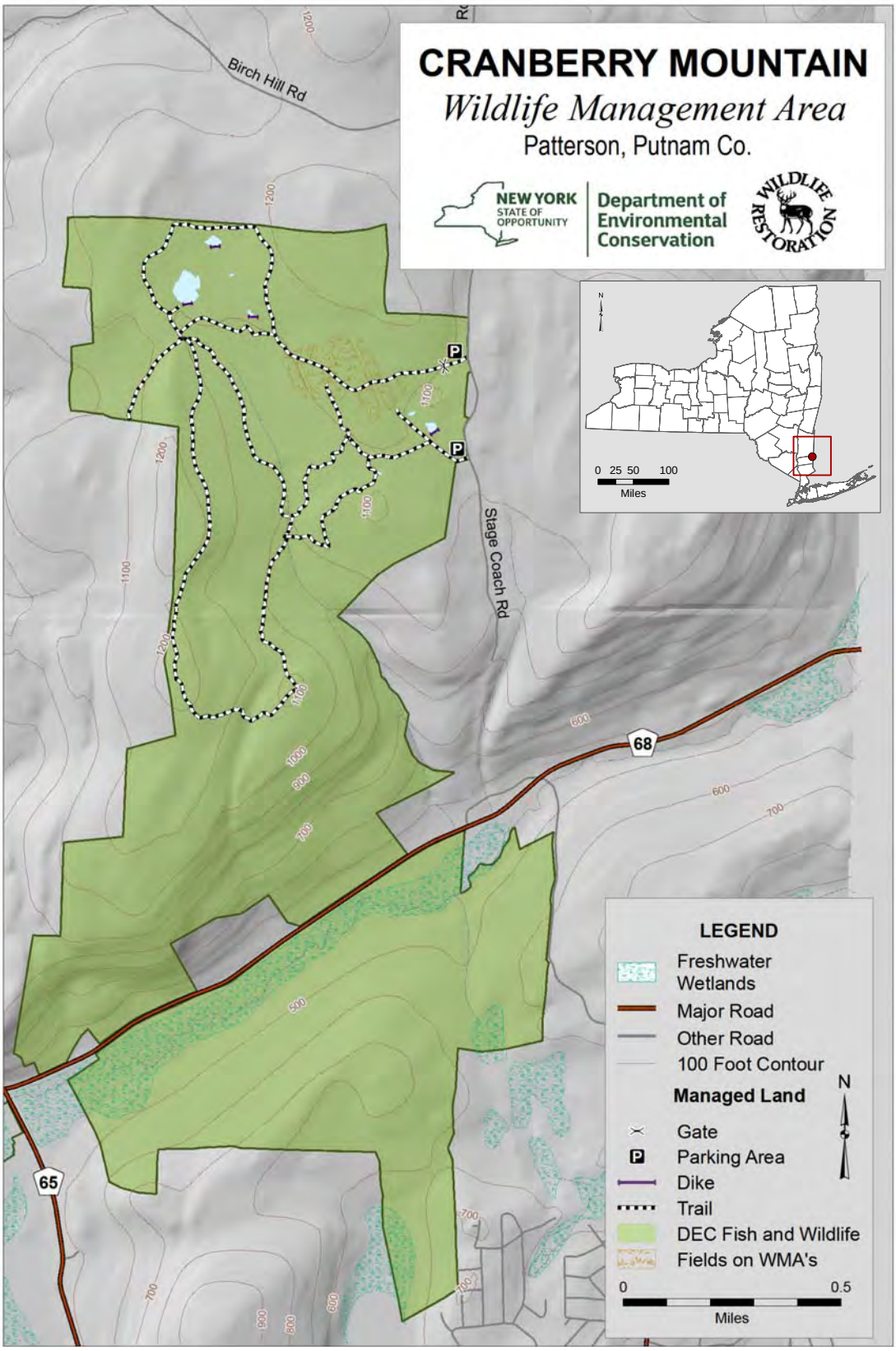

FIGURE 1. Location and access features at Cranberry Mountain WMA.

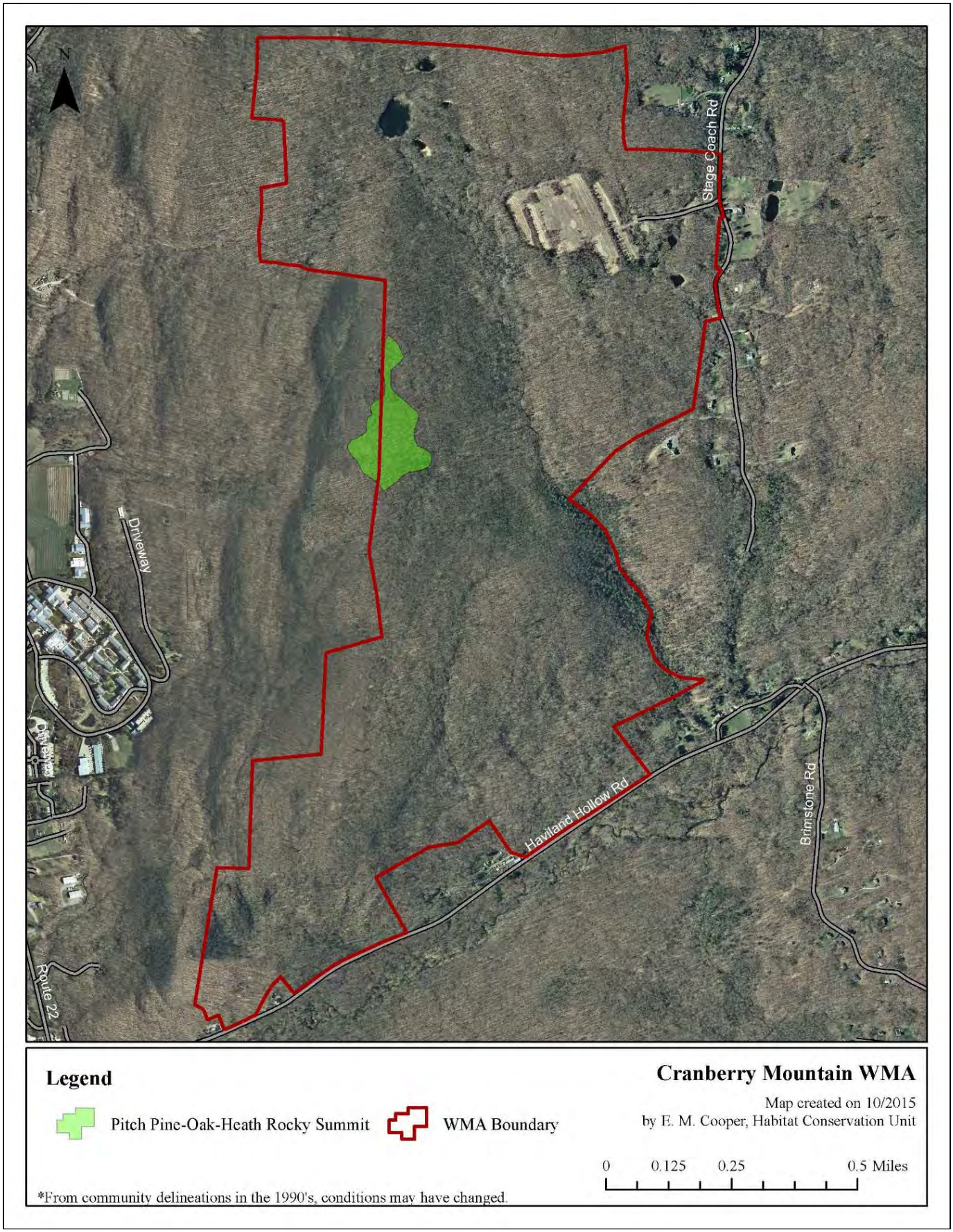

FIGURE 2. Significant ecological communities on Cranberry Mountain WMA. Data from the NY Natural Heritage Program.

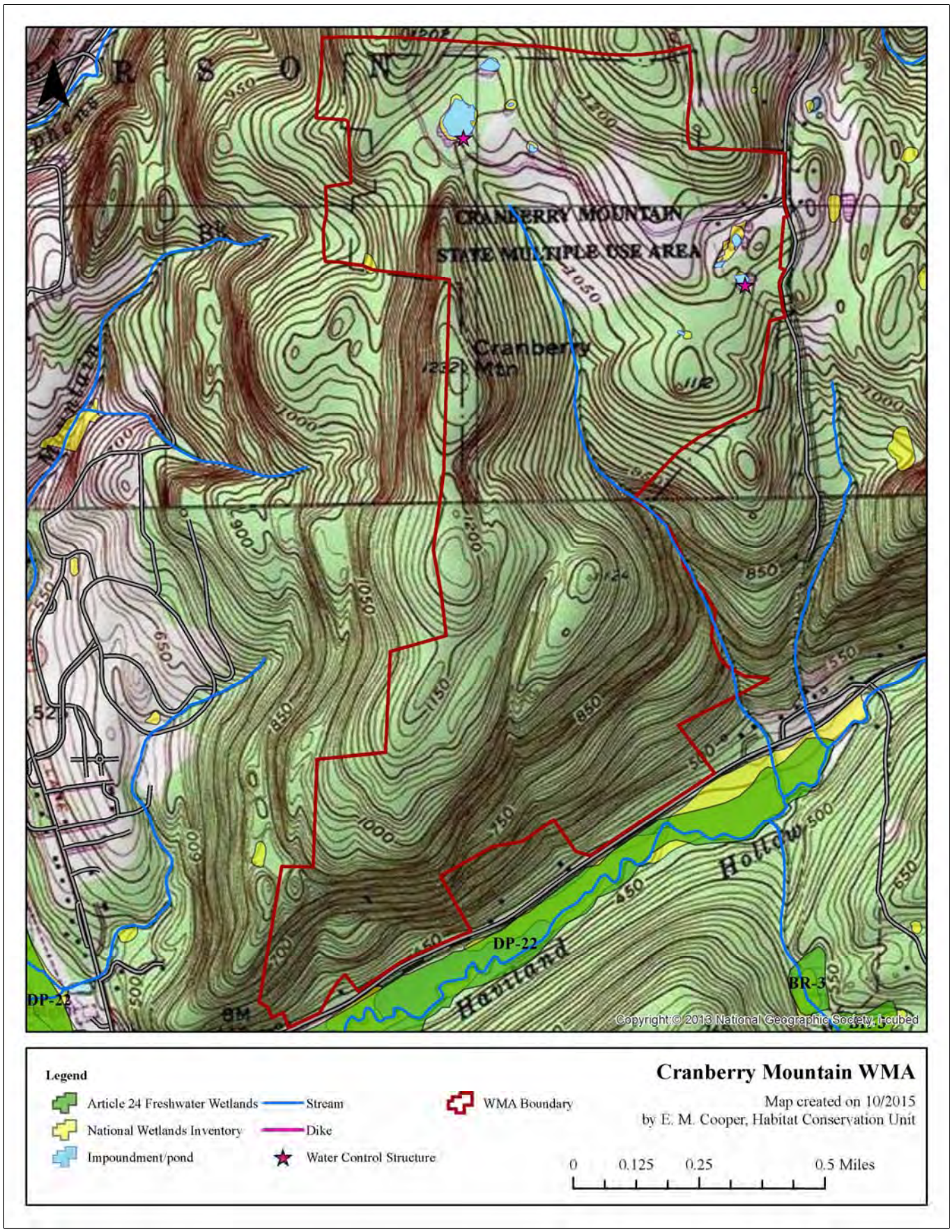

FIGURE 3. Wetlands, open water, and streams of Cranberry Mountain WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

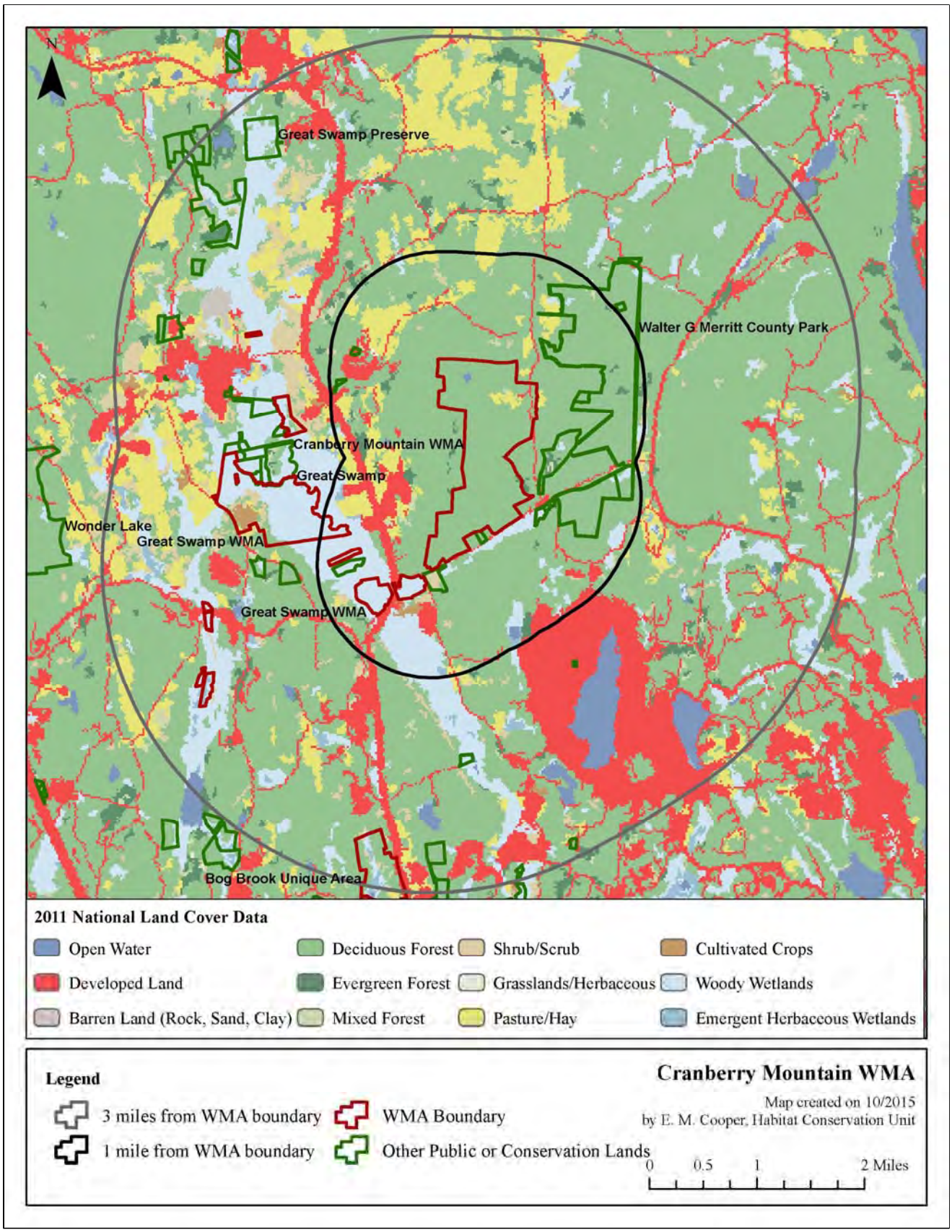

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Cranberry Mountain WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat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

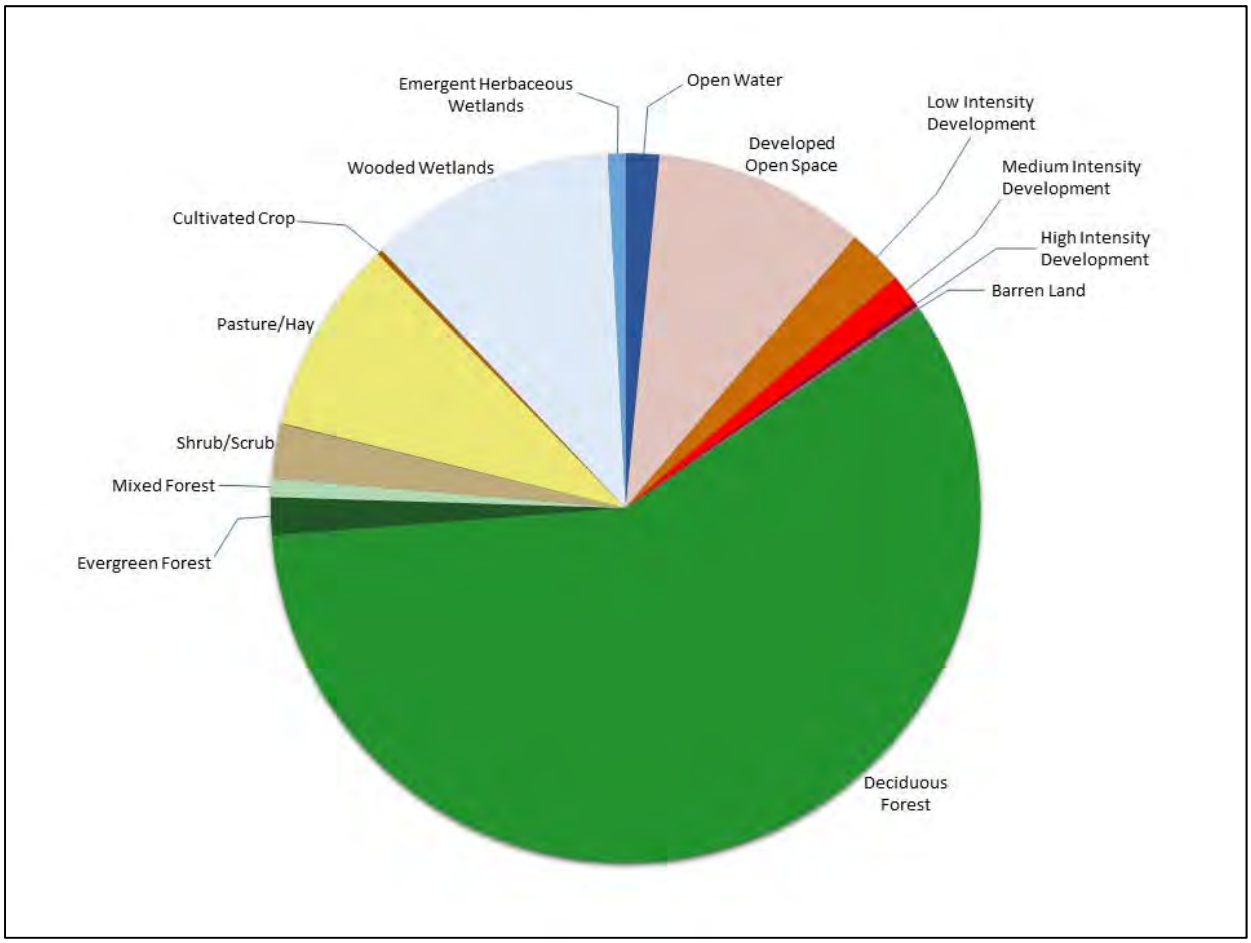

FIGURE 5. Percent cover of land cover types within three miles of Cranberry Mountain WMA. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

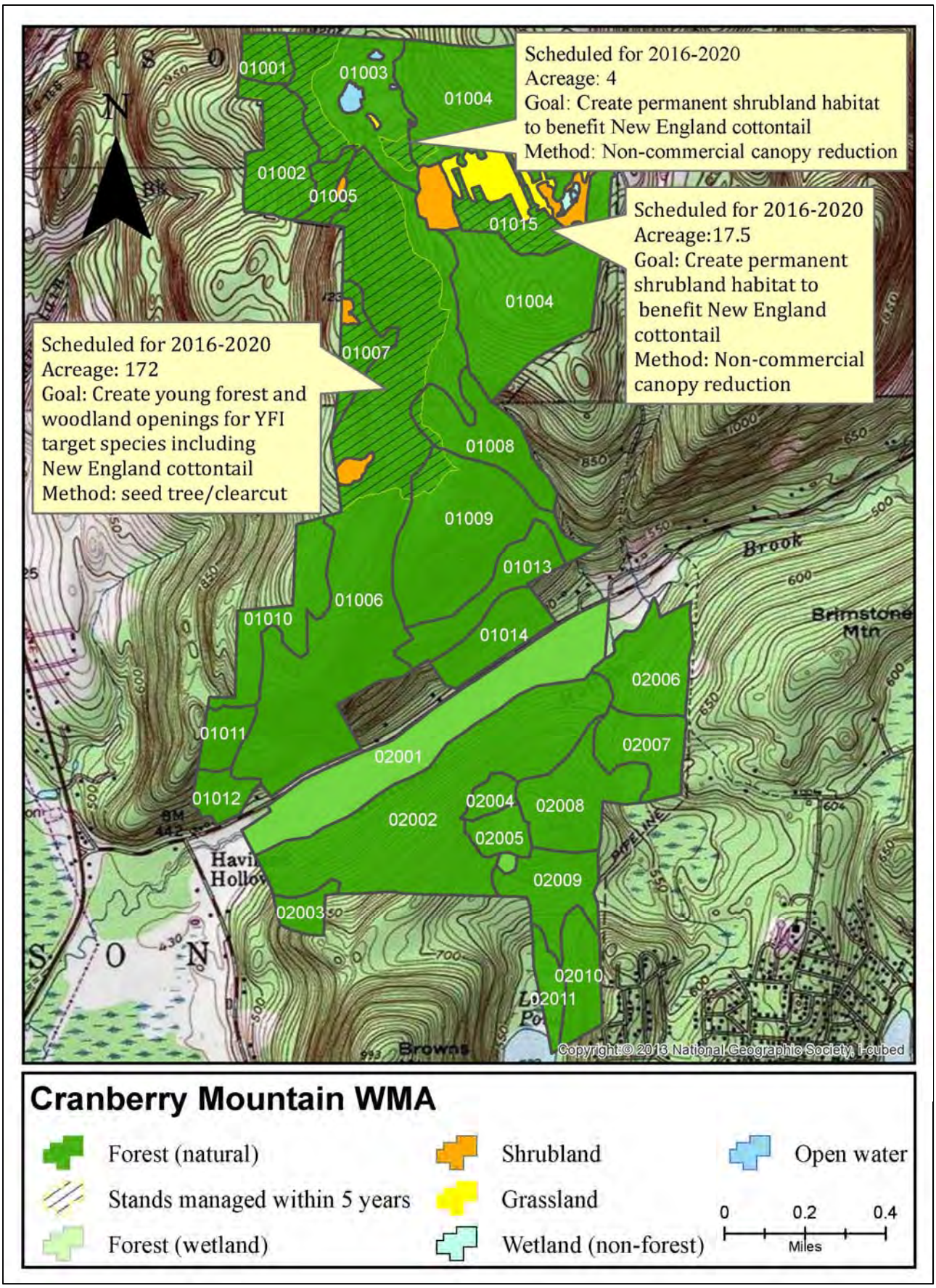

FIGURE 6. Habitat types and location(s) of proposed management on Cranberry Mountain WMA. Numbers indicate the stand number from habitat inventory.

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. 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.

FY 16-17 (4/1/16 - 3/31/17)