Habitat Management Plan
for
Hanging Bog Wildlife Management Area
2016 – 2025

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SUMMARY

Hanging Bog Wildlife Management Area (WMA), totaling 4,560 acres, has a rich history and has become one of the principle areas for ruffed grouse management in New York State. The U.S. Department of Agriculture acquired the property in the 1930s under the Bankhead-Jones Farm Tenant Act and managed it as a Civilian Conservation Corp (CCC) camp. After 1940, the federal government leased the land to the state as a game management area. Hanging Bog (WMA) was deeded to New York State from the federal government around 1962. It was named for a manmade bog that was constructed by the CCC in the late 1930s. Additional acreage has been acquired under the Park and Recreation Land Acquisition Act. The majority of the property acquired from the federal government is under administration by the Division of Fish and Wildlife and managed as Hanging Bog WMA. The remaining property adjoining much of the WMA is under administration by the Division of Lands and Forest and managed as Crab Hollow State Forest (1,154 acres) to the west and Rush Creek State Forest (1,404 acres) to the east. There are also a number of private parcels adjoining the WMA.

Hanging Bog WMA has historically been managed for ruffed grouse. Timber management in the form of hardwood and conifer clearcuts of various sizes and locations have occurred since 1988. A ruffed grouse focus area, mapped in a checker board pattern of alternating 5 acre patch clearcuts, was established in 1988.

Hanging Bog WMA is also host to one of four environmental education camps operated by the Department of Environmental Conservation (DEC) in New York. The camp was constructed in 1951 from logs salvaged from the Adirondacks after the blow down of 1950. Camp Rushford is the only DEC camp specifically designed and built as a conservation education camp.

Habitat management goals for Hanging Bog include:

- Manage approximately 12% of the WMA (13.7% 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 76% as intermediate and mature forest, including forested wetland;
- Manage 4% of the WMA as grassland habitat providing critical habitat for a variety of grassland-dependent species and to provide ring-necked pheasant release areas for hunting;
- Manage 5% as early successional shrublands;
- Manage approximately 2% of the WMA as natural and impounded wetlands;
- Manage 1% as open water habitat, maintaining water control structures and dikes on a number of small marshes, ponds, and potholes, providing aquatic habitat for a number of wildlife species.

I. BACKGROUND AND INTRODUCTION

PURPOSE OF HABITAT MANAGEMENT PLANS

BACKGROUND

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

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

SCOPE AND INTENT

Primary purposes of this document:

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

Within the next 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

Hanging Bog Wildlife Management Area is located in DEC Region 9, Town of New Hudson, Allegany County (Figure 1).

Total Area

4,560 acres

Habitat Inventory

A habitat inventory of the WMA was conducted in 2015 to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. A forest inventory will be completed in 2016 and is proposed to be updated every ten to fifteen years. 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 Hanging Bog WMA.

Habitat Type	Current Conditions (as of 2016)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	3,669	80.4%		3,441.1	Decrease to 75.4%[b]
Young forest	391	8.6%		547.8	Increase to 12%
Shrubland	192.1	4.2%		227.8	Increase to 5%
Grassland	114.6	2.5%		150	Increase to 3.3%
Agricultural land	0	0%		0	No Change
Wetland (natural) [c]	12.4	0.3%		12.4	No Change
Wetland (impounded) [c]	49.5	1.1%		49.5	No Change
Open water	25.9	0.6%		25.9	No Change
Other (Facilities/Parking lot)	18.2	0.4%		18.2	No Change
Roads	87.3	1.9%	18.7	87.3	No Change
Rivers and streams			15.4		No Change
Total Acres:	4,560	100%		4,560	

[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 Hanging Bog WMA include species commonly found on the Appalachian Plateau region of southwestern New York such as:

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

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or state Special Concern (SC) species and/or Species of Greatest Conservation Need (SGCN) may occur on the WMA (Table 2).[1] SGCN listed below include species that have been documented on or within the vicinity of the WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. Data sources include: the NY Natural Heritage Program, NY

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

Breeding Bird Atlases,[2] NY Reptile and Amphibian Atlas,[3] and DEC wildlife surveys and monitoring.

Table 2. Species of conservation concern that may be present on Hanging Bog 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
	Canada warbler			HP
	Eastern meadowlark			HP
	Northern harrier		T	x
	Pied-billed grebe		T	x
	Prairie warbler			x
	Red-shouldered hawk			x
	Ruffed grouse			x
	Scarlet tanager			x
	Wood thrush			x
Mammals	Eastern red bat			x
	Little brown myotis			HP
	Northern myotis (long-eared bat)	T	T	HP
	Silver-haired bat			x
Amphibians and reptiles	Blue-spotted salamander			HP
	Snapping turtle			x
Fish	Brook trout			x
Invertebrates	Spatterdock darner			x
Plants	None known			

Significant Ecological Communities:

There are nineteen ecological communities on Hanging Bog WMA and one rare and significant natural community as identified by the NY Natural Heritage Program. The state rank reflects the rarity within NY, ranging from S1, considered the rarest, to S5, considered stable; definitions are provided in Appendix A. The following significant ecological community occurs on the WMA;

[2] Available online at http://www.dec.ny.gov/animals/7312.html.
[3] Available online at http://www.dec.ny.gov/animals/7140.html.

community descriptions are from *Ecological Communities of New York State, Second Edition* [4] (Figures 3 and 4):

- **Dwarf shrub bog** (NY Status– S3) an ombrotrophic or weakly minerotrophic peatland dominated by low-growing, evergreen, ericaceous shrubs and peat mosses (*Sphagnum* spp.). The surface of the peatland is typically a mosaic of hummock/hollow microtopography. The hummocks tend to have a higher abundance of shrubs than the hollows; these bogs have more than 50% cover of low-growing shrubs. Water is usually nutrient-poor and acidic.

Additional information about significant ecological communities is available in the Hanging Bog WMA Biodiversity Inventory Final Report (1995) prepared by the NY Natural Heritage Program.

Special Management Zones:

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

- Three freshwater wetlands regulated by Article 24 of the Environmental Conservation Law and several additional wetlands shown on the National Wetlands Inventory (NWI; Figures 5 and 6). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated wetland boundary, known as the adjacent area. There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.
- 21 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 Class C (TS) (ts) standard indicates trout spawning has been observed within the stream.[5]
- A number of natural and constructed 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.*[6] 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 Hanging Bog

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

WMA (Figure 7). The landscape within a three mile radius of the WMA is primarily privately-owned land including: [7]

- Deciduous forest (52.9%)
- Pasture/Hay (20.6%)
- Mixed forest (6.8%)
- Evergreen forest (6.2%)
- Cultivated crops (5.6%)
- Wetlands (3.1% combining open water, emergent and woody wetlands)
- Developed (2.3%)
- Shrub/Scrub (1.9%)
- Grasslands/Herbaceous (0.6%)

Hanging Bog WMA is adjacent to Crab Hollow (1,154 acres) and Rush Creek (1,404 acres) State Forests. The hardwood and softwood stands of these state forests are managed through a series of thinnings which remove the lower quality trees and give more growing space to the best quality trees. Periodic thinnings in the red pine plantations have allowed native hardwoods to seed into the sunlit openings. Many of the pine stands have reached maturity and the remaining overstory is now being removed to allow the hardwoods to grow to maturity.

The management goals typically used for the hardwood and softwood stands on the nearby state forests differ from the management goals for Hanging Bog WMA. The goal at Hanging Bog is to create young forest habitat on WMAs 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 Hanging Bog 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.

[7] Land cover types are from the 2011 National Land Cover Data (NLCD). NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php

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.

Mature natural forest stand.

Photo: Nick Brown, NYSDEC

Forest management on Hanging Bog WMA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat. [8]

MANAGEMENT OBJECTIVES

- Increase young forest acreage from an existing 391 acres to 547.8 acres to improve habitat for ruffed grouse, American woodcock, white-tailed deer, and wild turkey.
    - Continue existing patch cutting program.
- Convert select softwood plantations into native hardwood stands (44.3 acres).
- Retain existing forested wetlands (24 acres) due to the relative scarcity of forested wetlands within the WMA and surrounding landscape.

[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.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 4,060 forested acres on Hanging Bog WMA. Forested habitat primarily consists of intermediate/mature natural forest with a species composition typical to that of a transition hardwood forest or a northern hardwood (NH) forest. Due to its large size, Hanging Bog WMA has been divided into five compartments. Over the course of the 10 year management plan for the property, select acres of natural forest will be converted to shrubland, resulting in a decrease in the total amount of forested acres from 4,060 to 3,988.9 acres, further detailed in shrubland management below. Table 3 provides a breakdown of forested acres across Hanging Bog WMA.

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

Forest Type	Acres (as of 2016)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	2,918	2,734.4	Red maple, sugar maple, red oak
Plantation	727	682.7	Norway spruce, red pine
Forested wetland	24	24	Black willow, alder
Young forest	391	547.8	
Young forest (forested wetland)	0	0	
Total Forested Acres:	4,060	3,988.9	

Soils on Hanging Bog WMA are mostly loamy tills common to glaciated uplands. The soil group found throughout the Hanging Bog WMA is Volusia-Mardin-Lordstown.[9] Depths vary from moderately deep to deep, with a fragipan layer 10 to 26 inches from the surface. Volusia soils are also acidic. The low pH and root restrictive layers can negatively influence tree growth. Forest types typically associated with this soil group are northern hardwoods and northern hardwood-oak transition forests.[10] Despite the somewhat poor soil conditions at Hanging Bog WMA it is possible to achieve large sawtimber, however the timeframe to do so may be longer than that of a more favorable site with better soil conditions.

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

- **American Woodcock:**
  - Singing/peenting ground – Open areas from 1 acre to over 100 acres usually in an abandoned field.
  - Daytime areas – Moist, rich soils w/ dense overhead cover of young alders, aspen, or birch.
  - Nesting – Young open, second growth woodlands.

[9] 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.
[10] Soil Survey of Allegany County. 1956. USDA. U.S. Bureau of Chemistry and Soil.

- Brood rearing – Similar to nesting except there needs to be bare ground and dense ground cover.
- Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields.[11]

- **Ruffed Grouse:**
  - Drumming areas – Downed trees surrounded by small diameter woody cover.
  - Foraging – Open areas with dense overhead cover of young forest with good mast production.
  - Nesting – Young open forest stands or second growth woodlands.
  - Brood rearing – Herbaceous ground cover with a high midstory stem density.[12]

Ruffed grouse (*Bonasa umbellus*).

Photo: Ruffed Grouse Society website (http://www.ruffedgrousesociety.org/Photos#.Vw4-B6Oospg)

- **Wild Turkey (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]

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

- **White-tailed Deer (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

Hanging Bog WMA has been actively managed throughout its history, primarily through a patch cutting program established in 1988 to provide ruffed grouse habitat. To date, a total of 818 acres, 578 acres of natural forest and 240 acres of plantations, have been clearcut on the WMA. An additional 21 acres have been cleared through salvage operations due to natural disturbances. There have also been numerous local firewood sales, typically with a revenue less than $500 and ranging from 1 to 20 acres, throughout the property dating back to the 1970s.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

Past even-aged management has established 391 acres of young forest habitat on Hanging Bog WMA.

The following management is proposed to create 547.8 acres or 13.7% young forest of the total forested acres for the next ten years:

- **Management planned for 2016-2020** (Table 4, Figures 9-14):
  - Carry out the next phase of scheduled hardwood patch cuts in Compartment A Stands 126, 138, 140, 141, 143, 145, 150, 163, 165, 167, and 168 (38.3 acres).
  - Carry out the final phase of scheduled hardwood patch cuts in Compartment A Stands 15, 42, 44, 54, 64, 80, 82, 84, 112, 121, 123, and 125 (72.4 acres).
  - Clearcut softwood plantations compromised of Norway spruce in Compartment E Stand 33 and red pine in Compartment D Stands 19, 26, 39, 40, 41, and 51 (44.3 acres).
  - Hardwood clearcuts in Compartment E Stands 48 and 52 (30.7 acres).
  - Hardwood clearcut in Compartment C Stands 7.2 and 7.4 (35.9 acres).
- **Management planned for 2021-2025** (Table 5, Figures 9-14):
  - Hardwood clearcut in Compartment C Stands 8, 9.2, and 10 (74.1 acres)
  - Create a hardwood clearcut mosaic in Compartment B Stands 41, 54, 71, 80, 96, 98, 100, 102, and 114 (29.4 acres).
  - Clearcut hardwood in Compartment D Stand 9.2 (20.3 acres).
  - Clearcut hardwood in Compartment A Stands 52 and 34 (52.5 acres).
  - Hardwood clearcut in Compartment B Stands 49, 51, and 120 (50.8 acres).

[15] Halls, L. K., ed. 1984. White-tailed Deer: Ecology and Management. The Wildlife Management Institute. Stackpole Books, PA. 864 pp.

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

Compartment - Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-126	1.2	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-138	3.7	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-140	1.5	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-141	4.5	Small Sawtimber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-143	3.8	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-145	3.2	Pole Timber	Other Natural Stands	Young Forest	Wildlife	Clearcut
A-150	2.0	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-163	5.0	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-165	5.3	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-167	8.1	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-15	4.6	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-42	8.6	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-44	6.8	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-54	13.9	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-64	7.2	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-80	2.7	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-82	3.2	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-84	2.7	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-112	5.3	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut

Table 4. Continued

Compartment - Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-121	6.8	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
A-123	6.3	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
A-125	4.3	Pole Timber	Northern Hardwood	Young Forest	Wildlife	Clearcut
E-33	8.4	Pole Timber	Norway Spruce	Young Forest	Wildlife	Clearcut
D-19	4.2	Pole Timber	Red Pine	Young Forest	Wildlife	Clearcut
D-26	4.8	Pole Timber	Red Pine	Young Forest	Wildlife	Clearcut
D-39	5.1	Pole Timber	Red Pine	Young Forest	Wildlife	Clearcut
D-40	3.8	Small Sawtimber	Red Pine	Young Forest	Wildlife	Clearcut
D-41	8.5	Small Sawtimber	Red Pine	Young Forest	Wildlife	Clearcut
D-51	9.5	Pole Timber	Red Pine	Young Forest	Wildlife	Clearcut
E-48	11.5	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
E-52	19.2	Small Sawtimber	NH-White Pine	Young Forest	Wildlife	Clearcut
C-7.2	19.2	Pole Timber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
C-7.4	16.7	Pole Timber	Northern Hardwoods	Young Forest	Wildlife	Clearcut

Table 5. Forest management schedule for the second five-year period of this HMP (2021-2025).

Compartment - Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
C-8	15.7	Small Sawtimber	NH- White Pine	Young Forest	Wildlife	Clearcut
C-9.2	42.4	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
C-10	16.0	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-41	4.2	Small Sawtimber	Northern Hardwoods	Young Forest	Wildlife	Clearcut

Table 5. Continued

Compartment - Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
B-54	3.9	Medium Sawtimber	Other Natural Stands	Young Forest	Wildlife	Clearcut
B-71	3.1	Medium Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-80	2.2	Medium Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-96	2.6	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-98	2.9	Medium Sawtimber	Northern Hardwoods	Young Forest	Wildlife	Clearcut
B-100	1.9	Medium Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-102	2.3	Small Sawtimber	Northern Hardwoods	Young Forest	Wildlife	Clearcut
B-114	6.3	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
D-9.2	20.3	Pole Timber	Other Natural Stands	Young Forest	Wildlife	Clearcut
A-34	26.4	Pole Timber	Northern Hardwoods	Young Forest	Wildlife	Clearcut
A-52	26.1	Medium Sawtimber	Northern Hardwoods	Young Forest	Wildlife	Clearcut
B-49	20.6	Small Sawtimber	Other Natural Stands	Young Forest	Wildlife	Clearcut
B-51	9.2	Small Sawtimber	Transition Hardwoods (NH-Oak)	Young Forest	Wildlife	Clearcut
B-120	21.0	Pole Timber	Other Natural Stands	Young Forest	Wildlife	Clearcut

Stand locations and planned management actions are also summarized in Figures 9-14. 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 2016-2020 (221.6 acres):

Forested Wetlands (24 acres[16]):

- **Compartment A Stands 20 and 21**

  Forested wetland (24 acres) will be kept as is due to its low abundance throughout Hanging Bog WMA.

Transition Hardwoods (76.8 acres):

- **Compartment A Stands 15, 42, 80, 82, 84, 112, 121, 126, 138, 150, and 165**
- **Compartment C Stand 7.2**
- **Compartment E Stand 48**

  Clearcut a combined 76.8 acres of transition hardwoods (NH-Oak) forest to establish young forest for target species, listed above. Special consideration will be given to retaining wildlife trees (snags, cavity, legacy, and reserve trees) throughout the project area for the purpose of providing wildlife habitat as well as mast and seed sources. Sources of native hardwood regeneration are not a concern given the adjacent mature hardwood forest as well as the acceptable growing stock within the stands. Interfering vegetation, primarily American beech and striped maple, is present in the understory and may hinder desirable regeneration, therefore pre- or post-treatment herbicide applications may be necessary to aide in the establishment of preferred vegetation.

Northern Hardwoods (78.1 acres):

- **Compartment A Stands 44, 54, 64, 123, 125, 140, 141, 143, 163, and 167**
- **Compartment C Stand 7.4**

  Clearcut a combined 78.1 acres of northern hardwood forest to establish young forest for target species, outlined above. Special consideration will be given to selecting wildlife trees throughout the project area for the purpose of providing wildlife habitat as well as mast and seed sources. Sources of native hardwood regeneration are not a concern given the adjacent mature hardwood forest as well as the acceptable growing stock within the stands. Interfering vegetation, primarily American beech, is present in the understory and it may hinder desirable regeneration, therefore pre- or post-treatment herbicide applications may be necessary to aide in the establishment of preferred vegetation. Additionally, Japanese barberry was observed in stand 163.

Other – Natural (3.2 acres):

- **Compartment A Stand 145**

  Clearcut 3.2 acres of other - natural forest composed mostly of low grade mature shagbark hickory, pole size white ash and aspen to establish young forest for target species. Wildlife trees are abundant in the stand. Special consideration will be given to leaving these trees throughout the project area for the purpose of providing additional wildlife habitat as well as mast and seed sources. Stand A-145 is an inferior quality site where vegetation growth is inhibited, therefore achieving and maintaining large sawtimber in a realistic time frame is unlikely. Invasive and interfering vegetation, such as ironwood and blue beech, will be managed pre- and post-treatment as needed.

[16] Forested wetland acres not included in total management acreage for 2016-2020 (221.6 acres).

Norway Spruce (8.4 acres):

- **Compartment E Stand 33**

  Clearcut southern half (8.4 acres) of Norway spruce plantation to create young forest habitat for target species. Sources of desirable seed should readily move into the stand from surrounding hardwood stands.

Red Pine (35.9 acres):

- **Compartment D Stands 19, 26, 39, 40, 41, and 51**

  Clearcut a total of 35.9 acres of red pine plantations in the eastern portions of stand 19; the western portions of stands 26, 39, and 40; and all of stands 41 and 51 to create young forest habitat for target species. Sources of desirable seed should readily travel into these stands from surrounding hardwood stands. Undesirable vegetation, American beech and ferns (spp), will be managed pre- and post-harvest, as needed.

Northern Hardwood – White Pine (19.2 acres):

- **Compartment E Stand 52**

  Clearcut western half (19.2 acres) of northern hardwood – white pine forest to create young forest habitat for target species. The remaining unmanaged half will be revisited at a later time. Retention guidelines will be considered for residual trees throughout treatment areas. Sources of desirable seed should readily travel into the stand from surrounding hardwood stands. Undesirable vegetation, including American beech, blue beech, buckthorn, and autumn olive, will be managed pre- and post-harvest, as needed.

Management for 2021-2025 (227.1 acres):

Transition Hardwoods (83.7 acres):

- **Compartment B Stands 51, 71, 80, 96, 100, and 114**
- **Compartment C Stands 9.2, 10**

  Clearcut a combined 83.7 acres of transition hardwoods (NH-Oak) forest to establish young forest for target species, listed above. Special consideration will be given to residual wildlife trees throughout the project area for the purpose of providing additional wildlife habitat as well as mast and seed sources. Sources of native hardwood regeneration is not a concern given the adjacent mature hardwood forest as well as the acceptable growing stock within the stands. Interfering vegetation, such as American beech, striped maple, and blue beech, is present in the understory and it may hinder desirable regeneration, so post treatment herbicide applications will aide in the establishment of preferred vegetation.

Northern Hardwoods (61.9 acres):

- **Compartment A Stands 34 and 52**
- **Compartment B Stands 41, 98, and 102**

  Clearcut a total of 61.9 acres of mature northern hardwood forest to create young forest habitat for target species. Each stand will be clearcut entirely, with exception to Compartment 1 Stand 52 which only the northern half will be treated. Retention guidelines will be considered for residual trees throughout treatment areas. Sources of native hardwood regeneration is not a concern given the adjacent mature hardwood forest as well as the

acceptable growing stock within the stands. Undesirable vegetation, primarily American beech and ironwood, will be managed pre- and post-harvest, as needed.

Other - Natural (65.8 acres):

- **Compartment B Stands 49, 54, and 120**
- **Compartment D Stand 9.2**

Clearcut a total of 65.8 acres of other – natural forest to establish young forest for target species. These stands consist of similarly low percentages of northern hardwoods, transition hardwoods, pioneer hardwoods, and conifers. Sources of desirable seed should readily travel into these stands from surrounding hardwood stands. Also, the seed bank of each stand may contain viable hardwood seed. American beech will be managed pre- and post-harvest, as needed.

Northern Hardwood – White Pine (15.7 acres):

- **Compartment C Stand 8**

Clearcut a total of 15.7 acres of northern hardwood – white pine forest to create young forest habitat for target species. Retention guidelines will be considered for residual trees throughout treatment areas. Undesirable vegetation, including American beech, striped maple, and ironwood, will be managed pre and post-harvest, as needed.

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.

The Northern long-eared bat has been documented on Hanging Bog WMA. 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 a U. S. Fish and Wildlife Service (USFWS) approved 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.

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

Forest Health Considerations:

Undesirable species may outcompete desirable regeneration. In stands with an understory dominated by undesirable vegetation pre- or post-treatments will be applied. Observed interfering and invasive vegetation includes: American beech, ironwood, striped maple, cucumber tree, Japanese barberry, honeysuckle, buckthorn, ferns and grasses.

As of 2016, Hanging Bog WMA is not located within an emerald ash borer quarantine zone therefore additional regulations on ash wood products do not currently apply. However standard firewood regulations do apply in attempts to minimize the spread of invasive species.

White-tailed deer herbivory varies throughout Hanging Bog WMA. It poses a concern to regenerating vegetation in certain areas and has little impact in others. In high concern areas, regeneration enclosures may be constructed to reduce browse. Lastly, the poorly suited soils found on the property may result in slow tree growth.

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.

Pre- and post-treatments occur at the stand level and achieve several goals. Primarily they reduce competing vegetation, expose mineral soil, and improve the seedbed.[18] Pre- and post-treatment actions are typically carried out through mechanical or chemical means. However, certain ecological situations may be best treated through prescribed burning.

Treatments will usually serve to control invasive and/or interfering vegetation. Anticipated mechanical treatments include cutting invasive/undesired species from the understory and/or soil scarification. Commonly used chemical treatments involve herbicide application to reduce vegetative competition. Also, planting native shrub/tree species may be warranted to provide specific habitat needs for target wildlife species.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife response has 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.[19] The Monitoring Plan establishes statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three, and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Hanging Bog WMA, which may be assessed to determine response to management, include:

- American woodcock
- Ruffed grouse
- Wild turkey

[18] Nyland, R.D. 2007. Silviculture: Concepts and Applications 2nd ed. Waveland Press.
[19] Available online at http://www.dec.ny.gov/outdoor/104218.html.

- 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 227.8 acres of shrubland habitat (5% of the WMA), providing habitat for a variety of shrubland dependent species.
- Convert 35.4 acres of shrubland into grassland to provide additional brood rearing habitat for ruffed grouse, woodcock and wild turkey(spp).
- Convert 61.7 acres of poor quality hardwood regeneration to shrubland habitat.
- Convert 9.4 acres of poor quality pole timber to shrubland habitat.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently there are 192.1 acres of shrublands on Hanging Bog WMA comprised of grey stemmed dogwood, red osier dogwood, honeysuckle, crabapple, witch hazel, and wild apple. These densely-stemmed habitats provide foraging and escape cover for both young of year and adults of numerous wildlife species focusing on the YFI target species:

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

Other species benefiting from shrubland management include: black-billed cuckoo, Canada warbler, cottontail rabbit, and bobcat.

MANAGEMENT HISTORY

Shrubland management has consisted of two techniques: complete removal to provide additional acres of grassland cover and strip mowing within the shrub stand to provide open grassy and herbaceous areas. A brushhog and brontosaurus brush mower have been used to clear strips within the shrub stands.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2020** (Figures 9-14):
    - **Compartment A Stand 115:** Brush hog approximately 16.1 acres of shrubland converting the acreage to grassland
    - **Compartment E Stand 58:** Brush hog approximately 13.6 acres of shrubland converting the acreage to grassland.

- **Compartment E Stand 59:** Brush hog approximately 5.7 acres of shrubland converting the acreage to grassland.
- **Compartment B Stand 35:** Convert entire forest stand to shrubland (4.3 acres). A forestry cutter will be used initially followed by periodic brush hogging every 3 to 5 years or as conditions dictate.

Habitat management will include the following:

- **Compartment A Stand 115; Compartment E Stands 58 and 59:** Sparse shrubland growth will be brush hogged and maintained as grassland through an annual perimeter and strip mowing schedule. The perimeters of the new stands will be irregular, providing additional edge habitat. This additional grassland acreage will provide needed brood foraging areas.

- **Management planned for 2021-2025** (Figures 9-14):
  - **Compartment A Stand 183:** Convert entire forest stand to shrubland (15.6 acres). A forestry cutter will be used initially followed by periodic brush hogging every 3 to 5 years.
  - **Compartment A Stand 99:** Convert approximately 8.7 acres of forest to shrubland via a clearcut. Periodic brush hogging every 3 to-5 years will be used to maintain the shrubland.
  - **Compartment A Stand 116:** Convert approximately 0.7 acres of forest to shrubland via a clearcut. Periodic brush hogging every 3 to 5 years will be used to maintain the shrubland.
  - **Compartment B Stand 121:** Convert 19.7 acres of sparse regeneration within the stand to shrubland. A forestry cutter will be used initially followed by periodic brush hogging every 3 to5 years. This will generate a new stand numbered 121.1.
  - **Compartment D Stand 31:** Convert entire forest stand to shrubland (15.8 acres). A forestry cutter will be used initially followed by periodic brush hogging every 3 to-5 years.
  - **Compartment D Stand 43:** Convert entire forest stand to shrubland (6.3 acres). A forestry cutter will be used initially followed by periodic brush hogging every 3 to-5 years.

Habitat management will include the following:

- **Compartment A Stand 183:** Sparse natural regeneration is found in this stand. Voluntary seeding from adjacent stands of some spruce and scotch pine are scattered throughout the stand and will be removed. Several patches of aspen regeneration will be left and managed for ruffed grouse habitat, providing foraging areas of dense cover in addition to a winter food source of aspen buds and catkins.
- **Compartment A Stands 99 and 116:** Poor quality pole timber exist in these stands. A portion of each stand will be converted to shrublands via an initial clearcut and stump removal followed by brush hogging every 3 to 5 years. This will provide foraging areas for a variety of species and a shrub corridor between grassland fields.

- **Compartment B Stand 35:** This stand was cut in 2005 and has not regenerated to expected levels in part due to poor soils and drainage. Clumps of aspen regeneration will be retained and managed for ruffed grouse habitat.
- **Compartment C Stand 121:** A portion of this stand will be divided up into twelve 100 foot wide strips. This will generate stand 121.1 adjacent to Stand 130, which is a poorly drained alder bottom. Four of the twelve strips will be mowed every 3 to 5 years from the drier soils up slope to the wetter soils of the alder bottom providing foraging areas for woodcock.
- **Compartment D Stand 31:** Poor natural regeneration has followed the conifer clearcut of this stand in 2009. Wet areas and several small drainages add to poor regeneration. Several patches of aspen regeneration will be left and managed for ruffed grouse habitat, providing foraging areas of dense cover in addition to a winter food source of aspen buds and catkins.
- **Compartment D Stand 43:** This conifer stand that was cut in 2009 has not regenerated to desirable hardwood species. The stand contains desirable shrub species such as crabapple, hawthorn, and sumac that will provide cover and food for both ruffed grouse and woodcock.

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

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

GRASSLAND AND OTHER OPEN SPACE

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

MANAGEMENT OBJECTIVES

- Maintain 150 acres of grassland fields and open areas to provide nesting and brood rearing habitat for a wide range of wildlife including wild turkey. These areas will also provide hunting opportunities during the fall pheasant season from stocked pheasants.
- Convert 35.4 acres of shrubland 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 115 acres of grassland fields and open areas on the WMA. All of the grassland/fields are less than 25 acres in size. Although the acreages of these fields are less than 25 acres, several grassland dependent species were observed during the most recent Breeding Bird Atlas (2000-2005) and are noted below. Smaller fields or open areas also exist within several of the shrub stands. The fields provide nesting, brood rearing and escape cover for a variety of grassland dependent species as well as game bird species and fawning areas for white-tailed deer.

Species that benefit from grassland best management practices include:

- Bobolink
- Eastern meadowlark
- Northern harrier

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 and also provides strips of uncut vegetation for the release of pheasants for the fall pheasant hunting season. Several projects have been completed with funding and seed provided by the National Wild Turkey Federation. Approximately 19 acres of grasslands have been restored through these cooperative efforts.

Warm season grassland annually perimeter and strip mowed.

Photo: Emilio Rende, NYSDEC

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016 - 2020** (Figures 9-14):
  - **Compartment A Stands 73, 86, 88; Compartment B Stands 58 and 60; Compartment D Stand 30; and Compartment E Stands 49, 54, 56, 82, 94, and 95:** Continue annual perimeter mowing and strip mowing of the stands.
  - **Compartment A Stand 115:** Brush hog three areas of shrubs to convert to grasslands/fields. This will generate three new stands - 115.1 (7.2 acres), 115.2 (1.9 acres) and stand 115.3 (7.0 acres).
  - **Compartment E Stand 58:** Brush hog two areas of shrubs to convert to grasslands/fields. This will generate two new stands - 58.1 (7.5 acres) and 58.2 (6.1 acres).
  - **Compartment E Stand 59:** Brush hog a portion of the stand to convert to grasslands/fields. This will generate one new stand 59.1 (5.7 acres).

  Habitat management will include the following:
  - **Compartment A Stand 115; Compartment E Stands 58 and 59:** Sparse shrubland growth will be brush hogged and maintained as grassland through an annual perimeter and strip mowing schedule. The perimeters of the new stands will be irregular, providing additional edge habitat. This additional grassland acreage will provide needed brood foraging areas.
  - Strip mowing will provide areas of uncut vegetation in the fields for the release of adult pheasants for the fall pheasant season.

- **Management planned for 2021-2025** (Figures 9-14):
  - **Compartment A Stands 73, 86, 88; Compartment B Stands 58 and 60; Compartment D Stand 30; and Compartment E Stands 49, 54, 56, 82, 94, and 95:** Continue annual perimeter mowing and strip mowing of the stands.

  Habitat management will include the following:
  - **Compartment A Stands 73, 86, 88, 115, 115.1, 115.2, and 115.3; Compartment B Stands 58 and 60; Compartment D Stand 30; and Compartment E Stands 49, 54, 56, 58.1, 58.2, 59.1, 82, 94, and 95:** Perimeter and strip mowing to prevent encroachment/establishment of woody vegetation from surrounding stands.
  - Strip mowing will provide areas of uncut vegetation in the fields for the release of adult pheasants for the fall pheasant season.

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

Hanging Bog 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 24 acres of forested wetland as it currently exists.
- Maintain 49.5 acres of impounded wetlands, 12.4 acres of natural wetlands, and 25.9 acres of open water as they currently exist.
- Monitor threats to Hanging Bog and the rare dwarf shrub bog community, which include flooding by beaver and nutrient enrichment from runoff in Crawford Creek.
- Maintain natural hydrology and water quality in Hanging Bog.
- 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 and water control structures as needed.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 12.4 acres of natural wetlands and 49.5 acres of impounded wetlands (totaling 61.9 acres) on Hanging Bog WMA (Figures 5 and 6). The wetland acreage is a combination of small, shallow open water areas, emergent aquatic vegetation and scrub shrub-species. Hanging Bog is a manmade bog containing water that is usually nutrient poor and acidic. The bog is characterized by peatland dominated by low-growing evergreen, ericaceous shrubs, and peat mosses (*Sphagnum* spp.). A dwarf shrub floating mat consisting of leather leaf, bog cranberry, common blueberry, bog rosemary, and viburnum spp. was identified in the 1995 New York Natural Heritage Biodiversity Inventory report. Hanging Bog has 24 acres of forested wetland as described in the Forest section.

The wetlands provide habitat for species such as:

- American woodcock
- Beaver, muskrat
- Migratory waterfowl
- American toad, wood frog, spring peeper, bull frog, northern leopard frog
- Garter snake, snapping turtle, painted turtle

MANAGEMENT HISTORY

Hanging Bog is a manmade impoundment built by the CCC in the late 1930s prior to DEC ownership. The 'Bog' is located on portions of the Hanging Bog WMA and Crab Hollow State Forest.

Upgrades to the dikes and water control structures on several of the smaller impoundments have been completed in recent years. Several other rehab projects are being planned and will be completed as funding becomes available.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2025** (Figures 9-14):
    - Continue annual routine maintenance of dikes 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 flowing water or 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.

There are approximately 21 streams or segments of streams (approximately 15.4 miles) located on the WMA. Crawford Creek, one of two named streams, flows through the WMA and is classified as a C stream indicating it can support a fishery and is suitable for non-contact activities. Rush Creek is the other named stream flowing through the WMA and has a C classification and a (TS) standard indicating it supports a trout fishery.[21]

MANAGEMENT HISTORY

A number of ponds have been constructed since 1962 when the DEC acquired the WMA from the federal government. Upgrades to the dikes and water control structures on several of the smaller impoundments have been completed in recent years. Several other rehab projects are being planned and will be completed as funding becomes available. Plans to construct new ponds, enhance existing vernal pools and construct additional vernal pools will be initiated as funding becomes available.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2016-2025** (Figures 9-14):
    - Routine maintenance on all dikes and water control structures including yearly inspections, annual mowing of the dikes, and monitoring of beaver and muskrat activity.
    - Several dike rehab projects as funding becomes available.
    - Construct new ponds and vernal pools as funding becomes available.

[21] Protection of Waters Program. Classification of Waters. NYS DEC. http://www.dec.ny.gov/permits/6042.html

BEST MANAGEMENT PRACTICES

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

MANAGEMENT EVALUATION

None.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Hanging Bog 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 Hanging Bog WMA, 2016-2025. (Also see Figures 9-14.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut hardwood patches in Compartment A Stands 126, 138, 140, 141, 143, 145, 150, 163, 165,167, and 168	38.3	2016-2020
Forest	Clearcut hardwood patches in Compartment A Stands 15, 42, 44, 54, 64, 80, 82, 84, 112, 121, 123, and 125	72.4	2016-2020
Forest	Clearcut Norway spruce plantation in Compartment E Stand 52 and red pine plantations in Compartment D Stands 19, 26, 39, 40, 41, and 51	44.3	2016-2020
Forest	Clearcut hardwood forest in Compartment E Stands 48 and 52	30.7	2016-2020
Forest	Clearcut hardwood forest in Compartment C Stands 7.2 and 7.4	35.9	2016-2020
Shrubland/ Grassland	Convert shrubland to grassland in Compartment A Stand 115 (generating Stands 115.1, 115.2 and 115.3), Compartment E Stands 58 (generating Stands 58.1 and 58.2) and 59 (generating Stand 59.1)	35.4	2016-2020
Shrubland	Convert poor regeneration to shrubland using a forestry cutter followed by brush hogging every 3-5 years in Compartment B Stand 35	4.3	2016-2020
Forest	Clearcut hardwood forest in Compartment C Stands 8, 9.2, and 10	74.1	2021-2025

Table 7. Continued

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut hardwood mosaic in Compartment B Stands 41, 54, 71, 80, 96, 98, 100, 102, and 114	29.4	2021-2025
Forest	Clearcut hardwood forest in Compartment D Stand 9.2	20.3	2021-2025
Forest	Clearcut hardwood forest in Compartment A Stands 52 and 34	52.5	2021-2025
Forest	Clearcut hardwood forest in Compartment B Stands 49, 51, 120	50.8	2021-2025
Shrubland	Convert poor regeneration to shrubland in Compartment A Stand 183 and Compartment D Stands 31 and 43 followed by brush hogging every 3-5 years	37.7	2021-2025
Shrubland	Convert a portion of Compartment A Stands 99 and 116 (generating Stands 99.1 and 116.1) to shrubland via clearcutting followed by brush hogging every 3-5 years	9.4	2021-2025
Shrubland	Convert a portion of Compartment C Stand 121 (generating Stand 121.1) to shrubland. Four of the twelve 100' strips will be brush hogged every 3-5 years	19.7	2021-2025
Grassland	Perimeter and strip mowing in Compartment A Stands 73, 86, 88, 115, 115.1, 115.2 and 115.3 Compartment B Stands 58 and 60, Compartment D Stand 30 and Compartment E Stands 49, 54, 56, 58.1, 58.2, 59.1, 82, 94 and 95		2016-2025, annually or as needed
Wetland	Conduct routine inspections and maintenance of dikes and water control structures. Reconstruct dikes and replace water control structures as necessary. Monitor water quality in Hanging Bog.		2016-2025, as needed
Open Water	Conduct routine inspections and maintenance of dikes, water control structures and emergency spillways. Reconstruct dikes and replace water control structures as necessary. Construct new ponds.		2016-2025, as needed

III. FIGURES

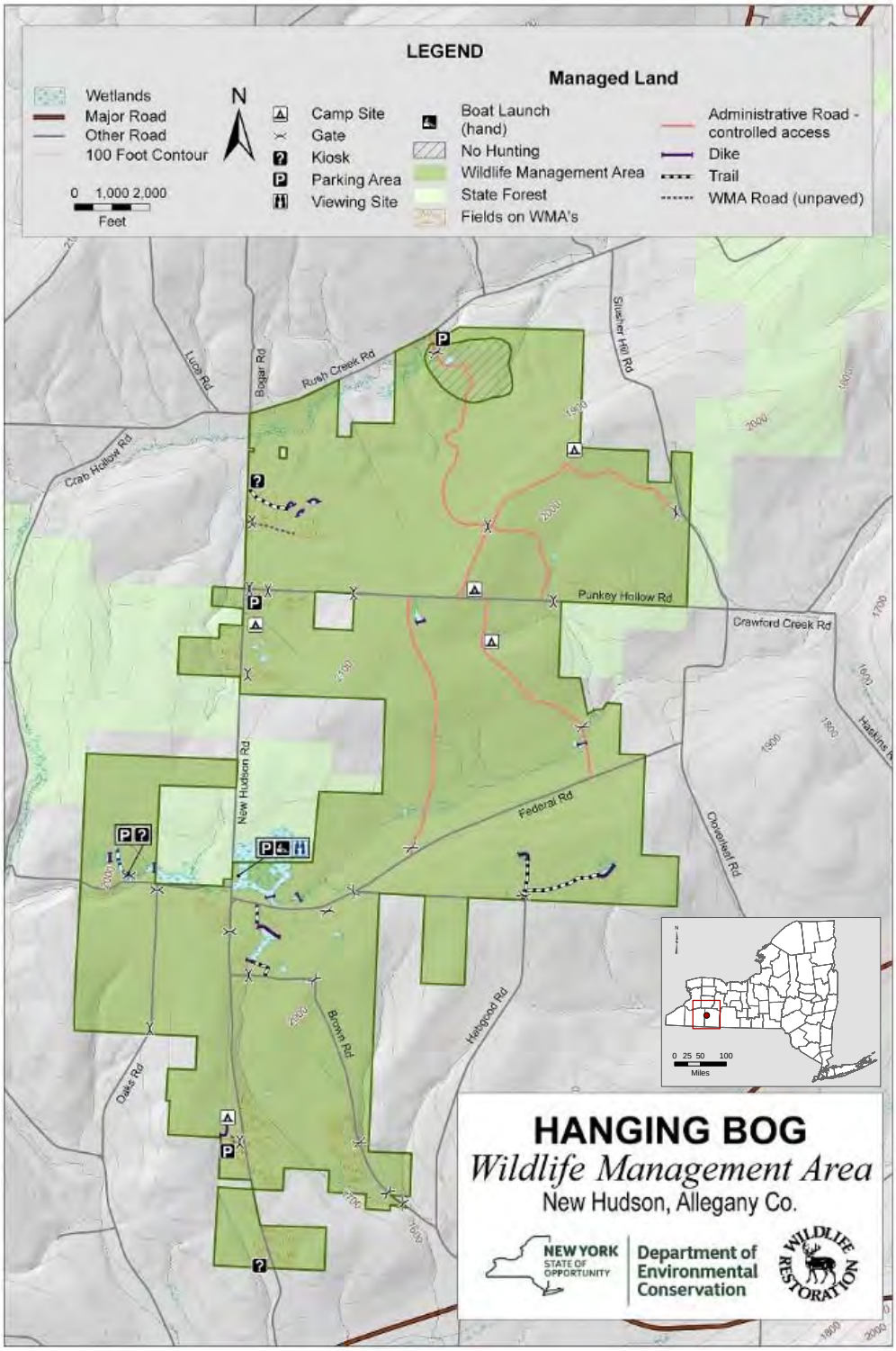

FIGURE 1. Location and access features at Hanging Bog WMA.

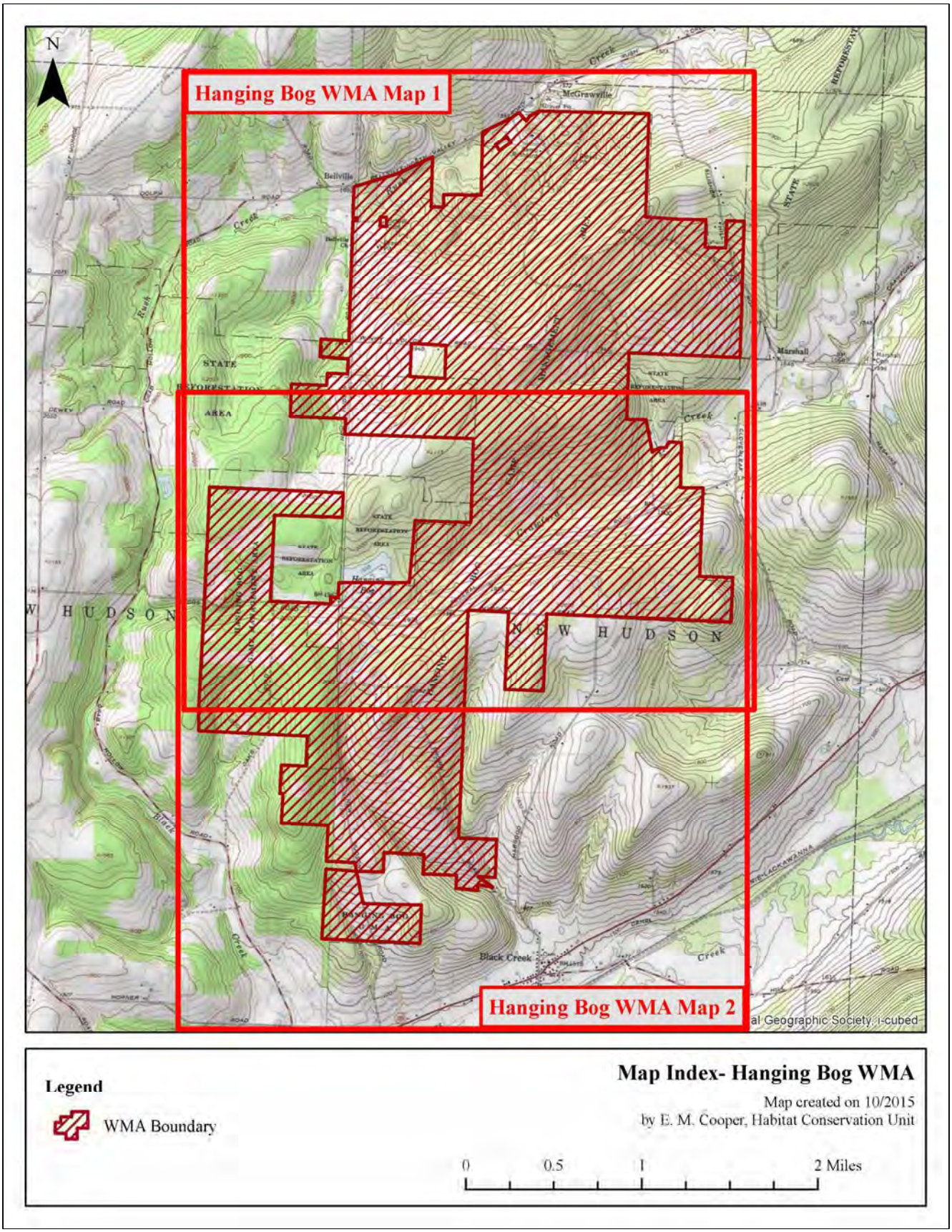

FIGURE 2. Hanging Bog locator map.

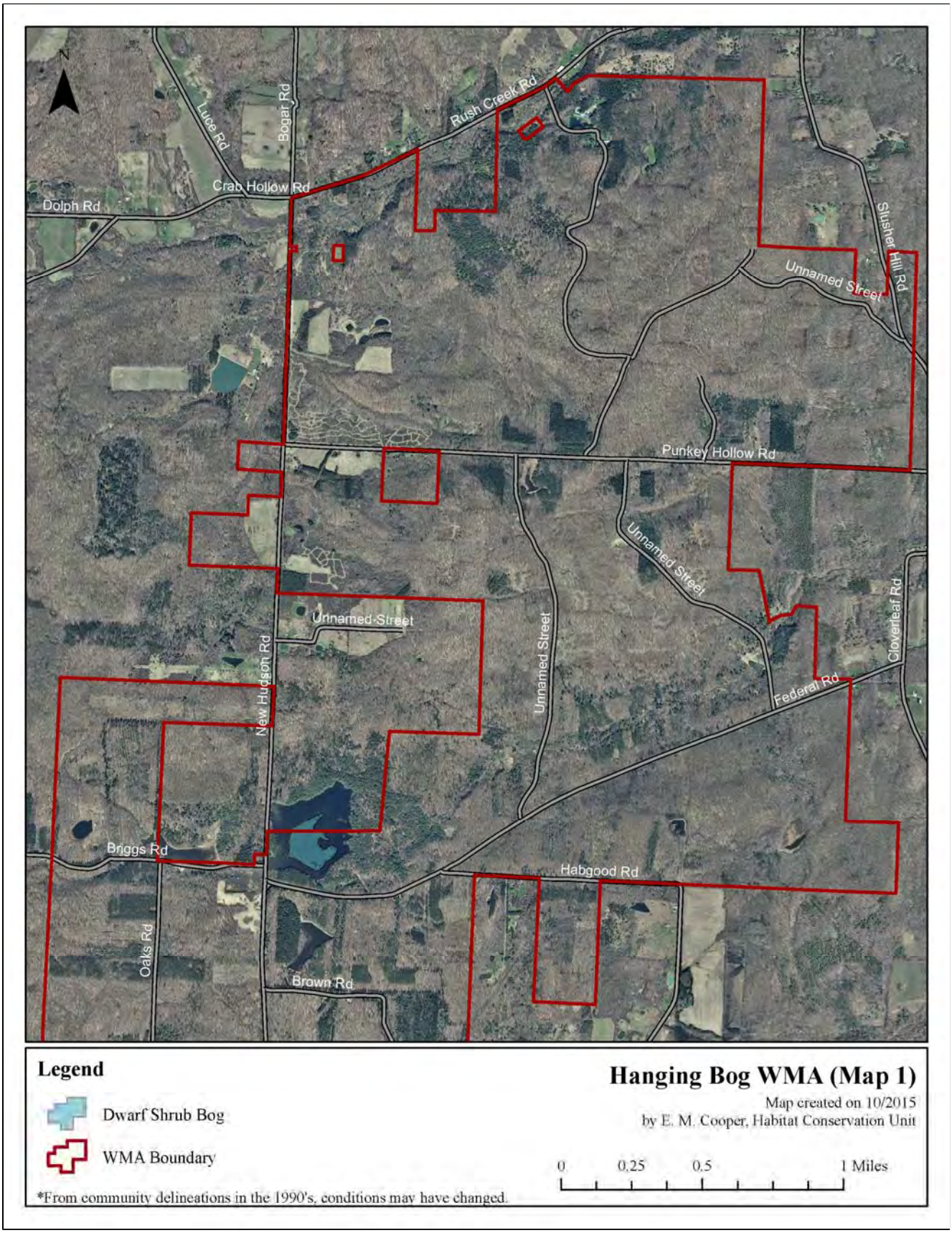

FIGURE 3. Significant ecological communities on northern Hanging Bog WMA. Data from the NY Natural Heritage Program.

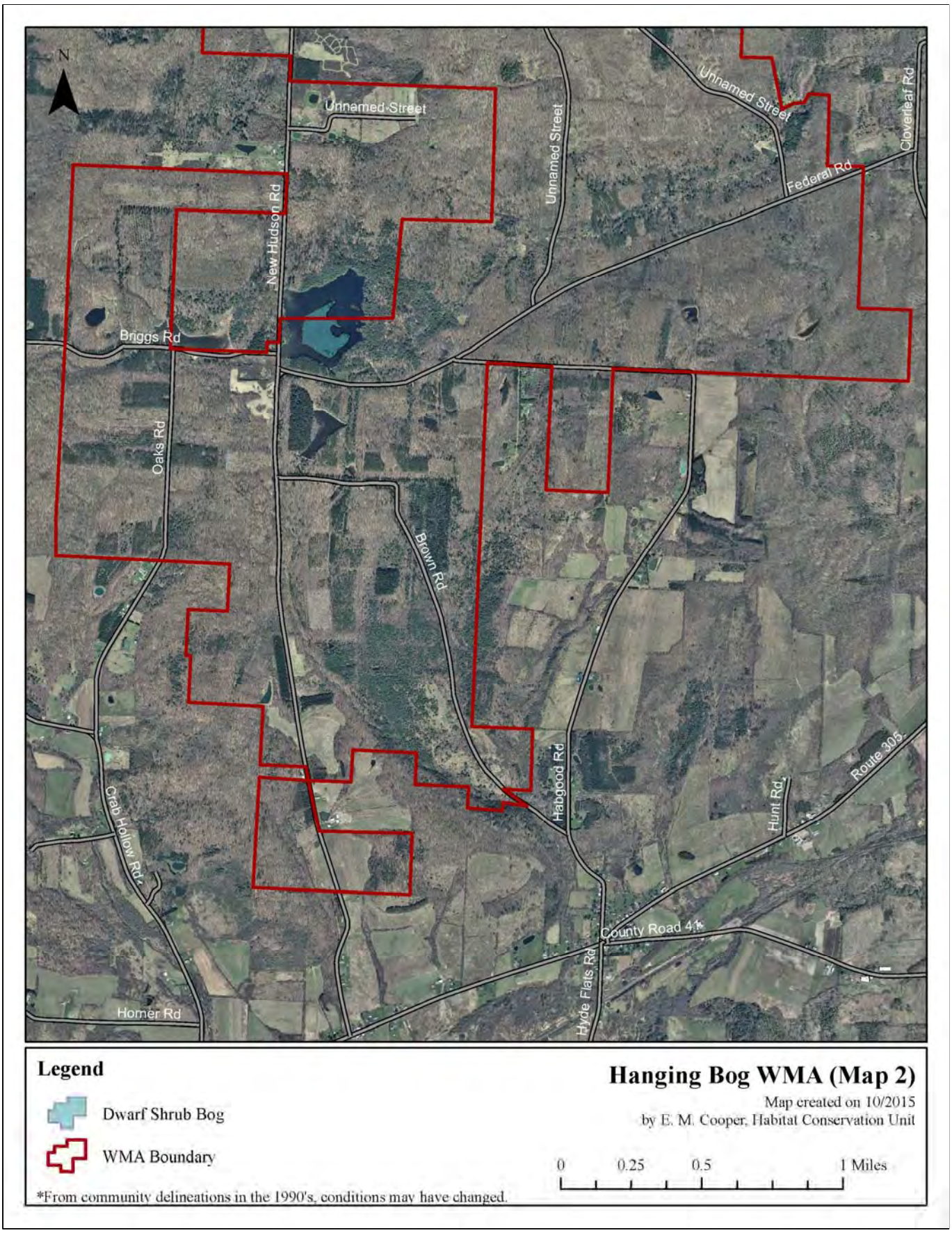

FIGURE 4. Significant ecological communities on southern Hanging Bog WMA. Data from the NY Natural Heritage Program.

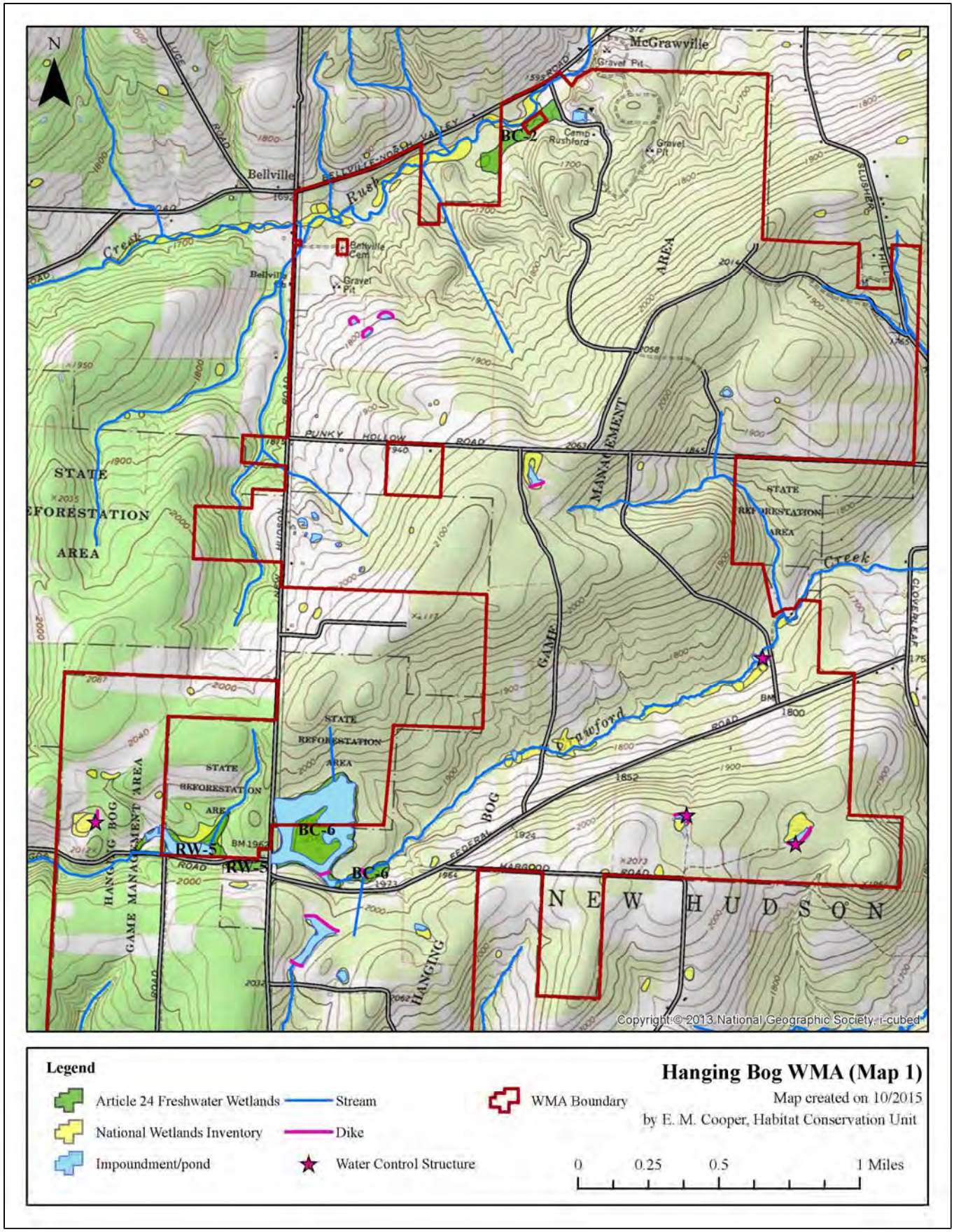

FIGURE 5. Wetlands, open water, and streams of northern Hanging Bog WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

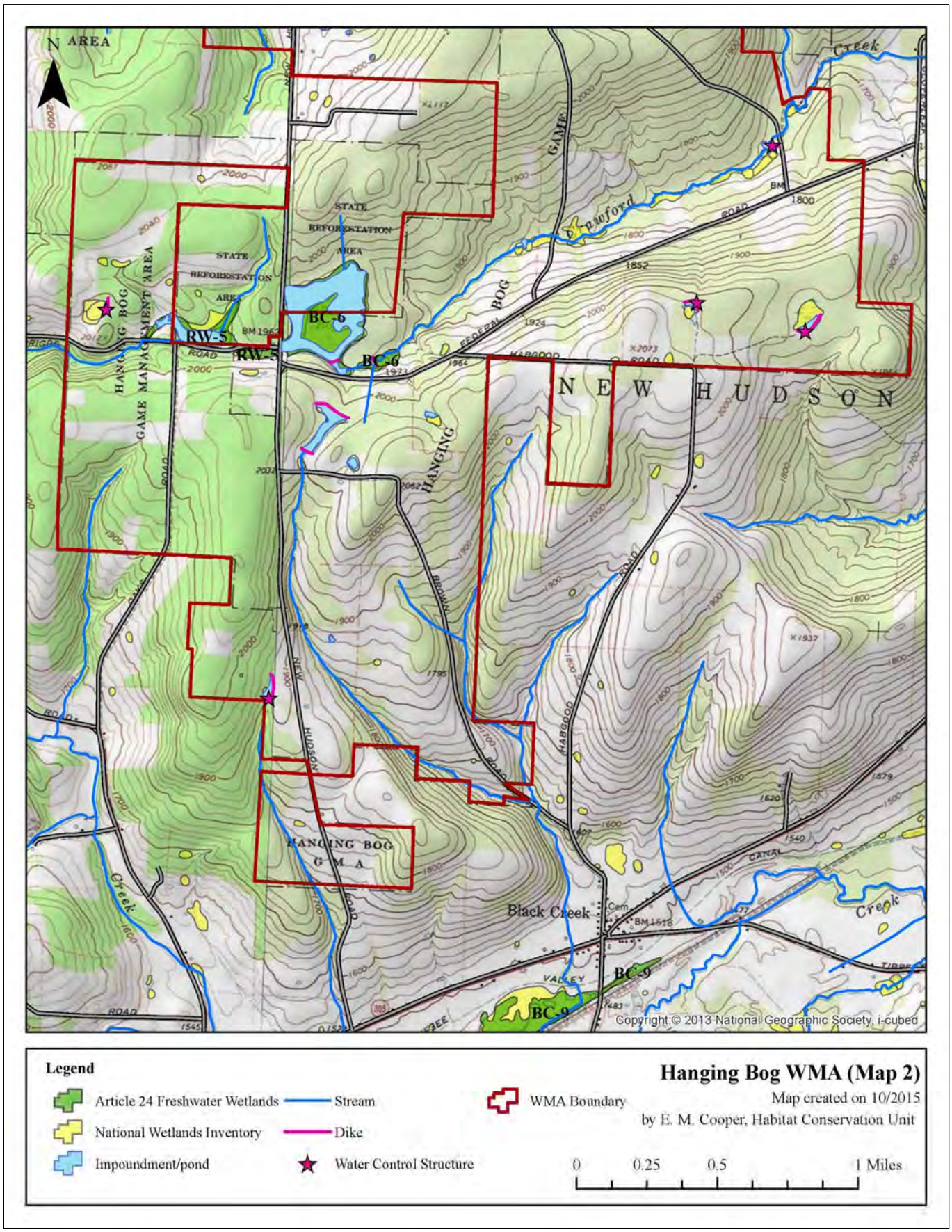

FIGURE 6. Wetlands, open water, and streams of southern Hanging Bog WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

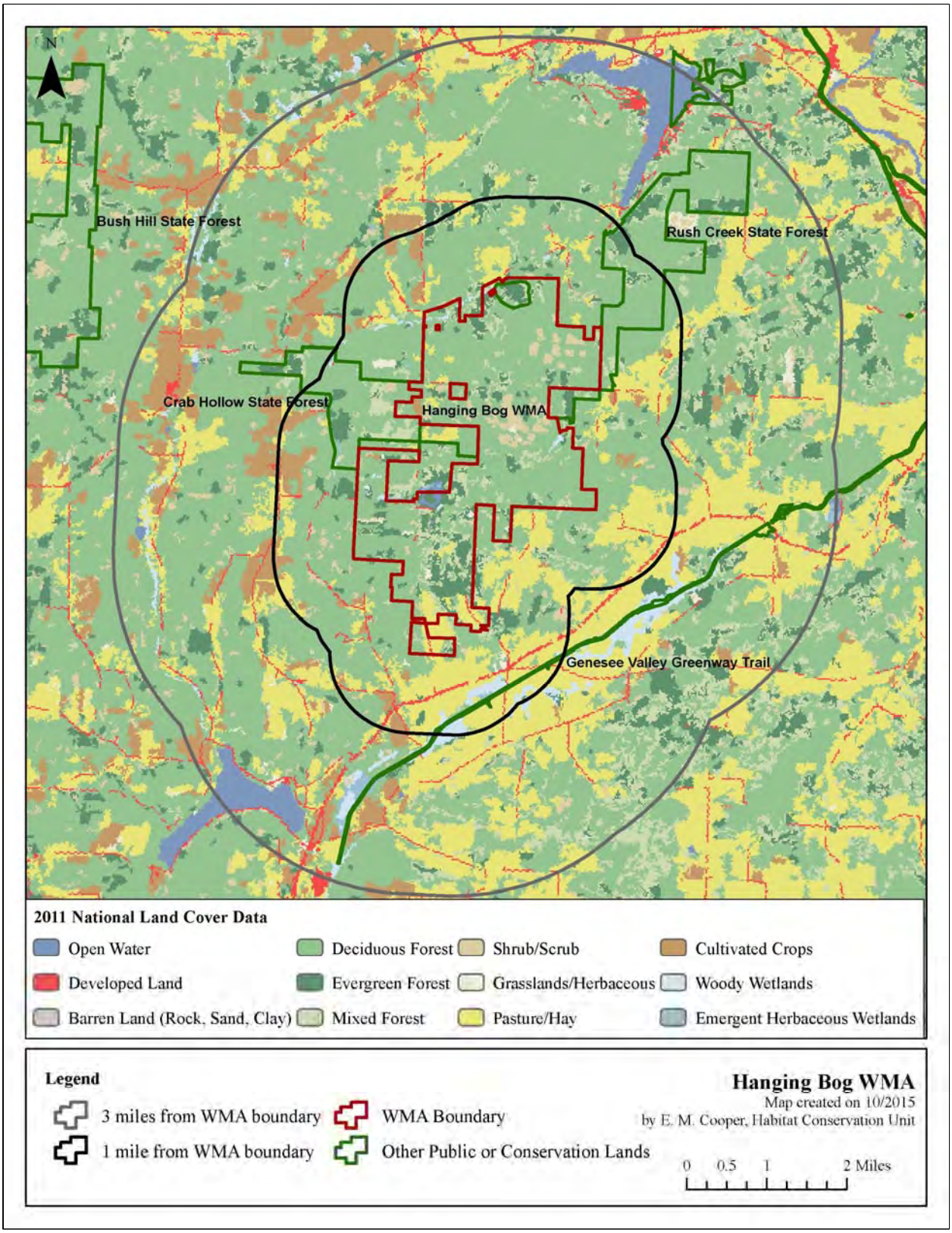

FIGURE 7. Land cover types and conservation lands in the landscape surrounding Hanging Bog WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at http://www.mrlc.gov/nlcd2011.php.

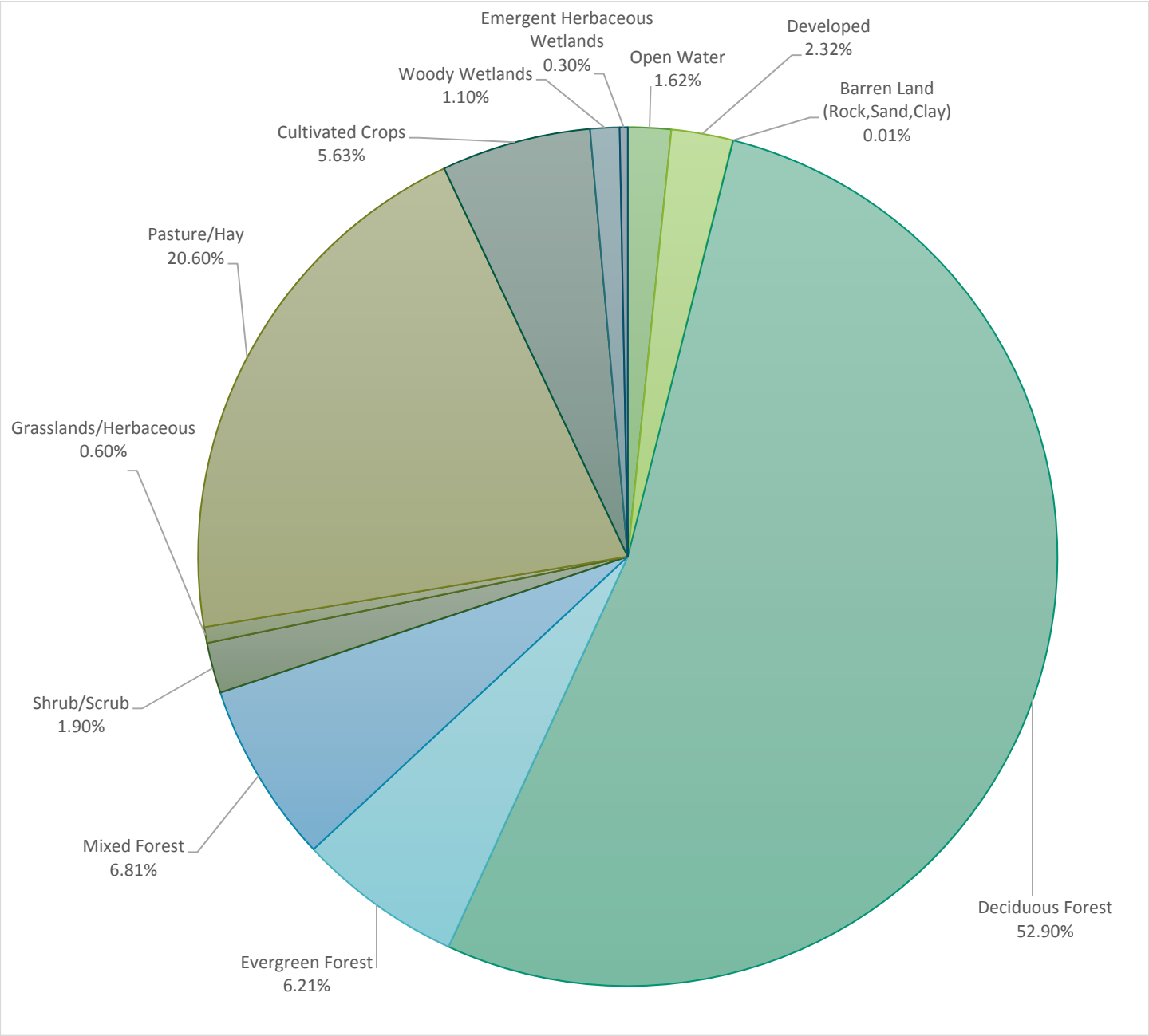

FIGURE 8. Percent cover of land cover types within three miles of Hanging Bog WMA.

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.

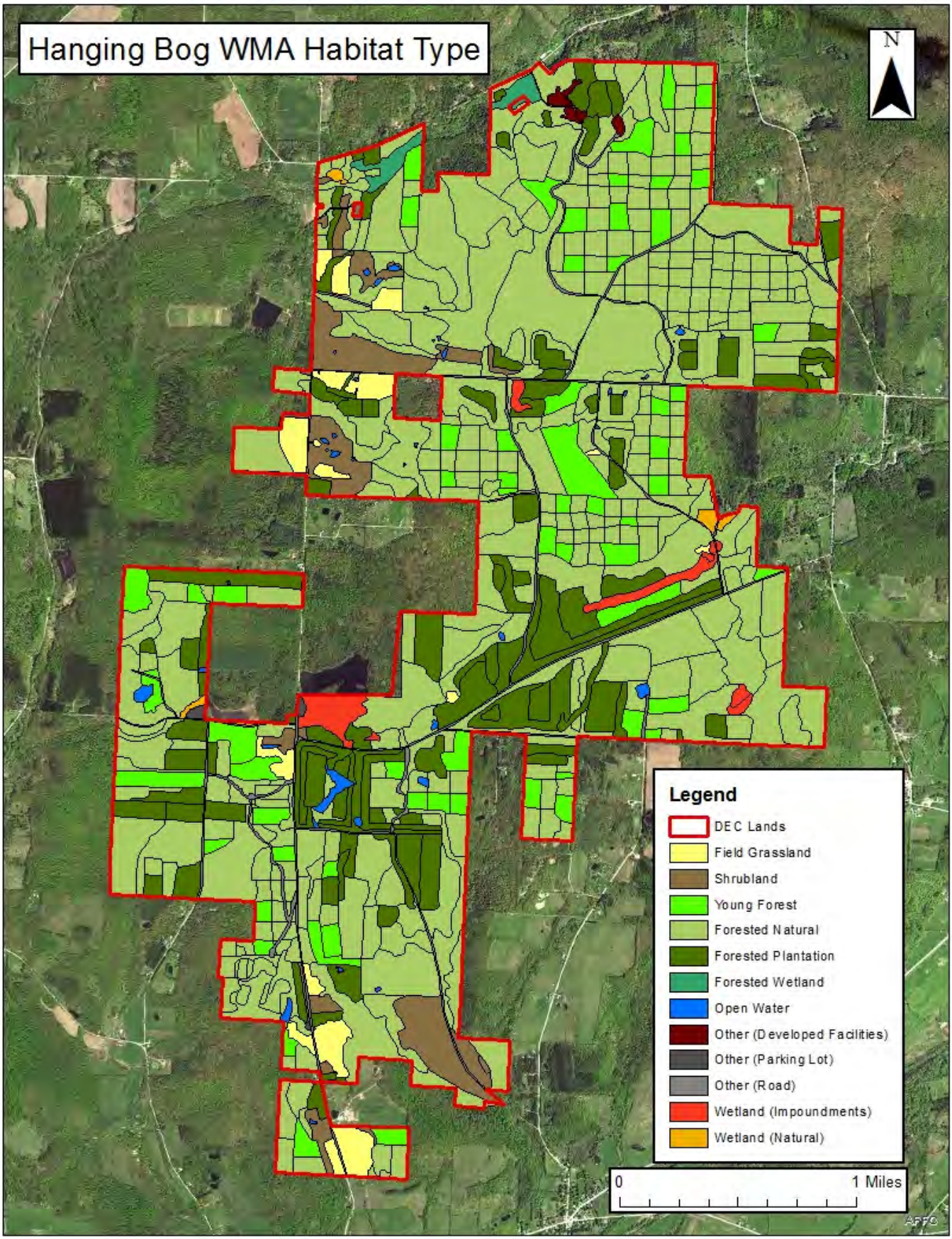

FIGURE 9. Habitat types on Hanging Bog WMA.

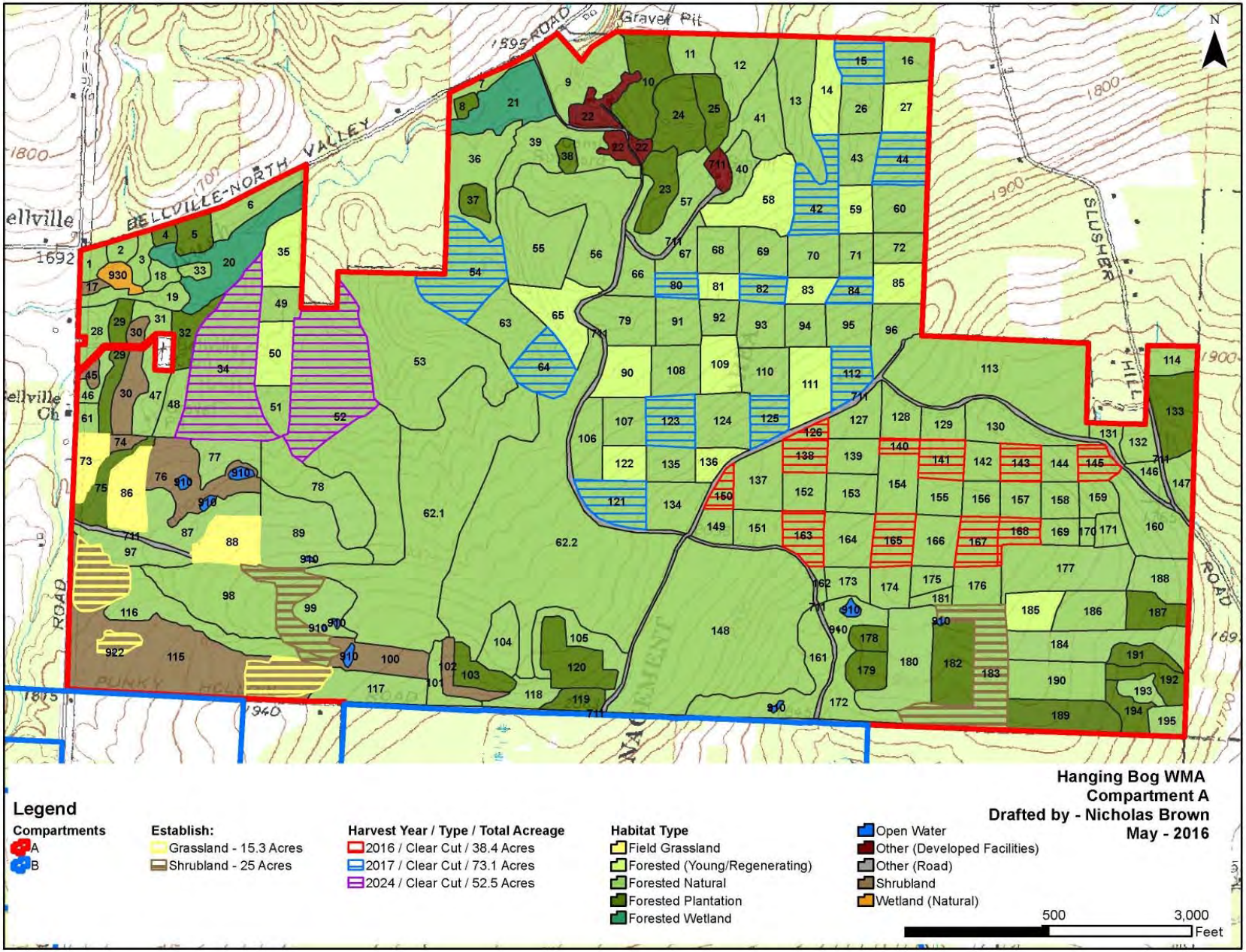

FIGURE 10. Compartment A habitat types and location(s) of proposed management on Hanging Bog WMA. Numbers indicate the stand number from habitat inventory.

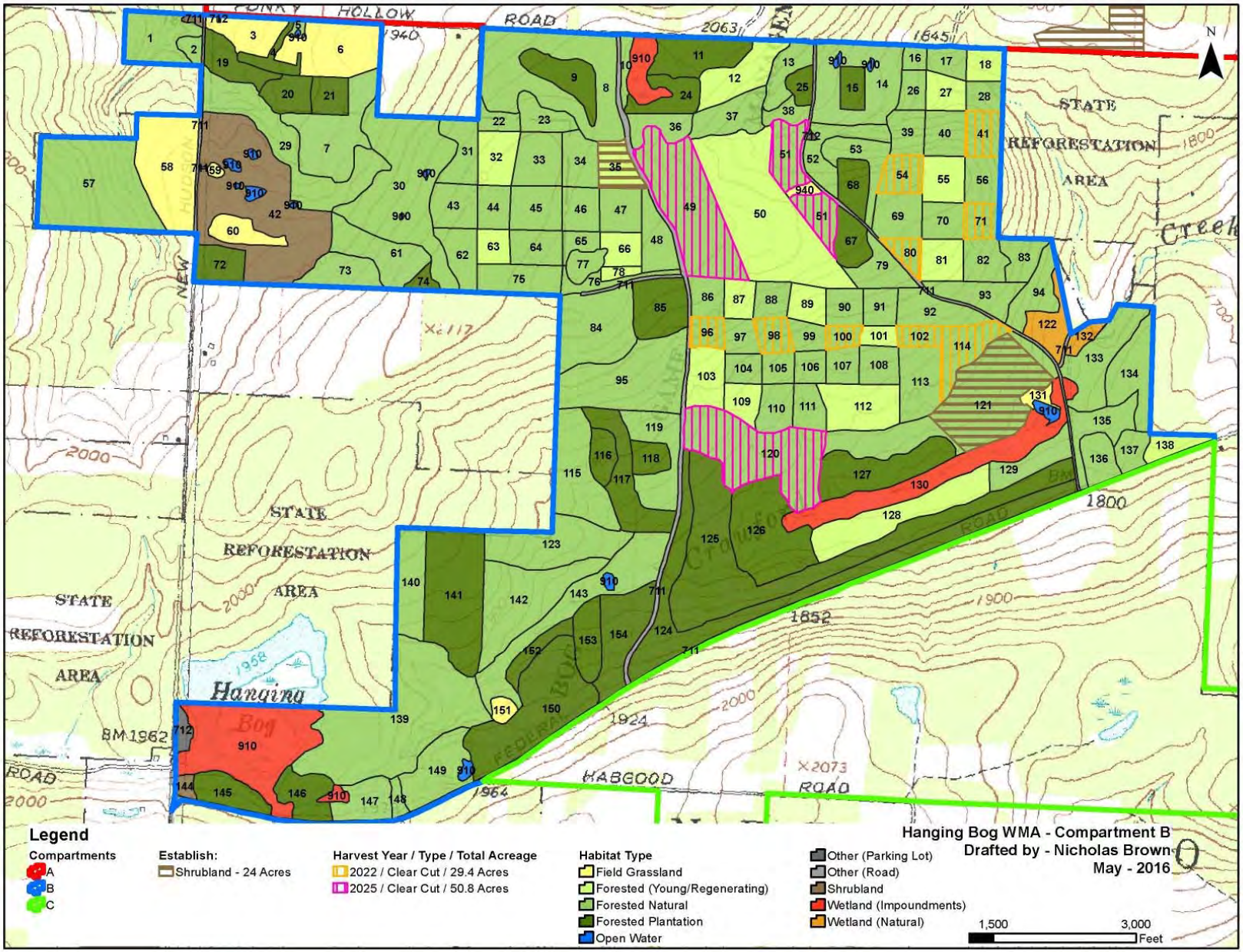

FIGURE 11. Compartment B habitat types and location(s) of proposed management on Hanging Bog WMA. Numbers indicate the stand number from habitat inventory.

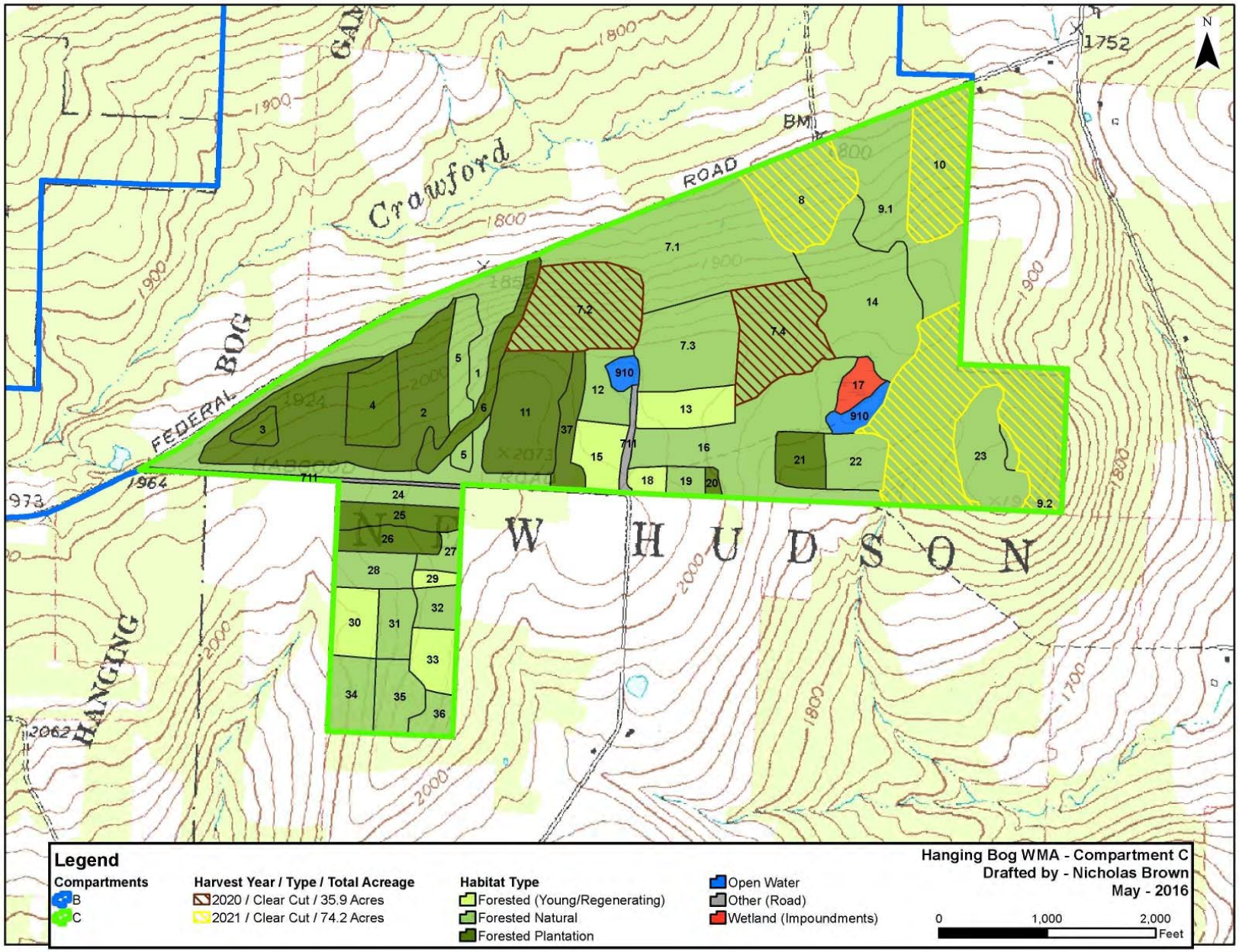

FIGURE 12. Compartment C habitat types and location(s) of proposed management on Hanging Bog WMA. Numbers indicate the stand number from habitat inventory.

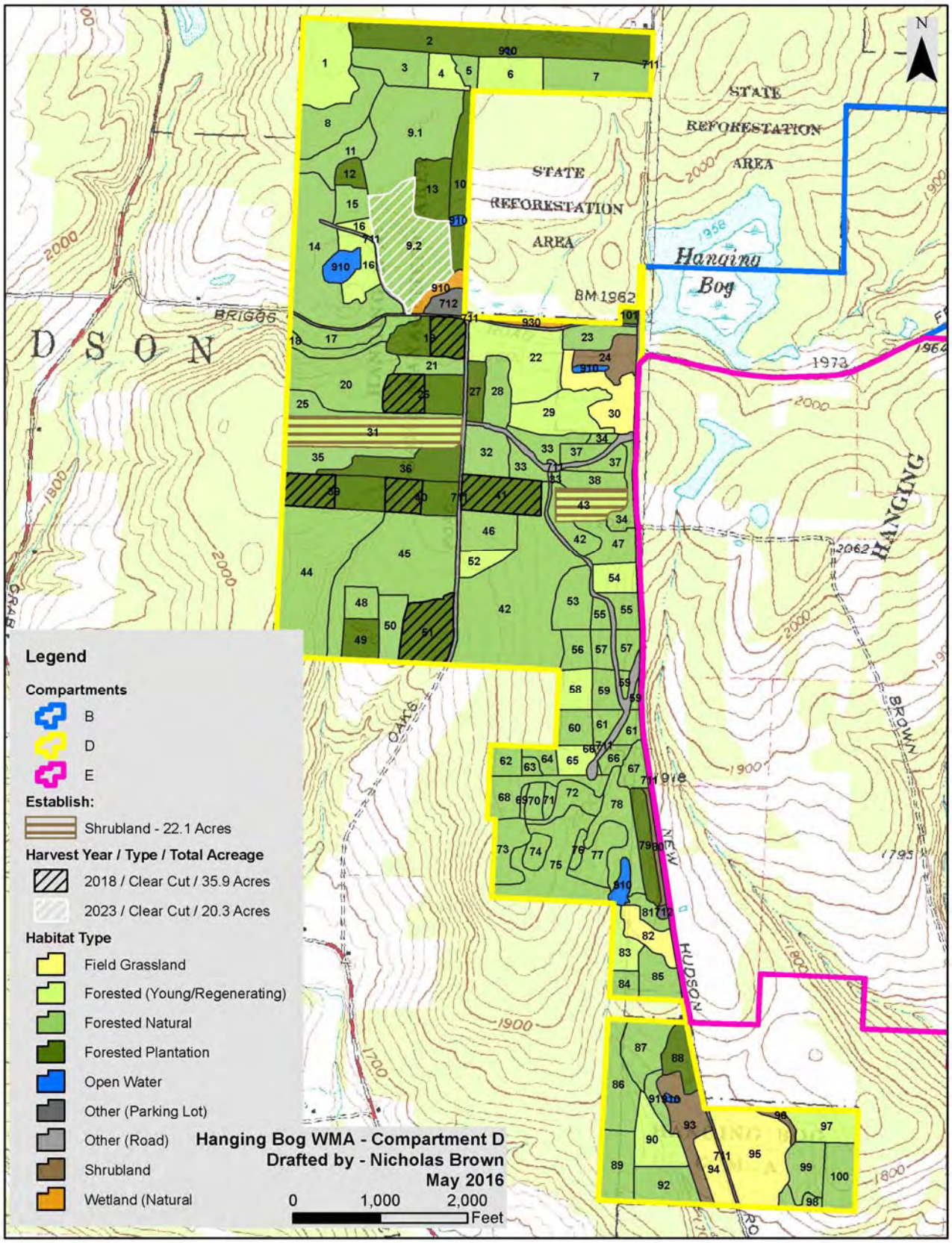

FIGURE 13. Compartment D habitat types and location(s) of proposed management on Hanging Bog WMA. Numbers indicate the stand number from habitat inventory.

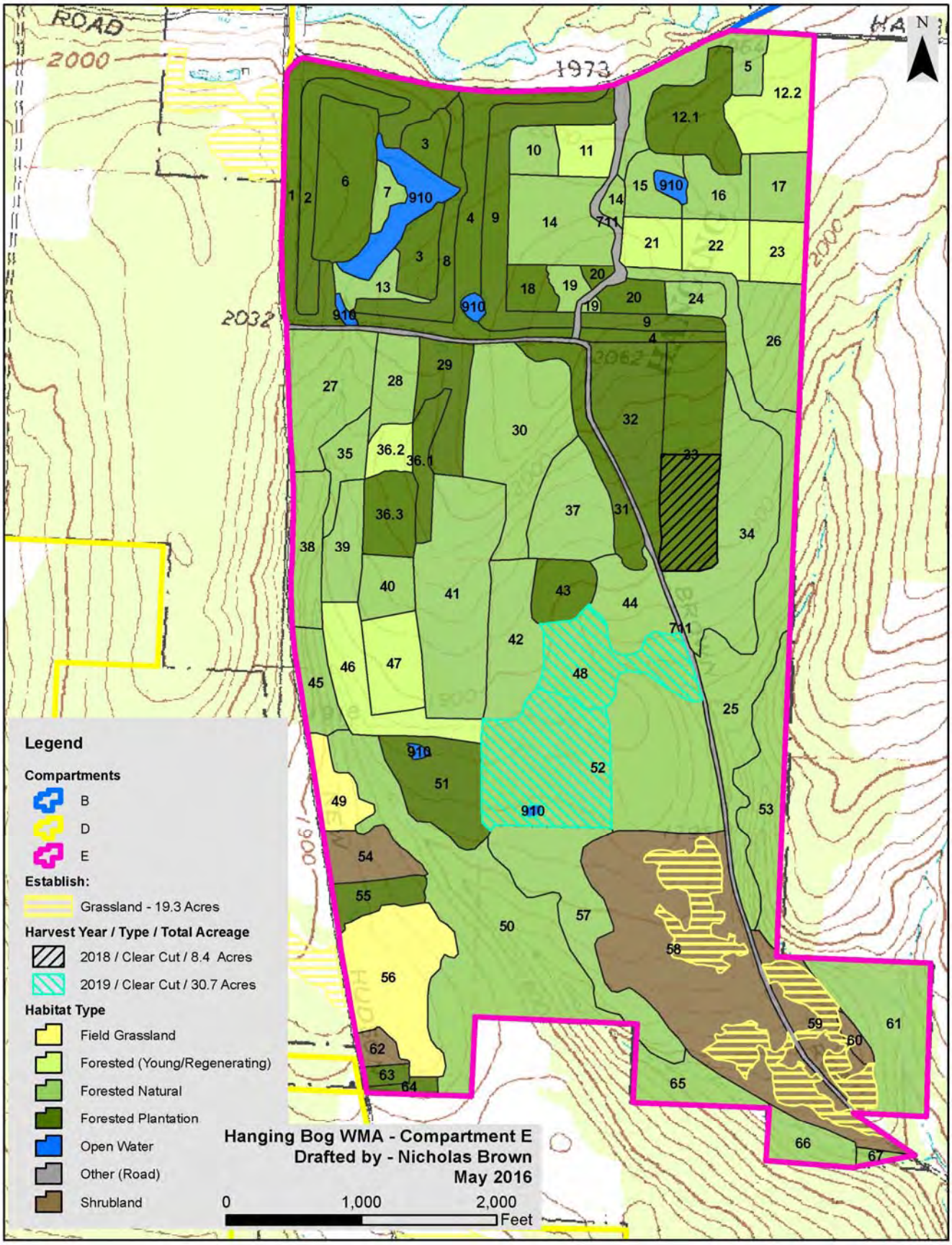

FIGURE 14. Compartment E habitat types and location(s) of proposed management on Hanging Bog WMA. Numbers indicate the stand number from habitat inventory.

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)