Habitat Management Plan for
Bear Spring Mountain Wildlife Management Area
2019 – 2028

Division of Fish and Wildlife
Bureau of Wildlife

65561 State Route 10, Stamford, NY 12167

December 23, 2019

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

Prepared by:

Selinda Brandon, Biologist 1 (Wildlife), Michael Echtner, Forester 1,
Ben Peters, Forester 1 and Karl Dumoulin, Forestry Technician 1
Young Forest Initiative

Reviewed and approved by:

Michael Clark, Regional Wildlife Manager
Bureau of Wildlife — 1/16/20 Date

James Farquhar, Chief
Bureau of Wildlife — 2/5/2020 Date

Anthony Wilkinson, Director
Division of Fish and Wildlife — 2/5/20 Date

Financial support for development of this Habitat Management Plan was provided by the Federal Aid in Wildlife and Sport Fish Restoration Program and non-federal funds administered by the New York State Department of Environmental Conservation including Habitat & Access Stamp funds.

TABLE OF CONTENTS

LIST OF FIGURES

SUMMARY

Bear Spring Mountain Wildlife Management Area (WMA) consists of 7,120 acres, most of which is covered with semi-mature to mature stands of maple, ash, cherry, beech and oak. Numerous ponds, streams, and plantations of spruce and larch are scattered throughout the property. Open fields and shrublands are maintained to provide early successional habitat. This area was initially settled in the 1800s. The principle livelihood over the years was the harvest of forest products and farming. Most of the farms were sold during the 1930s and in 1937 the federal government acquired most of the area. The DEC leased the land in 1941 and in 1961 officially acquired the land for management as a WMA. This WMA is located on the western edge of the Catskill Mountains and is characterized by narrow V-shaped north-south valleys, separated by narrow ridges. Wildlife on the area are typical of forests and forest edge habitats including white-tailed deer, black bear, beaver, otter, fisher, bobcat, raccoon, ruffed grouse, wild turkey, woodcock, a variety of songbirds, woodland raptors, reptiles, and amphibians. This WMA is included in the Catskill Peaks Important Bird Area. This designation is attributed to the site's proximity to the Catskill Park and includes one of the largest contiguous forest tracts in the state. This area supports a diverse assemblage of forest breeding birds, including wood thrush, hermit thrush, magnolia warbler, and dark-eyed junco. The WMA also contains populations of brook and rainbow trout. This WMA affords multiple recreational opportunities including hunting, trapping, and bird watching.

Habitat management goals for Bear Spring Mountain WMA include:

- Managing approximately 10.69% of the WMA as young forest (11% of the total forested area) to promote wild turkey, ruffed grouse and American woodcock habitat;
- Maintaining approximately 85.64% as mature forest to provide habitat for forest interior species;
- Maintaining approximately 1.24% as grasslands;
- Maintaining approximately 0.88% as shrublands;
- Maintaining approximately 0.30% as wetlands;
- Maintaining approximately 0.35% as open water; and
- Maintaining approximately 0.90% of the WMA as roads, trails and parking lots.

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 DEC Division of Fish and Wildlife (DFW) initiated a holistic

planning process for wildlife habitat management projects. Habitat Management Plans (HMPs) are being developed for WMAs and other properties administered by DFW Bureau of Wildlife, including select Multiple Use and Unique Areas. The goal of HMPs is to guide habitat management decision-making on those areas to benefit wildlife and facilitate wildlife-dependent recreation. HMPs guide management for a ten-year time period, after which the plans and progress on implementation will be assessed and HMPs will be modified as needed.

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

SCOPE AND INTENT

Primary purposes of this document:

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

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

Definitions are provided in Appendix A.

The effects of climate change and the need to facilitate wildlife adaptation under expected future conditions will be incorporated into the habitat management planning process and will be included in any actions that are recommended in the HMPs. For example, these may include concerns about invasive species, anticipated changes in stream hydrology and the desirability for maintaining connectedness on and permeability of the landscape for species range adjustments.

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

WMA OVERVIEW

LOCATION

Bear Spring Mountain WMA is located in DEC Region 4, Towns of Walton, Colchester and Hancock, Delaware County (Figure 1).

TOTAL AREA

7,120 acres

HABITAT INVENTORY

A habitat inventory of the WMA was updated in 2019 and is proposed to be updated every ten to fifteen years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the WMA and conditions in the surrounding landscape (see Landscape Context section below).

Table 1. Summary of current and desired habitat acreage on Bear Spring Mountain WMA.

Habitat Type	Current Conditions (as of 2019)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	6456	90.67%		6098	Decrease to 85.64%
Young forest	403	5.66%		761	Increase to 10.69%
Shrubland	63	0.88%		63	No change
Grassland	88	1.24%		88	No change
Agricultural land	0	0%		0	No change
Wetland (natural) [b]	21	0.30%		21	No change
Wetland (impounded) [b]	0	0%		0	No change
Open water	25	0.35%		25	No change
Other	3	0.04%		3	No change
Roads	61	0.86%		61	No change
Rivers and streams			11.3		No change
Total Acres:	7120	100%		7120	

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

ECOLOGICAL RESOURCES

Wildlife Overview:

Wildlife present on Bear Spring Mountain WMA includes many species commonly found throughout central New York and the Catskill Mountains such as:

- Wild turkey, ruffed grouse, sharp-shinned hawk
- Eastern coyote, white-tailed deer, fisher, otter, black bear
- Eastern red-backed salamander, American bullfrog, Northern dusky salamander
- Common garter snake, Northern ring-necked snake, snapping turtle

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), state species of Special Concern (SC), and/or Species of Greatest Conservation Need (SGCN) may occur on the WMA (Table 2).[1] SGCN listed below include species that have been documented on or within the vicinity of the WMA that are likely to occur in suitable habitat on the WMA. Other SGCN may also be present on the WMA. Data sources include: the NY Natural Heritage Program, NY Breeding Bird Atlases,[2] NY Reptile and Amphibian Atlas,[3] DEC wildlife surveys and monitoring, and eBird.[4]

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

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American woodcock			x
	Bald eagle		T	x
	Black-billed cuckoo			x
	Black-throated blue warbler			x
	Bobolink			HP
	Brown thrasher			HP
	Cerulean warbler		SC	x
	Ruffed grouse			x
	Scarlet tanager			x
	Sharp-shinned hawk		SC	
	Wood thrush			x
	Worm-eating warbler			x
Mammals	Indiana bat	E	E	HP
	Northern long-eared bat	T	T	HP
	Tri-colored bat (Eastern pipistrelle)			HP
Amphibians and reptiles	Smooth green snake			x
	Snapping turtle			x
	Wood turtle		SC	HP
Fish	Brook trout			x

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

Table 2. Continued

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Invertebrates	West Virginia white			
Plants	None known			

Significant Ecological Communities:

There are no rare or significant ecological communities on Bear Spring Mountain WMA.

Additional information about significant ecological communities is available in *Ecological Communities of New York State, Second Edition*.[5]

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 Bear Spring Mountain WMA include:

- One wetland regulated by Article 24 of the Environmental Conservation Law and 74 additional wetlands shown on the National Wetlands Inventory (Figure 2). 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.
- Seven streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). Streams designated as class C(T) or higher are regulated by Article 15 of the Environmental Conservation Law. The highest stream classification on this property is Class C(TS), trout spawning. Water quality standards will be adhered to on all streams.
- A number of vernal pools exist on the WMA. Management activities will follow SMZ guidelines established on 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.

Soils:

Soils at Bear Spring Mountain WMA vary with the topography. Steep hills and valley streams dominate this WMA with rock outcroppings becoming more common as you gain elevation.

[5] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological Communities of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/29384.html.
[6] Available online at http://www.dec.ny.gov/outdoor/104218.html.

Consistently, the soils are well drained and very rocky or very stony. Three major soil complexes dominate the property: Halcott, Mongaup & Vly, Lackawanna & Bath, and Willowemoc & Willdin. These soils are compatible with timber production but would be a limitation to agriculture.

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 Bear Spring Mountain WMA (Figures 3 and 4). The landscape within a three-mile radius of the WMA is primarily privately-owned land including:

- Forest (87% combining deciduous, evergreen and mixed forests)
- Pasture/Hay (5%)
- Development (3%)
- Cultivated crops (2%)
- Woody wetlands (1%)
- Grasslands (1%)
- Shrub/scrub (1%)

Bear Spring Mountain WMA is located within close proximity to the Catskill Park. Currently, the forested landscape on the WMA and the surrounding landscape is primarily composed of large continuous tracts of mature forested habitats, including DEC owned forest preserve land. Due to the limited amount of young forest habitat on the WMA and in the surrounding landscape, it is the goal of this plan to create young forest habitat to promote regeneration of select forest stands to ensure a healthy forest in the future. The creation of young forest habitat on Bear Spring Mountain WMA increases habitat diversity, creating a healthy sustainable forest benefiting many different species of wildlife.

Nearby conservation lands include:

- Colchester Forest Preserve (370 acres)
- Walton Forest Preserve (109 acres)
- Tomannex State Forest (1028 acres)
- Delaware Wild Forest (18389 acres)

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitat on Bear Spring Mountain WMA to provide the following benefits:

- Maintain habitat characteristics that will benefit wildlife abundance and diversity within the New York landscape.
- Promote Best Management Practices for targeted wildlife and habitats.

- Provide opportunities for wildlife-dependent recreation such as trapping, hunting and bird watching compatible with the ongoing habitat management practices and species management considerations.
- Improve habitat quality by reducing invasive species, if present and identified for treatment.

FOREST

Forested acreage includes the following forest types:

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

Forest management on Bear Spring Mountain WMA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a wide range 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.[7] The Initiative's goal is to increase forest management so that a minimum of 10% of the WMA's forested acreage is classified as young forest habitat. The goal at Bear Spring Mountain WMA is to create approximately 761 acres of young forest habitat, approximately 11% of the forested acreage.

MANAGEMENT OBJECTIVES

- Retain the majority of the existing mature forest (6098 acres) for forest interior species, including wood thrush and fisher.
- Creation of canopy openings within existing mature forest to develop adequate subcanopy structure to benefit forest breeding birds including wood thrush.
- Increase young forest from 403 to 761 acres (approximately 11% of the total forested area) to improve habitat for young forest-dependent wildlife, targeting wild turkey, ruffed grouse and American woodcock.
- Encourage dispersal of native hardwoods (cherry and oak) to promote regeneration and increase availability of hard mast for wildlife.

[7] 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 6859 forested acres on Bear Spring Mountain WMA. Much of the WMA is forested with several wetlands, grasslands and shrublands scattered in the lower elevations (Table 3; Figure 5). The forests consist mainly of northern hardwoods and hemlock. Small stands of Norway spruce and European larch are scattered along the roads and trails throughout the property. Timber has been actively managed on this property for wildlife purposes since the 1930s. Table 3 provides a summary of the forested areas, including the most common species found in the WMA's forests.

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

Forest Type	Acres (as of 2019)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	6190	5860	black cherry, sugar/red maple, red oak
Plantation	266	238	Norway spruce, European larch
Forested wetland	0	0	
Young forest	403	761	cherry, birch, maple, oak, spruce
Young forest (forested wetland)	0	0	
Total Forested Acres:	6859	6859	

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

- Wild turkey:
    - 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 – The best brooding cover is 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 flightless 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. [8, 9]
- Ruffed grouse:
    - Drumming areas – Downed trees surrounded by small diameter woody cover.
    - Foraging areas – Open areas with dense overhead cover of young forest with good mast production.
    - Nesting – Young, open forest stands or second growth woodlands.
    - Brood rearing – Herbaceous ground cover with a high midstory stem density.[10, 11]
- American woodcock:
    - Singing/Peenting Ground – Open areas from 1 to >100 acres, usually in an abandoned field.
    - Foraging – Moist, rich soils with dense overhead cover of young alders, aspen or birch.
    - Nesting – Young, open, second growth woodlands.
    - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.

The mature forest stands on the property provide habitat for songbirds, deer, turkey, forest nesting raptors and small mammals. Among the songbirds that utilize these stands is the wood thrush. The wood thrush is a SGCN in NY and frequents the large tracts of mature forest that exist on this property. Many of these mature forest stands lack intermediate age classes and subcanopy, which wood thrush require to nest within. Mature forest stands within the WMA will be evaluated and canopy openings will be created by single tree or small group selection, to simulate natural disturbance events.

Habitat requirements for wood thrush that will benefit from both mature and young forest habitats are as follows:

- Wood thrush:
    - Breeding – Mature deciduous and mixed forests, typically with red maple, American beech, American hornbeam, oaks, pines and Eastern hemlock in the Northeast. Prefer a somewhat shrubby understory that includes striped maple among other species.
    - Nesting – Mature tree in forests as well as fragmented habitats and even park lands if larger trees are present.
    - Diet – primarily insects but also includes soft mast.
    - Overwintering – Tropics.

MANAGEMENT HISTORY

Bear Spring Mountain WMA was acquired by DEC in 1961 after being leased from the federal government since 1941. The federal government likely acquired this parcel as farms were being

[8] USDA – NRCS. 1999. Wild Turkey (*Meleagris gallopavo*) Fish and Wildlife Habitat Management Leaflet. 12 pp.
[9] Dickson, J. G. 1992. The Wild Turkey: Biology and Management. National Wild Turkey Federation and USDA Forest Service. Stackpole Books, PA. 480 pp.
[10] Dessecker, D. R., G. W. Norman, and S. J. Williamson. 2006. Ruffed Grouse Conservation Plan. Association of Fish & Wildlife Agencies: Resident Game Bird Working Group. 94 pp.
[11] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.

abandoned around 1930. This area of Delaware County was used for timber production since very early in its settlement in the late 18th century. Logs and lumber were rafted to Philadelphia on the Delaware River. Since the state acquired this property it has had timber harvests as time and resources have allowed.

The following management is proposed in order to reach the young forest acreage goal of 761 acres within ten years:

- **Management planned for 2019-2023** (Table 4, Figure 6):
  - Conduct clearcut treatments in stands A-7, A-8, A-14, B-1, B-2, F-1, F-2, F-4, F-6, G-5, I-1, I-2, J-4, J-9, K-4, O-1, O-5, P-2 and Q-5. These treatments will cover approximately 126 acres.
- **Management planned for 2024-2028** (Table 5, Figure 6):
  - Conduct clearcut treatments in stands A-12, A-15, E-1, V-1, V-2, W-1, W-2 and W-3. These treatments will cover approximately 107 acres.
  - Conduct seed-tree treatments in stands M2.11, M-3, W-3 and W-4. These treatments will cover approximately 101 acres.
  - Conduct shelterwood treatments in stands V-1 and V-4. These treatments will cover approximately 24 acres.

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-7	2	Small sawtimber 12”-17” DBH	Transition Hardwood: northern hardwood/oak	Young forest	Wildlife	Clearcut
A-8	1	Medium sawtimber 18”-24” DBH	Natural Forest: Northern hardwood-Norway Spruce	Young forest	Wildlife	Clearcut
A-14	8	Small sawtimber 12”-17” DBH	Plantation: Norway Spruce	Young forest	Wildlife	Clearcut
B-1	8	Small sawtimber 12”-17” DBH	Natural Forest: Northern Hardwood-Hemlock	Young forest	Wildlife	Clearcut
B-2	2	Small sawtimber 12”-17” DBH	Plantation: Norway Spruce	Young forest	Wildlife	Clearcut
F-1	1	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
F-2	15	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
F-4	1	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood-Norway Spruce	Young forest	Wildlife	Clearcut

Table 4. Continued

F-6	1	Small sawtimber 12”-17” DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut
G-5	2	Medium sawtimber 18”-24” DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut
I-1	23	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
I-2	16	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
J-4	4	Pole timber 6”-11” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
J-9	6	Pole timber 6”-11” DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut
K-4	4	Small sawtimber 12”-17” DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut
O-1	18	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
O-5	9	Medium sawtimber 18”-24” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
P-2	2	Small sawtimber 12”-17” DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut
Q-5	3	Large sawtimber 25” + DBH	Plantation: Norway spruce	Young forest	Wildlife	Clearcut

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-12	14	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
A-15	23	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
E-1	28	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
M-2.11	24	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Seed tree cut

Table 5. Continued

M-3	56	Pole timber 6”-11” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Seed tree cut
V-1	8	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young Forest	Wildlife	Clearcut
V-1	3	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young Forest	Wildlife	Shelterwood cut
V-2	10	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
V-4	21	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Shelterwood cut
W-1	11	Pole timber 6”-11” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
W-2	3	Pole timber 6”-11” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
W-3	10	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Clearcut
W-3	19	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Seed tree cut
W-4	2	Small sawtimber 12”-17” DBH	Natural Forest: Northern hardwood	Young forest	Wildlife	Seed tree cut

Stand locations and planned management actions are also summarized in Figure 6. Specific forest stand descriptions and detailed management prescriptions will be prepared for each proposed forest management area prior to implementation (see template, Appendix C). Briefly, habitat management for each of these stands will include the following:

Management Planned for 2019-2023

- **Stands A-8 & 14, B-2, F-4 & 6, G-5, J-9, K-4, P-2 and Q-5:** These stands are spruce plantations that have reached maturity. These stands will be clearcut and allowed to regenerate naturally into mixed hardwood-softwood stands that will provide nesting areas, cover and food sources for the target species. Harvested areas will be monitored for desirable and undesirable regeneration. Please see *Table 4* for the acreages of these treatments.
- **Stands A-7, B-1, F-1 & 2, I-1 & 2, J-4, O-1 and O-5:** These stands are natural hardwood stands that have been designated by the land manager for treatment. Portions of these stands will be clearcut and allowed to regenerate naturally to create desirable conditions for the target species. This natural regeneration will be supplemented with softwood seeding or planting in stands J-9, O-1, I-1 and I-2 to further enhance the habitat being created. Harvested areas will be monitored for desirable and undesirable regeneration. Please see *Table 4* for the acreages of these treatments.

Management Planned for 2024-2028

- **Stands A-12 & 15, E-1, V-1 & 2 and W-1, 2 & 3:** These stands are natural Northern hardwood stands that have matured and have been designated by the land manager for habitat creation. Portions of these stands will be clearcut and allowed to naturally regenerate creating nesting areas, food sources and cover needed by the target species. Natural regeneration in Stands V-1 and V-2 will be augmented by softwood seeding or planting. These cut areas will be monitored for desirable and undesirable regeneration. Please see *Table 5* for the acreage of these harvest.
- **Stands M-2.11 & 3, V-1 & 4 and W-3 & 4:** These stands are mature Northern hardwood stands that have been designated for harvest by the land manager. Portions of Stands V-1 & 4 will have shelterwood cuts to encourage the regeneration of hemlock, along with other species. Portions of Stands M-2.11 & 3 and W-3 & 4 will have seed tree harvests which will leave some trees in the stand as a seed source to supplement natural regeneration. These cuts will be performed to create habitat needed by the target species and will be monitored for desirable and undesirable regeneration. Please see *Table 5* for the acreage of these harvest.

Natural regeneration of the stands will be allowed to occur to create quality habitat for wild turkey, ruffed grouse and American woodcock. Small canopy openings will be created within mature forest stands to simulate natural disturbance events. Best Management Practices for American woodcock and wood thrush will be incorporated into the forest management planned. Planting and seeding of conifers will occur in select stands to help maintain a conifer component within the WMA. Forest management prescriptions on this WMA will focus on promoting regeneration with a high stem count per acre (i.e., stump sprouting of native hardwoods).

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** [12]
Soils	*Rutting Guidelines for Timber Harvesting on Wildlife Management Areas*
Water quality	*NYS Forestry Best Management Practices for Water Quality*
Wildlife	*Retention Guidance on Wildlife Management Areas*
Plantations	*Plantation Management Guidance on Wildlife Management Areas*

Wildlife Considerations:

Considerations will be taken to avoid negative impacts on protected bats, as well as nesting woodland raptors. Surveys will be conducted for both bats and raptors to determine their presence/absence within or surrounding the treatment areas. If protected bat species are found on the property or within close proximity, timber harvests will be conducted during the hibernation

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

season. Raptor call back surveys will be conducted during the nesting season to identify nesting trees and buffers will be designated around any identified nests.

Forest Health Considerations:

Soil quality is not expected to inhibit the ability of trees to regenerate in most areas within the WMA. Where soils are poorly drained in low lying areas, regeneration may be slower than well drained sites.

This WMA contains mainly natural forest stands and few plantations. Emerald ash borer (EAB) has not been confirmed to be within the WMA, but has been found nearby in Sidney, New York. Delaware County is included in the EAB restricted zone. Hemlock wooly adelgid (HWA) has not been found to be within the WMA, but has been confirmed in the Towns of Walton, Hancock and Tompkins. These invasive pests, if found to be present in the future, can have a detrimental effect on the health of forest stands.

This WMA has a relatively low volume of invasive or undesirable vegetation present. Observed vegetation includes; honeysuckle, Japanese barberry and Japanese knotweed, along with other plant species. These species can inhibit or outcompete desirable or native species. Stands where American beech is a significant component will be evaluated to see if control is necessary. While beech is not invasive it is a prolific stump and root sprouter that can severely limit more desirable forest regeneration. Beech in New York State is heavily infested with beech bark disease and the vast majority of trees will not survive to become viable trees or mast producers. However, as trees die and resprout they continue to shade out other species.

Pre- and Post-treatment Considerations:

If site conditions limit regeneration following treatment, planting of desirable species may supplement natural regeneration. Invasive and undesirable species may outcompete desirable regeneration. In stands where such understory plants occur, herbicide or mechanical control may be utilized pre and/or post-harvest. White-tailed deer herbivory may pose a threat to forest regeneration in certain areas of the WMA. If this is determined to be a major threat to desirable forest regeneration, deer exclosures may be erected around or within harvested areas.

The possibility exists that desirable forest regeneration may not occur after treatment. If this is determined to be the case, the stand(s) may be re-treated to attempt to improve the quality or quantity of desired regeneration. This may include re-cutting of the overstory or using mechanical methods to restart the regeneration process.

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines in the Young Forest Initiative Monitoring Plan: 2016-2025.[13] The Monitoring Plan establishes statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed.

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

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. Deer exclosures may be installed to monitor regeneration annually. YFI wildlife target species selected for Bear Spring Mountain WMA, which may be assessed to determine response to management, include:

- Wild turkey
- Ruffed grouse
- American woodcock

SHRUBLAND

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

MANAGEMENT OBJECTIVES

- Maintain 63 acres of shrublands to provide early successional habitat for cottontail rabbit, ruffed grouse, pheasant and other early successional species.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Shrublands within the WMA are generally located alongside the two main roads running north to south, West and East Trout Brook Roads. These shrublands were originally fields that were allowed to succeed into the shrubland that is present today.

The shrublands provide habitat for species such as:

- American woodcock
- Wild turkey
- Ruffed grouse
- Eastern cottontail
- Ring-necked pheasant
- White-tailed deer

MANAGEMENT HISTORY

A large portion of the WMA was historically cleared for farming. Over the years, much of the land has reverted to forest. Some fields that had originally been maintained, have been allowed to succeed to shrubland. As equipment has been available, some of the shrubland has been periodically brush-hogged and allowed to regrow.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Figure 6):
    - The shrubland should be mowed every 7-10 years with a forestry mower or similar equipment in order to maintain shrub density.
    - As time is available, the tree component of these shrublands should be reduced by removal of trees so that trees do not dominate and shade out the shrubs.

- Invasive vegetation will be monitored and controlled if needed.

BEST MANAGEMENT PRACTICES

Mowing will typically be completed prior to the opening of most small game hunting October 1. However, in some cases work in these areas may occur in late December or throughout the winter when the ground is frozen.

MANAGEMENT EVALUATION

Visual evaluations of the shrublands will be conducted annually to assess needed management actions, such as brush-hogging of grassy areas, cutting or mowing of shrubs or removal of trees.

GRASSLAND

Grasslands are open, grassy areas with a minimal amount of shrub and tree cover (<35%) that are maintained, or could be maintained, without significant brush cutting. Grassland management will restore and maintain habitat that will be used by migratory birds as well as contribute to the goal of building self-sustaining grassland bird populations.

MANAGEMENT OBJECTIVES

- Maintain current acreage of grassland.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

The 88 acres of grassland habitat at this WMA are primarily found in fields located adjacent to the main roads and trails. Because these fields are all relatively small, and are interspersed with some shrubs and trees, they provide limited habitat for grassland nesting birds. These areas provide important habitat for pheasants released at this property immediately prior to and during the small game hunting season. They also provide foraging habitat for white-tailed deer and wild turkey.

The grasslands provide habitat for species such as:

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

MANAGEMENT HISTORY

This property was historically farmland and presumably existing fields were once used for grazing by cows and/or horses. Most recent management has involved maintaining and reclaiming fields that had become overgrown, and in trimming back perimeter tree growth that was continually encroaching on the fields and physically impeding mowing.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Figure 6):
  - Mow 88 acres of fields every 2-3 years to maintain grassland conditions. Some limited mowing may be done annually to provide hunter access. Mowing will

generally occur after August 15 and will be completed prior to release of pheasants in late September.
- Improve fields by limbing perimeter trees and limbing and/or removing individual trees or small stands of trees in fields that shade, obstruct, break up or have invaded the field.

MANAGEMENT EVALUATION

Fields will be assessed annually to determine the need for mowing. Most of the fields have a substantial component of suppressed shrubs that quickly regrows if not kept in check, so determination as to mowing will largely depend on the height and vigor of shrub regrowth.

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

Currently, Bear Spring Mountain WMA does not have any areas managed as agricultural land and no plan to develop such habitat at this time.

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 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 21 acres of existing wetlands to provide quality habitat for wildlife.
- Monitor and control invasive aquatic vegetation as needed.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

The wetlands on Bear Spring Mountain WMA are a mixture of emergent vegetation, shrubs and scattered trees (Figure 3). Currently, there are 21 acres of wetland on the WMA. Beavers and beaver activity in or near the waterbodies located throughout the WMA assist in the continuous creation and/or expansion of wetlands. The presence of beaver also creates management issues when their activities negatively impact existing structures or result in flooding. Management of beaver must maintain a balance between the creation of beneficial habitat and the negative impacts on WMA infrastructure.

The wetlands provide habitat for species such as:

- American woodcock, red-winged blackbird

- Muskrat, beaver, otter
- Migratory waterfowl
- Snapping turtle, painted turtle
- Spring peeper, Northern leopard frog, spotted salamander

MANAGEMENT HISTORY

Beaver activity has caused wetland acreage within Bear Spring Mountain WMA to fluctuate since DEC took over management of the property in the 1940s. Prior to 1996 DEC took a hands-off approach and allowed beaver activity to occur throughout the property, including building a dam on top of the man-made stone dam at Lower Pond. A storm in 1996 caused significant damage to the dam and flooding downstream. Since that time DEC has been more proactively in managing beaver activity, which has resulted in a decrease in total wetland habitat within the WMA. A nuisance beaver permit is issued annually to the regions Division of Operations to address negative impacts when they occur.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Table 4, Figure 5):
    - Maintain the current acreage and quality of wetlands.
    - Monitor and control invasive aquatic vegetation as needed.
    - Monitor and control beaver activity in impoundments as needed.

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

Periodic surveys for amphibians in the wetlands may occur as opportunities arise. Invasive aquatic vegetation will continue to be monitored and identified for control.

OPEN WATER (WATERBODIES AND WATERCOURSES)

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

MANAGEMENT OBJECTIVES

- Maintain the existing 25 acres of open water.
- Maintain water control structures and dykes on small ponds occurring on the WMA.

DESCRIPTION OF EXISTING OPEN WATER AND TARGET SPECIES

There are 25 acres of open water on Bear Spring Mountain consisting of streams and natural and impounded ponds. These areas provide aquatic habitat for many species of amphibians, reptiles waterfowl and fish.

There are seven streams or segments of streams that occur on the WMA, approximately 11.3 miles. West and East Trout Brooks run through the WMA and are classified as Class C(TS), protected trout spawning streams. The other streams located on the WMA are classified as Class C(T) and C(TS) indicating they can support a fishery.

Species that benefit from open water habitat include:

- Brook trout
- Common merganser
- Muskrat
- Snapping turtle

MANAGEMENT HISTORY

The ponds located within the WMA are likely remnant from past agricultural practices or homesteads. Dam boards were replaced on the beaver deceiver at Bear Cub Pond approximately 8 years ago. In 2017, DEC completed maintenance and repair of Lower Pond dam, after a portion of the dam was undermined.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2019-2028** (Table 4, Figure 5):
    - Maintain existing natural and impounded open water habitat.
    - Monitor and control invasive aquatic vegetation as needed.
    - Inspect and maintain water control devices.
    - Monitor beaver activity and control as needed.

BEST MANAGEMENT PRACTICES

All activities will comply with the New York State Freshwater Wetlands Act (ECL Article 24) and Water Resources Law (ECL Article 15, Title 5).

MANAGEMENT EVALUATION

Periodic surveys of the ponds and streams may occur as opportunities arise. Invasive aquatic vegetation will continue to be monitored and identified for control. Water control devices will be inspected periodically, to ensure structural integrity and functionality.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Bear Spring Mountain 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 Bear Spring Mountain WMA, 2019-2028. (Also see Figure 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut hardwoods in Stands A-7, A-8, A-14, B-1, B-2, F-1, F-2, F-4, F-6, G-5, I-1, I-2, J-4, J-9, K-4, O-1, O-5, P-2 and Q-5	126	2019-2023
Forest	Clearcut hardwoods in stands; A-12, A-15, E-1, V-1, V-2, W-1, W-2 and W-3	107	2024-2028
Forest	Conduct seed-tree treatments in stands; M2.11, M-3, W-3 and W-4, retaining mast producing trees	101	2024-2028
Forest	Conduct shelterwood treatments in stands; V-1 and V-4, retaining hemlock	24	2024-2028
Forest	Creation of small canopy gaps within mature forest	n/a	2019-2028
Grassland	Continue mowing grassland fields every 2-3 years to maintain grassland conditions	≤88	2019-2028
Shrubland	Continue to mow shrublands every 7-10 years	≤63	2019-2028
Wetland	Inventory and control invasives within wetlands	≤25	2019-2028

III. FIGURES

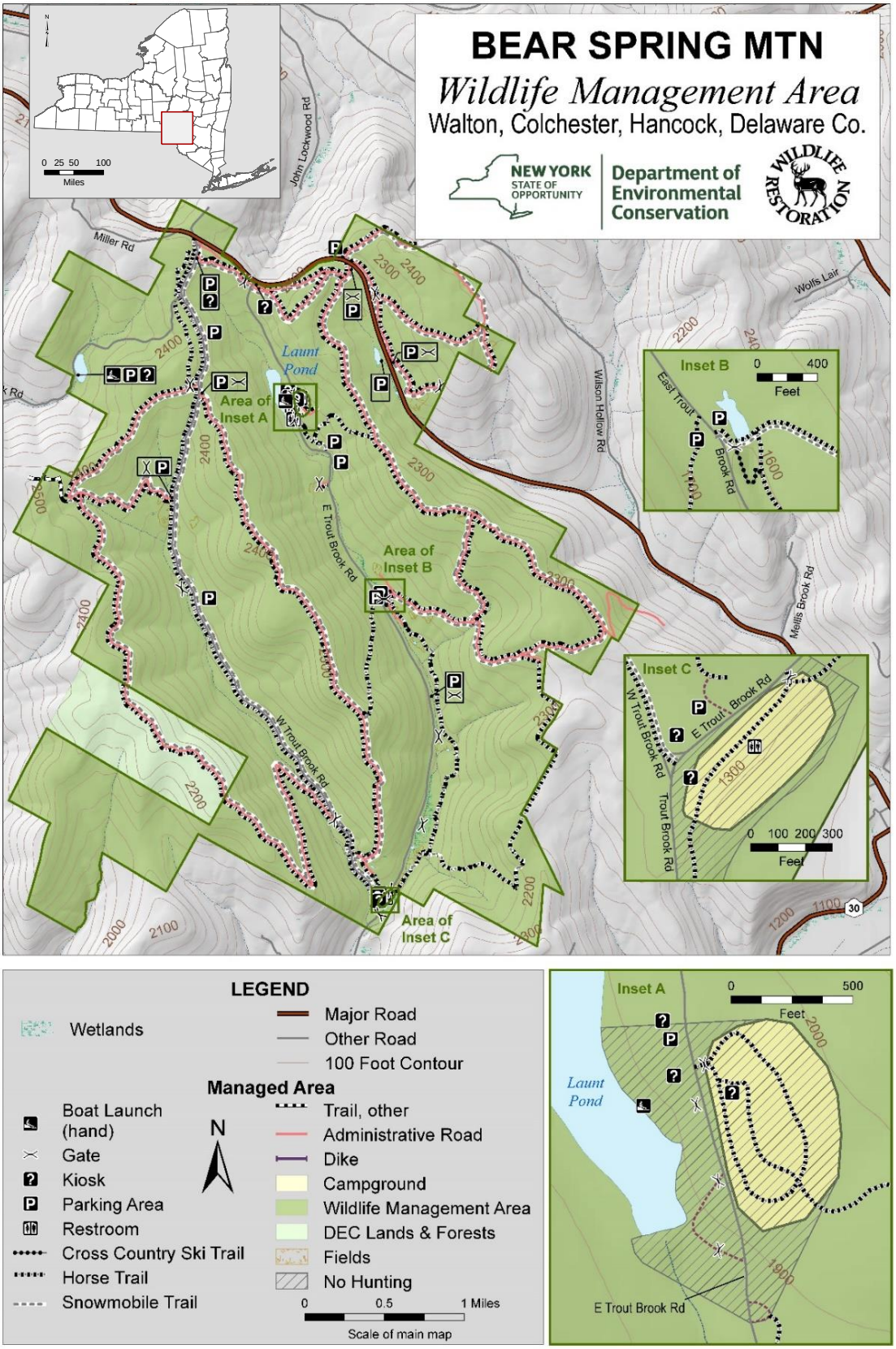

FIGURE 1. Location and access features at Bear Spring Mtn WMA.

FIGURE 2. Significant ecological communities on Bear Spring Mtn WMA. Data from the NY Natural Heritage Program.

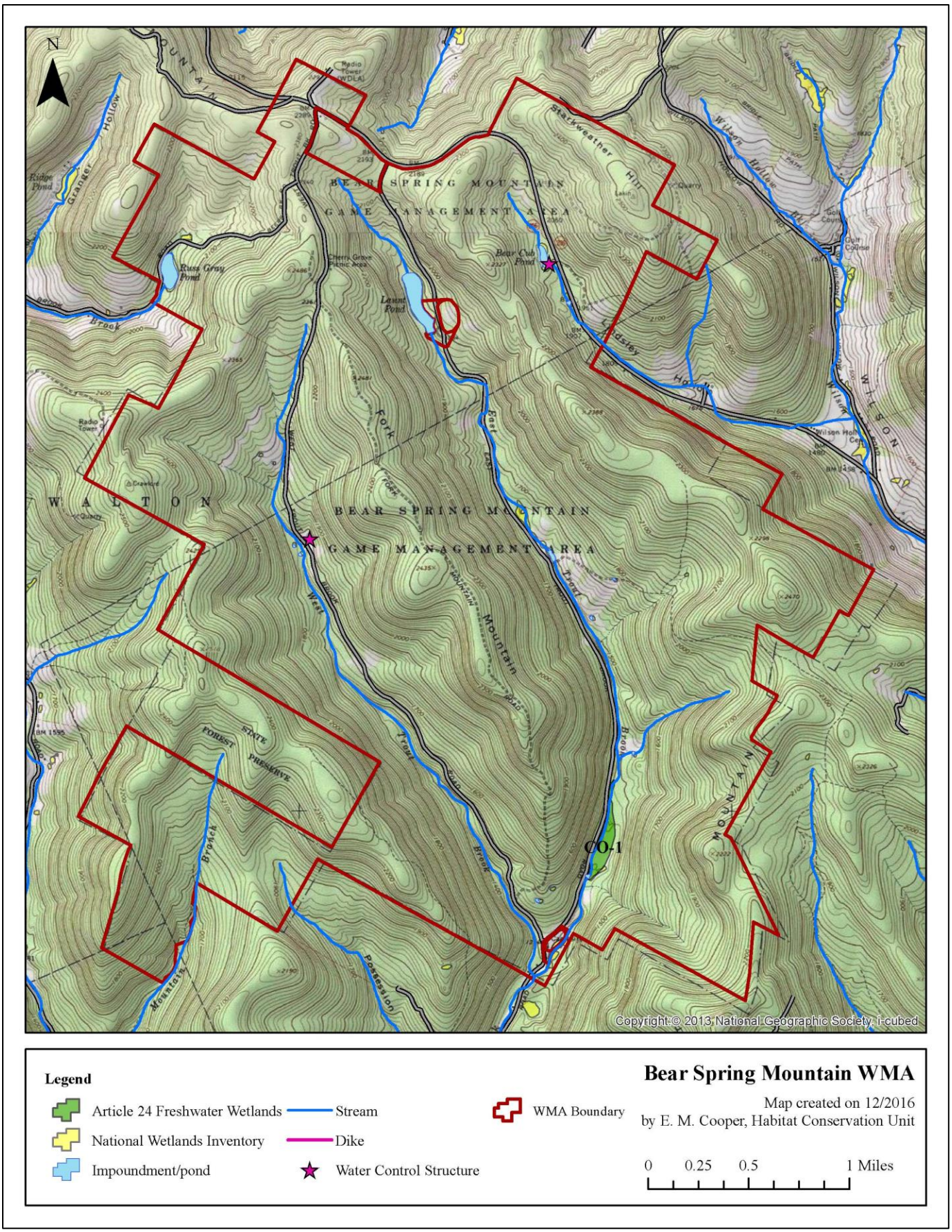

FIGURE 3. Wetlands, open water, and streams of Bear Spring Mtn WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

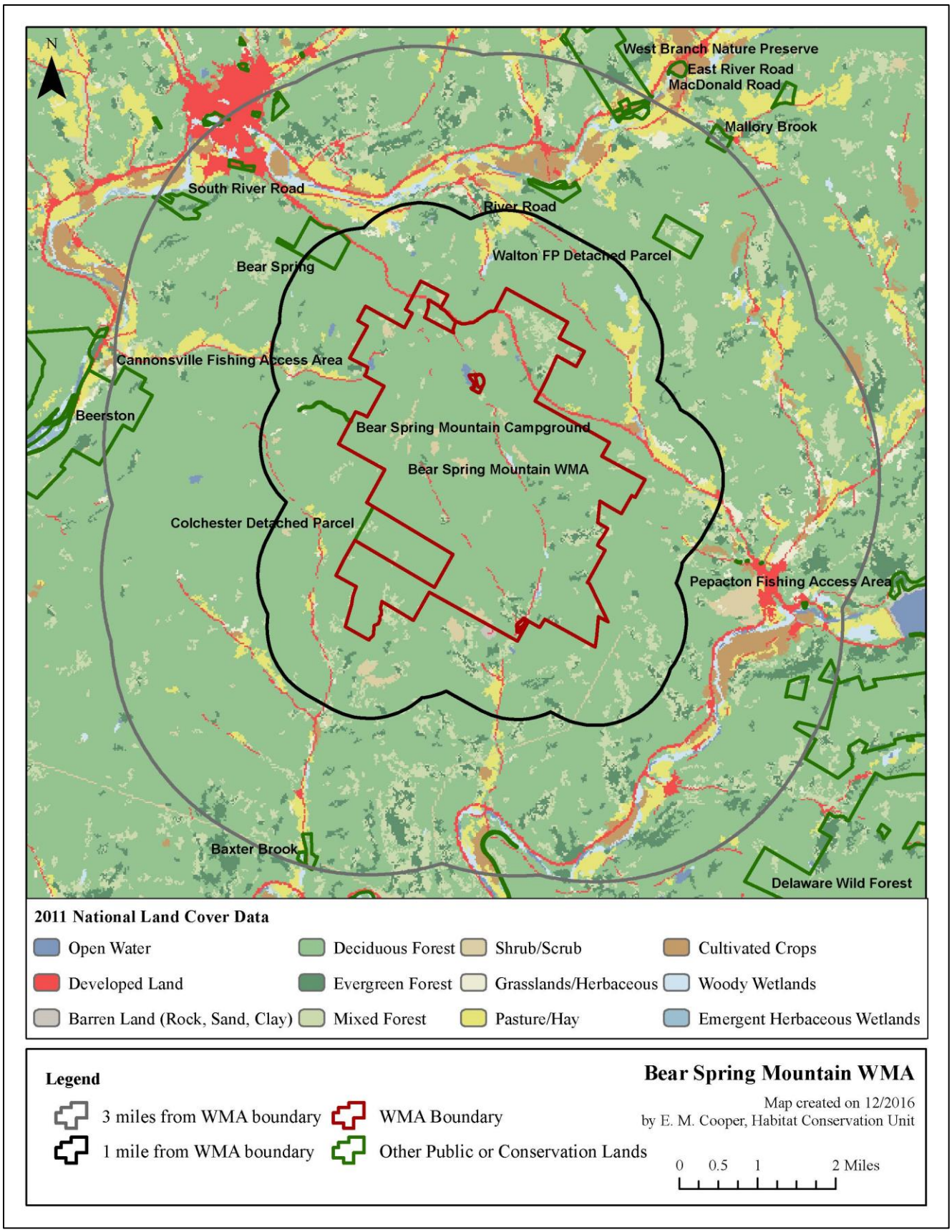

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Bear Spring Mtn WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend.

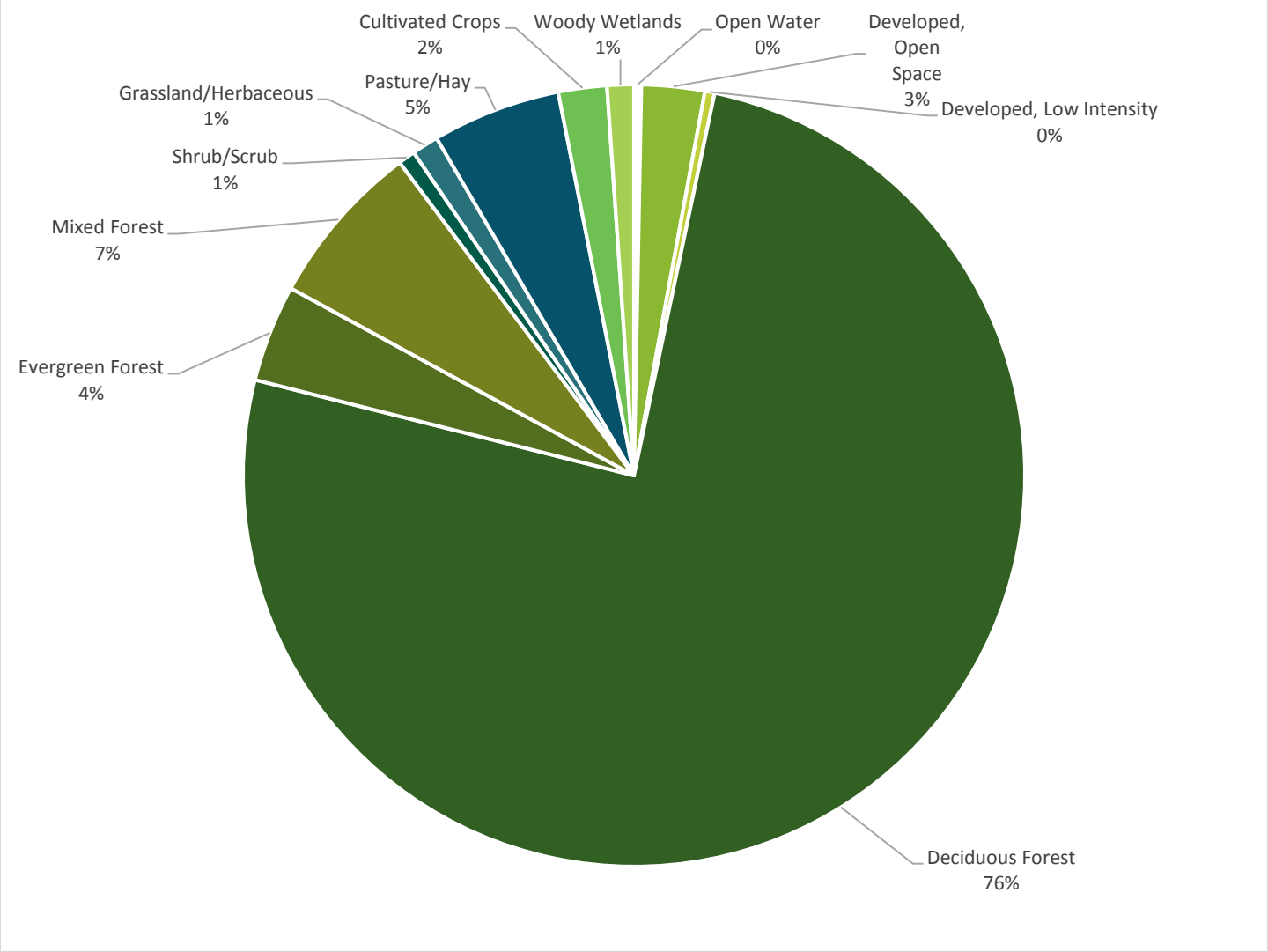

FIGURE 5. Percent cover of land cover types within three miles of Bear Spring Mtn WMA. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend.

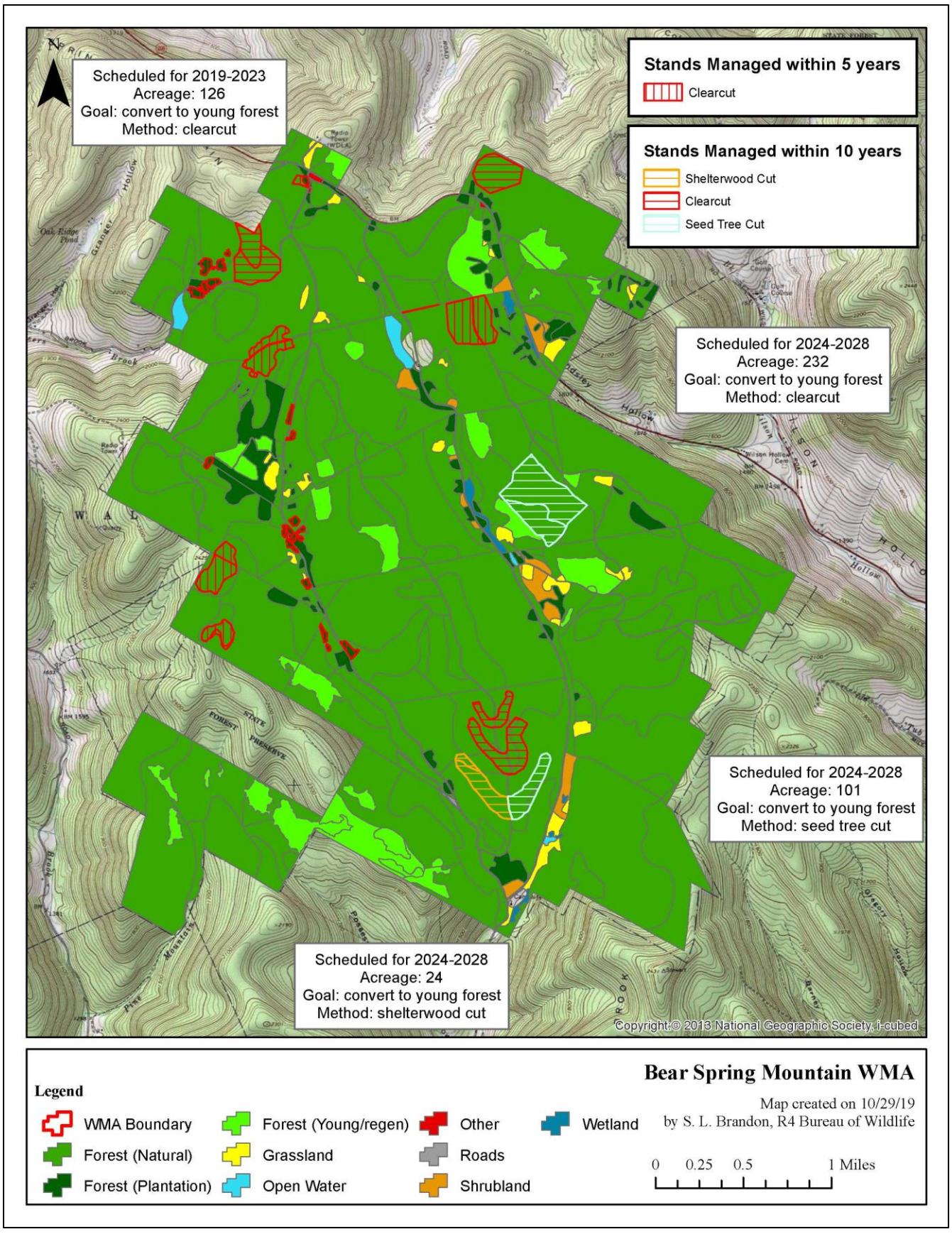

FIGURE 6. Habitat types and locations of proposed management on Bear Spring Mtn WMA. Numbers indicate the stand number from habitat inventory.

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. For example, young forest target species at Bear Spring Mtn. WMA include wild turkey, ruffed grouse, and American woodcock.

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

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

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

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

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

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

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

APPENDIX B. COMPLIANCE WITH STATE ENVIRONMENTAL QUALITY REVIEW

This plan identifies habitat management activities to be conducted on the Wildlife Management Area. These activities were analyzed in the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* (PEIS), as updated and amended in 2017 by the *Supplemental Final Environmental Impact Statement* (SFEIS).[14] Any activity that exceeds the thresholds of, or was not analyzed in the 1979 PEIS as amended in 2017, will require individual, site-specific environmental review. Environmental assessment forms prepared as a result of this review will be posted on the Environmental Notice Bulletin (ENB).[15]

The activities recommended in this plan:

- Will not adversely affect threatened or endangered plants or animals or their habitat.
    - Prior to implementation of any activity, staff review the NY Natural Heritage Program's "Natural Heritage Element Occurrence" database and perform field surveys when necessary. If a protected species is encountered in a project area, staff may establish buffer zones around the occurrence, move the project area, follow time-of-year restrictions, or cancel the project.
- Will not induce or accelerate significant change in land use.
    - All lands and waters within the WMA system are permanently protected as wildlife habitat.
- Will not induce significant change in ambient air, soil, or water quality.
    - Activities are designed to protect air, soil, and water quality through careful project planning, use of appropriate Best Management Practices, and establishment of Special Management Zones around sensitive land and water features requiring special consideration.
- Will not conflict with established plans or policies of other state or federal agencies.
    - Activities will follow established plans or policies of other state and federal agencies, including all relevant U.S. Fish and Wildlife Service rules and regulations.
- Will not induce significant change in public attraction or use.
    - The WMA system is part of a long-term effort to establish permanent access to lands in New York State for the protection and promotion of its fish and wildlife resources. Proposed activities will continue to protect, promote, and maintain public access to WMAs and their wildlife resources.
- Will not significantly deviate from effects of natural processes which formed or maintain an area or result in areas of significantly different character or ecological processes.
    - Activities will be conducted in a manner that maintains, enhances, or mitigates ecological processes and/or natural disturbances as appropriate for each WMA and habitat type. Some activities, such as even-aged forest management, intentionally result in areas of different character and ecological processes; however, they are not considered significant because they are ephemeral or transitional and will not permanently alter the landscape.
- Will not affect important known historical or archeological sites.
    - Activities that may result in ground disturbance are reviewed by DEC's State Historic Preservation Officer (SHPO) and/or the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) to identify potential impacts to historical or archeological sites. Sensitive sites will be protected under the direction of DEC's SHPO and the OPRHP Archaeology Unit.
- Will not stimulate significant public controversy.
    - It is not anticipated that activities on WMAs will stimulate significant public controversy. A public comment period was held during development of both the PEIS and the SFEIS; no relevant comments in opposition of proposed management activities were received during the SFEIS public comment period. Staff also hold a public information session after completing each HMP, consider feedback from these sessions, and may adjust management as deemed appropriate. Kiosks, signs, webpages, articles, demonstration areas, and other outreach materials also raise awareness about habitat management activities.

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

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX D: AMENDMENTS

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