Habitat Management Plan for
Charles Flood Wildlife Management Area at the Empire Brickyard
2021 – 2030

Division of Fish and Wildlife
Bureau of Wildlife

65561 State Route 10, Stamford, NY 12167

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

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SUMMARY

Charles Flood Wildlife Management Area (CFWMA) at the Empire Brickyard consists of 590 acres of grassland, forested upland, shrubland and tidal marsh. This property is the former site of the Empire Brickyard Company, which went out of business in the early 1900s due to depletion of natural resources in the area. The Wildlife Management Area (WMA) was acquired from Scenic Hudson, a non-profit land conservancy organization, in 2018 for wildlife and habitat management, as well as to expand and improve wildlife-dependent recreation. This WMA is located along the eastern banks of the Hudson River and is characterized by forested uplands of mainly oak and white pine and shrubby fields. Deep gullies run east to west on the property where water runs seasonally, emptying into the Hudson River. The western portion of the WMA is included within the Stockport Flats component of the Hudson River National Estuarine Research Reserve (HRNERR, Figure 2). Wildlife in the area are typical of the Hudson River valley including white-tailed deer, bald eagle, beaver, otter, wild turkey, Canada goose, raccoon, ruffed grouse, American woodcock, a variety of songbirds, waterfowl, woodland raptors, reptiles and amphibians. This property is an important feature of the Hudson River Estuary, providing spawning and nursery habitat for striped bass, American shad, shortnose sturgeon and alewives. Waterfowl, wading birds, and shorebirds use the wetlands and marshes as breeding and nesting habitat. This WMA is included in the Stockport Flats Important Bird Area. This tidal marsh supports a diverse assemblage of marsh birds and waterfowl, including pied-billed grebe, least bittern, American black duck and mallard. This WMA affords multiple recreational opportunities including hunting, trapping and bird watching.

Habitat management goals for Charles Flood WMA include:

- Managing approximately 7.6% of the WMA as young forest (10.8% of the total forested area) to promote wild turkey, ruffed grouse, and American woodcock habitat;
- Maintaining approximately 62.9% as mature forest to provide habitat for forest interior species;
- Maintaining approximately 7.1% as grasslands;
- Maintaining approximately 7.3% as shrublands;
- Creating approximately 1.7% as pollinator plots to benefit both pollinator species and gamebirds that feed within the plots;
- Maintaining approximately 12.7% as wetlands; and
- Maintaining approximately 0.7% 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 Department of Environmental Conservation (DEC)Division

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

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

SCOPE AND INTENT

Primary purposes of this document:

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

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

Definitions are provided in Appendix A.

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

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

WMA Overview

Location

Charles Flood WMA is located in DEC Region 4, Town of Stockport, Columbia County (Figure 1).

Total Area

590 acres

Habitat Inventory

A habitat inventory of the WMA was completed in 2020 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 Charles Flood WMA.

Habitat Type	Current Conditions (as of 2021)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	421.6	71.5%		371.2	Decrease to 62.9%
Young forest	8.6	1.4%		45	Increase to 7.6%
Shrubland	80.9	13.7%		42.9	Decrease to 7.3%
Grassland	0	0%		42	Increase to 7.1%
Agricultural land	0	0%		10	Increase to 1.7%
Wetland (natural) [b]	74.6	12.7%		74.6	No change
Wetland (impounded) [b]	0	0%		0	No change
Open water	0	0%		0	No change
Other	0	0%		0	No change
Roads	4.3	0.7%		4.3	No change
Rivers and streams			1.4		No change
Total Acres:	590	100%		590	

[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 Charles Flood Mountain WMA includes many species commonly found throughout eastern New York and the Hudson River valley such as:

- Wild turkey, pied-billed grebe, bald eagle
- Eastern coyote, white-tailed deer, Eastern cottontail, otter, beaver
- Gray treefrog, Northern leopard frog, Northern two-lined salamander

- Common garter snake, Eastern milksnake, snapping turtle
- Striped bass, alewife, short-nosed sturgeon

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 Charles Flood WMA, including state and federal Endangered (E) and Threatened (T) species, state Species of Special Concern (SC), High Priority SGCN (HP) and SGCN (x).

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American black duck			HP
	American kestrel			x
	American woodcock			x
	Bald eagle		T	x
	Bobolink			HP
	Blue-winged warbler			x
	Eastern meadowlark			HP
	Least bittern		T	x
	Northern bobwhite			HP
	Northern harrier		T	x
	Pied-billed grebe		T	x
	Prairie warbler			x
	Ruffed grouse			x
	Scarlet tanager			x
	Wood thrush			x
Mammals	Indiana myotis (Indiana bat)	E	E	HP
Amphibians and reptiles	Northern map turtle			x
	Smooth greensnake			x
	Snapping turtle			x
Fish	Alewife			x
	American shad			HP
	Atlantic sturgeon			HP
	Blueback herring			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 https://www.dec.ny.gov/animals/7179.html.
[2] Available online at https://www.dec.ny.gov/animals/7312.html.
[3] Available online at https://www.dec.ny.gov/animals/7140.html.
[4] Available online at https://ebird.org/content/ebird/about/. © Audubon and Cornell Lab of Ornithology.

Table 2. continued				
	Shortnose sturgeon			x
Mussels	Alewife floater			HP
Invertebrates	Brook snaketail			x
	Midland clubtail			x
	Russet-tipped clubtail			x
	Spine-crowned clubtail			x
	Umber shadowdragon			x
Plants	Golden club		T	
	Smooth beggar ticks		T	
	Spongy-leaved arrowhead		T	
	Marsh lousewort		T	

Significant Ecological Communities:

There are four rare and/or significant natural communities located on Charles Flood WMA as identified by the NY Natural Heritage Program. The state rank reflects the rarity within NY, ranging from S1, considered the rarest, to S5, considered stable; definitions are provided in Appendix A. The following significant ecological communities occur on the WMA; the community description is from *Ecological Communities of New York State, Second Edition* [5] (Figure 2):

- **Tidal river (S3):** the aquatic community of continuously flooded substrates that support no emergent vegetation. Within the river there are two zones; the deepwater zone includes areas where substrates are usually over 2 m (6 ft) deep at low tide, the shallow zone includes submerged areas less than 2 m (6 ft) deep at low tide that lack rooted aquatic vegetation. In the river there is a vertical salinity gradient through most of the year, with a surface layer of fresh water (salinity less than 0.5 ppt) floating over a deeper layer of brackish water (salinity between 0.5 and 18.0 ppt). Salinities at any one place in the river may fluctuate as the tides flow in and out because the "salt wedge" of brackish water alternately rises and falls with the tides. The wedge also fluctuates seasonally and with precipitation runoff.
- **Freshwater intertidal mudflats (S2):** a sparsely vegetated, to non-vegetated, community characterized by low rosette-leaved aquatics. This community occurs on exposed intertidal mudflats, or muddy sand, where the water is fresh (salinity less than 0.5 ppt). This community is best developed where mudflats are nearly level so that broad expanses are exposed at low tide. The plants are completely submerged in 0.9 to 1.2 m (3 to 4 ft) of water at high tide; and they are usually coated with mud.
- **Freshwater tidal marsh (S2):** a marsh community that occurs in shallow bays, shoals, and at the mouth of tributaries of large tidal river systems, where the water is usually fresh (salinity less than 0.5 ppt), and less than 2 m (6 ft) deep at high tide. The vegetation is dominated by aquatics that are emergent at high tide. Typically, there are two zones in a freshwater tidal marsh: a low-elevation area dominated by short, broad-leaf emergents

[5] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at https://www.nynhp.org/ecological-communities/.

bordering mudflats or open water, and a slightly higher-elevation area dominated by tall graminoids.

- **Freshwater intertidal shore (S2S3):** a community of the intertidal gravelly or rocky shores of freshwater tidal rivers and creeks. The community sometimes occurs at the base of cliffs, where the water is fresh (salinity less than 0.5 ppt). The vegetation may be very sparse.

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 Charles Flood WMA include:

- Two wetlands regulated by Article 24 of the Environmental Conservation Law and 15 additional wetlands shown on the National Wetlands Inventory (Figure 3). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated wetland boundary, known as the adjacent area. There may be forestry prescriptions associated with forested wetlands and adjacent areas, and each management prescription will be reviewed individually for determination of impacts.
- Two streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). The Hudson River runs along the western border 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 A, the Hudson River. Water quality standards will be adhered to on all streams.

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:

The soil types and characteristics at Brickyard WMA vary greatly. The flatter portions of the property away from the Hudson River are dominated by silt loams (Nassau, Unadilla, Collamer) and sand loams (Knickerbocker and Elnora). Sand loams are generally well drained and silt loams less well drained. Also in this area are soils of the Kingsbury & Rhinebeck, Hudson & Vergennes and Livingston & Madalin series. These soils are more poorly drained and are historically in areas that have been cleared to be used for agricultural purposes. Two other significant soil types that occur on this property are udipsamments and udorthents. Udipsamments are river dredgings placed by humans and exist in the area of the railroad tracks adjacent to the river. Udorthents, flattened modified areas, exist where clay was mined to make bricks, as the name of this WMA alludes to.

[6] Available online at https://www.dec.ny.gov/outdoor/104218.html.

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

- Forest (32% combining deciduous, evergreen and mixed forests)
- Pasture/Hay (30%)
- Development (12%)
- Wetlands (9% combining emergent herbaceous and woody wetlands)
- Open water (8%)
- Cultivated crops (7%)
- Shrub/scrub (2%)

Almost three quarters of the landscape surrounding Charles Flood WMA consists of forest, pasture/hay and developed habitats. The forested habitats are fragmented and surrounded by farmland and developed land. Due to the absence of young forest habitat on the WMA and limited amount 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 Charles Flood WMA increases habitat diversity and benefits many different species of wildlife.

Nearby conservation lands include:

- Vosburgh Swamp WMA (311 acres)
- Stockport Flats WMA (354.3 acres)
- Harrier Hill Park (6 acres)
- Greenport Public Conservation Area (736 acres)
- Stockport Flats site of the Hudson River National Estuarine Research Reserve (1543 acres)
- Hudson River Islands State Park (59 acres)
- Middle Grounds Flats Unique Area (372 acres)
- Several town/state owned boat launches

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitat on Charles Flood 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 Charles Flood 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 Charles Flood WMA is to create approximately 45 acres of young forest habitat, approximately 11% of the forested acreage.

MANAGEMENT OBJECTIVES

- Retain the majority of the existing mature forest (371.2 acres) for forest interior species.
- Increase young forest from 8.6 to 45 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 (hickory and oak) to promote regeneration and increase availability of hard mast for wildlife.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 430 forested acres on Charles Flood WMA (Table 3; Figure 6). This property, the former site of the Empire Brickyard, consists of a mix of grassland, shrubland and second growth forest. The depletion of resources from the earlier uses of the property prevents certain sections of the property to support anything more than shrubland habitat. The remaining habitat is indicative of previously cleared land, including the presence of many invasive species. Currently the forest habitat on the property is mainly mid-growth forest with very little understory, other

[7] Additional information about DEC's Young Forest Initiative and the YFI Strategic Plan is available online at https://www.dec.ny.gov/outdoor/104218.html.

than undesirable species. Older growth trees can be found on the inaccessible areas of the WMA including steep slopes and gullies. 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 Charles Flood WMA.

Forest Type	Acres (as of 2021)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	421.6	371.2	White pine, red oak, aspen, maple, eastern red cedar
Plantation	0	0	
Forested wetland	0	0	
Young forest	8.6	45	
Young forest (forested wetland)	0	0	
Total Forested Acres:	430.2	416.2*	

*Total forested acreage within Charles Flood WMA will decrease by 14 acres. This acreage will be permanently converted into grassland habitat.

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.

[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.

    - 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.

MANAGEMENT HISTORY

This WMA has been significantly modified by humans over the past few centuries. The property was widely cleared of trees to make way for agriculture and clay mines for brick production. These clearings would have resulted in logs that were likely utilized by those clearing the land as lumber, fuelwood as well as supplying the forest products industry. As farms were abandoned, fields became overgrown and required re-clearing or would revert back to shrubland or forest. This land use cycle resulted in the varied mosaic of vegetation types currently on this WMA. That same land use cycle made this property very susceptible to significant invasive species establishment, which is noted later in this section.

Charles Flood WMA was acquired from Scenic Hudson in 2018. There has been little to no forest management activity on the property since it was acquired by New York State.

The following management is proposed in order to reach the young forest acreage goal of 45 acres within ten years:

- **Management planned for 2021-2025** (Table 4, Figure 6):
    - Conduct clearcut/selective cut treatments in stands; A2 and A3 (14 acres).
- **Management planned for 2026-2030** (Table 5, Figure 6):
    - Conduct clearcut/seed tree treatments in stands; A1 and A950. These treatments will cover approximately 22.4 acres.

Table 4. Forest management schedule for the first five-year period of this HMP (2021-2025).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-2	12	Small sawtimber 12”-17” DBH	Transition Hardwood: northern hardwood/oak	Young forest	Wildlife	Clearcut/selective cut
A-3	2	Pole Timber 6-11” DBH	Natural Forest: Cedar	Young forest	Wildlife	Clearcut/selective cut

[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.

Table 5. Forest management schedule for the second five-year period of this HMP (2026-2030).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-1	12.2	Small sawtimber 12"-17" DBH	Natural Forest: Northern hardwood-white pine	Young forest	Wildlife	Clearcut/seed tree cut
A-950	10.2	Brushy fields	Non-forest: Cedar, dogwood, shrub spp.	Young forest	Wildlife	Clearcut/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 2021-2025

- **Stands A2 and A3:** These stands are a mix of small to medium sawtimber and brushy fields. These stands will be clearcut or selectively harvested (removing the larger overstory trees to allow light to reach the ground) and allowed to regenerate naturally into mixed hardwood-softwood stands that will provide nesting areas, cover and food sources for the target species. Cut areas will be monitored for invasive species and for desired regeneration. Please refer to Table 4 for the acreages of these treatments.

Management Planned for 2026-2030

- **Stands A1 and A950:** These stands are natural Northern hardwood stands that appear to have stagnated and have been designated by the land manager for habitat creation and improvement. Portions of these stands will be cleared, retaining good mast producing trees and desired shrubs with a goal of enhancing natural regeneration by providing a seed source. Portions of these stands will be clearcut and allowed to naturally regenerate creating nesting areas, food sources and cover needed by the target species. These cut areas will be monitored for desirable and undesirable regeneration. Please see Table 5 for harvest acreages.

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. 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. Raptor call back surveys will be conducted during the nesting season to identify nesting trees and buffers will be designated around any identified nests. Due to the possible presence of Indiana bats utilizing the forested habitat within the WMA, the harvesting of trees will be restricted to winter months.

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, and where soils have been impacted by agricultural practices(hardpan) or clay mining, regeneration may be slower than areas of less disturbance and well drained sites.

This WMA contains mainly natural forest stands and overgrown fields. Some areas of the WMA contain a significant amount of young ash trees. Emerald ash borer (EAB) has been confirmed to be within the towns surrounding the WMA. Columbia County is included in the EAB restricted zone. The presence of hemlock trees on this WMA is relatively low, with a few randomly scattered trees located on the steeper slopes. Hemlock wooly adelgid (HWA) has also been found to be within the towns surrounding the WMA, these invasive pests can have a detrimental effect on the health of forest stands.

This WMA has a relatively high volume of invasive or undesirable vegetation present. Observed vegetation includes honeysuckle, phragmites, Japanese barberry and buckthorn, along with other invasive plant species. These species can inhibit or outcompete desirable or native species. Stands where invasive species are a significant component will be evaluated to see if control is necessary.

Pre- and Post-treatment Considerations:

After treatment, it is possible that adequate forest regeneration of desired species may not occur. In that case, the stands may be retreated, or plantings of desirable species may be used to supplement natural regeneration. Invasive and undesirable species may outcompete the regeneration of native plant species. In stands where such understory plants occur, herbicide or mechanical control may be utilized pre and/or post-harvest. Over-browsing by white-tailed deer may pose a threat to forest regeneration in certain areas of the WMA. If browsing is determined to be a major threat to desirable forest regeneration, silvicultural or wildlife management techniques may be implemented in order to reduce the impact.

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

MANAGEMENT EVALUATION

In order to evaluate if desired forest regeneration and wildlife population goals have been achieved by the management plan 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. Regeneration assessments will be conducted either 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 Charles Flood 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

- Convert 28 acres of the existing shrubland to grassland habitat.
- Maintain 42.9 acres of shrublands to provide early successional habitat for ruffed grouse, woodcock, Eastern wild turkey, pheasant, Eastern cottontail and shrubland breeding birds.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Shrublands are an important component of WMAs and provide habitat for species such as: American woodcock, wild turkey, ruffed grouse, eastern cottontail, ring-necked pheasant and White-tailed deer. Currently the majority of shrubland area within the WMA is located in the southeast portions of the WMA, within an area consisting of long abandoned fields. The shrublands are bordered along their northern and western edges by mature forest. The current shrublands are made up of dogwood, viburnum, autumn olive, multiflora rose and spicebush.

The WMA was in agriculture approximately 30 years ago, and those fields and pastures have matured into shrubland. The shrubland areas on the WMA now include more acreage than is desired. Currently there are 80.9 acres of shrubland. One of the goals on the WMA is to restore grassland to create a more balanced habitat matrix, which means that 28 acres of the existing shrubland will be converted back to grasslands.

MANAGEMENT HISTORY

Roughly 140 acres of the property was used as fields to pasture livestock and grow hay after the location was depleted of clay for brick making and closed in the 1950s. The property was

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

utilized mainly for recreational purposes from the late 1980s until its purchase in 2015 by Scenic Hudson, who then cleaned up garbage dump sites on the property and mowed the old roadbeds for walking trials on the property. Other than walking trails, the property has been relatively untouched. Upon purchasing the property in 2018, DEC mowed approximately 5 acres to restore grasslands and then mowed an additional 42 acres of shrubland in 2019 to revert it back to grassland.

Implementation Plan and Anticipated Schedule

- **Management planned for 2021-2030** (Figure 6):
    - Convert 28 acres of the existing shrubland to grassland.
    - 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 outside of breeding bird season and 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

Shrublands will be assessed annually to determine the need for selective tree removal and to evaluate shrub density. Determining if forestry mowing is required will largely depend on the height and vigor of shrub regrowth.

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

- Create approximately 42 acres of grassland to provide quality grassland bird habitat for breeding, nesting, and wintering species.
    - Convert 28 acres of shrubland to grassland habitat.
    - Convert 14 acres of forested habited to grassland.
- Continue to enhance the quality of grassland fields by removing shrubs or dense vegetation from the fields (e.g., brush hogging, disking and seeding, and/or hydro-axing), depending on the species the habitat is being managed to support.
- Monitor fields for invasive species and eradicate where feasible.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

When this WMA was acquired in 2018, there were no grassland areas on the WMA because the long-abandoned fields had grown into shrubland. By 2020, approximately 15 acres of shrubland were mowed with a forestry mower to create grassland. In order to maintain the grassland once it is restored, mowing will occur every 2-3 years. Grassland birds can begin nesting as early as March and may still occupy the habitat into September. The recommended time period for mowing is mid-August through early October, so there is minimal interference with nesting or wintering activities of birds. Species that benefit from grasslands and the best management practices followed by NYSDEC include bobolink, eastern meadowlark, grasshopper sparrow, northern harrier, savannah sparrow and short-eared owl.

Grassland restoration in the Hudson Valley helps reduce habitat loss to residential and commercial development including new homes and solar projects. Creation of grassland also meets priorities set forth by the North American Bird Conservation Initiative.

MANAGEMENT HISTORY

As noted earlier, when this location was no longer used for brickmaking, it was used to pasture livestock or mowed for hay until the late 1980s. Following this timeframe, no management was done on the property other than mowing trails until NYSDEC acquired it from Scenic Hudson in 2018. By 2020, approximately 15 acres of shrubland have been mowed to start converting back to grassland.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2021-2030** (Figure 6):
    - Convert 28 acres of shrubland into grassland
    - Convert 14 acres of forest into grassland
    - Mow 42 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.

BEST MANAGEMENT PRACTICES

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

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity and consider the needs of both breeding and wintering grassland bird species.

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

- 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 (common 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, and grazing to maintain grassland habitat, after evaluating the appropriateness of these methods relative to site conditions and management objectives.

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 the preferred mowing regime and strip mowing should be limited (especially in fields over 25 acres).
- Un-mowed blocks should be in the shape of a square as opposed to long rectangles.
- 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

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 contracts, but also including wildlife food plots. A food plot is an agricultural crop or forage planted to attract wildlife.

Management Objectives

- Create approximately 10 acres of pollinator plots.

Description of Existing Agricultural Lands and Target Species

Currently, Charles Flood WMA does not have any areas managed as agricultural land. To promote and support populations of grouse, turkey and woodcock, pollinator wildflower plots will be established to create additional feeding opportunities. Planned food plots on Charles Flood WMA would be made up of a combination of clovers and native wildflower pollinator mixes. Native wildflower seed mixes are available and are pre-screened to ensure invasive plant seeds are not included in the mix. Native wildflowers host a variety of insects such as caterpillars, grasshoppers, and spiders, which are important foods for young wildlife. The seasonal growing cycle of wildflower plots also helps with breeding displays for woodcock and turkey since these plants tend to be short during the early spring.

Implementation Plan and Anticipated Schedule

- **Management planned for 2021-2030** (Figure 6):
    - Convert approximately 10 acres of shrubland to pollinator plots.
    - Mow 10 acres of pollinator plots every 2-3 years to maintain pollinator plants.
    - Monitor pollinator plots for invasive species and control where feasible.

Management Evaluation

Pollinator plots will be assessed annually to determine the need for additional management including re-seeding of clover or native wildflowers as needed and invasive management.

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 the 74.6 acres of wetland that currently exist on the WMA.
- Monitor for invasive species within the wetlands and control invasives as funding allows.
- Ensure that activities on or within the WMA do not decrease water quality or impair wetland habitats.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

The largest portion of wetlands that exist within Charles Flood WMA are tidal wetlands, totaling 73 acres. One small scrub-shrub freshwater wetland of 1.6 acres also occurs within the WMA in the remains of an abandoned clay pit in the upland forest.

Hudson River tidal wetlands are recognized as an important coastal habitat and provide critical habitat for fish and wildlife species. These wetlands are utilized as spawning grounds for migratory and resident fish species, breeding locations for turtles and amphibians, and nesting habitat for many kinds of birds and waterfowl. The tidal wetlands of Charles Flood WMA are also included in Audubon's Important Bird Area as part of Stockport Flats and the entire area extending several miles north and south was listed in the 2002 Open Space Conservation Plan as a priority site. A number of birds rely on the tidal wetland habitats for breeding, feeding and migration. This includes pied-billed grebe, northern harrier, least bittern, Virginia rail and marsh wren. Waterfowl utilize the aquatic beds for food including water celery and wild rice. The banks of the higher elevation wetlands are densely forested with floodplain species and thick undergrowth. Rare plants may occur within these sites, including heart leaf plantain, estuary beggar ticks, and kidney leaf mud-plantain. The tidal river wetlands are less than 6-foot-deep at high tide and have vegetation that is emergent during the high tide. These wetlands are made up of two zones, low and high elevation areas. Plants of the low marsh areas are often mud or silt coated from two daily tidal washes and include plants such as spatterdock and common arrowhead which border mud flats or open water. The higher elevation area is dominated by taller grasses, such as cattail and the invasive phragmites.

The 1.6 acre shrub wetland consists of brushy, woody plants with multiple trunks no higher than 20 feet. The vegetation within the wetland is made up of dogwoods, arrowwood and red maple saplings. The size of this wetland is smaller than most avian species prefer but is expected to support breeding amphibians such as gray treefrogs and eastern newt.

Access to the tidal wetlands is over railroad tracks owned by CSX, which are leased and managed by Amtrak. Trespassing on the tracks or crossing over the tracks is prohibited. The only legal access to the island and tidal wetlands on the west side of the tracks is via boat.

MANAGEMENT HISTORY

Starting from the late 1800s to the present, railroad causeways have changed the makeup of wetlands along the Hudson River. Sheltered coves and embayments behind these railroad causeways have weak tidal flow and higher sediment loads creating tidal flats and tidal wetlands. Dredging of the navigation channel created dredge spoil islands that further sheltered wetlands from the faster river flow, allowing the tidal wetlands to expand. Currently, no management actions other than the maintenance by the railroad of the rail bed adjacent to the wetland has occurred on the WMA.

Implementation Plan and Anticipated Schedule

- **Management planned for 2021-2030** (Table 4, Figure 5):
    - Maintain the current acreage and quality of wetlands.
    - Monitor and control beaver activity as needed.
    - Survey the wetlands to identify invasive species and document further spread or colonization of invasive species into new areas. Control or removal of invasive species through chemical and/or mechanical means will be evaluated to determine efficacy and feasibility.

Best Management Practices

Timing of management activities will be limited to ensure impacts to the habitat and wildlife are kept to a minimum. Projects will consider 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).

Description of Existing Open Water and Target Species

Currently, Charles Flood WMA does not have any areas managed as open water and no plan to develop such habitat at this time.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Charles Flood 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 Charles Flood WMA, 2021-2030. (Also see Figure 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut/selective cut in stands; A-3 and A-2	14	2021-2025
Forest	Clearcut/seed tree cut in stands; A-1 and A-950	22.4	2026-2030
Forest	Convert forest stands to grassland; A6 and A950	14	2021-2030
Shrubland	Convert shrubland to grassland	38	2021-2030
Grassland	Mow grassland fields every 2-3 years to maintain grassland conditions	≤52	2021-2030
Shrubland	Continue to mow shrublands every 7-10 years	≤42.9	2021-2030
Agricultural land	Convert shrubland to pollinator plots	10	2021-2030
Agricultural land	Mow pollinator plots every 2-3 to maintain pollinator plants	10	2021-2030
Wetland	Inventory and control invasives within wetlands	≤74.6	2021-2030

III. FIGURES

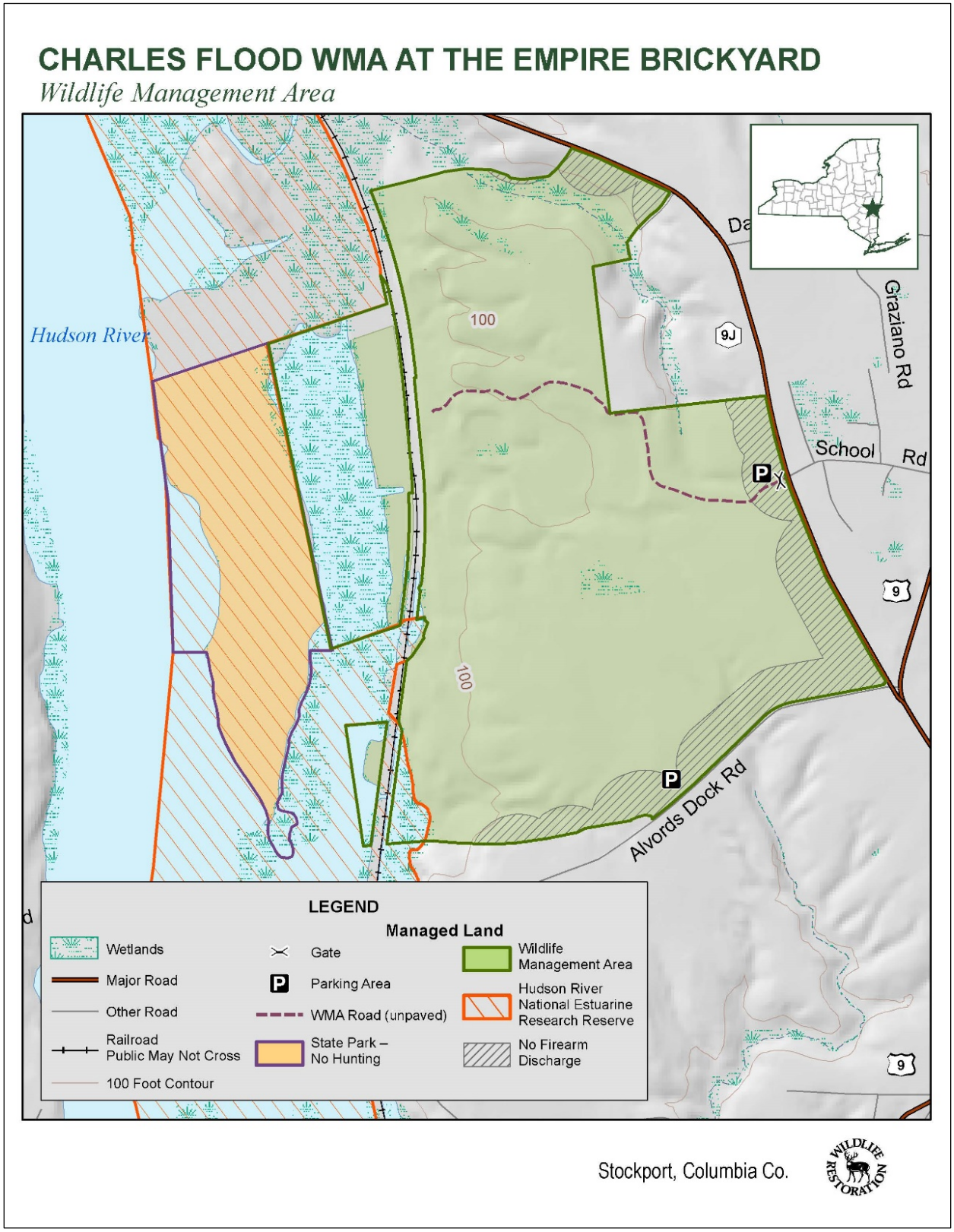

FIGURE 1. Location and access features at Charles Flood WMA.

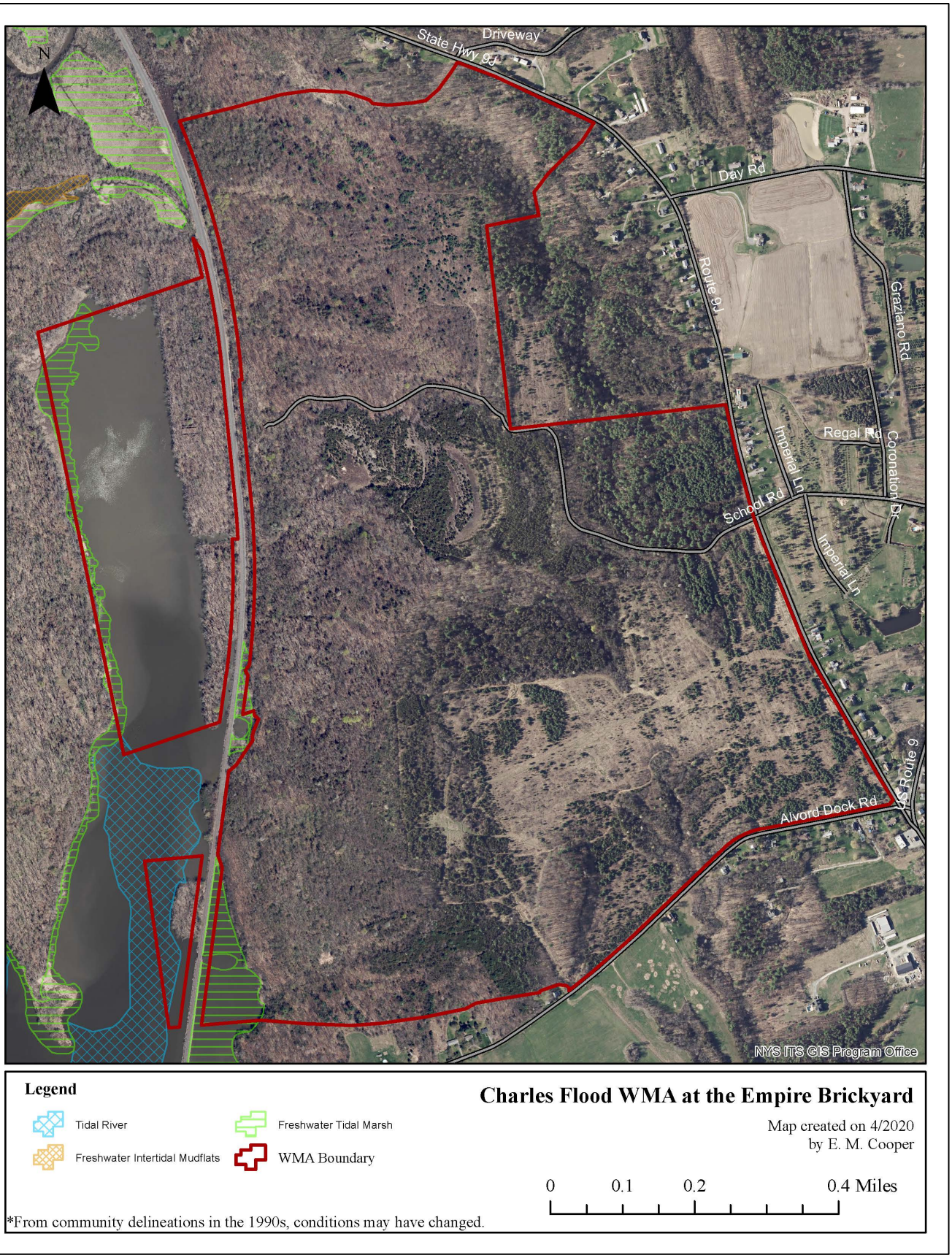

FIGURE 2. Significant ecological communities on Charles Flood WMA. Data from the NY Natural Heritage Program.

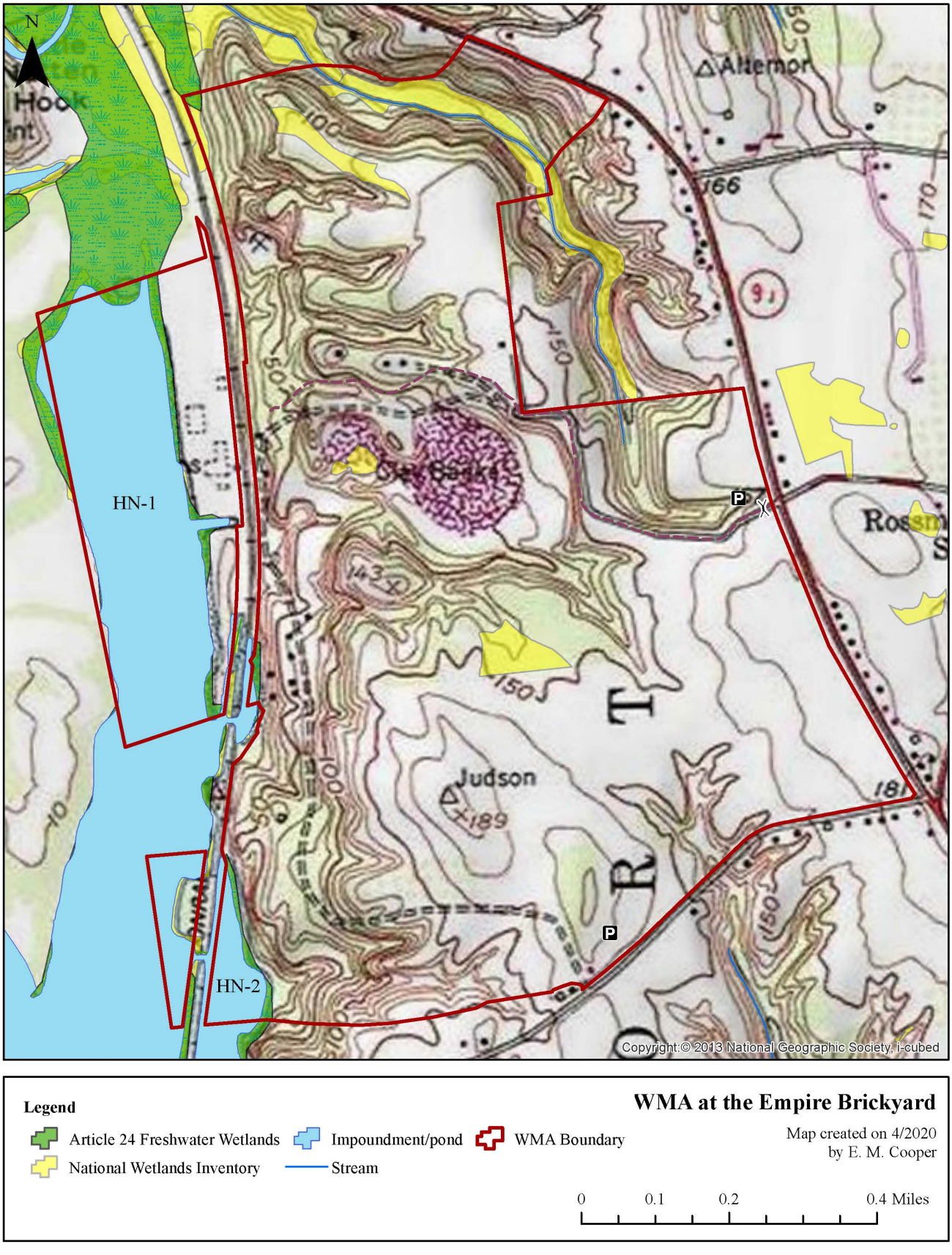

FIGURE 3. Wetlands, open water, and streams of Charles Flood WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

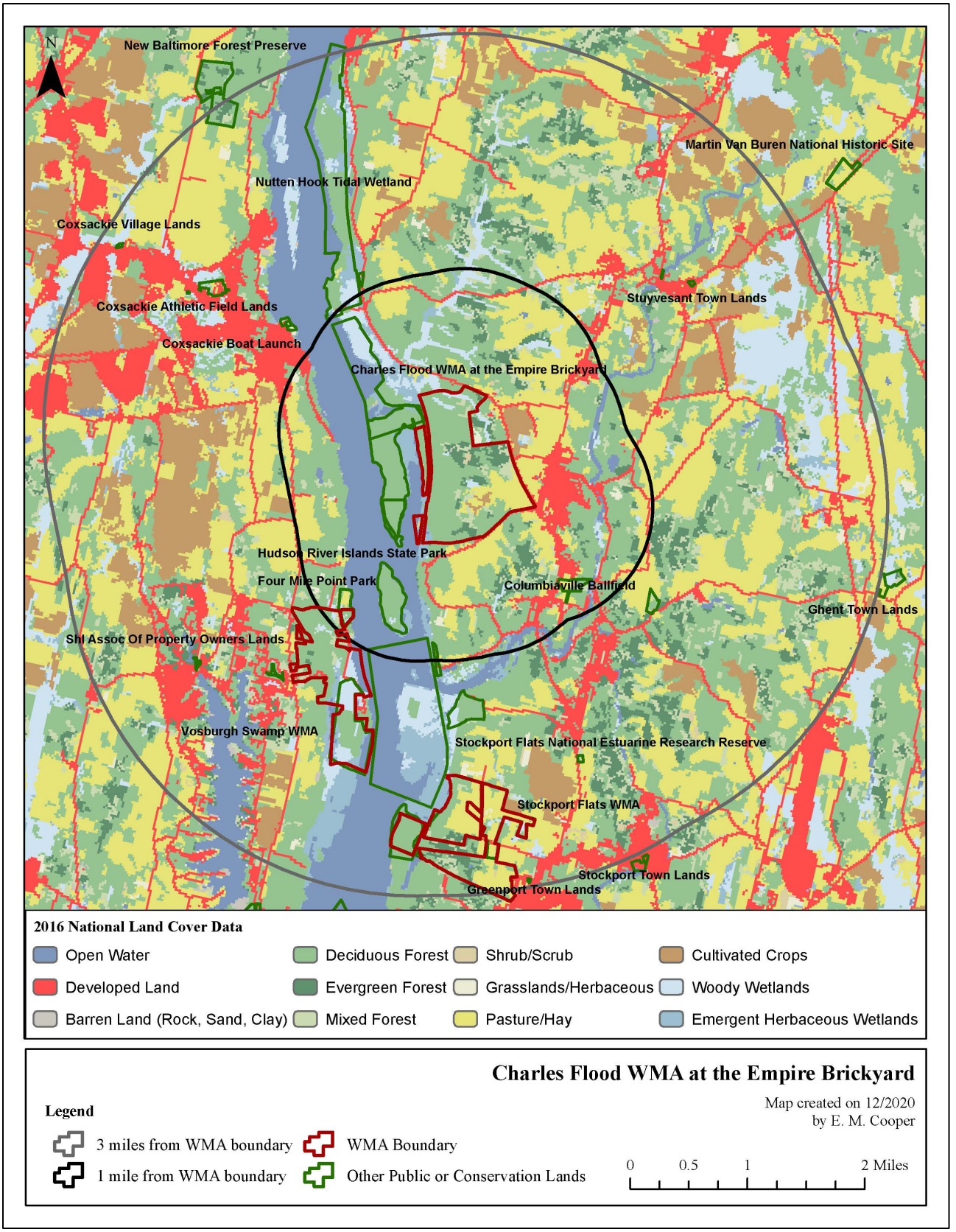

Figure 4. Land cover types and conservation lands in the landscape surrounding Charles Flood WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types 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.

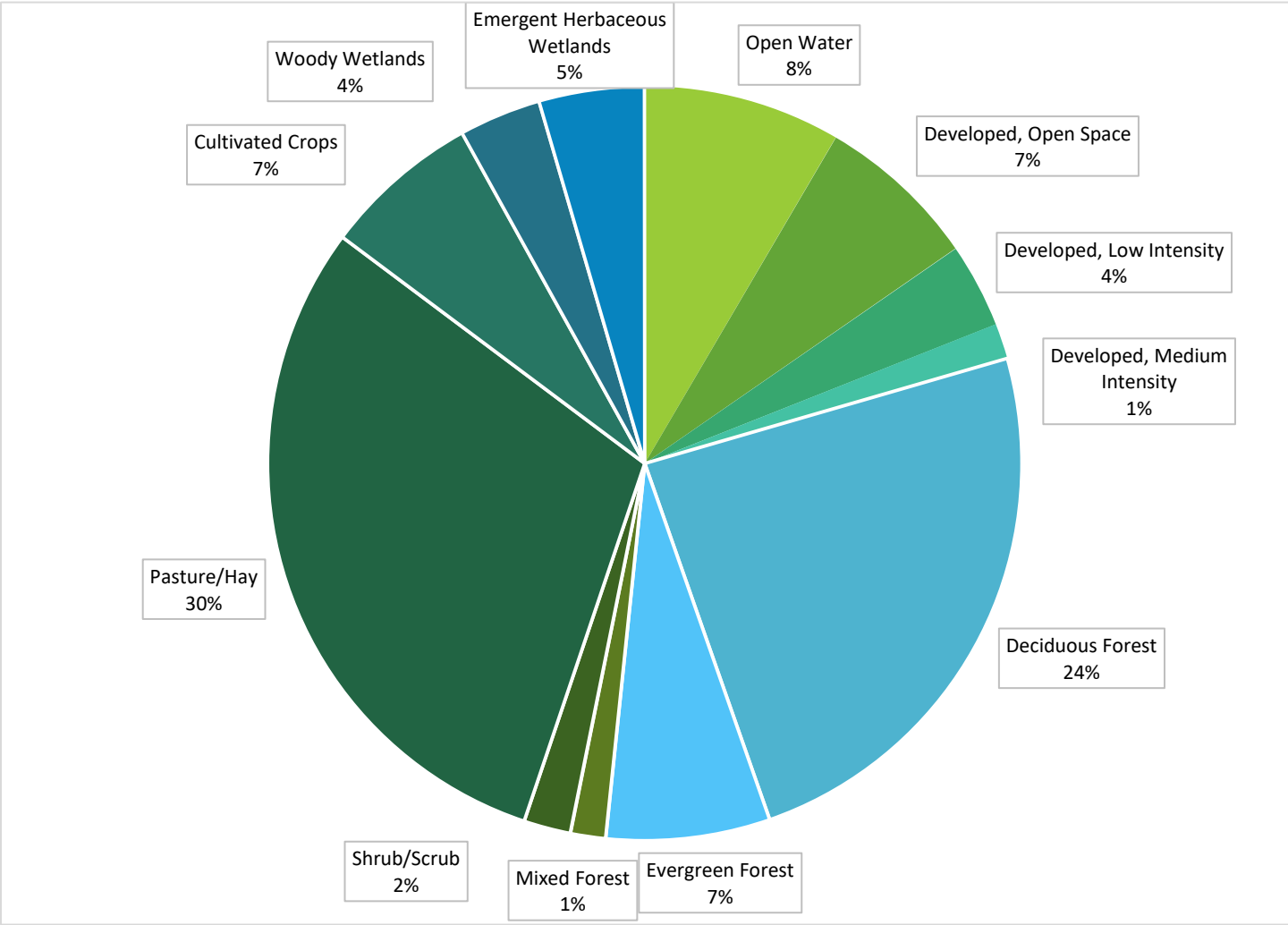

FIGURE 5. Percent cover of land cover types within three miles of Charles Flood WMA.

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*.

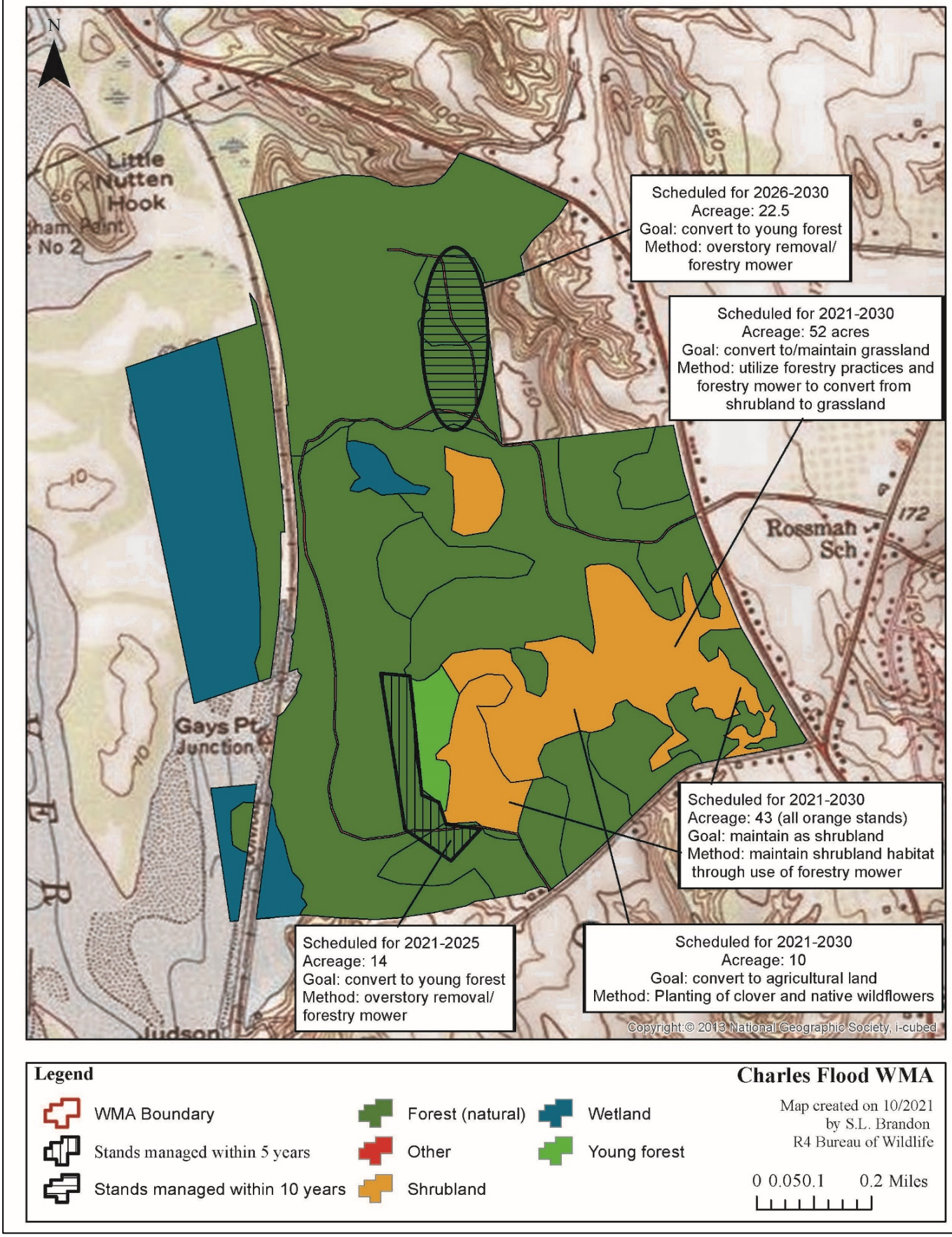

FIGURE 6. Habitat types and locations of proposed management on Charles Flood WMA. Numbers indicate the stand number from habitat inventory.

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 Charles Flood 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. STATEMENT OF CONFORMITY WITH SEQRA

This plan identifies habitat management activities to be conducted on the Wildlife Management Area. These activities were analyzed in the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* (PEIS), as updated and amended in 2017 by the *Supplemental Final Environmental Impact Statement* (SFEIS).[15] Any activity that exceeds the thresholds of, or was not analyzed in the 1979 PEIS as amended in 2017, will require individual, site-specific environmental review. Environmental assessment forms prepared as a result of this review will be posted on the Environmental Notice Bulletin (ENB).[16]

The activities recommended in this plan:

- Will not adversely affect threatened or endangered plants or animals or their habitat.
    - Prior to implementation of any activity, staff review the NY Natural Heritage Program's "Natural Heritage Element Occurrence" database and perform field surveys when necessary. If a protected species is encountered in a project area, staff may establish buffer zones around the occurrence, move the project area, follow time-of-year restrictions, or cancel the project.
- Will not induce or accelerate significant change in land use.
    - All lands and waters within the WMA system are permanently protected as wildlife habitat.
- Will not induce significant change in ambient air, soil, or water quality.
    - Activities are designed to protect air, soil, and water quality through careful project planning, use of appropriate Best Management Practices, and establishment of Special Management Zones around sensitive land and water features requiring special consideration.
- Will not conflict with established plans or policies of other state or federal agencies.
    - Activities will follow established plans or policies of other state and federal agencies, including all relevant U.S. Fish and Wildlife Service rules and regulations.
- Will not induce significant change in public attraction or use.
    - The WMA system is part of a long-term effort to establish permanent access to lands in New York State for the protection and promotion of its fish and wildlife resources. Proposed activities will continue to protect, promote, and maintain public access to WMAs and their wildlife resources.
- Will not significantly deviate from effects of natural processes which formed or maintain an area or result in areas of significantly different character or ecological processes.
    - Activities will be conducted in a manner that maintains, enhances, or mitigates ecological processes and/or natural disturbances as appropriate for each WMA and habitat type. Some activities, such as even-aged forest management, intentionally result in areas of different character and ecological processes; however, they are not considered significant because they are ephemeral or transitional and will not permanently alter the landscape.
- Will not affect important known historical or archeological sites.
    - Activities that may result in ground disturbance are reviewed by DEC's State Historic Preservation Officer (SHPO) and/or the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) to identify potential impacts to historical or archeological sites. Sensitive sites will be protected under the direction of DEC's SHPO and the OPRHP Archaeology Unit.
- Will not stimulate significant public controversy.

It is not anticipated that activities on WMAs will stimulate significant public controversy. A public comment period was held during development of both the PEIS and the SFEIS; no relevant comments in opposition of proposed management activities were received during the SFEIS public comment period. Staff also hold a public information session after completing each HMP, consider feedback from these sessions, and may adjust management as deemed appropriate. Kiosks, signs, webpages, articles, demonstration areas, and other outreach materials also raise awareness about habitat management activities.

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