Habitat Management Plan
for
Wilson Hill Wildlife Management Area
2017 - 2026

A raft of diving ducks in early fall at the East Pool of Wilson Hill WMA.

Photo: NYSDEC

Division of Fish and Wildlife
Bureau of Wildlife

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SUMMARY

Wilson Hill Wildlife Management Area (WMA) was a product of the Federal Energy Regulatory Commission (FERC) settlement with the New York Power Authority (NYPA). The original parcels were acquired around 1958 by NYPA as part of the St. Lawrence Power Project, with additional parcels subsequently added. The most recent addition was approximately 450 acres in 2014 from a Natural Resource Damage settlement with the Alcoa Corporation.

The relicensing of the St. Lawrence Power Project hydroelectric facility in 2003 required NYPA to construct improvements that allow greater management of the wetland habitats on the WMA. Primary habitat types of the WMA are wetlands, open water, and open and forested upland habitats. Wilson Hill WMA is currently a popular destination for waterfowl and upland bird hunters, trappers, deer hunters, and birdwatchers seeking a wide variety of species. Portions of the WMA are managed as a refuge to protect nesting waterfowl.

Habitat management goals for Wilson Hill WMA include:

- Managing approximately 4% of the WMA (10% of the forested acres) as young forest (0-10 years old) to promote Ruffed Grouse, white-tailed deer, and American Woodcock;
- Maintaining approximately 35% as intermediate and mature forest to support forest birds, raptors, and owls within the WMA;
- Maintaining approximately 53% as non-forested wetlands (e.g., emergent marsh) and open water to provide Blanding's turtle habitat, waterfowl breeding and migratory stopover habitat, and sustainable hunting and trapping opportunities.
- Maintaining approximately 6% as grassland and shrubland habitats to provide waterfowl nesting areas and potential Golden-winged Warbler habitat while providing opportunities for pollinators;
- Managing up to 1% of the WMA in agricultural leases to provide forage, cover, and potential breeding areas for wildlife; and
- Convert approximately 12 acres of other habitat to Blanding's turtle nesting habitat.

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 (HMP) 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 (UMP), 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

Wilson Hill WMA is located in DEC Region 6, Town of Louisville, St. Lawrence County (Figure 1) within and on the lands and waters of the St. Lawrence-FDR Power Project (FERC No. 2000). It is approximately 6 miles west of Massena, New York on Lake St. Lawrence and the St. Lawrence River.

TOTAL AREA

4,036 acres

HABITAT INVENTORY

A habitat inventory of the WMA was completed in Compartment A in 2012 and in Compartment B, a 2014 acquisition, in 2016. Habitat inventory should be conducted 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 Wilson Hill WMA.

Habitat Type	Current Conditions (as of 2016)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	1,472	37%		1,412	Decrease to 35%
Young forest	92	2%		152	Increase to 4%
Shrubland	22	<1%		26	Slight increase
Grassland	173	4%		213	Increase to 5%
Agricultural land	91	2%		20	Decrease to <1%
Wetland (natural) [b]	97	2%		112	Increase to 3%
Wetland (impounded) [b]	1,988	49%		1,988	No change
Open water	59	1%		59	No change
Other (buildings, Blanding's turtle nest sites)	7	< 1%		19	Slight increase
Roads	35	1%	5	35	No change
Rivers and streams			6		No change
Total Acres:	4,036	100%		4,036	

[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 Wilson Hill WMA are those typically found throughout Northern New York and the Lake St. Lawrence area, such as:

- Mammals including opossum, shrews, snowshoe (varying) hare, cottontail, gray and red squirrels, beaver, muskrat, porcupine, coyote, red fox, raccoon, fisher, long-tailed weasel, mink, river otter, and bobcat;
- Birds including Red-winged Blackbird, Swamp Sparrow, Broad-winged Hawk;
- Reptiles including painted turtle, northern water snake, red-bellied snake, ringneck snake, garter snake, northern ribbon snake, and milk snake;
- Amphibians including Jefferson salamander, eastern newt, red-backed salamander, two-lined salamander, gray treefrog, bullfrog, green frog, mink frog, wood frog, northern leopard frog, eastern American toad, and spring peeper.

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or Special Concern (SC) species and/or Species of Greatest Conservation Need (SGCN) may occur on the WMA (Table 2).[1] SGCN listed below include species that have been documented on or within the vicinity of the WMA and 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 Wilson Hill 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 Bittern		SC	x
	American Black Duck			HP
	American Kestrel			x
	American Woodcock			x
	Bald Eagle		T	x
	Black Scoter			x
	Black Tern		E	HP
	Black-bellied Plover			x
	Black-billed Cuckoo			x
	Black-crowned Night-heron			x
	Black-throated Blue Warbler			x
	Blue-winged Teal			x
	Bobolink			HP

[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 cont.

Species Group	Species	Federal Status	NY Status	NY SGCN Status
	Bonaparte's Gull			x
	Brown Thrasher			HP
	Caspian Tern			x
	Common Goldeneye			x
	Common Loon		SC	x
	Common Nighthawk		SC	HP
	Common Tern		T	x
	Eastern Meadowlark			HP
	Great Egret			x
	Greater Scaup			x
	Greater Yellowlegs			x
	Horned Grebe			x
	Least Bittern		T	x
	Lesser Scaup			x
	Long-tailed Duck			x
	Northern Pintail			x
	Northern Harrier		T	
	Osprey		SC	
	Peregrine Falcon		E	x
	Pied-billed Grebe		T	x
	Red-shouldered Hawk		SC	x
	Ruddy Duck			x
	Ruffed Grouse			x
	Rusty Blackbird			HP
	Scarlet Tanager			x
	Semipalmated Sandpiper			HP
	Short-billed Dowitcher			HP
	Surf Scoter			x
	Vesper Sparrow		SC	HP
	Whimbrel			HP
	White-winged Scoter			x
	Wood Thrush			x
Mammals	None known			
Amphibians and reptiles	Blanding's turtle		T	HP
	Blue-spotted salamander		SC	HP
	Common mudpuppy			x
	Eastern ribbon snake			x
	Four-toed salamander			HP
	Map turtle			x
	Smooth greensnake			x
	Snapping turtle			x
	Wood turtle		SC	HP

Table 2 cont.				
Species Group	**Species**	**Federal Status**	**NY Status**	**NY SGCN Status**
Fish	Lake sturgeon		T	x
Invertebrates	None known			
Plants	Slender bulrush		E	
	Water-plantain		T	

Significant Ecological Communities:

There are two noteworthy natural communities located on Wilson Hill 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 noteworthy ecological communities occur on the WMA; community descriptions are from *Ecological Communities of New York State, Second Edition* [5] (Figure 2):

- **Red maple-hardwood swamp** (S4S5) - a hardwood swamp that occurs in poorly drained depressions or basins, usually on inorganic soil, but occasionally on muck or shallow peat, that is typically acidic to circumneutral. This is a broadly defined community with several regional and edaphic variants. The hydrology varies from permanently saturated to the surface to seasonally flooded/wet with hummocks and hollows. In any one stand red maple (*Acer rubrum*) is either the only canopy dominant, or it is codominant with one or more hardwoods including ashes (*Fraxinus pennsylvanica*, *F. nigra,* and *F. americana*), elms (*Ulmus americana* and *U. rubra*), and yellow birch (*Betula alleghaniensis*). Other trees with low percent cover include butternut (*Juglans cinerea*), bitternut hickory (*Carya cordiformis*), blackgum (*Nyssa sylvatica*), American hornbeam (*Carpinus caroliniana*), swamp white oak (*Quercus bicolor*), and white pine (*Pinus strobus*). The trunks of maples are typically single-trunked unlike those of floodplain forests with multiple trunks.
- **Silver maple-ash swamp** (S3) - a hardwood basin swamp that typically occurs in poorly-drained depressions or along the borders of large lakes, and less frequently in poorly drained soils along rivers. These sites are characterized by uniformly wet conditions with minimal seasonal fluctuations in water levels.

Additional information about significant ecological communities is available in the Wilson Hill WMA Biodiversity Inventory Final Report (1996) prepared by the NY Natural Heritage Program.

Special Management Zones:

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

[5] Edinger, G. J., D. J. Evans, S. Gebauer, T. G. Howard, D. M. Hunt, and A. M. Olivero. 2014. Ecological Communities of New York State, Second Edition. New York Natural Heritage Program, NYS Department of Environmental Conservation, Albany, NY. Available online at http://www.dec.ny.gov/animals/97703.html.

- Five wetlands regulated by Article 24 of the Environmental Conservation Law (ECL) and several additional wetlands shown on the National Wetlands Inventory (NWI; Figure 3). Each state-regulated wetland is protected by a buffer zone of 100 feet from the delineated 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.
- Three streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). The highest stream classification is Class D, therefore no streams are regulated by Article 15 of the ECL. State agencies are exempt from the provisions of Article 15, but all water quality standards will be adhered to.[6]
- Several recreational trails are located within Wilson Hill WMA. No forest management will be planned near the trails south of Nichols Pool. For any other forest management near recreational trails, tops and slash will be kept at least 25 feet back from the edge of the trail. Interpretive signs explaining the rationale for the harvest will be installed wherever forest management occurs adjacent to a trail.

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

Soils:

Soil groups on Wilson Hill WMA include Adams, Croghan, Deford, and Naumburg loamy fine sand; Adams sand; Grenville, Hogansburg, and Swanton fine sandy loam; Borosaprists and Fluvaquents; muck; and Waddington gravely sandy loam.[8]

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features and the availability of habitats and other conservation lands adjacent to Wilson Hill WMA (Figures 4 and 5). The surrounding landscape within a three-mile radius of the WMA is composed of the following land cover types:

- Wetlands (47% combining open water, emergent, and woody wetlands)
- Deciduous forest (26%)
- Pasture/hay (8%)
- Evergreen forest (8%)
- Cultivated crops (3%)
- Developed (3%)
- Early successional shrubland (2%)

[6] Information about stream classification is available online at http://www.dec.ny.gov/permits/6042.html.
[7] Available online at http://www.dec.ny.gov/outdoor/104218.html.
[8] Soil classification information available from: US Department of Agriculture, Natural Resources Conservation Service. Available online at http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=NY.

- Grassland (2%)
- Mixed forest (1%)

Nearby conservation lands include Coles Creek State Park, Croil Island State Park, Canadian lands including the Upper Canada Migratory Bird Sanctuary, and multiple state forests that are managed by the DEC Division of Lands and Forests and are included in the St. Lawrence Flatlands UMP.[9] The acreage of the state forests is as follows:

- Grantville State Forest (775 acres)
- Raymondville State Forest (643 acres)
- Sodom State Forest (1,425 acres)
- Lost Nation State Forest (1,917 acres)
- Brasher State Forest (3,447 acres)
- Knapp Station State Forest (803 acres)

With a habitat mix similar to that of the surrounding landscape, Wilson Hill WMA is primarily wetland habitat surrounded by forested and open habitats. Currently, the forested landscape on the WMA includes 92 acres of young forest (approximately 6% of the forested habitat), which is less than the DFW's Young Forest Initiative (YFI) goal of managing at least 10% of the forested landscape on most WMAs as young forest.[10] The primary management purposes of Wilson Hill WMA are waterfowl production, wildlife habitat, and recreation. While creating additional young forest is desirable since there is little young forest on the surrounding landscape, there is limited forested habitat on the WMA that can be managed without interfering with the other management objectives (e.g., maintaining dead standing timber for nest cavities for species such as wood ducks and hooded mergansers). Thus, young forest management will focus on creating or maintaining young forest on parts of the WMA that have seen more recent forest management. In this way, the YFI goal of approximately 150 acres of young forest will be achieved without negatively impacting other management objectives on the WMA. Maintaining the young forest habitat component will provide cover, forage, and nesting habitat for a wide variety of species in an area that lacks sufficient disturbance-dependent habitat. This will also maintain the species richness that the WMA is known for.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Wilson Hill 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, fishing and bird watching compatible with the ongoing habitat management practices and species

[9] Available online at http://www.dec.ny.gov/lands/22578.html.
[10] 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.

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 hydrophytic forest or shrub vegetation accounts for greater than 50% of vegetative cover and the soil or substrate is periodically saturated or covered with water.
Young forest: young or regenerating forested acres, which are typically 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 Wilson Hill WMA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the YFI to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat.

MANAGEMENT OBJECTIVES

- Increase young forest habitat from 92 acres to 152 acres (10% of the total forested area), with species compositions and high stem densities that will provide cover for Ruffed Grouse and American Woodcock, food and cover resources for white-tailed deer, and habitat suitable for Golden-winged Warbler.
- Soften the transitional edge between forested areas and open habitat by creating a gradual transition between the cover types.
- Release apple trees in selected stands to provide larger quantities of soft mast for American Woodcock, Ruffed Grouse, and white-tailed deer.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

Wilson Hill WMA contains a moderate amount of forested habitat, ranging from regenerating seedling/sapling stands to mature saw timber. The natural forest stands have a variety of tree species including aspen, ash, hemlock, white pine, hickory, oak, elm, and basswood. Oaks and hickories are the primary mast producing trees on the WMA but patches of beech, black cherry, and apple trees scattered through the stands provide an additional source of food for wildlife. Green ash and red maple are the dominant trees in the forested wetlands. Dense honeysuckle and buckthorn understories limit regeneration in many of the forested stands.

There are several stands that were harvested sometime between 2005 and 2009, and are regenerating with aspen and other hardwoods. They currently provide suitable cover and food sources for young forest dependent species. While a couple of these stands are very near the 10-year mark, they will provide excellent young forest habitat for several more years. As proposed later in this plan, these stands will be maintained in a young forest condition by cutting the stands on a rotation. This will provide aspen forest in multiple age classes, which is ideal for Ruffed Grouse.

As of the 2016 inventory, there are 1,564 forested acres on Wilson Hill WMA, including 564 acres of forested wetlands (Figure 6). Table 3 provides a summary of the forested areas, including the most common species found in each.

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

Forest Type	Acres (as of 2016)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	908	848	maple, ash, aspen, hemlock, white pine, oak, hickory, basswood
Plantation	0	0	
Forested wetland	564	564	ash, maple, aspen, cedar
Young forest	92	152	aspen, beech, maple, ash, birch
Young forest (forested wetland)	0	0	
Total Forested Acres:	1,564	1,564	

Target species for young forest include Ruffed Grouse, white-tailed deer, American Woodcock, and potentially Golden-winged Warbler. 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:

- Ruffed Grouse:
  - Drumming areas – Downed trees surrounded by small diameter woody cover.
  - Foraging – Open areas with dense overhead cover of young forest with good mast production.
  - Nesting – Young open forest stands or second growth woodlands.
  - Brood rearing – Herbaceous ground cover with a high midstory stem density.[11]
- White-tailed Deer (in northern hardwood forests):
  - Fawning areas – Vary from open forest to hay fields to brushy cover.
  - Foraging – Primarily herbaceous vegetation (clover, *Rubus* sp., forbs, etc.), hardwood foliage, soft mast, and agricultural crops where available.
  - Bedding cover – Varies from open hardwoods with blowdowns to dense thickets of early succession shrublands or hard and softwood regeneration.[12]
- American Woodcock:

[11] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.
[12] Halls, L. K., ed. 1984. White-tailed Deer: Ecology and Management. The Wildlife Management Institute. Stackpole Books, PA. 864 pp.

    - Singing/peenting ground – Open areas from 1 acre to >100 acres usually in an abandoned field.
    - Foraging – Moist, rich soils with dense overhead cover of young alder, aspen, or birch.
    - Nesting – Young open, second growth woodlands.
    - Brood rearing – Similar to nesting except also including bare ground and dense ground cover.
    - Roosting – Open fields (minimum of 5 acres) or blueberry fields and reverting farm fields.[13]
- Golden-winged Warbler:
    - Singing ground – Open patches from 5 to 25 acres, usually in a patch with maple, oak, or hickory trees to perch on in the opening.
    - Nesting – Fields or patches from 5 to 25 acres that are heavily vegetated with herbaceous cover with a moderate density of shrubs near a mature forest edge.
    - Brood rearing – Similar to nesting except also including clumps of younger trees.
    - Foraging – Open areas with herbaceous vegetation that support insects and spiders.[14] Males use mature forest during the breeding season.[15]
    - Post-fledging – Mature forest.[16]

MANAGEMENT HISTORY

Little forest management has occurred on the WMA other than on the recently acquired parcels (Compartment B, Figure 6). A shelterwood harvest was conducted in Stands B-25, 26, and 27 shortly before the property was acquired by the DEC (harvesting completed by 2006). The residual overstory trees are primarily sugar maple and much of the regeneration is aspen. The current stand conditions are ideal for young forest dependent species. Stand B-5 was clearcut between 2006 and 2009. As with the other recently harvested stands, this stand is now excellent young forest habitat, with patches of thick pine, aspen, ash, and birch regeneration.

Upland sections of Wilson Hill WMA were cleared for waterfowl nesting habitat when the WMA was established in the 1950s. Much of the existing forested habitat occurs on lands that were not regularly mowed, or in areas too wet to maintain as grasslands.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management is proposed for the next ten years to create 60 acres of additional young forest habitat in order to reach the young forest goal of 152 acres:

- **Management planned for 2017-2021** (Table 4, Figure 6):
    - Seed tree harvest – 35 acres in Stand A-9
    - Seed tree harvest – 19 acres in Stand B-11

[13] Sepik, G. F. et al. 1981. A Landowner's Guide to Woodcock Management in the Northeast, Moosehorn National Wildlife Refuge, USFWS. 25 pp.
[14] Golden-winged Warbler Working Group. 2013. Best Management Practices for Golden-winged Warbler Habitats in the Great Lakes Region. Available online at http://gwwa.org/.
[15] Streby, H. M., J. P. Loegering, and D. E. Andersen. 2012. Spot mapping underestimates territory size and use of mature forest by breeding male Golden-winged Warblers. Wildlife Society Bulletin 36:40–46.
[16] Streby, H. M., S. M. Peterson, G. R. Kramer, and D. E. Andersen. 2015. Post-independence fledgling ecology in a migratory songbird: implications for breeding-grounds conservation. Animal Conservation. 18:228-235

- **Management planned for 2022-2026** (Table 5, Figure 6):
    - Patch clearcuts – 6 acres in Stand A-13
    - Seed tree harvest – 28 acres in Stand B-27, to begin harvest rotation. This acreage is currently considered young forest.

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-9	35	Seedling-Sapling	Seedling-Sapling-Natural	Seedling-Sapling-Natural	Wildlife	Seed Tree
B-11	19	Pole Timber 6"-11" DBH	Other Natural Stands	Seedling-Sapling-Natural	Wildlife	Seed Tree

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
A-13	6	Small Saw Timber 12"-17" DBH	Northern Hardwood – White Pine	Seedling-Sapling-Natural	Wildlife	Patch clearcuts
B-27	28	Seedling-Sapling	Seedling-Sapling-Natural	Seedling-Sapling-Natural	Wildlife	Seed Tree

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 will include the following:

- **Management planned for 2017-2021** (Table 5, Figure 6):
    - **Stand A-9** (71 acres): mixed hardwoods (ash, aspen, oak, white pine, and apple) with a dense understory of honeysuckle and buckthorn. A 35 acre seed tree harvest with reserves will be conducted in the southwestern part of the stand. Reserve trees will be apple and oak, where possible. The goal is to create habitat suitable for Ruffed Grouse, American Woodcock, and Golden-winged Warblers and to soften the transitional edge between the grassland in Stand A-8.6 and the forest in Stand A-9. The trail between Stand A-9 and Stand A-50 will be buffered as needed. The dense honeysuckle in Stand A-9 may need to be treated before harvesting begins.
    - **Stand B-11** (19 acres): brushy stand with ash, elm, and aspen bordering an old field (Stand B-12). A seed tree cut will be done in this stand, removing much of the brush and leaving scattered trees to create habitat suitable for golden-winged warblers. Mast producing trees such as hickory and oak will be retained where possible. Aspen regeneration is anticipated from root sprouting. The adjacent

stand (Stand B-12, 7 acres) is an old field, which currently provides habitat suitable for a singing ground or roosting site for American Woodcock.

- **Management planned for 2022-2026** (Table 5, Figure 6):
  - **Stand A-13** (54 acres): northern hardwood-white pine small sawtimber with patches of honeysuckle and buckthorn in the understory. Patch clearcuts will range in size from 0.5-3 acres, with the combined patches totaling 6 acres. The patches will provide small openings with regeneration which will add diversity to the otherwise mature forest stand.
  - **Stands B-25, 26, and 27** (17 acres, 18 acres, and 28 acres, respectively): These three stands were harvested between 2006 and 2009, and are currently counted as young forest (63 acres). Thick aspen regeneration throughout the stands is providing excellent young forest habitat. In order to maintain areas of aspen in a variety of age classes, it is proposed that these three stands be managed on a 30-45 year rotation, with a different stand being cut every 10-15 years. This rotation will particularly benefit Ruffed Grouse, but it will also provide a continuous supply of habitat for other young forest-dependent species. The first stand to be re-cut will be Stand B-27 (28 acres); a seed tree harvest is scheduled towards the end of the ten years covered by this plan.

BEST MANAGEMENT PRACTICES

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

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

Resource	Guidance Document [17]
Soils	*Rutting Guidelines for Timber Harvesting on Wildlife Management Areas*
Water quality	*NYS Forestry Best Management Practices for Water Quality*
Wildlife	*Retention Guidance on Wildlife Management Areas*
Plantations	*Plantation Management Guidance on Wildlife Management Areas*

Wildlife Considerations:

Sensitive species known to be present on or near Wilson Hill WMA that warrant special consideration include:

- Bald Eagle. Eagles are known to nest at two locations at Wilson Hill WMA and other locations near the WMA. The St. Lawrence River is an important wintering location. Forest management here will avoid disturbing any nesting within or adjacent to a stand with proposed timber harvest actions. This may include delaying nearby harvest actions until after the breeding season and/or the establishment of a forested buffer around any nests.
- Blanding's turtle. Blanding's turtles make overland movements prior to or during the breeding season (mid-May until mid-June), and also to wintering areas in late fall. While forest management itself is not likely to impact Blanding's turtle habitat, vehicular traffic to or from management sites should be considered, and operators should pay special

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

attention to avoiding turtles crossing roads or dikes. In addition, sandy openings within forest stands should be avoided and not used as "lay-down" or staging areas, to avoid disturbing potential nesting habitat.

- Migrating and breeding waterfowl and marsh birds. Wood Ducks and Hooded Mergansers nest in tree cavities near or in wetlands. Any trees that contain suitable nesting cavities should be considered and preserved whenever possible. While the emergent marsh and open water wetlands at Wilson Hill WMA are not candidates for forest management, vehicular access to stands at Wilson Hill is adjacent to these habitats, and disturbance to waterfowl and marsh birds should be considered when planning the location and timing of management activities.

Forest Health Considerations:

The forests on Wilson Hill WMA are in moderate to good health. Beech bark disease does not appear to be prevalent on the WMA. The regeneration in the recently harvested stands is excellent and the residual sugar maple trees have good form. However, many of the mature white pine have poor form from pine weevil damage. Another insect pest, the emerald ash borer (EAB), may become a threat to the ash trees on the WMA as this invasive beetle gradually works its way into the area.

An understory of thick brush consisting of honeysuckle, buckthorn, Japanese knotweed, and other invasive species, can be found in many of the forested stands. This thick brush often limits the regeneration of species that may be more beneficial for wildlife. The use of herbicide will be considered in areas where thick brush is a problem. Precautions such as inspections of equipment, plant/debris removal, or equipment cleaning may be implemented to prevent the spread of invasive species.

The Nichols Pool Trail meanders through Stands A-24, 25, and 26. Since one of the purposes of the trail system was to provide a mature forest feel for visitors, timber management will be avoided in these stands.

Pre- and Post-treatment Considerations:

Monitoring regeneration is key to slow the spread of invasive or undesirable species within Wilson Hill WMA. Many of the forested stands contain invasive species including honeysuckle, buckthorn, Japanese knotweed, and phragmites. These stands would benefit from selective herbicide application and removal of invasive species. Care should be taken to limit the spread of invasive species while managing the stands.

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

MANAGEMENT EVALUATION

In order to determine whether the desired forest regeneration and wildlife responses have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with the guidelines in the *Young Forest Initiative Monitoring Plan: 2016-*

2025.[18] The Monitoring Plan establishes statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three, and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI target species selected for Wilson Hill WMA, which may be assessed to determine response to management, include:

- Ruffed Grouse
- American Woodcock
- White-tailed deer
- Golden-winged Warbler

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

- Provide 26 acres of shrubland habitat for shrubland obligate species.
- Thin 15 acres of dense shrublands to improve habitat for Golden-winged Warbler, forage opportunities for white-tailed deer, and improve forest health conditions of the neighboring forest.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

There are currently 22 acres of shrublands on Wilson Hill WMA that consist of a mix of pioneer hardwoods (aspen, birch), apple trees, and shrubs. Maintaining shrublands on the WMA will benefit a suite of wildlife species including several of the YFI target species:

- Blanding's turtle
- Ruffed Grouse
- American Woodcock
- Golden-winged Warbler
- White-tailed deer

MANAGEMENT HISTORY

Limited apple tree releases and regrowth of old fields.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2021** (Figure 6, Table 7):
    - Plant approximately 4 acres in Stand B-2 (71 acres, currently agricultural land) with native shrubs.
    - Mow Stands A-5.1, A-5.3, and B-23 (22 acres) every three to five years to maintain the limited amount of shrublands located on the WMA.

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

    - Monitor stands for potential invasive species and remove as needed.
- **Management planned for 2022- 2026** (Figure 6, Table 7):
    - Continue periodic mowing/thinning to maintain shrubland habitat.
    - Monitor stands for potential invasive species and remove as needed.

Habitat management will include the following:

- **Stands A-5.1, A-5.3, and B-23** (5 acres, 14 acres, and 3 acres, respectively): Brushy stands with sparse trees and occasional herbaceous openings. Apple trees are found within several of these stands. An apple tree release would benefit Golden-winged Warbler, white-tailed deer, and Ruffed Grouse by producing larger quantities of soft mast in a mosaic of trees, shrubs, and herbaceous openings.
- **Stand B-2** (71 acres): Convert approximately 4 acres of agricultural fields to shrubland habitat by planting native shrubs. The actual acreage planted may vary. See agricultural section for details.

BEST MANAGEMENT PRACTICES

Brush hogging or hydro-axing will be conducted from mid-August through early October when dry conditions normally persist and there is minimal interference with nesting or wintering activities of wildlife. When infestations of honeysuckle and buckthorn become established (i.e., the habitat is degraded to the point that limited nesting opportunities are provided), occasional spring and summer brush hogging may be necessary to control the invasive shrubs.

MANAGEMENT EVALUATION

Future surveys may include Golden-winged Warbler point counts, singing ground surveys for American Woodcock, and spring drumming surveys for Ruffed Grouse (pre- and post-treatment) to document any response to recent habitat management for shrublands and young forest.

GRASSLAND AND OTHER OPEN SPACE

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

MANAGEMENT OBJECTIVES

- Maintain and enhance 173 acres of existing grassland fields to provide quality grassland bird habitat for breeding, nesting, and wintering species.
- Covert approximately 40 acres of agricultural land to grassland habitat.
- Provide nesting habitat and cover for waterfowl.
- Monitor fields for invasive species and eradicate where feasible.

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

Grassland restoration in the St. Lawrence Valley helps meet priorities set forth by conservation and watershed plans including the North American Bird Conservation Initiative and the

Comprehensive Wildlife Conservation Strategy for the northeast Lake Ontario-St. Lawrence Basin in NY. There are 173 acres of grassland habitat on Wilson Hill WMA. The fields provide habitat for nesting, foraging, roosting, and cover for several grassland birds and waterfowl. Species that benefit from grassland best management practices include but are not limited to:

- American Black Duck, Mallard, Gadwall, Green-winged Teal
- Eastern Meadowlark, Bobolink, Savannah Sparrow
- Short-eared Owl, Northern Harrier, and other raptors
- Wild Turkey

MANAGEMENT HISTORY

Annual mowing in the late fall, after the waterfowl nesting season, was completed by NYPA or DEC in various portions of the grasslands designated by DEC.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figure 6):
    - Continue mowing large grassland fields (Stands A-5.2, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 14.2, B-3, and B-12) on an annual, biennial, or triennial basis depending on vegetation growth to prevent woody growth while also allowing for thatch.
    - Plant approximately 40 acres in Stand B-2 (71 acres, currently agricultural land) with a mix of native grasses and forbs. The actual acreage planted may vary. See agricultural section.

BEST MANAGEMENT PRACTICES

The following sub-sections provide guidelines for grassland habitat management on all WMAs in NY. For more detailed information and recommendations see *A Plan for Conserving Grassland Birds in New York*.[19] In particular, refer to the plan for species-specific habitat requirements and detailed recommendations regarding grassland management and restoration techniques.

General Management Recommendations

- Target management for grassland bird species known to be in the vicinity, and consider the needs of both breeding and wintering grassland bird species.
- Consider the surrounding landscape when making management decisions.
- Conduct baseline grassland bird surveys on newly acquired fields or fields targeted for management changes to determine species present.
- Increase field size by hedgerow removal, removing trees, etc. to benefit species that require large fields.
- Conduct invasive species control (glossy buckthorn, pale and black swallowwort, Canada thistle, Phragmites, etc.) to improve habitat quality.
- Consider a variety of factors, such as the targeted grassland bird species, pollinators, seed mix (warm versus cool season grasses, forbs, wildflower mixes, grass height and density), timing of planting, existing conditions, and vegetation removal techniques

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

(including herbicide and intensive disking) in developing grassland planting or restoration projects.
- Utilize mowing, haying, burning, and grazing for maintaining grassland habitat, after evaluating the appropriateness of these methods relative to site conditions and management objectives. In particular, burning cool season grasses is not practical in most situations in New York.

Timing of Management

- Fields over 25 acres (including all contiguous fields) or fields with a history of listed (federally listed and/or state E/T or SC) grassland bird species within the last ten 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, and reptiles and amphibians).

Additional Mowing Guidelines

- Frequency of mowing, size of area mowed, and mowing techniques should be based on species present and current and desired habitat conditions.
- Block or spot mowing is preferred and strip mowing should be limited (especially in fields over 25 acres).
- Unmowed blocks should be in the shape of a square as opposed to long rectangles.
- When mowing, consider mowing from one side of the field to the other side or start in the center and mow outwards to avoid concentrating animals in the area yet to be mowed.
- In general, mow grass to a residual height of 6-12 inches, while ensuring that flowers of undesirable vegetation are removed.

MANAGEMENT EVALUATION

DEC staff recommend conducting grassland nest surveys (including surveying nesting waterfowl) once every five years by flushing nesting birds. When a nest is found it should be identified and mapped using a GPS. Avian point counts are also recommended annually. Other surveys may be required at the request of the Wilson Hill WMA Land Manager.

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.

MANAGEMENT OBJECTIVES

- Remove Stand B-2 from agricultural lands (71 acres) and convert to wetlands and grasslands to complement the Blanding's turtle Habitat Improvement Project.
- Continue with current agricultural agreements on 20 acres to provide cover, forage, and habitat for other wildlife on the WMA.

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

Agricultural agreements are currently limited to B-2 (row crops), B-22 (row-crops), and the eastern portion of A-8.2 (grazing).

MANAGEMENT HISTORY

Agricultural agreements for B-2 and B-22 were in place when the property was acquired in 2014, and were maintained to control weeds until restoration plans were developed. Grazing has been allowed along the northern edge of the East Pool (the eastern half of A-8.2), to maintain short grass adjacent to the wetland. Managers determined the short grass would provide a loafing area for Canada Geese, while reducing the impacts of geese grazing on lawns on the northern half of the island. In later years, grazing was continued to maintain sufficient geese for the annual "Wilson Hill Goose Drive" and banding effort.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2021** (Figure 6):
    - **Stand B-2 (71 acres):** Discontinue agricultural practices, block the field tile pipes, create a series of vernal pools, re-vegetate the area around the pools with native dogwoods, button bush, sedges, and rushes, and plant the remaining area with native grasses and forbs. This will provide approximately 5-15 acres of new wetland habitat, maintain 12 acres of nesting sites for Blanding's turtles, and create 40 acres of grassland. Several acres may be planted to shrubs, but the amount will depend on the final restoration plan associated with the Natural Resource Damage settlement associated with the land transfer to DEC.
    - **Stand B-22 (20 acres):** Continue with agricultural crops 1st year hay, 2nd and 3rd year crops, 4th and 5th year hay to extend the fertility of the soil and offer wildlife various stages of benefits. This schedule may be abbreviated if required by the Natural Resource Damage settlement restoration activities. Restoration activities are expected to duplicate the grassland restoration of Stand B-2. It is recommended that 10% of any harvested crop remain in the field to provide added benefits to wildlife for cover and forage benefits.

BEST MANAGEMENT PRACTICES

The current agricultural habitat on the WMA will be restored to native upland vegetation, as part of the Natural Resource Damage settlement/land transfer.

MANAGEMENT EVALUATION

DEC monitors Blanding's turtle nesting activity as part of the Blanding's Turtle Habitat Improvement Project, including surveys in the portion of Stand B-2 maintained as Blanding's turtle nesting habitat. Lands converted to grassland habitat will be monitored according to the methods described in that section. Restored wetlands will be surveyed periodically to investigate their condition and to search for any infestations of invasive species (see the following section).

WETLANDS (NATURAL AND IMPOUNDED)

Natural wetlands are areas where the soil or substrate is periodically saturated or covered with water, including emergent (perennial herbaceous vegetation accounts for >50% of hydrophytic vegetative cover) and scrub-shrub wetlands (woody vegetation under 20 feet tall accounts for >50% of hydrophytic vegetative cover). Impounded wetlands are areas similar to natural wetlands, but where water is held back by a berm, road, or other structure, typically to restore altered hydric conditions. In contrast to most restored or managed wetlands in New York, the dikes and water level management capacity at Wilson Hill serves to limit the degree of inundation of the wetlands from the impounded waters associated with the St. Lawrence Power Project, i.e., "holding water back." Forested wetlands are addressed in the Forest section above.

As natural wetlands are subject to varying conditions as weather conditions change each year (i.e., wet vs. dry years), wetland managers recognize the problems associated with fixed water level management regimes. However, establishing general management targets and objectives allows managers to evaluate the success of the management actions.

MANAGEMENT OBJECTIVES

- Stand B-2: Convert a portion of approximately 27 acres of agricultural habitat to wetland habitat as Blanding's turtle nesting habitat and sanctuaries as part of the turtle restoration/recovery plan for Wilson Hill WMA.
- Continue implementation of the Northeast Regional Blanding's Turtle Conservation Plan at Coles Creek/Wilson Hill WMA.
- Maintain and enhance 2,085 acres of existing wetland habitat. Enhancement will include conversion of open water habitats to emergent marsh and growing annual vegetation ("duck food").
- Continue to manage Nichols Pool as fish spawning habitat as intended by the Nichols Pool Habitat Improvement Project, while also providing habitat for waterfowl and other wildlife.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There are 2,085 acres of natural and impounded wetlands within Wilson Hill WMA. There are also 564 acres of forested wetlands within the WMA, included in the Forest section above. Wetland habitat comprises over half of the area of the WMA and is important for many wildlife and fish species. The following is adapted from the NYPA St. Lawrence-FDR Power Project Wilson Hill WMA Management Plan Draft of 2006 by Kleinschmidt Associates and gives an

excellent overview of the water management within the WMA (edited to reflect changes to the project implementation as well as current conditions).

Wilson Hill WMA includes four hydrologically connected pools – South Marsh, Bradford Pool, West Pool, and East Pool, and one independent pool named Nichols Pool isolated from South Marsh and Bradford Pool by a dike (Figure 3). These five pools – Nichols Pool (~185 acres), South Marsh (~20 acres), Bradford Pool (~290 acres), West Pool (~510 acres), and East Pool (~960 acres) – were created by a series of dikes during original construction of the St. Lawrence-FDR Power Project in the 1950s. Following project construction, water flow into and out of Wilson Hill WMA was primarily regulated by gravity flow through a water control structure located at Dike No. 4 (West Pool). Culverts in the Nichols Island Causeway and Dike No. 3 (the easterly end of the East Pool) allowed a limited degree of water control, depending upon the level of Lake St. Lawrence. Water level management capacity was greatly improved following relicensing of the Power Project in 2003. Water levels can now be managed with a cascading regime with higher elevations in the westerly pools and lower elevations downstream in the East Pool. With this regime water can be passed down gradient from the South Marsh and Bradford Pools to the West and East Pools. Water is ultimately discharged from the East Pool into the St. Lawrence River using a pumping station, even when River water levels are substantially higher than those in the wetland impoundments.

The objectives for managing habitats are separated into seasonal habitat objectives and non-seasonal habitat objectives and are as follows:

<u>Seasonal Habitat Objectives:</u>

1) *From ice-out (late March/early April) to early summer, the primary objective is the maintenance of water levels that:*
    a. *Remain stable over the period (i.e., do not rise to flood nests),*
    b. *Isolate islands from predators,*
    c. *Maximize breeding (i.e., waterfowl, shorebirds, songbirds) habitat consisting of small bays, coves and "potholes" in emergent vegetation,*
    d. *Provide for 70-80 percent shallow marsh two feet or less in depth and 20-30 percent deep, open marsh up to four feet, or more, in depth. During this time, upland management should provide the maximum amount of dense nesting grassland habitat for waterfowl, ground nesting wildlife, songbirds and Northern Harrier (Circus cyaneus) adjacent to the marsh and not obscured by a thick, wooded shoreline.*
2) *From June to September, the primary objective to provide feeding and rearing habitat for waterfowl, shorebirds, furbearers, amphibians, and reptiles. This objective is met by managing the pools as a hemi-marsh. This may require a change in pool levels depending on spring nesting season levels described above. The hemi-marsh provides hiding places (e.g., flooded cattail beds) and areas that are rich in invertebrate habitat and seed from wetland vegetation (primarily annual vegetation) for feeding by young aquatic wildlife.*
3) *From September through mid-November, the primary objective is to provide a resting and feeding place for migrating waterfowl, feeding and denning sites for muskrats, and over-wintering sites for reptiles, amphibians and invertebrates. If hemi-marsh conditions developed well during the summer months, water levels could remain the same. If ideal hemi-marsh conditions did not develop during the summer (e.g., water levels dropped), then*

the pools may be raised slightly (about 6 inches) depending on availability of water or rainfall, to allow stopover birds to feed on additionally flooded plants. Not all pools, however, need to be managed for this type of habitat.

4) *From mid-November to late March, water levels are managed for furbearers and other resident aquatic wildlife. Once ice cover forms, water levels should remain stable as muskrat and beaver must move under the ice to feeding areas and den sites. Pools are not drawn down to expose bottom sediments during the winter to reduce impacts on amphibians and reptiles wintering in the sediments and submerged aquatic plants. Pools should be drawn down slightly (about 6 inches) just before ice-up to provide for spring flood storage. Pools that have more than 30 percent deep marsh more than four feet deep may be drawn more than 6 inches. When there is an early spring with ice-out in early March, water levels may be drawn down to allow for flood storage without negative impacts to wildlife.*

<u>Periodic (Non Seasonal) Habitat Objectives:</u>

1) *Habitat conditions are continuously monitored and after three to five years, management practices are reviewed to determine if modifications are needed in order to reach hemi-marsh conditions. These modifications should be made during the growing season and could involve raising or lowering water levels more than six inches.*
2) *Following the periodic reviews, various pools are drawn down substantially during May/early June to expose bottom sediments that will oxidize during the summer months and increase the fertility of the marsh, and to promote the establishment of emergent wetland vegetation. Any repairs or modifications to control structures, islands or other marsh features are accomplished at this time. Only one pool should typically be in a drawdown status at a time; wildlife would still be able to use adjacent pools, which would reduce stress on all aquatic wildlife species. The objective of a marsh drawdown is to create and/or maintain aquatic habitat diversity and to rejuvenate the marsh bottom.*
    a. *In September water levels in drawn-down marshes may be raised six inches to one foot to flood mud bottoms that produce desirable emergent aquatics such as smartweed (Polygonum spp.). These flooded shallows provide ideal feeding sites for migrating waterfowl and shorebirds during early fall. While the manager may be tempted to reflood earlier in summer to exploit ideal water levels in the St. Lawrence River, the maximum benefit to both the habitat (e.g., through vegetation establishment) and wildlife (e.g., from fully developed seed heads and foraging conditions) will be realized when flooding in late summer or early fall, when levels in the St. Lawrence may not be conducive to gravity filling of the Wilson Hill WMA impoundments.*
    b. *In October/early November, water levels in drawn-down marshes may be raised to normal target levels before ice-up to prevent stress on wintering furbearers, and other aquatic wildlife such as amphibians and reptiles that settle in the marsh bottom. Exceptions to this routine may occur when modifications to control structures, islands or shorelines will be made during winter months. It may be easier and more economical to maintain low water levels during periods when the St. Lawrence River is at its lowest level rather than later when it may not be possible to gravity drain marshes to the St. Lawrence.*
3) *Nichols Pool is the site of a special Habitat Improvement Project associated with the St. Lawrence Power Project relicensing, and is designed to provide submerged aquatic vegetation habitat for spawning fish. The secondary objective is to provide wetland habitat*

for waterfowl and other wildlife. NYPA and its consultants have created management and monitoring plans for the implementation of the HIP, which complement the management of the greater Wilson Hill WMA (Kleinschmidt 2011a, 2011b).[20, 21]

The wetlands provide habitat for species such as:

- Blanding's turtle, snapping turtle, wood turtle, map turtle
- Blue-spotted salamander, mudpuppy, four-toed salamander
- Northern pike, muskellunge
- American Woodcock, American Bittern, Black-bellied Plover, Black-crowned Night Heron, migratory waterfowl, shorebirds, and other marsh birds
- Furbearers and other mammals

MANAGEMENT HISTORY

Historically, water level management was implemented to help control invasive and nuisance species such as purple loosestrife, cattails, and phragmites. As water level management capacity was very limited, the pools were typically maintained as one unit (all at a single water level) with depths greater than desired. The area now known as Nichols Pool was not isolated from the St. Lawrence River until 2013, and water levels couldn't be controlled until dikes and water control structures were constructed.

Following a series of construction projects from 2008 to 2013, many of the pools' water levels were altered to also provide foraging areas for waterfowl and other shallow water species. The East Pool is now held to a pond level typically between 237.5' - 238.5' to provide adequate shallow and deep emergent plants for migratory waterfowl. The West Pool maintains a level of about 239' to create a hemi-marsh habitat for creating islands for nesting waterfowl. The Bradford Pool ranges between 239.5' - 242' for waterfowl brood rearing activities. South Marsh elevations range between 241' - 242' for a shallow water emergent vegetation habitat for many shorebirds. Nichols Pool is managed primarily for northern pike and musky spawning to create a sustainable fishery within Lake St. Lawrence. These levels may be substantially deviated from in any given year to control invasive plants, establish beneficial wetland vegetation, or to isolate food sources for either fall or spring migration.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

- **Management planned for 2017-2026** (Figure 6):
    - Create up to 27 acres of wetlands by plugging field drainage tile, creating pothole vernal pools and wetlands, and planting button bush and native dogwoods within a portion of Stand B-2 (71 acres) as part of a Blanding's turtle restoration effort.
    - Perform a series of drawdowns as needed in Nichols Pool, South Marsh, Bradford Pool, West Pool, and East Pool.
    - Continue routine maintenance on dikes and control structures so that they function to impound water (i.e., mowing dikes, beaver debris removal).

[20] Kleinschmidt Associates. 2011a. Nichols Hill Island Pool HIP Monitoring Plan. Included as Appendix D in the Joint Application Package (Permit Application). Prepared for New York Power Authority. June 2011.
[21] Kleinschmidt Associates. 2011b. Nichols Hill Island HIP Operations Plan. Included as Appendix D in the Joint Application Package (Permit Application). Prepared for New York Power Authority. July 2011.

BEST MANAGEMENT PRACTICES

Limit winter drawdowns to protect hibernating amphibians and reptiles to prevent impacts to these species with the exception of Nichols Pool as this system needs to be regulated for fish spawning activities. The higher water levels may also encourage more muskrats to inhabit the area which may prevent a monotypic cattail stand. Activities should be considered to help propagate, protect, and enhance habitats for Blanding's turtles by protecting at least 50% of the identified Blanding's turtle nests, evaluating the nesting by Blanding's turtle, and effectiveness of the mitigation sites for Blanding's turtle nesting should be a priority within the WMA. Implementation of a Blanding's turtle restoration plan is highly recommended for the WMA.[22]

MANAGEMENT EVALUATION

Monitor fish reproduction within Nichols Pool to determine if management strategies are helping northern pike and muskellunge fisheries, as well as other native fish and excluding invasive fish such as carp. Evaluate the nesting success of migratory waterfowl and adjust water level management as the Wilson Hill WMA Land Manager requests. Evaluate effective and efficient marsh monitoring techniques (including muskrat overwintering dens) to ensure a beneficial ratio of open water and hemi-marsh conditions are being provided (and used by waterfowl). Map and monitor current invasive and nuisance species within all pools within the WMA and treat these species to gain further control (including monotypic stands of the invasive cattail hybrid). Continue with the nest box monitoring, goose banding, waterfowl reproduction monitoring, and other surveys as requested by the Wilson Hill WMA Land Manager.

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., St. Lawrence River or "Lake St. Lawrence," South Colwell Pond).

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

Currently there are 59 acres of open water habitat within the WMA. Stand A-56 is a small bay within Lake St. Lawrence and management is dependent of the water levels of Lake St. Lawrence. Other than this single area there is no other open water or a desire to develop this habitat on the WMA. However, there are pools associated with the WMA which are covered in the Wetland section of the management plan.

[22] New York Power Authority. 2011. Blanding's turtle Nesting Habitat Management Plan. New York Power Authority, White Plains, New York. June 2011.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Wilson Hill 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 Wilson Hill WMA, 2017-2026. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Seed tree harvest and apple tree release in Stand A-9	35	2017-2021
Forest	Seed tree harvest in Stand B-11	19	2017-2021
Forest	Patch clearcuts in Stand A-13	6	2022-2026
Forest	Seed tree harvest in Stand B-27	28	2022-2026
Shrubland	Mow or thin Stands A-5.1, A-5.3, and B-23 every 3-5 years, or as needed to maintain shrubland habitat.	22	2017-2026
Grassland	Continue mowing grassland fields (Stands A-5.2, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 14.2, B-3, and B-12) on an annual, biennial, or triennial basis depending on vegetation growth to allow for thatch and to prevent woody growth.	173	2017-2026
Agricultural Lands	Convert to wetland habitat and Blanding's turtle nesting sites in part of Stand B-2.	27	2017-2026
Agricultural Lands	Convert to grassland habitat by planting native grasses and forbs in remainder of Stand B-2.	40	2017-2026
Agricultural Lands	Maintain cooperative agreements.	20	2017-2026
Wetlands	Continue maintaining dikes and water control structures and managing water levels in impoundments, and controlling invasive species.	-	As required

III. FIGURES

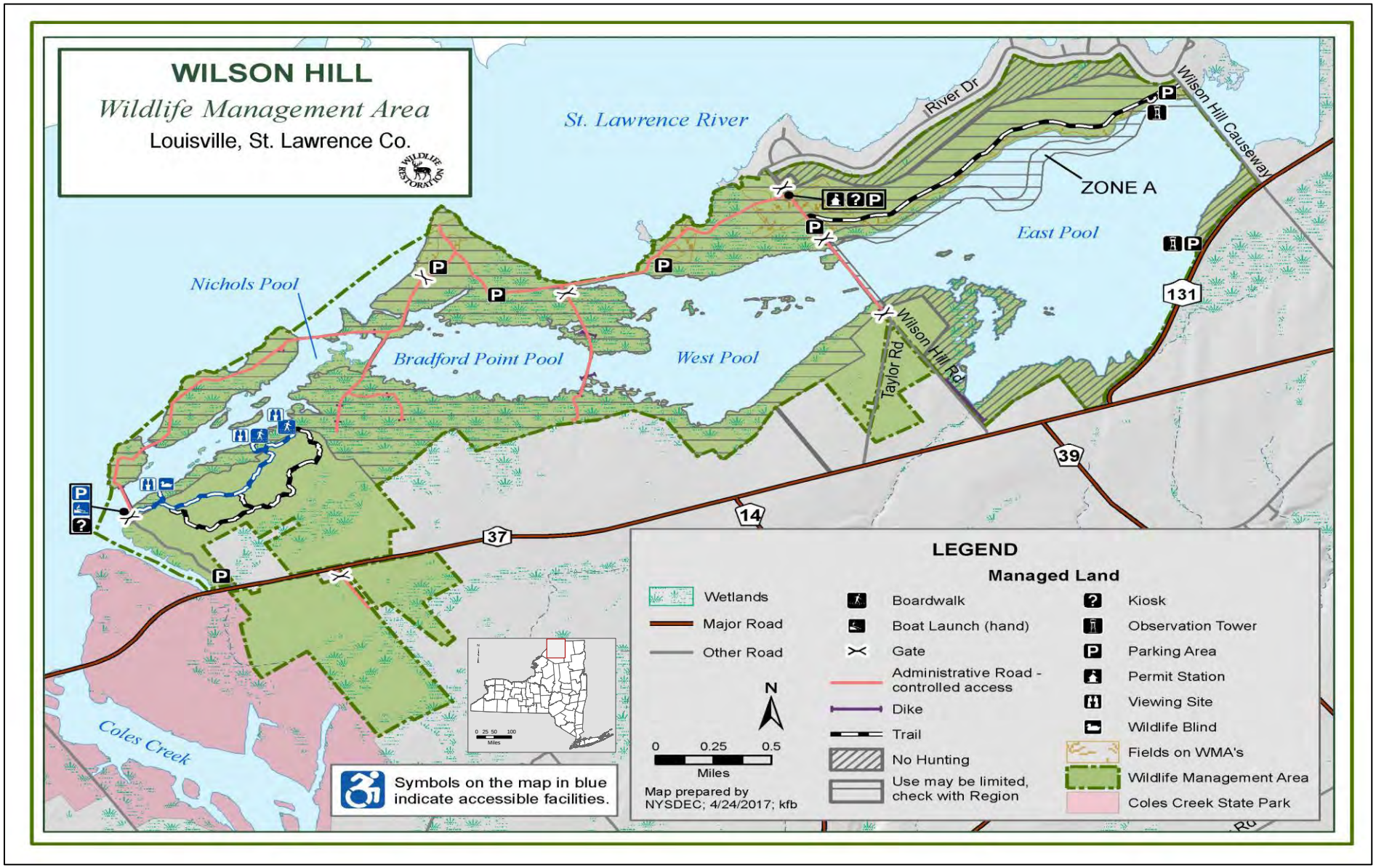

FIGURE 1. Location and access features at Wilson Hill WMA.

FIGURE 2. Significant ecological communities on Wilson Hill WMA. Data from the NY Natural Heritage Program.

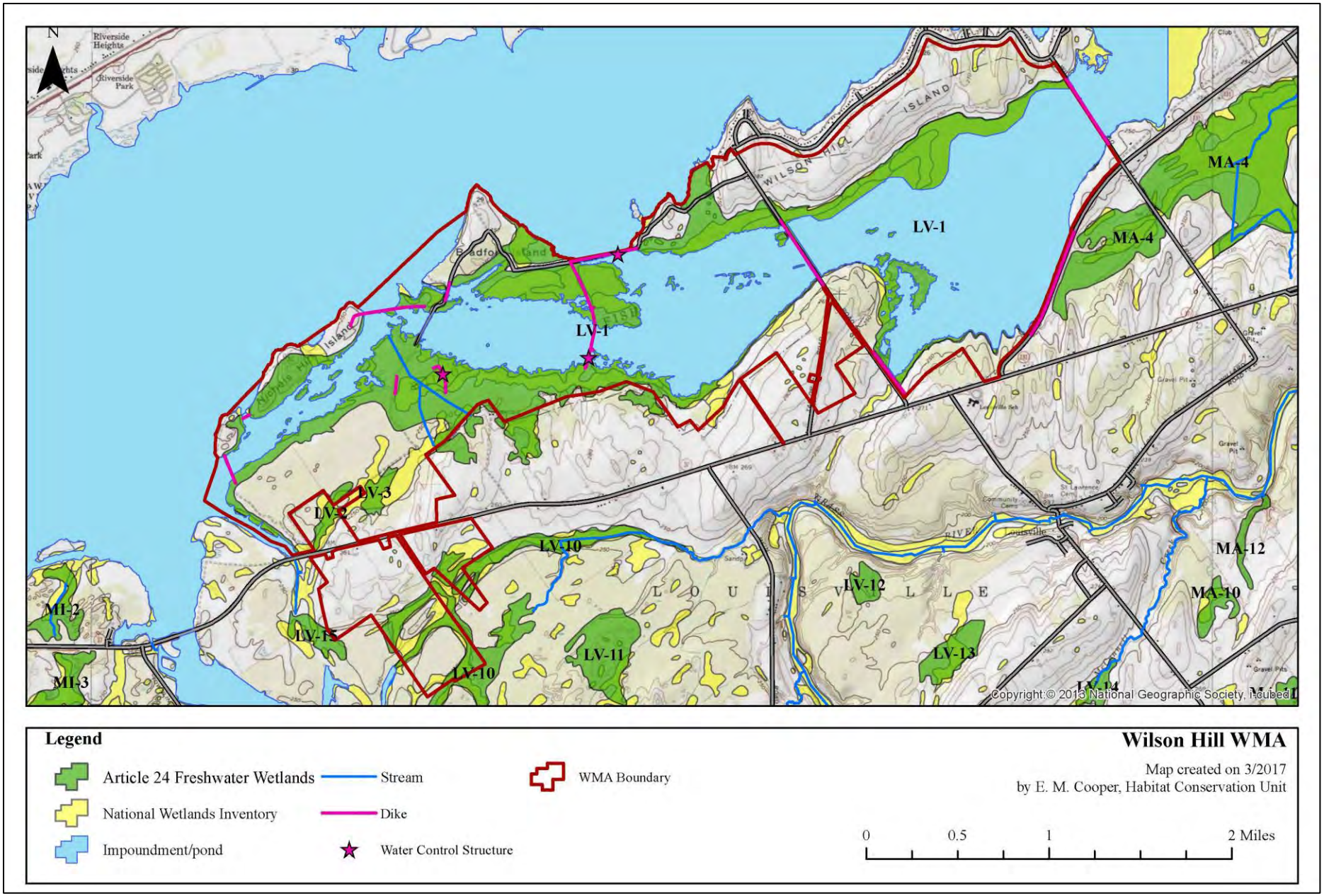

FIGURE 3. Wetlands, open water, and streams of Wilson Hill WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

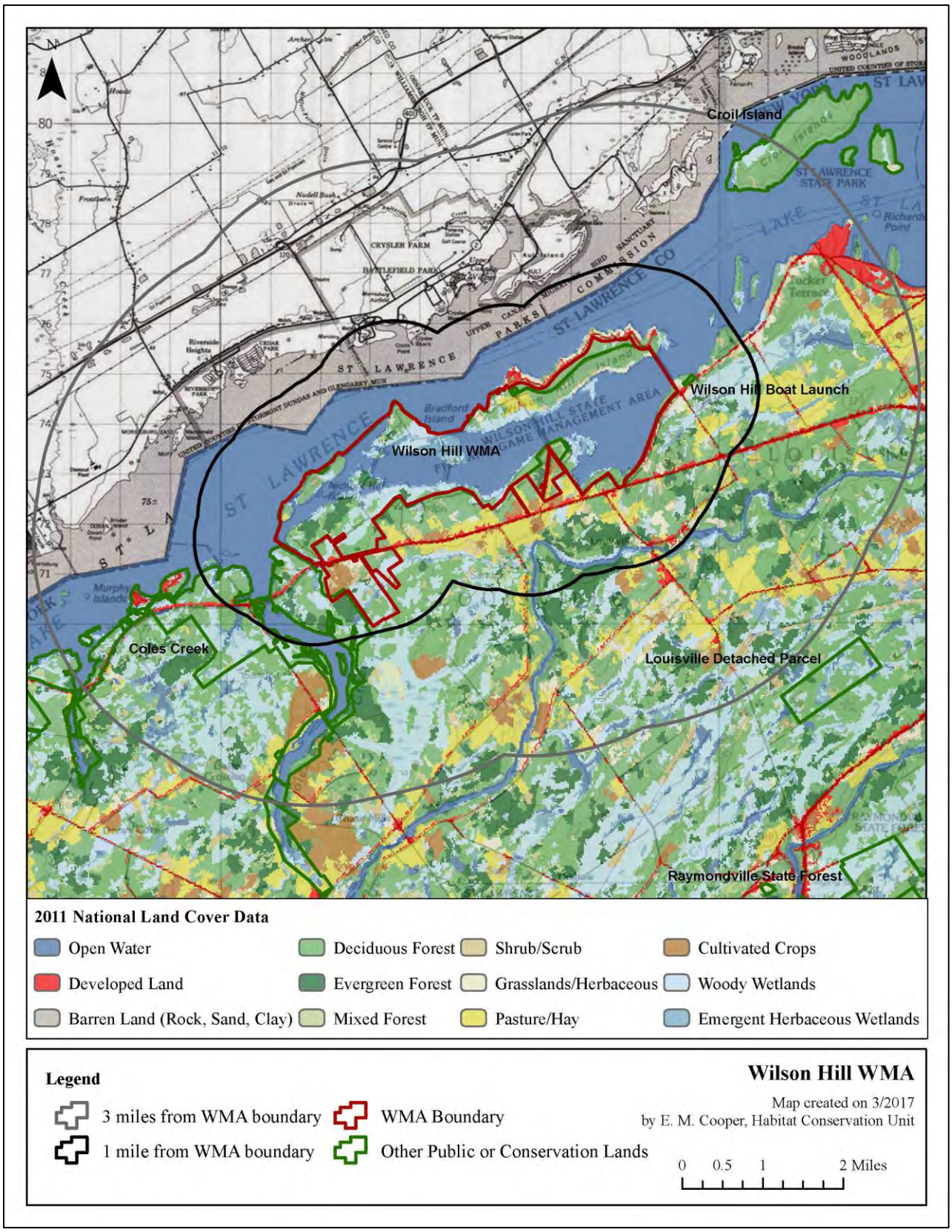

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Wilson Hill WMA. Conservation lands are from the NY Protected Areas Database available online at http://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used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

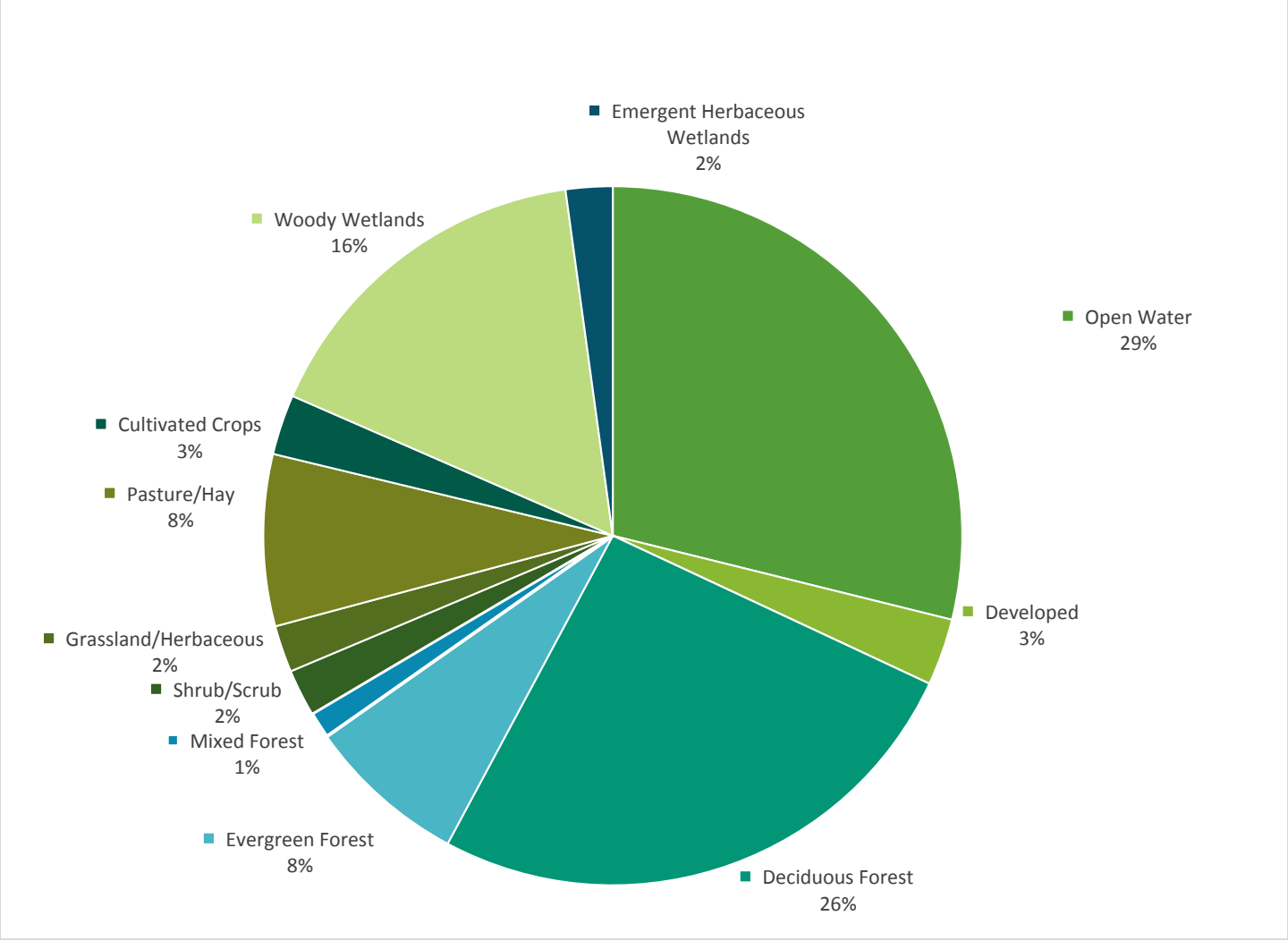

FIGURE 5. Percent cover of land cover types within three miles of Wilson Hill WMA.

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

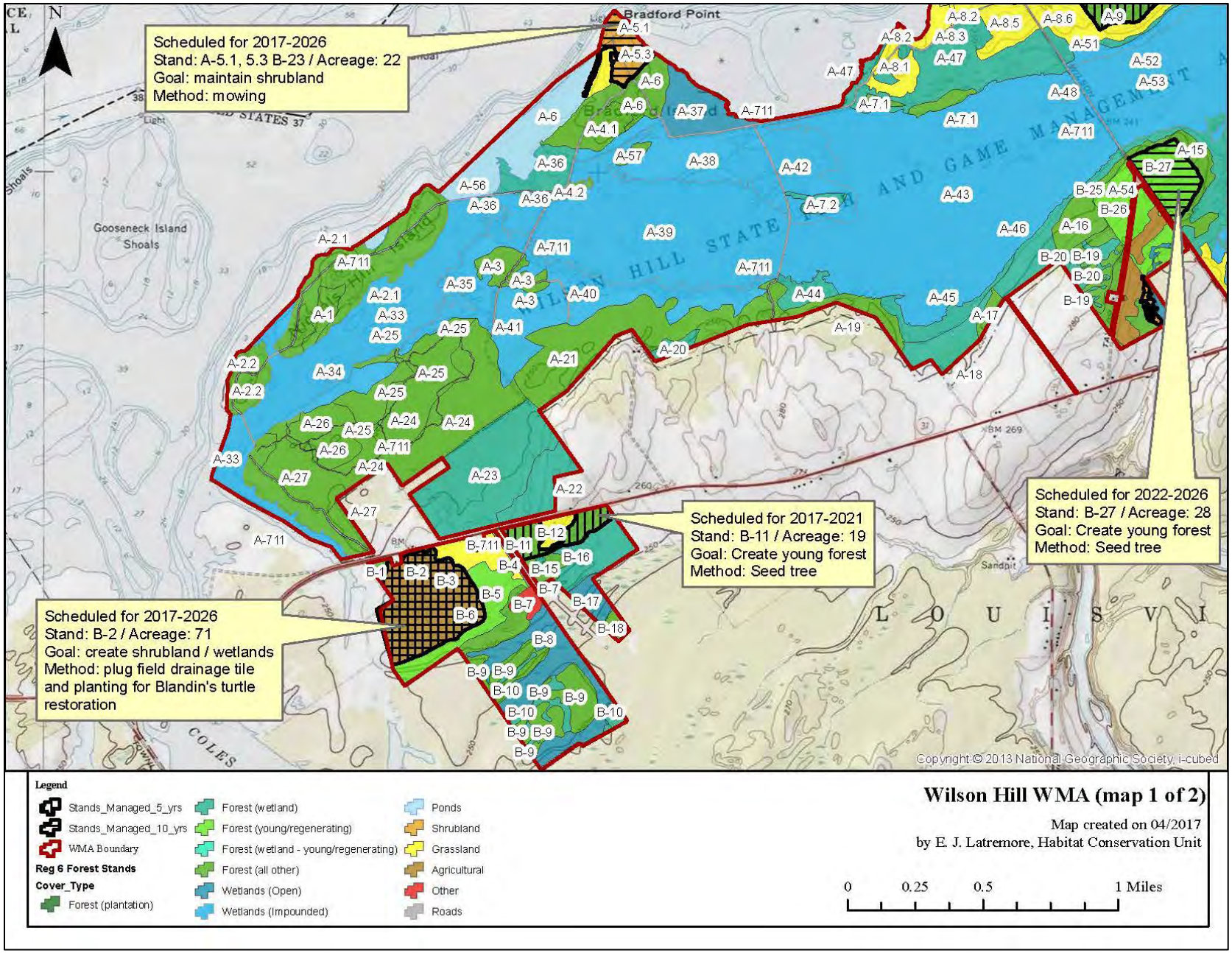

FIGURE 6A. Habitat types and locations of proposed management on Wilson Hill WMA. Numbers indicate the stand number from habitat inventory.

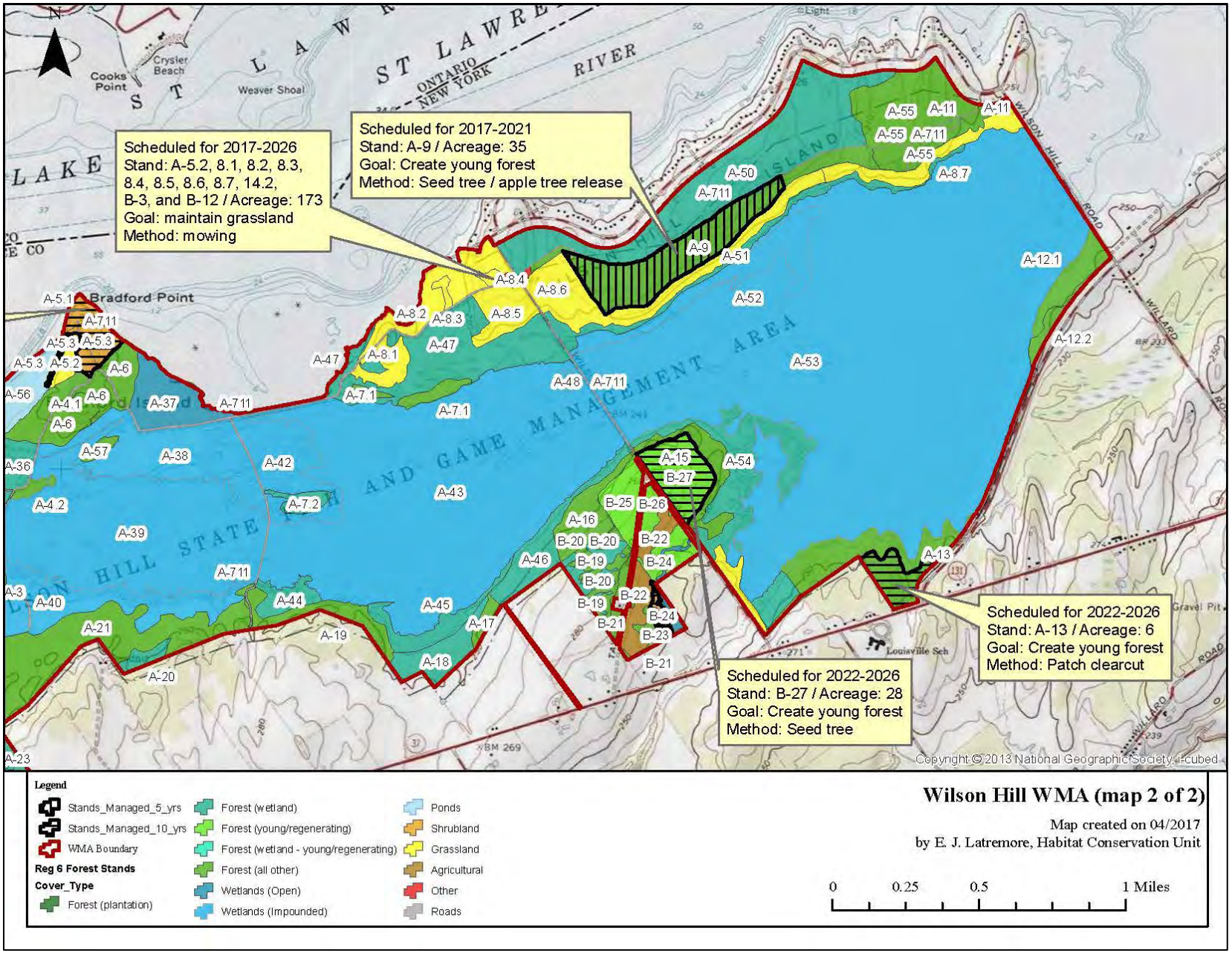

FIGURE 6B. Habitat types and locations of proposed management on Wilson Hill WMA. Numbers indicate the stand number from habitat inventory.

IV. APPENDICES

APPENDIX A: DEFINITIONS

The following key words were used in the development of this Habitat Management Plan. Definitions are adapted 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 (including technological, economical, and institutional considerations) 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.

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 Wilson Hill WMA include: Ruffed Grouse, American Woodcock, white-tailed deer, and Golden-winged Warbler.

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 (ECL 51-0703.4). The primary purpose of these lands is to protect the feature of significance that led to the land being acquired by the state. (Public Use of Lands Managed by the Bureau of Wildlife)

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

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

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

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

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

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

APPENDIX B. STATEMENT OF CONFORMITY WITH SEQRA

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

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

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

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

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

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

Treatment description: The intended treatment should be clearly described. The amount of information necessary to accomplish this will vary greatly. For instance, in a row thinning of a pole timber sized plantation that had no SMZs or other special features, it may be sufficient to simply indicate "Remove two out of every six rows, taking two adjacent rows and leaving four rows between successive pairs being removed." An intermediate thinning in a sawtimber sized hardwood stand with a recreational trail, two streams and a known occurrence of an endangered plan 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.