

**Habitat Management Plan
for
Louise E. Keir Wildlife Management Area
2016 – 2025**



Division of Fish and Wildlife
Bureau of Wildlife

1130 North Westcott Road, Schenectady, NY 12306

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**Department of
Environmental
Conservation**

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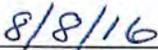
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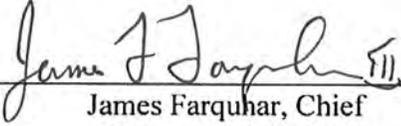
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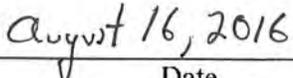
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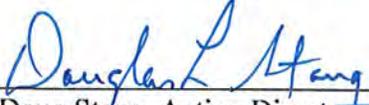
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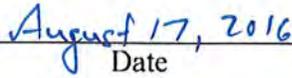
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TABLE OF CONTENTS

<i>SUMMARY</i>	3
<i>I. BACKGROUND AND INTRODUCTION</i>	3
PURPOSE OF HABITAT MANAGEMENT PLANS	3
WMA OVERVIEW	5
LANDSCAPE CONTEXT	8
<i>II. MANAGEMENT STRATEGIES BY HABITAT TYPE</i>	9
FOREST	9
SHRUBLAND.....	14
GRASSLAND.....	15
AGRICULTURAL LAND	15
WETLANDS (NATURAL AND IMPOUNDED)	15
OPEN WATER (WATERBODIES AND WATERCOURSES)	15
HABITAT MANAGEMENT SUMMARY	16
<i>III. FIGURES</i>	17
<i>IV. APPENDICES</i>	22
APPENDIX A: DEFINITIONS	22
APPENDIX B. STATEMENT OF CONFORMITY WITH SEQRA.....	25
APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS	27
APPENDIX D: AMENDMENTS.....	30

LIST OF FIGURES

FIGURE 1. Location and access features at Louise E. Keir WMA.	17
FIGURE 2. Significant ecological communities on Louise E. Keir WMA.....	18
FIGURE 3. Land cover types and conservation lands in the landscape surrounding Louise E. Keir WMA.	19
FIGURE 4. Percent Cover of land cover types within three miles of Louise E. Keir WMA.....	20
FIGURE 5. Habitat types and locations of proposed management on Louise E. Keir WMA..	21

SUMMARY

Louise E. Keir Wildlife Management Area (WMA) consists of 188 acres in southern Albany County along the southern extension of the Helderberg Escarpment. While the area was historically cleared and farmed, it has since reverted back to forestland. The entire WMA is forested, with two primary forest types: young oak forest and northern hardwood-conifer forest. One uncommon natural community exists on the WMA at the highest elevations, a pitch pine-oak-heath rocky summit. This community is fire dependent and since no fires have burned in the area for decades, the pitch pine is being shaded out and the habitat quality is declining. The management objectives on the WMA are to maintain forested habitat diversity and perpetuate the pitch pine-oak-heath rocky summit natural community to benefit wildlife. This WMA affords multiple recreational opportunities including hunting, trapping and bird watching.

Habitat management goals for Louise E. Keir WMA include:

- Managing approximately 14% of the WMA as young forest (15% of the total forested area) to promote ruffed grouse, wild turkey and white-tailed deer habitat.
- Maintaining approximately 84% as upland forested habitat.
- Maintain approximately 2% of the WMA as trails and parking lots.

I. BACKGROUND AND INTRODUCTION

PURPOSE OF HABITAT MANAGEMENT PLANS

BACKGROUND

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

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

SCOPE AND INTENT

Primary purposes of this document:

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

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

Definitions are provided in Appendix A.

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

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

WMA OVERVIEW

LOCATION

Louise E. Keir WMA is located in DEC Region 4, Town of Coeymans, Albany County (Figure 1).

TOTAL AREA

188 acres

HABITAT INVENTORY

A habitat inventory of the WMA was conducted in 2015 and is proposed to be updated every ten to fifteen years to document the existing acreage of each habitat type and to help determine the location and extent of future management actions. Table 1 summarizes the current acreage by habitat type and the desired acreage after management. Desired conditions were determined with consideration of habitat requirements of targeted wildlife, current conditions on the WMA, and conditions in the surrounding landscape (see Landscape Context section below).

Table 1. Summary of current and desired habitat acreage on Louise E. Keir WMA.

Habitat Type	Current Conditions (as of 2015)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest ^a	179.6	95.5%		158.0	Decrease to 84.0%
Young forest	5.5	2.9%		27.1	Increase to 14.4%
Shrubland	0	0%		0	No change
Grassland	0	0%		0	No change
Agricultural land	0	0%		0	No change
Wetland (natural) ^b	0	0%		0	No change
Wetland (impounded) ^b	0	0%		0	No change
Open water	0	0%		0	No change
Other (trails, parking lots)	2.9	1.5%		2.9	No change
Roads	0	0%	0	0	No change
Rivers and streams			0		No change
Total Acres:	188.0	100%		188.0	

^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 Louise E. Keir WMA includes many species commonly found throughout eastern New York and the Helderberg Escarpment, such as:

- White-tailed deer, bear, coyote

- Ruffed grouse, wild turkey, brown thrasher
- Wood frog, Eastern red-backed salamander
- Garter snake, ring-neck snake

Wildlife and Plant Species of Conservation Concern:

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

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

Species Group	Species	Federal Status	NY Status	NY SGCN Status
Birds	American woodcock			x
	Blue-winged warbler			x
	Brown thrasher			HP
	Louisiana waterthrush			x
	Prairie warbler			x
	Scarlet tanager			x
	Sharp-shinned hawk		SC	
	Eastern whip-poor-will			HP
	Wood thrush			x
Mammals	Indiana bat	E	E	HP
	Northern long-eared bat	T	T	HP
Amphibians and reptiles	None known			
Fish	None known			
Invertebrates	None known			
Plants	None known			

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.

Significant Ecological Communities:

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

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

This community was identified in the WMA's 1998 Biodiversity Report as being located just outside the boundary of the WMA. Since that time, DEC has purchased two parcels of land to now include this community within the WMA. This fire dependent community is located at the highest elevations of the WMA and consists of a mix of pitch pine, oak and blueberry. Since no fires have burned in this area for many decades, this community is being lost and shaded out by white pine. Due to the timing of the last Natural Heritage survey, this community is not recognized as being located on DEC lands. Natural Heritage plans on surveying the natural communities of Louise Keir WMA in 2016. Additional pitch pine were identified throughout the WMA during the 2015 habitat inventory. The existing pitch pine will be maintained on the WMA through future timber harvests and/or releases.

Additional information about significant ecological communities is available in the Louise E. Keir WMA Biodiversity Inventory Final Report (1998) 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.

- There are no state or federally regulated wetlands within Louise E. Keir WMA.
- There are no permanent streams or open water on Louise E. Keir WMA.

Guidelines for habitat management projects within these areas are outlined in the Division of Lands and Forests *Rules for Establishment of Special Management Zones on State Forests and Wildlife Management Areas*.⁶ Some habitat management activities may either be prohibited or

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>.

⁶ Available online at <http://www.dec.ny.gov/outdoor/104218.html>.

restricted in order to protect these features. Any deviations from these guidelines will be addressed in the individual stand prescriptions.

Soils:

The soil across much of Louise E. Keir WMA is shallow and well drained, which limits the establishment and growth of some tree species. The timber harvest area is comprised of mainly Lordstown-Arnot complex (LrE) and Kearsarge silt loam (KeB) soil groups. LrE soil is typically very rocky with a land capability classification of 7s, (having very severe limitations that make them unsuitable for cultivation and that restrict their use to mainly grazing, forestland or wildlife habitat, and are typically shallow, droughty, or stony) occurring on a 25-45% slope⁷. KeB soil is typically shallow and somewhat excessively drained with a land capability classification of 3s (having severe limitations that reduce the choice of plants or trees that may grow, and are typically shallow, droughty, or stony) typically occurring on 0-8% slope⁷. Due to this soil type and depth, tree growth is relatively slow and many trees have moderate to poor health.

LANDSCAPE CONTEXT

The goals of this HMP have been developed with consideration of surrounding landscape features, the availability of habitats, and other conservation lands adjacent to Louise E. Keir WMA (Figures 3 and 4). The landscape within a three mile radius of the WMA is primarily privately-owned land including:

- Forest (67% combining deciduous, evergreen and mixed forests)
- Cultivated crops (10%)
- Pasture/hay (7%)
- Development (6%)
- Woody wetlands (5%)
- Open water (2%)
- Barren land (2%)
- Scrub/shrub (1%)

The landscape surrounding the WMA is primarily composed of forested habitats. Due to the scarcity of young forest on the WMA and the limited amount in the surrounding landscape, it is the goal of the Young Forest Initiative (YFI) to create young forest habitat to promote regeneration of select forest stands to ensure a healthy forest in the future.⁸ The pitch pine-oak-heath community located on Louise E. Keir WMA is unique to the area and will be maintained, with plans to create additional suitable habitat to expand that ecological community.

⁷ 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>.

⁸ Additional information about DEC's Young Forest Initiative and the YFI Strategic Plan is available online at <http://www.dec.ny.gov/outdoor/104218.html>.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Louise E. Keir 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 hunting, trapping and bird watching) compatible with the ongoing habitat management practices and species management considerations.
- Improve habitat quality by reducing invasive species, if present and identified for treatment.

FOREST

Forested acreage includes the following forest types:

Natural forest: naturally forested acres, including hardwoods and softwoods. Includes any upland forested acreage that is not young forest, i.e., pole stands, other intermediate forest age classes, mature forest, and old growth forest.

Plantation: planted forested acres, generally planted in rows dominated by one or two species.

Forested wetland: acres where forest or shrub vegetation accounts for greater than 50% of hydrophytic vegetative cover and the soil or substrate is periodically saturated or covered with water.

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

Young forest (forested wetland): young, regenerating forested wetland acres.

Forest management on Louise E. Keir 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. Within the next ten years, young forest habitat (a minimum of 10% of the WMA's forested habitat) will be created and maintained in perpetuity on this WMA.

MANAGEMENT OBJECTIVES

- Retain the majority of the existing mature forest (158 acres).
- Increase young forest from 5.5 to 27.1 acres (15% of the total forested area) to improve habitat for young forest-dependent wildlife, targeting ruffed grouse, wild turkey and white-tailed deer.
- Encourage dispersal of native hardwoods (oak) and softwoods (pitch pine) to promote regeneration and increase availability of hard mast for wildlife.

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

There are 185.1 forested acres on Louis E. Keir WMA. The entirety of the WMA is forested with a small percentage currently in young forest habitat (Figure 5). Table 3 provides a summary of the forested areas, including the most common species found in the WMA’s forests.

Table 3. Summary of the acreage and dominant overstory species for each forest type present on Louise E. Keir WMA.

Forest Type	Acres (as of 2015)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	179.6	158.0	red oak, chestnut oak, white pine
Plantation	0	0	
Forested wetland	0	0	
Young forest	5.5	27.1	pitch pine, red oak, red maple
Young forest (forested wetland)	0	0	
Total Forested Acres:	185.1	185.1	

Target species for young forest include ruffed grouse, wild turkey, and white-tailed deer. 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 areas – Open areas with dense overhead cover of young forest with good mast production.
 - Nesting – Young, open forest stands or second growth woodlands.
 - Brood rearing – Herbaceous ground cover with a high midstory stem density.^{9, 10}
- Wild turkey:
 - Strutting areas – Open fields with short vegetation, <12 inches preferred, and mature hardwoods.
 - Nesting cover – Blowdowns and the bases of trees and stumps in open hardwoods and brushy cover in early successional habitats and field edges.
 - Brood rearing – The best brooding cover is fields with herbaceous vegetation from 12-18 inches preferred.
 - Foraging – The habitat required ranges from open old-field areas to mature forests:
 - Spring diet – Tubers and invertebrates.
 - Summer diet – Poul diets consist primarily of invertebrates. Adult diets consist of invertebrates and tubers, switching over to herbaceous vegetation and soft mast as summer progresses.
 - Fall diet – Hard and soft mast, seeds, and invertebrates.
 - Winter diet – Hard and soft mast, seeds (birch if available) and hardwood buds.

⁹ Dessecker, D. R., G. W. Norman, and S. J. Williamson. 2006. Ruffed Grouse Conservation Plan. Association of Fish & Wildlife Agencies: Resident Game Bird Working Group. 94 pp.

¹⁰ Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.

- Winter cover – Mature conifer stands.
- Roosting – Mature hardwoods and softwoods. Adults with flightless poults tend to roost on the ground under large trees with a dense understory of young trees, shrubs, downed trees, rock outcrops, or brushy fields.^{11, 12}
- White-tailed deer (in Northern Hardwood Forests):
 - Fawning areas – Vary from open forest to hay fields to brushy cover.
 - Spring/Summer diet – Primarily herbaceous vegetation (clover, *Rubus* sp., forbs, etc.), hardwood foliage, soft mast, and agricultural crops where available.
 - Fall diet – Hard mast, preferably acorns, hardwood foliage, and agricultural crops where available.
 - Winter diet – Hardwood buds, fallen leaves, hard mast and conifers, preferably white cedar.
 - Bedding cover – Varies from open hardwoods with laydowns to dense thickets of early succession shrublands or hardwood and softwood regeneration.¹³

The Eastern whip-poor-will (SC) has been documented in the general area surrounding Louise E. Keir WMA. This species was documented in the Breeding Bird Atlas (BBA) block containing the WMA in the 1980s survey and in surrounding blocks during the BBA in the early 2000s. Cornell's e-Bird database contains accounts of whip-poor-wills on properties west of Louise E. Keir WMA throughout the last ten years. The creation and expansion of young forest on Louise E. Keir WMA could provide suitable habitat for whip-poor-will, though they are usually found at elevations below 1000 feet.¹⁴ Forest management on Louise E. Keir will be primarily located between 800 and 1120 feet. If time and resources allow, the presence/absence of whip-poor-will will be monitored on the WMA. If whip-poor-wills are documented on the WMA in the future, the management goals for Louise E. Keir WMA will be re-evaluated and the feasibility of adding whip-poor-will as a target species will be addressed.

MANAGEMENT HISTORY

A commercial timber harvest was completed in 2008 to preserve the pitch pine-oak-heath rocky summit natural community and improve wildlife habitat. This harvest focused mainly on removal of white pine on approximately 50 acres of the parcel. About 5.5 acres were cleared of white pine in order to release existing pitch pine-oak-heath. The remainder of the 50 acre cut was a selective white pine harvest.

In 2010, the National Wild Turkey Federation paid a contractor to remove white pine and release remnant pitch pine within the pitch pine-oak-heath rocky summit community.

¹¹ USDA – NRCS. 1999. Wild Turkey (*Meleagris gallopavo*) Fish and Wildlife Habitat Management Leaflet. 12 pp.

¹² Dickson, J. G. 1992. The Wild Turkey: Biology and Management. National Wild Turkey Federation and USDA Forest Service. Stackpole Books, PA. 480 pp.

¹³ Halls, L. K., ed. 1984. White-tailed Deer: Ecology and Management. The Wildlife Management Institute. Stackpole Books, PA. 864 pp.

¹⁴ Cink, Calvin L. 2002. Eastern Whip-poor-will (*Antrostomus vociferus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online:

<http://bna.birds.cornell.edu.bnaproxy.birds.cornell.edu/bna/species/620>

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

The following management is proposed in order to reach the young forest acreage goal of 27 acres within ten years:

- **Management planned for 2016-2020** (Table 4, Figure 5):
 - Clearcut in Stand 2.1 and plant pitch pine seedlings to expand the existing pitch pine-oak-heath rocky summit natural community (6.6 acres).
 - Clearcut white pine and transitional hardwoods in Stands 3 and 4 (9.9 acres).
 - Selective cut of undesirable species in Stand 8 (4.6 acres).
- **Management planned for 2021-2025** (Table 5, Figure 5):
 - Clearcut hardwoods in Stand 1 (5.1 acres).

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
2.1	6.6	Small sawtimber 12"-17"DBH	White pine	Young forest/ plantation	Wildlife	Clearcut
3	5.4	Small sawtimber 12"-17"DBH	White pine	Young Forest	Wildlife	Clearcut
4	4.5	Small sawtimber 12"-17"DBH	Transition hardwoods (NH-Oak)	Young forest	Wildlife	Clearcut
8	4.6	Seedling/Sapling	Scrub oak	Scrub oak	Wildlife	Selective cut

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

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
1	5.1	Poletimber 6"-11" DBH	Oak	Young forest/ plantation	Wildlife	Clearcut

Stand locations and planned management actions are also summarized in Figure 5. Specific forest stand descriptions and detailed management prescriptions will be prepared for each proposed forest management area prior to implementation (see template, Appendix C). Briefly, habitat management for each of these stands will include the following:

- **Stand 1:** Stand 1 consists of a transitional hardwood forest consisting mainly of pole sized mixed oaks. A portion of the stand (5.1 acres) will be clearcut. The opening of the canopy and planting of pitch pine seedlings will expand the existing pitch pine-oak-heath rocky summit community in Stand 2.2, adjacent to the clearcut. In addition to the planting of pitch pine, the stand will also be allowed to regenerate naturally to create young forest habitat to provide both cover and a food source for ruffed grouse, wild turkey and white-tailed deer.

- **Stand 2.1:** Stand 2.1 consists of a natural white pine forest with a size class of small sawtimber. A portion of the stand (6.6 acres) will be clearcut in conjunction with clearcuts in Stands 3 and 4. The opening of the canopy and planting of pitch pine seedlings will expand the existing pitch pine-oak-heath rocky summit community in Stand 2.2, adjacent to the harvest. Invasive plants, such as multi-flora rose and barberry, within the stands will be controlled through herbicides or mechanical means as needed. Increasing the young forest habitat as proposed will establish more habitat for ruffed grouse, wild turkey and white-tailed deer.
- **Stands 3 and 4:** Stands 3 and 4 consist of both a natural white pine forest and a transitional hardwood forest of small sawtimber. Clearcuts of 5.4 acres in Stand 3 and 4.5 acres in Stand 4 will be conducted. Invasive plants, such as multi-flora rose and barberry, within the stands will be controlled using chemical or mechanical means as needed. Both stands will be allowed to regenerate naturally providing quality habitat for young forest dependent wildlife species.
- **Stand 8:** Stand 8 consists of a scrub (bear) oak forest with a size class of seedling/sapling. A selective cut within the stand will be conducted to remove undesirable species that are shading out the current scrub oak forest. Maintaining the current forest structure within the stand provides a food source for many different species of wildlife within the WMA.

If feasible, a prescribed burn will be planned in Stands 1, 2.1 and 2.2 to restore, improve and maintain the health of the pitch pine-oak-heath rocky summit woodland. Historically fire played an important role in shaping and maintaining this community. Exclusion of fire from the landscape has resulted in significant degradation of the pitch pine-oak-heath rocky summit woodlands by allowing the growth of species that are undesirable to this community, such as white pine and red maple. Use of prescribed fire as a management tool promotes regeneration and vigor of desirable species, improves wildlife habitat and reduces competing native and invasive vegetation. The prescribed burn would be used in conjunction with the planned timber harvests to maintain Stand 2.2 and sections of Stands 1 and 2.1 as a pitch pine-oak-heath rocky summit woodland. A forestry mower will be utilized, when needed, to prepare the stands prior to burning.

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 ¹⁵
Soils	<i>Rutting Guidelines for Timber Harvesting on Wildlife Management Areas</i>
Water quality	<i>NYS Forestry Best Management Practices for Water Quality</i>
Wildlife	<i>Retention Guidance on Wildlife Management Areas</i>
Plantations	<i>Plantation Management Guidance on Wildlife Management Areas</i>

¹⁵ All guidance documents referenced here are available online at <http://www.dec.ny.gov/outdoor/104218.html>.

Wildlife Considerations:

Due to the sensitivity of endangered, threatened or SGCN birds found on the WMA, cutting of trees and/or brush will be conducted outside the breeding time period if the species are known to be on the area or within close proximity. Due to the possibility of Indiana and Northern long-eared bats being on the area, tree selection for cuts and the timing of cuts will be evaluated to protect the bats.

Forest Health Considerations:

Trees in this WMA may grow slower than those in the surrounding landscape due to steep slopes and shallow rocky soils. Species that are well suited for these conditions will be considered when planning habitat management. Timber harvesting operations and locations may be affected by steep slopes and rocky soils.

Pre- and Post-treatment Considerations:

Stands 1, 2.1, 3,4 and 8 contain multiple invasive species (i.e., barberry, honeysuckle, multi-flora rose). These invasive plants will be monitored and removed through mechanical or chemical treatments when necessary to promote the regeneration of desired species.

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 response(s) have been achieved by the management outlined above, pre- and post-management assessments will be conducted in accord with guidelines in the *Young Forest Initiative Monitoring Plan: 2016-2025*.¹⁶ 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, and three and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Louise E. Keir WMA, which may be assessed to determine response to management, include:

- Ruffed grouse
- Wild turkey
- White-tailed deer

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.

¹⁶ Available online at <http://www.dec.ny.gov/outdoor/104218.html>.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

There is no acreage on Louise E. Keir WMA managed as shrubland and no plan to develop such habitat.

GRASSLAND

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

DESCRIPTION OF EXISTING GRASSLAND HABITAT AND TARGET SPECIES

There is no acreage on Louise E. Keir WMA managed as grassland and no plan to develop such habitat.

AGRICULTURAL LAND

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

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

There is no acreage on Louise E. Keir WMA managed as agricultural land and no plan to develop such habitat.

WETLANDS (NATURAL AND IMPOUNDED)

Natural wetlands are areas where the soil or substrate is periodically saturated or covered with water, including emergent (perennial herbaceous vegetation accounts for >50% of hydrophytic vegetative cover) and scrub-shrub wetlands (woody vegetation under 20 feet tall accounts for >50% of hydrophytic vegetative cover). Impounded wetlands are areas similar to natural wetlands, but where water is held back by a berm, road, or other structure. Forested wetlands are addressed in the Forest section above.

DESCRIPTION OF EXISTING WETLAND HABITAT AND TARGET SPECIES

There is no acreage on Louise E. Keir WMA managed as wetland and no plan to develop such habitat.

OPEN WATER (WATERBODIES AND WATERCOURSES)

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

DESCRIPTION OF EXISTING OPEN WATER HABITAT AND TARGET SPECIES

There is no acreage on Louise E. Keir WMA managed as open water and no plan to develop such habitat.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Louise E. Keir 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 Louise E. Keir WMA, 2016-2025. (Also see Figure 5.)

Habitat	Management Action	Acres	Timeframe
Forest	Clearcut hardwoods in Stand 1.	5.1	2021-2025
Forest	Clearcut softwoods in Stand 2.1 and plant pitch-pine seedlings.	6.6	2016-2020
Forest	Clearcut softwoods and transitional hardwoods in Stands 3 and 4.	9.9	2016-2020
Forest	Selective cut of undesirable trees in Stand 8.	4.6	2016-2025

III. FIGURES

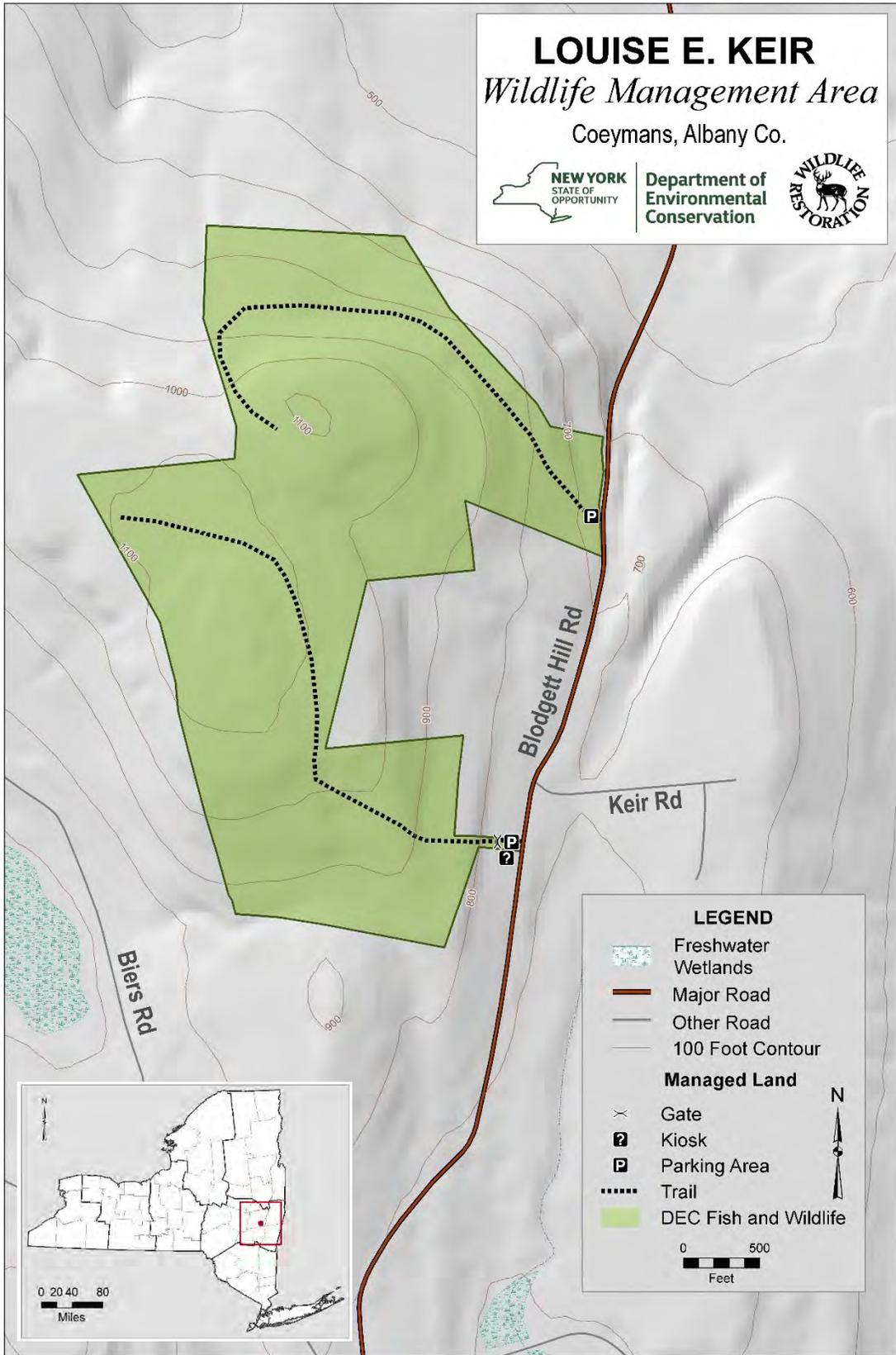


FIGURE 1. Location and access features at Louise E. Keir WMA.

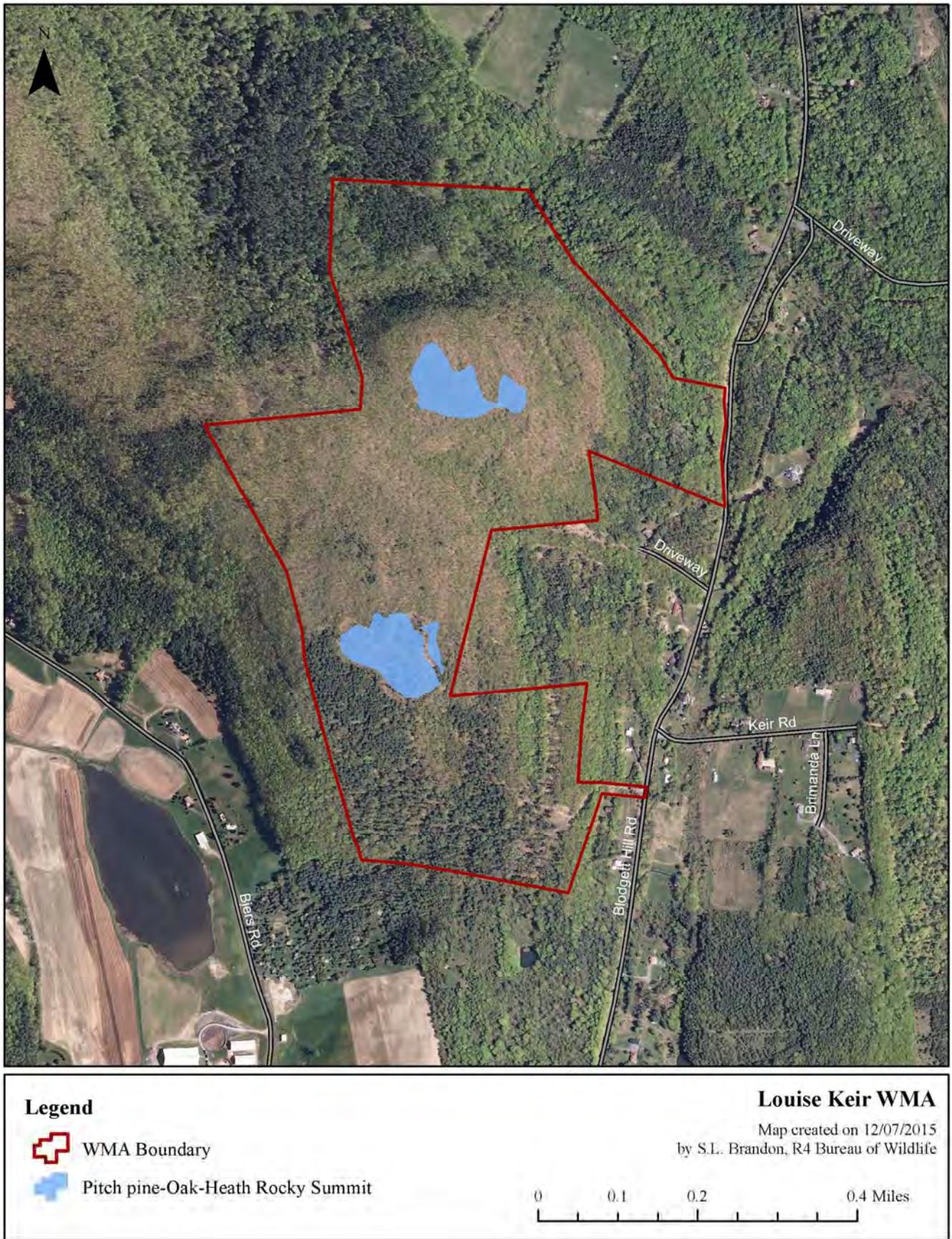


FIGURE 2. Significant ecological communities on Louise E. Keir WMA. Data from the NY Natural Heritage Program.

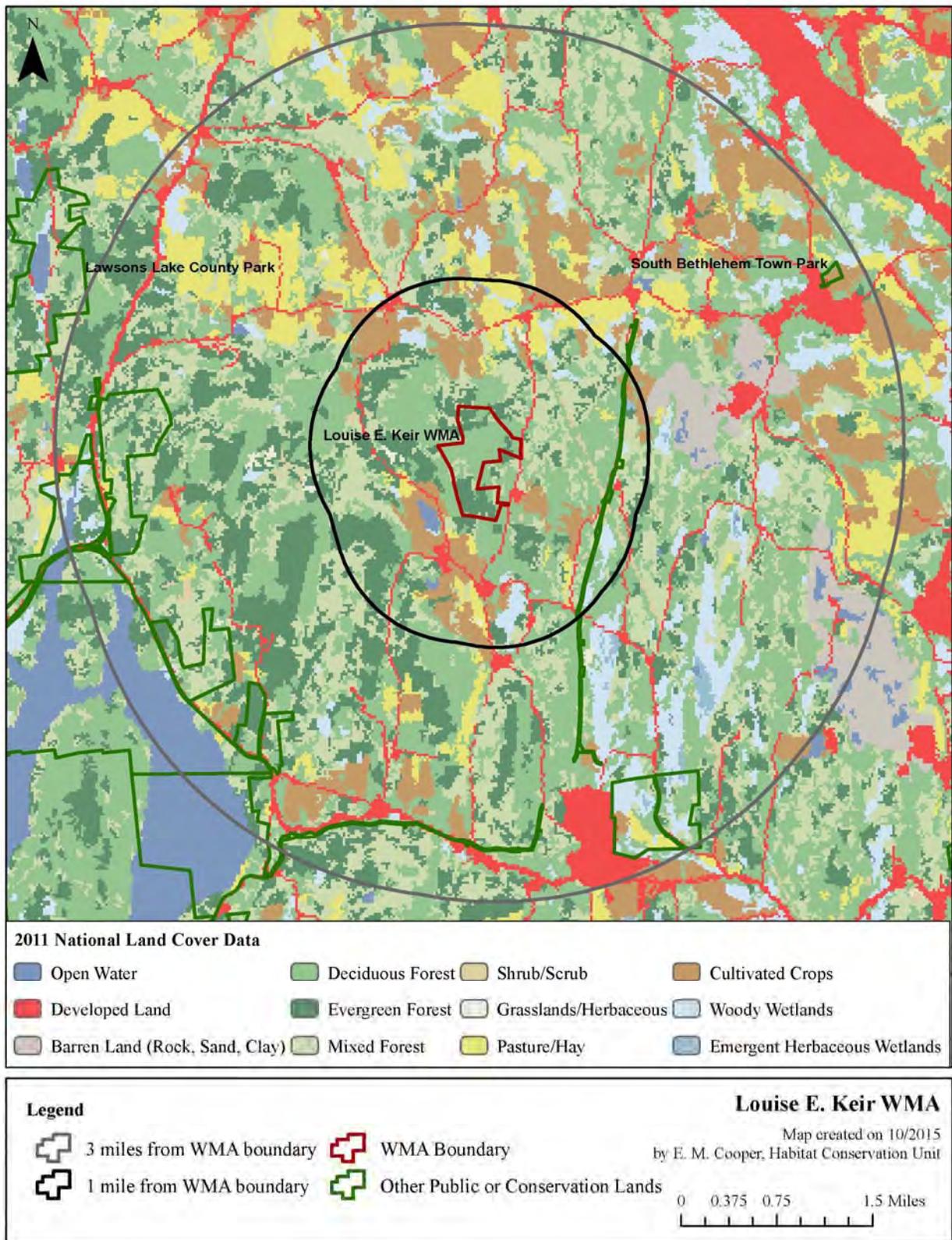


FIGURE 3. Land cover types and conservation lands in the landscape surrounding Louise E. Keir WMA. Conservation lands are from the NY Protected Areas Database available online at <http://www.nypad.org/>. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at <http://www.mrlc.gov/nlcd2011.php>.

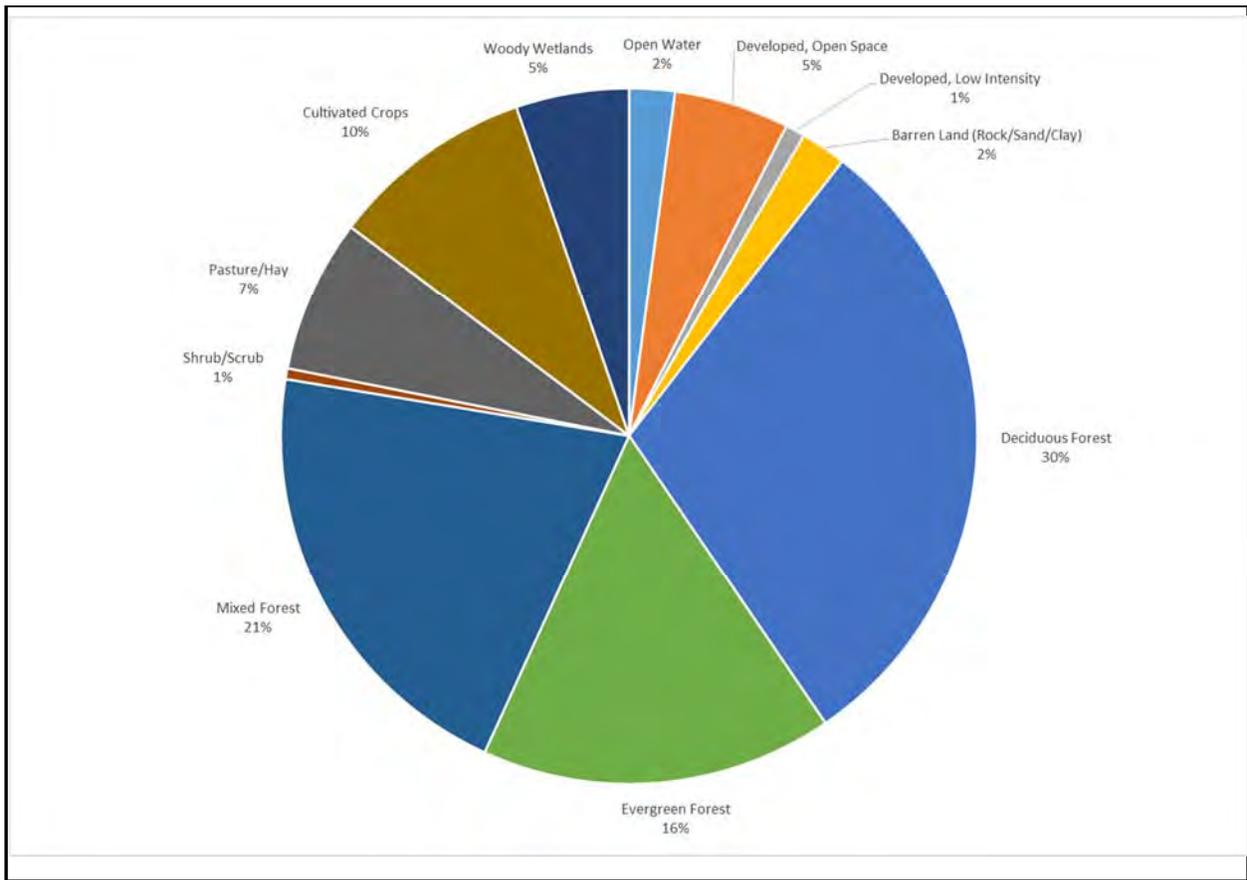
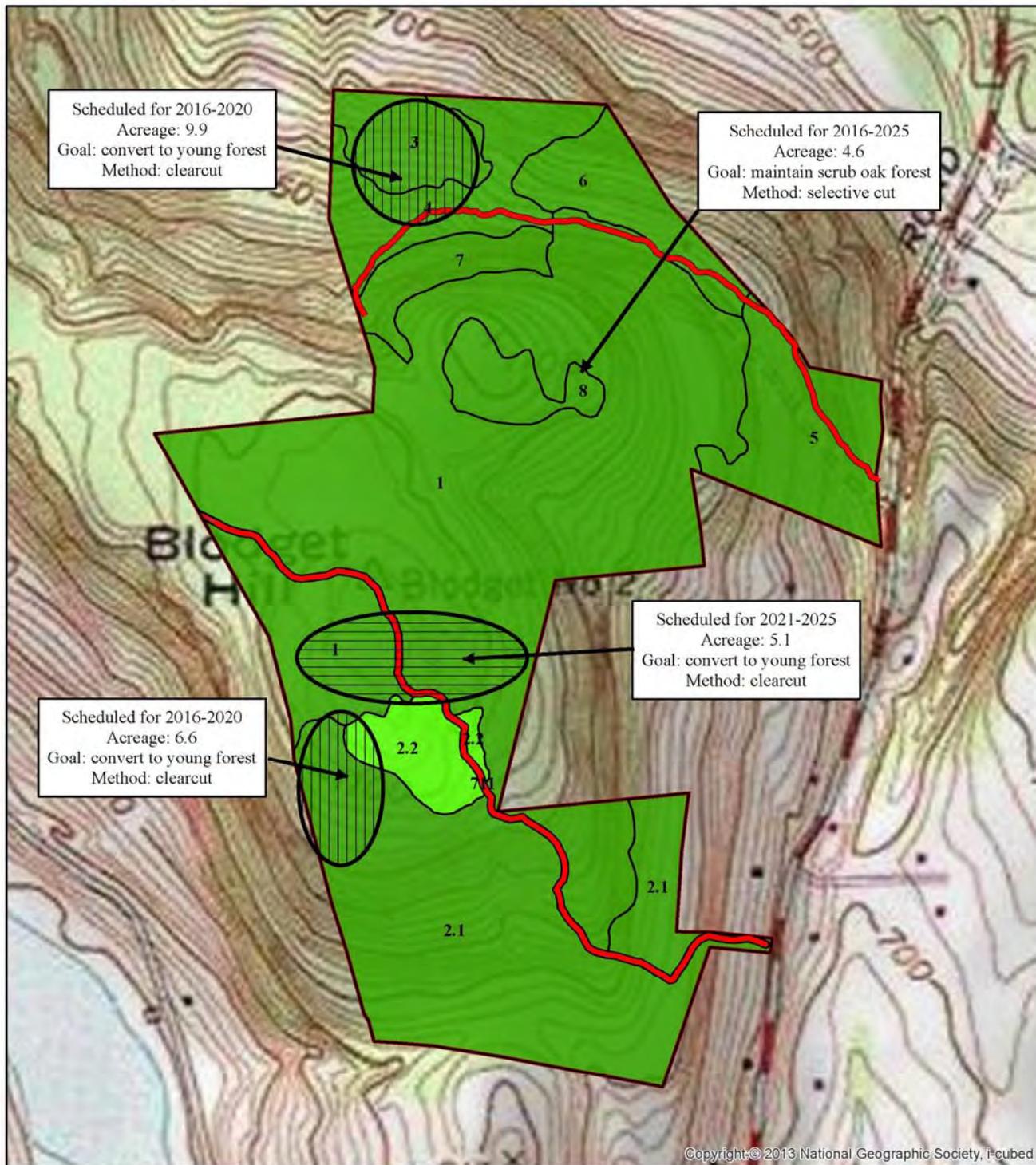


FIGURE 4. Percent Cover of land cover types within three miles of Louise E. Keir WMA.

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>.



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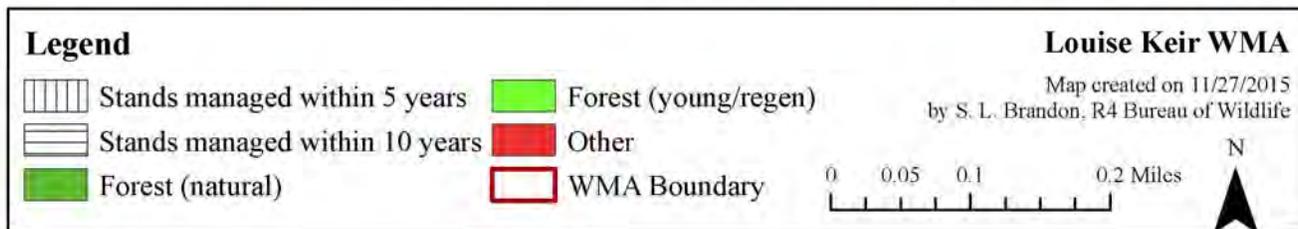


FIGURE 5. Habitat types and locations of proposed management on Louise E. Keir WMA. Numbers indicate the stand number from habitat inventory.

IV. APPENDICES

APPENDIX A: DEFINITIONS

The following key words were used in the development of this Habitat Management Plan. Definitions are from The Dictionary of Forestry, Society of American Foresters, J. A. Helms, Editor, unless otherwise noted.

Best Management Practices: (BMP) A practice or combination of practices that are determined to be the most effective and practicable means of avoiding negative impacts of habitat management.

Biodiversity: The variety and abundance of life forms, processes, functions, and structures of plants, animals, and other living organisms, including the relative complexity of species, communities, gene pools, and ecosystems at multiple spatial scales.

Clearcut method: 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 Cut 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 Cut Method: A forest regeneration or harvest method that entails the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment.

Shrubland: A community dominated by woody plants typically less than ten feet tall with scattered open patches of grasses and forbs that provide floristic diversity. Typically characterized by >50% cover of shrubs and <25% canopy cover of trees. (Adapted from Edinger et al. 2002. Ecological Communities of New York State, Appendix B)

Softwood: A coniferous tree belonging to the botanical group Gymnospermae, such as white pine, Eastern hemlock, balsam fir, red spruce, etc.

Special Management Zone: A vegetation strip or management zone extending from wetland boundaries, high-water marks on perennial and intermittent streams, vernal pool depression, spring seeps, ponds and lakes, and other land features requiring special consideration. (Adapted from DEC Division of Lands and Forests Management Rules for Establishment of Special Management Zones on State Forests)

State Rank of Significant Ecological Communities:

S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.

S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.

S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.

S4 = Apparently secure in New York State.

S5 = Demonstrably secure in New York State.

SH = Historically known from New York State, but not seen in the past 15 years.

SX = Apparently extirpated from New York State.

SE = Exotic, not native to New York State.

SR = State report only, no verified specimens known from New York State.

SU = Status unknown.

(Edinger et al. 2002. Ecological Communities of New York State, Appendix A)

Stand: In forestry, a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable and manageable unit. In this HMP, the term “stand” is also applied to other habitat types (e.g., grassland, shrubland) to describe an area composed of similar vegetation composition and structure, as delineated during the habitat inventory.

Stand Prescription: A planned series of treatments designed to change current stand structure to one that meets management goals. Note: the prescription normally considers ecological, economic, and societal constraints.

Target Species: A suite of high priority wildlife species of conservation interest that are being targeted to benefit from management of a particular habitat type.

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

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

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

- (a) lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting aquatic or semi-aquatic vegetation of the following types: wetland trees, wetland shrubs, emergent vegetation, rooted, floating-leaved vegetation, free-floating vegetation, wet meadow vegetation, bog mat vegetation, and submergent vegetation;
 - (b) lands and submerged lands containing remnants of any vegetation that is not aquatic or semi-aquatic that has died because of wet conditions over a sufficiently long period, provided that such wet conditions do not exceed a maximum seasonal water depth of six feet and provided further that such conditions can be expected to persist indefinitely, barring human intervention;
 - (c) lands and waters substantially enclosed by aquatic or semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b) the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation as set forth in paragraph (a) or by dead vegetation as set forth in paragraph (b) the regulation of which is necessary to protect and preserve the aquatic and semi-aquatic vegetation; and
 - (d) the waters overlying the areas set forth in (a) and (b) and the lands underlying.”
- (Refer to NYS Environmental Conservation Law, Article 24 § 24-0107 for full definition.)

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

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

APPENDIX B. STATEMENT OF CONFORMITY WITH SEQRA

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

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

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

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

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

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 “Hershisier-Koufax Sandy Silt Loam” in describing the soil conditions as they relate to management decisions. The important point is to note those characteristics that may limit equipment operation or establishment of regeneration. Soil type data is available for some counties on the Data Selector.

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

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

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

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

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

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

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

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

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

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

APPENDIX D: AMENDMENTS

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

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