Habitat Management Plan
for
Mongaup Valley Wildlife Management Area
2022 – 2031

Division of Fish and Wildlife
Bureau of Wildlife

Region 3 Headquarters
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SUMMARY

Mongaup Valley WMA is best known for its population of both nesting and overwintering bald eagles. It is a popular destination for the public to enjoy year-round viewing opportunities for eagles, with two designated viewing locations, a large blind at Mongaup Falls Reservoir and an eagle viewing site at Rio Reservoir. The importance of the Mongaup Valley as a wintering area for bald eagles was first documented by DEC staff during surveys conducted in the early 1970s, and continued research using radio-telemetry allowed DEC to define critical use areas. But it wasn't simply the overwintering habitat that made the Mongaup Valley so attractive to bald eagles, it was also the availability of a reliable food source. Alewives that get entrained during hydroelectric operations along the river are scavenged by the wintering bald eagles at water discharge locations. Further, the warmer water discharged by the hydroelectric projects prevents icing in the immediate area, providing open water throughout the winter months and making entrained alewives even more accessible to eagles, even during sub-freezing temperatures. In 1978, when the bald eagle was declared a Federally endangered species, the entire Lower Mongaup Valley and much of the Upper Delaware River Valley were nominated as critical bald eagle habitat and DEC began efforts to obtain land for its protection. It was not until 1990 that DEC finalized its purchase of the Mongaup Valley WMA from Orange & Rockland Utilities, Clove Development Corporation, and the Trust for Public Lands with funds made available from the Environmental Quality Bond Act II (EQBA II) of 1986. Currently, Mongaup Valley WMA totals approximately 11,855 acres, with 6,313 acres of State-owned property and the rest in easements.

In addition to the public viewing opportunities for bald eagles, Mongaup Valley WMA is also a destination for both in-state and out-of-state hunters pursuing white-tailed deer, wild turkey and black bear due to its large size and close proximity to both New Jersey and Pennsylvania. Ruffed grouse were once a popular game species in the area, but their populations and popularity have declined as the local forests have matured. Other species in need of management at Mongaup Valley include the Eastern whip-poor-will, golden-winged warbler, and timber rattlesnake. Ruffed grouse, whip-poor-will, and golden-winged warbler are all listed as Species of Greatest Conservation Need in New York and the timber rattlesnake is listed as Threatened. Although not recently detected in any surveys at the WMA, Mongaup Valley falls within the historic Appalachian Range for golden-winged warblers. The hope is that active forest management will help establish a breeding population of golden wings on the WMA and contribute to the restoration of their Appalachian population as a whole.

Approximately 97% of the habitat at Mongaup Valley is mature to maturing forest. The most common forest type is oak-pine, comprised of Northern red oak, white oak, chestnut oak, and white pine. Other than oak species, red maple, sugar maple, black birch, and American beech make up the majority of the deciduous forest component on the property. Active forest management using commercial timber harvests is being proposed in this HMP in order to create a greater diversity of habitat types on the property. Most of the proposed timber harvest locations are directly adjacent to existing powerline and pipeline rights-of-way (ROW) that run through the WMA. These cuts will create a gradient from early to late successional habitats that will include the ROW, the regeneration cut itself, and the surrounding mature forest. Proposed

timber harvest locations that are not adjacent to a utility ROW opening will include a small, 2-acre clearing that will be maintained as a permanent wildlife opening and provide the desired habitat gradient. Special consideration will be given to bald eagles and timber rattlesnakes to ensure that they are not negatively impacted by forest management. The small amount of wetland acreage on the property will be managed to maintain its natural state and protect against the establishment of non-native, invasive vegetation.

Habitat management goals for Mongaup Valley WMA include:

- Create an additional 468 acres of young forest, for a WMA total of 508 acres (9% of the total forested area), to provide habitat for ruffed grouse, Eastern whip-poor will, golden-winged warbler and other wildlife species.
- Create and maintain 24 acres (<1% of the total WMA acreage) of permanent wildlife openings to provide habitat for golden-winged warbler, Eastern whip-poor-will, wild turkey, white-tailed deer, timber rattlesnakes and other wildlife species.
- Monitor 9 acres of natural wetland for invasives and treat if necessary.

I. Background and Introduction

Purpose of Habitat Management Plans

Background

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

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

Scope and Intent

Primary purposes of this document:

- Provide the overall context of the habitat on the WMA and identify the target species for management;

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

Within the next 5 years, this HMP will be integrated into a comprehensive WMA Management Plan that will include management provisions for facilitating compatible wildlife-dependent recreation, access, and facility development and maintenance.

Definitions are provided in Appendix A.

The effects of climate change and the need to facilitate habitat adaptability and resilience under projected future conditions will be considered during the habitat management planning process and will be considered in any actions that are recommended in HMPs. Changing conditions that may affect habitat composition include warmer temperatures, milder winters, longer growing seasons, increased pressure from invasive species, more frequent intense storms, and moisture stress. It is also important to consider landscape level effects to maintain the connectedness of habitats to allow range adjustments of both plant and wildlife species.

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

Mongaup Valley WMA, Region 3, Towns of Bethel, Lumberland, Forestburgh, and Highland, Sullivan County and the Town of Deer Park, Orange County. (Figure 1).

Total Area

6,313 acres in fee ownership
5,542 acres in Conservation Easement

HABITAT INVENTORY

A habitat inventory of the WMA was completed in 2017 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 at Mongaup Valley WMA.

Habitat Type	Current Conditions (as of 2016)			Desired Conditions	
	Acres	Percent of WMA	Miles	Acres	Percent of WMA
Forest [a]	6,160	97%		5,668	90%[b]
Young forest	40	<1%		508	8%
Shrubland	0	0%		0	0%
Grassland/Permanent wildlife openings	0	0%		24	<1%
Agricultural land	0	0%		0	0%
Wetland (natural) [c]	9	<1%		9	<1%
Wetland (impounded) [c]	0	0%		0	0%
Open water	0	0%		0	0%
Other (maintained ROW)	104	2%		104	2%
Roads			5.5		
Rivers and streams			4.5		
Total Acres:	6,313	100%		6,313	100%

[a] Forest acreage includes all mature and intermediate age classes of natural forest, plantations, and forested wetlands. Young forest is reported separately. Definitions are provided in the Forest section of this plan.
[b] The forest management proposed in this plan aims to replace poor quality forest, promote regeneration of native species, and establish a healthy mature forest for the future. See Landscape Context and Forest sections.
[c] Wetland acreage does not include forested wetlands, since they are included in the Forest category.

ECOLOGICAL RESOURCES

Wildlife Overview:

The most noteworthy species at Mongaup Valley WMA is the bald eagle. Bald eagles have been documented overwintering at the WMA by DEC staff as far back as the early 1970s. In winter months, hydroelectric projects along the Mongaup River provide open water open, allowing eagles to forage on the local alewife population year-round. This, along with the available forested habitat adjacent to the river and its isolation from human populations, contributed to Mongaup Valley being an important overwintering area for the bald eagle in NY and the Northeast.

The WMA's river valley habitats currently serve as a wintering area for up to 100 birds, annually. There are two viewing blinds, one at the north end of the Rio Reservoir and one at the north end of Mongaup Falls Reservoir that allow the public to observe the wintering eagles with minimal disturbance. The first nesting pair of bald eagles was noted on the property by DEC staff in 1987. Currently, there are three active eagle nests on the WMA itself, and six total nests including the surrounding private properties and conservation easements. Bald eagles are currently listed as Threatened in New York State.

Bald eagles are the main attraction at Mongaup Valley WMA.

Photo: Mike Pogue, DEC.

Other notable species that could be encountered at Mongaup Valley WMA include the ruffed grouse and the Eastern whip-poor-will, whose populations have been in decline in the Northeast and are both Species of Greatest Conservation Need (SGCN) in New York. Ruffed grouse are an iconic game species across their range and were once much more abundant than they are now at Mongaup Valley and in New York in general. Known for their ritualistic courtship display and drumming routine, they attract the attention of hunters, photographers and artists alike and serve as a symbol of Northern forests in the U.S. and Canada. Although ruffed grouse are occasionally documented at Mongaup Valley WMA, their numbers are nowhere near what they once were in the area, in large part due to a lack of forest management. The same is also true for the Eastern whip-poor-will, known for their night-time calling focused around the full moon periods in the spring. According to the Breeding Bird Atlas, whip-poor-will populations have declined by approximately 50% over the last 30 years. However; recent surveys conducted by DEC staff at Mongaup Valley WMA have detected breeding whip-poor-will in newly created young forest patches both on and adjacent to the WMA.

Mongaup Valley WMA also falls within the historic Appalachian range of the golden-winged warbler. Populations within this range have declined by approximately 98% since the 1960s. A Golden-winged Warbler Conservation Plan was developed by a Working Group of professionals in order to direct management for this species across the Northeast, with a goal of increasing the number or breeding pairs by 50% by the year 2050. Efforts are now being made by a number of organizations and agencies, including DEC through the Young Forest Initiative, to restore the Appalachian population through targeted habitat management. At Mongaup Valley WMA, that management will entail the use of commercial timber harvests to create young forest habitat. Survey efforts by New York's Office of Parks, Recreation and Historic Preservation (OPRHP) have detected breeding golden-winged warblers in similar habitats at the nearby Sterling Forest State Park in Orange County.

Species that could potentially be found at Mongaup Valley WMA include:

- Bald eagle, Red-shouldered hawk, broad-winged hawk, osprey

- White-tailed deer, black bear, Eastern coyote, fisher, porcupine
- Wild turkey, ruffed grouse
- Whip-poor-will, blue-winged warbler, black-throated green warbler, ovenbird, hermit thrush, Eastern wood-pewee, golden-winged warbler
- Great blue heron, green heron

Wildlife and Plant Species of Conservation Concern:

The following federal or state listed Endangered (E), Threatened (T), or Special Concern (SC) species and/or 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 Mongaup Valley 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	Bald eagle		T	x
	Ruffed grouse			x
	Eastern whip-poor-will			HP
	Golden-winged warbler			HP
	Blue-winged warbler			x
	Scarlet tanager			x
	Wood thrush			x
	Red-shouldered hawk			x
Mammals	Northern myotis			HP
Amphibians and reptiles	Timber rattlesnake		T	HP
	Marbled salamander			x
Plants	Riverbank quillwort		E	
	Dwarf sand cherry		T	

Significant Ecological Communities:

There are several rare and significant natural communities located on Mongaup Valley 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

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

Appendix A. The following significant ecological communities occur on the WMA; community descriptions are from *Ecological Communities of New York State, Second Edition* [5] (Figure 2):

- **Floodplain forest (S2 S3):** Typically, a hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring and high areas are flooded irregularly. Some sites may be quite dry by late summer whereas other sites may be flooded again in late summer or early autumn (these floods are caused by heavy precipitation associated with tropical storms). This is a broadly defined community; floodplain forests are quite variable and may be very diverse.
- **Shoreline outcrop (S3 S4):** A community that occurs along the shores of lakes and streams on outcrops of non-calcareous rocks such as anorthosite, granite, quartzite, sandstone, gneiss, or schist. The shoreline is exposed to wave action and ice scour. The vegetation is sparse; most plants are rooted in rock crevices.
- **Pitch pine-oak-heath woodland (S2 S3):** A pine barren community that occurs on well-drained, infertile, sandy soils in eastern Long Island (and possibly on sandy or rocky soils in upstate New York). The structure of this community is intermediate between a shrub-savanna and a woodland.

Additional information about significant ecological communities is available in the Mongaup Valley WMA Biodiversity Inventory Final Report (2014) 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 Mongaup Valley WMA include:

- Four wetlands regulated by Article 24 of the Environmental Conservation Law and a number of additional wetlands, too small to be regulated by the State, shown on the National Wetlands Inventory (NWI; Figure 3). Some of the smaller, federally protected wetlands shown on the NWI have vernal pools associated with them as well. State regulated wetlands include HL-30, HL-41, HL-43, and HL-46, which all lie on the northern portion of the property, associated primarily with Lebanon Lake and Mongaup Falls Reservoir. All the wetlands, whether state or federally regulated, are 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.
- Five named streams (a watercourse entirely within the WMA) or segments of streams (a stream that meanders in and out of the WMA). Those streams include the Bush Kill, which flows into the Mongaup River south of the Rio Reservoir, Long Falls Brook and Black Brook, draining into the River just south of Mongaup Falls Reservoir, and Lebanon Lake Brook and Black Lake Creek on the northern portion of the property connecting

[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 https://www.nynhp.org/ecological-communities/.

Lebanon Lake and Cliff Lake to the Mongaup River. In addition, there are 20 other streams or stream segments on the WMA that will be protected as Special Management Zones, 12 of which are simply drainages mapped as ephemeral streams. The highest stream classification is B(T).[6]

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:

Much of the WMA consists of soils that are formed from glacial till, occupying the landscape from the Mongaup River to the surrounding hilltops. Hillsides are dominated by the Wurtsboro, Wellsboro, Swartswood, and Lackawanna Series, characterized by deep to very deep soils that are moderately well drained to well drained. Hilltops formed from glacial till are often comprised of the Arnot, Lordstown, and Oquaga Series that are typically shallow to moderately deep and well to excessively well drained. In the river valley and uplands on the southern portion of the WMA, the Valois Series becomes more common. These soils are very deep and well drained.

Soils formed by glacial outwash and alluvial deposits on the WMA include the Tunkhannock Series and Barbour Series, respectively. These soils are very deep and well drained to somewhat excessively drained, found predominantly in the Cliff Lake area on the northern portion of the property. The Barbour Series is commonly found on floodplains and terraces in the area, while the Tunkhannock Series is found on hillsides with up to 50% slope.

The deep soils found in the uplands of the WMA are susceptible to rutting and erosion during timber harvest operations. For this reason, any logging activities will be closely monitored to ensure that Best Management Practices are being followed, such as the use of water bars, silt fences and even time of year cutting restrictions.[8]

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

- Deciduous forest (52%)
- Mixed forest (24%)
- Evergreen forest (11%)

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

- Open water (5%)
- Wooded wetland (3%)
- Developed open space (3%)
- Developed (<1%)

State owned public land within a 3-mile-radius of Mongaup Valley is limited to two Forest Preserve parcels that total less than 200 acres located to the west of the WMA. The landscape within the WMA is very consistent with the surrounding landscape in that it is dominated by mature forest. This landscape is essentially a monoculture with very little disturbance aside from some small-scale logging projects that occur on private property from time to time. These mature forests are characterized by second and third growth forests, with intermediate and young forest age classes virtually absent on the landscape. Deciduous forests are the most abundant landscape throughout the WMA and surrounding area, but mixed stands of oak and white pine are common.

There is very little in terms of human development, including developed open spaces such as parks and ball fields. In the mid-1980s, prior to State acquisition, Orange and Rockland Utilities, the major landholder in the Mongaup Valley area, had developed plans to convert their entire holdings to human development. In 1985, they presented a Mongaup Lands Master Plan to DEC that laid out plans to convert most of the Mongaup Valley area to housing communities, golf courses, and a shopping center. However, in 1986, with the passage of the Environmental Quality Bond Act II, 250 million dollars were made available to New York State for land acquisition. By 1988, DEC was provided $15,000,000 to begin the process of acquiring what was then known as the Mongaup Valley Eagle Area, curtailing the development of the area by Orange and Rockland and ensuring the protection of bald eagles in the area.

Despite the majority of the surrounding area being in private ownership, open space is still abundant in the Mongaup Valley area to this day and forest tracts are large and contiguous, with 90% of the area forested. However, as the majority of the area is forested, the only real habitat diversity comes in the form of the limited human development and associated fields and lawns, wetlands, and a extensive pipeline that runs through the area, including the WMA itself. The pipeline is owned by Millennium Pipeline, whom maintains the easement through the WMA. That easement provides a linear and continuous open field habitat with a mix of ferns, grasses, and other herbaceous vegetation. This habitat diversity is an attractant to many species of wildlife on the property, including black bears, white-tailed deer, wild turkey, porcupines and a host of bird species from raptors to songbirds.

II. MANAGEMENT STRATEGIES BY HABITAT TYPE

DEC will continue active management of wildlife habitats on Mongaup Valley WMA to provide the following benefits:

- Maintain habitat characteristics that will benefit wildlife abundance and diversity within the New York landscape.
- Promote Best Management Practices for targeted wildlife and habitats.
- Provide opportunities for wildlife-dependent recreation such as trapping, hunting, and bird watching compatible with the ongoing habitat management practices and species management considerations.
- Improve habitat quality by reducing invasive species, if present and identified for treatment.

FOREST

Forested acreage includes the following forest types:

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

Forest management on Mongaup Valley WMA incorporates an approach to create and/or maintain the diversity of forest age classes that are required to support a diversity of wildlife. In 2015, DEC launched the Young Forest Initiative (YFI) to increase the amount of young forest on WMAs to benefit wildlife that require this transitional, disturbance-dependent habitat. [9]

MANAGEMENT OBJECTIVES

- Create 468 acres of new young forest to increase the total to 508 acres to benefit ruffed grouse, Eastern whip-poor-will, and golden-winged warbler.
- Retain 5,668 acres of mature forest to benefit of overwintering bald eagles, interior forest-nesting songbirds and raptors, and provide hard mast production.

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

DESCRIPTION OF EXISTING FOREST HABITAT AND TARGET SPECIES

The landscape at Mongaup Valley is dominated by second and third-growth forest created by over a century of logging activities going back to early European settlement. The average size-class across stands falls in the large pole timber to small saw timber range. Mature to maturing forest comprises approximately 97% of the total WMA acreage. The white oak-black oak-Northern red oak forest type is described to be the most common forest type in the Mongaup Valley area, with over 50% of the total surrounding area in deciduous forest according to the 2011 National Land Cover Data (Figure 5). However, the most recent forest inventory for Mongaup Valley indicates that most forest stands on the WMA are a mix of hardwood and softwood species to varying degrees.

Oak species (Northern red, white, and chestnut), red maple and white pine are co-dominants in the canopy in most forest stands on the property. Along with oak species and red maple, the most common deciduous/hardwood trees in the canopy at Mongaup are American beech and black birch (Table 3). Less common canopy species include sugar maple, quaking aspen and sycamore. Sycamores are limited to a small area of floodplain forest found at the confluence of the Mongaup River and the Delaware River on the very southern boundary of the WMA along State Rt. 97 (Figure 2). Based on the most recent DEC forest inventory data, 84% of the stands on the WMA have some evergreen/softwood component, with white pine accounting for the majority. Variations in the softwood component in individual forest stands are dependent upon the individual site characteristics, including soil type, slope, aspect, and past management. Eastern hemlock, although less common than white pine, is another conifer species on the property, found primarily in drainages and north and east facing slopes with cool, moist soil conditions. In fact, 91 acres of the forested habitat at Mongaup Valley are forested wetland in the form of hemlock-hardwood swamp, comprised predominantly of hemlock on this property. A stand of pitch pine can be found on the eastern side of the property associated with a pitch pine-oak-heath woodland, one of two significant natural communities on the property (Figure 2). However, this community, as the result of past management and the lack of fire for pitch pine regeneration, appears to be transitioning through natural succession to an oak-pine forest type.

The sub-canopy at Mongaup is mostly comprised of red maples and black birch, with oaks, American beech and others mixed in at times. The most recent forest inventory (ongoing) indicates that tree regeneration is generally lacking on the property, although there are some areas with significant white pine regeneration. While rocky, acidic soils can be beneficial for oak regeneration, the lack of sunlight reaching the forest floor prohibits the establishment of oak regeneration overall. Other than white pine regeneration, mountain laurel, rhododendron, and some patches of barberry make up the understory at Mongaup Valley. Blueberry and patches of hay-scented fern occupy the forest floor throughout much of the property. Management of the forested acreage at Mongaup Valley will primarily focus on providing habitat for bald eagle, ruffed grouse, Eastern whip-poor-will, golden-winged warbler, and timber rattlesnake.

The mature forests at Mongaup Valley WMA are most well-known for the habitat they provide for bald eagles throughout the year. Nests are built in large-canopy trees, especially white pines, along lakes, rivers, and wetlands as is the case at Mongaup Valley. Overwintering eagles are drawn to the open water and accessible food source (alewives) that the hydroelectric projects provide, the mature forest that surround the Mongaup River and its reservoirs, and the lack of

human disturbance. During mild weather, eagles roost close to water and available food, whether hardwood, softwood, or mixed forest stands. However, during severe winter weather, bald eagles will use deep-winter roosts for protection from the elements (Town and Nye 2001). Conditions at the roost directly affect over-winter survival and reproductive success. At Mongaup Valley WMA, deep-winter roosts are located in mature white pine stands on east or southeast facing slopes along the river and reservoirs, providing a buffer from prevailing winds.

The mature pine and hemlock forest stands on the property also provide winter cover for deer, turkey, and other wildlife species. These areas often have reduced snow-depths and provide some level of thermal cover. The mature oaks that make up the majority of the hardwood component at Mongaup provide hard mast in the form of acorns, probably the most important food resource for wildlife at the WMA. Beech nuts also contribute to the hard mast production on the property, but to a much lesser degree than acorns. Both acorns and beech nuts are so important for wildlife that annual production can be a limiting factor for wildlife populations. Species that depend upon hard mast production include small mammals (e.g., mice, chipmunks and squirrels), ruffed grouse, wild turkey, black bears and white-tailed deer. Further there are many species of songbirds that depend upon mature forest for breeding and post-breeding habitat. Forest nesting songbirds of concern in New York, such as SGCN, that may occur at Mongaup Valley include the wood thrush and scarlet tanager. Both species utilize mature forests for breeding, although wood thrush can do well in smaller, fragmented patches, while scarlet tanager require larger, more contiguous tracts of northern hardwood, oak, or oak-pine forest, a common habitat type at Mongaup. Even the golden-winged warbler, considered a young forest obligate, utilize mature forest as adult males will take broods to forage in mature hardwood stands adjacent to nesting areas.

With the preponderance of mature forest on the property, young forest habitat is generally lacking except for the location of a 40-acre commercial seed tree cut that occurred on the south side of the property in 2015 (Figure 6a). The creation of young forest habitat at Mongaup Valley could benefit the WMA's ruffed grouse and Eastern whip-poor-will populations, and perhaps allow the establishment of a breeding golden-winged warbler population. Young forests provide dense cover that many species, such as ruffed grouse, require to escape avian predators. Regenerating white pines also provide thermal cover for grouse and other species. Regenerating hardwood stands, especially oak, aspen, and birch, provide food for grouse in the form of leaf buds, seeds, and soft mast like raspberry and blackberry that often colonize harvested areas within the first couple of years post-management. Eastern whip-poor-will utilize dense, young forest habitats to forage on insects and for daytime roosting. Whip-poor-will can also be heard singing on the edges of these temporary forest openings and surveys conducted by DEC staff have detected whip-poor-wills in recently created young-forest patches both on and adjacent to the WMA. Golden-winged warblers utilize dense, young-forest patches up to 25 acres as nesting habitat, especially in association with herbaceous openings for foraging and when adjacent to mature hardwood stands.

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

Forest Type	Acres (as of 2022)	Desired Acres	Overstory species
Natural forest (mature/intermediate)	6,069	5,577	Northern red oak, white oak, chestnut oak, white pine, red maple, American beech, black birch, pitch pine, Eastern hemlock
Forested wetland	91	91	Eastern hemlock, red maple
Young forest	40	508	Northern red oak, white oak, chestnut oak, white pine, red maple, black birch
Total Forested Acres:	6,200	6,176	

- Bald eagle:
  - Overwintering – Mature forest adjacent to an available food source.
  - Deep winter roosts – Mature white pine stands on south or east facing slopes near water.
  - Nesting – Large, mature trees near water, typically white pine in NY.
  - Foraging – Often open water to feed on fish.

- Eastern whip-poor-will:
  - General – Large home ranges with both forested and open areas in close proximity. Suitable sites provide this landscape configuration and are typically near known, occupied areas especially within Focus Areas.
  - Nesting – Forested habitat with well-drained soils and adjacent to open areas. Often pine or pine/hardwood forests, especially pitch pine barrens; rarely hardwood forests or stands with closed canopy or dense shrub layer. Soils critical since the clutch of 2 eggs is placed directly in leaf litter on forest floor.
  - Foraging – Open habitat (e.g., fields, gravel or sand pits, regenerating forest clearcuts, powerlines) adjacent to mature forest, due to increased prey (Lepidopterans) availability and/or increased lunar illumination. Within regenerating stands, disproportionately use areas within 100m of mature forest edge and typically avoid interior of large clearcuts.
  - Roosting – Daytime roosts directly on ground or low branch in forest/young forest. [10, 11]

- 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.[12] Males use mature forest during the breeding season.[13]

[10] Hunt, P. 2014. Best Management Practices for the Eastern Whip-poor-will in New Hampshire. New Hampshire Audubon, Concord, NH. 13 pp.
[11] Wilson, M. D., and B. D. Watts. 2008. Landscape configuration effects on distribution and abundance on whip-poor-wills. The Wilson Journal of Ornithology. 120(4): 778-783.

- Post-fledging – Mature forest. [14]

- 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 mid-story stem density. [15]

Ruffed grouse drumming on a downed tree.

Photo: John Major.

- Scarlet tanager:
  - Breeding – Large tracts of mature deciduous and mixed forests. Prefer stands of oak, oak-pine, beech, and Eastern hemlock.
  - Nesting – Nests are high up in trees on horizontal branches.
  - Foraging – Forage on insects in trees and on ground in mature forests. Also eat fruits and tree buds.
  - Brood rearing – Similar to breeding.

- White-tailed deer:
  - Fawning areas – Vary from open forest to hay fields to brushy cover.
  - Spring/Summer diet – Primarily herbaceous vegetation (clover, Rubus, 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 – Honeysuckle, hardwood buds, fallen leaves, hard mast and conifers, preferably white cedar.
  - Bedding cover – Varies from open hardwoods with laydowns to dense thickets of early succession shrublands or hard and softwood regeneration. [16]

- Wild turkey:
  - Strutting areas – Open fields with short vegetation and mature hardwoods.
  - Nesting cover – Blowdowns and the bases of trees and stumps in mature forest, and herbaceous and brushy cover greater than 10 inches in forest openings and field edges.

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[12] Golden-winged Warbler Working Group. 2013. Best Management Practices for Golden-winged Warbler Habitats in the Great Lakes Region. Available online at https://gwwa.org.
[13] 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.
[14] 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
[15] Jones, B. C. et al. Habitat Management for Pennsylvania Ruffed Grouse, Pennsylvania Game Commission. 10 pp.
[16] Mattfield, G. F. 1984. Northern Hardwood and Spruce/Fir Forests. Pages 305-330 in L. K. Halls, editor. White-tailed Deer: Ecology and Management. Stackpole Books, Mechanicsburg, USA.

- Brood rearing – Best brooding cover are fields with herbaceous vegetation from 12-18 inches preferred.
- Spring diet – Tubers and invertebrates.
- Summer diet – Poult diets consist primarily of invertebrates. Adult diets consist of invertebrates and tubers, switching to herbaceous vegetation and soft mast as available.
- Fall diet – Hard and soft mast, seeds, and invertebrates.
- Winter diet – Hard and soft mast, seeds (birch if available) and hardwood buds.
- Winter cover – Mature conifer stands.
- Roosting – Mature hardwoods and softwoods.[17]

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

MANAGEMENT HISTORY

Early on in the human settlement of the area, timber harvests were common in the Mongaup Valley area, as with most of New York State. Forests were being cleared to provide materials for shelter, fuel, and raw materials for industry. From the mid-nineteenth to early twentieth century, timber harvests continued in the area for the lumber and tanning industries. More recent timber harvests were conducted by O&R from the 1950s through the 1970s, on land holdings that are now part of the Mongaup Valley WMA. Initially, harvests targeted white pine and hemlock, though later harvests focused primarily on oak species. In the 1980s and 1990s, the Clove Development Corporation dedicated 3,000 acres to Section 480A of the Real Property Tax Law, which provides tax relief for property owners willing to conduct timber management on their properties. During that period, more than 1,000 acres of timber were harvested commercially, while also conducting non-commercial stand thinnings on approximately 500 acres (DEC internal document). Evidence of these past timber harvests at Mongaup Valley can be seen in the form of stumps and uneven-aged forest stands throughout the property.

Active forest management since State acquisition has been very limited at Mongaup Valley WMA. The most notable habitat work was a timber harvest (seed tree cut) that occurred from 2015-2016. This was a 40-acre seed tree cut near Wilson Road on the south side of the property (Figure 6a) that was intended to benefit all species that require or utilize young forest habitats. This cut was intended to be left to regenerate hardwood species such as chestnut, white and Northern red oak. Some smaller cuts (<1 acre) were also made to provide openings for rattlesnake basking sites.

[17] Porter, W. F. 1992. Habitat Requirements. Pages 202-213 in J. G. Dickson, editor. The Wild Turkey: Biology and Management. Stackpole Books, Mechanicsburg, USA.

IMPLEMENTATION PLAN AND ANTICIPATED SCHEDULE

Stands harvested for ruffed grouse and whip-poor-will management will involve both seed tree and shelterwood cuts to regenerate oaks, and white pine, and/or Eastern hemlock. Cuts will range from 15 to 56 acres in size, and the residual tree component may vary within treatments. Stands treated for golden-winged warbler will involve clearcuts with residual oaks, situated directly adjacent to powerline and/or pipeline ROWs. Residual trees may include snags for perches. The idea behind this is to provide the three habitat components that golden-winged warblers require: herbaceous openings provided by the ROW, shrub/young forest habitat provided by the cuts, and the mature forest surrounding the cuts, used by adult males with broods. Clearcuts for warblers were situated in areas with a lesser pine component as it has been suggested that golden wings will avoid mature conifer stands. Management for rattlesnakes will be limited to the creation of small patch-cuts (≤ 1 acre) distributed throughout the WMA.

The main objective of DEC's Young Forest Initiative is to convert 10% of the existing forested acreage of a WMA to young forest habitat every 10 years. This lends to a 100-year forest management rotation that promotes a variety of forest stand ages across the property and an overall diversity of that habitat type. However, at Mongaup Valley WMA there are a few considerations that make that 10% objective unachievable. First, forest management activities should be minimized within the overwintering bald eagle "important area" that totals approximately 2,300 acres of forested habitat surrounding the Mongaup River, Swinging Bridge Reservoir, and Rio Reservoir (Figure 2). However, this does not preclude those areas from management consideration. Areas that will be avoided include those areas described as deep-winter roosts on east and southeast facing slopes adjacent to waters, especially with large tracts of mature white pine. The steep slopes also create access issues making commercial logging operations in those areas less feasible. A commercial logging project that was completed on the WMA in 2016 contributes 40 acres toward the objective of creating approximately 600 acres of young forest habitat on the property. An additional 470 acres is being proposed in this 10-year plan to reach the total young forest acreage objective of 510 acres by 2032. The goal of 510 acres of young forest is just short of the 10% goal for the program. This is in light of the difficulty in accessing sufficient acreage to meet that goal due to steep slopes, lack of road access, and rattlesnake and bald eagle considerations.

The following management is proposed in order to reach the objective of acres of young hardwood and mixed forest types within ten years:

- **Management planned for 2022-2026** (Table 4, Figure 6a):
  - Stands 10-3, 10-5, 11-1, 11-2, 12-4, 12-5.
- **Management planned for 2027-2031** (Table 5, Figure 6):
  - Stands 1-3, 1-7, 1-10, 3-9, 4-11, 9-2.

Table 4. Forest management schedule for the first five-year period of this HMP (2022-2026).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
1-3	80	Saw timber	Oak	Young oak	Ruffed grouse and golden-winged warbler habitat	Clearcut
1-7	45	Pole timber	Northern hardwood-white pine	Young Northern hardwood-white pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
1-10	15	Pole timber	Oak-pine	Young oak pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
3-9	52	Pole timber	Northern hardwood	Young hardwood	Ruffed grouse and golden-winged warbler habitat	Clearcut
4-11	16	Saw timber	Northern hardwood	Young oak	Ruffed grouse	Seed tree cut
9-2	56	Pole timber	Oak-pine	Young oak pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut

Table 5. Forest management schedule for the second five-year period of this HMP (2027-2031).

Stand	Acres	Size Class	Forest Type		Management Direction	Treatment Type
			Current	Future		
10-3	28	Pole timber	Transition hardwood	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
10-5	47	Pole timber	Oak-pine	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
11-1	16	Pole timber	Oak-pine	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
11-2	12	Saw timber	Oak-pine	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
12-4	76	Pole timber	Oak-pine	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut
12-5	35	Pole timber	Oak-pine	Young Oak-pine	Ruffed grouse and whip-poor-will habitat	Seed tree cut

Stand locations are shown in Figures 6 and 6a. 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 1-3:** Access to this stand is provided by the utility right-of-way that extends through this portion of the WMA. The canopy in stand 1-3 is dominated by chestnut oak, red oak, and red maple. The sub-canopy is comprised of smaller diameter red maple. The understory is largely dominated by mountain laurel and huckleberry and there is very little seedling or advanced regeneration of desired tree species. Eighty acres of stand 1-3 will be clearcut in two separate cuts of 47 and 33 acres, individually, leaving small diameter residual trees primarily for golden-winged warblers. The cut will occur directly adjacent to the utility ROW. The proximity of the cut to mature hardwoods and an herbaceous opening provided by the ROW make it very attractive to golden-winged warblers, but will also provide hard mast, soft mast, and the dense cover desired by ruffed grouse.
- **Stand 1-7:** Two seed tree cuts of 25 and 20 acres will be created within stand 1-7 directly adjacent to the existing utility ROW that will provide access for management. The canopy of this stand is dominated by white pine, red maple, and white oak. Small clusters of Eastern Hemlock are also scattered throughout this 200-acre stand. Although it is categorized as an even-aged stand, the intermediate canopy is largely dominated by small-diameter white pine. The understory contains some advanced white pine regeneration. However, it also contains dense patches of mountain laurel and hay-scented fern that could interfere with tree regeneration. The two seed tree cuts in this stand will be primarily for the benefit of ruffed grouse and Eastern whip-poor-will. For ruffed grouse, regeneration of white pine, white oak, and red maple are all desirable as it will provide both food and dense cover from avian predators.
- **Stand 1-10:** This stand, as with the others in compartment 1, will be accessed by the utility ROW, which will again provide a necessary habitat component as well. The upper canopy of this oak-pine stand is comprised primarily of mature white pine and red oak. The white pines are generally the largest and tallest trees in the stand. Chestnut oak and black birch can also be found in a dominant canopy position but in lesser numbers. However, the most prominent tree species in this stand is the red maple that occupies the intermediate canopy position. In fact, red maple makes up about one half of the entire basal area of stand 1-10. This marks a potential shift in the composition of this stand without active management. White Pine can be also be found in significant numbers in the intermediate and suppressed positions of the canopy. There is minimal tree regeneration, though white pines and scattered oaks in the suppressed canopy position would respond well to increased light levels associated with a timber harvest. Regeneration is hindered by the presence of scattered patches of mountain laurel and hay-scented fern in the understory. A 15-acre seed tree cut will be used to regenerate white pine and oaks for ruffed grouse and Eastern whip-poor-will habitat. Ruffed grouse would likely benefit from black birch regeneration as well.
- **Stand 3-9:** Access to the stands in Compartment 3 is very good, especially the proposed harvest area that is directly adjacent to a maintained utility right-of-way and close to a Lebanon Road, a well-maintained gravel road suitable for heavy equipment. The stand is even-aged, with red maple as a significant component in the canopy, but the stand has scattered pockets of Northern red and white oak as well. Red maple as large as 6-12 inches (large pole to sawtimber) can be found. Tree regeneration is generally lacking in

this stand, however. Moist soils favor red maple and limit pine and oak regeneration, and the presence of mountain laurel and hay-scented fern in the understory further suppresses tree regeneration of any kind. A 52-acre clearcut will provide young forest/shrubland habitat to benefit golden-winged warblers. This cut is very close to a ROW, which can provide the necessary herbaceous opening that golden-winged warblers require.

- **Stand 4-11:** This stand is classified as a transition hardwood, with northern hardwood and oak components. Red Maple is largely dominant, accounting for over 70% of the basal area of the stand and is the dominant tree species at every diameter class up to 17 inches. Red Oak is the second most dominant species in this stand 4-11, especially in the 18-inch and over size-class. Because of this, it is the most prominent species in the dominant canopy position. The scarcity of Oak saplings in the understory indicates a likely transition to a forest dominated almost exclusively by Red Maple in the future. Advanced regeneration is notably absent in this stand as well. The entire 16 acres of this stand will be harvested using a seed tree technique in an effort to regenerate oak forest and halt the transition to a red maple forest stand.
- **Stand 9-2:** The basal area in this stand is primarily composed of red oak, red maple, and white pine. However, the dominant canopy position is mostly composed of red oak, chestnut oak, and white oak. Scattered large, veteran white pines can be found throughout the stand. The intermediate canopy contains large numbers of red oak and red maple, and lesser numbers of Eastern hemlock and black birch. The suppressed canopy position mostly consists of red maple and white pine. There is some regeneration white pine, red maple, and oak species in the stand. The understory contains a large amount of mountain laurel, particularly in areas with significant slope. Mountain laurel patches are scattered but dense. Hay-scented fern can also be found in this stand. Stands in the compartment are generally highly accessible as they are bordered by a utility ROW and County Highway 43. Access to stands in this compartment are generally limited by streams and steep slopes, but this stand is directly adjacent to the utility ROW. A 56-acre seed tree cut will be conducted to regenerate oaks and white pine to benefit ruffed grouse and Eastern whip-poor-will, utilizing the adjacent ROW to provide additional habitat diversity.
- **Stand 10-3:** This stand has potential access issues related to the topography in compartment 10 and a lack of adjacent or interior roads. This stand is very diverse in its composition. According to basal area, the most common species are black birch, white pine, and red oak. Several other hardwood species contribute to the overstory, including sugar maple and white ash. The intermediate canopy is equally diverse, with black birch, sugar maple, red oak, chestnut oak, and shagbark and pignut hickory. Regeneration could be hindered by competing vegetation, including hay-scented fern, Japanese stiltgrass, and Japanese barberry. This stand is slated for a 28-acre seed tree cut to regenerate oaks and white pine for ruffed grouse and Eastern whip-poor-will, but access may prove a significant hindrance to accomplishing this cut. Since this cut will not be adjacent to a utility ROW, 2 acres will be cleared and maintained as a permanent wildlife opening to further improve the habitat for whip-poor-will.
- **Stand 10-5:** The upper canopy of this oak-pine stand is dominated by chestnut oak, red oak, and white pine. These species also make up the majority of the intermediate canopy, along with some black birch and red maple. There is some red maple and oak species in a suppressed canopy position as well. This stand will be treated using a seed tree cut of

47 acres that will take advantage of some of the many large diameter oaks to provide the next generation of oaks after management. Ruffed grouse and Eastern whip-poor-will should benefit from management in this stand. However, since this cut will not be adjacent to a utility ROW, 2 acres will be cleared and maintained as a permanent wildlife opening to further improve the habitat for whip-poor-will. As with stand 10-3, there are potential access issues for this stand due to topography and a lack of roads which will need to be addressed in order to accomplish this cut.

- **Stands 11-1 and 11-2:** Access to the stands in this compartment is favorable as a road runs adjacent to several stands. Further, existing forest roads could be utilized to access interior portions of the stands. There is also a utility right-of-way that may provide further access within the compartment. Steep slopes restrict access to every stand in this compartment, but those slopes and inaccessible stands are not slated for harvest. Stand 1 is an even-aged stand with Eastern hemlock, white pine, and chestnut oak at the mid- to upper levels of the canopy. A Sparse component of hardwood species such as sugar maple and American basswood can also be found in small concentrations. There is a large amount of advanced Eastern Hemlock regeneration in a suppressed canopy position in stand 1. There are also several small patches of Japanese Barberry closer to the adjacent utility ROW. Stand 2 is an uneven-aged stand dominated by white pine, accounting for over a third of the basal area. Much of this basal area is represented by large diameter (>20") pines that can be found throughout the entire stand. Eastern Hemlock can also be found in significant numbers in all canopy positions, however there is little advanced regeneration in the stand. Red, white, and chestnut oak can also be found in the intermediate canopy position in stand 2. Portions of both stands will be part of a larger, 28-acre seed tree cut (16 acres in 11-1 and 12 acres in 11-2) to regenerate white pine and oak species for the benefit of Eastern whip-poor-will. The utility ROW adjacent to the cut, the regeneration cut itself, and the surrounding mature pine and mixed forests will provide whip-poor-will with the combination of habitats that they require.
- **Stands 12-4 and 12-5:** Compartment 12 is easily accessible via a utility right-of-way, and access to individual stands will be accomplished by utilizing various old logging roads. Both stands are oak-pine stands comprised of red oak, chestnut oak, and white pine in the upper canopy. Stand 4 also has some pockets of Eastern hemlock. Red oak is the most prominent tree species at all canopy positions in stand 4, but black birch can also be found in high numbers within the suppressed to intermediate canopy. Red maple can also be found scattered throughout the stand. In stand 5, however, red oak, chestnut oak, white oak, black birch, sugar maple and various other hardwood species can all be found in the intermediate canopy position, allowing for a great amount of potential for tree species diversity as this age class develops. The only significant regeneration in stand 4 is scattered patches of white pine, which are generally dense clusters of saplings. There are few to no factors expected to inhibit regeneration of other tree species. There is little to no regeneration in the understory of stand 5. Two seed tree cuts in stand 4 (38 acres each) and one in stand 5 (35 acres) will be used to regenerate both white pine and oak species for the benefit of ruffed grouse and Eastern whip-poor-will. While the cut in stand 5 will be adjacent to the utility ROW to provide an additional habitat component for Eastern whip-poor-will and golden-winged warbler, a 2-acre permanent wildlife opening will have to be created to provide greater habitat diversity for wildlife in stand 4.

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 [18]
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:

Aside from bald eagles, timber rattlesnakes are another known NY State threatened species that resides at the Mongaup Valley WMA and impacts on either species during logging operations is of great concern. To avoid impacts on timber rattlesnakes, no timber harvest activities will occur within 1.5 miles of a den site during the active period from April 1st to October 31st. Timber harvests activities may be conducted During the hibernation period from November 1st through March 31st timber harvest activities may occur within 1.5 miles of a known den site. However, even during this period, logging roads, skid trails and log landings may not be constructed within 330 feet of a basking or gestating area and heavy equipment may never be used within 660 feet of a den.

To avoid impacts on bald eagles, logging activities, including road and log landing construction will stay a minimum of 330 feet from any active eagle nests. Any logging activities within 660-330 feet of an active nest will occur outside of the active nesting period from January 1st through September 30th. Because of Mongaup Valley's importance for overwintering bald eagles, proposed logging operations were limited within the bald eagle important area. East and southeast facing slopes along the river and reservoirs were especially avoided, as well as any stands of predominantly mature white pine. Regardless of location, DEC staff will conduct winter surveys of all proposed timber harvest sites in order to ensure the avoidance of locations commonly used as winter roosts.

Stands that are expected to be cut during the nesting period for forest-nesting raptors will be surveyed from April through May immediately prior to any timber harvest activities. Tree cutting activities will be avoided within a minimum of 200 feet of any documented nests. Acoustic surveys conducted by DEC staff failed to detect both Indiana and Northern Long-eared bats at Mongaup Valley WMA. Further, there are no records of occurrence of either species in the Natural Heritage Database. Therefore, there is no time-of-year restriction required for timber harvest activities related to bats.

Forest Health Considerations:

There are no immediate concerns about competing vegetation at Mongaup Valley WMA that would hinder or prohibit tree regeneration or shrub establishment. Although bracken fern may

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

become established, past harvests indicate that it does not preclude the establishment of other native vegetation. Hay-scented fern could be a concern in certain locations. If we find that hay-scented fern is prohibiting the establishment of the desired species, it can be treated with herbicide post timber harvest. White-tailed deer herbivory is likely to be the greatest concern at Mongaup. However, deer densities are not particularly high on this property, and the acreage to be harvested will likely be enough that the current deer population will not have a large impact on regeneration. Deer populations and their impacts can be monitored using pellet surveys and browse impact survey techniques in the spring pre- and post-treatment.

Pre- and Post-treatment Considerations:

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

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 that will be established in a Young Forest Initiative Monitoring Plan (in prep). The Monitoring Plan will establish statewide standards for evaluating vegetation and target wildlife responses to forest management to determine if the outcome is as prescribed. Regeneration assessments will be conducted within one year of harvest completion, three, and five years after the harvest or until the forester determines adequate natural or artificial (i.e., planting) regeneration has been securely established. YFI wildlife target species selected for Mongaup Valley WMA, which may be assessed to determine response to management, include:

- Bald eagle
- Eastern whip-poor-will
- Ruffed grouse
- Golden-winged warbler
- Timber rattlesnake

Ruffed grouse populations are known to be low on the property with the first detection on a DEC survey occurring in the spring of 2018, which was a visual ID of one single grouse on the pipeline. Golden-winged warblers have yet to be detected on the property. Eastern whip-poor-will use of the property has been limited to a 40-acre seed tree cut that was completed in 2015. In order to contribute information to the Golden-winged Warbler Working Group in order to evaluate the progress in achieving their goal of increasing the number of breeding pairs by 50% by the year 2050.

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. Typically characterized by >50% cover of shrubs and <25% canopy cover of trees.

DESCRIPTION OF EXISTING SHRUBLAND HABITAT AND TARGET SPECIES

Currently, there is no shrubland habitat at Mongaup Valley WMA nor are there plans to create and maintain permanent shrublands.

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

- Four, 2-acre permanent wildlife openings (8 acres total) will be created in forest stands 10-3, 10-5, 12-4, and 2-2 within the larger regeneration cuts in those stands. Those openings will provide habitat diversity within those stands and an important habitat component for a variety of wildlife species.
- Make small (≤ 1 acre) patch-cuts (approximately 12 acres total) in undisclosed locations to create or improve basking habitat for timber rattlesnakes.

DESCRIPTION OF OPEN SPACE HABITATS AND TARGET SPECIES

Open field habitats at Mongaup Valley are exist in the form of both a power line and pipeline right-of-way (ROW) that run through the property from north to south (Figures 6 and 6a). They provide 104 acres of habitat diversity in the form of herbaceous openings in an otherwise homogenous landscape of intermediate to mature forest. These permanent openings are beneficial for a variety of bird and mammal species. The power line right-of-way is mowed less frequently than the pipeline and has some taller vegetation, including true ferns (primarily hay-scented and bracken), sweet fern, scattered low shrubs, and even occasional tree saplings. The pipeline ROW is mowed annually and is occupied primarily by low lying herbaceous vegetation included grasses and forbes.

Black bears, wild turkey, white-tailed deer, and even porcupines can often be seen in the ROWs at Mongaup Valley. Nutritious forbs, including clover and strawberry, grow in utility ROWs and provide a valuable forage base for deer and turkey. These openings are frequently used by turkeys as strutting areas and for poult rearing as well as insects like grasshoppers are abundant in the existing vegetation. Bats and forest nesting birds like the olive-sided flycatcher, Eastern wood pewee, and indigo bunting utilize forest openings, including utility ROWs, to feed on insects as well. The Eastern wood pewee, especially, is frequently heard along the ROWs at Mongaup Valley WMA throughout the nesting season. It is also likely that the ROWs at Mongaup Valley serve as nesting habitat for ground nesting birds. Song sparrows nest on the ground in thick grasses and other lush vegetation, and even hermit thrush often nest in fern thickets on forest edges. Timber rattlesnakes use small forest openings with a lot of exposed rock as basking areas. Basking areas can be small, one acre or less, and are typically within a mile of a hibernacula. These basking areas are important for snakes to maintain an appropriate body temperature for hunting and meal digestion.

When possible, forest management activities to create young forest habitat will be situated adjacent to the ROWs at Mongaup. This will provide a matrix of habitat types (mature forest, young forest, and permanent forest openings) that will benefit a greater number of species. This blueprint was designed specifically to benefit two of the young forest target wildlife species, the Eastern whip-poor-will and the golden-winged warbler. Whip-poor-will use fields and other open habitats, even sand and gravel pits for foraging. Night-time whip-poor-will surveys conducted by DEC staff at Mongaup Valley WMA have documented them singing in clearcuts adjacent to the ROWs. Golden-winged warblers also forage within herbaceous openings associated with both young and mature forest habitats in their nesting territories.

Millennium pipeline running through Mongaup Valley WMA, demonstrating the open field habiatat that ROWs like this one provide for wilidlife.

Photo: Nathan Ermer, DEC.

MANAGEMENT HISTORY

The open habitats as described above at Mongaup Valley WMA are and will continue to be maintained by the entities to which those utilities belong. The power line is maintained by Orange & Rockland Utilities and the pipeline by Millennium Pipeline. Both entities are issued Temporary Revocable Permits (TRPs) by DEC that allows them to do this work on the WMA. Millennium Pipeline mows their right-of-way annually in late summer, while O&R simply treats/removes any established woody vegetation either by cutting or herbicide application when necessary, typically every 3-5 years.

AGRICULTURAL LAND

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

DESCRIPTION OF EXISTING AGRICULTURAL LANDS AND TARGET SPECIES

Currently, there is no agricultural land at Mongaup Valley WMA nor are there plans to create 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.

MANAGEMENT OBJECTIVES

- Monitor all 9 acres of emergent marsh and shrub/scrub wetland for encroachment of non-native, invasive vegetation and employ appropriate removal techniques, including mechanical or application of approved herbicides when if and when deemed necessary through the duration of this plan.

DESCRIPTION OF WETLAND HABITATS AND TARGET SPECIES

There is approximately 94 total acres of wetland at Mongaup Valley. Of those 94 acres, 58 acres are State Regulated as part of wetlands HL-30, HL-41, HL-43, and HL-46. The remaining 36 acres are Federally protected by the Army Corps of Engineers. The majority of the wetland acreage at Mongaup Valley is forested and categorized as the hemlock-hardwood swamp wetland community. There are only approximately 4 acres in the emergent marsh wetland and 5 acres of shrub/scrub wetland communities. Most of these wetlands lie within the northwestern finger of the property to the south and west of Lebanon Lake where the soils are deeper and more poorly drained.

Although emergent marsh comprises only a very small part of the total acreage at Mongaup Valley, they play an important role for some species. Golden-winged warblers, a priority species for management at Mongaup Valley are often associated with these small wetlands, especially when the patches are contained within a forested setting. These small wetlands provide forest openings with herbaceous vegetation that allow golden-winged warblers and other songbirds to forage on insects and nest in the small amount of shrubby vegetation often found on their perimeters. Other songbirds that may use these areas include common yellowthroats, Acadian flycatchers and even hermit thrushes may nest and forage on the woodland edges of these openings. Wood ducks are sometimes found in small wetlands within a forested setting, especially when there is a stream corridor with some open water. Probably the biggest benefit these small wetlands provide, and often overlooked, is as habitat for reptile and amphibian species including garter snakes, wood frogs, and spring peepers, as well as dragon and damsel flies, adding diversity to an otherwise homogenous appearing forested landscape.

The goal for the 4 acres of emergent marsh and 5 acres of shrub/scrub wetland at Mongaup Valley is protection and maintenance in their natural state. The wetland will be monitored to address encroachment of any non-native, invasive wetland vegetation. If it is decided that invasive removal is necessary, appropriate all measures including mechanical removal and herbicide application will be considered. Protection of water quality in these wetlands, especially during timber harvest operations, will be addressed using Best Management Practices

for logging, including the designation of "Special Management Zones" as discussed in the "Ecological Resources" section of this plan.

Open Water (Waterbodies and Watercourses)

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

Management Objectives

- There is no management planned for the open water habitat at Mongaup Valley WMA.

Description of Existing Open Water Habitat and Target Species

Open water habitats associated with Mongaup Valley WMA include Lebanon Lake (293 acres), Cliff Lake (162 acres), Swinging Bridge Reservoir (886 acres), Mongaup Falls Reservoir (130 acres), Rio Reservoir (435 acres), Hull Pond (49 acres), and approximately 14 miles of the Mongaup River. Despite the proximity of these waterbodies to Mongaup Valley WMA, none of them are part of the WMA except for a 5-mile stretch of the Mongaup River between Rio Reservoir and the confluence with the Delaware River.

View of Mongaup Falls Reservoir from inside the bald eagle viewing blind.

Photo: Nathan Ermer, DEC.

The most significant contribution to wildlife of the open water at the WMA is as bald eagle habitat. In fact, both Lebanon Lake and Cliff Lake are within a conservation easement established by DEC for the protection of bald eagle habitat. The reservoirs associated with Mongaup Valley WMA provide bald eagles with year-round feeding opportunities for alewives. The damming of the Mongaup River to create the reservoirs provided ideal, deep water conditions for alewives, likely once stocked and now permanent residents of the waters. Water discharge from the hydroelectric plants on the reservoirs releases entrained alewives into the open water in the river downstream of the dams and the eagles take full advantage of this resource. In fact, without the abundance of entrained alewives from the reservoirs, eagles would not likely exist in the numbers that they do in the area. The combination of open water, alewives, and undisturbed white pine forest in the Mongaup River valley provides such ideal conditions for eagles at the WMA that they can be found nesting, feeding, roosting and overwintering on the property. There are currently two eagle viewing blinds for the public to enjoy eagle watching on the WMA. One eagle viewing site is located on

County Route 43 at the north end of Mongaup Falls Reservoir. The second eagle viewing blind is located on Plank Road at the north end of Rio Reservoir.

MANAGEMENT HISTORY

Construction of the reservoirs in the Mongaup Valley area began with Mongaup Falls Reservoir in 1922 and was completed by 1923. Construction of the Rio Reservoir began in 1926, for which approximately 1,000 acres of forest were cleared. Swinging Bridge Reservoir construction began in 1927, shortly after the completion of the Rio Reservoir and was completed by 1929. The reservoirs were owned and operated by Orange and Rockland Utilities until 1999, at which time Southern Company purchased the power-generation portions. The hydroelectric projects are currently under the ownership of Eagle Creek Renewable Energy. As mentioned previously, these open water habitats play an extremely important role in the history and current populations of bald eagles in the Mongaup Valley area and on the WMA itself.

The creation of the reservoirs along the Mongaup River had at one time drastically altered the hydrology of the river. Dam construction and water drawing to generate power had reduced the water flow to the point of dewatering certain stretches. Water flow rates on the river were re-established over time with the implementation of minimum flow release rates, mandated by the Federal Energy Regulatory Commission (FERC). These minimum flow release rates were necessary to ensure the protection of the river's valued aquatic resources.

HABITAT MANAGEMENT SUMMARY

In summary, Table 7 lists the habitat management actions planned for Mongaup Valley 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 Mongaup Valley WMA, 2022-2031. (Also see Figures 3 and 6.)

Habitat	Management Action	Acres	Timeframe
Forest	Seed tree cut stands 10-3, 10-5, 11-1, 11-2, 12-4, 12-5 to regenerate hardwood-pine/oak-pine	214	2022-2026
	Clearcut with residuals in stand 1-3 and 4-11 to regenerate oak forest.	96	2027-2031
	Clearcut with residuals in stand 3-9 to regenerate Northern hardwood forest.	52	2027-2031
	Seed tree cut stands 1-7, 1-10, 9-2 to regenerate hardwood-pine/oak-pine forest.	116	2027-2031
Grassland/permanent wildlife openings	Create 2-acre, permanent wildlife openings within the regeneration cuts in stands 2-2, 3-9, 4-11, 10-3, 10-5, and 12-4.	12	2022-2026
	Create additional small forest openings (<1 acre) in undisclosed locations for rattlesnake basking	12	2022-2031
Wetlands	Monitor routinely for invasive vegetation and control when necessary.	9	2022-2031

III. FIGURES

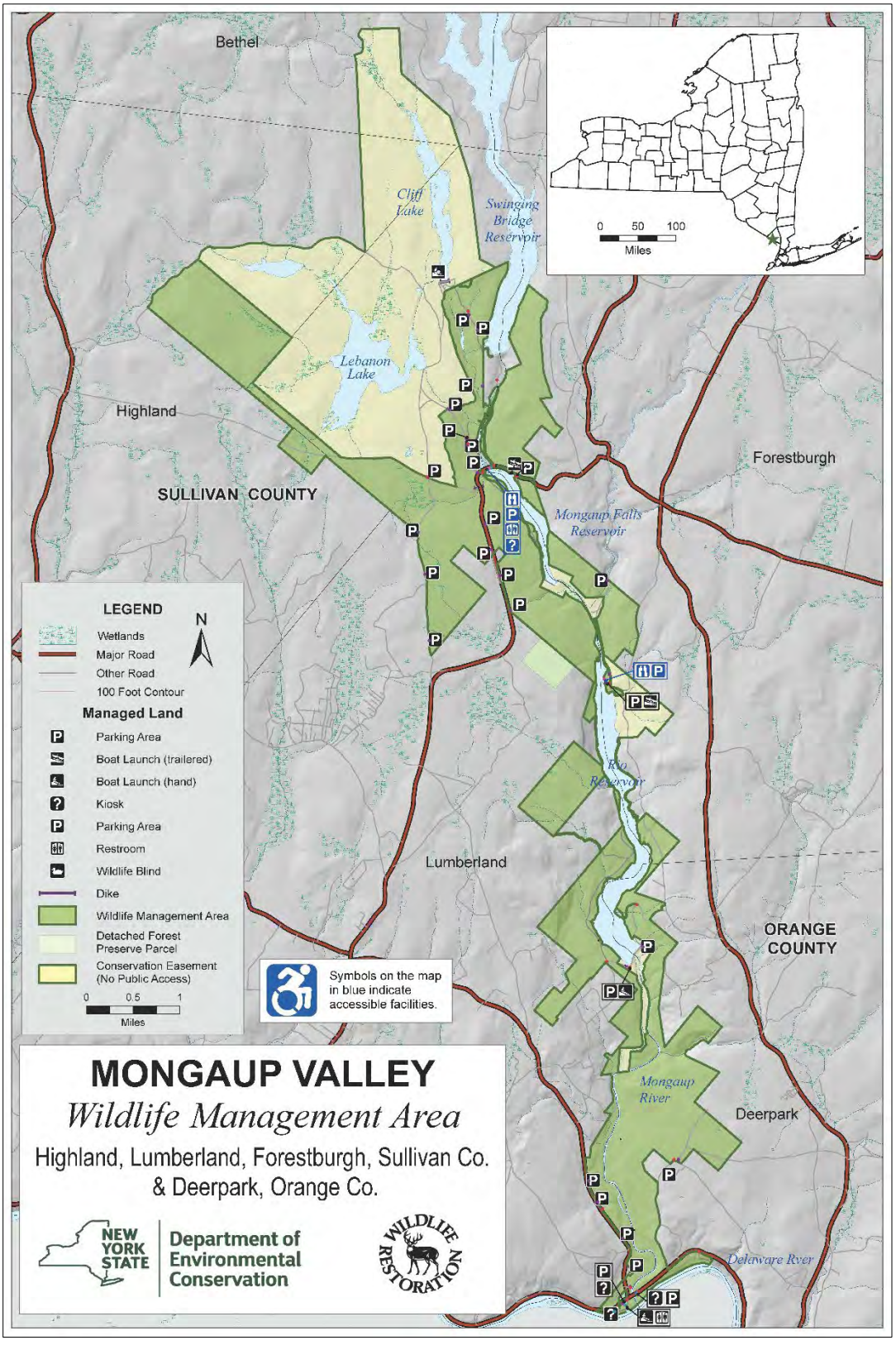

FIGURE 1. Location and access features at Mongaup Valley WMA.

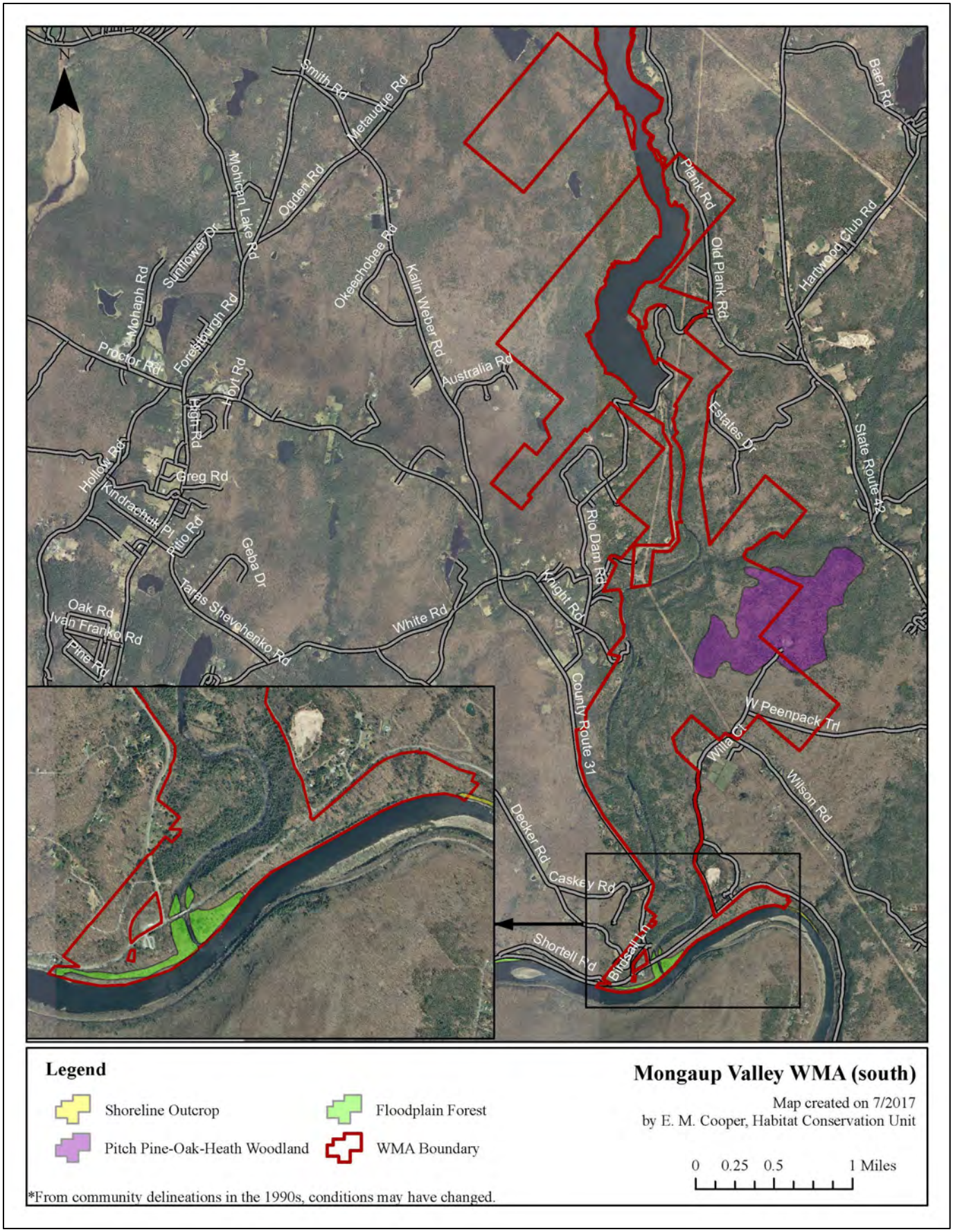

FIGURE 2. Significant ecological communities on Mongaup Valley WMA. Data from the NY Natural Heritage Program.

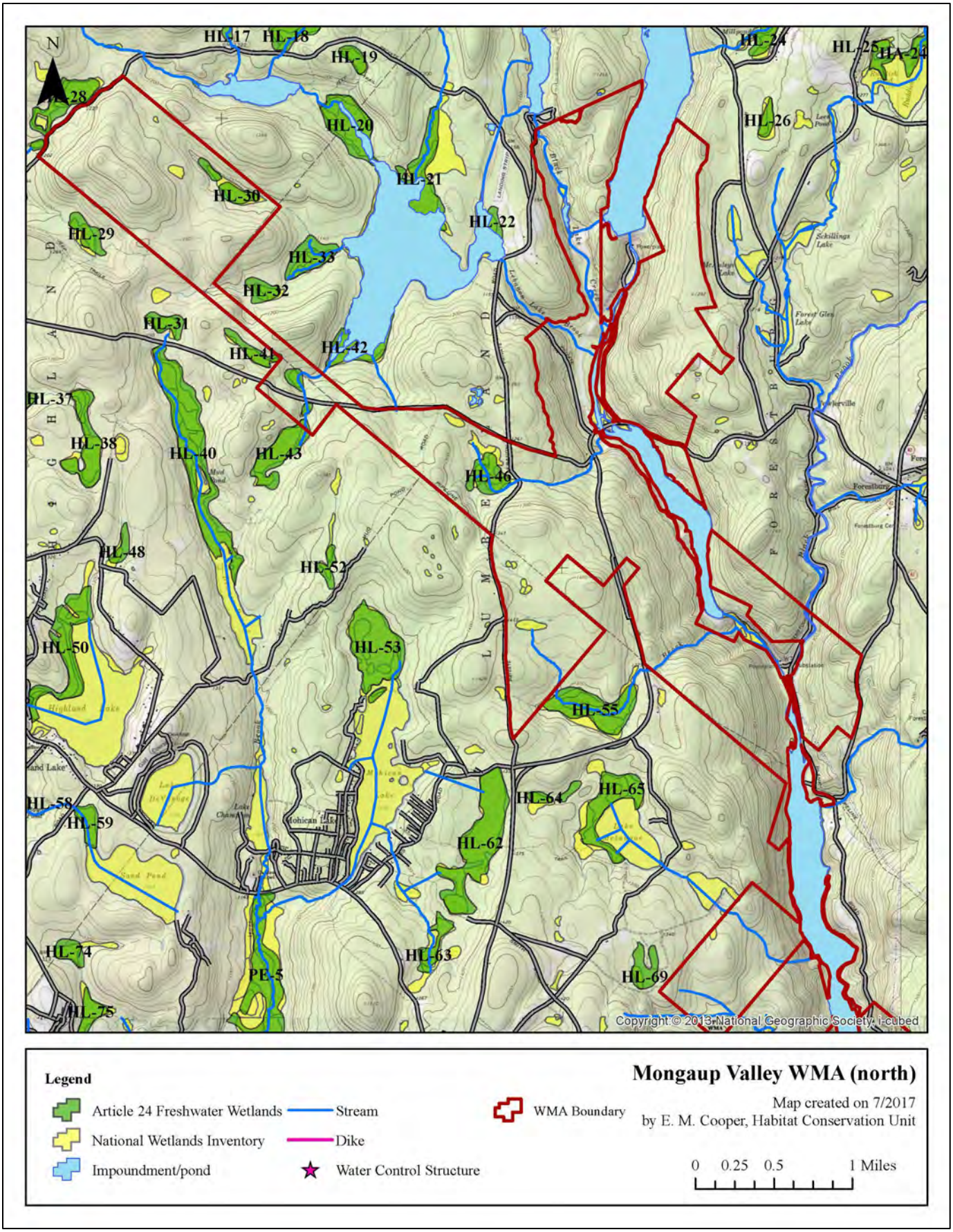

FIGURE 3. Wetlands, open water, and streams of Mongaup Valley WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

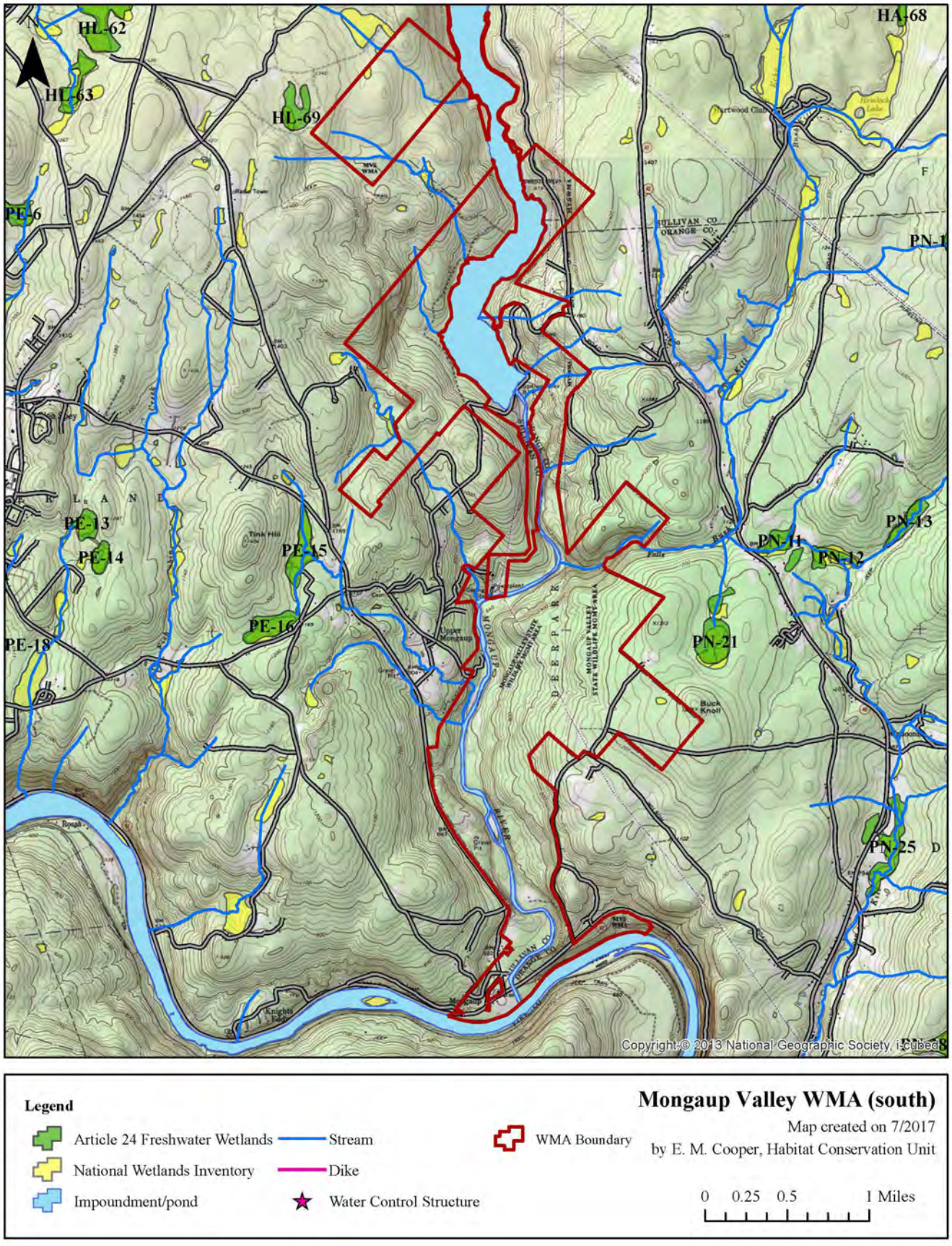

FIGURE 3A. Wetlands, open water, and streams of Mongaup Valley WMA. Note: Wetland boundaries are not exact and may not be used for regulatory purposes without a current delineation.

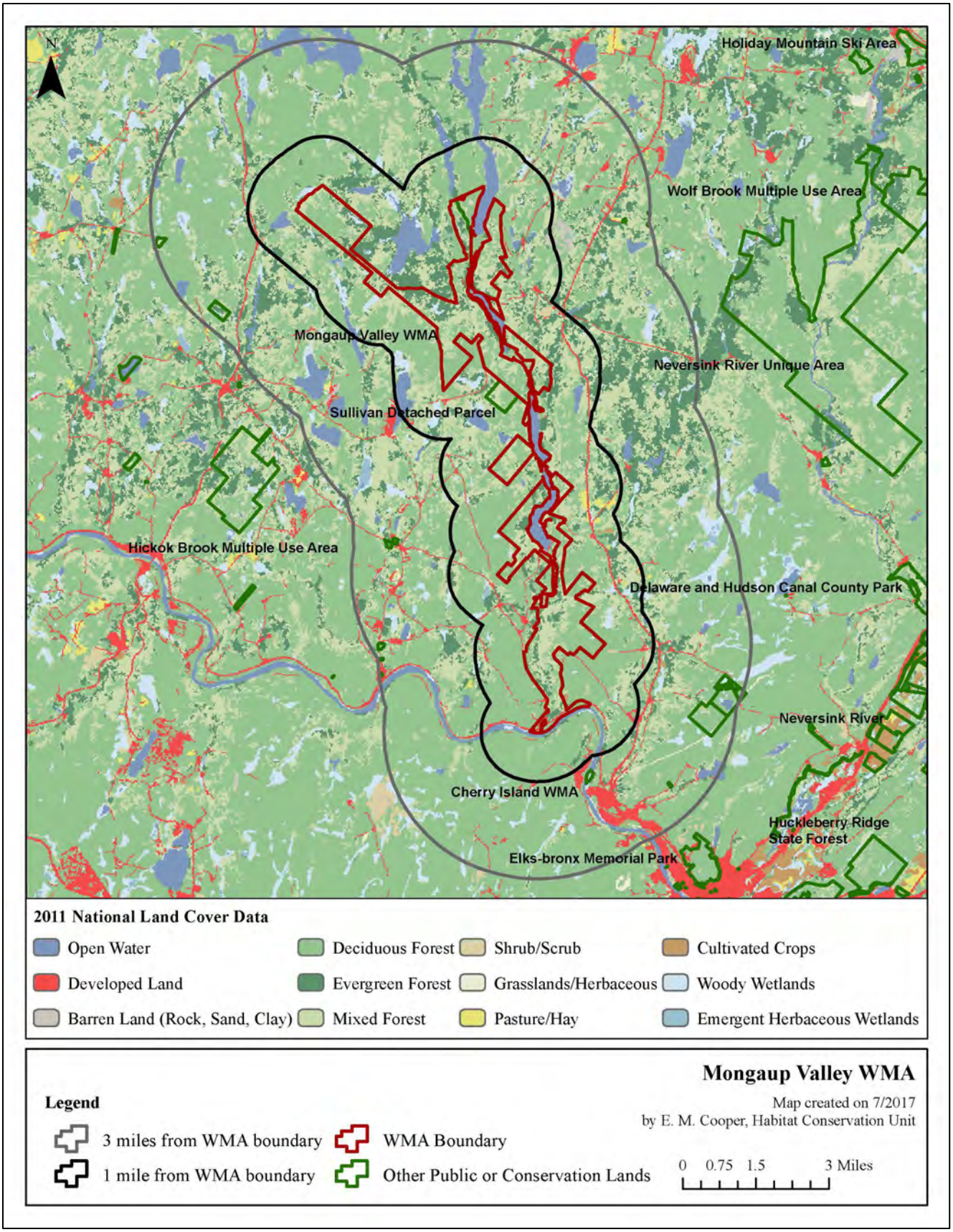

FIGURE 4. Land cover types and conservation lands in the landscape surrounding Mongaup Valley WMA. Conservation lands are from the NY Protected Areas Database available online at https://www.nypad.org/. Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types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

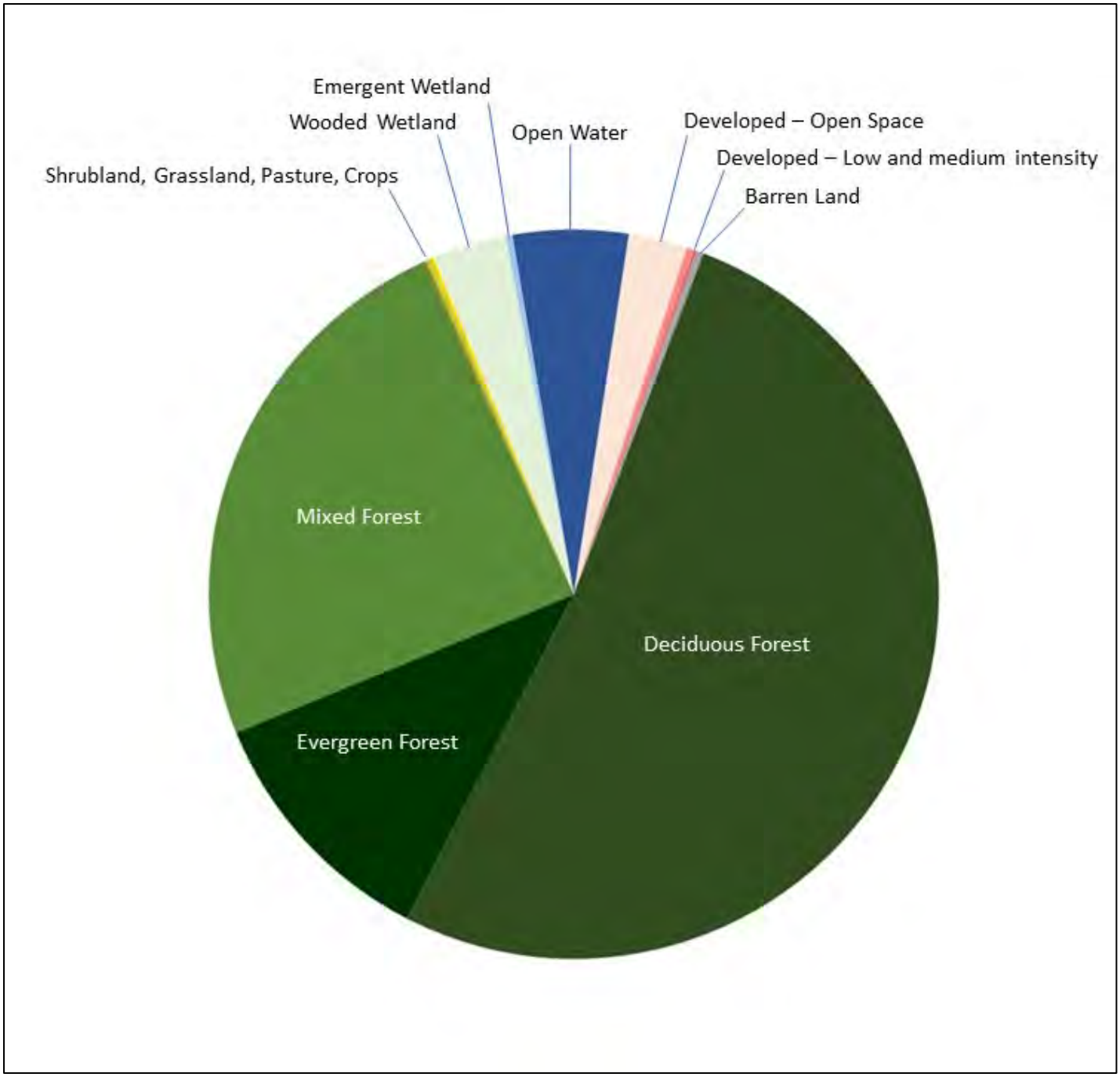

FIGURE 5. Percent cover of land cover types within three miles of Mongaup Valley WMA.

Land cover types are from the 2011 National Land Cover Data (NLCD) and differ from the habitat types used in the WMA habitat inventory. NLCD definitions are available online at https://www.mrlc.gov/data/legends/national-land-cover-database-2011-nlcd2011-legend.

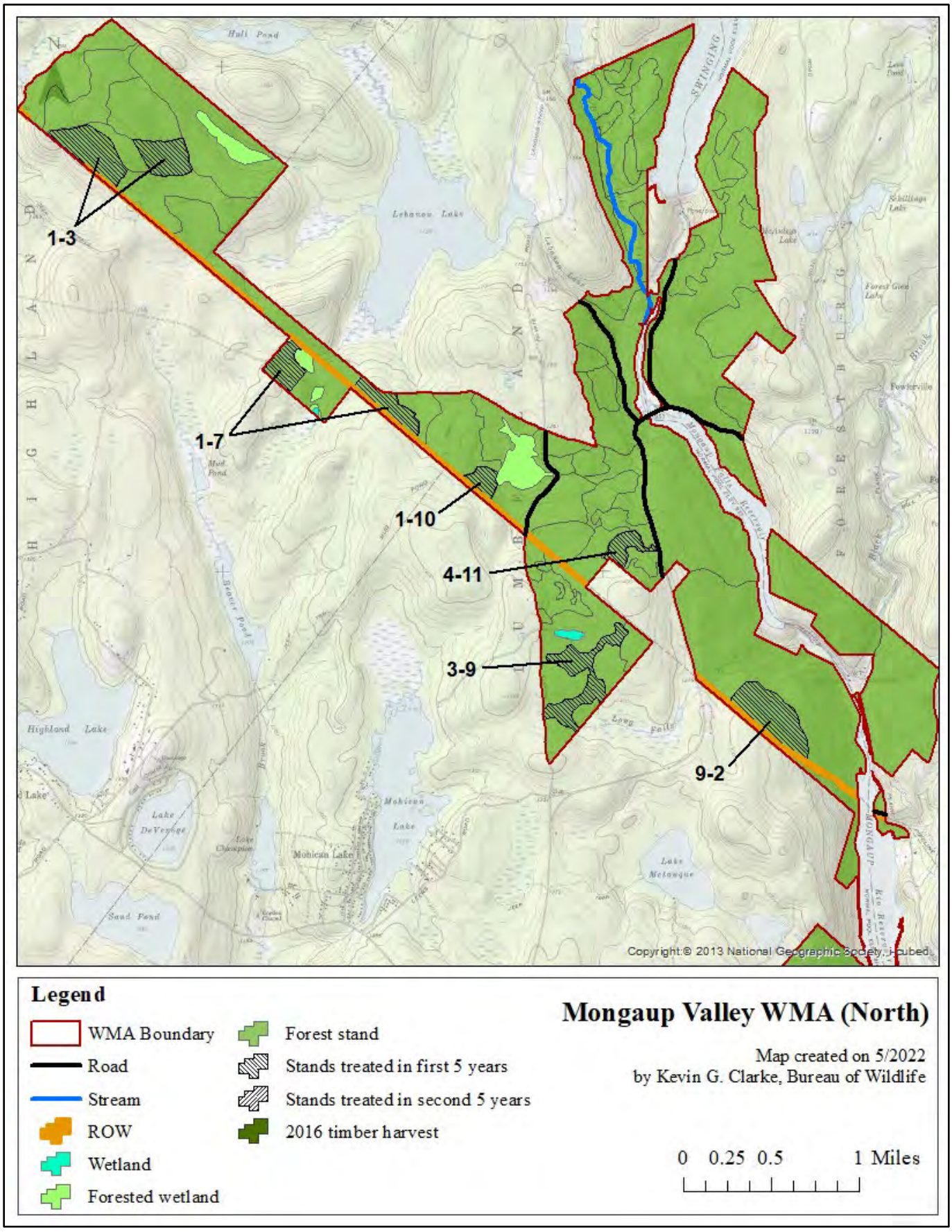

FIGURE 6. Habitat types and location(s) of proposed management on Mongaup Valley WMA. Numbers indicate the stand number from habitat inventory.

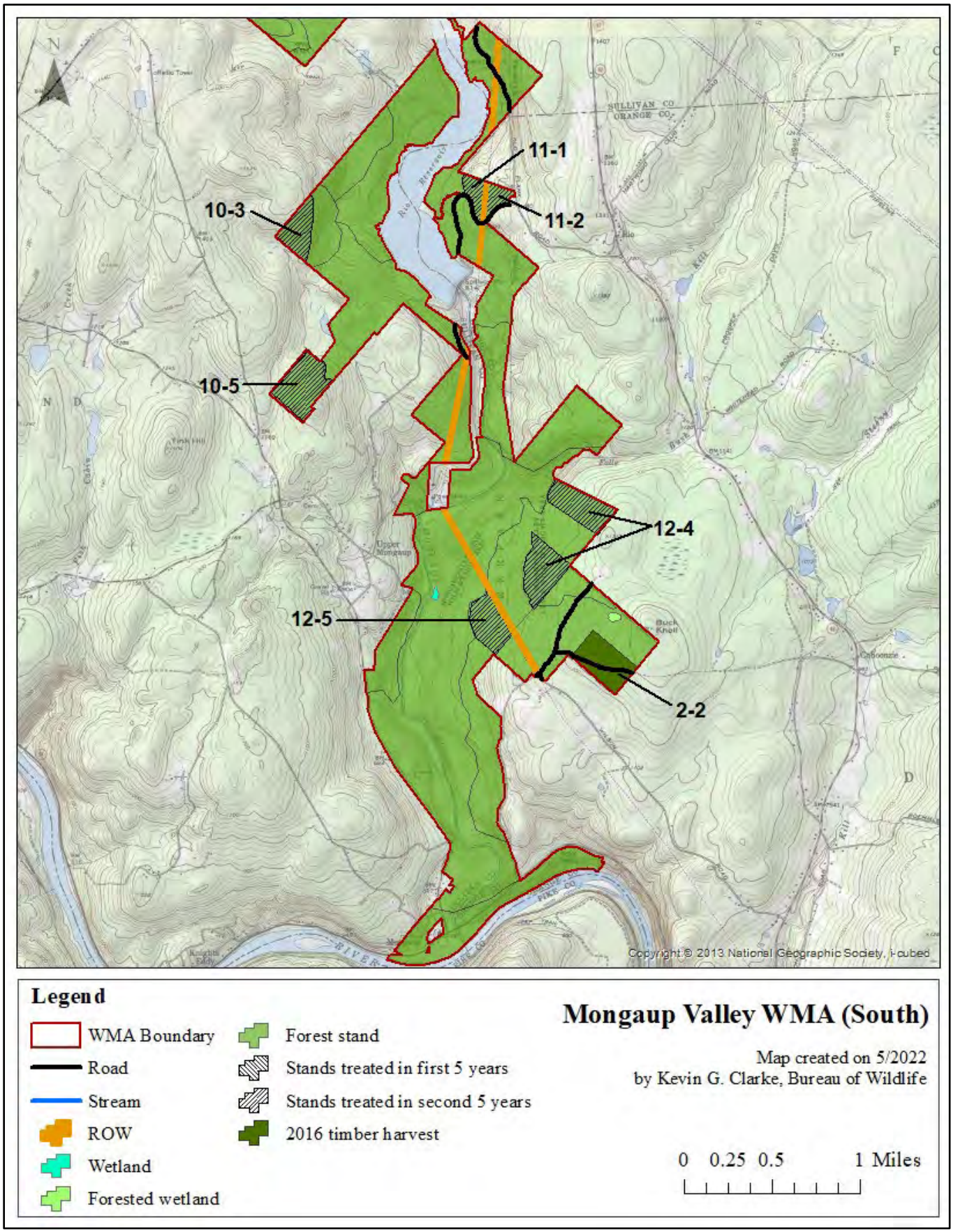

FIGURE 6A. Habitat types and location(s) of proposed management on Mongaup Valley WMA. Numbers indicate the stand number from habitat inventory.

IV. APPENDICES

APPENDIX A: DEFINITIONS

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

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

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

Clearcut: A forest regeneration or harvest method that entails the cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration.

Community: An assemblage of plants and animals interacting with one another, occupying a habitat, and often modifying the habitat; a variable assemblage of plant and animal populations sharing a common environment and occurring repeatedly in the landscape. (NY Natural Heritage Program)

Endangered Species: Any species listed on the current state or federal endangered species list as being in danger of extinction throughout all or a significant portion of its range.

Forb: Any broad-leafed, herbaceous plant other than those in the Poaceae (Gramineae), Cyperaceae, and Juncaceae families (i.e., not grass-like).

Forest: An ecosystem characterized by a dense and extensive tree cover, often consisting of stands varying in characteristics such as species composition, structure, age class, and associated processes, and commonly including meadows, streams, fish, and wildlife.

Forest Health: The condition of a forest derived from concerns about such factors as its age, structure, composition, function, vigor, presence of unusual levels of insects or disease, and resilience to disturbance.

Grassland Focus Area: Regions of NY that support key, residual populations of grassland birds. There are currently eight focus areas, within which there is a concentrated conservation effort for these species. (A Plan for Conserving Grassland Birds in New York, Audubon NY.)

Habitat: A place that provides seasonal or year round food, water, shelter, or other environmental conditions for an organism, community, or population of plants or animals.

Hardwood: A broad leaved, flowering tree belonging to the botanical group Angiospermae, such as red maple, yellow birch, American beech, black cherry, etc.

Impoundment: A pond caused by a dam across a stream and used for purposes such as water supply, water power, or wildlife habitat. (Edinger et al. 2002. Ecological Communities of New York State, Appendix B)

Landscape: A spatial mosaic of several ecosystems, landforms, and plant communities across a defined area irrespective of ownership or other artificial boundaries and repeated in similar form throughout.

Mast: The fruit of trees considered as food for wildlife. Hard mast is the fruits or nuts of trees such as oak, beech, walnut, and hickories. Soft mast is the fruits and berries from plants such as dogwood, viburnum, elderberry, huckleberry, hawthorn, grape, raspberry, and blackberry.

Multiple Use Area: Lands that were acquired by DEC to provide outdoor recreation and wherever possible the conservation and development of natural resources. As their name suggests, they are to be managed for a broader range of public use. (Public Use of Lands Managed by the Bureau of Wildlife)

Native: A plant or animal indigenous to a particular locality.

Old Growth Forest: Forest with an abundance of late successional tree species, at least 180 - 200 years of age in a contiguous forested landscape that has evolved and reproduced itself naturally, with the capacity for self-perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy, and a conspicuous absence of multiple stemmed trees. (Adapted from the NYS Strategic Plan for State Forest Management)

Pole: A tree of a size between a sapling (1" to 5" diameter at breast height) and a mature tree.

Regeneration Cut: A cutting procedure by which a new forest age class is created; the major methods are clearcutting, seed tree, shelterwood, selection, and coppice. The Young Forest Initiative includes these silvicultural treatments: clearcuts, seed tree cuts, and shelterwood cuts. Salvage (following a natural disturbance) will be considered based on the size and scope of the disturbance.

Seed Tree Method: A forest regeneration or harvest method that entails cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment.

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

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

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

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

State Rank of Significant Ecological Communities:

S1 = Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology making it especially vulnerable in New York State.
S2 = Typically 6 to 20 occurrences, few remaining individuals, acres, or miles of stream, or factors demonstrably making it very vulnerable in New York State.
S3 = Typically 21 to 100 occurrences, limited acreage, or miles of stream in New York State.
S4 = Apparently secure in New York State.
S5 = Demonstrably secure in New York State.
SH = Historically known from New York State, but not seen in the past 15 years.
SX = Apparently extirpated from New York State.
SE = Exotic, not native to New York State.
SR = State report only, no verified specimens known from New York State.
SU = Status unknown.

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

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

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

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

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

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

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

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

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

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

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

APPENDIX B. STATEMENT OF CONFORMITY WITH SEQRA

This plan identifies habitat management activities to be conducted on the Wildlife Management Area. These activities were analyzed in the 1979 *Programmatic Environmental Impact Statement on Habitat Management Activities of the Department of Environmental Conservation; Division of Fish and Wildlife* (PEIS), as updated and amended in 2017 by the *Supplemental Final Environmental Impact Statement* (SFEIS).[19] Any activity that exceeds the thresholds of, or was not analyzed in the 1979 PEIS as amended in 2017, will require individual, site-specific environmental review. Environmental assessment forms prepared as a result of this review will be posted on the Environmental Notice Bulletin (ENB).[20]

The activities recommended in this plan:

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

[19] Available online at https://www.dec.ny.gov/regulations/28693.html.
[20] Available online at https://www.dec.ny.gov/enb/enb.html.

APPENDIX C: FOREST MANAGEMENT PRESCRIPTIONS

PRESCRIPTION FOR WILDLIFE MANAGEMENT AREA TIMBER HARVEST

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

Species composition:

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

Stand inventory or analysis date:

Regeneration data:

Natural Heritage Element Occurrence layer review:

SMZ layer review:

Retention data:

Soil types and drainage:

Interfering vegetation:

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

Technical guidance/stocking guide:

Treatment purpose:

Management Objective: Even aged or Uneven Aged

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

Clearcut acreage and configuration: (if applicable)

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

Retention considerations and adjustments:

Treatment descriptions:

Name and Title of Preparer:

Central Office Lands and Forests Staff **Date**

Regional Wildlife Manager **Date**

PRESCRIPTION NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

APPENDIX D: AMENDMENTS

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