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FOREST STEWARDSHIP PLAN

Property Owner:	**TEN ALP PARK, LLC**
Mailing Address:	4 Park Place, Newton, NJ 07860
Telephone:	(973) 214-3626
Location of Property:	466 Sparta Avenue, Sparta, NJ 07871
Total Area:	108.120 +/- acres Woodland +/- 101.320 acres
Tax Information:	Andover Township, Sussex County, New Jersey Block: 103 Lots: 2 & 3.02 Sparta Township, Sussex County, New Jersey Block: 7001 Lot: 1
Plan Prepared By:	Andrew Bennett – SAF, NJ Approved Forester Dylon L. Borger – SAF, NJ Approved Forester

Landowner Statement:

I certify that I am the owner of the property or am authorized by the owner to make this certification. I have read the within Forest Stewardship Plan and the information contained in the plan is true. To the best of my knowledge, the plan meets the requirements of the Forest Stewardship Program rules at N.J.A.C. 7:3-5 and applicable Federal and State law. The owner agrees to implement the plan, as approved or subsequently amended.

10/07/2024

Landowner Signature Date

Forester's Statement:

We prepared the attached Forest Stewardship Plan in consultation with the owner of the property. We certify that, to the best of our knowledge, the plan meets the requirements of the Forest Stewardship Program rules at N.J.A.C. 7:3-5 and applicable Federal and State law.

Andrew Bennett Dylon L. Borger 10/7/2024

Forester Signatures Date

Plan preparation date: September 30, 2024

******This plan will be submitted as part of an application for Farmland Assessment******

Do not write below this line (for NJFS only)

Date Received:	10/10/24	Date of Approval:	10/15/24
Plan Start Date:	10/15/24	Plan End Date:	10/15/2031
NJFS ID#:	A-1394	Owner requested start date:	09/30/2024

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Farmland Assessment Filing Explanation

There is a direct relationship between this plan and the annual Farmland Assessment Application that is filed with both the local Tax Assessor and the NJ Forest Service. The acreage breakdown that is provided within this plan should match the acreage numbers being used on the Farmland Assessment Application (Form FA-1). The NJ Forest Service does not monitor the use of any acreage outside of woodland acres (*referred to as Non-Appurtenant Woodland on the FA-1*). **Therefore, the NJ Forest Service has neither reviewed nor approved anything in the table found below except the woodland acres, which match the woodland acres on the cover page of this plan.**

These numbers are not based on an actual land survey. Ridge & Valley Forest Management uses digital tax maps, aerial photos, GPS coordinates with mapping, and field observations in an attempt to ensure the numbers listed below accurately represent what exists on the ground at the property. This effort is made by Ridge & Valley Forest Management so that there is some consistency between the various forms used as part of the Farmland Assessment Filing. If a landowner changes the use of a portion of their property after this plan is complete, these numbers will no longer be accurate. However, this table should form a good baseline and reference point for the landowner, tax assessor, and consulting forester.

Breakdown of Property by Land Use Class (same as FA-1)

Township	Block	Lot	Acres Per Lot	Woodland *(Non-Appurtenant)*	Open Water (*Appurtenant)*
Andover Twp.	103	2	64.12	62.87	1.25
	103	3.02	11.45	11.45	---
Sparta	7001	1	32.55	27.00	5.55
		Total	***108.12***	***101.32***	***6.80***

NOTES:

- the acres represented by wetland (*if applicable*) will be classified as "Appurtenant Woodland or Wetland" when entered on the FA-1
- if property includes more than one lot, see parcel map in Appendix B for further information on acreage breakdown

Terminology

AGS - acceptable growing stock; trees that are of good form and quality, and those that would be satisfactory as 'crop trees' in a final forest stand on the site.

Aspect – the compass direction in which a slope faces.

Basal area - the cross-sectional area of a tree trunk at breast height (DBH); the total basal area per acre is the total amount of ground surface area which would be occupied by trees if every tree on that acre would be severed at DBH; average total basal area per acre is used by foresters to assess and regulate stand density in order to make timber harvesting and forest stand improvement recommendations.

Biodiversity - the variability among living organisms from all sources, including terrestrial and aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems.

Board foot – the basic unit of measurement for estimating volume in trees with diameters at breast height of greater than twelve inches; its dimensions are 12" x 12" x 1".

Crop tree - any tree forming, or selected to form, a component in the final crop in a forest stand; generally this is a tree selected in a young stand to carry through to maturity; these trees are selected largely for their genetic vigor and consequential potential to develop into a high value forest product.

DBH - diameter at breast height; the diameter of a tree 4 ½ feet above ground level.

Even-aged stand - a forest stand in which all the trees are the same age, or at least of the same age class (within 20 years of one another in mature or nearly mature stands); these types of stands develop following drastic environmental changes such as fire, clearcutting, massive insect or disease outbreak, or historical abandonment from non-forest land use (i.e. abandoned pasture)

Forest Stand - a community of trees which possesses sufficient uniformity with regard to species composition and tree age, condition, and arrangement, to be distinguishable from adjacent tree communities; the stand is the basic forest management entity.

Forest Stand Improvement (FSI) - a term comprising all intermediate cuttings made to improve the composition, constitution, condition, resiliency, and/or growth of a forest stand.

Herbaceous – pertaining to or characteristic of an herb; a plant that does not have persistent woody growth.

Invasive plant - is a species that is not native to a specific location (an introduced species), and that has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health.

Midstory - that portion of the trees, in a forest of more than one story, forming the middle stratum between the overstory and understory; typically these are trees in the intermediate crown class.

Non-Native plant – (aka - introduced species, alien species, exotic species, or non-indigenous species) is a species living outside its native distributional range, but which has arrived there by human activity, either deliberate or accidental.

Overstory - the portion of the trees, in a forest of more than one story, that form the uppermost canopy level.

Percent Stocking - in a forest, a more or less subjective indication of the number of trees as compared to the desirable number for optimal results; more precisely, it is a measure of the proportion of the available growing area actually occupied by trees.

Poletimber - trees which are not large enough to be sawn into lumber, but are well-suited as fenceposts or firewood; these trees are normally in the 6"-10" diameter class.

Sawtimber - trees which are large enough to be sawn into lumber; these trees are normally in the 12"+ diameter class.

Silvicultural - the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis.

Site index - a term used to describe the productivity of a site; it is based on the height of the dominant overstory trees in the stand at a certain base age (usually 50 years); a high site index indicates a productive site; the site index for hardwoods in the Northeast United States generally ranges from 45 to 95.

Succession - the process whereby one natural plant community replaces another; in forest succession, trees which can thrive in full shade succeed trees which can thrive only in full or partial sunlight; over time, shade-intolerant species such as aspen and paper birch are replaced by shade-intermediate species such as oaks, which in turn, are replaced by shade-tolerant species such as hemlock, beech, and sugar maple.

UGS - Unacceptable Growing Stock. Trees which are not desired in the stand because of defect or poor form; these trees are typically only harvested for firewood or are left for wildlife habitat.

Understory - generally, trees or other woody species which are growing in the lowest stratum of a forest stand.

Uneven-aged stand - a forest stand comprised of trees that differ markedly in age.

Vigor - the capacity of an organism to resist strain or stress (any adverse conditions).

Vernal pool - a small depression in the landscape which seasonally holds water only during very wet periods, normally in the spring; they are most often, but not always, associated with forests.

Wetlands - areas where water covers the soil or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. (NOTE: the NJDEP labels most wetlands on their hydrology maps, and therefore these areas are considered classified wetlands).

Property Background and Goals

A) Location

The Ten Alp Park, LLC property lies within Sparta and Andover Townships, Sussex County, NJ. The physical address of the property is 466 Sparta Avenue, Sparta, NJ 07871. The property lies on the south side of Newton Sparta Road (CR 616). The property entrance is approximately 0.2 +/- driving miles to the west of the intersection of Newton Sparta Road and Pinkneyville Road. The property is located approximately 3.2 +/- driving miles to the west of the intersection of Sparta Avenue and NJ Route 15 (*see Appendix B for Property Location Map).*

It is situated within the Highlands physiographic region of New Jersey. Characteristics of this region are discontinuous rounded ridges separated by deep narrow valleys. For planning purposes, it is helpful to note that the property is located within the Highlands Planning Area.

B) History

The property has been owned by the current landowner since 2023. The previous 10-year Woodland Management Plan (WMP) was developed by Ridge & Valley Forest Management for the previous landowner (BFD Associates) in 2014. The plan expires in September of 2024; this plan was created to continue the forest management that has been in place on the property for more than 30 years.

Sussex County has a long history of settlement and small family farms. Many of the valley soils within the county are conducive to row cropping, as well as hay and pasture for dairy herds. Soils that are wetter in nature or contain a significant amount of rock outcropping were generally restricted to pasture and woodland. This property was used for several agricultural purposes throughout its history. When its predominant use was as part of a farm, certain areas were used as open pasture while other areas were used as wooded pasture and as a farm woodlot. Portions of the property were also utilized as a Girl Scout camp into the 1970s. All these observations are further supported by the 1930 aerial map accompanying this plan. Additionally, the presence of stonewalls indicates that the property was used for agriculture. Through the past century, the land has been abandoned from farming. This has allowed for the establishment of different age classes of trees in different portions of the property.

The property is made up of two lots in Andover Township and one lot in Sparta Township. There are no maintained structures on the property, though there are several abandoned buildings from the Girl Scout camp that are in various states of decay.

Previous formal forest management has been active on portions of the property since 1994 when the first known WMP for the property was created by Appalachian Woodlands Consulting. In the past decade, firewood and timber have been removed from several locations around the property. Some of this work has focused simply on the removal of storm damaged and/or dead and dying trees. Other work has been part of a more formal Forest Stand Improvement (FSI) schedule. It is estimated that 100 +/- cords of firewood and 35,000 board feet of timber have

been harvested from the property over the course of the past decade. Most recently, a timber harvest of EAB susceptible white ash was conducted on the property (around 2017). The property is hunted during deer season and contains a basic trail system which provides good access for forestry activities.

C) Wetlands Buffers, Riparian Zones, and Easements

The property contains wetlands and wetland transition areas near the perimeter of many portions of the property. Kymer Brook as well as a tributary stream to Kymer Brook are located in the northern portions of the property along Newton Sparta Avenue. These streams, along with two water bodies, will be protected by the appropriate Riparian Zone(s).

Details relating to transition areas (wetland buffers and riparian zones) can be found in the section titled "Hydrological Considerations" which is part of the Property Overview portion of the plan.

The property does not contain any known easements.

D) General Property Goals

1) Manage the property in cooperation with professional consulting foresters so as to ensure the long term sustainability of the forest land
2) Manage the property in accordance with established best forest management practices
3) Maintain and improve the health, biodiversity, and vigor of the woodlot through one or more of the following –

    A. Improve the woodlot through the use of silviculture activities such as Forest Stand Improvement (FSI) and/or Timber Harvesting.
    B. Control invasive non-native plants within all wooded areas of the property.
    C. Consider planting appropriate species of trees to assist in the regeneration process and/or shelter natural regeneration which is already present within the woodlot.
    D. Utilize prescribed fire to limit the growth of invasive species and to encourage the growth of native vegetation.

4) Consider the sustainable harvest of certain forest products which may include firewood, cedar posts, timber, mushrooms, maple syrup, etc.
5) Maintain and improve the aesthetic qualities of the property.
6) Establish, improve, and maintain woodland access throughout the property.
7) Improve wildlife habitat in conjunction with forest management activities.
8) Restoration work focused on native plants and shrubs.
9) Protect the soil and water resources on and near the property through the implementation of best forest management practices.
10) Qualify the property on an annual basis for the land-use property taxation provided for in New Jersey's Farmland Assessment Program.

E) Monitoring and Recordkeeping – Statement

The landowner understands his responsibility and obligation to monitor and keep records of the various forest management activities that are performed on his land. It is recommended that the landowner record activities on a spreadsheet (*example on next page*) or in some type of journal. Additionally, taking before and after photographs is another method for documenting work. The prescriptions and recommendations within this Forest Stewardship Plan will make certain that excessive and unnecessary cutting does not occur and that all activities will ensure the sustainability of the forest land.

Date	Stand	Description of Work (include est. of time, herbicide info, etc.)

Property Overview

A) Boundaries and Infrastructure

The boundaries of this property are identified by Newton Sparta Road, stonewalls, and posters. Some of the corners have been identified with posters and stakes.

The property contains limited woodland access throughout the property; any woodland roads or trails are depicted on the Forest Stand Map *(see Appendix B for Forest Stand Map*). Furthering and maintaining access should be one of the first objectives for this property; limited access could hinder the opportunity for successful forest management on the property.

B) Forest Use and General Overview

The forested portion of the property makes up approximately 101.32 +/- acres of the property. There is nothing planned at this point to either expand or reduce the footprint of the forested acres. The wooded portion of the property is divided into four different forest stands (Stands A-1, A-2, B, & CFW). These stands comprise all woodland acres of the property. These stands are described further within the management plan and are labeled on the Forest Stand Map which is found in Appendix B of this report.

C) Topography

The topography of the property varies from being mostly flat in some areas to extremely steep in other areas. It is situated between 640 and 800 feet above sea level. The high point occurs in the central portion of the property. The low point occurs in the northwestern portion of the property, along the road frontage. Due to the varying topography on the property, there is no distinctive aspect.

D) Hydrological Considerations

Protection of water quality will be an important consideration when executing any forest management practice on this property. Forest management in wetlands and along stream corridors, as well as in upland riparian buffer zones to these features, are regulated by the NJ Freshwater Wetlands Act (FWPA) and Flood Hazard Area Control Act (FHACA). Conducting forestry activities within these areas can be exempt from having individual permits issued from NJ Division of Land Use Regulation (DLUR), provided the following criteria are met –

1. The activities are prescribed in a Forest Management or Stewardship Plan that has been approved by the NJ Forest Service (NJFS) prior to the activities taking place.
2. The activities are conducted in accordance with the 'New Jersey Forestry and Wetlands Best Management Practices' (BMP) manual.
3. The activities do not impair the flow and circulation patterns of the freshwater wetlands and/or the activities do not reduce the extent of freshwater wetlands.
4. The activities do not have an adverse impact on a state or federally listed endangered or threatened species.

This section of the forest management plan seeks to address forest management concerns near streams, water bodies and wetlands as outlined in the 'New Jersey Forestry and Wetlands Best Management Practices Manual' (NJ Forest Service, 1995). Following the description of each of the major components of the BMPs is the recommendation related to this property.

As mentioned earlier, there are classified wetlands in several areas around the property. There are also streams located on the property which both occur in conjunction with and separately from the wetland areas. Additionally, there are two ponds located on the property.

1) Wetland Buffers and Upland Transitional Areas

Forested wetlands are found throughout New Jersey and are considered one of the state's vital natural resources. They provide many benefits including: food storage capacity; flood velocity reduction; groundwater recharge opportunities; nutrient and sediment control; wildlife habitat; recreational opportunities; and timber supply. Freshwater wetlands provide essential breeding, spawning, nesting and wintering habitats for a major portion of New Jersey's fish and wildlife, including migratory birds, endangered species and commercially and recreationally important wildlife.

As mentioned earlier, the FWPA regulates forestry activities within forested wetlands and transitional areas. In addition to the wetland areas, their associated buffers are also under regulation of the FWPA. The width of the buffer area is based on the resource value of the wetland.

*The classified wetlands on this property are characterized as having exceptional resource value as the site contains habitat that could be used by certain state threatened and/or endangered species. Therefore, a **150' wetland buffer** will be maintained around the wetlands on the property.*

2) Streamside Management Zones (SMZ) or Riparian Zones (RZ)

These are designed to protect areas adjacent to ponds, lakes, marshes or perennial and intermittent streams from negative impacts, which require specific management practices. The plants in these zones are living filters which among other things filter out sediments and pollutants; maintain stream temperature; provide a corridor for wildlife movement; and provide a visual buffer to minimize the visual impact of silvicultural activities. Determination of the width of an SMZ is a combination of factors including but not limited to topography, soil erodibility, depth of soil to water table, the degree of management being practiced, and the designation of the regulated water. The recommendations for the SMZ and the width of the SMZ are found on pages 2-3 of the NJFWBMPM. Determination of the width of an RZ is determined by the particular classification of a specific regulated stream or water body by the NJ DEP. The recommendations for the RZ and the width of the RZ are found on pages 43-50 of the FHACA manual. Both of these "zones" are critical when considering forest management and they are being handled together in this section because they overlap one another in relation to regulated waters. Often times only the RZ is mentioned because the recommended width of an RZ is usually greater than the recommended width of the SMZ, therefore the RZ width is what is enforced.

For all management activities alongside the streams and ponds, an RZ shall be maintained. Equipment use will be limited or restricted in these areas and the forestry activities shall exclude clearcutting the vegetation. The recommended RZ listed below is based on several criteria as mentioned above.

- *Kymer Brook & tributary – there are two streams located in the northern and central portions of the property. These streams all occur within the New Wawayanda Lake / Andover Pond trib sub-watershed (HUC 14) and the larger Pequestt River (above/inc. Bear Swamp) Watershed (HUC 11). These streams are classified as FW2/NTC1 by the NJDEP; this means that they are classified as fresh water (FW) and they do not occur wholly within state or federal lands (FW2); they are designated as Non-Trout waters (NT) which indicates they do not have any carrying capacity for trout; most importantly, they are classified as Category One Waters (C1) which means they are further protected against degradation. Since the tributary streams are considered C1 waters, a* ***Riparian Zone of 300'*** *must be maintained along these streams.*
- *Ponds – there are two ponds located on the property. The pond in the northeastern portion of the property is known as Straders Pond. The pond in the central portion of the property is unnamed. Both of these waterbodies are fed and drained by the aforementioned Kymer Brook and tributary stream and therefore a* ***Riparian Zone of 300'*** *must be maintained around these ponds as well.*

3) Filter Strips

These are undisturbed areas consisting of natural vegetation and litter (leaves, brush, branches) located between a wetland or water course and forestry activities (truck roads, skid trails, harvest areas or loading areas). Filter strips reduce the velocity of water runoff so that any sediment is dropped into this strip rather than entering adjacent wetland or water course. Filter strips also help maintain water temperature and preserve wildlife habitat. The recommendations for the filter strips are found on page 4 of the NJFWBMPM.

No filter strips are recommended for the activities prescribed on the property.

4) Stream Crossings

Stream crossings represent the point at which a forest road or skid trail comes in contact with a body of water. The stream crossings should provide a stable bottom or surface that allows for equipment to cross intermittent or perennial streams without increasing stream sedimentation. Temporary crossings may not need a permit, only a letter of no jurisdiction from the DEP. Permanent crossings will need a Stream Encroachment Permit. The recommendations for stream crossings are found on pages 5-8 of the NJFWBMPM.

There is a stream crossing over the Kymers Brook tributary where the stream flows under the woodland road in the central portion of the property. This stream crossing is a land berm with a buried culvert pipe and can be utilized by UTVs and pickup trucks. This stream crossing will be supportive of the forestry activities.

5) Access Roads

Access to forest land is accomplished through the use of existing or newly constructed roads. These roads if not properly constructed can result in a major source of erosion which in turn can reduce fish and wildlife habitats. Access roads and trails should be designed to minimize the total number of roads, the miles or acres used in their construction, the size and number of landings, the number of skid trail, and the number of stream crossings. Permanent roads are used for year round access for forestry activities and fire protection and are a permanent part of the forested landscape. Temporary roads are constructed to provide access into a specific area for a particular forestry practice. Once the practice is completed temporary roads should be closed and/ or stabilized. The recommendations for access roads are found on pages 9-15 of the NJFWBMPM.

Existing access roads/trails will be maintained and improved for forestry activities. Additional woodland roads/trails will need to be constructed in order to gain access to certain portions of the property to execute forestry activities. These roads/trails will be temporary in nature and will be retired once the activity in that portion of the property is completed. These roads/trails may go through the aforementioned transition areas. Necessary remediation measures will be taken if any rutting or significant soil displacement were to occur – this would include grading

the road/trail and spreading a seed mixture. These activities may occur within Stands A-1, A-2, B, and CFW.

6) Timber Harvests

The practice of applied forest management consists of intermediate and regeneration cuts. The objectives of intermediate cuts are to improve the existing stand, regulate tree growth, and provide early financial returns without any effort directed toward regeneration. Regeneration cuts are performed to harvest the timber crop and create environmental conditions favorable for forest regeneration. When properly carried out, the cutting of trees for a prescribed silvicultural purpose will minimize adverse impacts on the environment. Forest vegetation will be established naturally and soil disturbance will be limited. The recommendations for timber harvests are found on pages 16-19 of the NJFWBMPM.

Forest management activities in the form of intermediate and regeneration cuts may be carried out on this site within the transition areas. These activities may include the removal of dead, cull, diseased, storm damaged trees, crop trees, or thinning around individual crop trees. These activities may occur within Stands A-1, A-2, B, and CFW.

7) Site Preparation

Site preparation is a silvicultural tool used to prepare areas for the establishment of a desired tree species and to control the growth of undesirable vegetation. Areas recently harvested occasionally require site preparation in order to establish a new stand of trees. Site preparation consists of either mechanical or chemical means or a combination of both. The objectives of site preparation may include any of the following: amelioration of soil characteristics to enhance seedling establishment, allow newly established seedlings to get a growing head start over competing vegetation, improve access for planting, create additional planting micro-sites and clear a site of logging debris. The recommendations for site preparation are found on pages 20-21 of the NJFWBMPM.

Site preparation will not be needed on the property.

8) Forest Herbicides

Herbicides for forest purposes are valuable, practical tools when used in accordance with the labeling instructions. The use of pesticides is regulated on both the state and federal level. Restricted herbicides can only be applied by trained and certified applicators. The law requires certified applicators to use all chemical products only as directed in accordance with the label and in a careful and prudent manner. The recommendations for forest herbicides are found on page 22 of the NJFWBMPM.

Forest herbicides may be used within the transition areas. Herbicides will only be used according to the instructions on the product label. These activities may occur within Stands A-1, A-2, B, and CFW.

9) Reforestation

Reforestation includes the planting of tree seedlings and direct seeding. Hand planting and direct seeding do not normally cause any type of site disturbance that could produce adverse environmental impacts. However, machine planting can expose mineral soil, creating a slight concern for erosion. The recommendations for reforestation are found on pages 22-23 of the NJFWBMPS.

Natural regeneration should become established in any wetland areas after forestry activities; however, deer browse, plant competition from non-natives, or other problems may require reforestation to maintain stocking or to introduce some other wetland species for species diversity or wildlife habitat planting. These activities could occur within the transition areas. These activities may occur within Stands A-1, A-2, B, and CFW.

10) Forest Protection

This section refers to the use of prescribed burns to reduce the level of fuel so future wildfires will cause less damage and be easier to control. The recommendations for forest protection are found on pages 25-26 of the NJFWBMPS.

No prescribed burns are planned for this property at this time.

E) Ecology and Biodiversity

General Information - the woodlot's vegetative diversity, at the time of the forest inventory, consisted of at least 17 different tree species in the overstory, at least 20 different species of trees in the midstory, and at least 20 different species of trees occurring in the regeneration layer. The herbaceous layer consisted of over 35 different native species and non-native species. Approximately 8 non-native species were identified which have invasive qualities. The forest consists of a diversity of size classes of trees. There are currently no acres on this property that are in an early successional condition. Due to the history of forest management in some parts of the property, the overall forest is considered 'fully stocked' but is not nearing a point of being considered 'overstocked'. There are some portions of the property where the forest is obviously 'understocked' and other areas where the forest is 'overstocked'.

The property provides habitat for a diversity of wildlife species. In addition to the forested acres, the property contains areas of classified forested wetlands, open water bodies, and streams. There is an average layer of leaf litter and coarse woody debris within the forest which also create opportunities for populations of amphibians and reptiles. Thermal cover during the wintertime is provided for certain wildlife within more dense areas within both stands. In addition to the Threatened and Endangered Species which this property may support, this property likely hosts a variety of wildlife species including - white-tailed deer, black bear, turkey, gray squirrel, chipmunk, coyote, fox, raccoon, opossum, rabbit, several species of turtles and snakes, bats, raptors, owls, and a variety of songbirds.

Portions of the woodlot is infested with invasive plants and the entire property contains an over population of white-tailed deer. One of the concerns related to the forest's long-term ability to maintain biodiversity is the growing presence of non-native Japanese barberry which covers approximately 15% of the forest floor on average. Additionally, deer are negatively affecting the woodlot as was evidenced during the inventory by the lack of natural tree regeneration. Due to the canopy cover, intense deer browse, and already mentioned growing presence of non-native invasive shrubs, the future biodiversity of the forest may in fact decline.

Threatened and Endangered Species - the Endangered Species Act of 1973 defines 'Endangered' as any species which is in danger of extinction throughout all or a significant portion of its range. 'Threatened' is defined as any species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. In many cases, declines in populations of plants and animals are caused by more than one event. Habitat degradation and destruction by humans are the most serious threats to wildlife and plants worldwide. Destruction occurs through development activities, environmental pollution, introduction of invasive and nonnative species, overharvesting of wild species, and conversion of habitat to other uses.

The presence or absence of certain species can be a reflection of overall environmental quality; when a species is threatened or endangered, it typically means the habitat it relies on to survive and procreate is being negatively impacted or degraded. Many times degradation of habitat that negatively impacts a specific species is most likely having a much wider impact on a greater suite of species, included the resources that we also depend upon. For example, a mussel can act

as a water quality indicator: when the mussel is threatened or endangered the quality of water that we depend upon is most likely degraded. In addition, each plant and animal is an important part of the balance of the entire community of living things. The loss of even one species can have a significant effect on many others. Species depend upon each other as well as the overall health and quality of habitat to survive and thrive.

The New Jersey Office of Natural Lands Management (ONLM) Natural Heritage Program was consulted in order to determine if there are any state threatened and/or state endangered species on (or near) the property. Likewise, a report was generated from the US Fish and Wildlife Service which is known as an IPaC (Information for Planning and Consulting) to determine if there are any federally threatened or federally endangered species on (or near) the property. Both of these complete reports can be found in Appendix C. The following is a summary of the species which were listed –

State Threatened and Endangered Species

- *Barred owl (threatened)*
- *Bobcat (endangered)*
- *Wood turtle (threatened)*

Federally Threatened and Endangered Species

- *Indiana bat (endangered)*
- *Northern long-eared bat (threatened)*
- *Tricolored Bat (proposed endangered)*
- *Bog turtle (threatened)*
- *Dwarf wedgemussel (endangered)*
- *Green floater (proposed threatened)*
- *Small whorled pogonia (threatened)*
- *Monarch Butterfly (Candidate)*
- ****According to the IPaC report, there is no critical habitat for any of these species found on the property***

It is important to note that the above-listed species have not necessarily all been sighted recently on or near the property, but rather that the property offers potential habitat for the listed species. Therefore, due consideration must be given to the habitat requirements of the listed species, but in order to best serve the widest possible range of species (and hence the widest possible range of biodiversity), consideration should be given to all potential habitat types when planning to meet objectives for the forest. For properties with multiple ownership objectives, it is a questionable practice to develop management strategies that focus on retaining or enhancing a single forest habitat type, or to encourage a single species or small group of species. Such a strategy does not take into account the dynamic character of forests and can lead to a long term loss of biodiversity. Rather, it is recommended that strategies be followed that help to create or sustain the widest possible range of habitat types. Management practices such as well-planned and appropriate forest stand improvement, non-native plant control, and tree planting can help to ensure forest health and diversity. In order to be effective, these practices must be properly planned and executed with objectives clearly defined and potential outcomes understood in advance. All intensive management practices must be executed in accordance with best forest

management practices. By adhering to forestry practices that are sustainable and scientifically sound, forest biodiversity can be increased which can provide high quality habitat for the widest possible range of wildlife species, including threatened and endangered species. A thoughtful approach to forest management that incorporates existing conditions, an understanding of ecological processes, and is carried out in accordance with accepted standards will produce positive benefits for both wildlife, the natural resource as a whole, and the landowner.

For further reading and more specific information on one or more of the aforementioned species on the threatened and endangered species list for this property, you can go the Conserve Wildlife Foundation of New Jersey's website. There you will find a field guide of sorts which can help you better understand these wildlife. http://www.conservewildlifenj.org/species/fieldguide/

Portions of the property are contained within an area which has been identified as a Natural Heritage Priority Site. The site is known as the Perona Lake Natural Heritage Priority Site (Sussex County). The site contains excellent occurrences for two critically imperiled state plant species. The site contains wet deciduous woods and seepage areas along a stream.

An area to the east of this property has also been identified as a Natural Heritage Priority Site. The site is known as the Sparta Avenue Natural Heritage Priority Site (Sussex County). The site has been given this designation because it contains a small example of a globally rare wetland ecological community and one state critically imperiled plant species. The site consists of a series of small herbaceous wetland openings with several springs emerging from the ground. The wetland openings total less than 1 acre of open herbaceous dominated meadow, grading into a swamp forest containing larch and hardwoods.

F) Threats to Sustainability

For thousands of years, fire was an integral part of the forested landscape, with natural wildfires occurring periodically throughout northern New Jersey. Some of these natural fires burned uncontrolled over thousands of acres creating a mosaic of forest structure and age classes across the region. In more recent history, both Native Americans and early settlers used fire to clear the land to make room for agriculture, maintain desired forest composition, and improve hunting opportunities. Over the last century, overly effective fire suppression has removed fire from the landscape, and in many cases created forest conditions that are homogenous in structure and composition. Additionally, in the absence of active management, fuel loads (understory vegetation and coarse woody debris on the ground) may be present in some forests which are conditions that can increase the future threat of a serious wildfire.

The current woodland on this property shows no evidence of any recent fire history. A moderate amount of ground fuels is present throughout this property which has the capacity to carry a low to medium intensity fire. If a wildfire was to occur, the township and county road systems along with the existing property trails would provide sufficient access to assist in extinguishing and containing a fire. These access points and trails also provide an opportunity to employ prescribed burning as a management activity if desired. Maintaining and improving the trail systems is always recommended and would further improve access in the case of a fire.

During the inventory, certain forest health issues were observed and noted which could pose a long-term threat to the sustainability of this forest. Historically, the most severe insect and disease infestations came primarily in the form of spongy moth infestations occurring from the 1970s to the early 1990s. Spongy moth egg mass counts are currently on the rise and the property may be negatively impacted in the upcoming growing season. More recently, the most severe insect infestation on the landscape has been the Emerald Ash Borer (EAB) which was introduced into the United States in 2002 and was first discovered in New Jersey back in 2014. Almost all of the white ash has been salvaged from the property. The small remaining white ash inventory was found to be dead or in sharp decline as a result of the ongoing EAB infestation. Some of the black birch on the property was found to contain nectria canker which can be removed through ongoing FSI. Additionally, some of the American beech on the property was found to contain beech bark disease and beech leaf disease which both spread easily and will cause the beech inventory to decline. Lastly, Spotted Lantern Fly was observed on the property. The Spotted Lantern Fly (SLF) is an emerging forest pest that will likely be observed on the property or in the vicinity of the property in the next few years. SLF is an invasive planthopper native to Asia; it feeds on sap from a myriad of different plants with a strong preference for economically important plants including grapevines, maples, and black walnut. For more information on this bug, please go to
https://www.nj.gov/agriculture/divisions/pi/prog/pests-diseases/spotted-lanternfly/

Weather events have had a significant effect on portions of the woodland through the years. Some older storm damage was observed as well as more recent damage which most likely occurred during recent early ice storms or other wind events. The storms have resulted in crown breakage and several fallen trees.

G) Stewardship Principles

1) Soils

Forests and forest soils play a broad, complex, and interactive role within the environment. Soils are an important component of any forest ecosystem as they help to regulate important ecosystem processes, such as nutrient uptake, decomposition, and water availability. Soils provide trees with anchorage, water, and nutrients. In turn, trees and other vegetation are an important factor in the creation of new soils as leaves and woody debris rot and decompose within the forest.

Soils and forests are intrinsically linked, with large impacts on each other and on the wider environment. Forest soils are a contributing factor to the ability of a forest to sequester carbon (discussed later) as they provide the necessary elements for vegetation to grow. Sustainably managed forests help to control soil erosion and therefore conserve soil. Forest cover on erosion-prone soils helps to control or reduce the risk of soil erosion. Forests and their soils are also a key component of watershed management. In summary, protecting the soils on the landscape is a critical component of stewardship, and therefore the forest needs to be managed responsibly.

The forestry activities conducted on the property will be conducted in such a way as to limit the disturbance to the soils. Most of the activities will be less intense in nature and therefore will have very little effect on the soils. If commercial timber harvesting activities become part of the recommended activities on this property, much thought and planning will occur in order to minimize soil disturbance. These activities will be carried out during seasons when soil rutting will be kept to a minimum. If any rutting does occur, remediation will take place at the end of the harvest to restore these areas to what they were like prior to the harvest.

On the following page is a summary table containing information related to the soils found on the property. The table highlights the important characteristics of these soils related to forest management. Within Appendix B of this report is a Soils Map.

Summary of Soils Information, Limitations, and Locations

Soil Name (Symbol)	Slope Class	Erosion Concerns	Harvesting Suitability	Seedling Mortality	Site Index	Species to Favor	Productivity Limits	Location by Stand
Catden muck (CatbA)	0-2%	slight	poorly suited	high	<55	red maple	excessive wetness	A-2
Chatfield-Hollis-Rock outcrop (ChkC)	0-15%	slight	poorly suited	low	55-75	oaks, hickory, sugar maple	surface fragments	B
Chatfield-Hollis-Rock outcrop (ChkE)	35-60%	severe	poorly suited	low	50-70	oaks, sugar maple	surface fragments, slope	A-1. A-2, B- CFW
Hazen-Paulins Kill complex, very stony (HdxpBb)	3-8%	slight	moderately suited	low	50-70	mixed oaks, hickory, sugar maple	surface fragments	A-2
Hibernia loam, extremely stony (HhmBc)	0-8%	slight	moderately suited	high	<55	red maple, elm	excessive wetness	A-1
Hollis-Rock outcrop-Chatfield complex, New Jersey Highlands (HncD)	15-35%	moderate	moderately suited	moderate	50-70	oaks, hickory, sugar maple	rock outcroppings, slope	A-1, B

2) Forest Health, Biological Diversity, and Invasive Species

Healthy forests allow for a diverse array of benefits. They provide habitat for many wildlife species, improve water quality, filter pollutants from water and air, enhance outdoor recreational activities, provide wood products and supply jobs that support local economies. Forest management can fulfill an important role in shaping future forests. Where lands allow for active management to occur, active forest management can enhance forest resilience to fire, insects and diseases. Forest management also will continue to provide much-needed wood products and help diversify local economies. When we maintain a broad array of forest products markets, the economic value they provide assists us in meeting our desired future forest conditions in a cost-effective manner. Monetary value derived from a forest can be reinvested into the site to promote forest health.

Most forest management practices influence biological diversity to varying degrees. Knowledge of the interaction among biological, social, and silvicultural systems is necessary to plan and implement actions that will have the desired effect on biodiversity. Historically, human demands on natural systems have resulted in modification of many biological systems together with a loss of open space. Forest management practices can restore, maintain, or reduce biodiversity depending on how they are conducted.

Hundreds of species of non-native invasive forest insects, diseases, plants, and other organisms are established in the United States. Some of these species have become invasive, spreading rapidly and causing significant economic and ecological impacts to the nation's forest and urban trees. In NJ alone, there are several species having a significant effect on the forest health.

The current health of the forests on the property is considered average and is further explained within the "Forest Stand Information" portion of this report. Forest management activities recommended for this property will all seek to promote forest health and ecological diversity. Most of the activities on the property will simply maintain the biodiversity. On this site, there are several non-native invasive forest insects, diseases, and plants that are present or could become present. Further information related to invasive plants, diseases, and insects can be found in the "General Information on Forest Management Prescriptions" section of this plan.

3) Fish & Wildlife Resources

Wildlife and forest management are not only compatible but are interrelated. Developing a forest management plan allows you to place a special emphasis on wildlife species in which you are interested. Wildlife have four basic requirements: food, cover, water and space. Different wildlife species require different stages of forest growth to meet these needs. The arrangement and ratio of these stages dictates the kinds of wildlife that can live on a landscape. The key to wildlife diversity and abundance is habitat diversity. How a forest is managed contributes to the presence and arrangement of habitats, directly impacting the use of the land by wildlife.

Several aspects of a property determine how many species can live and thrive in the forest: plant cover, harvest operations, water resources, and topography. A forest may have streams, swamps,

rivers, ponds, and areas that adjoin fields, pastures, roads and other openings. Even managing these 'edges' of a forest is crucial to abundant populations of some wildlife species. Edge is easy to manage but some interior species can be harmed by creating edge habitat. The relationship between vegetation management and wildlife species habitat is well established. Understanding relationships is the first step in determining how the forest can be managed to promote the wildlife species one may want to attract.

For example, quail, many songbirds, and some small mammals feed on seeds of annual and perennial weeds and grasses that occur in young stands of timber, where sunlight reaches the forest floor. This is early successional habitat. Pileated woodpeckers, gray squirrels, and other songbirds depend on mature forests. This is late successional habitat. Still other wildlife prefer mid successional habitat, the stage between early and late succession.

The forestry activities on this property will seek to promote and further the diversity of habitat and opportunities for wildlife. If thinning work is executed on this property, gaps will be created within the woodlot which will help to promote regeneration of certain trees, shrubs, and plants. By controlling the invasive species and promoting native vegetation, the presence of wildlife will be encouraged. If regeneration is planted (artificial regeneration) or protected (with tree tubes), a future forest is being grown which will benefit the wildlife in years to come.

4) Recreation & Aesthetics

Forest management planning is an ideal time to consider the recreational potential of your property - whether it is for self and family, groups, and/or public access. Further, the leasing of private lands for hunting or fishing privileges, trail riding, camping and non-timber forest products harvesting can provide income in some cases. Forest management practices can enhance these activities with proper planning. If public or fee-based recreation is to be allowed, special consideration needs to be given to liability and possible impacts to the forest. Addressing unauthorized recreation or use improves the security of your property and reduces trespass.

Different aspects of forest management may affect the aesthetic values of a property. Views, sunlight intensity, and privacy can all be impacted by forest management, both negatively and positively. Often the way the property will look after a harvest is not taken into account, both in the long and short term, and aesthetics can greatly impact a landowner's satisfaction. Aesthetics should be discussed during the planning stages and again prior to implementing harvest operations to ensure the landowner receives the desired property appearance.

The recreational use of this property is private and will be used by the landowner and other invited guests. During the deer season, the property is hunted by a hunting club. Trails created by forestry activities will help provide the landowner with further opportunities to enjoy walking the property and observing the wildlife.

The aesthetics of the property are important to the landowner. If thinning the forest, a buffer of trees will be left in more sensitive areas near roads and structures. Recommendations to treat the invasive species found within the forest will certainly increase the aesthetic value of the

property.

5) Cultural & Historical Resources

Cultural resources are an important part of our history and heritage. Often, cultural resources are difficult to identify and even more difficult to determine their purpose. Cultural resources help define our human history, remind us of our interdependence with the land, and show how cultures change over time. Cultural resources are in places where people lived everyday life, leaving structures and objects as evidence of how they lived, where important events occurred, and where traditional, religious, ceremonial, and social activities took place. Protecting cultural resources preserves human tradition, culture, and history.

Cultural resources can be found above or below ground. Therefore, when conducting forestry activities such as trail building, it is important to look for physical evidence that might indicate a past use of that area. If cultural resources are found either on or adjacent to an area where forestry activities are recommended, it does not mean these activities cannot be conducted. It does mean however that the activity should be performed in such a way as to minimize the disturbance on the cultural resource. Many times, an activity can be worked around these areas, rather than through them.

Historical sites and artifacts can include areas such as graves or cemeteries, old homesteads and foundations, cabins, barns, fences, stonewalls, saw mills, roads, weapons, pottery, bottles, or coins. They can also be places associated with an individual important to the history of a certain town, county, state, or even country. In certain cases, significant historical events might have occurred in a location, even though no physical evidence of the event remains.

Several stone walls occur on the property which attest to the property's former use in agriculture over much of the property. The 1930 aerial photograph included in Appendix B is another helpful tool in uncovering some of the historical use of the property. This photo confirms that these stone walls that are seen today were present 90 years ago and created as the land was used for certain farming purposes. Additionally, a portion of this property was previously used as a Girl Scout camp. There are several abandoned structures present on the property.

As indicated on the Cultural Resource Map, this property is directly adjacent to a historical property known as 100 Current Drive.

Forest stewardship activities on the property will not disturb any historical or cultural resources.

6) Carbon Sequestration

Carbon sequestration is the process by which atmospheric carbon dioxide is taken up by trees, grasses, and other plants through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils. The carbon stock in forests is the amount of carbon that has been sequestered from the atmosphere and is now being stored within the forest ecosystem,

mainly within living biomass and soil and to a lesser extent also in dead wood and litter. Carbon sequestration helps to offset sources of carbon dioxide to the atmosphere, such as deforestation, forest fires, and fossil fuel emissions. Sustainable forestry practices can increase the ability of forests to sequester atmospheric carbon while enhancing other ecosystem services, such as improved soil and water quality. Planting new trees, improving forest health through thinning or timber harvesting, and prescribed burning are some of the ways to increase the forest's ability to sequester carbon in wood products and new forest growth. Certain forest management activities can affect the short term carbon stock of a forest, but in the long run (*>150 years*) a properly managed forest will hold more carbon than an unmanaged forest.

The recommendations provided within this plan will have the long-term effect of maintaining (and hopefully enhancing) the ability of the forest to store carbon. Thinning activities that may be conducted on the property will help to foster a healthier, vibrant, and growing forest which will increase its ability to sequester carbon. Additionally, the planting (artificial regeneration) and/or the protecting (natural regeneration) of certain seedlings on the property will also increase the property's 'sink.'

7) Timber Resource

When they are well managed, forests provide clean air and water, homes for wildlife, beautiful scenery, places for recreation, and more than 5,000 products we all use every day. When they are not well managed, forests are often unhealthy and unproductive because of overcrowding, disease, insects, and competition for light, water and nutrients. To maintain or improve the health and productivity of a forest and to achieve the landowner's objectives for the property, foresters use a number of management techniques, including timber harvesting.

In forest management, trees are harvested for a variety of reasons including improving the health of the forest, controlling the types of trees that grow on the site, attracting certain wildlife species, providing a source of income for the landowner, improving access to the area, and producing paper, lumber and numerous other forest products. And just as there are many reasons for harvesting trees, there are many different harvesting methods. Each method has its benefits, drawbacks, and conditions under which it is the most suitable way to harvest trees. No one harvesting method is ideal for all situations. Methods include clearcutting, shelterwood and seed tree harvesting, single-tree selection, group selection.

Within the "Forest Stand Information" section of the report, the timber resource is described in some detail. Appendix A offers a comprehensive inventory of the forested stands on the property and gives the landowner and forester the information needed to manage the timber resource.

8) Agroforestry

Agroforestry is a system where trees and shrubs are deliberately used on the same land-management unit as agricultural crops and/or animals. In agroforestry systems there are both ecological and economical interactions between the different components. Agroforestry can also be defined as a dynamic, ecologically based, natural resource management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains

production for increased social, economic and environmental benefits for land users at all levels. Agroforestry systems are multifunctional systems that can provide a wide range of economic, sociocultural, and environmental benefits. Agroforestry systems are intentional, intensive, interactive, and integrated.

There are five basic types of agroforestry practices today in the North America: windbreaks, alley cropping, silvopasture, riparian buffers and forest farming. Within each agroforestry practice, there is a continuum of options available to landowners depending on their own goals (e.g., whether to maximize the production of interplanted crops, animal forage, or trees).

The landowner has no plan to practice agroforestry in the immediate future.

9) Estate Planning

Estate planning is the process of anticipating and arranging, during a person's life, for the management and disposal of that person's estate during the person's life and after death. Any land owned by this person is part of their estate and therefore should be part of their planning process. Depending on a particular landowner's objectives, there is likely a desire to see a tract of forested land preserved into the future and passed down to heirs.

The landowner hopes to keep the property long into the future.

Forest Stand Information

An Explanation of Sampling Procedures

Ideally, the best inventory of a forest or woodland would be to count and measure each tree within the confines of each component stand. Such a procedure is impractical and time consuming. In order to produce reliable results in a timely manner, a statistical sampling method was selected. The inventory utilized a point sampling procedure that is frequently used in forestry-related practices for quantifying forest stand characteristics. The point sampling procedure is a method for selecting trees on the basis of their size, rather than on the frequency of their occurrence. Under this sampling scheme, the probability of tallying any given tree is proportional to its size; larger trees are sampled more intensively than smaller trees, which is desirable from the standpoint of estimating the structure and composition of the forest stand.

Following the location and marking of property boundary lines, sample point centers were identified on 300 foot intervals. From each point, sample trees identified using a ten-factor prism were classified and tallied according to species, height, DBH (diameter at breast height), and quality. A reproduction survey was made, in which the presence or absence of seedlings and/or saplings of desirable species of trees were noted at each sample plot. Ground vegetation was also noted at each location along with the presence or absence of non-native invasive species.

Physiographic features such as stand boundaries, open water, wetlands, structures, steep areas, field edges, trails, and improvements were noted and mapped during travel between points and compared as possible with "scale" aerial photographs. This information appears on the following page on the Forest Stand Map (*this map is also included in Appendix B*). Work-up of the inventory cruise field data was completed using procedures standard to the forest products industry.

FOREST STAND MAP

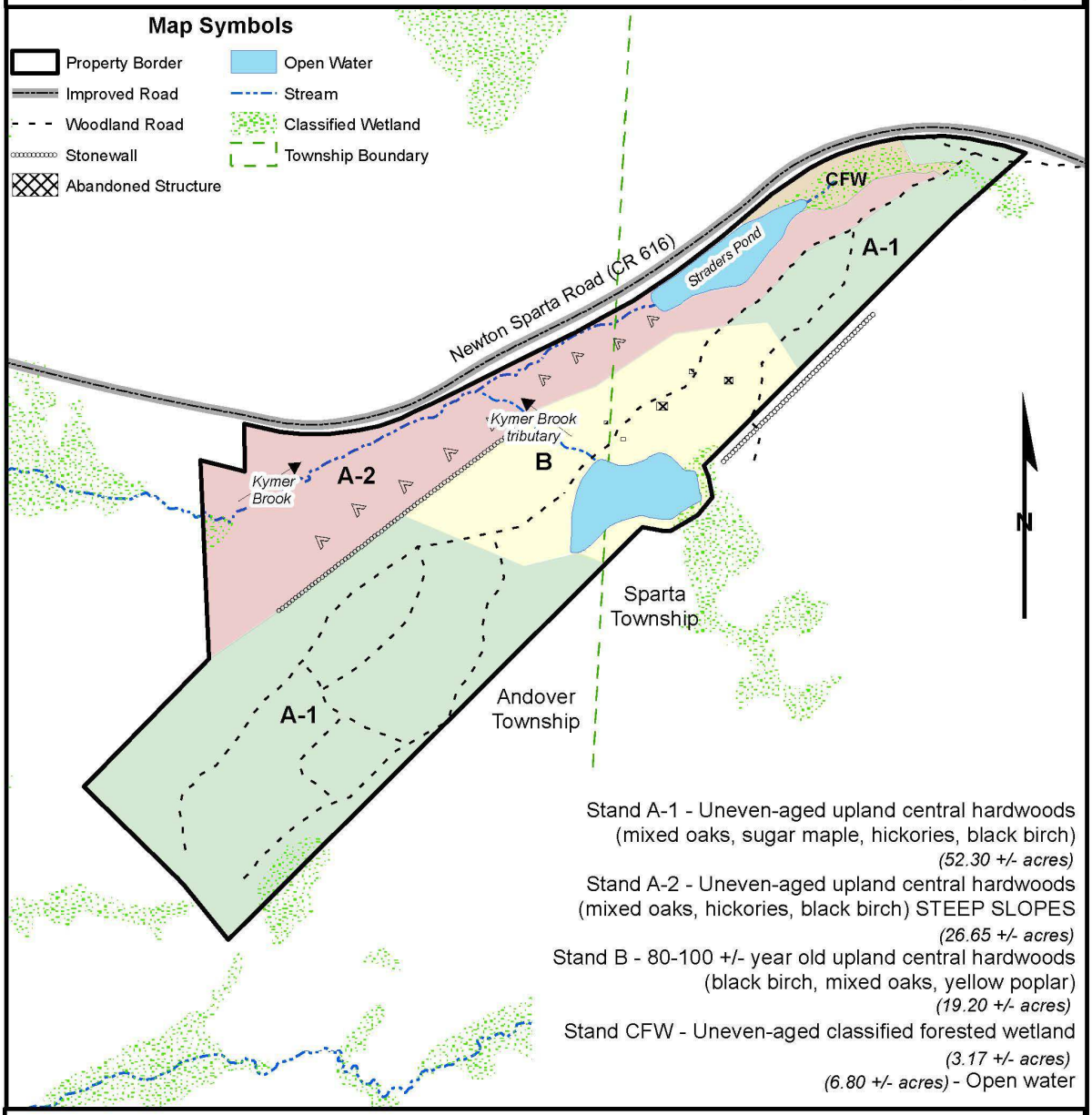
Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover Block 103 / Lots 2 & 3.02 and Sparta Block 7001 / Lot 1

Total area = 108.12 +/- acres

September, 2024



Stand A-1 - Uneven-aged upland central hardwoods (mixed oaks, sugar maple, hickories, black birch) *(52.30 +/- acres)*

Stand A-2 - Uneven-aged upland central hardwoods (mixed oaks, hickories, black birch) STEEP SLOPES *(26.65 +/- acres)*

Stand B - 80-100 +/- year old upland central hardwoods (black birch, mixed oaks, yellow poplar) *(19.20 +/- acres)*

Stand CFW - Uneven-aged classified forested wetland *(3.17 +/- acres)*

(6.80 +/- acres) - Open water

***This map was developed to be used exclusively as part of a Woodland Management Plan or Forest Stewardship Plan**

*The property boundary was taken from a digitized tax map and may not be accurate; this is not a survey.
*This map was developed using the NJ Geographic Information Network (NJGIN)
*Any regulated areas and/or transition areas included on this map are based on information gathered from the NJ Geographic Information Network (NJGIN)

1 inch = 600 feet

0 300 600 1,200 feet

Stands A-1 & A-2

NOTE: Stands A-1 & A-2 are being considered together in this description, as their characteristics are nearly the same. The main difference is the steep terrain found in stand A-2 which will severely limit any forestry activities in these areas.

A) Stand Description & Attributes

Stand A-1 & A-2 (*to be referred to as Stand A where appropriate*) encompass approximately 78.95 +/- acres of the property. Stand A is the oldest and largest forested stand on the property. It occupies portions of the eastern, southern, western, and central portions of the property (*see Forest Stand Map which accompanies this report within Appendix B*). Historically, the area occupied by the stand was likely used as wooded pasture and a farm woodlot. It was probably at least partially cleared for use as pasture, but some trees were likely left standing. Stand A was abandoned from agriculture 70-90 +/- years ago and has also been selectively harvested during past management plans. These are some of the reasons for the different age classes of trees evidenced within the stand.

SUMMARY OF STAND ATTRIBUTES				
Forest Type	mixed upland central hardwoods		Basal Area Range (*per acre*) Basal Area Average (*per acre*)	30 – 120 (*sq. ft. per acre*) 79 (*sq. ft. per acre*)
Age Structure	uneven-aged		Stocking Percent Stocking Level	68% fully stocked
Age Class	80 - 120 +/- 40 - 60 +/- 10 - 20 +/-		Sawtimber Volume (*per acre*)	4,610 (*bd. ft. per acre*)
Diameter Range Average Diameter	6” – 32” +/- 10.6”		Sawtimber Growth (*per acre*)	81 (*bd. ft. per acre*)
Crown Class Distribution	suppressed - dominant		Cordwood Volume (*per acre*)	4.0 (*cords per acre*)
Size Class	small to large sawtimber		Cordwood Growth (*per acre*)	0.08 (*cords per acre*)
Site Index	<55 *(CatbA)* 70 *(ChkE)* 70 *(HdxpBb)* <55 *(HhmBc)* 70 *(HncD)*		Forest Health	average
Site Limitations	surface fragments, steep slopes , wet soils		Leaf Litter Layer	average
Coarse Woody Debris	average			

The table below represents the different species present within the stand separated by vegetation stratum. The species are listed from what is found most frequently to least frequently within the stratum listed.

Vegetation Stratum (Stand A)	Species Composition*
Overstory (12-20" + diameter trees)	Sugar maple, hickories, white oak, chestnut oak, red oak, black oak, black birch, red maple, American beech, white ash, aspen, black cherry, Eastern hemlock, yellow poplar, ailanthus *(non-native)*
Midstory (6"-10" diameter trees)	Black birch, sugar maple, hickories, red maple, chestnut oak, yellow poplar, serviceberry, white ash, ailanthus *(non-native)*, sassafras, Eastern hemlock, hophornbeam
Regeneration layer Sapling (1" - 4" diameter, > 4' tall) Status of Sapling Regeneration - *moderate*	black birch, sugar maple, hickories, hophornbeam, serviceberry, American beech, hophornbeam, dogwood, white oak, chestnut oak, ailanthus *(non-native)*, hornbeam
Seedling (< 1" diameter, < 4' tall) Status of Seedling Regeneration – *sparse to moderate*	mixed oaks, sugar maple, American beech, yellow poplar, sassafras, white ash
Ground Vegetation (average % percent cover across stand) (*Ground vegetation ranges from moderate to dense)*	**Native (31%)** *Dominant* – ferns (21%), witch hazel (4%), warm season grasses (3%), rubus (3%) *Other* – hog peanut, wood aster, maple leaf viburnum, richweed, sedge, wintergreen, trillium, Solomons seal, white snake root, jumpseed, tick trefoil, partridge berry, sarsaparilla, smilax, lowbush blueberry, other native forbs **Non-native (16%)** *Dominant* - Japanese barberry (13%), Japanese stilt grass (3%) *Other* – multiflora rose, autumn olive
Vines (% of trees containing vines) *(vine competition is sparse)*	**Total (2%)** grape (2%), <1% poison ivy, Virginia creeper, English ivy, Oriental bittersweet

Stand photos depict a portion of Stand A that is representative of the stand as a whole and aim to capture the most common tree species and ground vegetation within the stand, as well as accurately portray the average stocking level found across the stand.





The overall quality of Stand A is average. Many of the overstory trees consisting of the mixed oaks, sugar maple, black birch, and hickories are considered Acceptable Growing Stock (AGS). About 50% of the stems in the midstory consisting of the black birch and sugar maple were considered Unacceptable Growing Stock (UGS) stems. Many of the suppressed trees contain some sweep and slower growth rates.

Overall, the stand health within Stand A is average. A few overstory oaks have been weakened over the years from spongy moth defoliations. Spongy moth egg mass counts are currently on the rise and the stand may be negatively impacted by the caterpillars in the upcoming growing season. The scattered white ash within the stand was found to be in sharp decline or already dead as a result of the ongoing EAB infestation. A portion of the overstory American beech within the stand was found to contain beech bark disease and beech leaf disease which negatively impacts the health of the large trees and causes excessive suckering. Some of the black birch was found to contain nectria canker which can be removed through continued FSI. The majority of the overstory contains little to no signs of disease.

The vigor of the trees within Stand A is stable in some areas and increasing in others. Areas that have undergone past timber harvests and FSI in tandem with vine cutting and invasive brush removal were found to have increasing vigor. Portions of the stand with limited access that have not been managed as intensively were found to have stable vigor.

Storm damaged trees were observed frequently throughout Stand A. Many broken limbs and crowns as well as fallen trees were present in the stand. The recent damage likely occurred during early snow and ice events as well as high wind events in the last two years. Historical storm damage that has become unsalvageable over time likely occurred during Hurricane Sandy in 2012. There was no other evidence of damage causing agents observed during the inventory.

Stand A contains average biodiversity within the overstory, midstory, and understory. Hardwood regeneration is very sparse within the stand, but this is average compared to many other properties in this area. This can be attributed to shading from the overstory, severe deer browse, soil constraints, and the presence of non-native Japanese barberry.

B) Stand Objectives, Measurable Parameters, and Prescriptions

As mentioned earlier in this plan, the landowner's overall desire is to manage the forest sustainably. Improving the overall health and vigor of the forest are subsequent goals which play a major role in managing this forest towards sustainability. Within Stand A, the landowner hopes to reduce the presence of non-native invasive shrubs.

In order to work towards these future conditions, certain activities must be planned and executed over the next 10 years. These activities must be based on current conditions. The table below contains the following: 1) objectives for the stand, 2) parameters which make the objectives measurable, and 3) prescriptions which will help to achieve the objectives.

Objective #1	reduce or control the presence of the following non-native invasive species so that they represent less than 1% of the herbaceous layer across the stand – Japanese barberry
Baseline Parameter	these invasive shrubs cover approximately 13% of the herbaceous layer on average
Prescription	mechanically and/or chemically treat the aforementioned invasives within the annual treatment area (5 +/- acres) *NOTE: in each year of the plan, the landowner should also go back through the areas that were treated in previous years and spot treat any reoccurrence of these invasives* **see further details on **invasive treatments** within the section titled "General Information on Forest Management Recommendations"*

This stand will benefit from invasive species control. Non-native invasive species such as Japanese barberry will be targeted through cutting and herbicide applications. Additionally, areas that have already been successfully treated will be revisited on an annual basis to spot treat any reoccurrences of invasives. The goal of these activities is to decrease the competition on the forest floor so that natural regeneration has an opportunity to occur in the future as well as to limit the seed source from the forest which diminish the ability of this invasive to take more growing space in the future. These activities will help to ensure that the forest health is improving.

There are other activities which could also be executed within this stand as the previously mentioned work is being carried out. Continuing to establish and maintain access into the stand should be a high priority during the course of completing the activities. Any occurrence of naturally occurring regeneration could be protected with tree shelters. Lastly, brush piles could be made within the stand from treetops to offer habitat to certain wildlife.

The landowner will document any executed treatments on the annual WD-1 form and a monitoring spreadsheet (*spreadsheet can be found in Appendix C; landowner is encouraged to take progress photos along the way).* The forester and owner will inspect the completed treatment area in years 3, 6, and 9 of this plan to ensure management activities are satisfactory. The inspection will consist of a thorough walk through of the stand by the forester who will make estimates of certain forest data and when appropriate a prism will be used to estimate basal area. These findings will be recorded on the monitoring spreadsheet.

General Forest Stewardship Recommendations to consider within the stand:

- create and maintain access trails to improve access
- salvage storm-damaged, standing dead, or fallen trees
- proactively harvest white ash trees before infestation of EAB
- mark and preserve den and nest trees (*2-3 per acre*)
- girdle a few select trees to create 'snag' trees for wildlife (*2-3 per acre*)
- create wildlife brush piles from treetops and tree branches (*1-3 per acre*)
- cut any occurrence of vines found growing in trees
- treat any occurrence of non-native Ailanthus (*mechanically and/or with herbicide*)
- place nest boxes at various locations
- shelter natural regeneration of native species (*emphasis on hardwoods*)

Since Stand A occurs within transition areas, some of the prescribed work will undoubtedly occur within these areas. Information related to the impact of the activities on regulated areas and protective measures being employed in these areas can be found within the section of the plan titled "Property Overview / Hydrological Considerations". Information related to the impact of the activities on threatened and endangered species and protective measures being employed to further protect these species can be found within the section of the plan titled "Property Overview / Ecological & Biodiversity".

Stand B

A) Stand Description & Attributes

Stand B encompasses approximately 19.20 +/- acres of the property. Stand B is the youngest forested stand on the property; it occupies most of the central portions of the property (*see Forest Stand Map which accompanies this report within Appendix B*). Historically, the area occupied by the stand was likely used as open pasture and then as a Girl Scout camp. It was likely mostly cleared for its use as pasture before being abandoned from agriculture 80-100 +/- years ago. Stand B was also selectively harvested during past management plans.

The table below contains a summary of some of the key attributes of Stand B. A more detailed inventory of the stand can be found within Appendix A of this plan.

SUMMARY OF STAND ATTRIBUTES				
Forest Type	mixed upland central hardwoods		Basal Area Range (*per acre*) Basal Area Average (*per acre*)	70 – 130 (*sq. ft. per acre*) 93 (*sq. ft. per acre*)
Age Structure	even-aged		Stocking Percent Stocking Level	81% fully stocked
Age Class	80 - 100 +/- 10 - 20 +/-		Sawtimber Volume (*per acre*)	5,557 (*bd. ft. per acre*)
Diameter Range Average Diameter	6” – 32” +/- 10.6”		Sawtimber Growth (*per acre*)	98 (*bd. ft. per acre*)
Crown Class Distribution	suppressed - dominant		Cordwood Volume (*per acre*)	6.0 (*cords per acre*)
Size Class	small to large sawtimber		Cordwood Growth (*per acre*)	0.12 (*cords per acre*)
Site Index	70 *(ChkE)* 70 *(HncD)*		Forest Health	average
Site Limitations	surface fragments, steep slopes		Leaf Litter Layer	average
Coarse Woody Debris	average			

The table below represents the different species present within the stand separated by vegetation stratum. The species are listed from what is found most frequently to least frequently within the stratum listed.

Vegetation Stratum (Stand B)	Species Composition*
Overstory (12-20" + diameter trees)	black birch, chestnut oak, white oak, red oak, black oak, yellow poplar, hickories, aspen, sugar maple, red maple, American beech, black cherry
Midstory (6"-10" diameter trees)	black birch, sugar maple, red maple, red oak, black oak, hickories, dogwood, American beech, black cherry, yellow birch, hophornbeam, yellow poplar
Regeneration layer Sapling (1" - 4" diameter, > 4' tall) Status of Sapling Regeneration - *moderate*	sugar maple, red maple, hophornbeam, black birch, American beech, serviceberry, yellow birch, dogwood, mixed oaks
Seedling (< 1" diameter, < 4' tall) Status of Seedling Regeneration – *sparse*	mixed oaks, American beech, yellow poplar, white ash, black birch, hornbeam
Ground Vegetation (average % percent cover across stand) (*Ground vegetation ranges from moderate to dense)*	**Native (17%)** *Dominant* – ferns (14%), warm season grasses (3%) *Other* – rubus blackhaw viburnum, wild strawberry, wintergreen, maple leaf viburnum, sedge, patridge berry, hog peanut, may flower, white snake root, lowbush blueberry, witch hazel, spice bush, cleavers, other native forbs **Non-native (15%)** *Dominant* - Japanese barberry (9%), autumn olive (3%), Japanese stilt grass (3%) *Other* – multiflora rose, winged euonymus
Vines (% of trees containing vines) *(vine competition is sparse)*	**Total (<1%)** Oriental bittersweet, grape (<1%)

Stand photos depict a portion of Stand B that is representative of the stand as a whole and aim to capture the most common tree species and ground vegetation within the stand, as well as accurately portray the average stocking level found across the stand.





The overall quality of Stand B is average. Many of the overstory trees consisting of the black birch and mixed oaks are considered Acceptable Growing Stock (AGS). About 40% of the stems in the midstory consisting of the black birch and maples were considered Unacceptable Growing Stock (UGS) stems. Many of the suppressed trees contain some sweep and slower growth rates.

Overall, the stand health within Stand B is average. A few overstory oaks have been weakened over the years from spongy moth defoliations. Spongy moth egg mass counts are currently on the rise and the stand may be negatively impacted by the caterpillars in the upcoming growing season. The scattered white ash within the stand was found to be in sharp decline or already dead as a result of the ongoing EAB infestation. A portion of the overstory American beech within the stand was found to contain beech bark disease and beech leaf disease which negatively impacts the health of the large trees and causes excessive suckering. Some of the black birch was found to contain nectria canker which can be removed through continued FSI. The majority of the overstory contains little to no signs of disease.

The vigor of the trees within Stand B is increasing throughout much of the stand. As FSI, vine cutting, and invasive brush spraying is continued throughout the stand, the vigor will likely remain increasing into the future.

Storm damaged trees were observed frequently throughout Stand B. Many broken limbs and crowns as well as fallen trees were present in the stand. The recent damage likely occurred during early snow and ice events as well as high wind events in the last two years. Historical storm damage that has become unsalvageable over time likely occurred during Hurricane Sandy in 2012. There was no other evidence of damage causing agents observed during the inventory.

Stand B contains average biodiversity within the overstory, midstory, and understory. Hardwood regeneration is very sparse within the stand, but this is average compared to many other properties in this area. This can be attributed to shading from the overstory, severe deer browse, soil constraints, and the presence of non-native Japanese barberry and Japanese stilt grass.

B) Stand Objectives, Measurable Parameters, and Prescriptions

No specific prescription will be carried out within Stand B during the plan period. The landowner may treat some of the invasives each year if time permits. Additionally, the landowner may harvest white ash trees for firewood which will suffer mortality from the impending arrival of EAB. Lastly, the landowner may install wildlife boxes to further promote biodiversity on the property.

If conditions warrant management or the landowner's goals for this stand change, a revision will be made to this plan prior to the implementation of any activities.

The landowner will document any executed treatments on the annual WD-1 form and in the *'Journal of Forest Management Activities'* (*NOTE: journal can be found in the back sleeve of the plan notebook; landowner is encouraged to take progress photos along the way).* The forester and owner will inspect the area in year 9 of this plan to consider if management will be required during the next 10 year plan cycle. The inspection will consist of a thorough walk through of the stand by the forester who will make estimates of certain forest data and when appropriate a prism will be used to estimate basal area. These findings will be recorded on the monitoring spreadsheet.

General Forest Stewardship Recommendations to consider within the stand:

- create and maintain access trails to improve access
- salvage storm-damaged, standing dead, or fallen trees
- proactively harvest white ash trees before infestation of EAB
- create wildlife brush piles from treetops and tree branches (*1-3 per acre*)
- treat any occurrence of non-native invasive shrubs (*mechanically and/or with herbicide*)
- cut any occurrence of vines found growing in trees
- treat any occurrence of non-native Ailanthus (*mechanically and/or with herbicide*)
- place nest boxes at various locations
- shelter natural regeneration of native species (*emphasis on hardwoods*)

Description of Un-Inventoried Forested Stand(s)

Stand CFW encompasses approximately 3.17 +/- acres of the property. It occupies an area in the northeastern portion of the property characterized by extremely wet soils (*see Forest Stand Map which accompanies this report within Appendix B*). Historically, the area occupied by the stand always contained wet soils and was likely used as pasture or not utilized at all.

The overall quality of Stand CFW is average when compared to other forested wetland stands. The red maple, mixed oaks, and birch within the stand were found to be average in quality and health.

Stand CFW has not been managed recently due to limited access. The wet soils within the stand hinder machinery or even hand tools from effectively working within the stand.

Description of Unforested Areas on the Property

NOTE: The NJ Forest Service does not monitor the use of any acreage outside of woodland acres (referred to as Non-Appurtenant Woodland on the FA-1). Therefore, the NJ Forest Service has neither reviewed nor approved anything in this portion (Description of Unforested Areas) of the plan. The acreages listed in the descriptions below were derived during the inventory process. These numbers could fluctuate depending on landowner activities so they should be considered as simply estimates.

Open Water

Approximately 6.80 +/- acres of the property is represented by open water. These open water acres are comprised of two ponds. The pond in the northeastern portion of the property is known as Straders Pond, while the other pond in the central portion of the property is unnamed. These ponds are freshwater ecosystems which provide habitat for a host of wildlife species during different stages of life, including several threatened and endangered species that have been documented on or near the. Besides supporting certain T&E species there are a variety of other fish, birds, insects, amphibians, and crustaceans that utilize these bodies of water. Additionally, certain rare and endangered plants are supported by the ponds.

General Information on Forest Management Recommendations

Management of this property over the next ten years will be concentrated on some or more of the following - salvage of storm damaged trees, forest stand improvement (FSI) work, non-native plant control, prescribed burning, tree planting, protections of natural regeneration, and access establishment and maintenance. A variety of wildlife management practices can be accomplished in the course of carrying out FSI and other forestry practices. *Also, periodic marking of property lines is a forest management priority as it is required in order to maintain farmland tax abatement*.

The text which follows provides information on the various forest management practices that are available to ownership during the period covered by this plan.

Forest Stand Improvement (FSI)

Forest Stand Improvement (FSI) involves the harvest of poor quality, suppressed, and diseased trees and trees of undesirable species in order to improve tree species composition, enhance visual aesthetics, preserve and improve wildlife habitat, reduce the incidence and chance for the spread of harmful tree disease, and enhance the diameter growth rates of vigorous, high quality (AGS) trees. *NOTE: at any point in the course of the ten years that this plan covers, salvaging downed and damaged trees is an acceptable activity and a recommended practice as long as the removal and felling can be performed safely.*

It is estimated that five years can be spent on the silvicultural improvement of a five acre area. When marking the FSI, the forester will need to be very mindful of any accessibility issues created by rock outcropping, steep slopes, wetter soils, and/or open water. These harvesting activities will provide firewood that may be necessary to qualify the property under the farm income provision of the Farmland Assessment Act.

FSI will be aimed at enhancing forest health and tree species composition, as well as improving the environment for the establishment and development of natural hardwood regeneration. Undesirable species such as red maple, diseased black birch, and hophornbeam (ironwood), as well as unhealthy ash and oak, will be discriminated against in order to encourage the growth and development of desirable mixed upland oaks, hickories, sugar maple, yellow poplar, and healthy black birch. Of course, no singular species will be discriminated against to a point where it is completely eliminated from the stand. Plenty of high quality individuals of all species will be retained in order to preserve current tree species diversity. Additional benefits will result from FSI work. Visual aesthetics will be enhanced, and the incidence and chance for the spread of harmful tree disease will be reduced.

FSI will concentrate mostly on smaller diameter trees (<14" DBH), but occasional poor quality larger diameter trees will also be removed, unless the trees provide wildlife habitat, in which case they will be marked for preservation. In the course of executing FSI, invasive vines should be severed wherever they are found to be in competition with high quality 'crop trees'. However, if native grape vines are growing in poorly formed or dead trees, they can be allowed to remain on the site so as to continue to provide wildlife food. In addition to the thinning activities and vine control, non-native brush control will be of importance in the FSI program. Non-native plant control will be discussed in detail in a later section of the report.

For further information on FSI, visit our website –
http://www.ridgeandvalleyforest.com/forest-stand-improvement.html

Wildlife Management

The management recommendations set forth in this plan will result in the protection and enhancement of wildlife habitat. A significant amount of wildlife habitat improvement can be accomplished during the 10-year period covered by this plan.

FSI recommendations set forth in this plan will result in an enhancement of wildlife habitat by encouraging expansion of the crowns of acorn and nut producing trees (oaks and hickories). This will lead to increased fruit production, and by making food available from the tops of trees harvested. FSI will also contribute to wildlife habitat by creating small openings in the forest canopy that encourages growth on the forest floor.

Den and perch trees can be identified and preserved in the course of cuttings. Occasional trees marked for harvest can be 'girdled' rather than felled so that they may eventually serve as 'snags' that will be used by hawks and owls for hunting and perching, by cavity-nesting birds and mammals for denning and rearing young, and by insect-eating mammals and bark-gleaning birds for foraging. By 'girdling' some poor quality trees near the margins of open areas or along the power line right away, good habitat can be produced for foraging bats, hawks, and owls. As many as two to five trees can be 'girdled' per acre in certain areas of the woodlot. It is best if trees over a range of diameter classes are 'girdled'.

Brush piles can be created using the small diameter branches from the tops of marked trees and salvaged wind thrown trees. These piles can serve as temporary shelters for small mammals and woodland birds. Brush piles must be properly constructed and located if they are to be of maximum benefit. Larger diameter (6"+) material should be crisscrossed at the base of the pile, with smaller diameter branches piled on top. Piles should be as many as six feet high and fifteen to twenty feet or more across at the base. Brush piles are of greatest value when they are constructed on rocky ground or on top of stone walls. Brush piles would be of specific benefit on this property since white-tailed deer have browsed away some of the native woody ground vegetation which previously provided cover and nesting sites for an array of small mammals and birds. One brush pile for every one acre of woodland on the property would provide significant additional wildlife habitat.

In order to further enhance nesting opportunities for a number of wildlife species, artificial nesting boxes could be placed at key areas around the property. Screech owl boxes can be placed in trees 15'-30' up the trunk in a shady, south-facing location. Bat boxes can be placed in large trees in locations near any wetlands or open water sources. By encouraging bats in this way, the local mosquito population can be reduced. Wood duck boxes could be placed along any of the wetlands and/or streams within the property in areas containing slow moving open water. The property forester can provide ownership with nest boxes that are constructed in accordance with New Jersey Forest Service specifications, and can place boxes in the field at proper locations. Box construction specifications can also be provided by the property forester.

For further information on Wildlife Management, visit our website –
http://www.ridgeandvalleyforest.com/wildlife-management.html

Deer Management

The problems posed by deer have been mentioned previously, but bear repeating because of the profound negative effect they exert on the woodlands of the region. White-tailed deer are desirable as a wildlife species when present in numbers that can be supported by the environment. But this species is very adaptable and resilient, and can exert a significant negative influence on the life cycles of many other species when present in numbers that cannot be sustained by the environment. The current local deer herd is large enough to have a significant detrimental influence on tree regeneration on this property. Newly established hardwood seedlings are heavily browsed by deer, and this threatens the long-term sustainability of the woodland. Very little hardwood regeneration is established in the woodlot. Some deer simply pass through the property on the way from one area to another, feeding on whatever can be found along the way. But there is also a resident deer population which spends significant time on the property. The impact of white-tailed deer is also resulting in a reduction in habitat for other wildlife species. An effective way to counter these trends is to implement a quality deer management (QDM) program that concentrates on harvesting antlerless (female) deer. This will have the long-term effect of balancing the buck-to-doe ratio, leading to a genetically stronger and better-balanced herd, as well as a reduced birth rate.

Non-Native Plant Management

Non-native plant species are considered to pose a significant biological threat in this region of the country for a number of reasons. Perhaps the most important of which is that they tend to replace native species in the environment, thereby upsetting native predator/prey relationships.

Over the next 10 years, ownership will have a good opportunity to reduce the current abundance and control the further spread of invasive plants. Fortunately, these plants can be controlled rather easily by mechanical and/or chemical means. Control can be gained by removing individual plants mechanically by the roots, but this is a labor-intensive process. Spraying Japanese barberry and multiflora rose with a 3% solution of Roundup (glyphosate) herbicide with a spray adjuvant added to the tank mixture can result in a high degree of control. Perhaps the best way to control non-native shrubs is to cut the shrubs early in the growing season, then spray the re-sprouted plants late in the growing season or the following growing season with a

post-emergent herbicide. A much higher degree of control is obtained by spraying smaller re-sprouted plants, and the volume of herbicide used is much lower than if larger uncut shrubs are sprayed. According to the manufacturers, when its instructions are followed, Glyphosate is an environmentally safe herbicide; it is a plant enzyme inhibitor – it does not affect insects, birds, or mammals. But it must not be applied on or near open water bodies. If herbicide is not used as a control measure, non-native plants will have to be periodically re-cut until the sugar reserves in the root systems are finally exhausted and the plants 'give up' and die. *NOTE: when using any herbicide, caution must be taken by the user and the instructions on the label must be followed.*

Non-native vines should continue to be cut where ever found. Cutting vines helps release crop trees, producing more shade to compete with the vines. Applying herbicide (glyphosate) to cut vines as described above, on non-native shrubs, is an affect measure as well.

It is recommended that a non-native and invasive plant control program be incorporated into this management program. Such a program can be successful in containing the spread of these plants, and gradually reducing their abundance and the potential for seed dispersal. There is no need to establish a formal framework for such a program, or to prioritize areas of the property for treatment. Non-native shrubs and vine can be cut wherever they are encountered on the woodlot, either in combination with TSI work, or as a separate forestry activity.

For further information on Invasive Species, visit our website –
http://www.ridgeandvalleyforest.com/invasive-species-control.html

Reforestation

Reforestation can occur naturally or through artificial means managed by people. Natural reforestation occurs without human intervention and is the most common method of regrowth a forest will have experienced throughout its history. This regrowth is often referred to as natural regeneration. Most of the forests that we view here in Northern NJ came into existence through natural regeneration. The other method of reforestation happens artificially and involves the physical planting of trees in an effort by humans to assist the forest in regrowing. This method of reforestation can simply be referred to as artificial reforestation.

There are several obstacles that have presented themselves in recent times which have stymied the forest's ability to naturally regenerate itself. The suppression of fire in our forests has eliminated one of the main naturally occurring phenomena that created a disturbance within the forest which promoted natural regeneration. Many forests are overstocked and therefore seedlings don't receive enough sunlight and don't have space to grow, which curbs the opportunity for natural regeneration. More and more, invasive species are becoming a major presence on many properties and if left unmitigated, these invasive species will almost completely choke out natural regeneration. Lastly, the presence of high deer populations leaves natural regeneration vulnerable to repeated browsing which can prevent the seedling from ever growing to sapling size. If they do manage to grow beyond the seedling stage, regularly browsed saplings are typically malformed. For these reasons and more, natural regeneration often struggles to gain traction throughout Northern New Jersey.

In light of the issues affecting natural regeneration, artificial reforestation should be considered. Artificial reforestation involves the planting of seedlings within the existing forest to encourage vigorous growth of the forest into the future. Multiple-aged forests which are also high in diversity withstand damage-causing agents such as disease, pests, and storms better than single-aged forests with less diversity. Typically, artificial reforestation is accomplished through planting well-established seedlings in prepared areas free from invasive brush and vine pressure where more light tends to be available on the forest floor. Choosing well-prepared sites will help ensure the seedlings' success.

In addition to reforestation, afforestation should be considered on properties where the eventual goal is increased forested acres. Afforestation is the process of artificially changing non-forested land into forest by planting and maintaining seedlings. The succession of land from open acres to forested acres as land is abandoned from agriculture, faces the same challenges as natural regeneration; if things are allowed to occur naturally in these locations, invasive species will almost always lay hold of these areas and prevent a future forest from becoming established on these sites. In these situations, it is important to create conditions where desirable tree species can become the dominant vegetation on the landscape and lead to the establishment of a healthy and diverse forest.

Prescribed Fire (RxB)

As previously described in this plan, natural wildfires have been part of the landscape for thousands of years, even in upland hardwood forests. The most recent scientific literature estimates that fire frequency in northern NJ was somewhere between 10-20 years intervals. Although seemingly counterintuitive, the presence of a natural disturbance like wildfires can have positive, long-term effects on forested ecosystems. Low to moderate intensity fires help to maintain or promote structural heterogeneity, increase species diversity, and allow for important nutrient cycling into the soil.

Prescribed fire (RxB) is a management tool currently being incorporated by foresters and landowners throughout the state to meet management objectives. Legislation was passed in NJ in 2018 known as the *Prescribed Burn Act* which codified the limit of liability for landowners operating under an approved prescribed burn, memorialized landowner's rights to prescribed burns, strengthened protections for practitioners, and expanded acceptable uses of prescribed fire to include forestry and ecological needs.

The New Jersey Forest Fire Service (NJFFS) is a resource that can be engaged and utilized for relatively low costs to help private landowners plan and administer RxB activities on a property. RxB can be used to control heavy non-native plant infestations, mimic light thinning practices, and/or promote the establishment and perpetuation of desired tree species such as oak and hickories.

Additional information about RxB through NJFFS can be found at -
https://www.state.nj.us/dep/parksandforests/fire/aboutus.html

Additional information on the history of fire on the landscape and the benefits of prescribed fire can be found in the following publication produced by the US Forest Service - **https://www.nrs.fs.fed.us/pubs/46252**

Management Schedule / Productivity Statement

Year	Stand(s)	Activity	Extent (Acres)	Prescription Goal (measurable)
2024–2034	All	Periodically re-mark all property boundaries with posters and/or long-lasting paint.	All	-
2024–2034	All	Create new access and/or maintain woodland access on existing roads and trails	All	-
2024–2034	A	Control non-native shrubs	5 *(annually)*	Reduce to <1%
2034	All	Prepare new 10 year plan *(includes new inventory, new mapping, and new forest management prescriptions)*	All	-

*Changes may be made after consultation between the landowner and forester. This may occur as the result of change in ownership objectives, insect infestation, disease, storm damage, etc.

**If necessary, sufficient income to apply toward the requirement for Farmland Assessment will come from the sale of firewood, saw timber, and possible other forest or agricultural products.

Appendix A

COMPREHENSIVE INVENTORY FOR
STAND A-1 52.30 +/- acres

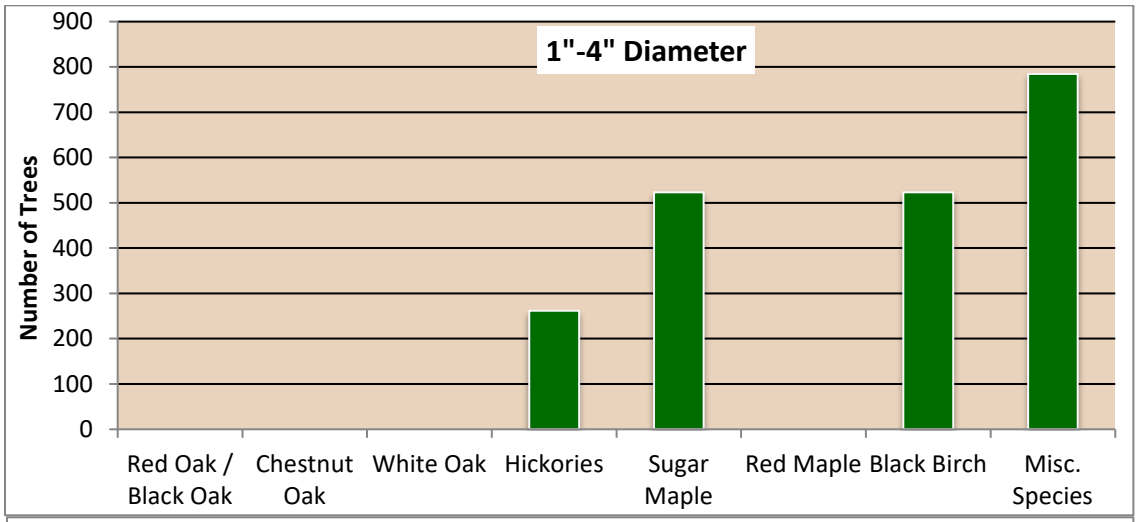
1. Number of Trees

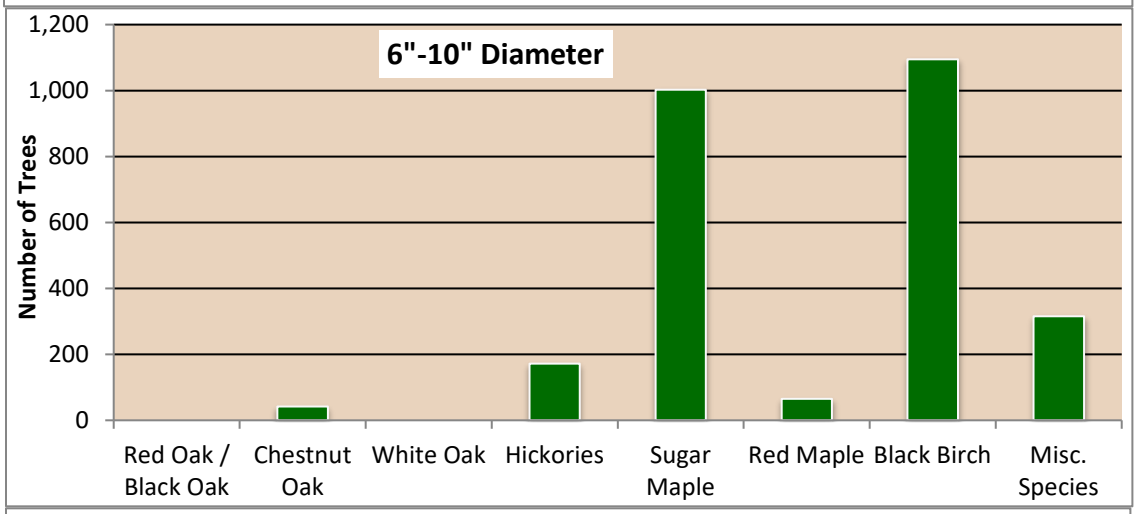
The following is an estimate of the number of 1" diameter and larger trees within the wooded stand, by species and size class. Sizes are reported in diameters at breast height (DBH).

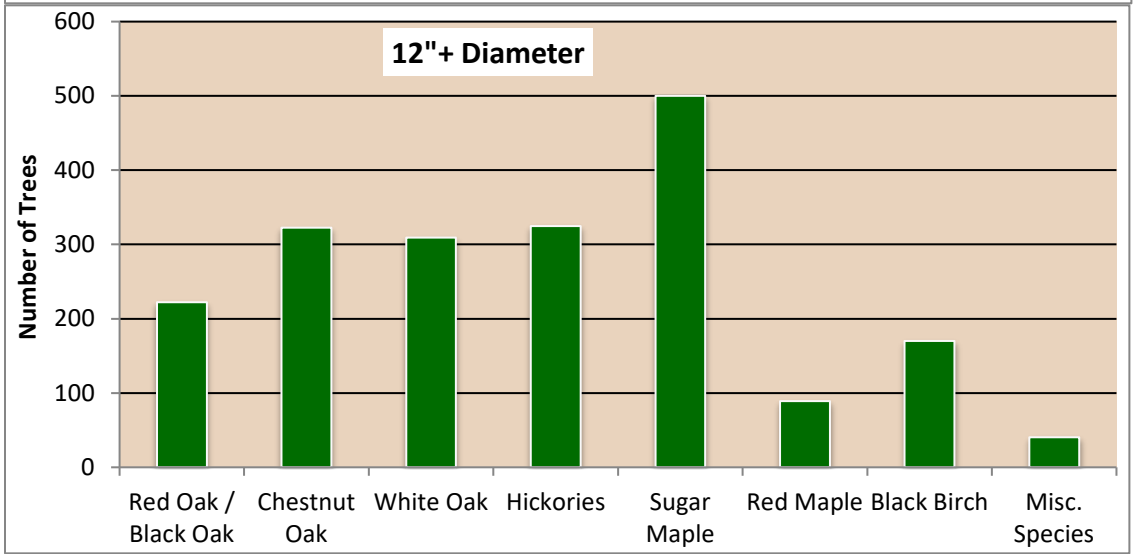
	Size Class				
Species	**1-4"**	**6-10"**	**12-14"**	**16"+**	**Total**
Red Oak / Black Oak	---	---	64	159	222
Chestnut Oak	---	42	100	222	364
White Oak	---	---	85	224	309
Hickories	262	172	164	161	758
Sugar Maple	523	1,003	265	236	2,026
Red Maple	---	65	71	18	154
Black Birch	523	1,095	79	91	1,788
Misc. Species	785	315	---	41	1,140
Total	**2,092**	**2,692**	**829**	**1,150**	**6,762**

Average number of trees per acre 129
Average tree diameter (DBH) ..... 10.6”
Average total basal area per acre ..... 79 sq. ft.
Average stocking percent 68%

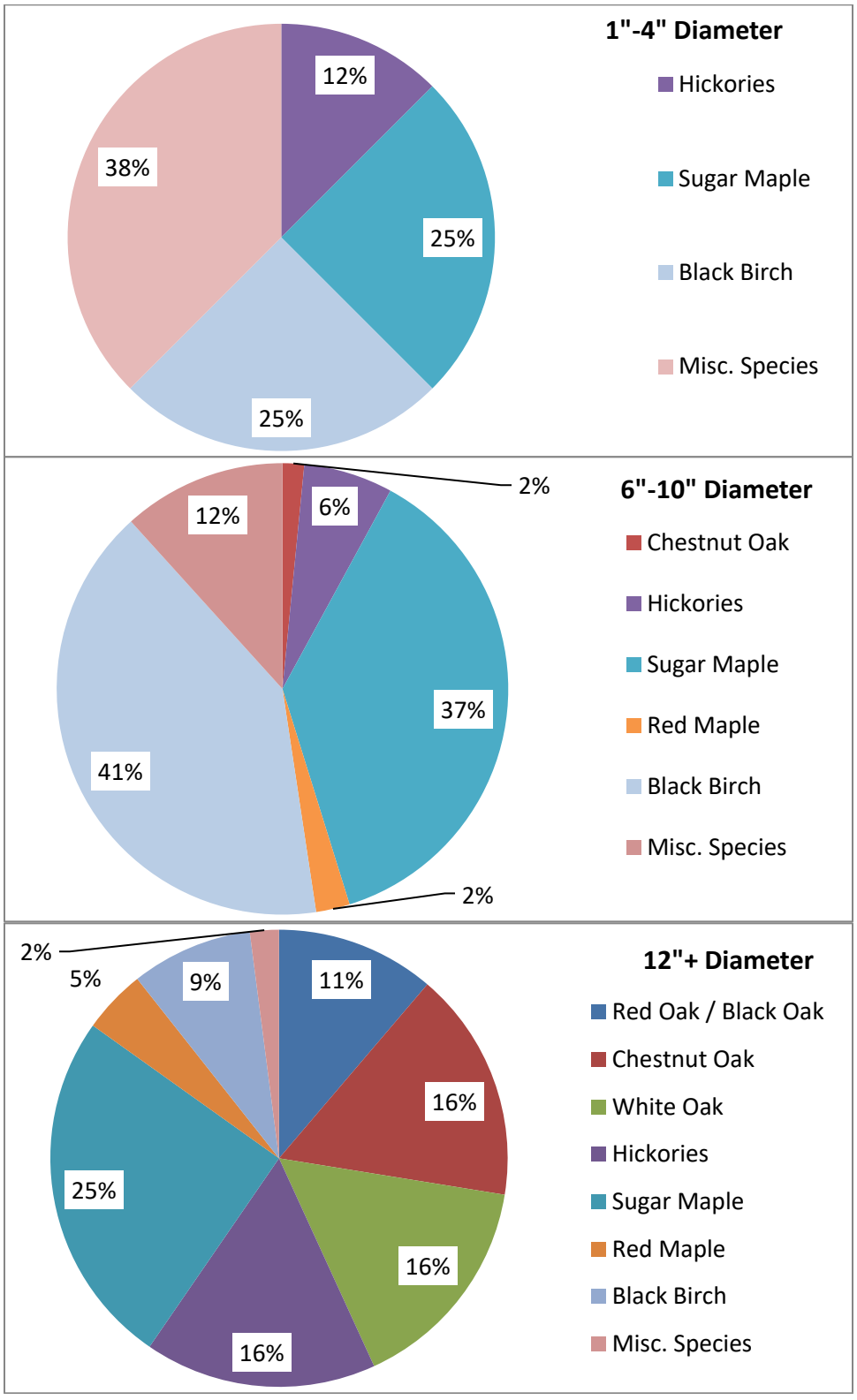
Graphic Representation of Number of Trees







Graphic Representation of Number of Trees – Percent Distribution



2. Timber Volume

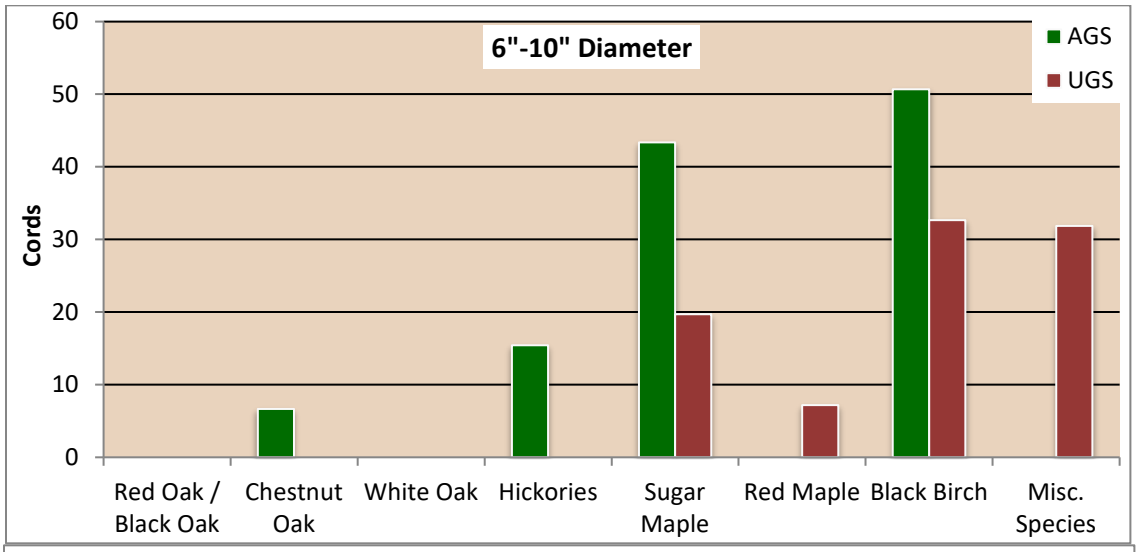
The following is an estimate of the total gross merchantable volume contained in trees on within the wooded stand, by species, size class, and quality. Volume is estimated by the Doyle Log Rule for trees of average form. Poletimber volume is reported in cords. Sawtimber volume is reported in board feet, and in cords (in parentheses).

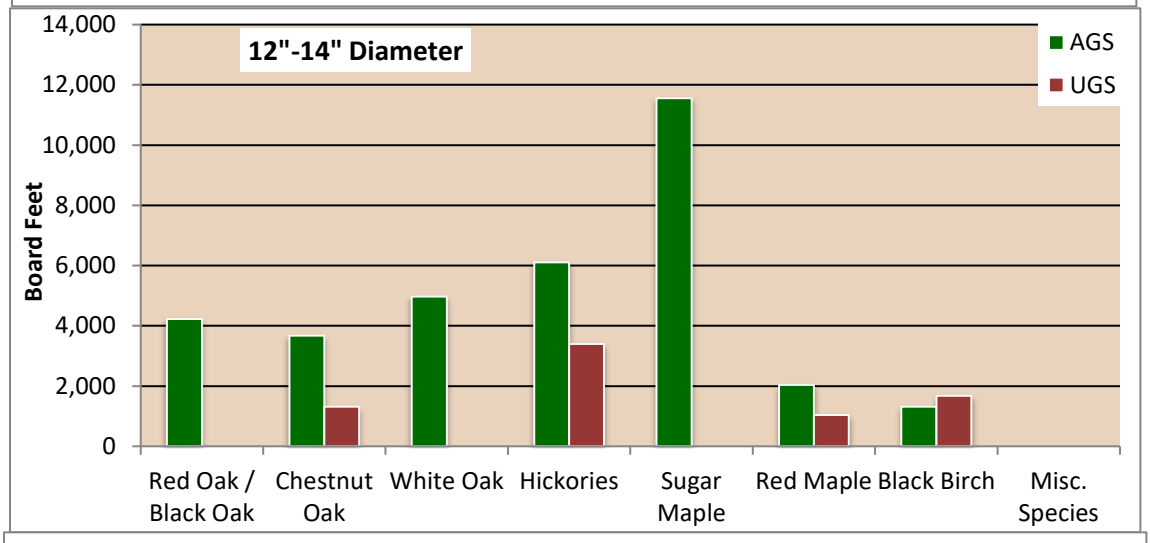
	---------- Size Class ----------							
	Poletimber		---------- Sawtimber ----------				Sawtimber Total	
	6-10"		12-14"		16"+			
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Red Oak / Black Oak	---	---	4,231	---	29,123	14,087	33,354	14,087
Chestnut Oak	7	---	3,679	1,318	11,013	24,270	14,692	25,589
White Oak	--	---	4,975	---	29,315	8,695	34,290	8,695
Hickories	15	---	6,102	3,402	18,314	7,641	24,415	11,043
Sugar Maple	43	20	11,556	---	30,513	3,959	42,069	3,959
Red Maple	---	7	2,041	1,042	3,967	---	6,008	1,042
Black Birch	51	33	1,318	1,679	10,236	---	11,554	1,679
Misc. Species	---	32	---	---	6,913	1,699	6,913	1,699
Total	**116**	**91**	**33,902 (291)**	**7,442 (69)**	**139,392 (807)**	**60,351 (319)**	**173,294 (1,099)**	**67,793 (388)**

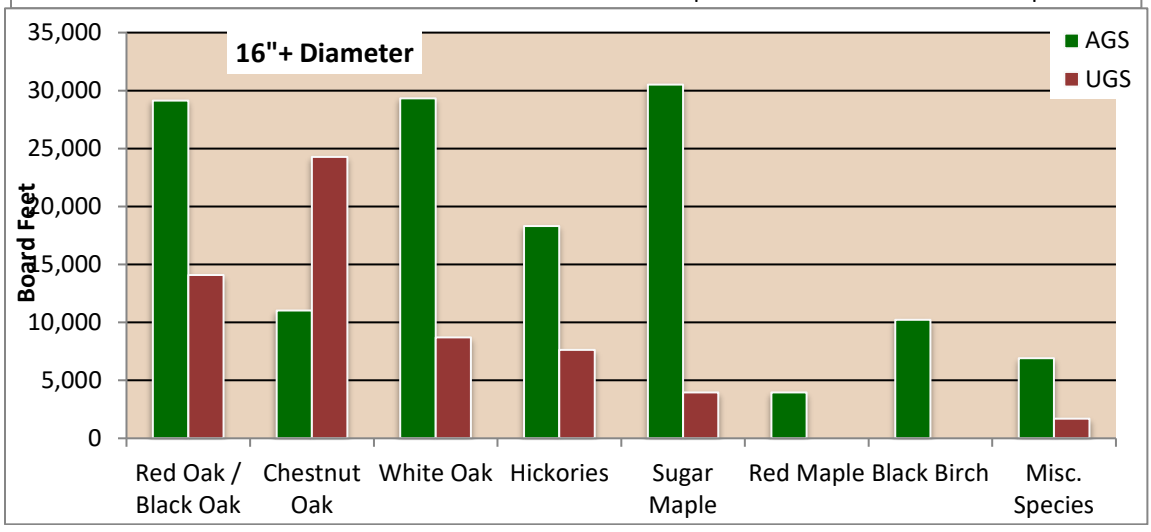
Average poletimber volume per acre ..... 4.0 cords
Average AGS poletimber volume per acre ..... 2.2 cords
Average UGS poletimber volume per acre ..... 1.8 cords

Average sawtimber volume per acre ..... 4,610 Bd.ft. (28.4 cords)
Average AGS sawtimber volume per acre ..... 3,313 Bd.ft (21.0 cords)
Average UGS sawtimber volume per acre ..... 1,297 Bd.ft (7.4 cords)

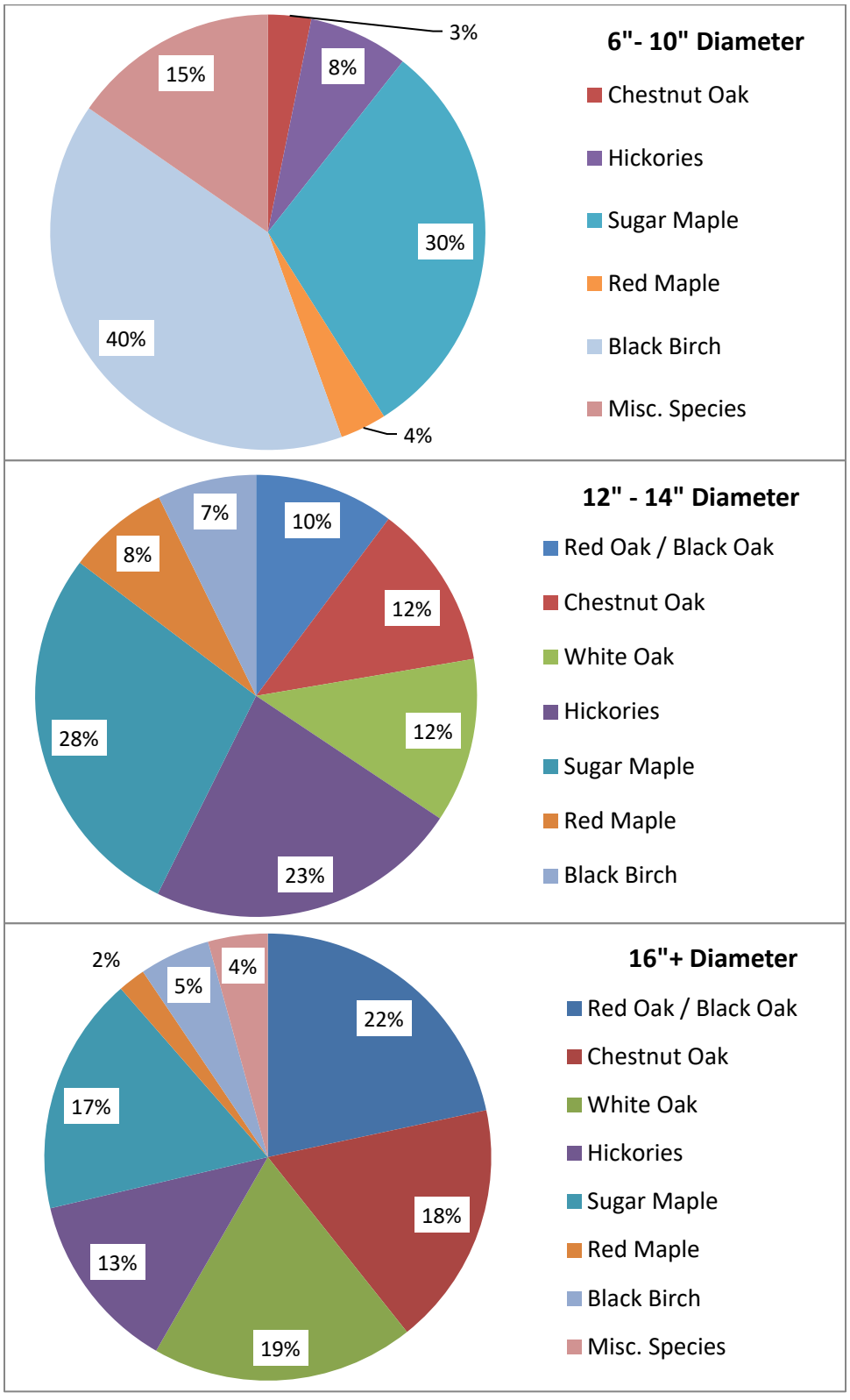
Graphic Representation of Timber Volume







Graphic Representation of Timber Volume – Percent Distribution



3. Timber Growth

The following is an estimate of the current annual growth of the trees within the wooded stand, by size class. Poletimber growth is reported in cords. Sawtimber growth is reported in cords, and in board feet (Bd. ft.).

Size Class	Current gross volume (cords)	Current gross volume (Bd.ft.)	Current annual growth rate (%)	Current annual growth (cords)	Current annual growth (Bd.ft.)
6 - 8"	158	---	2.0	3.2	---
10"	50	---	2.0	1.0	---
12"	105	10,519	2.1	2.2	221
14"	255	30,824	2.2	5.6	678
16"	247	41,803	2.0	4.9	836
18"	224	39,306	1.8	4.0	708
20"+	655	118,634	1.5	9.8	1,780
Total	**1,694**	**241,087**		**30.8**	**4,222**

Average current annual poletimber growth per acre ..... 0.08 cords
Average current annual AGS poletimber volume per acre ..... 0.04 cords
Average current annual UGS poletimber volume per acre ..... 0.04 cords

Average current annual sawtimber growth per acre..... 81 Bd.ft. (0.51 cords)
Average current annual AGS sawtimber vol./acre ..... 60 Bd.ft. (0.38 cords)
Average current annual UGS sawtimber vol./acre .....21 Bd.ft. (0.13 cords)

4. Graphical Representation of Average Timber Stocking

The graph below illustrates the current average level of timber stocking within the wooded stand. It is apparent that, on average, the woodland is *fully stocked*. This means that, on average, the inherent growth potential of the sites on which the stand is located is being fully utilized by the trees that are growing there. FSI, salvage work, timber harvesting, non-native shrub and vine control, restoration work, and/or tree planting can result in a further improvement of stand quality while maintaining a level of *full stocking.*

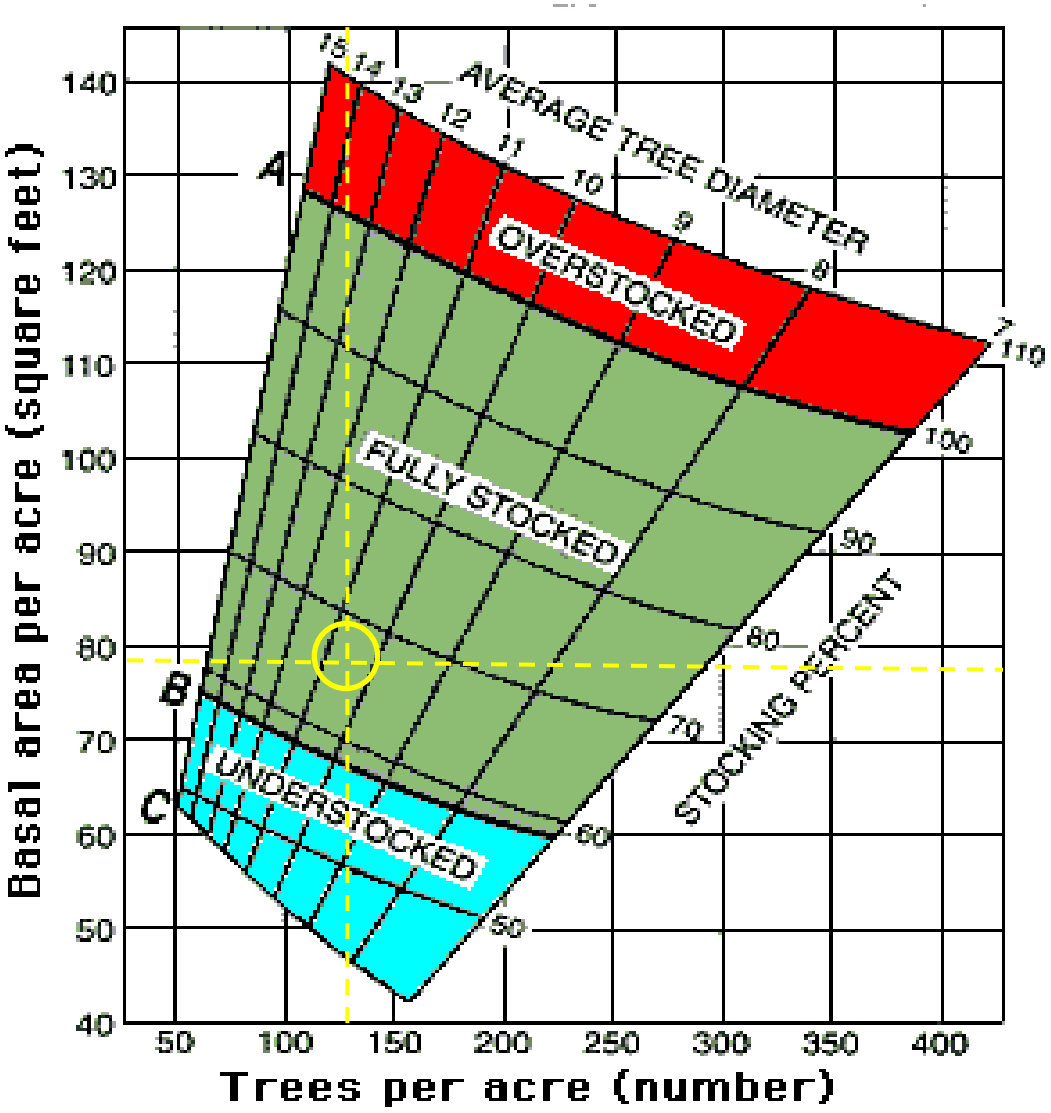


Figure – Relation of basal area, number of trees, and average tree diameter to stocking percentage for upland central hardwoods. The area between curves A and B on both charts indicates the range of stocking where trees can fully utilize the growing space. Curve C shows the lower limit of stocking necessary to reach the B level in the 10 years on average sites

From: Roach B.A., and S.F. Gingrich (1968). Even-aged silviculture for upland central hardwoods. USDA-FS Agric. Handbook 355.

COMPREHENSIVE INVENTORY FOR STAND B – 19.20 +/- acres

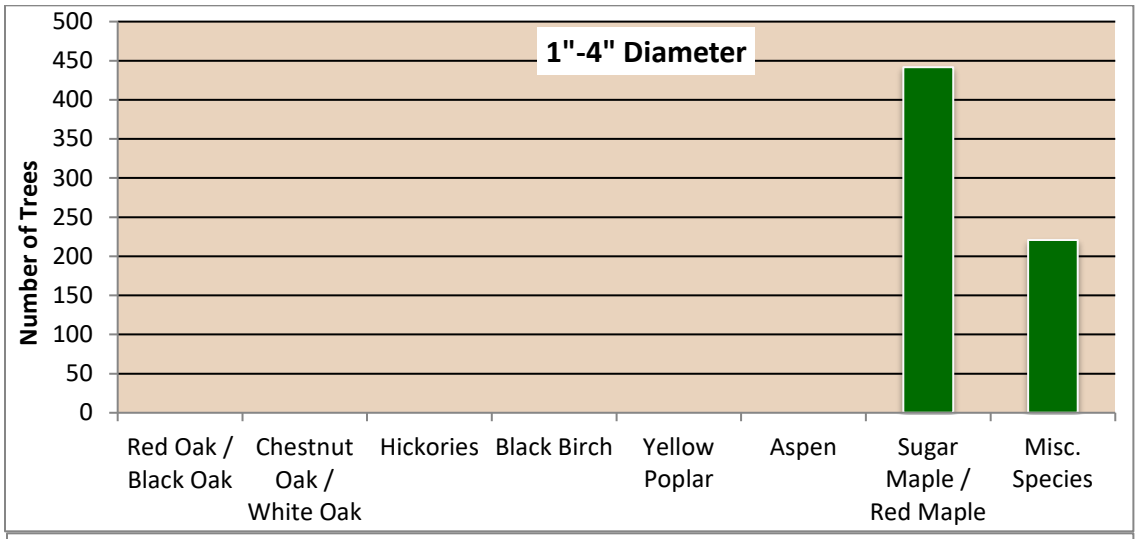
1. Number of Trees

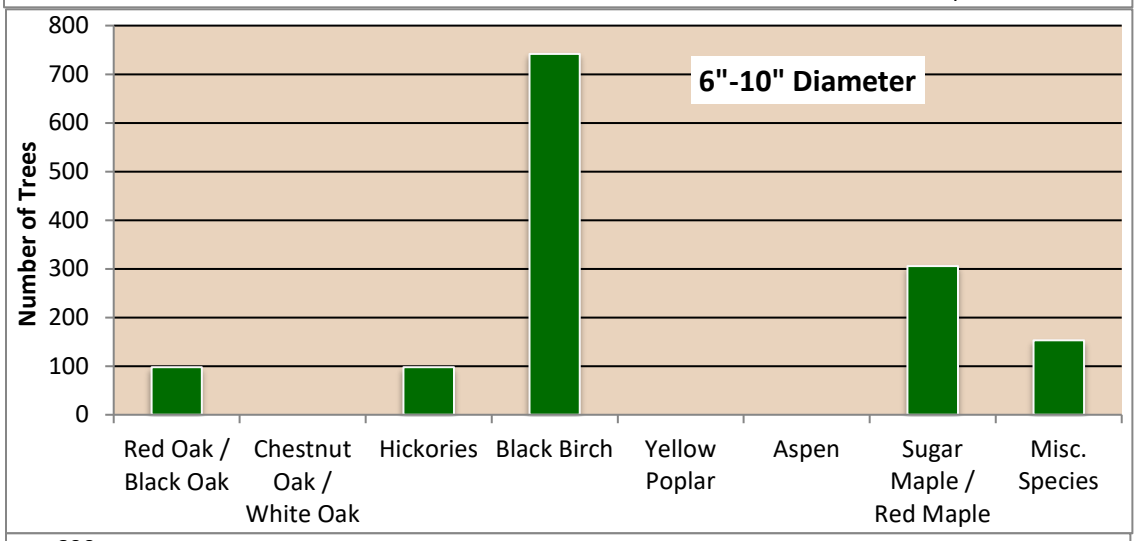
The following is an estimate of the number of 1" diameter and larger trees within the wooded stand, by species and size class. Sizes are reported in diameters at breast height (DBH).

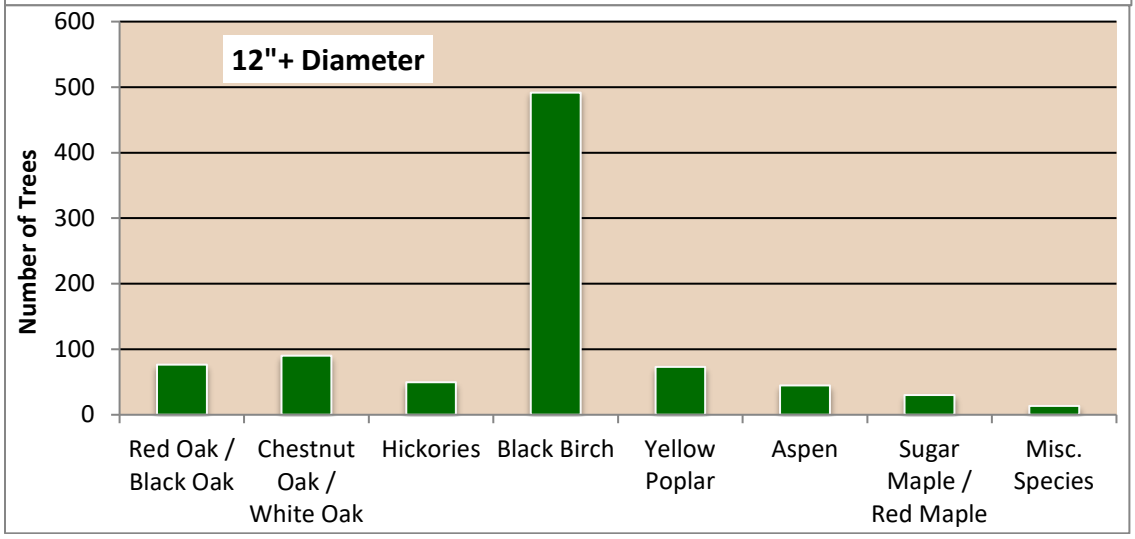
	Size Class				
Species	**1-4"**	**6-10"**	**12-14"**	**16"+**	**Total**
Red Oak / Black Oak	---	98	---	76	174
Chestnut Oak / White Oak	---	---	49	41	90
Hickories	---	98	36	14	147
Black Birch	--	742	382	110	1,233
Yellow Poplar	---	---	18	55	73
Aspen	---	---	18	27	45
Sugar Maple / Red Maple	442	306	18	12	777
Misc. Species	221	153	---	14	387
Total	**662**	**1,396**	**520**	**349**	**2,927**

Average number of trees per acre 152
Average tree diameter (DBH) ..... 10.6”
Average total basal area per acre ..... 93 sq. ft.
Average stocking percent 81%

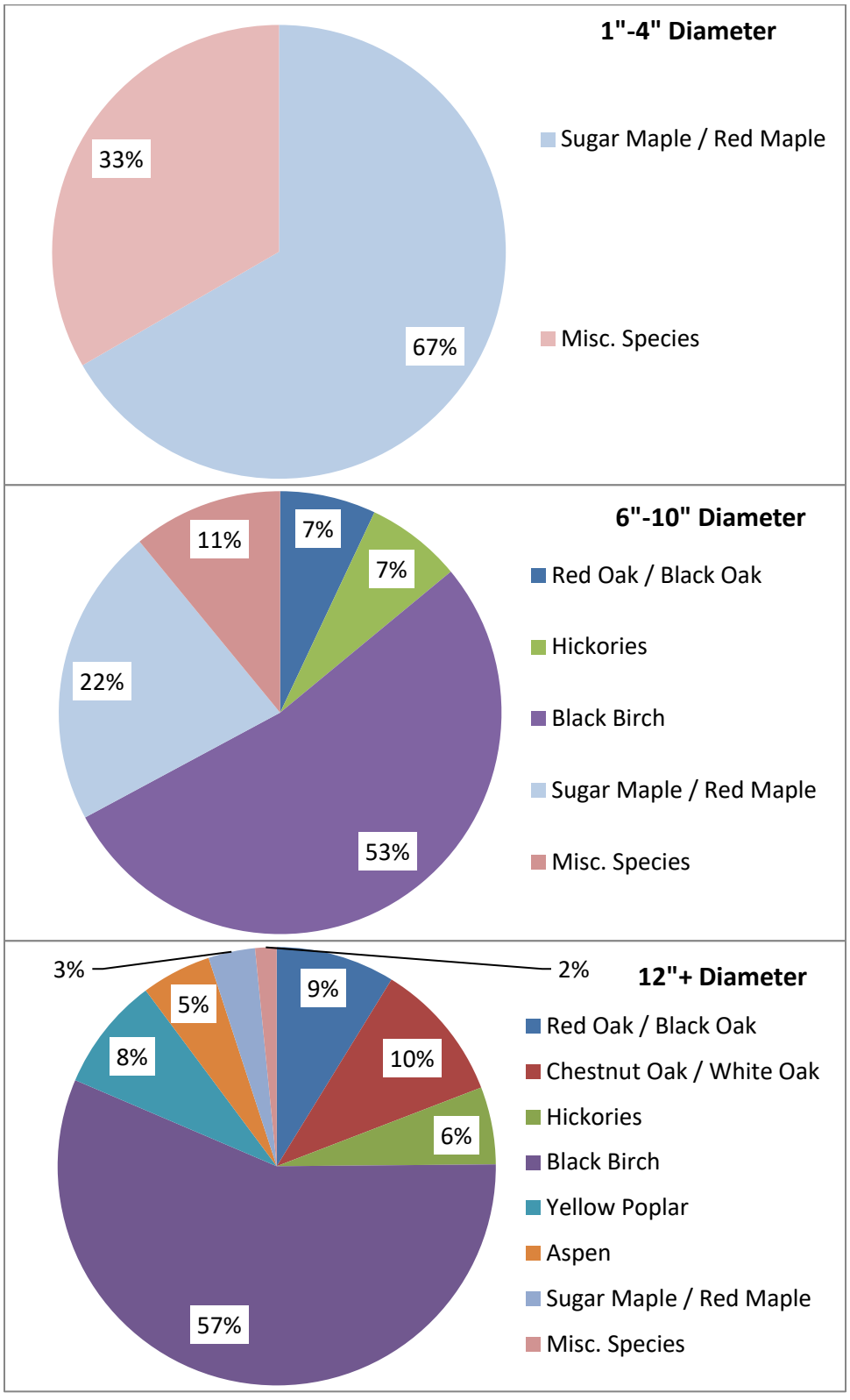
Graphic Representation of Number of Trees







Graphic Representation of Number of Trees – Percent Distribution



2. Timber Volume

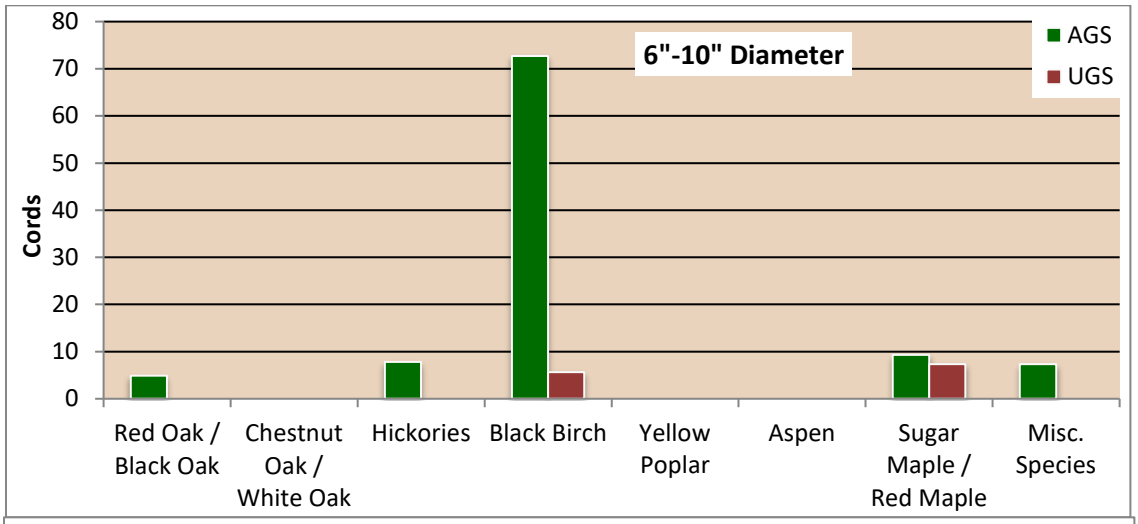
The following is an estimate of the total gross merchantable volume contained in trees on within the wooded stand, by species, size class, and quality. Volume is estimated by the Doyle Log Rule for trees of average form. Poletimber volume is reported in cords. Sawtimber volume is reported in board feet, and in cords (in parentheses).

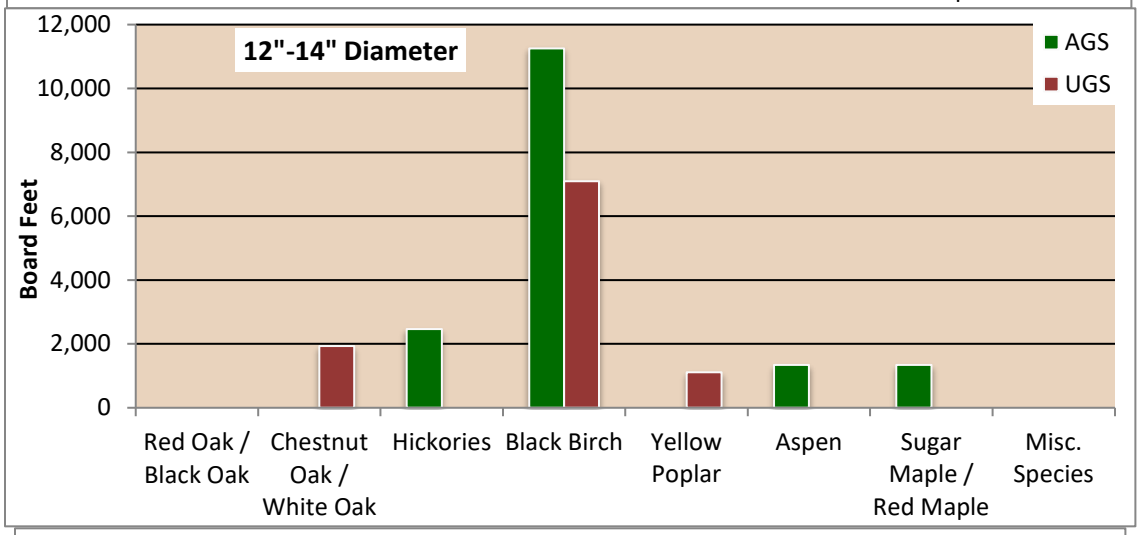
	---------- Size Class ----------							
	Poletimber		---------- Sawtimber ----------				Sawtimber Total	
	6-10"		12-14"		16"+			
Species	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**	**AGS**	**UGS**
Red Oak / Black Oak	5	---	---	---	16,787	3,567	16,787	3,567
Chestnut Oak / White Oak	--	---	---	1,931	---	12,199	---	14,130
Hickories	8	---	2,459	---	1,292	---	3,752	---
Black Birch	73	6	11,249	7,092	8,038	4,960	19,287	12,052
Yellow Poplar	---	---	---	1,113	14,879	6,799	14,879	7,912
Aspen	---	---	1,346	---	3,365	2,147	4,711	2,147
Sugar Maple / Red Maple	9	7	1,346	---	2,610	2,231	3,957	2,231
Misc. Species	7	---	---	---	---	1,292	---	1,292
Total	**102**	**13**	**16,401 (129)**	**10,136 (85)**	**46,972 (225)**	**33,194 (162)**	**63,373 (354)**	**43,330 (247)**

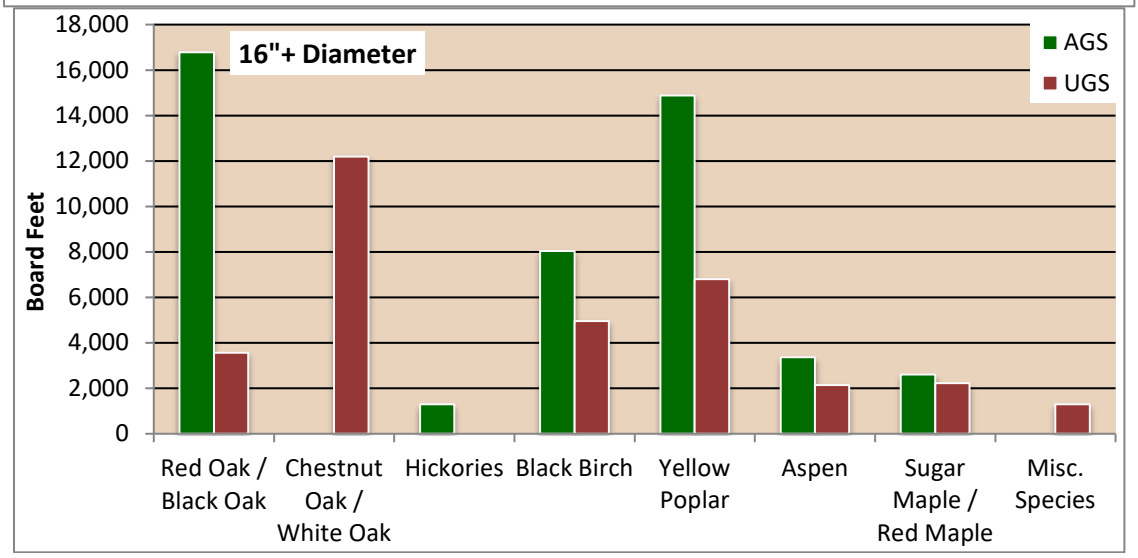
Average poletimber volume per acre ..... 6.0 cords
Average AGS poletimber volume per acre ..... 5.3 cords
Average UGS poletimber volume per acre ..... 0.7 cords

Average sawtimber volume per acre ..... 5,557 Bd.ft. (31.3 cords)
Average AGS sawtimber volume per acre ..... 3,301 Bd.ft (18.4 cords)
Average UGS sawtimber volume per acre ..... 2,256 Bd.ft (12.9 cords)

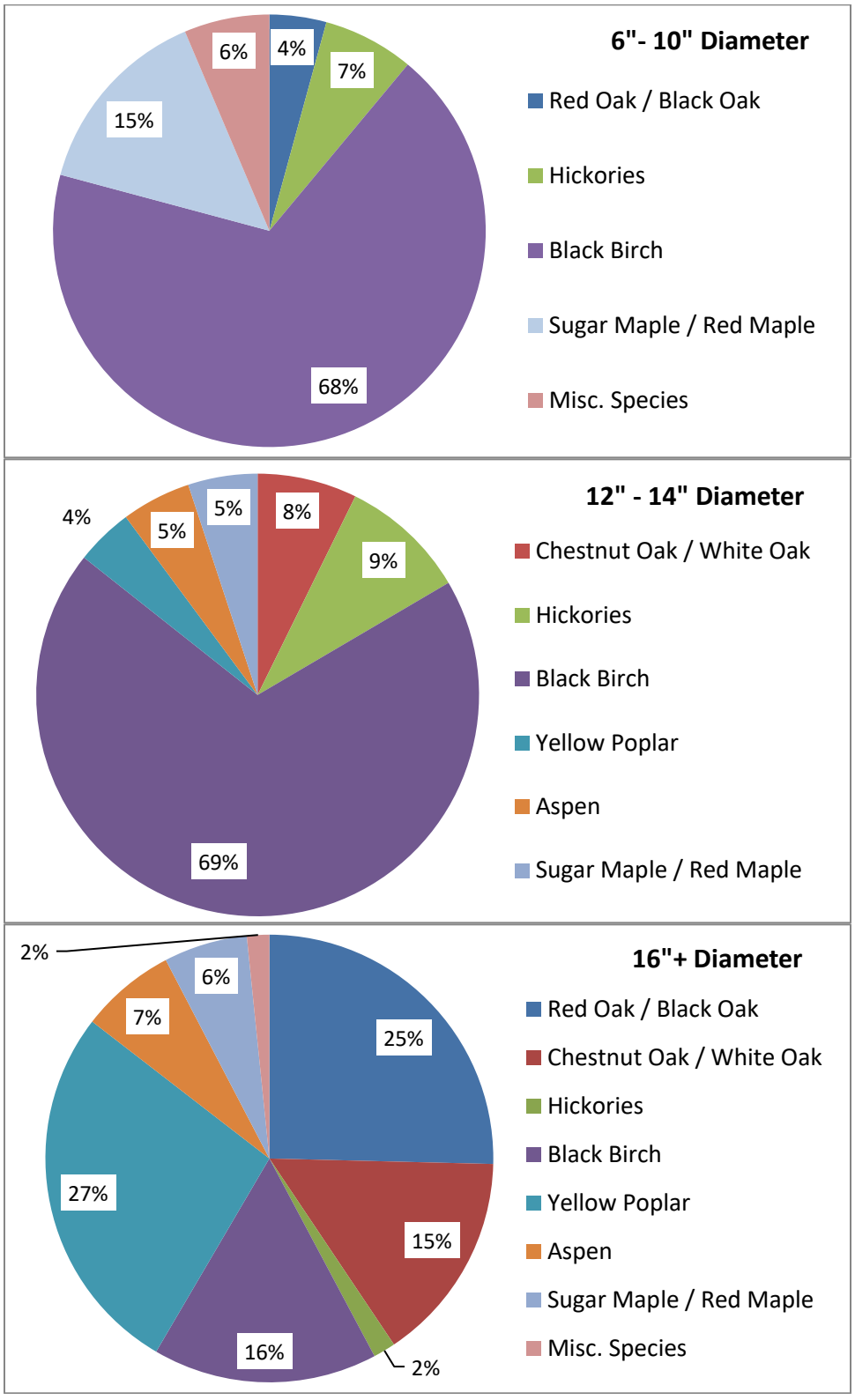
Graphic Representation of Timber Volume







Graphic Representation of Timber Volume – Percent Distribution



3. Timber Growth

The following is an estimate of the current annual growth of the trees within the wooded stand, by size class. Poletimber growth is reported in cords. Sawtimber growth is reported in cords, and in board feet (Bd. ft.).

Size Class	Current gross volume (cords)	Current gross volume (Bd.ft.)	Current annual growth rate (%)	Current annual growth (cords)	Current annual growth (Bd.ft.)
6 - 8"	81	---	2.0	1.6	---
10"	34	---	2.0	0.7	---
12"	89	10,021	2.1	1.9	210
14"	126	16,516	2.2	2.8	363
16"	56	9,348	2.0	1.1	187
18"	81	16,475	1.8	1.5	297
20"+	250	54,343	1.5	3.7	815
Total	**716**	**106,703**		**13.3**	**1,872**

Average current annual poletimber growth per acre ..... 0.12 cords
Average current annual AGS poletimber volume per acre ..... 0.11 cords
Average current annual UGS poletimber volume per acre ..... 0.01 cords

Average current annual sawtimber growth per acre..... 98 Bd.ft. (0.57 cords)
Average current annual AGS sawtimber vol./acre ..... 57 Bd.ft. (0.34 cords)
Average current annual UGS sawtimber vol./acre .....41 Bd.ft. (0.23 cords)

4. Graphical Representation of Average Timber Stocking

The graph below illustrates the current average level of timber stocking within the wooded stand. It is apparent that, on average, the woodland is *fully stocked*. This means that, on average, the inherent growth potential of the sites on which the stand is located is being fully utilized by the trees that are growing there. FSI, salvage work, timber harvesting, non-native shrub and vine control, restoration work, and/or tree planting can result in a further improvement of stand quality while maintaining a level of *full stocking.*

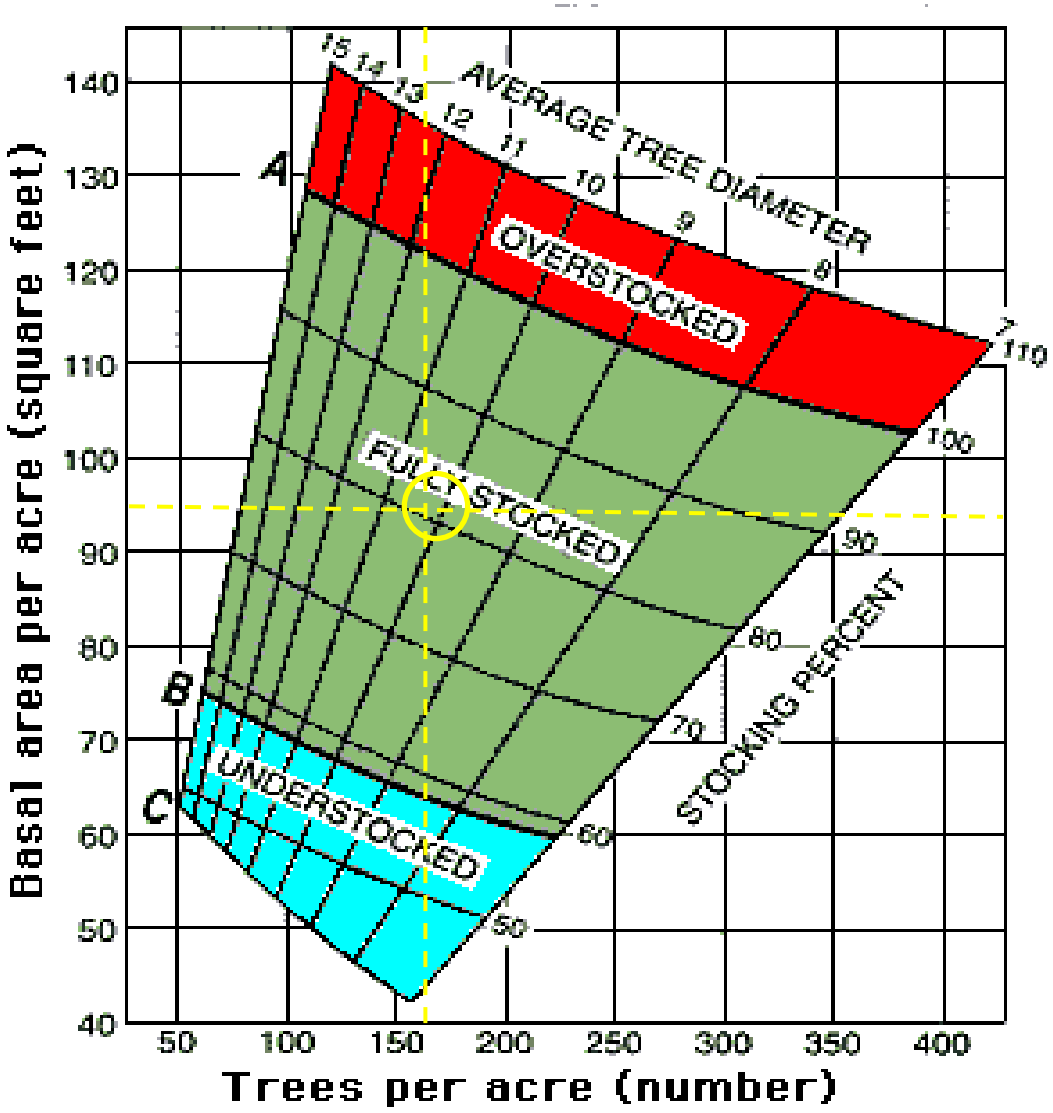


Figure – Relation of basal area, number of trees, and average tree diameter to stocking percentage for upland central hardwoods. The area between curves A and B on both charts indicates the range of stocking where trees can fully utilize the growing space. Curve C shows the lower limit of stocking necessary to reach the B level in the 10 years on average sites

From: Roach B.A., and S.F. Gingrich (1968). Even-aged silviculture for upland central hardwoods. USDA-FS Agric. Handbook 355.

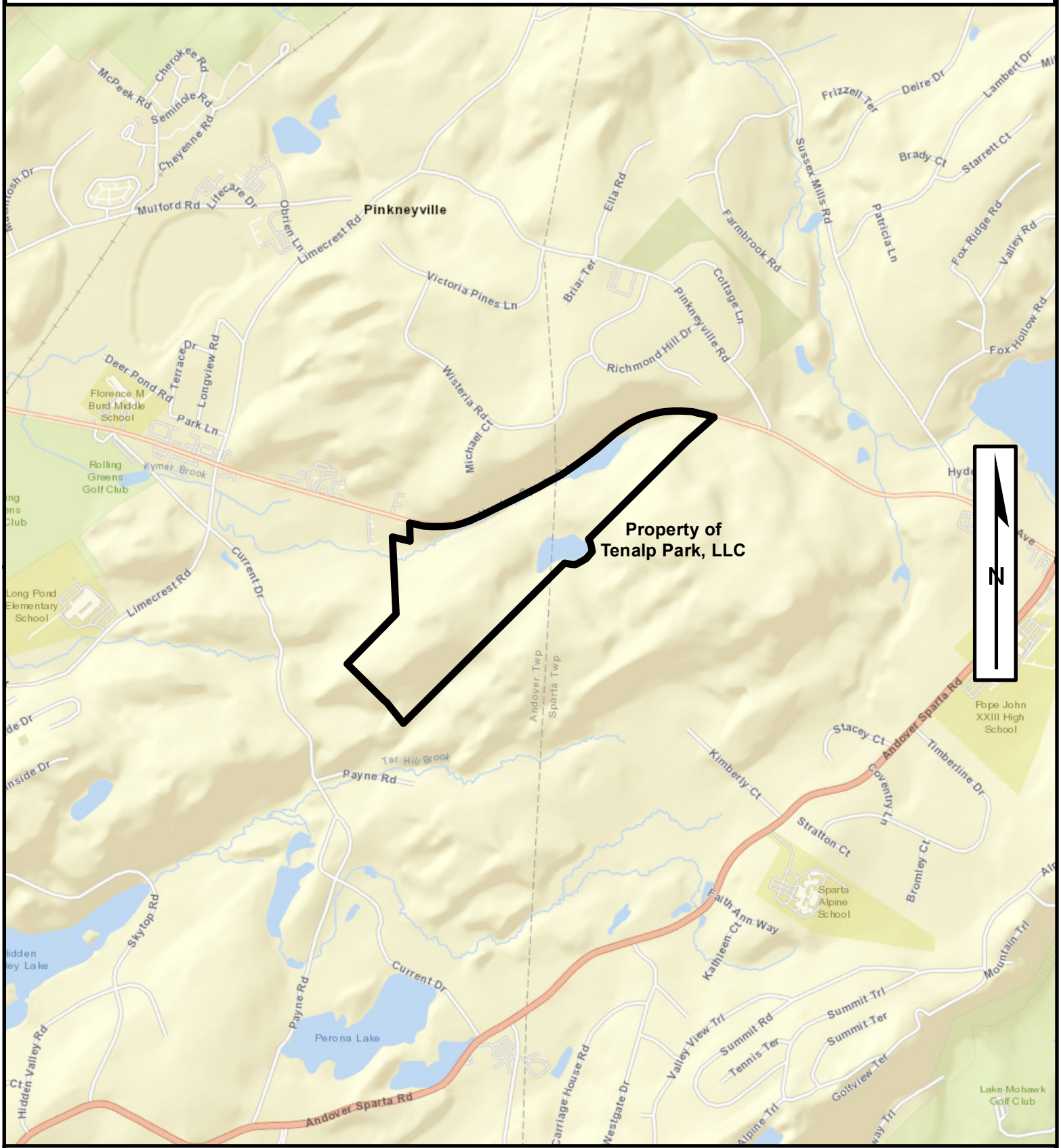
Appendix B

PROPERTY LOCATION MAP

Property of Tenalp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

September, 2024



***This map was developed to be used exclusively as part of a Woodland Management Plan or Forest Stewardship Plan**

*The property boundary was taken from a digitized tax map and may not be accurate; this is not a survey.

*This map was developed using the NJ Geographic Information Network (NJGIN)

*Any regulated areas and/or transition areas included on this map are based on information gathered from the NJ Geographic Information Network (NJGIN)

1 inch = 1,500 feet

0 750 1,500 3,000 feet

1930 AERIAL MAP

Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

September, 2024



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1 inch = 800 feet

0 400 800 1,600

feet

CULTURAL RESOURCES MAP

Property of Tenalp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover Block 103 / Lots 2 & 3.02 and Sparta Block 7001 / Lot 1

Total area = 108.12 +/- acres

September, 2024



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1 inch = 1,000 feet

0 500 1,000 2,000 feet

PARCEL MAP

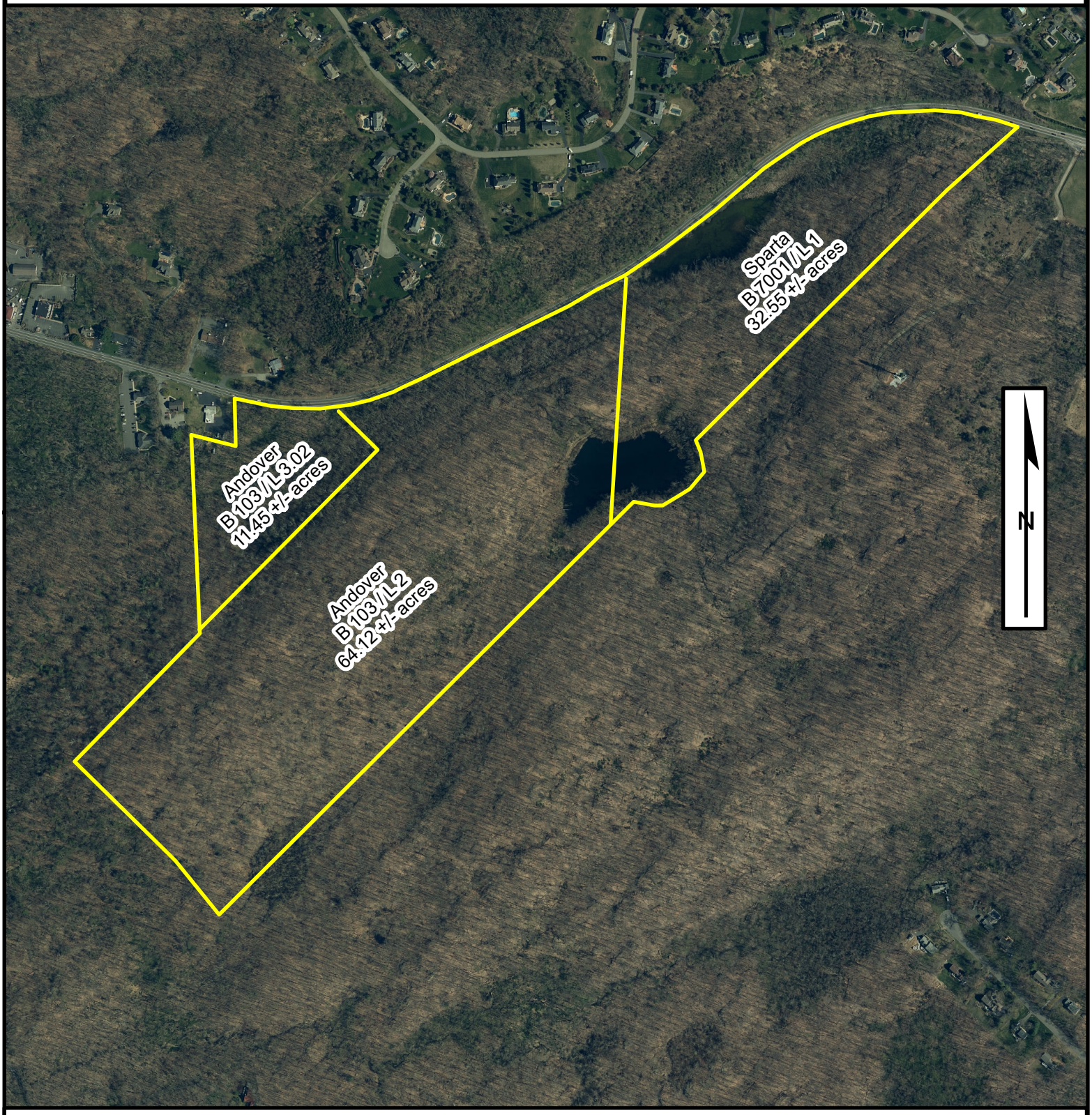
Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover Block 103 / Lots 2 & 3.02 and Sparta Block 7001 / Lot 1

Total area = 108.12 +/- acres

September, 2024



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1 inch = 600 feet

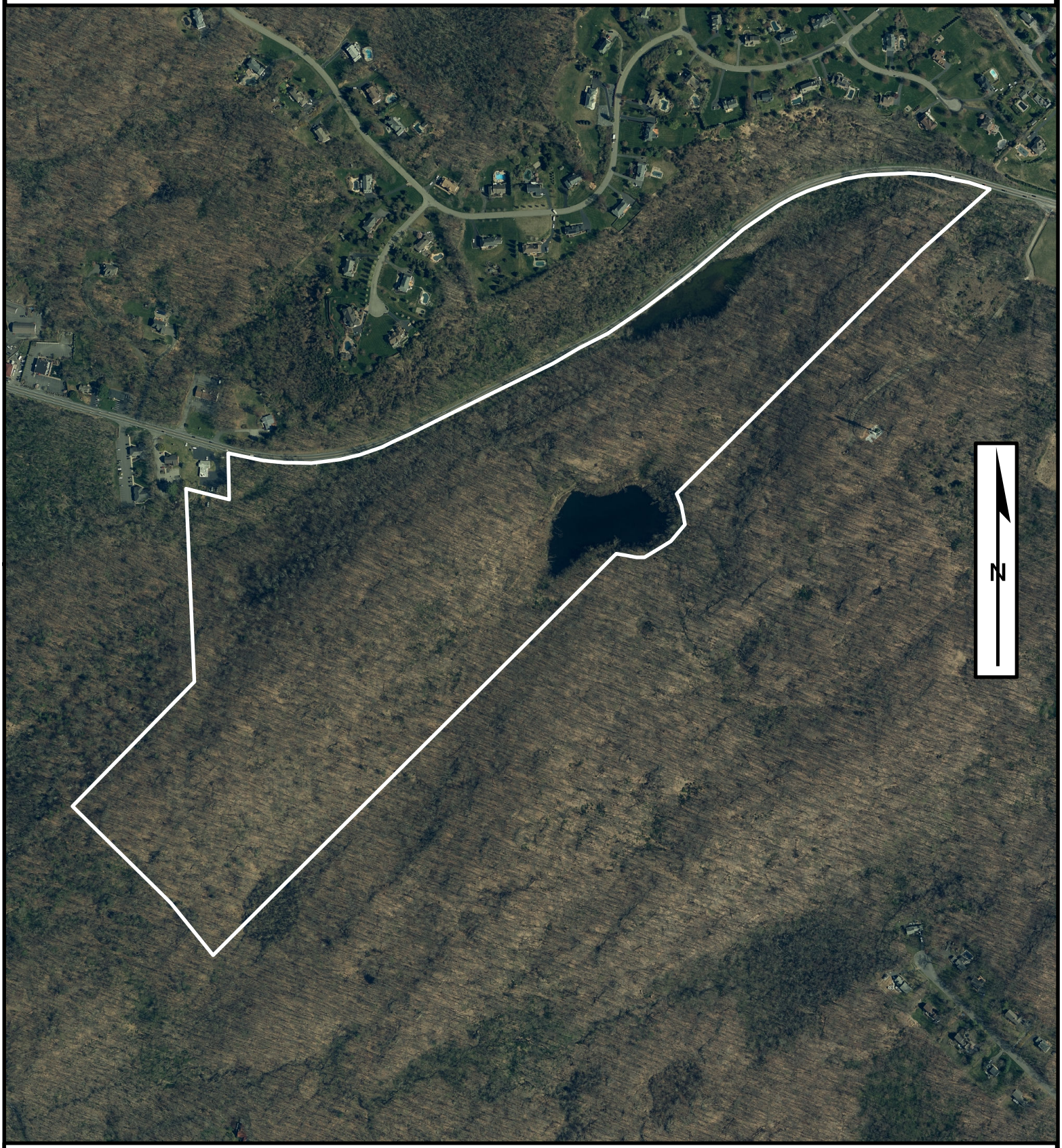
0 300 600 1,200 feet

AERIAL MAP

Property of Tenalp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

September, 2024



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1 inch = 600 feet

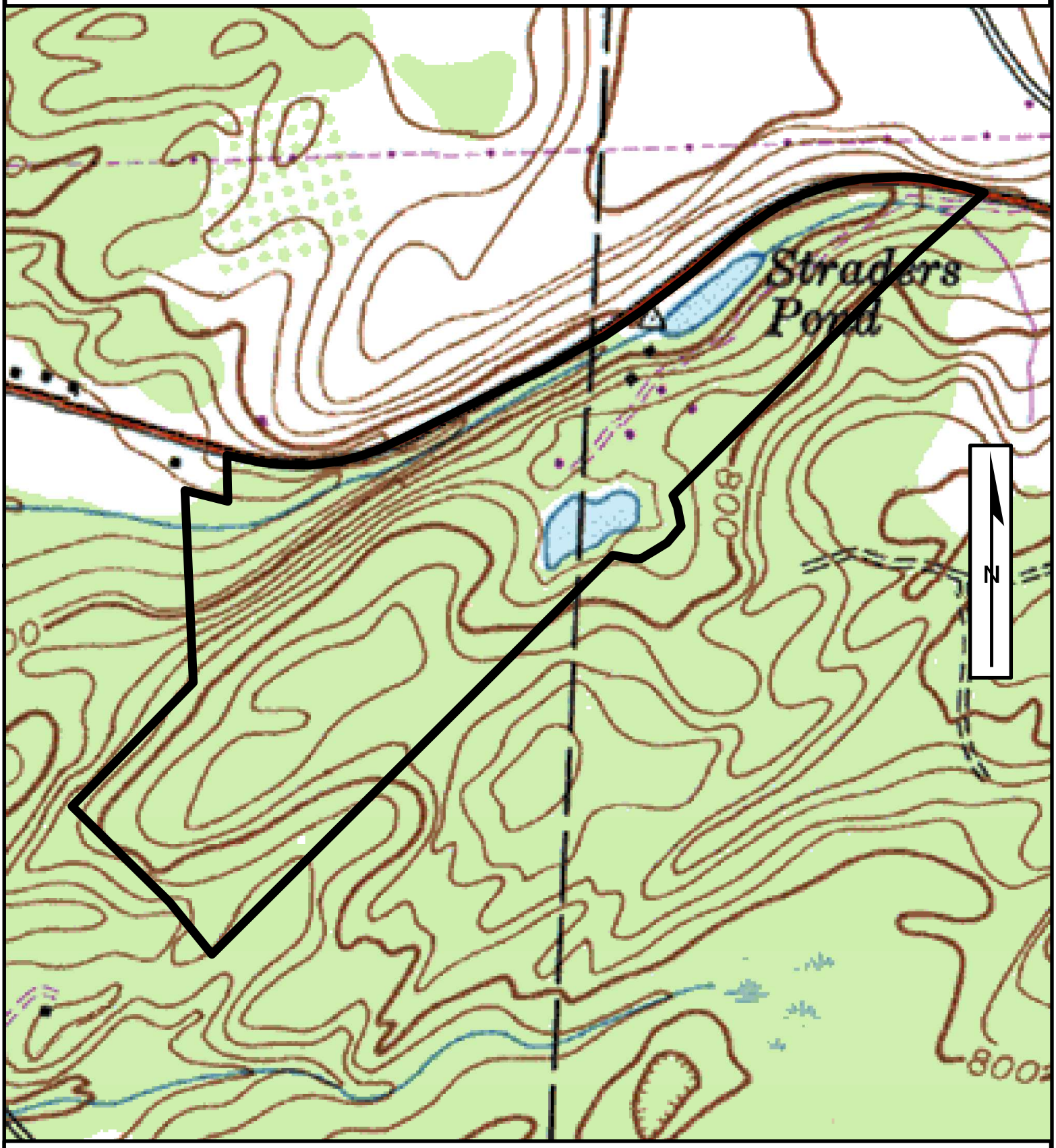
0 300 600 1,200 feet

TOPOGRAPHIC MAP

Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

September, 2024



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1 inch = 600 feet

0 300 600 1,200 feet

FOREST SOILS MAP

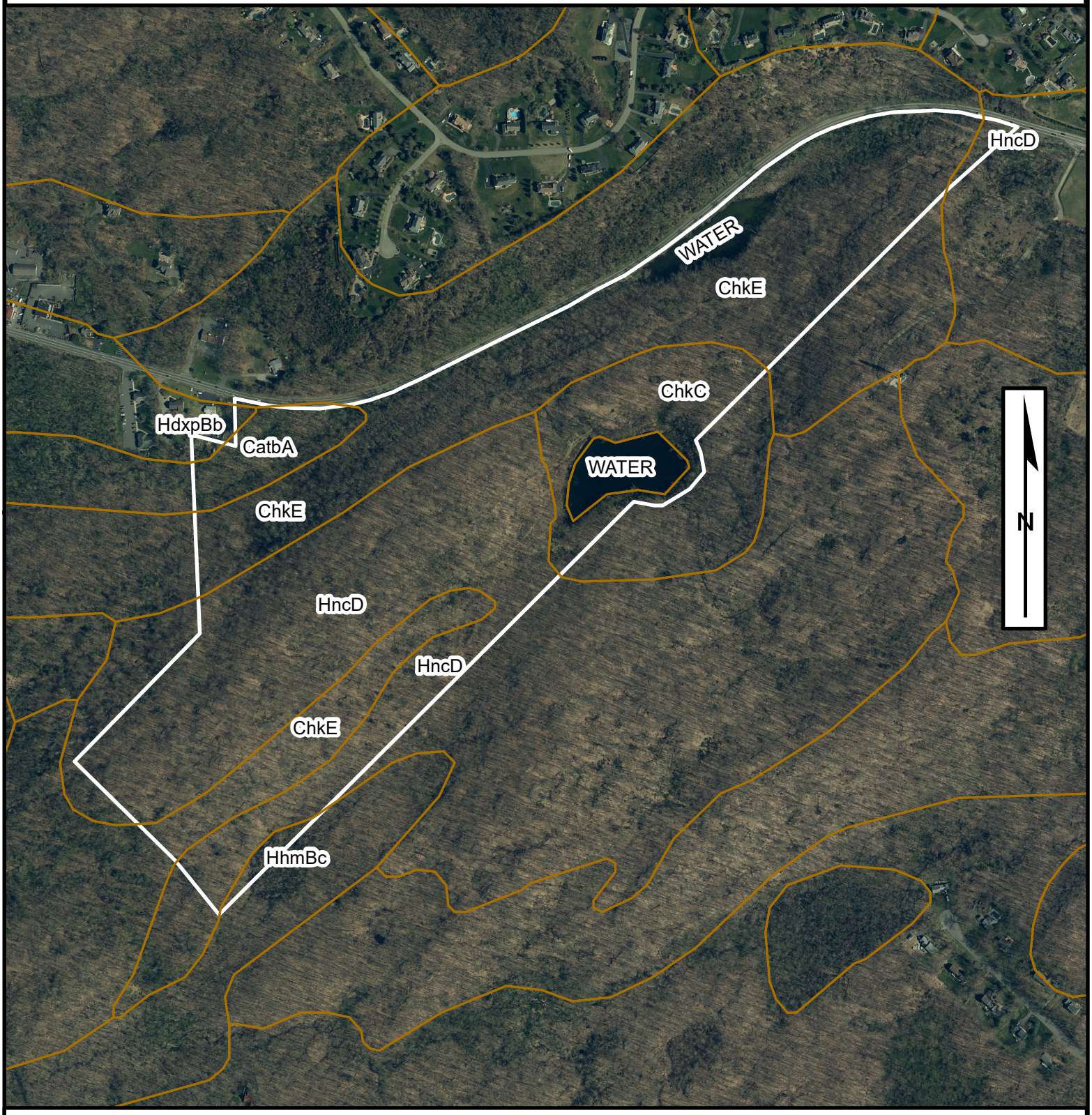
Property of Tenalp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover Block 103 / Lots 2 & 3.02 and Sparta Block 7001 / Lot 1

Total area = 108.12 +/- acres

September, 2024



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1 inch = 600 feet

0 300 600 1,200

feet

RIPARIAN ZONE & WETLAND BUFFER MAP

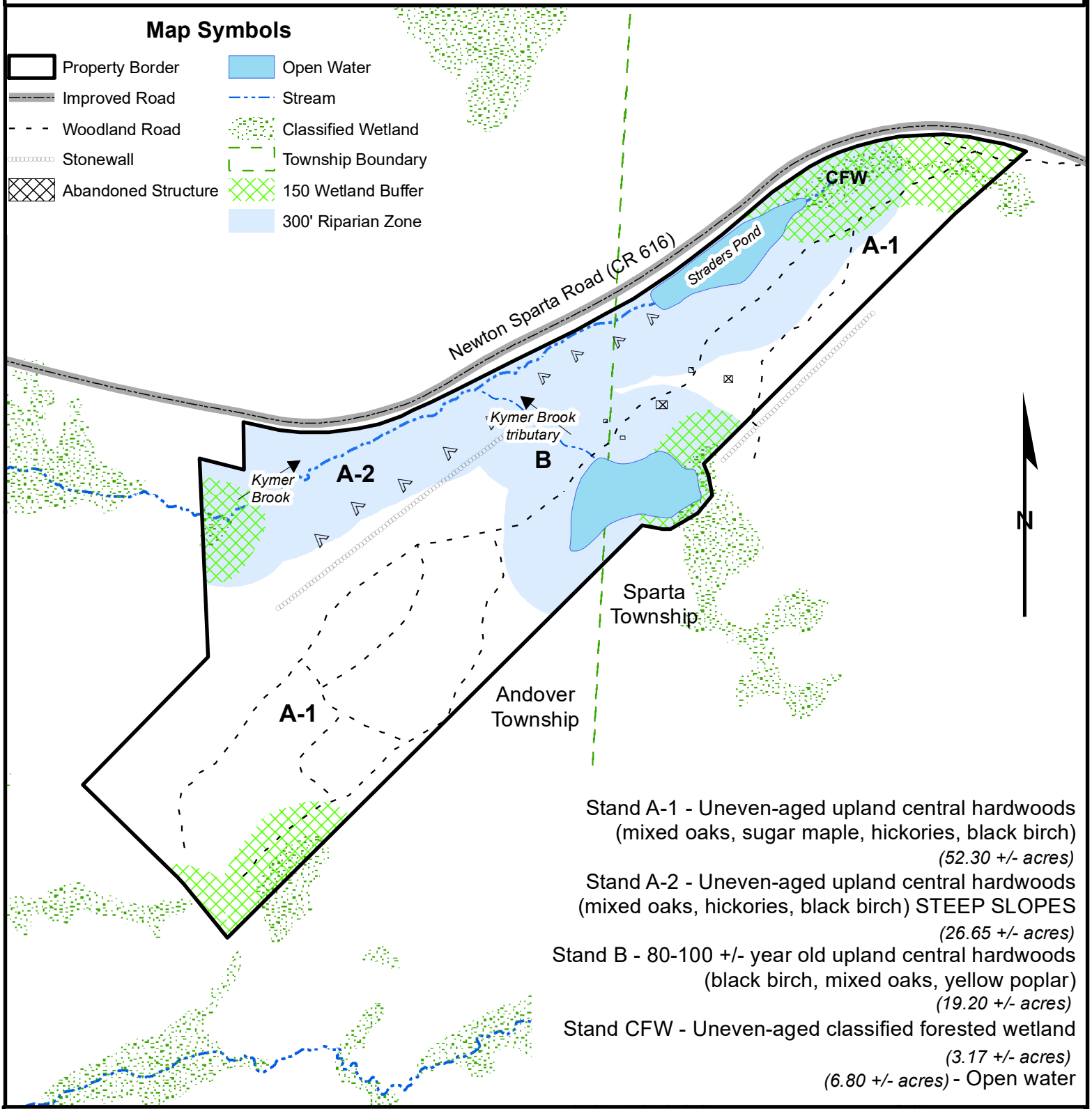
Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover - Block 103 / Lots 2 & 3.02 and Sparta - Block 7001 / Lot 1

Total area = 108.12 +/- acres

September, 2024



Stand A-1 - Uneven-aged upland central hardwoods (mixed oaks, sugar maple, hickories, black birch) *(52.30 +/- acres)*

Stand A-2 - Uneven-aged upland central hardwoods (mixed oaks, hickories, black birch) STEEP SLOPES *(26.65 +/- acres)*

Stand B - 80-100 +/- year old upland central hardwoods (black birch, mixed oaks, yellow poplar) *(19.20 +/- acres)*

Stand CFW - Uneven-aged classified forested wetland *(3.17 +/- acres)*

(6.80 +/- acres) - Open water

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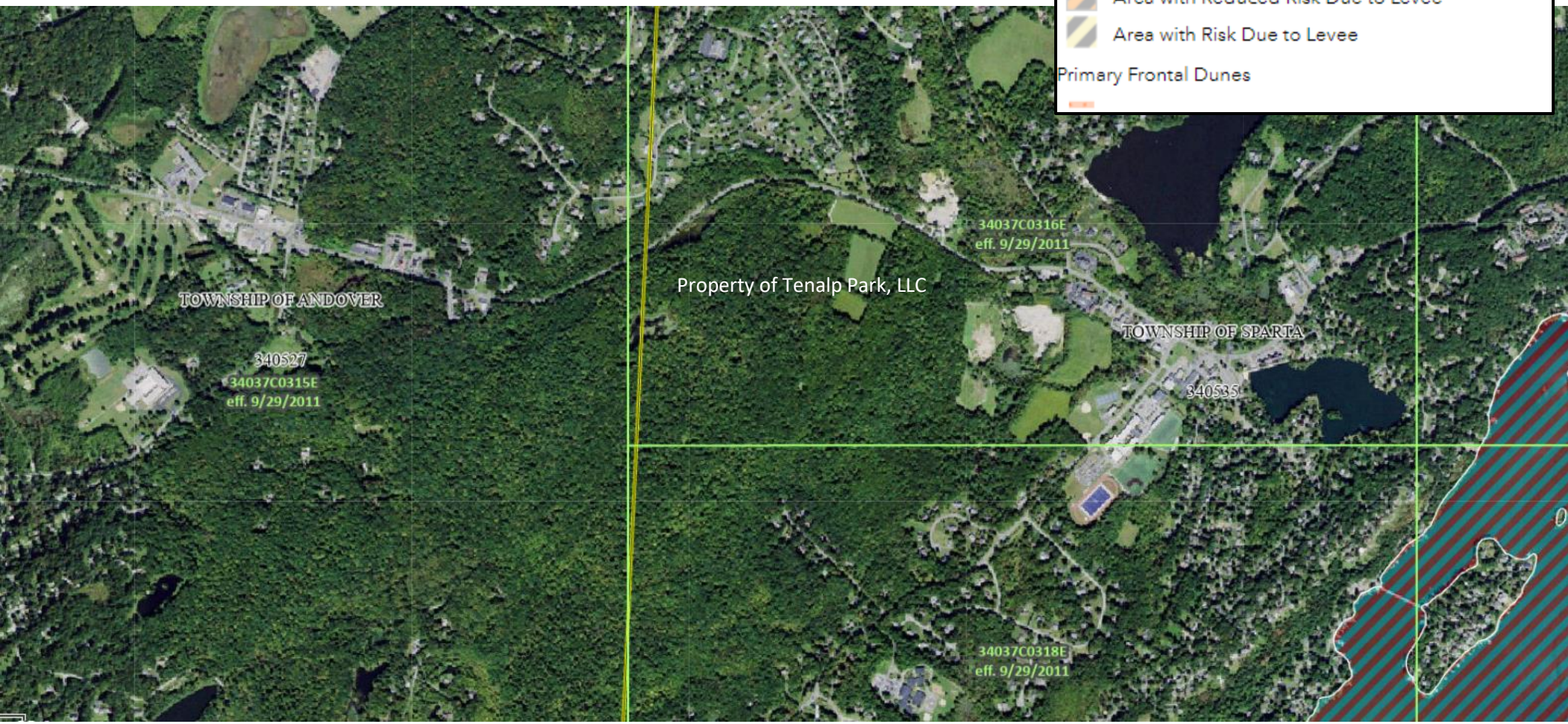
1 inch = 600 feet

0 300 600 1,200 feet

FEMA Flood Hazard Map

Property of Tenalp Park, LLC

Andover & Sparta Townships, Sussex County



FOREST STAND MAP

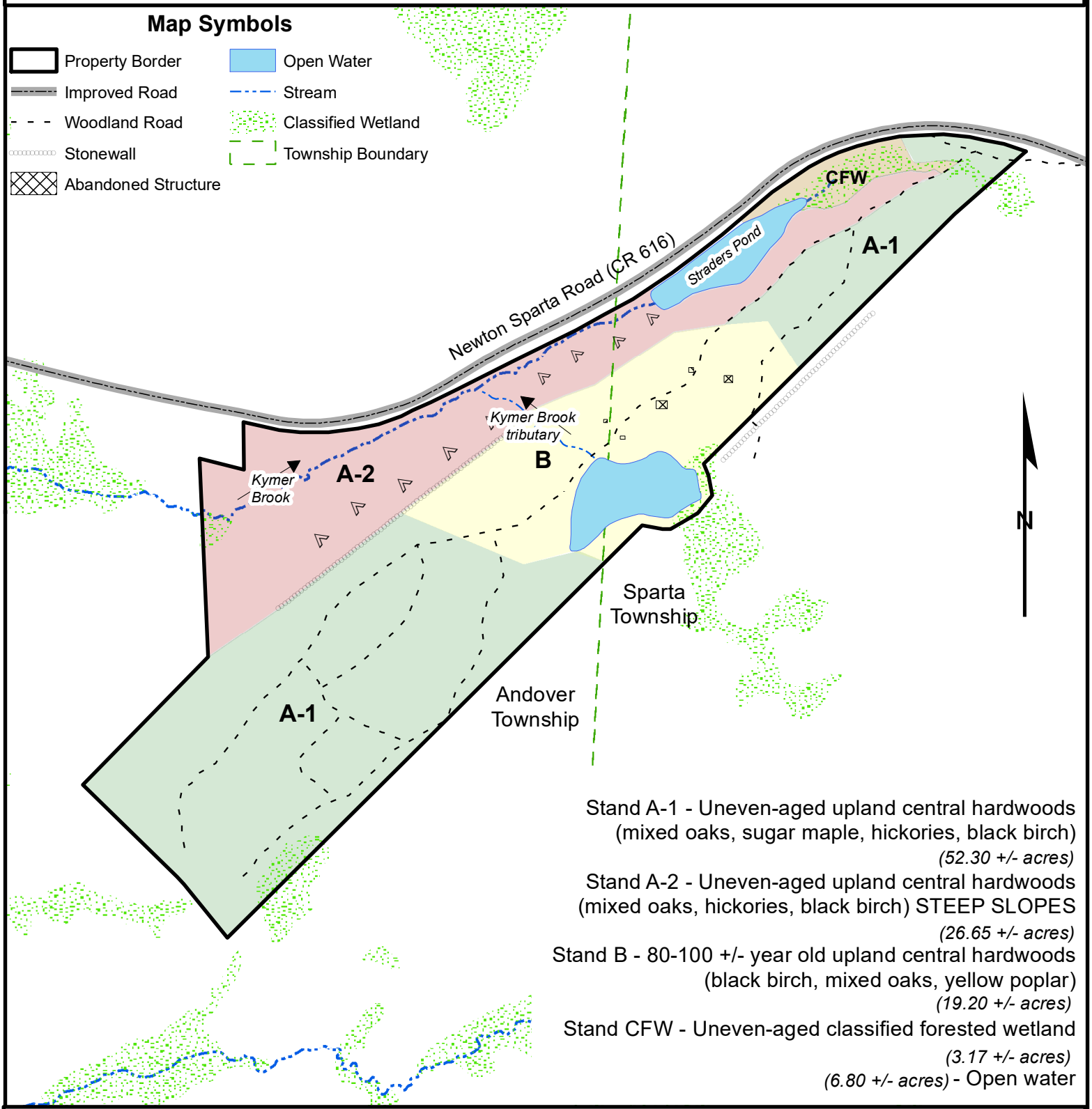
Property of Ten Alp Park, LLC

Andover Township & Sparta Township, Sussex County, NJ

Andover - Block 103 / Lots 2 & 3.02 and Sparta - Block 7001 / Lot 1

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September, 2024



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1 inch = 600 feet

0 300 600 1,200 feet

Appendix C

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATE PARKS, FORESTS & HISTORIC SITES
OFFICE OF NATURAL LANDS MANAGEMENT
501 East State Street
P.O. Box 420, Mail Code 501-04
Trenton, New Jersey 08625-0420
Tel. (609) 984-1339 * Fax (609) 984-1427
https://www.nj.gov/dep/parksandforests/natural/index.html

PHILIP D. MURPHY
Governor

TAHESHA L. WAY
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

September 14, 2024

Andrew Bennett
Ridge & Valley Forest Management
PO Box 790
Lafayette, NJ 07848

Re: Tenalp Park, LLC Woodland Mgmt Plan
Block(s) - 7001, Lot(s) - 1
Sparta Township, Sussex County

Dear Andrew Bennett:

Thank you for your data request regarding rare species information for the above referenced project site.

Searches of the Natural Heritage Database and the Landscape Project (Version 3.3) are based on a representation of the boundaries of your project site in our Geographic Information System (GIS). We make every effort to accurately transfer your project bounds from the map(s) submitted with the Natural Heritage Data Request Form into our GIS. We do not typically verify that your project bounds are accurate, or check them against other sources.

We have checked the Landscape Project habitat mapping and the Biotics Database for occurrences of any rare wildlife species or wildlife habitat on the referenced site. The Natural Heritage Database was searched for occurrences of rare plant species or ecological communities that may be on the project site. Please refer to Table 1 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented on site. A detailed report is provided for each category coded as 'Yes' in Table 1.

We have also checked the Landscape Project habitat mapping and Biotics Database for occurrences of rare wildlife species or wildlife habitat in the immediate vicinity (within ¼ mile) of the referenced site. Additionally, the Natural Heritage Database was checked for occurrences of rare plant species or ecological communities within ¼ mile of the site. Please refer to Table 2 (attached) to determine if any rare plant species, ecological communities, or rare wildlife species or wildlife habitat are documented within the immediate vicinity of the site. Detailed reports are provided for all categories coded as 'Yes' in Table 2. These reports may include species that have also been documented on the project site.

The Natural Heritage Program reviews its data periodically to identify priority sites for natural diversity in the State. Included as priority sites are some of the State's best habitats for rare and endangered species and ecological communities. Please refer to Tables 1 and 2 (attached) to determine if any priority sites are located on or in the immediate vicinity of the site.

A list of rare plant species and ecological communities that have been documented from the county (or counties), referenced above, can be downloaded from https://nj.gov/dep/parksandforests/natural/heritage/database.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from https://nj.gov/dep/parksandforests/natural/docs/nhpcodes_2010.pdf.

NHP File No. 24-4107416-31345

Beginning May 9, 2017, the Natural Heritage Program reports for wildlife species will utilize data from Landscape Project Version 3.3. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive web application at the following URL, https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=0e6a44098c524ed99bf739953cb4d4c7, or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292-9400.

For additional information regarding any Federally listed plant or animal species, please contact the U.S. Fish & Wildlife Service, New Jersey Field Office at http://www.fws.gov/northeast/njfieldoffice/endangered/consultation.html.

Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements (species and/or ecological communities) or their locations. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,



Robert J. Cartica
Administrator

c: NHP File No. 24-4107416-31345

Table 1: On Site Data Request Search Results (6 Possible Reports)

Report Name	Included	Number of Pages
1. Possibly on Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	No	0 pages included
2. Natural Heritage Priority Sites On Site	Yes	See emailed attachments
3. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat on the Project Site Based on Search of Landscape Project 3.3	No	0 pages included
5. Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	Barred Owl	Strix varia	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Veery	Catharus fuscescens	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Wood Thrush	Hylocichla mustelina	Breeding Sighting	2	NA	Special Concern	G4	S3B,S4N
	Worm-eating Warbler	Helmitheros vermivorum	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
Insecta								
	Arrowhead Spiketail	Cordulegaster obliqua	Territorial Display	2	NA	Special Concern	G4	S3
	Brush-tipped Emerald	Somatochlora walshii	Territorial Display	2	NA	Special Concern	G5	S3
Mammalia								
	Bobcat	Lynx rufus	Live Individual Sighting	4	NA	State Endangered	G5	S2
	Bobcat	Lynx rufus	On Road	4	NA	State Endangered	G5	S2
	Bobcat	Lynx rufus	Telemetry: Home Range	4	NA	State Endangered	G5	S2
	Indiana Bat	Myotis sodalis	Active Season Sighting	5	Federally Listed Endangered	State Endangered	G2	S1

Rare Wildlife Species or Wildlife Habitat on the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Indiana Bat	Myotis sodalis	Maternity Colony	5	Federally Listed Endangered	State Endangered	G2	S1
	Indiana Bat	Myotis sodalis	Roost Site	5	Federally Listed Endangered	State Endangered	G2	S1
Reptilia								
	Wood Turtle	Glyptemys insculpta	Occupied Habitat	3	NA	State Threatened	G3	S2

Other Animal Species On the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Polites mystic	Long Dash			G5	S3?
Satyrium edwardsii	Edwards' Hairstreak			G5	S3

Total number of records: 3

Table 2: Vicinity Data Request Search Results (6 possible reports)

Report Name	Included	Number of Pages
1. Immediate Vicinity of the Project Site Based on Search of Natural Heritage Database: Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database	Yes	1 page(s) included
2. Natural Heritage Priority Sites within the Immediate Vicinity	Yes	See emailed attachments
3. Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches	Yes	2 page(s) included
4. Vernal Pool Habitat In the Immediate Vicinity of Project Site Based on Search of Landscape Project 3.3	Yes	1 page(s) included
5. Rare Wildlife Species or Wildlife Habitat In the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Stream Habitat File	No	0 pages included
6. Other Animal Species In the Immediate Vicinity of the Project Site Based on Additional Species Tracked by Endangered and Nongame Species Program	Yes	1 page(s) included

Immediate Vicinity of the Project Site
Based on Search of Natural Heritage Database
Rare Plant Species and Ecological Communities Currently Recorded in the New Jersey Natural Heritage Database

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Regional Status	Grank	Srank	Identified	Last Observed	Location
Vascular Plants									
Conioselinum chinense	Hemlock-parsley		E	LP, HL	G5	S1	Y	1983-09-16	CA. 0.5 MI. NE OF PERONA LAKE.
Gymnocarpium dryopteris	Oak Fern			HL	G5	S1	Y	1945-05-20	At stream 1.5 miles southwest of Sparta, Sussex County.

Total number of records: 2

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
Aves								
	Bald Eagle	Haliaeetus leucocephalus	Foraging	4	NA	State Endangered	G5	S1B,S2N
	Barred Owl	Strix varia	Breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Great Blue Heron	Ardea herodias	Foraging	2	NA	Special Concern	G5	S3B,S4N
	Red-headed Woodpecker	Melanerpes erythrocephalus	Non-breeding Sighting	3	NA	State Threatened	G5	S2B,S2N
	Veery	Catharus fuscescens	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
	Wood Thrush	Hylocichla mustelina	Breeding Sighting	2	NA	Special Concern	G4	S3B,S4N
	Worm-eating Warbler	Helmitheros vermivorum	Breeding Sighting	2	NA	Special Concern	G5	S3B,S4N
Insecta								
	Arrowhead Spiketail	Cordulegaster obliqua	Territorial Display	2	NA	Special Concern	G4	S3
	Brush-tipped Emerald	Somatochlora walshii	Territorial Display	2	NA	Special Concern	G5	S3
Mammalia								
	Bobcat	Lynx rufus	Live Individual Sighting	4	NA	State Endangered	G5	S2
	Bobcat	Lynx rufus	On Road	4	NA	State Endangered	G5	S2

Rare Wildlife Species or Wildlife Habitat Within the Immediate Vicinity of the Project Site Based on Search of Landscape Project 3.3 Species Based Patches

Class	Common Name	Scientific Name	Feature Type	Rank	Federal Protection Status	State Protection Status	Grank	Srank
	Bobcat	Lynx rufus	Telemetry: Home Range	4	NA	State Endangered	G5	S2
	Indiana Bat	Myotis sodalis	Active Season Sighting	5	Federally Listed Endangered	State Endangered	G2	S1
	Indiana Bat	Myotis sodalis	Maternity Colony	5	Federally Listed Endangered	State Endangered	G2	S1
	Indiana Bat	Myotis sodalis	Roost Site	5	Federally Listed Endangered	State Endangered	G2	S1
Reptilia								
	Bog Turtle	Glyptemys muhlenbergii	Occupied Habitat	5	Federally Listed Threatened	State Endangered	G3	S1
	Wood Turtle	Glyptemys insculpta	Occupied Habitat	3	NA	State Threatened	G3	S2

Vernal Pool Habitat
In the Immediate Vicinity of
Project Site Based on Search of
Landscape Project 3.3

Vernal Pool Habitat Type	Vernal Pool Habitat ID
Vernal habitat area	3087
Potential vernal habitat area	2283

Total number of records: 2

Saturday, September 14, 2024

NHP File No.: 24-4107416-31345

Other Animal Species
In the Immediate Vicinity of the Project Site Based on
Additional Species Tracked by
Endangered and Nongame Species Program

Scientific Name	Common Name	Federal Protection Status	State Protection Status	Grank	Srank
Invertebrate Animals					
Cucullia alfarata	A Moth			G4	S2?
Polites mystic	Long Dash			G5	S3?
Satyrium edwardsii	Edwards' Hairstreak			G5	S3

Total number of records: 3

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
Phone: (609) 646-9310

In Reply Refer To: 09/04/2024 15:57:18 UTC
Project Code: 2024-0139291
Project Name: Tenalp Park, LLC Forest Stewardship Plan

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through IPaC by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see Migratory Bird Permit | What We Do | U.S. Fish & Wildlife Service (fws.gov).

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New Jersey Ecological Services Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, NJ 08205
(609) 646-9310

PROJECT SUMMARY

Project Code: 2024-0139291
Project Name: Tenalp Park, LLC Forest Stewardship Plan
Project Type: Forest Management Plan
Project Description: Tenalp Park, LLC Forest Stewardship Plan
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.033905000000004,-74.69023462466123,14z



Counties: Sussex County, New Jersey

ENDANGERED SPECIES ACT SPECIES

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

REPTILES

NAME	STATUS
Bog Turtle *Glyptemys muhlenbergii* Population: Wherever found, except GA, NC, SC, TN, VA No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6962	Threatened

CLAMS

NAME	STATUS
Dwarf Wedgemussel *Alasmidonta heterodon* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/784	Endangered
Green Floater *Lasmigona subviridis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Small Whorled Pogonia *Isotria medeoloides* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Ridge and Valley Forest Management
Name: Ridge and Valley Forest Management
Address: 161 Sparta Avenue
City: Newton
State: NJ
Zip: 07860
Email laura@ridgeandvalleyforest.com
Phone: 8459136187

Frequently Asked Questions About The Natural Heritage Priority Sites GIS File

What are Natural Heritage Priority Sites?

Through its Natural Heritage Database, the Office of Natural Lands Management (ONLM) identifies critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. The database provides detailed information on rare species and ecological communities to planners, developers, and conservation agencies for use in resource management, environmental impact assessment, and both public and private land protection efforts.

Using the database, ONLM has identified 343 Natural Heritage Priority Sites, representing some of the best remaining habitat for rare species and rare ecological communities in the state. Although the primary focus of these sites is rare plant species and ecological communities, the DEP Endangered and Nongame Species Program also provided key information and assisted with the delineation of a number of the sites that encompass significant habitats for rare animals. These areas should be considered to be top priorities for the preservation of biological diversity in New Jersey. If these sites become degraded or destroyed, we may lose some of the unique components of our natural heritage.

How are Natural Heritage Priority Sites used in conservation of biological diversity?

Natural Heritage Priority Site maps are used by individuals and agencies concerned with the protection and management of land. The maps have been used by municipalities preparing natural resource inventories; public and private conservation organizations preparing open space acquisition goals; land developers and consultants identifying environmentally sensitive lands; and public and private landowners developing land management plans. However, the coverage was not developed for regulatory purposes, and should not be used as a substitute for the on-site surveys and Natural Heritage Database searches required by regulatory agencies.

Natural Heritage Priority Sites contain some of the best and most viable occurrences of rare plant species and ecological communities, but they do not cover all known habitat for these elements or most rare animal species in New Jersey. Most of the state has not been surveyed for rare species and ecological communities. If information is needed on whether or not endangered or threatened species have been documented from a particular area, a Natural Heritage Database search can be requested by contacting the Office of Natural Lands Management.

What do the boundaries of the sites contain?

The boundaries of each Natural Heritage Priority Site are drawn to encompass critical habitat for the rare species or ecological communities. Often the boundaries extend to include additional buffer lands that should be managed to protect this critical habitat. A justification for the boundary is provided for each site.

Boundaries of site polygons may overlap. Site polygons may also be nested so that one site may be found entirely within a larger site. When viewing the shape file, a larger site may sometimes obscure a smaller site within it. Such confusion can be eliminated by highlighting the area of interest and checking the attribute table to reveal all sites within the selected area.

How was the GIS coverage developed?

The coverage was originally developed as lines on USGS topographic paper maps and subsequently edited to fit on either 1995/97 color infrared aerial imagery, 1991 black and white aerial imagery or scanned USGS 1:24,000 topographic maps as an ArcView shape file (NJ State Plane Coordinate System, NAD83). Within the Highlands Region the coverage was developed using the NJDEP 2002 Land use/Land cover: Highlands Study Area (DRAFT) coverage, and then subsequently edited using 2002 High Resolution Orthophotography, as well as scanned USGS 1:24,000 topographic maps, as references.

What attributes are included with the shape file?

(Note: Text fields in the attribute table are truncated at 254 characters. Therefore, some text may be deleted from the attribute table of some of the sites. The complete text for all the site records is contained in the **Prisites.rtf** file that is included in the Prisites Winzip distribution file.)

Identifying attributes – The Sitecode and Sitename fields are assigned by the Office of Natural Lands Management to track each site by a unique alphanumeric code and name. The Version field indicates the year and month of the current version of the Natural Heritage Priority Sites coverage.

Locational attributes – Information about where each

site is located can by found in the County, Quadname (US Geological Survey 7.5 minute topographic quadrangle map) and Municipali(ty) fields. More detailed information can be gathered by overlaying county and municipal coverages that are available from NJ DEP.

Descriptive attributes – A description of the site can be found in the Descriptio(n) field, while the Boundjust field contains a written justification for the site boundaries.

Significance attributes – The relative significance of each site is determined by assigning a biodiversity significance rank (Biodivrank). Justification for the rank can be found in the BiodivComm(ents) field. The Siteclass field indicates whether the site is categorized as a macrosite or a standard site. Standard sites are smaller in size (usually less than 3200 acres in size), while macrosites tend to be larger (usually greater than 3200 acres in size). It is not unusual to find several standard sites entirely contained within the boundaries of a macrosite.

What is the biodiversity significance rank and how is it used?

Each site is ranked according to its significance for biological diversity using a scale developed by The Nature Conservancy, the network of Natural Heritage Programs and the New Jersey Natural Heritage Program. The ranks can be used to distinguish between sites that are of global significance for conservation of biological diversity vs. those that are of state significance. The global biodiversity significance ranks range from B1 to B5. Within the Highlands Region the global biodiversity significance rank has been combined with a state biodiversity significance rank which provides information about the significance of the site on a state level. The state biodiversity significance ranks for sites in the Highlands Region range from V1 to V5. Therefore, all sites have been assigned a global biodiversity rank (B rank), but not all sites have been assigned a state biodiversity rank (V rank). The specific definitions for each rank are as follows:

B1 - Outstanding significance on a global level, generally the "last of the least" in the world, such as the only known occurrence of any element (species or ecological community), the best or an excellent occurrence of an element ranked critically imperiled globally, or a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled globally. The site should be viable and defensible for the elements or ecological processes contained.

B2 - Very high significance on a global level, such as the most outstanding occurrence of any ecological community. Also includes areas containing other occurrences of elements that are critically imperiled globally, a good or excellent occurrence of an element that is imperiled globally, an excellent occurrence of an element that is rare globally, or a concentration (4+) of good occurrences of globally rare elements or viable occurrences of globally imperiled elements.

B3 - High significance on a global level, such as any other viable occurrence of an element that is globally imperiled, a good occurrence of a globally rare element, an excellent occurrence of any ecological community, or a concentration (4+) of good or excellent occurrences of elements that are critically imperiled in the State.

B4 - Moderate significance on a global level, such as a viable occurrence of a globally rare element, a good occurrence of any ecological community, a good or excellent occurrence or only viable state occurrence of an element that is critically imperiled in the State, an excellent occurrence of an element that is imperiled in the State, or a concentration (4+) of good occurrences of elements that are imperiled in the State or excellent occurrences of elements that are rare in the State.

B5 - Of general biodiversity interest.

V1 - Outstanding significance on a state level. Only known occurrence in the state for an element **or** Site with an excellent occurrence or the best occurrence in the state for an element ranked critically imperiled in the state **or** a concentration (4+) of good or excellent occurrences of elements that are imperiled or critically imperiled in the state.

V2 - Very high significance on a state level. Includes sites containing other occurrences of elements that are critically imperiled in the state **or** a concentration (4+) of other occurrences of state imperiled elements and/or good or excellent occurrences of state rare elements.

V3 - High significance on a state level. Includes sites containing the best occurrence in the state or an excellent occurrence of a state imperiled element **or** multiple (2+) other occurrences for state imperiled elements and/or excellent, good or moderate quality occurrences of state rare elements.

V4 - Moderate significance on a state level. Includes sites containing the best occurrence in the state or an excellent occurrence of a state rare element **or** any site with other occurrences of a state imperiled element **or** multiple (2+) other occurrences of state rare elements.

V5 - Any site with any other occurrence of a state rare element.

How can I obtain Natural Heritage Priority Site maps for an area of interest to me?

Natural Heritage Priority Site hard copy maps can be obtained by submitting a written request accompanied by a check or money order made payable to the Office of Natural Lands Management at the following address:

Office of Natural Lands Management
P.O. Box 404
Trenton, NJ 08625-0404
Phone: 609-984-1339; Fax: 609-984-1427

Individual 8.5" X 11" maps are available at the following rate:

1 - 10 site maps & reports:	$1.50/site
11 - 20 site maps & reports:	$1.00/site
> 20 sites:	$0.50/site

Digital GIS Coverage of Natural Heritage Priority Sites

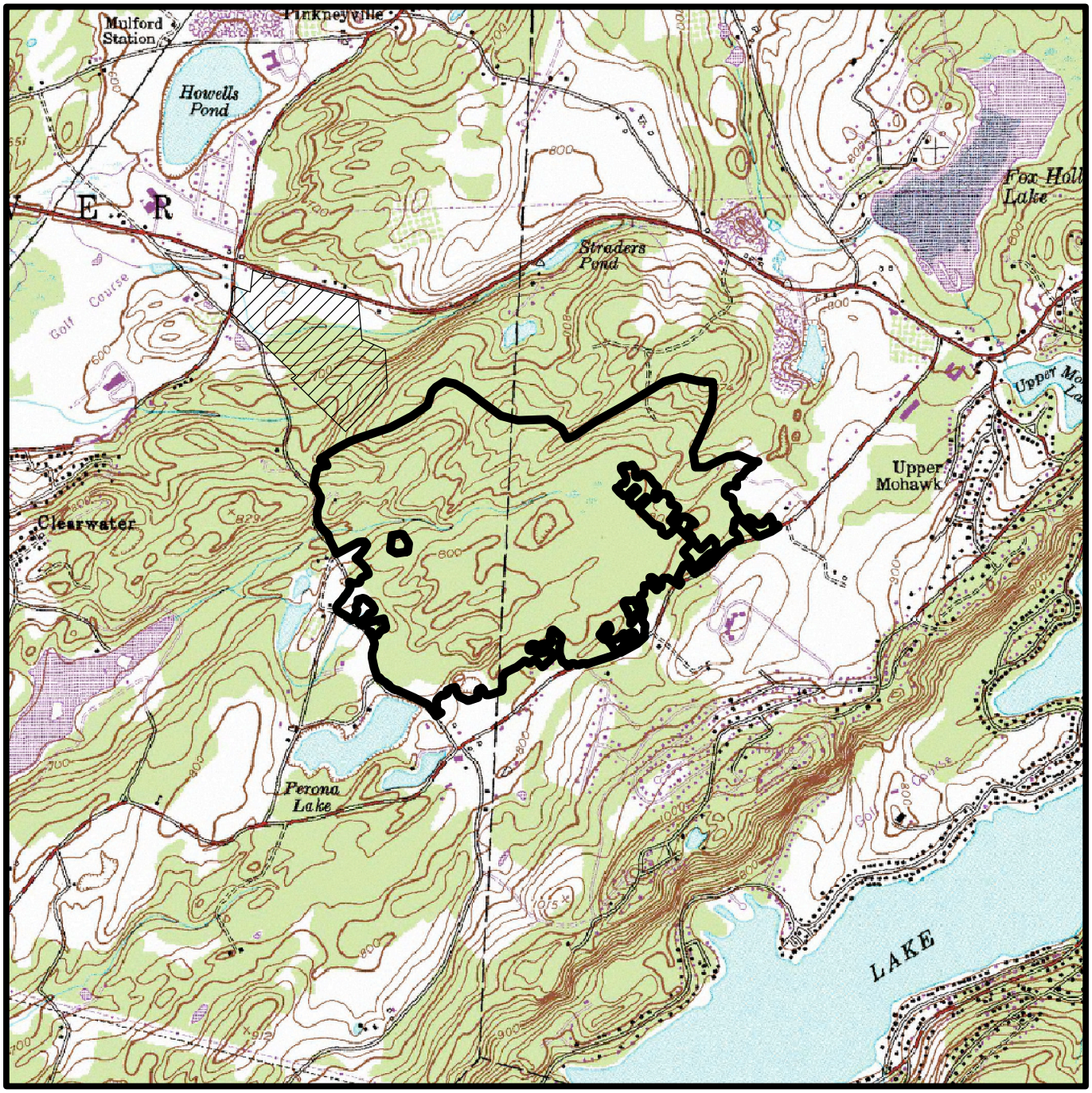
A digital version of the ArcView GIS file of Natural Heritage Priority Sites is also available. The 2007 version of Natural Heritage Priority Sites will be sent as an email attachment upon request. There is no charge for emailing the GIS data.

How often are the maps updated?

The Natural Heritage Priority Site information is constantly being updated in the Natural Heritage Database. A new edition of the maps will be made available after significant revisions or additions to the Database.

May 17, 2007

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management



Natural Heritage Priority Site

Perona Lake

Sussex County

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

Miles
0.5 0.25 0 0.5

Priority Sites
Public Land

4

Natural Heritage Priority Site

Perona Lake

Locational Information

Quad Name: Newton East
County: Sussex
Municipality: Sparta Twp ; Andover Twp

Description of Site

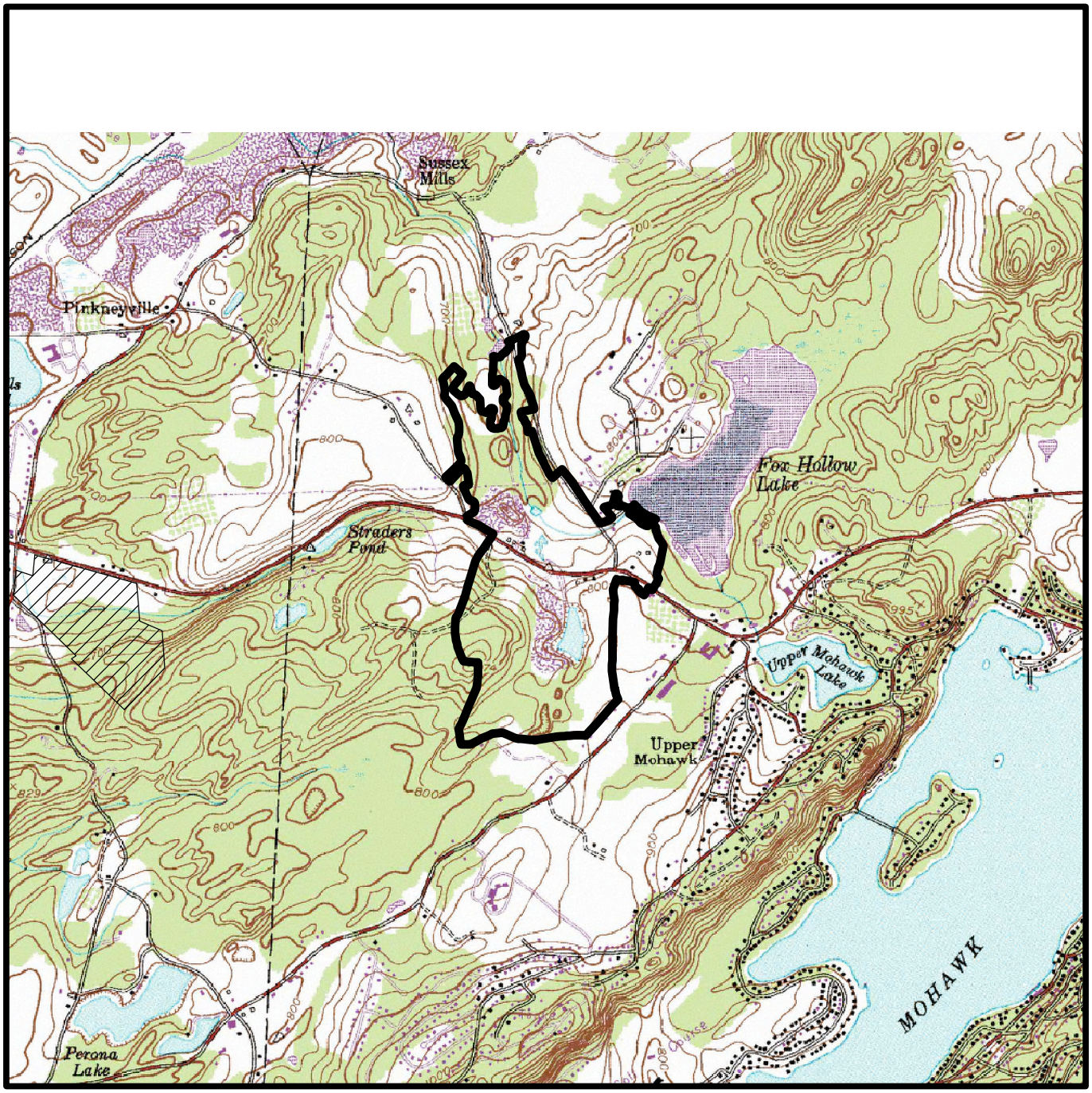
The site contains wet deciduous woods and seepage areas along a stream.

Boundary Justification

The site bounds include wetland habitat for critically imperiled plant species.

Biodiversity Rank B4V1

The site contains excellent occurrences for two critically imperiled state plant species.



Natural Heritage Priority Site

Sparta Avenue

Sussex County

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

Miles
0.3 0.15 0 0.3

Priority Sites
Public Land

4

Natural Heritage Priority Site

Sparta Avenue

Locational Information

Quad Name: Newton East
County: Sussex
Municipality: Sparta Twp

Description of Site

A series of small herbaceous wetland openings with several springs emerging from the ground. The wetland openings total less than 1 acre of open herbaceous dominated meadow, grading into a swamp forest containing larch and hardwoods.

Boundary Justification

Bounds drawn to include the drainageway containing the wetland openings and the adjacent uplands.

Biodiversity Rank B5V2

The site contains a small example of a globally rare wetland ecological community, and one state critically imperiled plant species.

March, 2007
Site Code: **S.USNJHP1*509**