BENCHMARK FOREST & LAND MANAGEMENT, LLC

41 ACORN AVE CLIFTON PARK, NY 12065

518-538-3373

FOREST STEWARDSHIP PLAN

Property of

The Aspetuck Land Trust

Elizabeth Luce Moore Nature Preserve

28 Stewardship Acres

2012-2021

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GENERAL INFORMATION

Date Prepared: **Field work in February of 2012**

Prepared By: **BENCHMARK FOREST & LAND MANAGEMENT, LLC**
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Forester: John J. O'Donnell, CF

SAF Certified Forester #3860

CT Forester #603

MA Forester #382

NRCS TSP #09-6266

Tree Farm Inspector #96619

Property Owner: Aspetuck Land Trust

Mailing Address: PO Box 444 Westport, CT 06881

Contact: David Brant-Executive Director (203) 331-1906 dbrant@aspetucklandtrust.org

Property Address: Hill Farm Rd & Davis Hill Rd Weston, CT

Total Acreage: 28 Ac

Signatures:

Preparer: _____ **Date:** _____

BENCHMARK FOREST & LAND MANAGEMENT, LLC

As the property owner, I have reviewed this management plan with my forester and I understand the contents and agree that it reflects my goals and intention for the management of this property.

Property Owner(s): _____ **Date:** _____

INTRODUCTION

Upon request by The Aspetuck Land Trust John J. O'Donnell, Principal Forester of Benchmark Forest & Land Management, LLC has prepared a ten-year (2012-2021) forest stewardship plan for the Elizabeth Luce Moore property located at Hill Farm Rd & Davis Hill Rd in Westport, CT. A forest inventory of this property was conducted in February 2012 in order to determine how to best implement the natural resource stewardship objectives of the landowner.

Objectives specified are:

1) Actively manage the property with goals of improving recreational opportunities as well as wildlife habitat.

This forest stewardship plan provides an organized approach for the long-term protection and use of the forest's resources. The plan also allows the landowners to become aware of the full detail and potential of their forest and to become personally involved and proactive in reaching their objectives. An inventory of the forest's condition and the landowner's stewardship objectives provide the basis for the recommendations. Implementation of these recommendations will create forest improvements that will last well beyond our lifetime and will provide benefits beyond the property's borders. Furthermore, this plan is written to the standards of the American Tree farm System (ATFS) as well as the Natural Resource Conservation Service (NRCS) where the latter may be a source of cost share funding for various forestry activities.

While not necessarily presented in a formal schedule to allow flexibility, the recommendations within this plan are designed to cover a ten-year management period. As management progresses on this property it may become apparent that some recommendations are no longer valid and others become critical. Please note that while these management activities are recommended over the next ten years, the order and timing are not carved in stone.

Please refer to the maps located in the appendices while reading the plan. Throughout the following narrative, features are described which can be located on the maps. Using the maps will make the narrative much more meaningful. Please also refer to the 'Definitions of Forestry Terms' section to explain any terms that are unfamiliar or confusing.

Resource concerns observed are:

1) Presence of Non-Native Invasive Plants (NNIP)

2) Poor hiking trail location

3) High deer population contributing to lack of adequate tree regeneration as well as promoting invasive plan proliferation.

WATER RESOURCES

Water resources on the property include intermittent/seasonal watercourses and small wetlands. Water exits the property eventually draining into the Saugatuck River.

HISTORY

There is no evidence of past timber harvesting as there are no stumps, basal scars from logging equipment or tops and slash from past timber harvesting.

FOREST HEALTH

Forest health encompasses many aspects of the woodlands. Health issues range from individual tree diseases to insect outbreaks, fire, tree species decline, seedling regeneration, among many other issues affecting forest health.

Tree Regeneration

There is no tree regeneration of any significance. This may be a result from the lack of natural or man-made disturbances (hurricane, lightening, timber harvesting), and or high deer pressure.

Vines & Non-Native Invasive Plants (NNIP)

The problem with NNIP is that they displace and in some cases inhibit natural vegetation growth thereby creating a monoculture of NNIP which both impacts natural forest communities and wildlife habitat. Once established in significant density, NNIP are difficult to eradicate.

NNIP detected include; Japanese barberry, multiflora rose, Norway maple, oriental bittersweet and garlic mustard.

FOREST MANAGEMENT & SILVICULTURAL TREATMENTS

This property is to be managed with the goals of improving wildlife habitat and improving recreational opportunities. Because of this properties geographical arrangement among residential areas, location of boundary lines as related to topography which limits commercial timber management, forest management on this parcel should be limited to pre-commercial, minor treatments that favor its development of wildlife resources, protects public access and further develops the property to a late-successional (old growth) type forest.

Active management would include treatments that mimic minor disturbances in the forest canopy such as girdling select trees to become dead standing trees that favor wildlife as well as allowing the development of shade tolerant tree species to become established in those canopy gaps.

Similarly, long-lived trees should be favored for both wildlife and what would be expected in old-growth type forests such as oak and sugar maple. Standing dead trees (snags) will eventually fall to the ground and become course woody debris important to wildlife and soil conditions.

For the most part, management of tree species and cover will be passive with some girdling

WILDLIFE HABITAT & MANAGEMENT

Wildlife habitat is described as food, water, and cover that suit various wildlife species. Most properties in the northeast host transient deer populations which are evident by herd paths, droppings, scrapes and rub lines. A high deer population can significantly impact regeneration of native plant life as well as promote the expansion of NNIP through selective browsing. Deer, turkey, and smaller mammals seek out acorns as the calorie content is high when compared to other forms of food. Special care should be taken to enhance the oak species on the property with respect to wildlife.

Cover

Change in Cover Type: With the property entirely forested, potential access to adequate cover (mountain laurel, wetlands shrubs), water (intermittent streams and wetlands) and low cover (wetland shrubs, adjacent agricultural fields) wild life have great opportunities to thrive. An example of an animal that needs a variation in of habitat is the Wood thrush. The Wood thrush sings in upper canopies, nests in the mid-story, and feeds on the ground. Owls and raptors prefer areas with high perches and riparian areas with mature trees and open under stories allowing them to spot prey.

Wetlands: Wetlands provide cover, food source and water for all species including large and small mammals, deer, turkey, reptiles and amphibians as well as waterfowl. Wet areas provide a water source needed by all animals.

Snags and Deadwood: Snags left on the property can also be a critical part of the forest habitat. Snags are standing dead trees. Snags and dead wood on the ground serve as important habitat benefits. Over one-quarter of the wildlife species that potentially inhabit this property require dead wood, hollow trees, or rotten wood for some part of their life cycle. Dead wood provides cover, moisture, nest sites, and den sites as well as drumming roosts for grouse. Snags are standing dead trees that provide food and cover for over 85 wildlife species. Snags are important foraging sites for many species of birds and often serve as cavity trees when primary excavators, such as woodpeckers, initiate cavity development. Snags, especially those with good vantage points in clearing or along edges, are also used as perching sites for raptors, phoebes and other birds. A greater number of wildlife species will benefit from large snags (greater than 18 inches diameter) as opposed to numerous small ones. Large snags generally last longer and can be used by both large and small birds and mammals. Locating snags along the openings may be counterproductive for the retention of upland game birds. In this case snags should be kept away from these openings and retained in the interior of the forest.

Cavity or Den Trees: Den trees are trees having the trunk or large limbs hollowed out by rot, with an opening to the outside. Cavities in trees of all sizes are essential to many species of birds and mammals. Blacked-capped chickadees and eastern bluebirds use cavities in stems less than 6 inches in diameter. Gray squirrels, screech owls, and various woodpeckers such as northern flickers use cavities in stems between 12 and 18 inches in diameter. Larger birds and mammals such as pileated woodpeckers, fishers, and raccoons require larger cavities in stems greater than 18 inches in diameter. Where possible, den trees should be retained and not necessarily removed during pre-commercial or commercial forestry operations. One method of maintaining an adequate number of den trees is to double girdle the cambium of these trees so they slowly decline and die over the course of a few years. This is an excellent way to reduce competition on crop trees and to increase the diversity of wild life. Over the past several years, fishers have been observed more frequently. Fishers require den trees for raising their young. Retaining and creating den trees may encourage habitat on the property.

Conifers: Some conifers (pine species, hemlock, spruce and cedar) should always be retained to provide mammals and birds protection from harsh winter weather. They provide food and cover for resting, roosting, and nesting. They also help to moderate the effects of inclement weather. Forests that contain both conifer and deciduous trees generally contain more wildlife species that either one exclusively.

Perches: Perching sites are most often found in old fields, pastures, roadsides, riparian corridors, and in stands with an over story tree that clearly towers above all other forest vegetation. Supracanopy white pines, hemlocks, yellow poplars, and large roadside sugar maples are examples of high exposed perching sites. The exposed nature of these high perches provides excellent hunting and nesting sites for various raptors such as osprey, red-tailed hawks and kestrels that forage in non-forest cover types and open forests. Fences, utility lines, isolated deciduous shrubs, and woody sprout clumps less than 10 feet high can serve as low perches. Again, perches may conflict with the objective of retaining upland game birds.

Travel Lanes: Fence rows, stonewalls, drainage ways surrounded by tall herbaceous vegetation and low woody growth make excellent travel lanes. Stonewalls provide structure to wildlife habitats and are especially valuable as travel lanes. For small mammals, such as chipmunks, stonewalls serve as an important cover for nearly all daily functions. For larger species, stonewalls provide protective cover along which to travel. Where stonewalls boarder fields or woodland roads lush herbaceous edges may be present.

Food

Food, a source of energy for growth, maintenance of good health, and reproduction is essential to all wildlife species. All animals must have an adequate seasonal supply of nutritious foods provided by a variety of habitat types. The seasons and weather can be an important factor in determining food availability. Insects, grasses, forbs, mast (nuts), and fruits as well as other animals are important food sources for wildlife. The following are two major sources of food for wildlife in the forest.

Hard Mast: Hard mast is hard shelled seeds (nuts and acorns) that provide high caloric source of digestible lipids and carbohydrates required by most resident and migratory wildlife species. Native hard mast-producing trees include the oaks, hickories, and beeches. A variety of hard mast producing tree species will ensure food all year and are insurance against seed failure of any one species. White oak acorns are particularly valuable because of their high protein content and are less tannic therefore more palatable to many animals. Hard mast trees such as oaks and hickories produce nuts variably. Some years there will be a bumper crop of acorns, while other years there will be a very small acorn crop. All species of mast trees should be retained to ensure a good source of nuts every year. Promoting large crowns on mast producing trees will allow for a higher volume of mast production.

Fruit: Fleshy (soft) fruits produced from a variety of native shrubs are an important food source for wildlife. Some common shrubs of high value are blueberry, huckleberry (vaccinium), common juniper, serviceberry, spicebush, winterberry, dogwoods, sumacs, black cherry, apple, viburnum and chokeberry.

BOUNDARIES

Boundaries need to be well marked to protect the property from trespass and encroachment. The standard for marking boundaries is the use of paint marks. These are hand-sized paint marks at eye-level. Trees within arm's length of the boundaries are blazed, with the blazes facing the boundary line. Trees that fall right on the boundary receive a front and back blaze in the direction of the line. The blazes should be given a new coat of paint every 5 years. Custom signs can also be hung about every 100 feet to communicate anything the landowner desires, like 'Nature Preserve' or 'No Hunting.'

The southern property line is bounded by wire as well as old blazes with red paint. This line should be repainted early in this planning period. The eastern property line is well painted with orange paint by the abutting landowner.

CULTURAL AND RECREATIONAL RESOURCES

Cultural resources include evidence of past human alterations to the land, structures and evidence of past land use and conversion. These may include stone walls, barbed wire fence remains, pasture trees, trails, ponds, debris piles, foundations for homes and barns, etc.

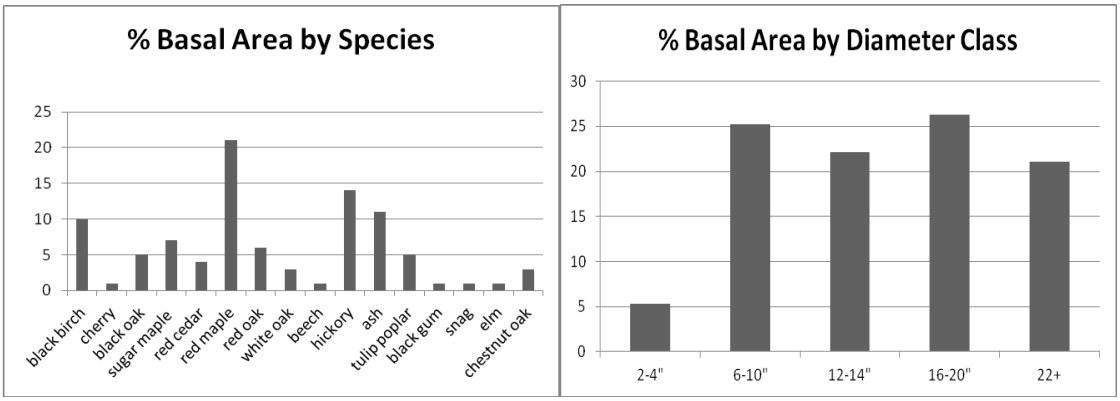
Two old stone foundations were located near Davis Hill Rd where a residence or outbuildings associated with a residence or business once existed. Further information could be realized researching the deeds of this property and details could arise regarding past land use and ownership.

There is a loop trail system through the property. The trail locations in some areas need to be re-routed as they are located in wet areas and in some instances, travel up an intermittent water course. As a result, the trails become muddy and erode while offering a less than satisfactory recreational experience. Intermittent sections of the trails are difficult to follow as they are both underused and marked inconsistently.

THREATENED & ENDANGERED PLANTS AND ANIMALS

CT DEEP data indicates there are no known threatened and endangered species or critical habitat on or immediately adjacent to this property.

COVER TYPE: MIXED HARDWOOD, UPLAND OAK (28 ACRES)



Description:

The forest inventory indicates that there are 15 different types of trees found in significant numbers. There is however white pine and hemlock, both of which did not fall within an inventory point. That would make 17 different types of tree species found on this property.

The terrain is variable with small wetlands located at the bottom of the property as well as upland, dry ridges with oak and red cedar.

25% of the basal area is poletimber (6-10" DBH) with sawtimber (12" dbh +) accounting for 70% and saplings comprising the remaining 5%. Snags, standing dead trees, account for only 1% of the basal area of this property

Using the Upland Central Hardwood Stocking Guide, this property is fully stocked at 85%.

During the site visit two or more pileated woodpeckers were observed foraging on standing dead and dead limbs of trees within the property.

Invasive species are present generally in and around areas of ample available water and light. This includes the wetland areas as well as areas where there is abundant edge and side lighting as along road edges and the field.

Stand Technical Data:

Trees/Ac: 185

Basal Area/Ac (Sq/Ft): 93

Forest Management/Wildlife Recommendations:

It is recommended that the basal area devoted to snags be increased through the selection of certain appropriate trees to be girdled. White ash appears to be declining for a variety of reasons consistent with the woodlands of CT and therefore girdling of these is not recommended as they will soon be dead and may already be hollow which could be hazardous to girdle.

Approximately 3 girdled trees of a large diameter should be created per acre, this number is a general

recommendation and existing trees should be accounted for. Trees should not be girdled near trails which may be a challenge on this property.

Girdling trees should also benefit the residual forest. For example, girdling trees to release unique or mast producing trees such as red cedar and oak.

NNIP Control:

NNIP control consists of mechanical (cutting & mowing) and chemical (foliar spray & brush application) control and in some case both in tandem.

Chemical applications should be done at appropriate times of the year such as later in the growing season for barberry, rose and honeysuckle. Generally a 2% solution of glypohosate and water sprayed on the foliage. Care should be taken when working around wetlands and along trails.

In some cases the offending vegetation can be too large to spray and it may be more effective if first the plant is cut and a chemical concentrate is applied to the remaining stump. This is appropriate when the plant vegetation is too tall to reach (Norway maple, large euonymus) and spraying up in the air may affect other plants that are to be retained.

Recreational Recommendations:

- Relocate sections of trail to more suitable locations
- Install, foot bridge or culvert at the Hill farm access.
- Install signage at both entrances
- Mark trails.

10 YEAR WORK SCHEDULE

Year	Acreage	NRCS Practice Code	Practice
2012	All	NA	Locate, blaze and paint property lines
2013	All	NA	Apply for pertinent NRCS funding
2014	All	568-trails & walkways	Relocate portions of trail to appropriate areas. Mark trails so they are easy to follow
2015	NA	560-access road	Improve access points with signs and culvert (Hill Farm Rd)
2016	6.1	314-brush management	Chemical invasive control 6.1 Acres (Early & Late Application)
2017	5.0	314-brush management	Chemical invasive control 5.0 Acres (Early & Late Application) Paint property lines
2018	11.1	314-brush management	Follow-invasive chemical control (June-October)
2019	28	666-forest stand improvement	Select & Girdle trees
2020	NA	NA	No Treatment Necessary
2021	NA	NA	No Treatment Necessary
2022	28	106	Revise/update plan

DEFINITIONS OF FORESTRY TERMS

Acceptable Growing Stock (AGS): Trees considered acceptable, free of major defect, will increase in volume and value over time.

Basal Area: The area in square feet of the cross section of a tree at DBH

Board foot: Wood used for lumber that measures 1"x 12"x 12" (**MBF** = 1000 board feet)

Canopy: Where the leaves and upper branches in a tree are located

CTT: Crop Tree Thinning: Culturing individual trees with the greatest potential to produce specific benefits

DBH: Diameter at Breast Height: diameter of a tree at 4.5' above the ground

Girdling: Creates a cut area around the circumference of the tree that blocks the flow of food

Hardwood: Broad-leaved trees that usually shed their leaves in the fall

Mast: Tree seeds that supply valuable wildlife nutrition; Hard: acorns, nuts; Soft: berries

Overstory: Upper canopy of treetops

Pole or Poletimber: Trees having a DBH of 6 to 11 inches

Regeneration: New young trees

Release: Remove competition such that the released tree has more sunlight and growing space

Sapling: Trees having a DBH of 1 to 5 inches

Sawtimber or Sawlog: Trees having a DBH 12 inches and greater

Seedling: Trees having a DBH less than 1 inch

Silviculture: The art, science, and practice of producing and tending a forest

Stand: Separate and distinct natural community

Unacceptable Growing Stock (UGS): Trees considered a high risk. Trees with rot and decay or are losing volume and value. Not expected to survive until the next cutting cycle

TSI/FSI: Pre-commercial thinning where trees that have little or no value are killed or removed

Water Bar: Ditches or logs placed at an angle to the slope to divert water from its downhill path

APPENDIX A: OVERVIEW MAP

APPENDIX B: SOILS MAP & DATA

46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	2.4	8.7%
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	0.0	0.0%
61B Canton and Charlton soils, 3 to 8 percent slopes, very stony	2.4	8.7%
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	3.7	13.3%
73E Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	5.3	19.3%
75C Hollis-Chatfield-Rock outcrop complex, 3 to 15 percent slopes	10.0	36.4%
75E Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	1.2	4.5%
76E Rock outcrop-Hollis complex, 3 to 45 percent slopes	0.0	0.1%
84C Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	2.5	9.0%
Totals for Area of Interest	27.6	100.0%

APPENDIX C: CONSERVATION ACTIVITY MAP