

# A LAND MANAGEMENT PLAN FOR

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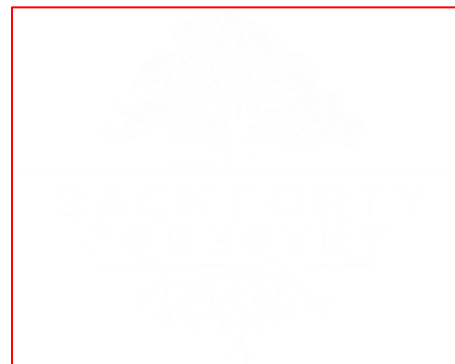
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# EXECUTIVE SUMMARY

2-3 paragraphs succinctly describing preserve location, size, process undertaken, and what the plan presents..

In [REDACTED] of 2016 Shane Hetzler, a consulting forester with Back Forty Forestry, LLC. began work on a forest management plan for [REDACTED]. The [REDACTED] own [REDACTED] acres of [REDACTED] in the town of [REDACTED]. Mr. Hetzler and [REDACTED] met on the property to talk about [REDACTED] objectives, and Mr. Hetzler inspected the woods and gathered data to support this forest management plan.

Mr. Hetzler first assessed the geology, soils, and hydrology of the site as a foundation for understanding the vegetative patterns. Next, he gathered extensive biophysical data by setting up [REDACTED] sampling plots and evaluating characteristics of the property's forests, including: structure, development, land use history, wildlife habitat, invasive species, and site indicators.

This management plan presents [REDACTED] with a biophysical inventory of their property. It summarizes the social considerations associated with the land, as well as provides a collection of maps, photos, and figures that describes past, current, and future land use. The management plan presents [REDACTED] with a suite of future land management recommendations that are compatible with their stated goals and interests. They are described as follows (and discussed in greater detail on pages [REDACTED]):

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# INTRODUCTION

## PROPERTY DESCRIPTION

The \_\_ property is located \_\_. It is comprised of \_\_ acres of \_\_. \_\_ stands were identified, consisting of... A stand is a basic unit of management and is defined by a combination of factors that separate it from surrounding areas. Defining factors include similarities in forest species composition, forest structure, past land use history, soil type, hydrology, and current utilization.

The property is accessed...

## LAND USE HISTORY

1 paragraph- what was the land historically used for? How do you know this?

## OWNERSHIP

1 paragraph- Who owned it in the past? How far back can you go?

## RESTRICTIONS

1 paragraph- What restrictions are on the property- No hunting? No cutting? Closed to the public?

## ABUTTERS

1 paragraph- who are the neighbors? What is their current relationship with the LT?

## **BASEMAP**

Can be developed in ArcGIS, or potentially through other free mapping programs, recent aeriels in Google Maps.

# **STEWARDSHIP GOALS**

## **CLIENT OBJECTIVES**

What do you want the land to look like? What do you want to manage it for? Timber, wildlife, recreation, non-timber forest products, aesthetics, etc.

## **SOCIAL STAKEHOLDER ANALYSIS**

Discussion of social stakeholders- neighbors, LT members, preserve users (legal and illegal)

## **IDENTIFICATION OF RESOURCE CONCERNS**

Water quality? Dumping? Forest health pest? Invasive species?

## **REGIONAL CONSERVATION PLANNING**

(How does management/stewardship of this property fit into conservation efforts at broader landscape levels?)

# EXISTING CONDITIONS

How were existing conditions established? What tools did you use? What was your criteria for sampling?

In order to paint an accurate and thorough picture of the biophysical characteristics of the property, the property was first assessed in ArcGIS using data provided by the University of Connecticut, the Natural Resources Conservation Service (NRCS), and the Connecticut Department of Energy and Environmental Protection (CT DEEP). Hydrology, elevation, soil types, and historic aerial photos dating back to 1934 were all used to create a basic understanding of the property in the form of a base map.

From this working base map, a random sampling design was created in Plothound, a forest sampling program for IOS created by SilviaTerra. Randomly generated sampling plot locations were created on a systematic grid, equating to approximately 10 plots per acre.

Forest vegetation of at least four inches in diameter at breast height (4.5 ft. from the ground; abbreviated "DBH") was sampled in variable radius plots using an angle gauge of basal area factor ten (BAF 10). Each tree in the plot was tallied as well as measured at DBH with a twenty-five inch reach Biltmore stick. Qualitative evaluations were made of the immediate cover type and site conditions at each plot, as well as noting other features of interest like wildlife signs or evidence of past land use history. Qualitative assessments were also made for non-forested components of the landscape, such as wetlands and fields. These observations were used to inform the written stand descriptions included in this plan.

The data collected in the field was compared with the geospatial information to create 10 distinct stands to better manage the property.



## **STANDS MAP**

Property map depicting all the stands on the property and identifying feature (Stand A is a Wooded Wetland, Stand B is a Upland Mixed Hardwoods stand, etc.)

## **SOILS**

Describe soils, especially wetland soils...

       distinct soil types were identified at       .

## **HYDROLOGY**

The main hydrological features found on     are...

## **PAST LAND USE HISTORY**

A key driver of species composition is the human-land interactions that have taken place in the past. From aerial photographs going back to...

## **WILDLIFE HABITAT**

Tracks in the snow or mud, observations, scat, observations from preserve visitors, what species you would expect to see there given the habitat type.

# SOILS MAP

Best drawn in ArcGIS or created in NRCS' WebSoilSurvey

# TOPOGRAPHY/HYDROLOGY MAP

Most easily created in ArcGIS

# STANDS SUMMARIES

## **STAND | DESCRIPTION**

Describe each stand according to the relevant subsections below..

STAND HISTORY

CURRENT STAND DESCRIPTION

TOPOGRAPHY AND SOILS

PATHOGENS AND INVASIVES

WILDLIFE CONSIDERATIONS

WATER QUALITY CONSIDERATIONS

IMPORTANT NATURAL FEATURES

IMPORTANT HISTORICAL FEATURES

DESIRED STAND CONDITION

STAND | MANAGEMENT RECOMMENDATIONS

## **STAND | DESCRIPTION**

(Insert stand description table)

STAND HISTORY

CURRENT STAND DESCRIPTION

TOPOGRAPHY AND SOILS

PATHOGENS AND INVASIVES

WILDLIFE CONSIDERATIONS

WATER QUALITY CONSIDERATIONS

IMPORTANT NATURAL FEATURES

IMPORTANT HISTORICAL FEATURES

DESIRED STAND CONDITION

STAND **I** MANAGEMENT RECOMMENDATIONS

**STAND **I** DESCRIPTION**

(Insert stand description table)

STAND HISTORY

CURRENT STAND DESCRIPTION

TOPOGRAPHY AND SOILS

PATHOGENS AND INVASIVES

WILDLIFE CONSIDERATIONS

WATER QUALITY CONSIDERATIONS

IMPORTANT NATURAL FEATURES

IMPORTANT HISTORICAL FEATURES

DESIRED STAND CONDITION

STAND **█** MANAGEMENT RECOMMENDATIONS

# **CURRENT ACTIVITIES**

## **RECREATION**

What kind of recreation is allowed on the property? Who?

## **RESEARCH**

Is there currently any research being performed?

## **EDUCATION**

What educational opportunities are available? For whom?

## **CURRENT MANAGEMENT PRACTICES**

What current management is happening? Trail maintenance? Forest thinnings?  
Road repairs? Invasive removal?



# **MANAGEMENT RECOMMENDATIONS**

## **MANAGEMENT ISSUES AND OPPORTUNITIES**

Discussion of challenges and potential prospects.

## **RECOMMENDATIONS**

Incorporate biophysical data, social considerations, economic realities

## **MANAGEMENT SCHEDULE OF ACTIVITIES**

This should outline every proposed management activity in sequential order for the next 10 years.

# MANAGEMENT PLAN DOCUMENTATION

## PERMITS

Any permits needed to perform management? From where? How much?

## THREATENED AND ENDANGERED SPECIES

Connecticut Department of Energy and Environmental Protection request performed? Any known T&A species on the property or nearby?

## BEST MANAGEMENT PRACTICES (BMPs)

Discussion of BMP's as they relate to proposed activities (horses will not use certain trails designed for hikers only, no harvesting in 50ft. riparian buffer, no chemical treatment of invasives near stream, etc.)

## MONITORING

Who will monitor preserve and management progress? How?

## CONTACTS

Who can help? State, federal, private resources? Neighbors with knowledge or experience in certain activities (haymaking or syruing for example)

## POTENTIAL FUNDING SOURCES

State? Federal? Private donors? Other non-profits? For which activities?

# APPENDIX

## APPENDIX \_\_: HISTORICAL AERIAL PHOTOS

Available at UConn MAGIC website

## APPENDIX \_\_: TREE AND SHRUB LIST

Vegetation positively identified on the property

## APPENDIX \_\_: INVASIVE SPECIES IDENTIFICATION

Invasive species positively identified on the property

## APPENDIX \_\_: GLOSSARY

Can add or delete terms as you see fit

### **Age class**

A group of individual trees or shrubs that is of the same age.

### **Basal Area**

The cross-sectional area of the trunk 4 1/2 feet above ground; this can be measured on a per acre basis, which means summing the basal areas of all trees in one acre; such a measurement offers insight into foresty density.

### **Canopy**

The continuous cover formed by the crowns of trees in a forest.

### **Chain**

One chain is equal to 66 feet.

### **Clay**

A general term including many combinations of one or more clay minerals with traces of metal oxides and organic matter. Geologic clay deposits are mostly composed of phyllosilicate minerals containing variable amounts of water trapped in the mineral structure.

**Conifers**

Any of various mostly needle-leaved or scale-leaved, chiefly evergreen, cone-bearing gymnospermous trees or shrubs such as pines, spruces, and firs.

**Crown**

The top part of the tree, which features branches that grow out from the main trunk and support the various leaves used for photosynthesis.

**DBH (diameter at breast height)**

Measure of tree girth at 4.5 feet (1.3 meters above ground level).

**Disturbance**

Both natural and anthropological events such as hurricanes, tropical storms, wildfires and harvesting that impact forest ecosystems in a manner that results in the damage or death of individual trees.

**Drumlin**

An elongate or oval hill of glacial drift.

**Ecological Community**

A community is an assemblage or associations of populations of two or more different species occupying the same geographical area.

**Ephemeral stream**

A stream that flows only briefly during and following a period of rainfall in the immediate locality.

**Erosion**

The washing away of soil by the flow of water.

**Facultative Species**

Facultative species are species that can use a habitat feature such as a vernal pool, but do not rely on it to complete their life cycle.

**Floodplain**

An area of low, flat land along a water body that may flood.

## **Forest Succession**

The sequential change in composition, abundance, and patterns of species that occurs as a forest matures and/or responds to disturbance.

## **Form Class**

Form class = diameter inside bark at 17' height/dbh outside bark\*100. Form class 80 says that the diameter inside the bark at the end of the first log is 80% of the dbh. A ladder can be used to do measurements at that height.

## **Geographic Information Systems (GIS)**

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data. The acronym GIS is sometimes used for geographical information science or geospatial information studies to refer to the academic discipline or career of working with geographic information systems and is a large domain within the broader academic discipline of Geoinformatics. In the simplest terms, GIS is the merging of cartography, statistical analysis, and computer science technology.

## **Glaciation**

The process, condition, or result of being covered by glaciers or ice sheets.

## **Glacial erratic**

A piece of rock existing on the surface of the forest floor that differs from the size and type of rock native to the area in which it rests.

## **Glacial till**

Unsorted sediment deposited by the activity of glaciers.

## **Hardwoods**

Collective term referring to trees such as oaks, beech, and maples; hardwoods lose their leaves in the fall.

## **Herbaceous plants**

Low growing non-woody plants.

## **Histosol**

A soil of an order comprising peaty soils, with a deep surface layer of purely organic material.

### **Horizons (soil)**

A layer in a soil profile with unique characteristics that distinguishes it from other layers.

### **Hydric (sites)**

Extremely wet site.

### **Hydrology**

The study of the movement, distribution, and quality of water.

### **Illuvium**

Material displaced across a soil profile, from one layer to another one, by the action of rainwater.

### **Inceptisol**

A soil of an order comprising freely draining soils in which the formation of distinct horizons is not far advanced, such as brown earth.

### **Invasive species**

Species that are not native to a site; these frequently out-compete native species and prevent them from establishing.

### **Kettle Depression**

Depression in the surface of glacial drift resulting from the melting of an included ice mass.

### **Leaching**

To remove (nutritive or harmful elements) from soil by percolation

### **Loam**

Loam is soil composed of sand, silt, and clay in relatively even concentration. These proportions can vary to a degree however, and result in different types of loam soils: sandy loam, silty loam, clay loam, sandy clay loam, silty clay loam, and loam.

### **Management area**

Management areas are specific geographical areas defined by a plan. Each management area has a set of objectives and a management prescription unique to it.

### **Mesic (sites)**

Soil sites with moderate or well-balanced supply of moisture.

### **Microclimate**

The climate of a very small or restricted area, esp. when this differs from the climate of the surrounding area.

### **Moraine**

A mass of rocks and sediment carried down and deposited by a glacier, typically as ridges at its edges or extremity.

### **Obligate Species**

Obligate species require something to complete their life cycle, such as a vernal pool.

### **Old-field Succession**

Ecological succession which occurs on abandoned farmland.

### **Organic Horizon**

A soil horizon comprised of organic material derived mainly from natural litter and debris.

### **Overstory**

The level of forest canopy that includes the crowns of dominant, co-dominant, and intermediate trees.

### **Peat (or muck peat)**

An accumulation of partially decayed vegetation. One of the most common components is Sphagnum moss, although many other plants can contribute. Peat forms in wetland conditions, where flooding obstructs flows of oxygen from the atmosphere, slowing rates of decomposition.

### **Pioneer Species**

Pioneer species are hardy species which are the first to colonize previously disrupted or damaged ecosystems, beginning a chain of ecological succession that ultimately leads to a more biodiverse steady-state ecosystem.

### **Plate tectonics**

A theory explaining the structure of the earth's crust and many associated phenomena as resulting from the interaction of rigid lithospheric plates that move slowly over the underlying mantle.

### **Quadratic Mean Diameter**

Quadratic mean diameter is the average tree diameter at breast height using the square root of the sum of squared diameters to give a mean more weighted to larger trees, which is more closely related to other mensuration information such as basal area and volume.

### **Regeneration**

Forest regeneration is the act of renewing tree cover by establishing young trees, generally promptly after the previous stand or forest has been removed.

### **Riparian**

Land area on the banks of a river.

### **Sapling**

A tree at least 4.5 feet tall and up to 4 inches in diameter.

### **Scarification**

To break up and loosen the organic layer of soil, exposing the mineral soil.

### **Sediment**

Solid matter that settles to the bottom of a liquid.

### **Shade tolerant**

Trees that do well in shade and can tolerate low light levels for long periods.

### **Silviculture**

Silviculture is the practice of controlling the establishment, growth, composition, health, and quality of forests to meet diverse needs and values. Silviculture also focuses on making



sure that the treatment(s) of forest stands are used to preserve and to better their productivity.

### **Softwood**

Generally, the wood from a conifer (such as pine, fir, or spruce) as distinguished from that of broadleaved trees.

### **Species Composition**

Species composition or richness is simply a count of species, and it does not take into account the abundances of the species or their relative abundance distributions.

### **Spodosol**

A soil of an order rich in aluminum oxide and organic matter, typically characterized by low fertility, and including most podzols.

### **Stand**

A group of forest trees of sufficiently uniform species composition, age, and condition to be considered a homogeneous unit for management purposes.

### **Stonewall (double and single row)**

Stonewalls with double rows of stones usually denote land that was plowed, while walls with single rows of stones suggest old pastures, which did not generate as many stones. Small piles of stones on boulders indicate that farmers once mowed hay with scythes in those places -- if the scythe hit a small stone, they picked it up and put it where it wouldn't nick the blade the following year.

### **Subcanopy**

Woody plants between the canopy and understory zones.

### **Succession**

The natural replacement of one plant community by another over time in the absence of disturbance. This follows a predictable pattern based on the ecology of species, with pioneer species (fast-growing, shade intolerant) being gradually replaced by late-successional species (slow-growing, shade tolerant) over time.

### **Sugarbush**

A forest stand which is exploited for maple syrup. The tree canopy is dominated by sugar maple or black maple. Other tree species, if present, form only a small fraction of the total tree cover.

### **Thinning**

Removal of individual trees from an immature, overstocked stand of trees in order to lower stand density and reallocate growing space to concentrate on individuals with the best growth potential.

### **Topography**

The arrangement of the natural and artificial physical features of an area.

### **Understory**

The level of forest vegetation beneath the canopy and above the groundstory.

### **Variable Radius Plot**

Variable-radius plot sampling (also known as angle gauge sampling, prism sampling or point sampling) is one of the most common and efficient sampling methods for timber inventory.

### **Vernal Pool**

A vernal pool is a seasonally wet area in a defined depression or basin that holds water only 2 months out of the year. It supports or is capable of supporting breeding and development of both obligate and facultative species and is especially important habitat because it lacks a fish population. Species that rely on vernal pools include spotted salamander, Jefferson salamander complex, marbled salamander, wood frogs, and fairy shrimp.

### **Wetland**

Land consisting of marshes or swamps; saturated land.

### **Wolf tree**

A large, older tree with a spreading crown and little or no timber value, but often high value for wildlife. The spreading crown indicates that these trees originally grew in open conditions. Frequently they are found in second-growth forests that have regrown from pastures.

