

# Climate Resilience Plan for The Hoffman Preserve

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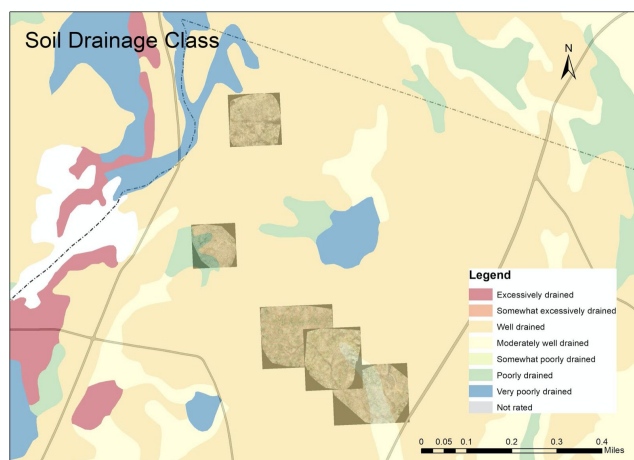
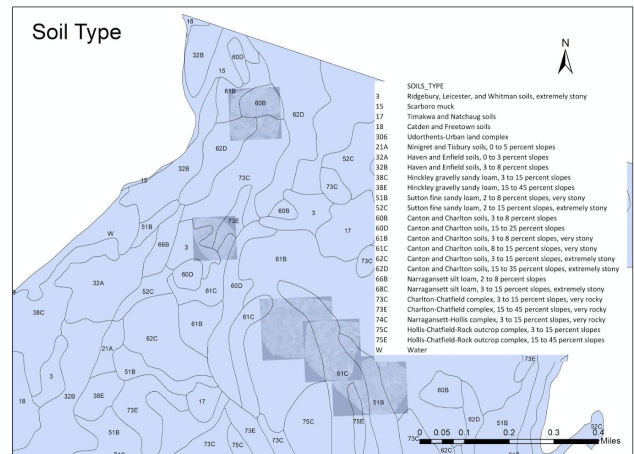
## Goals:

- Suggest New England native plants adaptable to changes the Hoffman Preserve may encounter in the future.
- Provide specific plant species for specific patch cuts.
- Include current climate and projected climate

## Current State Of Hoffman Preserve:

Patch Cuts (Categorized by Soil type, Acreage, Sunlight exposure and Soil Drainage Type)

- **Patch Cut 1 (top):**
  - Acreage: 1.92 acres.
  - Soil Type: Canton and Charlton soils, edges are stony.
  - Sunlight Exposure: Mix of Northern and Western Orientation (More afternoon and evening light).
  - Soil Drainage Class: Well drained.
- **Patch Cut 2:**
  - Acreage: 1.34 acres.
  - Soil Type: Charlton-Chatfield complex, overall area is very stony.
  - Sunlight Exposure: Mix of northern and western orientation (More afternoon and evening light).



- Soil Drainage Class: Mostly well drained with poor drainage at edges.
- **Patch Cut 3:**
  - Acreage: 0.74 acres.
  - Soil Type: Canton and Charlton soils, very stony.
  - Sunlight Exposure: Half west and half east orientation (More morning, afternoon, and evening light).
  - Soil Drainage Class: Well drained.
- **Patch Cut 4:**
  - Acreage: 0.74 acres.
  - Soil Type: Canton and Charlton soils, very stony.
  - Sunlight Exposure: Primarily eastern orientation (More morning light).
  - Soil Drainage Class: Mostly well drained with a small amount of poor drainage.
- **Patch Cut 5 (Bottom):**
  - Acreage: 1.38 acres.
  - Soil Type: Mix of Hollis-Chatfield-Rock outcrop complex, Sutton fine sandy loam, Canton and Charlton soils.
  - Sunlight Exposure: Primarily eastern orientation (More morning light).
  - Soil Drainage Class: Mostly well drained with somewhat poor drainage through the middle.

## Projected Regional Climate Change:

Projected Climate (By end of the century):

- Temperatures in the region are expected to increase 3 to 10°F by the end of the century according to Climate Models. This change in temperature will increase the duration of the growing season.
  - Large increases are projected for annual changes in temperature (+5 to +8oF annual mean, mid- and late-century) and in seasonal average temperatures for all regions in the state, with the greatest increase experienced in summer (June—August, +6oF) by mid-century and fall (September— November, +10 oF) by late-century.
- “Precipitation patterns will continue to change, with less winter snow and the potential for drier conditions later in the growing season.”
  - Annual precipitation across the state is projected to increase (8.5% and 9.5%, by mid- and late-century), however, the largest increase is projected for winter (13.4% & 16.3%) and spring (10% and 16.5%).

- “Many “northern” tree species will face increasing stress from climate change, while those that have more southerly distributions and can tolerate hotter and drier conditions may be favored.”

## Plants Species Selection Process:

- Different plant species of both shrubs and trees will be selected depending on their adaptability to changes the Hoffman Preserve may face in the future.
  - Changes including: climate, hydrology, sunlight exposure, etc.
- Species selected must be native to different areas around New England (Mainly southern New England for best climate adaptability).
- Each species will be divided into categories consisting of: Species type, Habitat/ Suggested Patch Cut, EnviroAttributes, Liabilities, and Growth Attributes. This will give a brief overview of the most important attributes (both positive and negative) of each suggested species.

## Defining Native:

- USA NRCS’ Definition of Native: A plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Note: The word native should always be used with a geographic qualifier (that is, native to New England. Only plants found in this country before European settlement are considered to be native to the United States.

## Suggested Native Species:

### Trees:

Species	Habitat/ Suggested Patch Cut	EnviroAttributes	Liabilities	Growth Attributes
<i>Betula lenta</i>  <i>Sweet Birch,</i> <i>Black Birch</i>	- Eastern North America  - Suggested Patch Cut(s): Best fit for cut 3 however, due to this plant's	- Best on deep, rich, moist, acidic soils, but can also be found on rocky, drier sites and heavy soil  - Best in full sun; tolerates light shade	- Can have a number of other insect and disease problems common to birch	- 40' to 55' in the landscape; 70' to 80' tall in the wild

	<p>adaptability, it could work in any of the 5.</p>	<ul style="list-style-type: none"> <li>- Resistant to bronze birch borer</li> </ul>		
<p><b>Pinus Strobus</b></p> <p><b>Eastern White Pine</b></p>	<ul style="list-style-type: none"> <li>- Native to all of New England</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2. Due to the well drained and slightly damper soils.</li> </ul>	<ul style="list-style-type: none"> <li>- Easily transplanted, easily grown</li> <li>- Prefers moist, well-drained, slightly acidic soil</li> </ul>	<ul style="list-style-type: none"> <li>- White pine weevil is common, causing leader death, but plants recover with an altered form</li> <li>- Wood is weak and cannot tolerant strong winds</li> </ul>	<ul style="list-style-type: none"> <li>- 50 to 80' tall by 30-50' wide, can reach well over 100' tall.</li> </ul>
<p><i>Celtis occidentalis</i></p> <p><b>Common Hackberry</b></p>	<ul style="list-style-type: none"> <li>- CT native</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts due to this plant's adaptability to almost any soil and weather conditions.</li> </ul>	<ul style="list-style-type: none"> <li>- Edible fruit</li> <li>- Easily transplant form B&amp;B container or bare root</li> <li>- Prefers rich soil however very soil adaptable</li> <li>- Tolerant of most conditions</li> <li>- Wind tolerant</li> <li>- Full sun</li> </ul>	<ul style="list-style-type: none"> <li>- Leaf spot, powdery mildew, hackberry nipple gall, scale</li> <li>- Problems don't kill tree, but make tree very unattractive</li> </ul>	<ul style="list-style-type: none"> <li>- 40' to 60' tall and has an almost equal spread</li> <li>- Fast growth rate</li> </ul>
<p><i>Diospyros virginiana</i></p> <p><b>Common Persimmon</b></p>	<ul style="list-style-type: none"> <li>- Native to Eastern North America</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2 due to the well drained and moist soils.</li> </ul>	<ul style="list-style-type: none"> <li>- Edible fruit attractive to wildlife</li> <li>- Prefers moist, well-drained soil</li> <li>- Often found growing in sandy, infertile soils</li> <li>- pH adaptable</li> <li>- Full sun</li> </ul>	<ul style="list-style-type: none"> <li>- Difficult to transplant</li> <li>- Leaf spot</li> </ul>	<ul style="list-style-type: none"> <li>- 35' to 40' tall</li> <li>- Fast growth rate</li> </ul>

	Could work in any of the 5 however.			
<i>Carya glabra</i> Pignut Hickory	<ul style="list-style-type: none"> <li>- Native to Maine down through Florida</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2 however, this plant could work in any of the 5 because it does not require full sun.</li> </ul>	<ul style="list-style-type: none"> <li>- Prefers fertile, well-drained soil</li> <li>- Full sun to partial shade</li> <li>- Edible fruit</li> </ul>	<ul style="list-style-type: none"> <li>- Has a large taproot, which makes transplanting difficult</li> <li>- Few pest and disease problems</li> </ul>	<ul style="list-style-type: none"> <li>- 50' to 60' tall and 25' to 35' wide</li> <li>- Medium growth rate</li> </ul>
<i>Acer negundo</i> Boxelder, Ash-leaved Maple	<ul style="list-style-type: none"> <li>- CT native</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 patch cuts. This plant is very adaptable to many soils which makes it a perfect fit. However, there are a good amount of negative aspects about this tree.</li> </ul>	<ul style="list-style-type: none"> <li>- Transplants easily</li> <li>- Performs well on poor, wet or dry sites, in areas or soils of extreme pH levels; withstands flooding</li> </ul>	<ul style="list-style-type: none"> <li>- Huge flocks of migratory birds (Evening Grosbeak, Cedar Waxwing) usually strip all seeds from this tree as they pass through</li> <li>- Seeds germinate well, creating a weed problem</li> <li>- Weak wood breaks easily in storms</li> <li>- Short-lived tree</li> </ul>	<ul style="list-style-type: none"> <li>- 30' to 60' tall</li> <li>- Extremely fast-growing, especially when young</li> </ul>

<p><i>Carpinus caroliniana</i></p> <p>American Hornbeam, Ironwood</p>	<ul style="list-style-type: none"> <li>- Native to Canada down through Texas across to Florida</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2 due to the moist soils however, this plant could work in any of the 5 cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- Transplants from containers</li> <li>- Prefers, deep fertile, moist, acidic soil</li> <li>- Full sun to shade</li> <li>- Prune tolerant</li> <li>- Shade tree</li> <li>- Hedge</li> </ul>	<ul style="list-style-type: none"> <li>- Leaf diseases</li> <li>- Cankers</li> <li>- Doesn't transplant well</li> </ul>	<ul style="list-style-type: none"> <li>- 20' to 30' tall and as wide or wider</li> <li>- Slow growth rate</li> </ul>
<p><i>Carya ovata</i></p> <p>Shagbark Hickory</p>	<ul style="list-style-type: none"> <li>- Native to Quebec and southwest to Texas</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 patch cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- Prefers deep, well-drained soil</li> <li>- Has a large taproot, which makes transplanting difficult</li> <li>- Full sun to partial shade</li> <li>- Used for fruit</li> <li>- Unique bark</li> <li>- Naturalized areas</li> <li>- Used for barbecues (hickory smoked meat)</li> </ul>	<ul style="list-style-type: none"> <li>- Fruit can be a litter problem</li> <li>- Few pest and disease problems</li> </ul>	<ul style="list-style-type: none"> <li>- Large deciduous tree</li> <li>- Up to 80' tall</li> <li>- About two-thirds as wide</li> </ul>

Shrubs:

<p><i>Ceanothus americanus</i></p> <p>New Jersey Tea</p>	<ul style="list-style-type: none"> <li>- Eastern North American Native</li> <li>- New Jersey tea is usually found on the sandy soils of open woodlands and prairies, and on rocky hillsides.</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- High tolerance for drought and restricted water conditions</li> <li>- Rabbit, elk and deer browse New Jersey tea and turkey and quail</li> <li>- Eat the fruit.</li> <li>- <i>Ethnobotanical</i> uses</li> <li>- Good for pollinators like bees butterflies and moths</li> </ul>	<ul style="list-style-type: none"> <li>- Foliar disease</li> <li>- Leaf spot</li> <li>- Powdery mildew</li> </ul>	<ul style="list-style-type: none"> <li>- Approximately 3 feet in height</li> <li>- Up to 3 inches long and 2 inches wide</li> </ul>
<p><i>Aronia melanocarpa</i></p> <p>Black Chokeberry</p>	<ul style="list-style-type: none"> <li>- Eastern North American Native</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts. Very adaptable.</li> </ul>	<ul style="list-style-type: none"> <li>- Tolerant of both dry and wet soils</li> <li>- Easily transplanted and established</li> <li>- Full sun or partial shade, but best flowering, fruiting and fall color in full exposure</li> <li>- Fruit eaten by birds</li> </ul>	<ul style="list-style-type: none"> <li>- Can get all the problems common to the rose family</li> <li>- Tends to spread by suckers</li> </ul>	<ul style="list-style-type: none"> <li>- Generally 3' to 5' tall, but can get larger</li> <li>- Forms large colonies and spreads</li> </ul>
<p><i>Symphoricarpos albus</i></p> <p>Common Snowberry</p>	<ul style="list-style-type: none"> <li>- Native from Nova Scotia and Alberta south to Minnesota and Virginia</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- Easy to transplant</li> <li>- Tolerates any soil</li> <li>- Sun to medium shade</li> <li>- Prune before new growth</li> </ul>	<ul style="list-style-type: none"> <li>- Suckers profusely and spreads</li> <li>- Little floral show</li> <li>- No fall color</li> </ul>	<ul style="list-style-type: none"> <li>- 3-6 ft. tall and wide</li> <li>- spreads by suckers underground</li> </ul>

<p><i>Juniperus horizontalis</i></p>	<ul style="list-style-type: none"> <li>- Native to northern North America</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2 because this plant does best in full sun however, this plant could work in any of the 5 due to its adaptability.</li> </ul>	<ul style="list-style-type: none"> <li>- Easily transplanted</li> <li>- Adaptable to most conditions</li> <li>- Full sun</li> <li>- pH adaptable</li> <li>- Salt tolerant</li> </ul>	<ul style="list-style-type: none"> <li>- Juniper blight and spider mites</li> </ul>	<ul style="list-style-type: none"> <li>- 1' to 2' tall and 4' to 8' wide</li> <li>- Medium growth rate</li> </ul>
<p><i>Rosa virginiana</i></p>	<ul style="list-style-type: none"> <li>- Native to eastern North America</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2 however, could work in any of the 5 cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- Full sun</li> <li>- Easy to transplant and grow</li> <li>- Prefers well-drained, acidic soil</li> <li>- pH adaptable</li> <li>- Salt tolerant</li> <li>- Prune tolerant</li> <li>- Showy fruit</li> </ul>	<ul style="list-style-type: none"> <li>- Blackspot</li> <li>- Powdery mildew</li> <li>- Aphids</li> <li>- Thrips</li> <li>- Mites</li> <li>- Suckers</li> </ul>	<ul style="list-style-type: none"> <li>- 4' to 6' tall</li> <li>- Fast growth rate</li> </ul>
<p><i>Cercis canadensis</i>  Eastern Redbud</p>	<ul style="list-style-type: none"> <li>- Native to the southeastern and central United States, from New Jersey south</li> <li>- Suggested Patch Cut(s): Best fit for cuts 1 and 2. Could work in any of the 5 however, this plant does not like very dry soil.</li> </ul>	<ul style="list-style-type: none"> <li>- Full sun to light shade</li> <li>- Likes a moist, well-drained, soil, but is adaptable to most soils that are not permanently wet</li> <li>- Avoid very dry and hot locations</li> <li>- Transplant young trees for best success</li> </ul>	<ul style="list-style-type: none"> <li>- Lack of cold hardiness if proper genetic material isn't used</li> <li>- Twig kill and dieback in zones 5 and 4</li> <li>- Wood can be brittle with trees splitting at crotches</li> <li>- Persistent fruits can be</li> </ul>	<ul style="list-style-type: none"> <li>- A small, deciduous tree</li> <li>- 20' to 30' tall</li> <li>- 25' to 35' wide</li> </ul>



		<ul style="list-style-type: none"> <li>- Showy spring flowering</li> </ul>	<ul style="list-style-type: none"> <li>objectionable</li> <li>- Canker</li> <li>- Tends to be short-lived, especially when exposed to chronic stresses</li> </ul>	
<p><i>Viburnum acerifolium</i></p> <p>Mapleleaf Viburnum, Dogmackie</p>	<ul style="list-style-type: none"> <li>- Native to eastern United States</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts.</li> </ul>	<ul style="list-style-type: none"> <li>- Prefers well-drained, mildly acidic soil</li> <li>- Full sun to shade</li> <li>- Flowers on new wood</li> <li>- Shrub borders</li> <li>- Naturalizing</li> <li>- Used for mass plantings</li> <li>- Used for fruiting effect</li> </ul>	<ul style="list-style-type: none"> <li>- Bacterial leaf spot</li> <li>- Nematodes</li> <li>- Rootstocks tend to sucker</li> </ul>	<ul style="list-style-type: none"> <li>- A deciduous small shrub</li> <li>- Multi stemmed</li> <li>- 4' to 6' tall with an equal width</li> <li>- Moderate growth rate</li> </ul>

<p><i>Viburnum cassinoides</i></p> <p>Witherod Viburnum (Strong suggestion)</p>	<ul style="list-style-type: none"> <li>- Native to eastern United States</li> <li>- Suggested Patch Cut(s): Best fit for any of the 5 cuts. Very adaptable plant.</li> </ul>	<ul style="list-style-type: none"> <li>- Very easy to grow</li> <li>- Full sun to partial shade</li> <li>- Soil adaptable from dry to fairly wet</li> <li>- Easily transplanted</li> <li>- Used to border</li> <li>- Useful for its extreme durability</li> <li>- Attractive to</li> </ul>	<ul style="list-style-type: none"> <li>- Free from serious problems</li> <li>- May need occasional rejuvenation pruning</li> </ul>	<ul style="list-style-type: none"> <li>- A dense, multi stemmed shrub</li> <li>- 5' to 6' tall</li> <li>- Moderate growth rate</li> </ul>
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		birds - Provides a nice neutral effect in the landscape - Perfect for difficult sites		
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## Resources:

- “Woody Plants Database.” *Woodyplants Database*, woodyplants.cals.cornell.edu/home.
- *Plant Database*, hort.uconn.edu/search.php.
- “Providence Water: Planting Future-Adapted Forests.” *Providence Water: Planting Future-Adapted Forests | Climate Change Response Framework*, forestadaptation.org/adapt/demonstration-projects/providence-water-planting-future-adapted-forests.
- “Welcome to the PLANTS Database: USDA PLANTS.” *Welcome to the PLANTS Database | USDA PLANTS*, plants.sc.egov.usda.gov/java/.
- “Connecticut Environmental Conditions OnlineMaps and Geospatial Data for Everyone.” *CT ECO Home*, [www.cteco.uconn.edu/](http://www.cteco.uconn.edu/).
- “Celebrate Native Plants.” *Native Plant Trust*, [www.nativeplanttrust.org/](http://www.nativeplanttrust.org/).
- [https://plants.sc.egov.usda.gov/factsheet/pdf/fs\\_ceam.pdf](https://plants.sc.egov.usda.gov/factsheet/pdf/fs_ceam.pdf)
- <https://circa.uconn.edu/wp-content/uploads/sites/1618/2019/08/CTPCSAR-Aug2019.pdf>