ESEK HOPKINS PARK
SCITUATE RI

PLAN AMENDMENT & RECOMMENDATIONS

This amendment is provided to update the Stand Descriptions at the Esek Hopkins Park following the February 2021 implementation of the Salvage and Harvest Contract.

The Forest Stand Map is amended to reflect the current conditions, with:

- an expansion of Stand 2 in the northern portions of the property where mixed White and Pitch pine are present along with the oaks and other hardwoods;
- Stand 3 extends from the vernal pool along Battey Meetinghouse Road along a strip of an intermittent drainage area to the small area of wetland along the eastern boundary line;
- And Stand 4 occupies the upland knoll in the southern portion of the property.

Please refer the amended Forest Stand Map that follows.

Comparison of pre- and post- stocking levels and standing dead:

The post-harvest inventory reveals a moderate reduction in live stocking conditions in each of the three referenced stands, measured by the Basal Area per acre figure, as can be seen in the table below. Adjusting the stand configurations results in the inconsistencies represented in a couple of the stand's pre and post stocking levels.

The focus of the project was to remove the hazardous dead trees on the property. The presence of standing dead trees has been significantly reduced to just a scattering of trees representing less than 10 square feet of Basal Area per acre.

		STOCKING LEVELS			
STAND	SPECIES	PRE-LIVE	PRE-DEAD	POST-LIVE	POST-DEAD
2	PINES	70 sq. ft.	3 sq. ft.	47 sq. ft.	2 sq. ft.
2	HDWD	38 sq. ft.	14 sq. ft.	72 sq. ft.	10 sq. ft.
3	HDWD	40 sq. ft.	100 sq. ft.	60 sq. ft.	5 sq. ft.
4	W. PINE	6 sq. ft.	0	6 sq. ft.	0
4	HDWD	87 sq. ft.	16 sq. ft.	74 sq. ft.	5 sq. ft.

Management Recommendations:

The recently-completed salvage harvest has created several canopy openings, or small gaps, which mimic storm events in natural woodland settings. These small areas that now have plenty of sunlight will naturally fill in with vegetation. The local deer population will have an influence on what vegetation develops into these canopy gaps, and will likely consist of White pine, Black birch, Red maple, and Sassafras.

The SCC has the option to conduct plantings of hardwood species, some of which will require deer browse protection measures. Species selection will depend on micro-site conditions, with soil moisture and canopy gap size being important in that selection. The SCC may also want to consider planting species that will be better suited to changing climatic conditions. To that end the attached "Climate Change Projections for Individual Tree Species, Southern and Coastal New England" publication from the National Institute of Applied Climate Science (NIACS) is a good guide, and more information is available at www.forestadaption.org.

The larger of the above-referenced openings are present in the lower-slope, wetter soils of the middle of Stand 3, and the well-drained mid-slope landing area at the western edge of Stand 4. There are also a number of small openings in the upland area and adjacent north-facing slope of Stand 4. An opening is also present in the eastern portion of Stand 2, in an upland site.

In the moister sites, Yellow poplar, American elm, Sycamore, Black gum, and Shagbark hickory will be good choices.

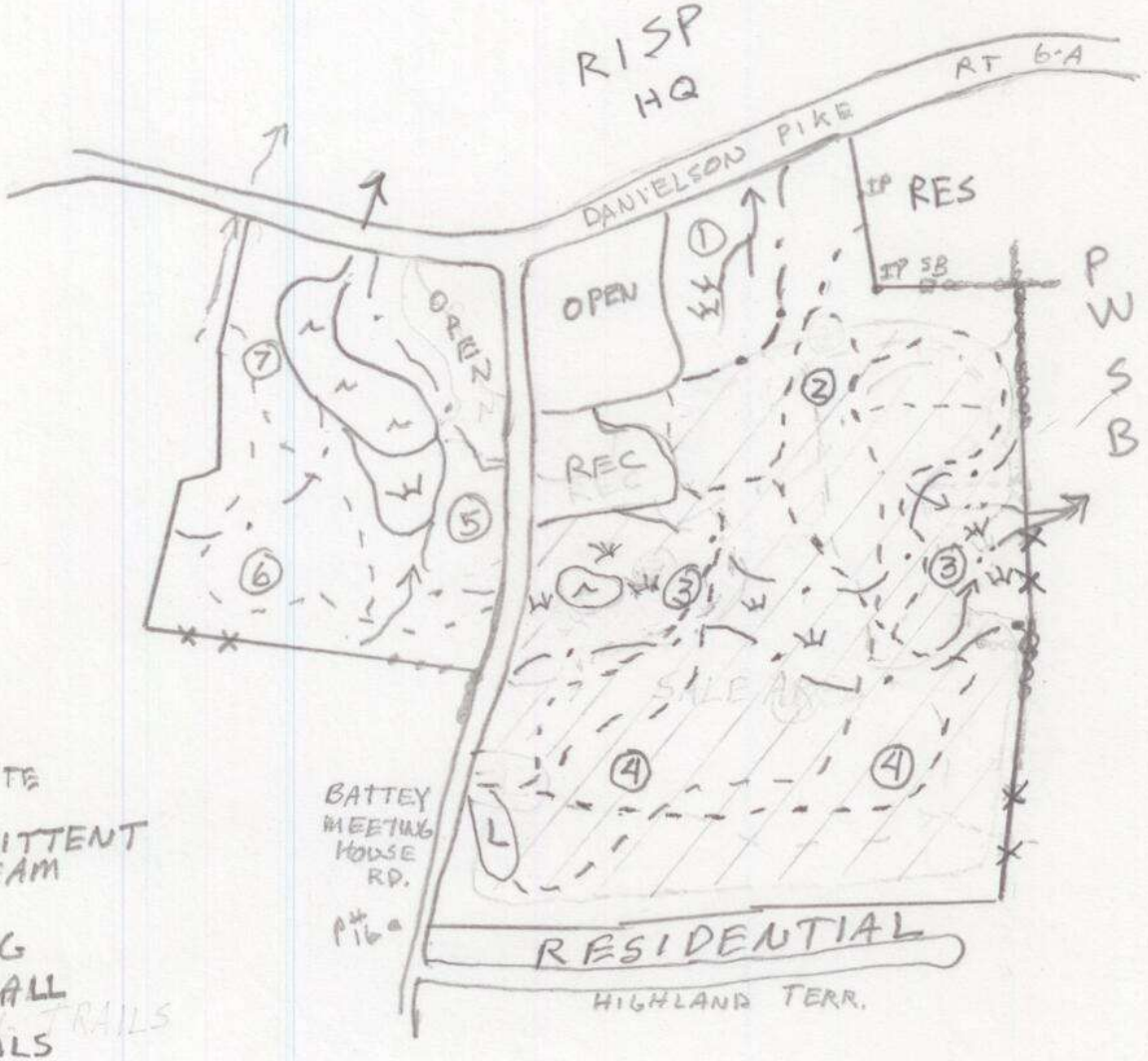
In the drier sites, Black oak, White oak, Chestnut oak, Pignut and Mockernut hickories, and American chestnut will be good choices.

Deer browse protection through the use of individual tree tubes or fencing around small groups of trees will be needed for most of the species listed above.

ESEK HOPKINS PARK
SCITUATE, RI
FOREST STAND MAP

N

1"=550'



LEGEND

- WETLAND + POOL SITE
- INTERMITTENT STREAM
- L - LANDING
- STONE WALL
- SCC TRAILS

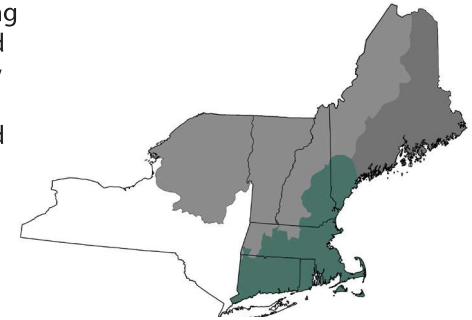
LAND MANAGEMENT SERVICE
MARC J. TREMBLAY, CF
303 COURTHOUSE LN
PASCOAG, RI 02859-2813

FEB., 2021

CLIMATE CHANGE PROJECTIONS FOR INDIVIDUAL TREE SPECIES

SOUTHERN AND COASTAL NEW ENGLAND

The region's forests will be affected by a changing climate during this century. A team of forest managers and researchers created an assessment that describes the vulnerability of forests in New England and northern New York (Janowiak et al. in press). This report includes information on the current landscape, observed climate trends, and a range of projected future climates. It also describes many potential climate change impacts to forests and summarizes key vulnerabilities for major forest types. This handout is summarized from the full assessment.



Remember that models are just tools, and they're not perfect. Model projections don't account for some factors that could be modified by climate change, like droughts, wildfire activity , and invasive species. If a species is rare or confined to a small area, Tree Atlas results may be less reliable. These factors, and others, could cause a particular species to perform better or worse than a model projects. Human choices will also continue to influence forest distribution, especially for tree species that are projected to increase. Planting programs may assist the movement of future-adapted species, but this will depend on management decisions.

TREE SPECIES INFORMATION:

This assessment uses two climate scenarios to "bracket" a range of possible futures. These future climate projections were used with two forest impact models (Tree Atlas and LANDIS) to provide information about how individual tree species may respond to a changing climate. More information on the climate and forest impact models can be found in the assessment. Results for "low" and "high" climate scenarios can be compared on page 2 of this handout.

Despite these limits, models provide useful information about future expectations. It's perhaps best to think of these projections as indicators of possibility and potential change. The model results presented here were combined with information from published reports and local management expertise to draw conclusions about potential risk and change in the region's forests.

SPECIES	ADDITIONAL CONSIDERATIONS
LIKELY TO DECREASE	
Balsam fir	Requires cold climate and susceptible to drought, fire, and insects
Eastern white pine	Good disperser, but susceptible to drought and insects
Paper birch	Early-sucessional colonizer, but susceptible to insects and drought
Quaking aspen	Early-sucessional colonizer, but susceptible to heat and drought
Red spruce	Needs a particular type of habitat, limited seedling establishment
Striped maple	Shade tolerant and easily established, but susceptible to drought
MAY DECREASE	
American beech	Affected by beech bark disease, extremely shade tolerant
Bigtooth aspen	Early-sucessional colonizer, but susceptible to drought
Eastern hemlock	Hemlock woolly adelgid causes mortality
Gray birch	Disperses easily, but susceptible to drought, fire, and insects
Red pine	Fire-adapted, but susceptiple to some insects
Yellow birch	Good disperser, but susceptible to fire, insects, and disease
NO CHANGE	
Black cherry	Susceptible to insects and fire, but tolerates some drought
White ash	Emerald ash borer causes mortality

SPECIES	ADDITIONAL CONSIDERATIONS
MAY INCREASE	
American elm	Affected by Dutch elm disease, grows across a variety of sites
Black oak	Drought-tolerant, but susceptible to insects and disease
Eastern hophornbeam	Grows across a variety of sites and tolerates shade
Eastern redcedar	Drought-tolerant, but susceptible to insects and fire
Pitch pine	Susceptible to some insect pests
Shagbark hickory	Susceptible to some insect pests
White oak	Fire-adapted and grows on a variety of sites
MIXED MODEL RESULTS	
Chestnut oak	Grows on a variety of sites, but susceptible to insects and disease
Northern red oak	Susceptible to some insect pests
Pignut hickory	Grows on a variety of sites, but susceptible to drought and insects
Red maple	Competitive colonizer tolerant of disturbance and diverse sites
Scarlet oak	Drought- and fire-adapted, but susceptible to insects and disease
Sugar maple	Grows across a variety of sites and tolerates shade
Sweet birch	Susceptible to drought, fire topkill, and insects

SOURCE: Janowiak et al. in review. New England and New York forest ecosystem vulnerability assessment and synthesis: a report from the New England Climate Change Response Framework. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. ***www.forestadaptation.org/new-england/vulnerability-assessment***

NIACS Northern Institute of Applied Climate Science

www.forestadaptation.org

FUTURE PROJECTIONS

Data for the end of the century are summarized for two forest impact models under two climate change scenarios. The Climate Change Tree Atlas (www.fs.fed.us/nrs/atlas) models future suitable habitat, while LANDIS models changes in forest growth over time (future tree density presented in this table; additional data are available in the assessment).

- ▲ **INCREASE**
  Projected increase of >20% by 2100
- ● **NO CHANGE**
  Little change (<20%) projected by 2100
- ▼ **DECREASE**
  Projected decrease of >20% by 2100
- ★ **NEW HABITAT**
  Tree Atlas projects new habitat for species not currently present

ADAPTABILITY

Factors not included in the models, such as the ability to respond favorably to disturbance, may make a species more or less able to adapt to future stressors.

- \+ high
  Species may perform better than modeled
- · medium
- – low
  Species may perform worse than modeled

SPECIES	LOW CLIMATE CHANGE (PCM B1) TREE ATLAS	LOW CLIMATE CHANGE (PCM B1) LANDIS	HIGH CLIMATE CHANGE (GFDL A1FI) TREE ATLAS	HIGH CLIMATE CHANGE (GFDL A1FI) LANDIS	ADAPT
American basswood	●		▲		·
American beech	●	●	▼	▼	·
American chestnut	●		●		·
American elm	▲		▲		·
American holly	●		▲		·
American hornbeam	●		▲		·
American mountain-ash	●		●		–
Bald cypress	★		★		·
Balsam fir	▼	▼	▼	▼	–
Balsam poplar	▼		▼		·
Bigtooth aspen	●		▼		·
Black ash	▼		▼		–
Black cherry	●	●	●	●	–
Black hickory			★		·
Black oak	▲	●	▲	●	·
Black spruce	▼	▼	▼	▼	·
Black walnut	★		★		·
Blackgum	▲		▲		+
Blackjack oak			★		+
Boxelder	●		●		+
Bur oak	●		▲		+
Cherrybark oak			★		·
Chestnut oak	▲	▲	▲	▼	+
Chinkapin oak			★		·
Common persimmon	★		★		+
Eastern hemlock	●	●	▼	▼	–
Eastern hophornbeam	●		▲		+
Eastern redbud	★		★		·
Eastern redcedar	▲		▲		·
Eastern white pine	▼	▼	▼	▼	·
Flowering dogwood	▲		▲		·
Gray birch	●		▼		·
Green ash	●		▲		·
Hackberry	●		▲		+
Loblolly pine	★		★		·
Mockernut hickory	▲		▲		+
Mountain maple	●		▼		+
Northern red oak	●	●	▼	●	+
Northern white-cedar	▼	▼	▼	▼	·
Overcup oak			★		–

SPECIES	LOW CLIMATE CHANGE (PCM B1) TREE ATLAS	LOW CLIMATE CHANGE (PCM B1) LANDIS	HIGH CLIMATE CHANGE (GFDL A1FI) TREE ATLAS	HIGH CLIMATE CHANGE (GFDL A1FI) LANDIS	ADAPT
Paper birch	▼		▼		·
Pignut hickory	▲	●	▲	▼	·
Pin cherry	●		●		·
Pin oak	▲		▲		–
Pitch pine	▲	●	●	●	·
Pond pine	★		★		–
Post oak	▲		▲		+
Quaking aspen	▼	▼	▼	▼	·
Red maple	●	●	▼	●	+
Red pine	●		▼		·
Red spruce	▼	▼	▼	▼	–
Sassafras	▲		▲		·
Scarlet oak	▲	●	▲	▼	·
Serviceberry	●		▼		·
Shagbark hickory	▲	●	▲	●	·
Shingle oak			★		·
Shortleaf pine	★		★		·
Silver maple	▲		▲		+
Slippery elm	●		▲		·
Sourwood	▲		▲		+
Southern red oak	★		★		+
Striped maple	▼		▼		·
Sugar maple	●	●	●	▼	+
Sugarberry			★		·
Swamp chestnut oak	●		▲		·
Swamp tupelo	★				–
Sweet birch	▲		▼		–
Sweetbay	★				·
Sweetgum	★		★		·
Sycamore	▲		▲		·
Tamarack (native)	▼		▼		–
Virginia pine	★	●	★	●	·
Water oak			★		·
White ash	●	●	●	●	–
White oak	▲	●	▲	●	+
White spruce	▼		▼		·
Willow oak			★		·
Winged elm	●		▲		·
Yellow birch	●	●	▼	▼	·
Yellow-poplar	▲	▲	▲	●	+

www.forestadaptation.org