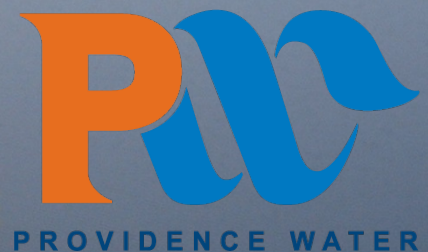


EXPERIMENTING WITH “CLIMATE ADAPTATION PLANTING” AT PROVIDENCE’S SCITUATE RESERVOIR: CHALLENGES AND OPPORTUNITIES

CHRISTOPHER RIELY
Forest Supervisor, Water Supply
March 9, 2017

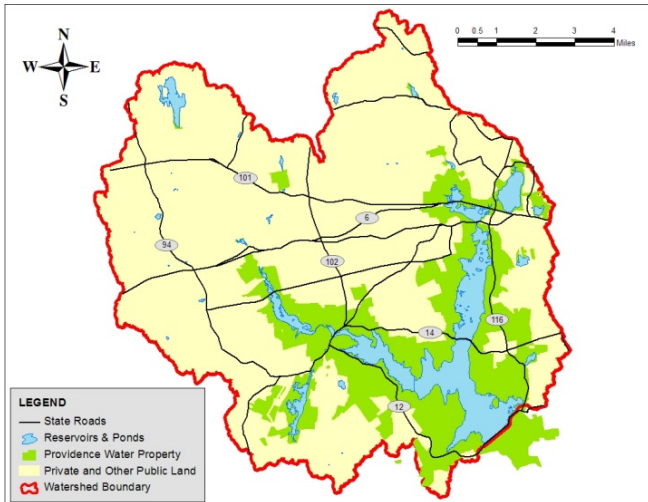


PROVIDENCE WATER AND THE SCITUATE RESERVOIR WATERSHED

- Public utility developed and operated by City of Providence
- Current system established c. 1920
- Now provides water to 600,000 people or 2/3 of all Rhode Islanders
- Main Scituate Reservoir and several smaller tributary reservoirs
- 93 square mile watershed, mostly private land
- Water Resources Division manages 13,000 acres of City-owned forest surrounding reservoir system



WATERSHED MANAGEMENT PROGRAMS



- Forestry and land management
- Land conservation
- Water sampling
- Policy and planning engagement with state and watershed towns
- Outreach and education

WHY WE ACTIVELY MANAGE THE FOREST



Overarching goal is to maintain a forest that is adaptive to change and resilient to disturbances that could impact water quality

HISTORIC MANAGEMENT CONTEXT

- Active management for nearly 100 years
- Planting species from elsewhere is nothing new
- 7 million seedlings planted
- Foresters used best info available at the time
- Species selection driven by forest heath, markets, etc.
- Looking back, sound overall but some plans have worked out better than others



HISTORIC MANAGEMENT CONTEXT



HOW DID WE COME TO PURSUE THIS PROJECT?



Training Opportunity!
www.forestadaptation.org/amherst
September 23-24, 2014

Climate Change & Southern New England Forests

Details

DATE:

September 23-24, 2014

LOCATION:

UMass Amherst Campus
Student Union
Amherst, MA

COST & REGISTRATION:

No cost to attend

Register online (required) :

www.forestadaptation.org/amherst

QUESTIONS?

Email Maria Janowiak

mjanowiak02@fs.fed.us

Natural resource professionals face the tremendous challenge of developing and implementing conservation and management actions that help ecosystems respond to climate change.

This session will:

- Provide information on the current and anticipated effects of climate change on Southern New England and its forests
- Describe resources and tools that can be used to integrate climate change into resource conservation and management
- Outline adaptation concepts and strategies in the context of sustainable forest management
- Identify actions that enhance the ability of forests and other ecosystems to adapt to changing conditions

Real-world examples of adaptation projects will be featured, and participants will engage in a variety of interactive activities to identify climate change issues and potential management responses.

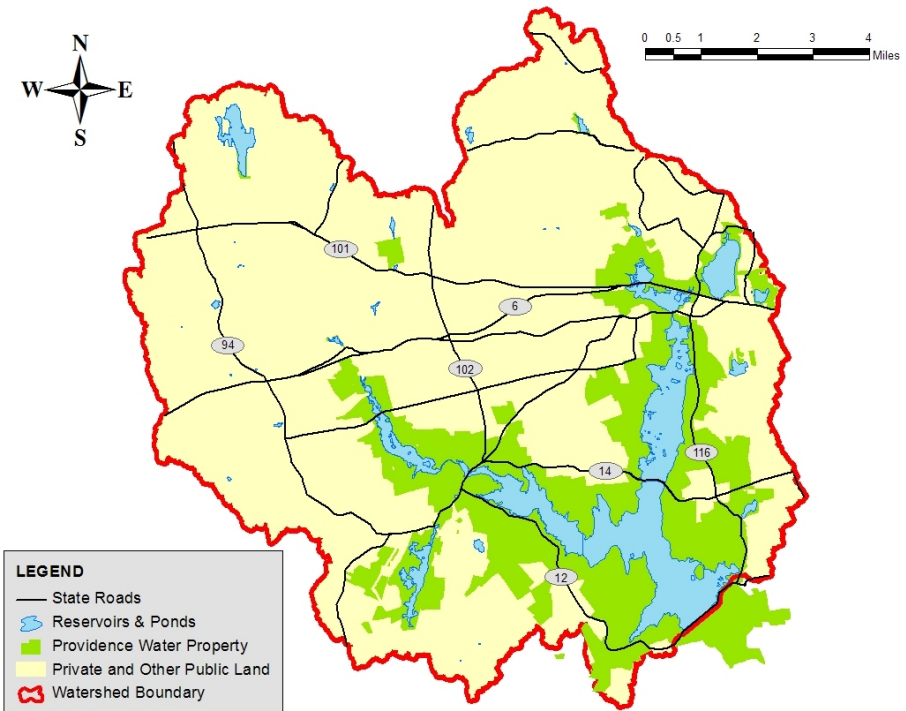
- 2014 NIACS Training on Climate Change Response Framework
- Hands-on day of coached work in small groups was especially helpful
- Project concept started here
- Highly recommend for incorporating climate change considerations into management



HOW DID WE COME TO PURSUE THIS PROJECT?

POTENTIAL VULNERABILITIES

- Climate change not explicitly addressed in current stewardship plan
- Forest health and regeneration
- Invasives
- Internal road system (severe storm effects)



HOW DID WE COME TO PURSUE THIS PROJECT?

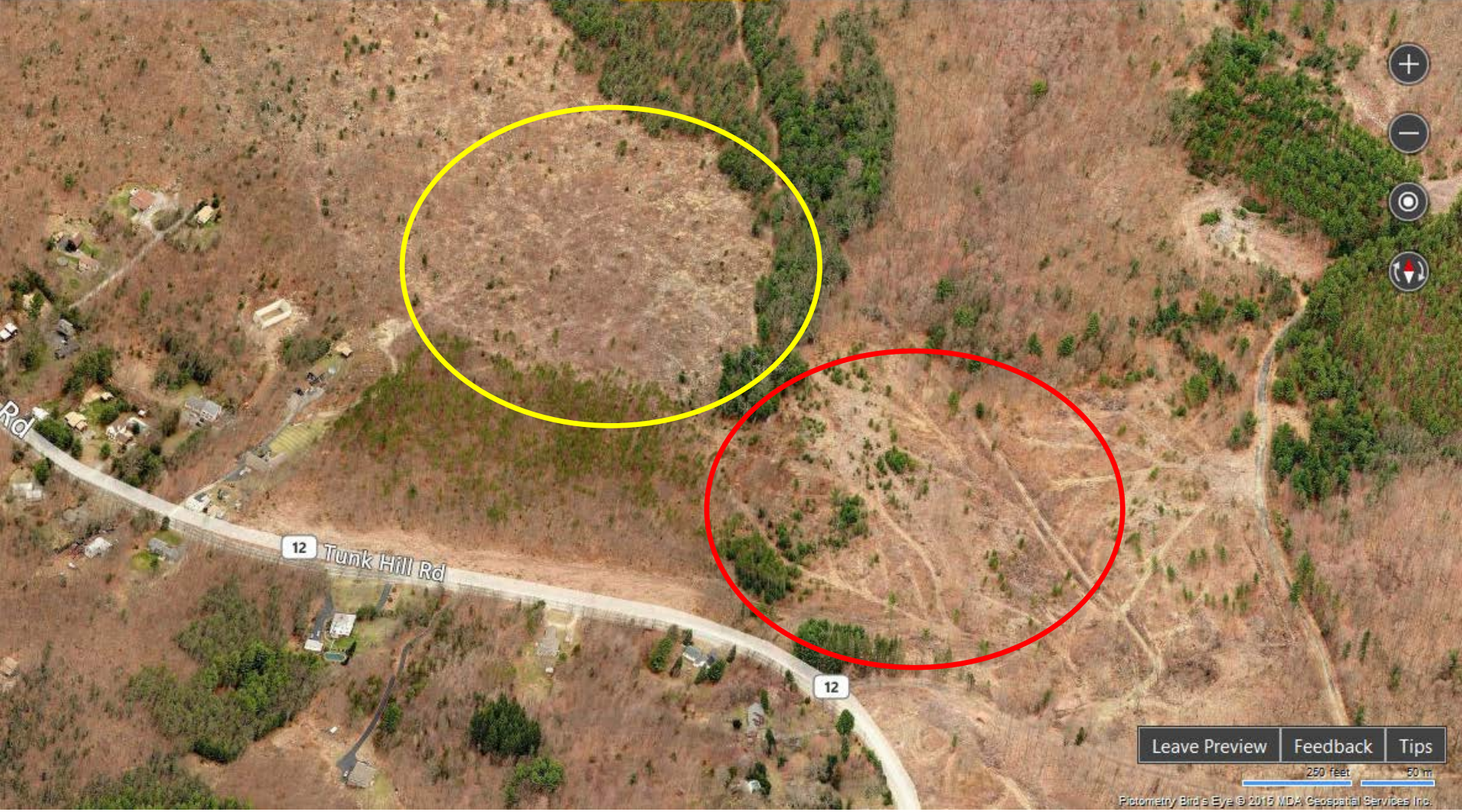


- Poor upland oak growing site with some young pine
- Land acquired recently; not historic ownership
- Death of remaining trees and regeneration failure following shelterwood timber harvest
- Drought, defoliation, deer
- “Nightmare” of what a significant acreage could come to resemble following a severe windstorm
- What to do with this site?
- Opportunity to experiment with “transition” strategy



Photo credit:
Tom Rawinski





Winter “Bird’s Eye” view from a decade ago (Bing Maps)

2015 PLANTING: MIX OF SPECIES DIVIDED DIVIDED EQUALLY BETWEEN TWO SITES

CONIFERS (250 each)

- Eastern red cedar
- Loblolly pine
- Pitch pine
- Shortleaf pine

Native species

Non-native with limited
presence

Not currently present

HARDWOODS (100 each)

- Black locust
- Black oak
- Persimmon
- Pin oak
- Sassafras
- Sweetgum
- White oak

Planting: May 5-7, 2015

Watering: May 8



MONITORING AND INITIAL RESULTS

- Irregular but varied species distribution by planting crew
- Significant mortality resulting from drought immediately following planting
- Survivors are doing OK
- Monitoring height growth of 10 individuals of each species in both areas
- Annual height measurements planned for at least 5 years
- **Results indicate deer browse is having a significant impact**





Tunk Hill Rd

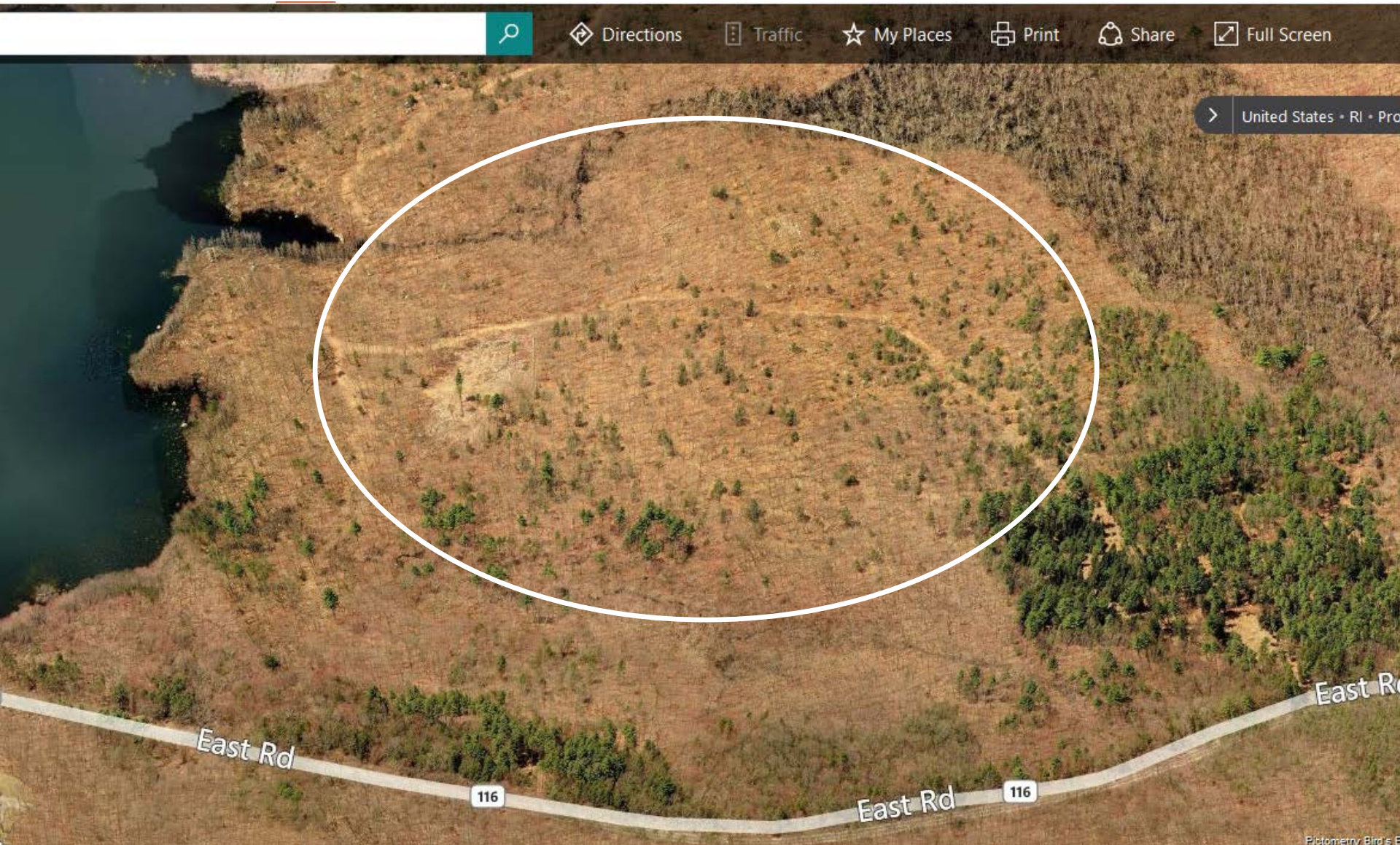
Recent summer aerial view (Google Maps)

Google

2016 ENRICHMENT PLANTING AT SIMILAR SITE



- 38 acre upland oak stand thinned in 2014-15
- Anticipated natural regeneration challenges
- Students planted “climate adaptation mix” in 2016
- Part of larger grant funded by Arbor Day Foundation TD Green Streets Program
- Possible future seeding



Pre-harvest “Bird’s Eye” view during winter (Bing Maps)

2016 ENRICHMENT PLANTING

300 seedlings planted by high school students

CONIFERS (75 each)

- Shortleaf pine
- Virginia pine

Native species

Non-native with limited presence

Not currently present

HARDWOODS (25 each)

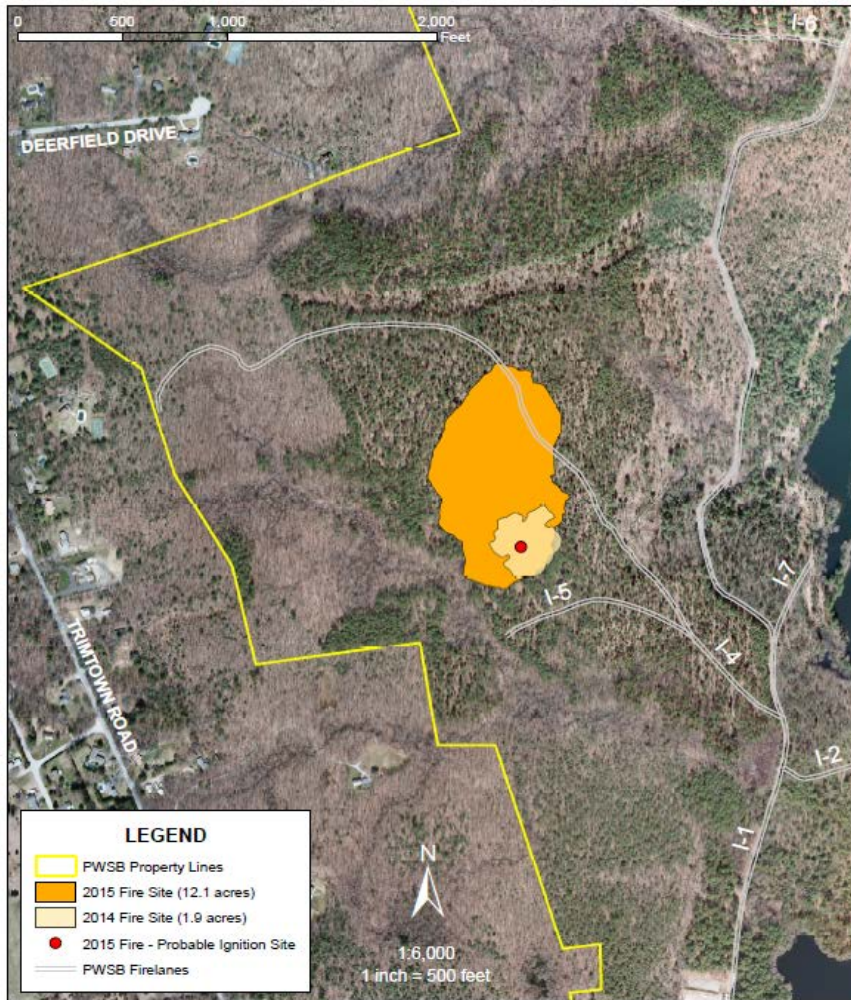
- Black locust
- Black oak
- Chestnut oak
- Persimmon
- Sweetgum
- White oak

2016 ENRICHMENT PLANTING



2017 REPLANTING OF 2014-15 BURN SITE

I BLOCK FIRE SITES - June 20, 2014, and May 11-13, 2015



2017 REPLANTING OF 2014-15 BURN SITE

300 seedlings to be planted by high school students

HARDWOODS

- Chestnut oak (100)
- White oak (25)

Native species

Non-native with limited presence

Non-native similar to native species

CONIFERS

- Eastern red cedar (25)
- Japanese larch (25)
- Norway spruce (25)
- Pitch pine (100)

CHALLENGES & OPPORTUNITIES

- In SNE, deer take a toll on seedling survival
- Important variables:
 - seedling availability
 - planting crew experience
 - planting season weather
- Untested and not yet viable from a purely economic perspective
- Some skepticism from traditionalists
- Relatively modest cost
- Benefits from participating in community of practice and updating education
- Example of a tangible on-the-ground local action
- Opportunity to engage others on climate change
- Significant external interest in projects

QUESTIONS?

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