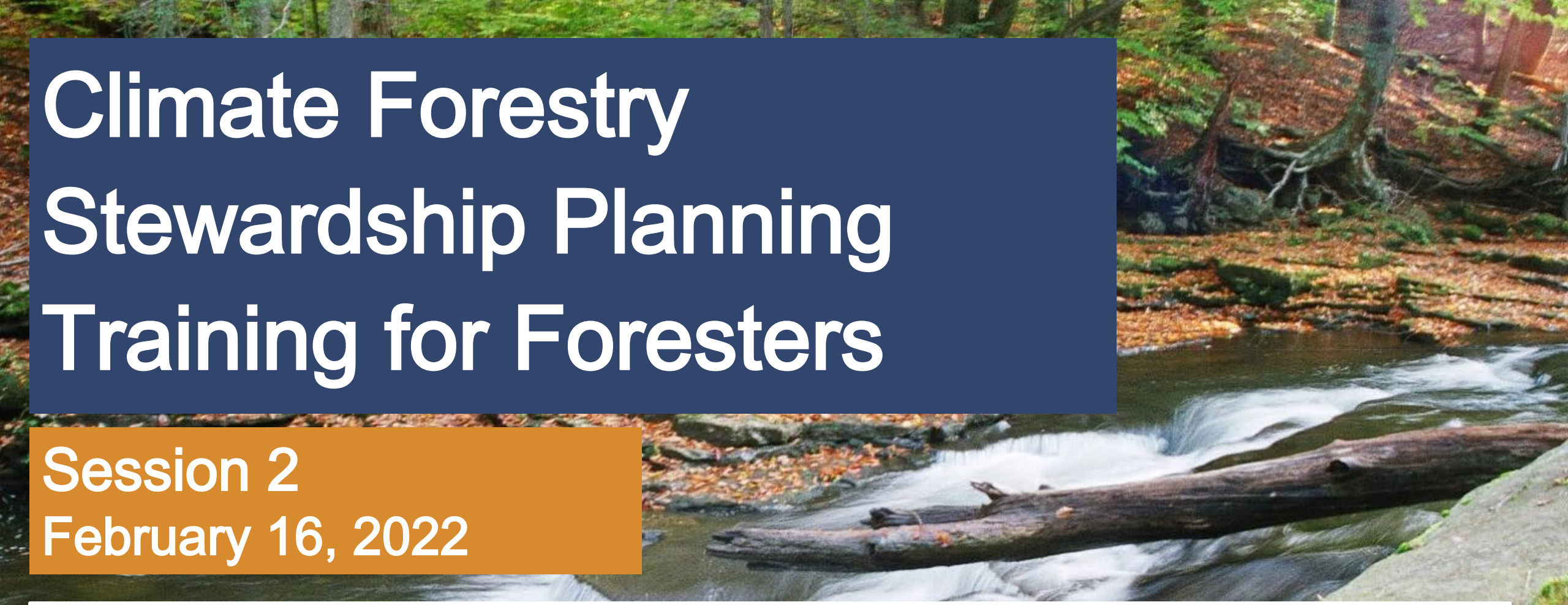


Climate Forestry Stewardship Planning Training for Foresters

Session 2
February 16, 2022

dcr MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

Mass Audubon

NEW ENGLAND FORESTRY FOUNDATION

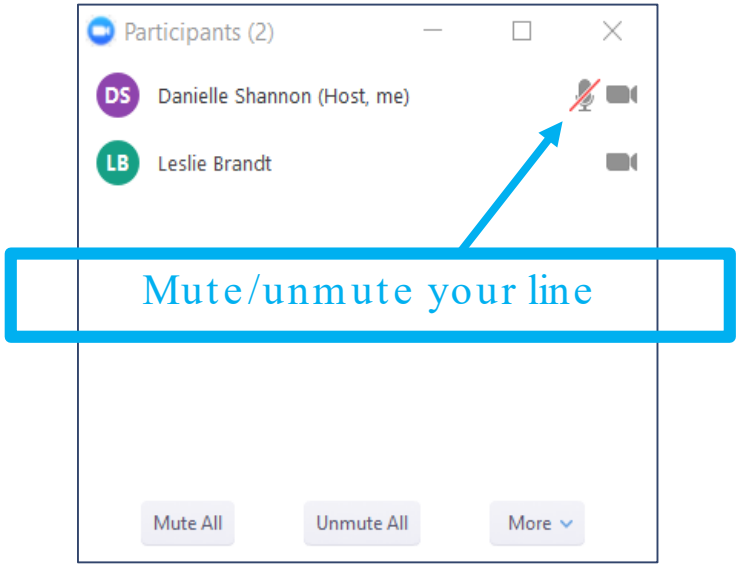
NIACS
Northern Institute of Applied Climate Science

Massachusetts Woodlands Institute
A SUBSIDIARY OF FRANKLIN LAND TRUST

Welcome!

For today, please:

- **Turn on your webcams** (if you can).
- **Mute** yourself unless in a breakout room
- **Have a question?** Use the chat box!
- **‘Rename’ yourself**: **First name, Affiliation**



Welcome!

This training will be led by a team made up of staff from the Northern Institute of Applied Climate Science, as well as the Massachusetts Department of Conservation and Recreation.

Maria Janowiak

Maddy Baroli

NIACS
Northern Institute of Applied Climate Science

Learn more: www.forestadaptation.org/team
& www.mass.gov/orgs/department-of-conservation-recreation

Continuing Education Credits

- **This training has been approved for:**
  - 6.5 Category 1 credits through the New England SAF
  - 6.25 Category 1 credits through the Massachusetts DCR

SAF New England

dcr MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

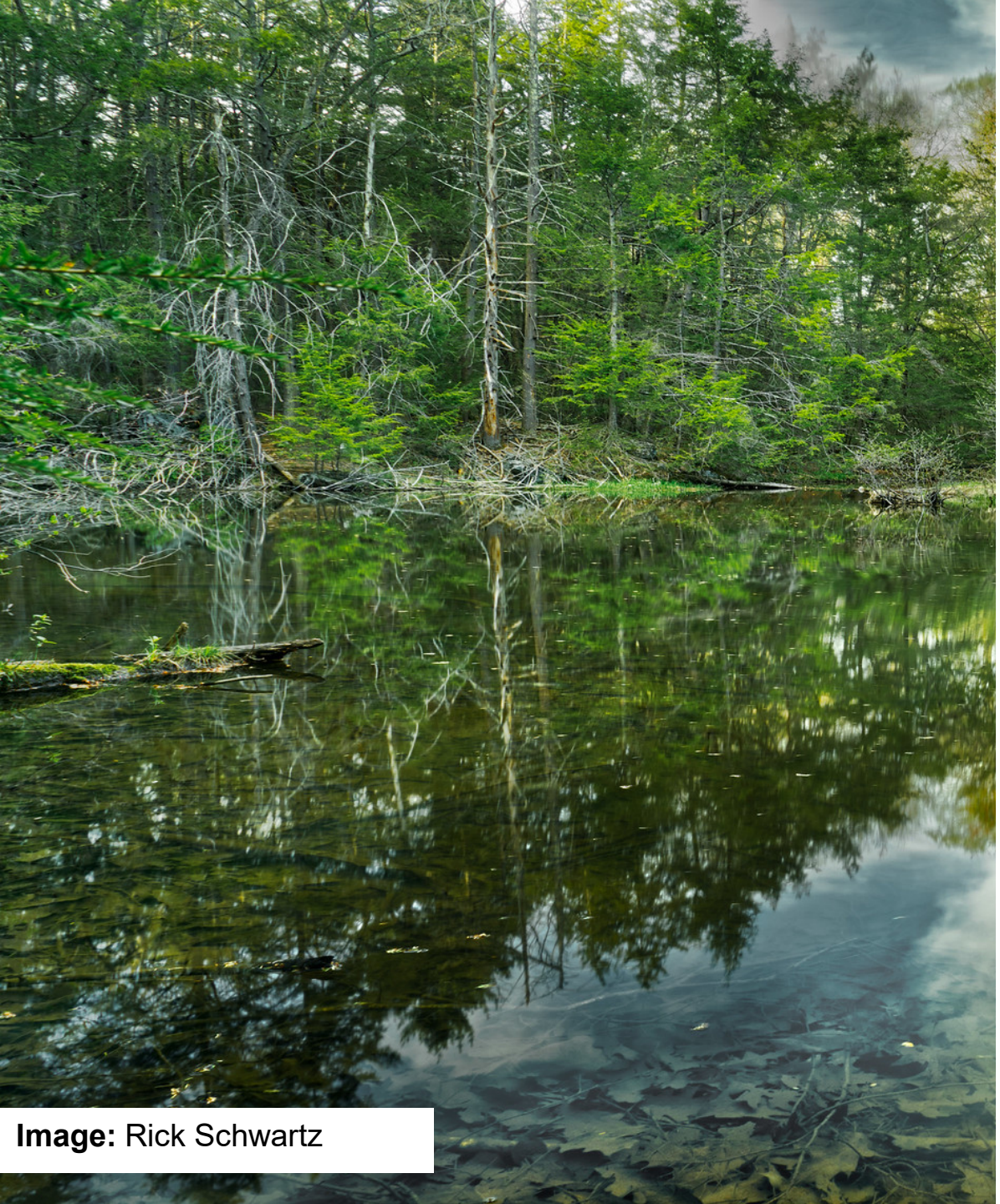


Image: Rick Schwartz

Training Objectives

- Overview of new climate forest stewardship planning efforts
- Identify site-specific climate change impacts, challenges and opportunities, and adaptation actions
- Familiarize with climate forest stewardship plan directions and requirements
- Explore the Forester Guide as supporting tool for climate change planning
- Communicate climate change and adaptation ideas to landowners

Training Schedule

February 9 - Web Session 1

- Introduction to Climate Forestry Program, climate impacts on Massachusetts forests

February 16 - Web Session 2

- Integrating climate adaptation into forest management

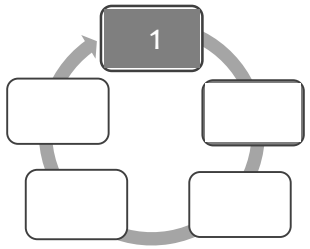
February 23 Web Session 3

- Walkthrough of climate forest stewardship plan directions and sample plan

TODAY: Integrating climate adaptation into forest management

But first!

- Landowner goals
- Climate change impacts / vulnerabilities
- Communication considerations



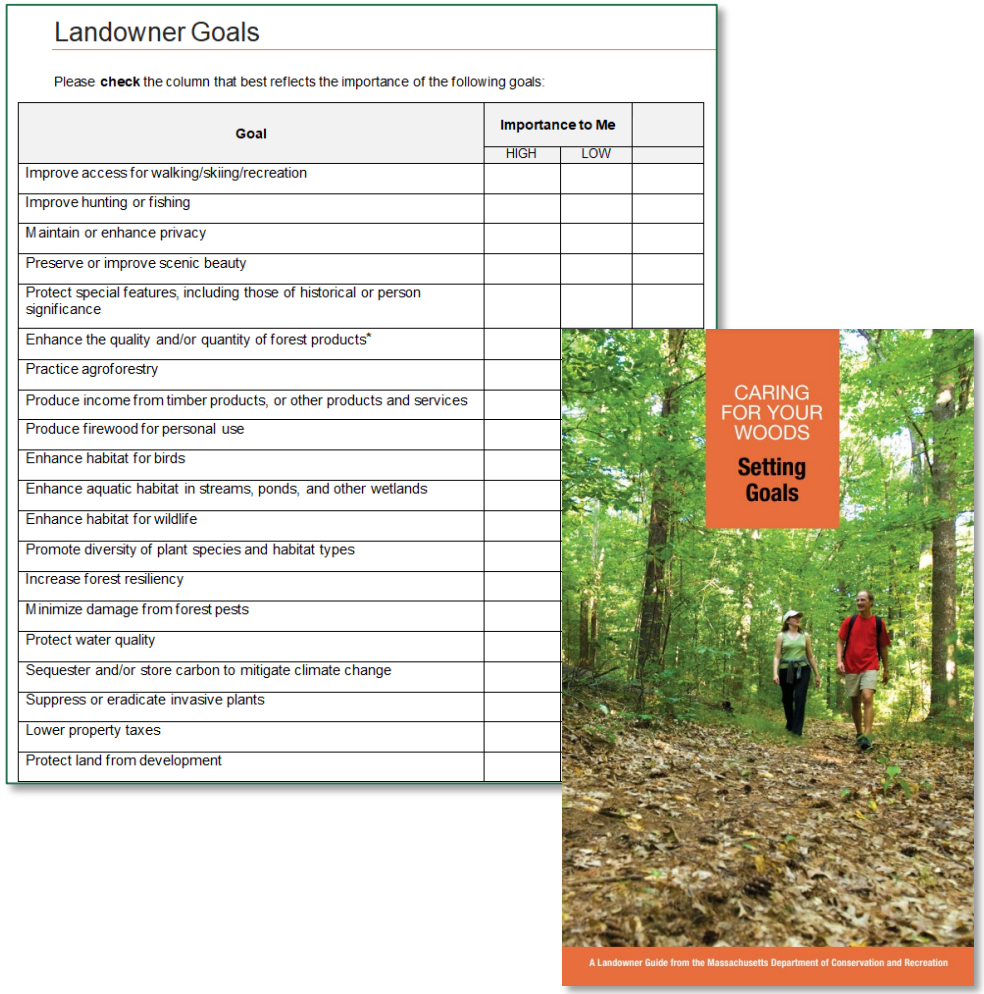
Define Management Goals and Objectives

Management Goal

Broad, general statements, usually not quantifiable, that express a desired state or process to be achieved

Management Objective

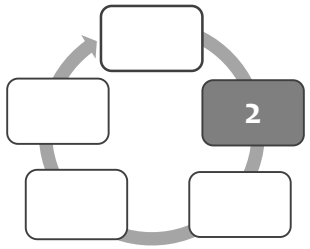
Concise statements of measurable planned results that correspond to pre-established goals in achieving a desired outcome



Landowner Goals

Please **check** the column that best reflects the importance of the following goals:

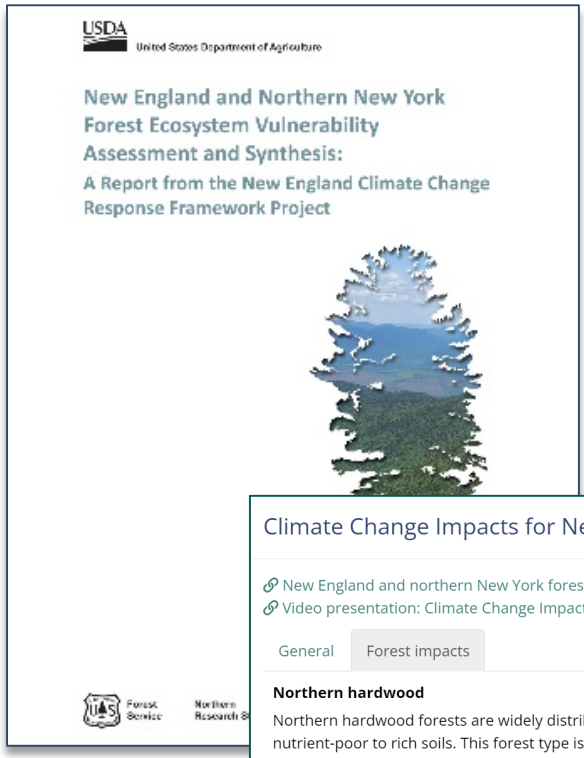
Goal	Importance to Me		
	HIGH	LOW	
Improve access for walking/skiing/recreation			
Improve hunting or fishing			
Maintain or enhance privacy			
Preserve or improve scenic beauty			
Protect special features, including those of historical or person significance			
Enhance the quality and/or quantity of forest products*			
Practice agroforestry			
Produce income from timber products, or other products and services			
Produce firewood for personal use			
Enhance habitat for birds			
Enhance aquatic habitat in streams, ponds, and other wetlands			
Enhance habitat for wildlife			
Promote diversity of plant species and habitat types			
Increase forest resiliency			
Minimize damage from forest pests			
Protect water quality			
Sequester and/or store carbon to mitigate climate change			
Suppress or eradicate invasive plants			
Lower property taxes			
Protect land from development			

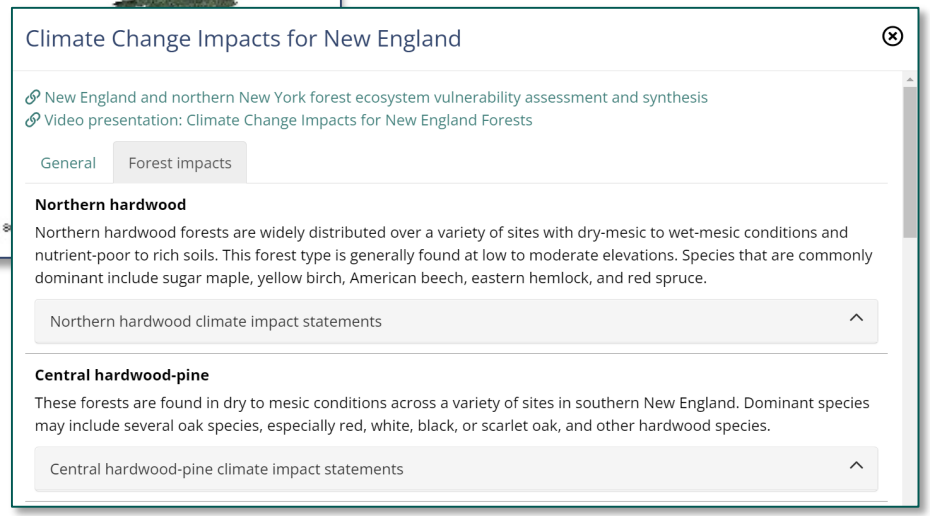


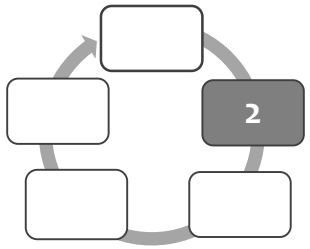
Climate Change Impacts and Vulnerabilities

What climate change impacts and vulnerabilities are most important to this site?

- Warmer temperatures/more days with extreme heat
- Fewer days with extreme cold
- Altered precipitation patterns
- More frequent and severe weather events
- Less snow/shorter winter season
- Reduced soil moisture in summer
- Altered stream flows
- Declines in northern tree species
- Potential changes in wildfire
- Increases in insect pests/forest pathogens
- Changes in patterns of herbivory
- More. . .



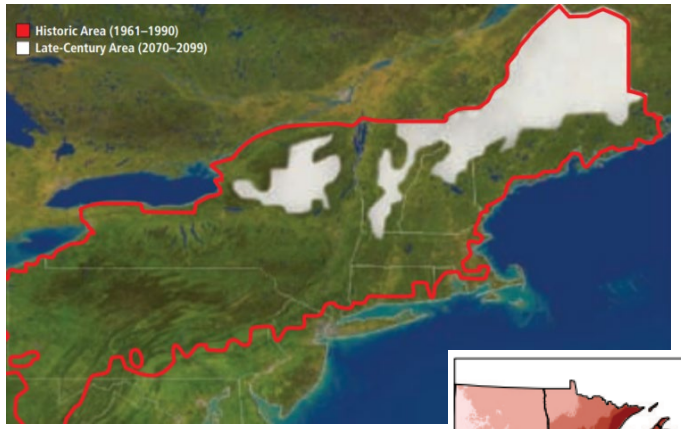




2: ASSESS CLIMATE CHANGE IMPACTS & VULNERABILITIES

Regional Climate Impacts

Based on regional resources



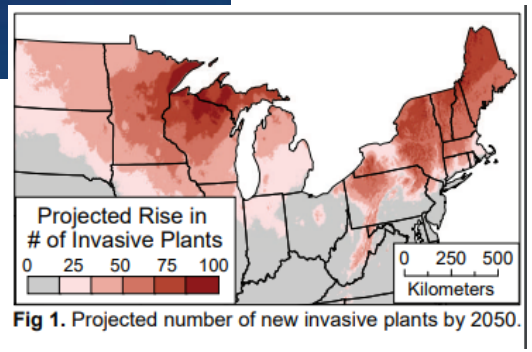


Fig 1. Projected number of new invasive plants by 2050.

Site -specific Impacts

Based on your expertise

Breakout Groups – 15 minutes

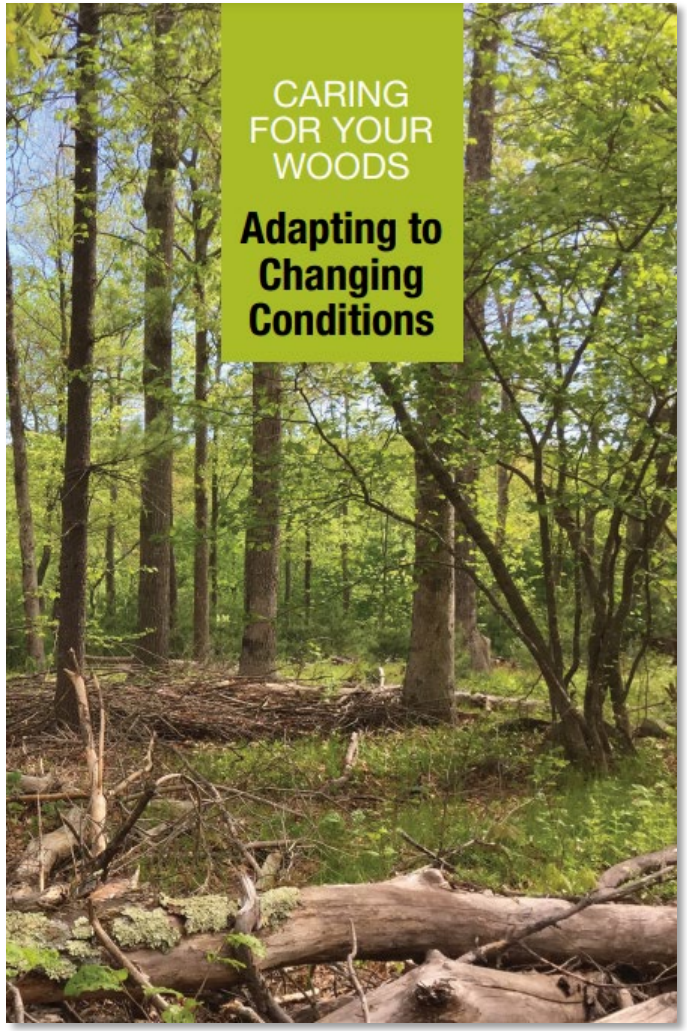
- Join your breakout room
- Round-robin
  - Focal property
  - Landowner goals
  - Climate impacts / vulnerability

Report out: Any goals seem unfeasible given climate impacts? What management challenges and/or opportunities might exist?

Management Actions for Climate Change:

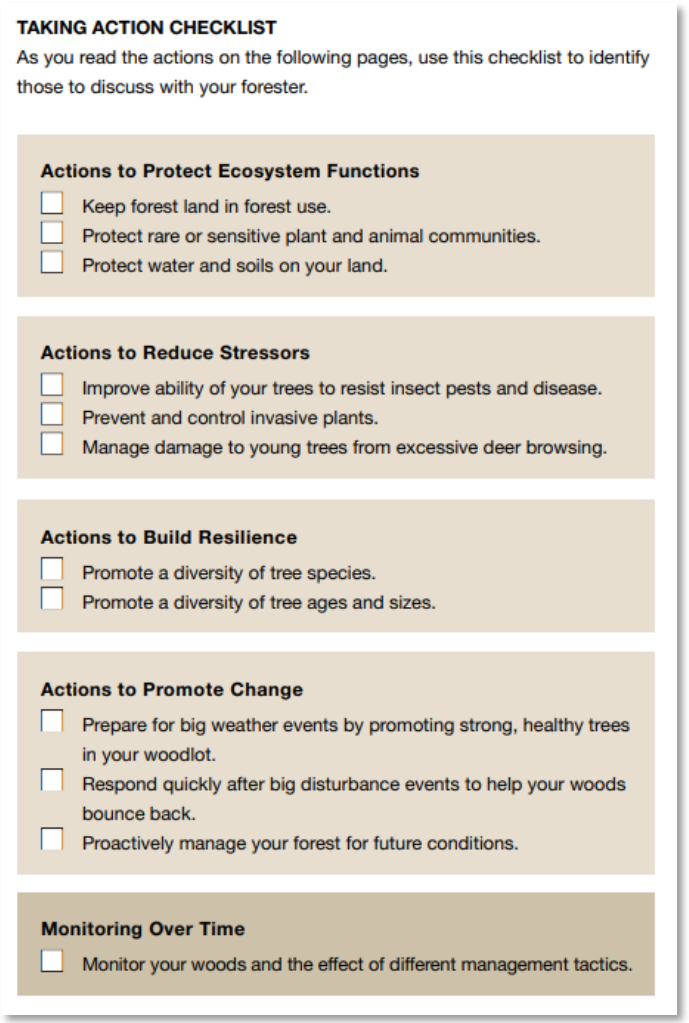
Identify potential adaptation actions for your project

Helping Landowners Understand Adaptation Planning



Actions to:

- Protect ecosystem functions
- Reduce stressors
- Build resilience
- Promote change



TAKING ACTION CHECKLIST

As you read the actions on the following pages, use this checklist to identify those to discuss with your forester.

Actions to Protect Ecosystem Functions

- ☐ Keep forest land in forest use.
- ☐ Protect rare or sensitive plant and animal communities.
- ☐ Protect water and soils on your land.

Actions to Reduce Stressors

- ☐ Improve ability of your trees to resist insect pests and disease.
- ☐ Prevent and control invasive plants.
- ☐ Manage damage to young trees from excessive deer browsing.

Actions to Build Resilience

- ☐ Promote a diversity of tree species.
- ☐ Promote a diversity of tree ages and sizes.

Actions to Promote Change

- ☐ Prepare for big weather events by promoting strong, healthy trees in your woodlot.
- ☐ Respond quickly after big disturbance events to help your woods bounce back.
- ☐ Proactively manage your forest for future conditions.

Monitoring Over Time

- ☐ Monitor your woods and the effect of different management tactics.

Connecting the Dots

Management Goals & Objectives

Climate Change Impacts

Challenges & Opportunities

Identify adaptation actions

Adaptation Intention (Strategy & Approach)

Specific Action to Implement (Tactic)

Monitoring effectiveness

Climate change adaptation options

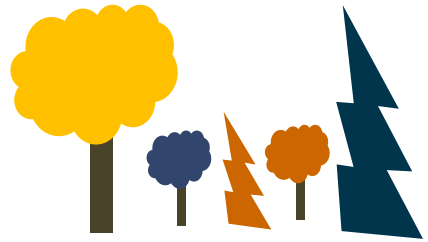
RESISTANCE

- Improve defenses of forest against change and disturbance
- Maintain relatively unchanged conditions

RESILIENCE

- Accommodate some degree of change
- Return to prior reference condition following disturbance

TRANSITION



- Intentionally facilitate change
- Enable ecosystem to respond to changing and new conditions

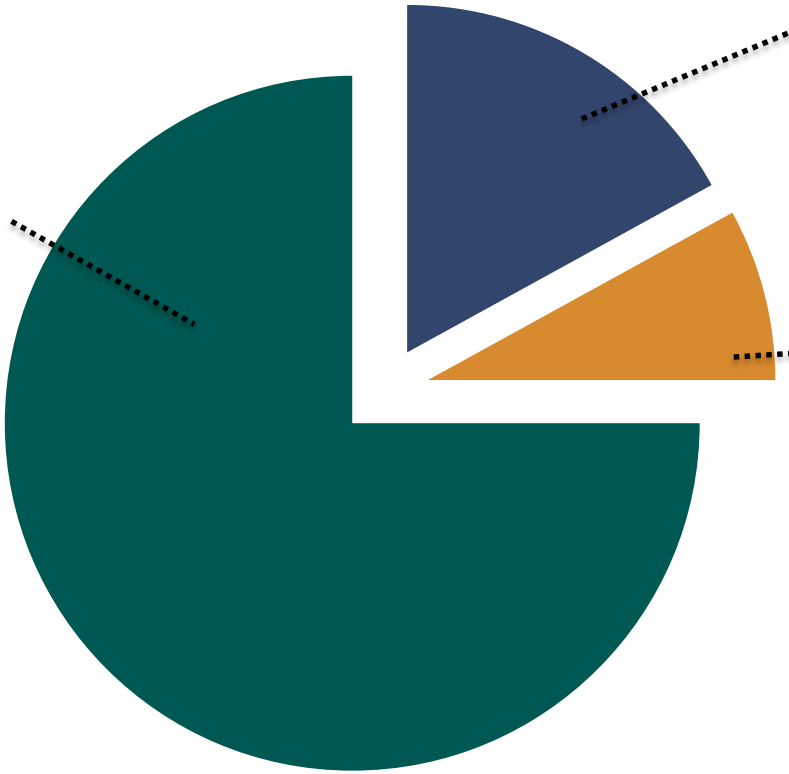
*Reduce impacts/maintain current conditions

*Forward-looking/promote change

Millar et al. 2007, Swanston et al. 2016, Nagel et al. 2017

Adaptation Actions Can Be…

Same actions– *climate change just makes them that much more important*



Small "tweaks" *that improve effectiveness*

New & different *actions to consider, even some that may seem* ***wild & crazy***

Adaptation actions may not look that different from current management actions, especially in the near term.

Adaptation Menus

Adaptation Strategies and Approaches (Forest)

Adapted from Forest Adaptation Resources: Climate Change Tools and Approaches for Land Managers

Created using the NIACS Adaptation Workbook

- Strategy 1: Sustain fundamental ecological functions
  - Reduce impacts to soils and nutrient cycling
  - Maintain or restore hydrology
  - Maintain or restore riparian areas
  - Reduce competition for moisture, nutrients, and light
  - Restore or maintain fire in fire-adapted ecosystems
- Strategy 2: Reduce the impact of biological stressors
  - Maintain or improve the ability of forests to resist pests and pathogens
  - Prevent the introduction and establishment of invasive plant species and remove existing invasive species
  - Manage herbivory to promote regeneration of desired species
- Strategy 3: Reduce the risk and long-term impacts of severe disturbances
  - Alter forest structure or composition to reduce risk or severity of wildfire
  - Establish fuelbreaks to slow the spread of catastrophic fire
  - Alter forest structure to reduce severity or extent of wind and ice damage
  - Promptly revegetate sites after disturbance
- Strategy 4: Maintain or create refugia
  - Prioritize and maintain unique sites
  - Prioritize and maintain sensitive or at-risk species or communities
  - Establish artificial reserves for at-risk and displaced species
- Strategy 5: Maintain and enhance species and structural diversity
  - Promote diverse age classes
  - Maintain and restore diversity of native species
  - Retain biological legacies

A collection of plausible adaptation actions that are:

- Specific to a discipline
- Organized into a tiered hierarchy
- Thorough and comprehensive (including opposing ideas!)

forestadaptation.org/strategies

Variety of menus available for different topics!

Identifying adaptation approaches and tactics

Strategy & Approach – Select from booklet or menu. Pick any that seem to make sense and help address the challenges.

Ex.: Strategy 1. Sustain fundamental ecological functions, Approach 1.4. Reduce competition for moisture, nutrients and light.

Tactic – Describe a specific action you can take.

Ex.: Remove invasive honeysuckle along forest edge, mulch area after removal.

These details should ideally answer the

why, what, where, and **how**

actions will be implemented.

Identifying adaptation approaches and tactics:

Dingley Dell Property —Opacum Land Trust

74 acre Nature Preserve, 3 stands outlined in plan

Goals

Protect and conserve open space for the long-term, provide passive recreational opportunities for local residents, and promote ecological diversity.

Climate impacts

- Forest insect pest and pathogen outbreaks are expected to increase in occurrence and inflict more damage
- Many northern tree species will face increasing stress from climate change
- Conditions may become more favorable for some southern tree species

Identifying adaptation approaches and tactics:
Dingley Dell Property —Opacum Land Trust

Stand 1: 61 acres Hemlock-White pine

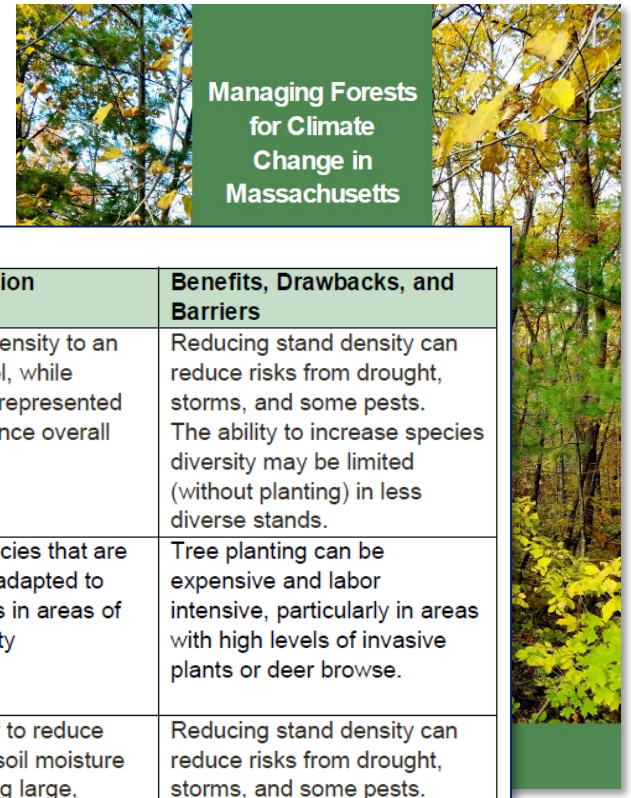
Approaches –

- Favor or restore native species that are expected to be adapted to future conditions.
- Guide changes in species composition at early stages of stand development.

Tactics – 2025 forest stand improvement incorporating both group and single tree selection to create conditions for desired hardwood species. Reduce density of hemlock (widespread HWA) and white pine, retain pitch pine, favor oaks and hickories.

Forester Guide Table

- Clearly connecting **management objectives**, climate change **impacts**, and **adaptation actions** will help landowners understand the rationale for the management actions outlined in their plan



Examples of Adaptation Actions

Management Goals or Objectives	Adaptation Action	Benefits, Drawbacks, and Barriers
Enhance the overall health of an overstocked stand and reduce the abundance of high-risk trees (likely to die or lose value between now and the next entry)	Reduce forest density to an appropriate level, while retaining under-represented species to enhance overall diversity	Reducing stand density can reduce risks from drought, storms, and some pests. The ability to increase species diversity may be limited (without planting) in less diverse stands.
Increase canopy cover along stream to increase shade and cooling Create opportunities for regeneration of long-lived species in the stream buffer	Plant native species that are expected to be adapted to future conditions in areas of hemlock mortality	Tree planting can be expensive and labor intensive, particularly in areas with high levels of invasive plants or deer browse.
Enhance growth rates of the residual forest through ecologically-based silviculture.	Thin from below to reduce competition for soil moisture while maintaining large, healthy trees	Reducing stand density can reduce risks from drought, storms, and some pests. Retention of large, healthy trees helps develop late-successional forest characteristics.
Develop and maintain a trail network on the property to support walking and other outdoor activities	Layout new trail segments with weather and climate considerations in mind.	There may be increased time or cost associated with trail layout and creation.

Breakout Groups – 15 minutes

- ***First:*** *10 min. brainstorm & break*
- Discussion of potential adaptation actions
- Use Forester Guide & adaptationwork.org/strategies

Assignment

- **Identify adaptation actions** for one stand, highlighting benefits for birds, climate, carbon, or other landowner goals
  - Using table in the Forester Guide
  - Utilize Adaptation Menus at adaptationworkbook.org/strategies
- Quick review of the **sample Climate Forest Stewardship Plan** to be included in follow-up email

Questions? Share now or email NIACS or DCR staff

Examples of Adaptation Actions

Management Goals or Objectives	Adaptation Action	Benefits, Drawbacks, and Barriers
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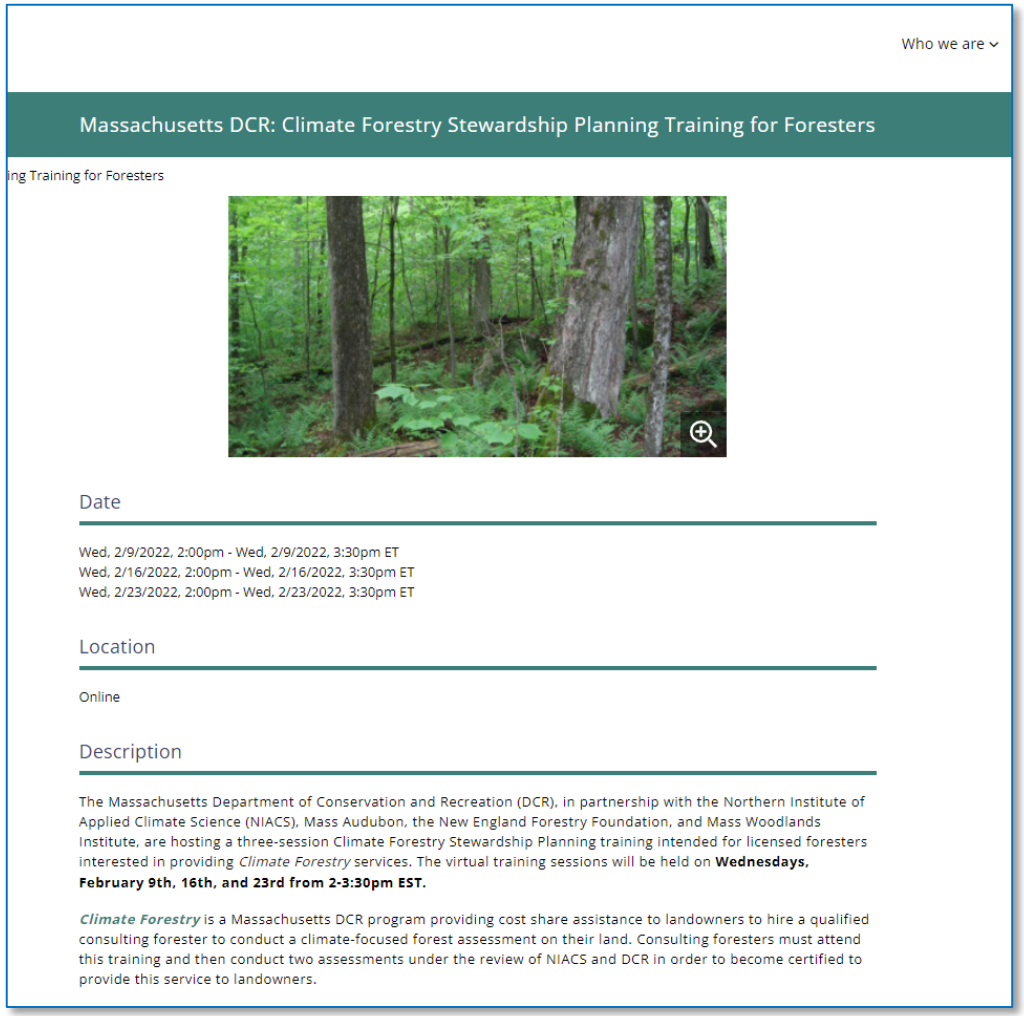
Keep an eye out for *Emails*

And visit training webpage to access:

- Slides
- Agenda & assignments
- Links to relevant resources

Final Session:
Wednesday, February 23rd
2:00-3:30pm EST



forestadaptation.org/learn/training-and-workshops


INSIGHTS ?

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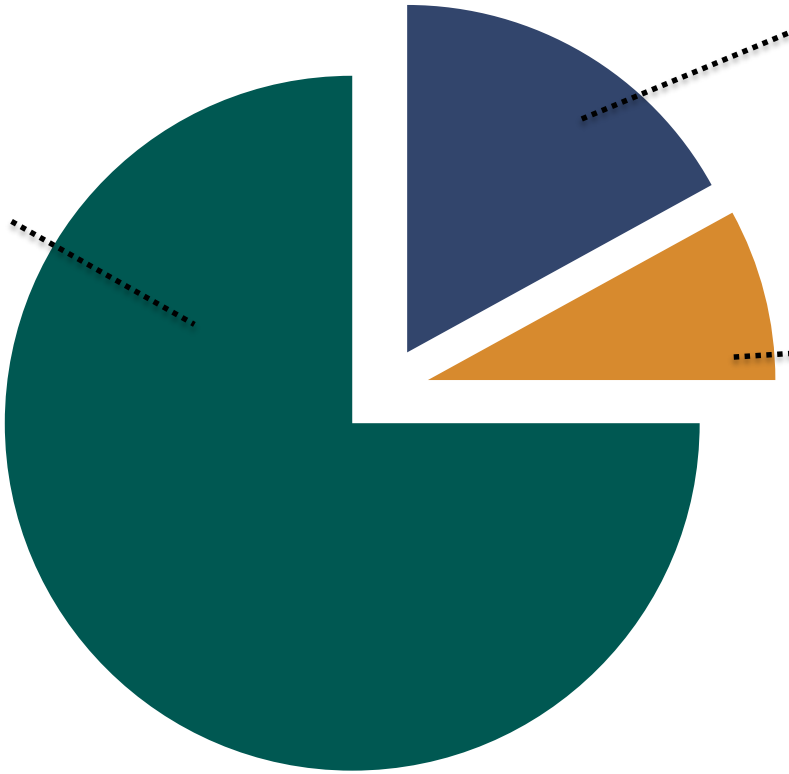

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THANK YOU!

dcr MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

NIACS Northern Institute of Applied Climate Science

Maria Janowiak janowiak@usda.gov

Madeline Baroli mjbaroli@mtu.edu

Jennifer Fish Jennifer.fish@state.ma.us