

WORKSHOP: Day 1

Welcome!

Maine Climate Resilient Forest Management Workshop



May 2024

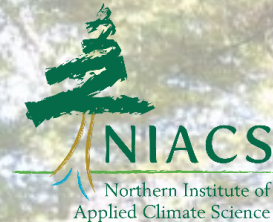




What we hope you'll take away...

- Forest management/stewardship plans that include consideration of climate-resilient forest adaptation strategies and approaches.
- Increased understanding of climate-adapted forest management that builds forest resilience across Maine, enhances carbon sequestration and storage, and achieves other management goals in a changing climate.
- Greater awareness of the intersection between Tribal needs and climate change adaptation in Maine's forests and ideas for collaboration with Tribes.

Facilitators & Partners



Michigan
Technological
University



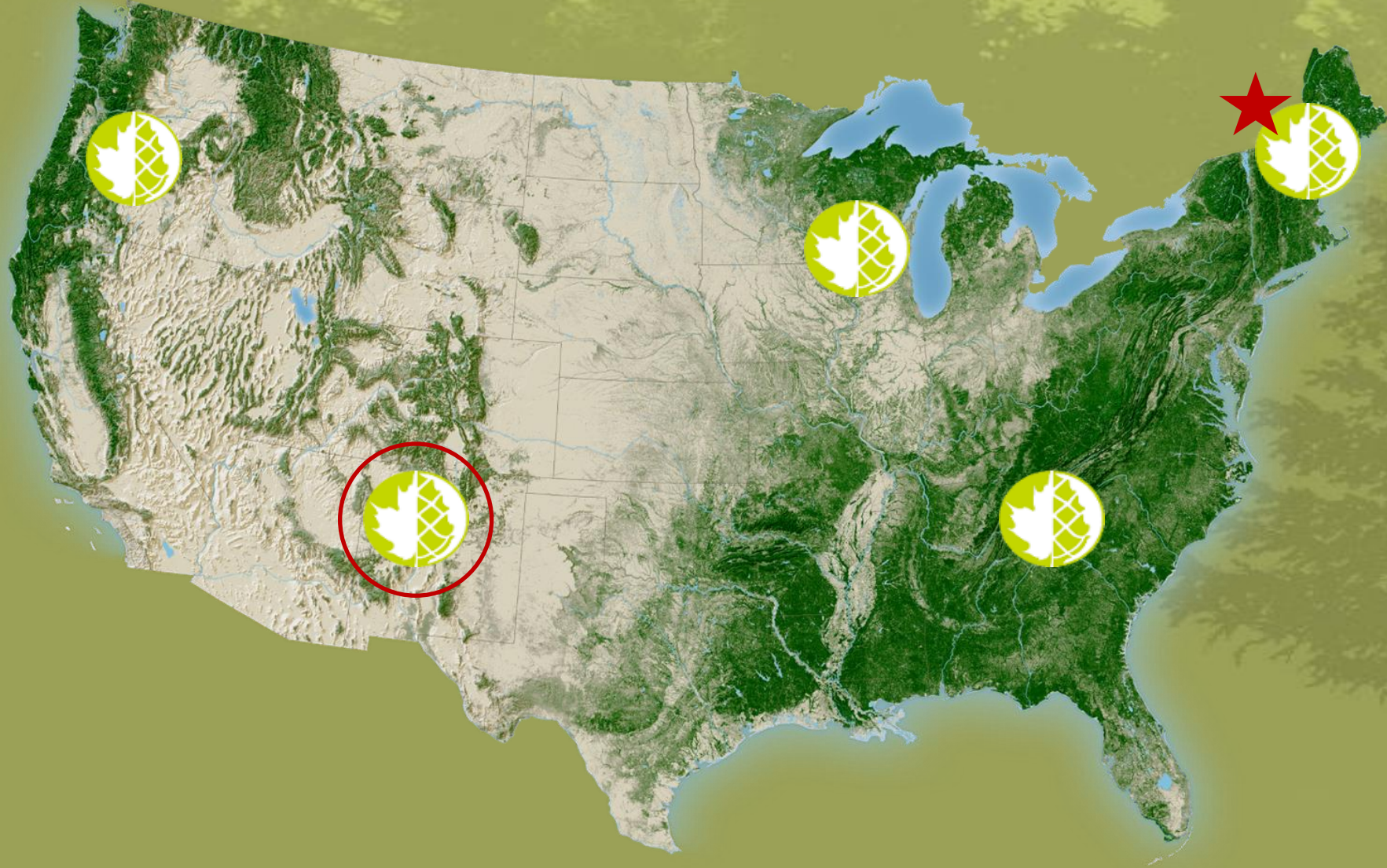
Funding: This project is supported through the Land and Climate Grant Program, a joint initiative of **Open Space Institute and Land Trust Alliance** made possible with funding from the Doris Duke Foundation, Jane's Trust Foundation, the J.M. Kaplan Fund, the Merck Family Fund, the Volgenau Foundation, and the William Penn Foundation.






Guild Members

Regional Programs



The Forest Stewards Guild is actively working to develop real-world strategies to respond to the changing climate and other current challenges

Forest Stewards
 **Guild**

A group of people, including men and women, are gathered outdoors in a wooded area. They are looking at a large map spread out on a table. There are several brochures or booklets on the table. The people are wearing outdoor clothing, including hats and sunglasses. The scene is brightly lit, suggesting it is daytime.

We partner with federal, tribal, state,
local, and non-profit collaborators
across the country

Forest Stewards
 **Guild**

Promoting Learning & Info Sharing

- Forest Climate Change Initiative (FCCI) Science & Practice Series (Many!)
- Forestry for the Birds
- Women Owning Woodlands
- Fire: North Atlantic Fire Science Exchange, Fire Learning Network
- Coordination of Ash Preservation Efforts in the NE



Bird Friendly Forest Management for Central Appalachian Forests

A Silviculture Guidebook for Foresters



Supporting Implementation-Forest Resilience

- NextGen Forest Program (TNC)
- Eastern Forest Resilience Initiative (NPS)
- North Atlantic Fire Science Exchange
- Ash management demonstration areas in northeast



THANK YOU: First Light

Wabanaki Commission: Representing five nations, the Wabanaki Commission is improving the health and well-being of Wabanaki people by expanding access, management, and ownership of ancestral lands to practice their cultures.

First Light: A collective of non-native land-oriented organizations and agencies working to expand Wabanaki access and stewardship of land toward a future of nature and people thriving in Wabanaki homelands.

- Two organizations working interdependently
 - Wabanaki Commission
 - First Light
- Upcoming *Learning Journey* to learn more
- Reach out to First Light staff with any questions, ideas, a connection to their broader community, etc.

Website: <https://dawnlandreturn.org/>

Learning Journey:

<https://dawnlandreturn.org/first-light/courses/learning-journey-cohort-3>

Contact

Maggie Mansfield
Northeast Region Manager
maggie@forestguild.org

Connect With Us!



@forestguild



@foreststewardsguild



@forestguild



www.foreststewardsguild.org

Northern Institute of Applied Climate Science

Climate

Carbon

The Northern Institute of Applied Climate Science (NIACS) develops synthesis products, fosters communication, pursues science, and provides technical assistance in climate change adaptation and carbon management.

NIACS is a collaborative partnership of Federal, research, conservation, higher education, and tribal organizations led and supported in part by the USDA Forest Service.



USDA Northern Forests Climate Hub



The Hubs help to make climate change science + resources usable, useful, and used



Science and data syntheses



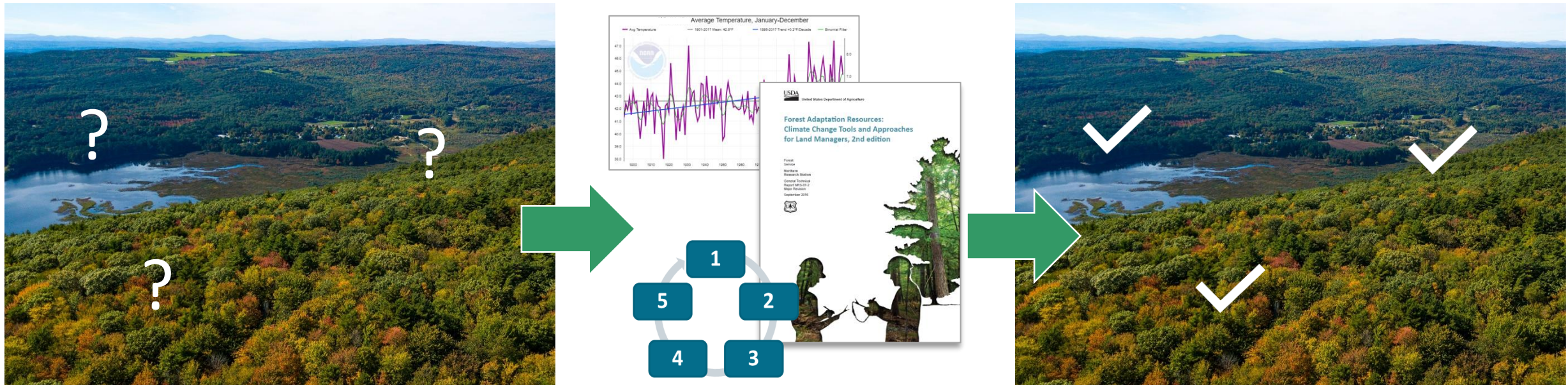
Decision-support tools and information



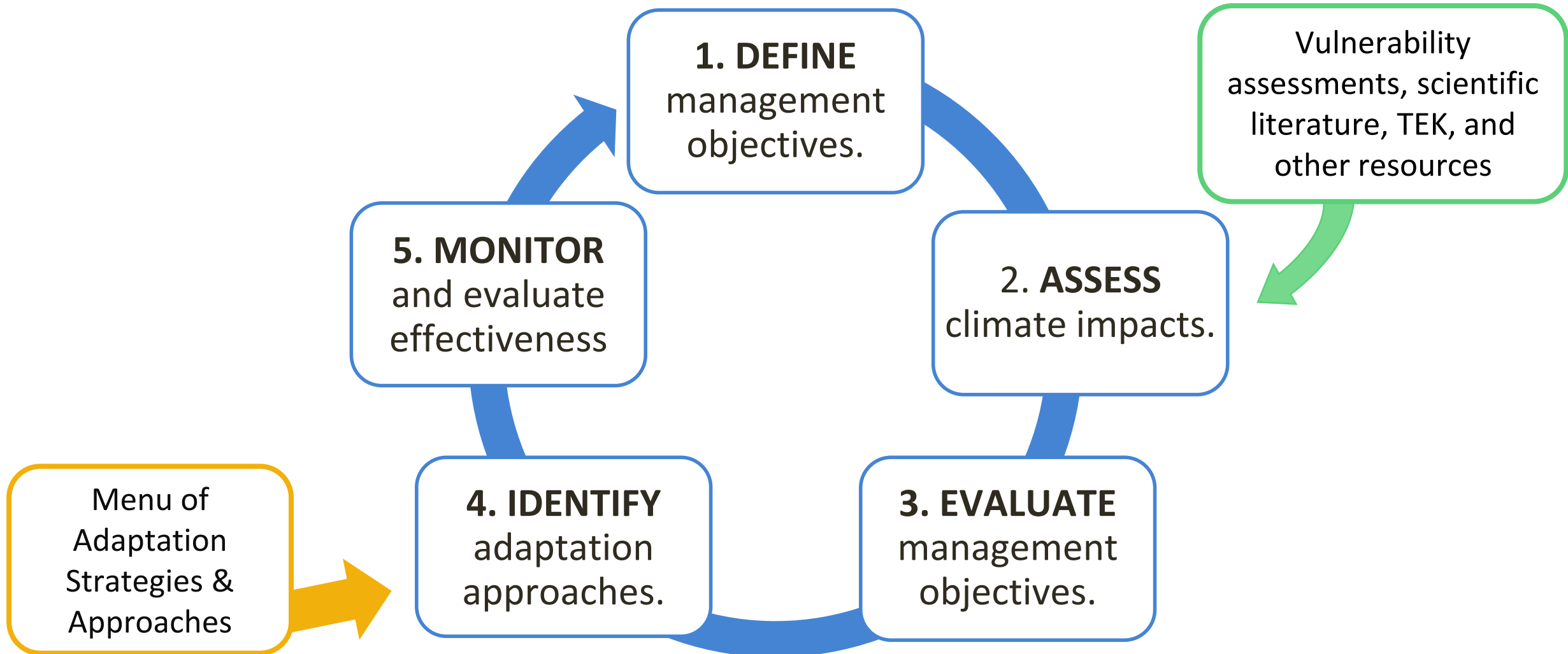
Outreach, convening, and training

Workshop Objective

To intentionally integrate climate change considerations into management efforts across Maine's forests

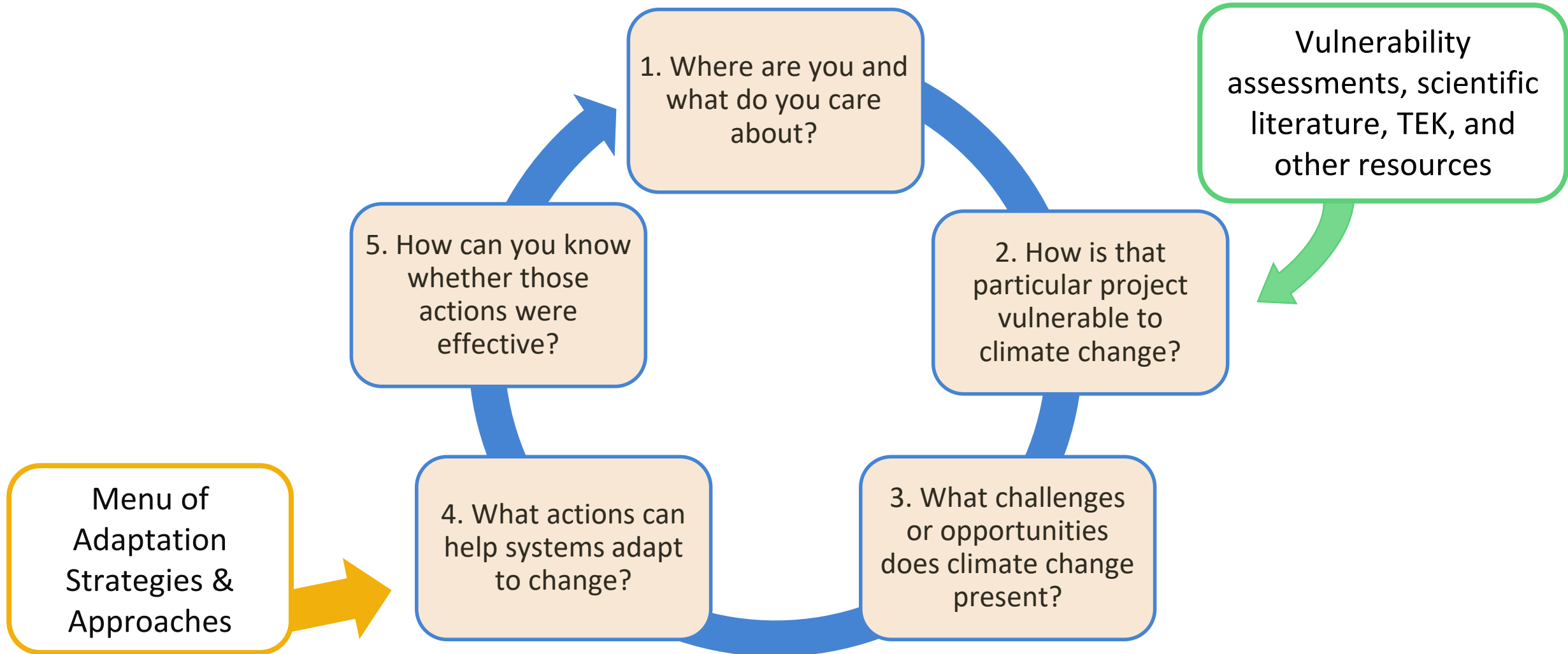


Adaptation Workbook



Deciphered

Adaptation Workbook



General purpose of the workshop

Learn the process, so you can use it again

Seeing through a climate lens becomes easier over time.

Use your expertise & judgement

Think about place and objectives within the context of risk and values

Document intent

Management can play out on the order of decades

Learn as a community of practice

Learn new things, meet new friends

Become an adaptation example for the region (and state)

This is a working workshop

- **Be present**, turn off distractions!
- **Be gentle** with each other as we work through these wicked problems.
- **Your engagement is key** to the success of this workshop.
- Ideas developed here are not considered “final.” This is the start of many more conversations on the topic (*we hope!*)



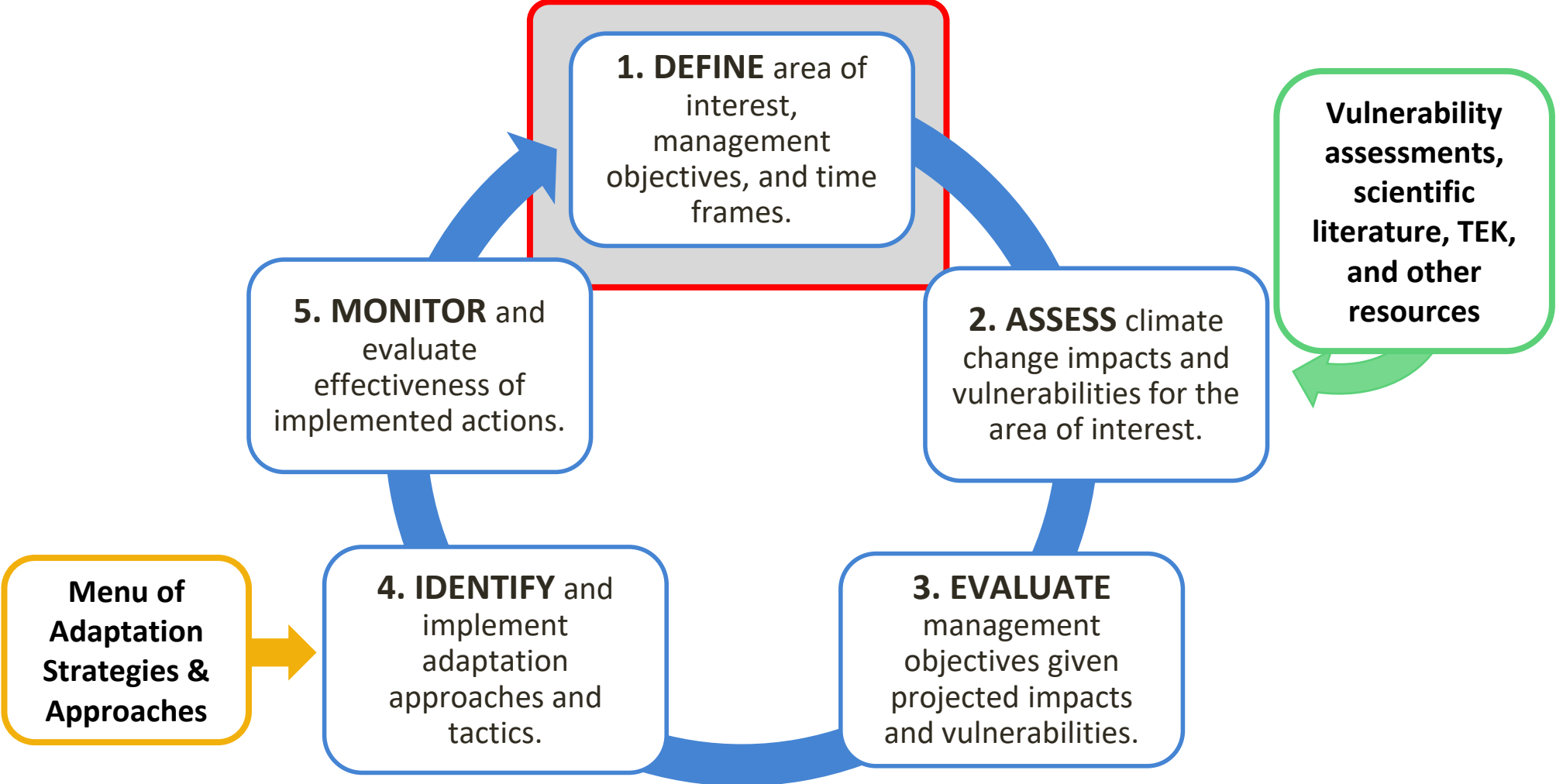
Day 1 agenda

- 9:30 Welcome & introduction
- 10:00 Project and participant introductions (Workbook Step 1)
- 11:00 Break**
- 11:15 Intersection of conservation & Tribal forestry (Carolyn Ziegra, AMC and Chuck Loring, Penobscot Nation)
- 12:00 Lunch (provided)**
- 12:45 Climate change and carbon in Maine forests (Andy Whitman, Maine Forest Service)
- 1:15 Identifying impacts to your site (Workbook Step 2)
- 2:45 Break**
- 3:00 Climate challenges and opportunities (Workbook Step 3)
- 4:15 Prep for day 2
- 4:30 Adjourn**

***This workshop was approved for 11.5 SAF CFE credits.
Please use the sign-in sheet to get credit!***



Step 1



Step 1: DEFINE location, project, and time frames.

Key Questions:

- Where are you working?
- What are your goals and objectives for this area?
- What is the broader community context of your project?



Adaptation Workbook = Climate Change Filter



Reminder: Your goals/objectives do not need to include the terms 'climate change' or 'resilience'.

Considering climate change in our planning should ensure ALL of our goals and objectives are robust to climate change impacts.

Defining Goals



Goals: Big picture – Desired future condition / what you're trying to do

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

Objectives: More detailed description of how you're going to achieve your goals

- Concise, measurable statements that form the basis for further planning to achieve the identified goals.

***** If possible, draw from existing management plans, or planning documents *****

Examples

Goal: Maintain and improve the health of North Brook as a Coldwater Fish Resource.

Objective: Increase riparian vegetation cover along 300 ft of streambank over the *next 5 years*.

Goal: Reduce invasive species cover

Objective: Reduce area covered by invasive buckthorn from 10% to no more than 5% in the *next 10yrs*.

Step 1. DEFINE the scope of the project

Key Questions:

- Who are the people on your team?
- Where are you working?
- What are your goals and objectives for this area?
- *Who are your partners in stewardship; who else is affected by your management?*



Project
introductions!

Hello
my name is

Where are you working?



An aerial photograph of a vast, forested valley. In the foreground, a dense forest of trees with green and yellow foliage is visible. In the middle ground, a large, irregularly shaped lake or reservoir is situated, surrounded by more forested land. The background shows rolling hills and mountains under a clear blue sky. A semi-transparent white rectangular box with a thin black border is centered over the middle of the image, containing the text "Break (15 minutes)".

Break (15 minutes)



Presentation

Intersection of conservation & Tribal forestry

*Carolyn Ziegra, AMC, Research Forester and Chuck Loring, Penobscot
Nation Director of Natural Resources*



Lunch

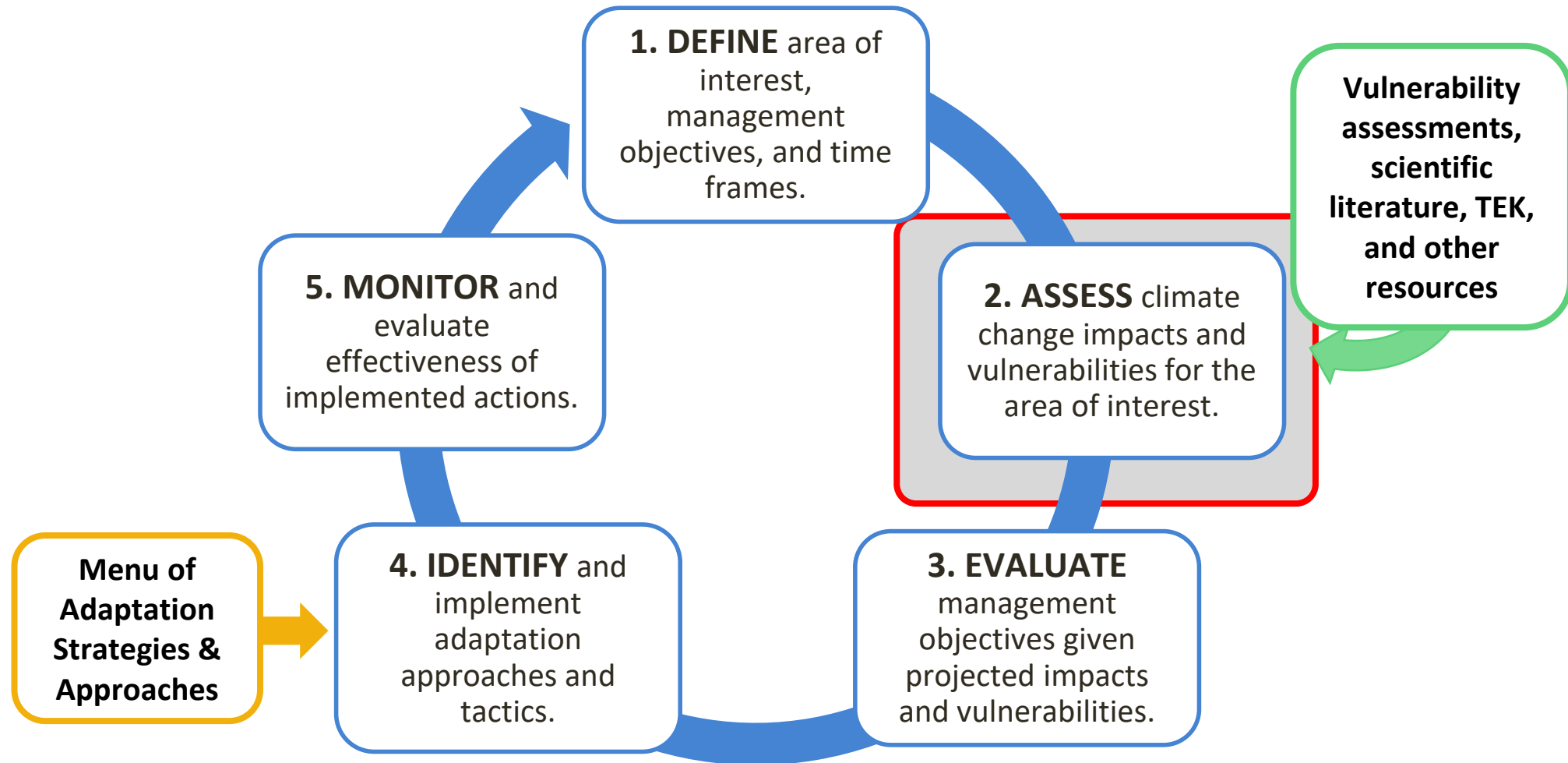


Presentation

Climate change and carbon in Maine forests

Andy Whitman, Climate and Forest Carbon Specialist, Maine Forest Service

Step 2: Assess Climate Impacts



The background of the slide features a vibrant autumn forest scene. On the left and right sides, there are vertical panels showing trees with leaves in shades of red, orange, and yellow. The central area is white, providing a clean background for the text.

Step 2: ASSESS site-specific climate change impacts and vulnerabilities

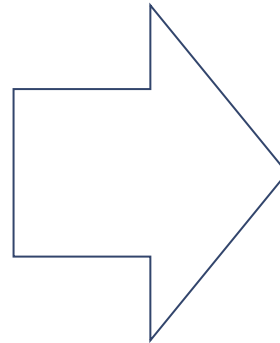
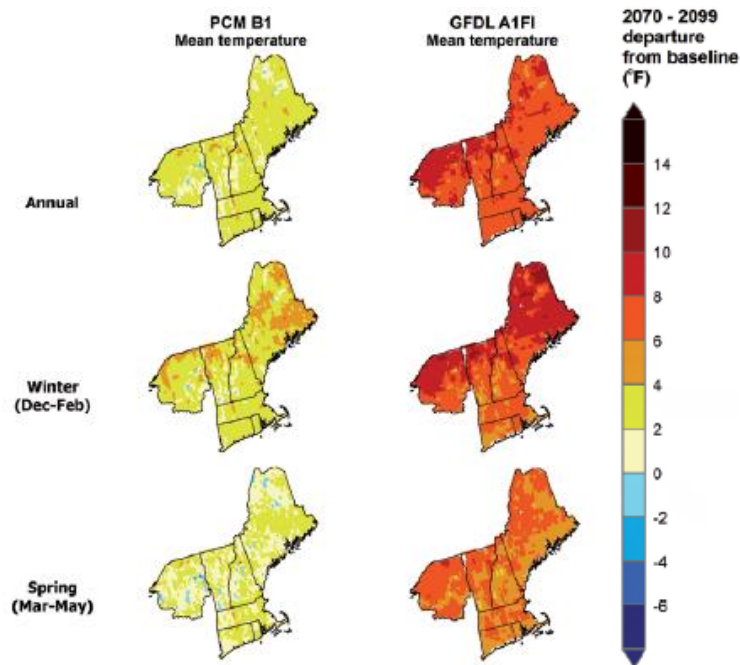
Key Question:

- How might your site be uniquely affected by climatic change and subsequent impacts?
- Which human communities, cultures, economies, linked to the project area are (in)directly vulnerable to and affected by these impacts?

Step 2: ASSESS climate change impacts and vulnerabilities

Regional Climate Impacts

Based on regional resources



Site-specific Impacts

Based on your expertise



Step 2: ASSESS climate change impacts and vulnerabilities

Regional Climate Impacts

Based on regional resources

Site-specific Impacts

Based on your expertise

Regional	Local and Project-level impacts
Shorter, milder winter season	Hemlock is prevalent on site, along stream; less severe winters increase risks from hemlock woolly adelgid
Warmer annual temperatures	North Brook is a high-quality tributary with a healthy trout population. Warmer stream temperatures reduce habitat. Loss of hemlock shading would cause more warming.

Climate Change Tree Atlas

Explore current and future habitats of 125 tree species in the eastern US (and 147 bird species!)

Information can be used to:

- Assess whether current tree species are at risk from climate change
- Identify future-adapted species for projects

The screenshot shows the homepage of the Climate Change Tree Atlas. At the top, it identifies itself as an official website of the United States government. The main header features the 'Climate Change Atlas' logo and a search bar for the entire atlas. Below the header, there are navigation tabs for 'Trees', 'Birds', and 'Products'. The main content area is titled 'Tree Atlas' and includes a 'Version 4' badge. A sub-header reads: 'Modeled potential suitable habitat for 125 tree species in the East, with an additional 23 species with current information only.' A 'Featured Trees' section displays three cards: 'American beech' (*Fagus grandifolia*), 'Live Oak' (*Quercus virginiana*), and 'Virginia pine' (*Pinus virginiana*). Each card includes a photograph of the tree and a small map of the eastern United States showing its distribution. To the right of the featured trees, there are buttons for 'Cautions', 'Model Info', and 'FAQ'. Below these is a search bar for trees or birds. A 'Previous Versions' section lists 'Tree Atlas' versions 1, 2, and 3, and 'Bird Atlas' version 1. A 'Tutorial Videos' section includes links to 'An Introduction to the Climate Change Atlas: How Does it Work?' and 'Adaptability Ratings: Understanding Biological and Disturbance Factors'. At the bottom, there is a section for 'Regional Summary Tree Tables' with a dropdown menu currently set to 'Current and Potential Future Habitat, Capability, and Migration'. A footer note states: 'Summaries for tree species are available for a variety of geographies, in both PDF and Excel.'

Atlas site: <https://www.fs.usda.gov/nrs/atlas/tree/>

Climate Change Tree Atlas – Components



distribution
model

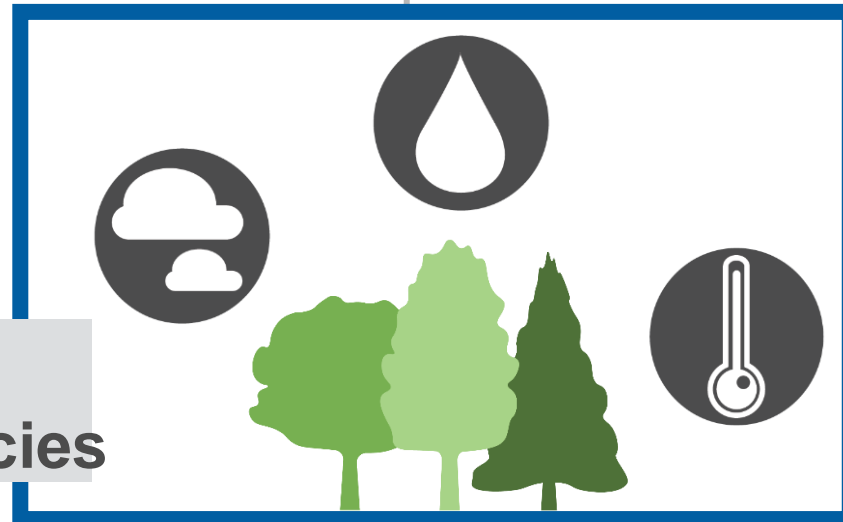


migration model



tree species
traits

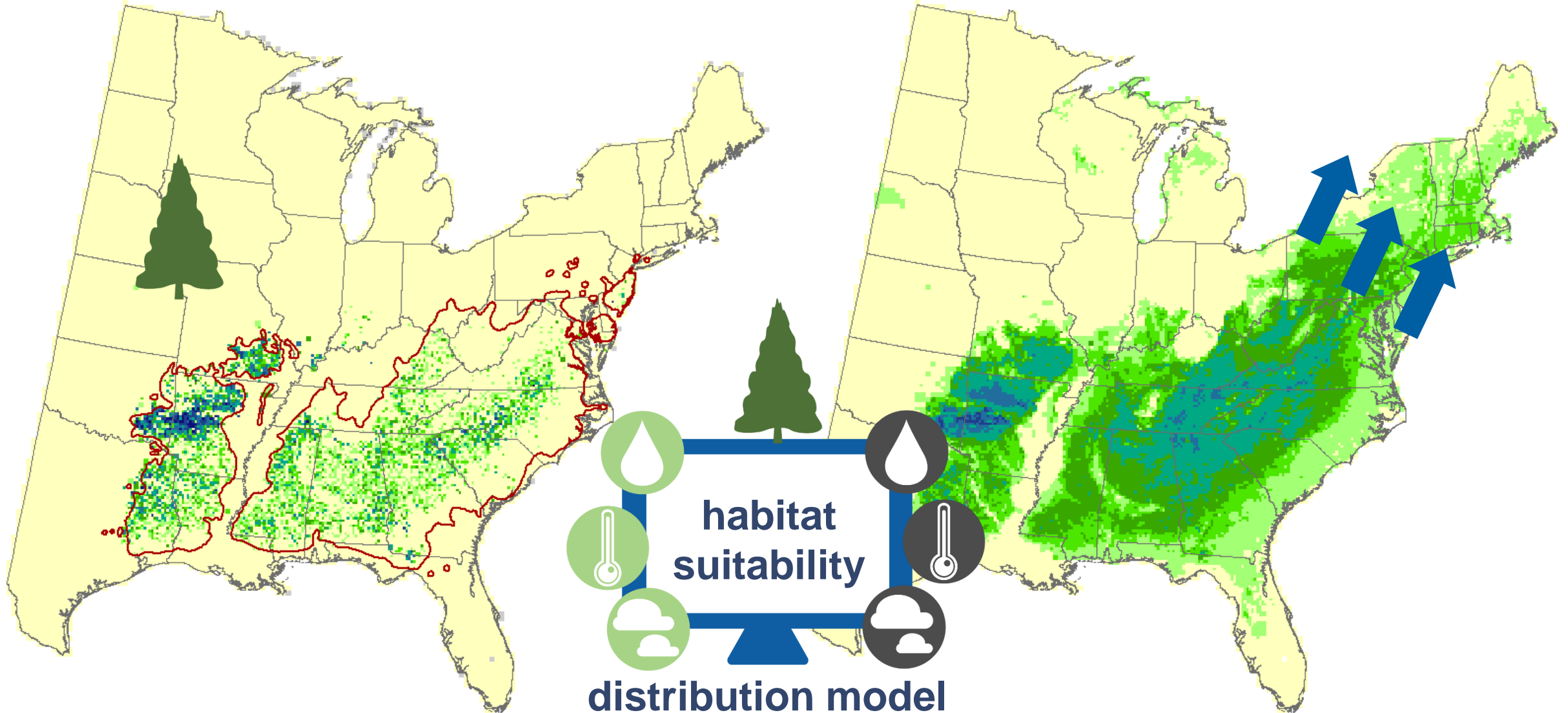
125 tree
species



Habitat Suitability

current

future



Activity:

Assess the influence of climate change on your site



Describe site characteristics that may present climate-related vulnerabilities

Adaptation Workbook Step 2 – *Select climate change impacts that are most likely to affect your project area, and determine vulnerability.*

Which of these regional climate change impacts is likely to affect your area? *Climate change impacts for New England* (see pre-readings)

How could these regional climate change impacts affect your local area? Which present the greatest risk, and why?

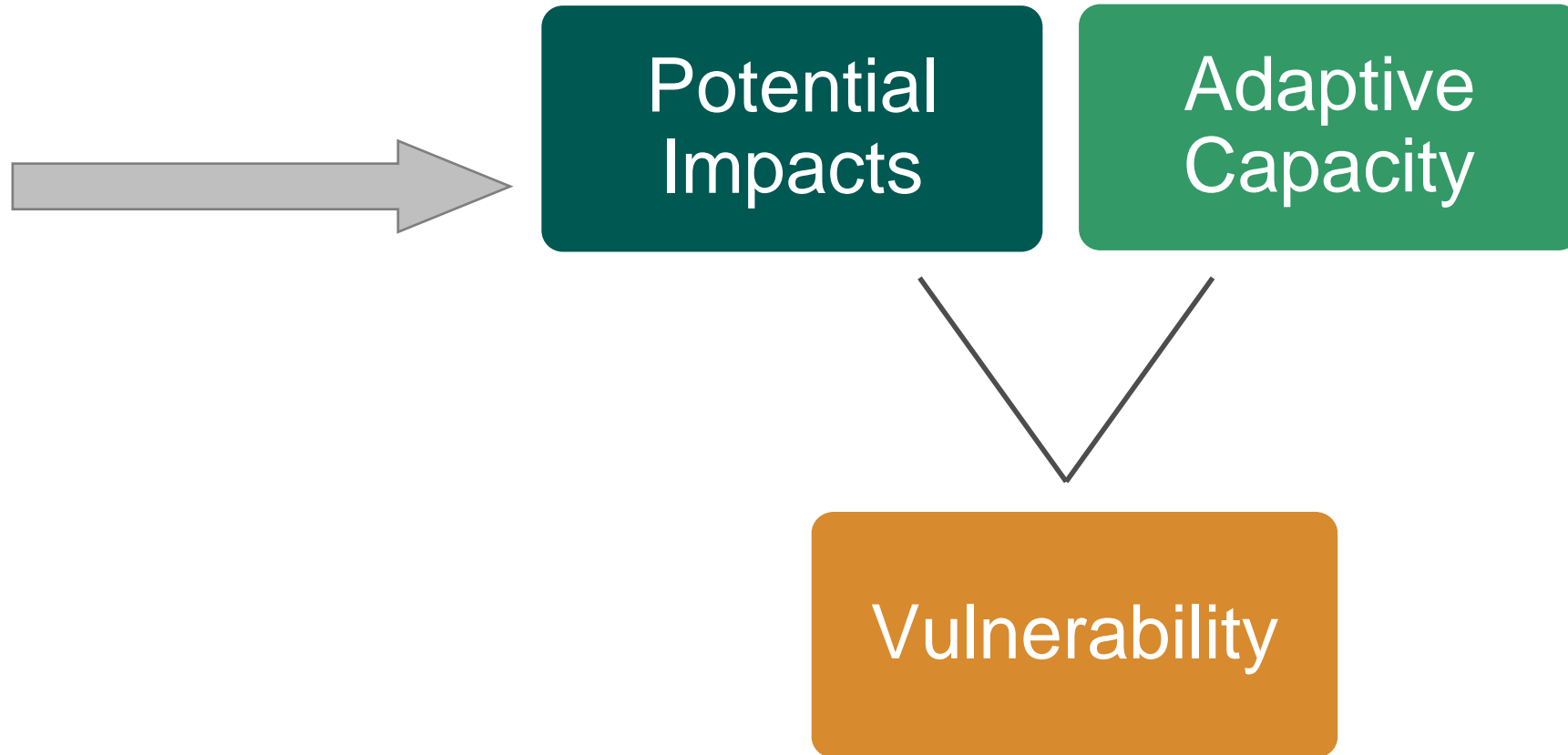
**Assign Points*
20
Total**

- Warmer temperatures across the entire year, particularly warmer winters
- More days with extreme heat
- Fewer days with extreme cold
- Increased winter & spring precipitation
- Slight or large decrease in summer precipitation
- More frequent heavy precipitation events
- Shorter winters
- Less snow and ice cover, more variable snow and ice conditions
- More high streamflow days in winter and spring
- More low streamflow days in the summer and fall
- Increased water temperature
- Reduced soil moisture in summer
- Longer growing seasons
- Increased water evaporation and plant water usage
- Increased length of dry spells, more days without precipitation
- Changes in phenology or phenology mismatches
- Carbon dioxide fertilization – increased plant growth and water-use efficiency
- Declines in northern and boreal plant and animal species
- Increases in southern plant and animal species
- Increase in wildfire activity
- More damage due to insect pests and forest pathogens
- Increases in invasive species
- Other:

**You have 20 points to distribute as you see fit. If particular impacts are most concerning for your resource area, give them more points. If something's not concerning to you, don't give it any points.*

What is vulnerability?

Two components:

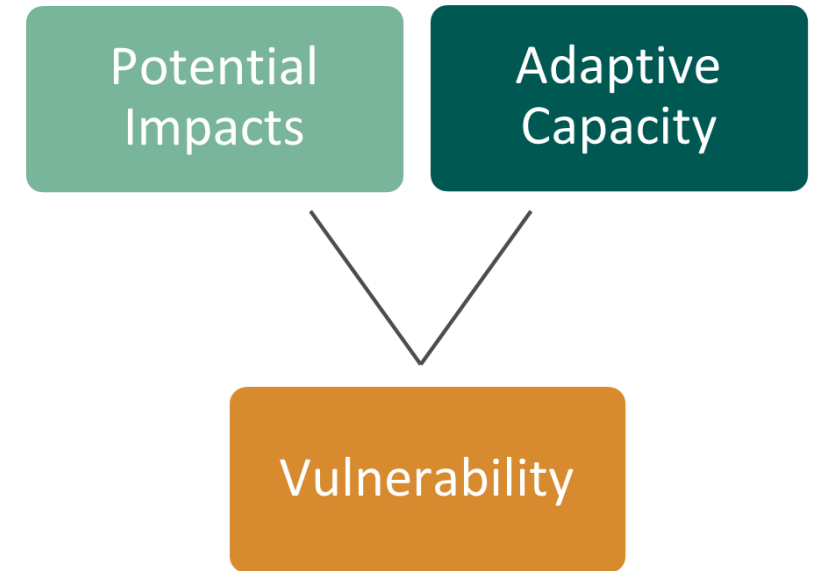


What is vulnerability?

Potential Impacts

Consider

- What the system is **exposed** to
Changes in temperature, rainfall, storms, dominant species, stressors
- How **sensitive** the systems is to those changes



Big question:

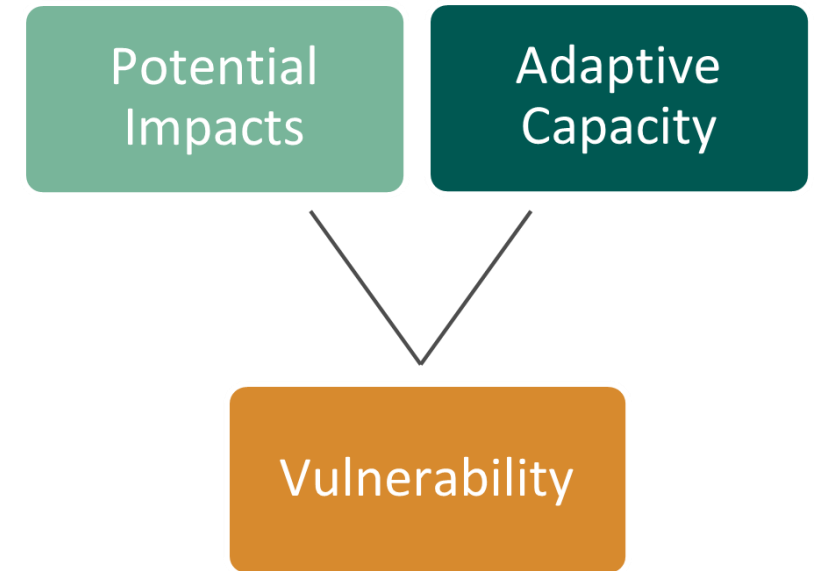
Are the potential impacts likely to **support** or **disrupt** the health and function of the system?

What is vulnerability?

Potential Impacts

Consider

- What the system is **exposed** to
Changes in temperature, rainfall, storms, dominant species, stressors
- How **sensitive** the systems is to those changes



Example

Two forests could both be exposed to 3°F of warming

An alpine forest of spruce trees may be more sensitive to this impact than a forest of oak trees

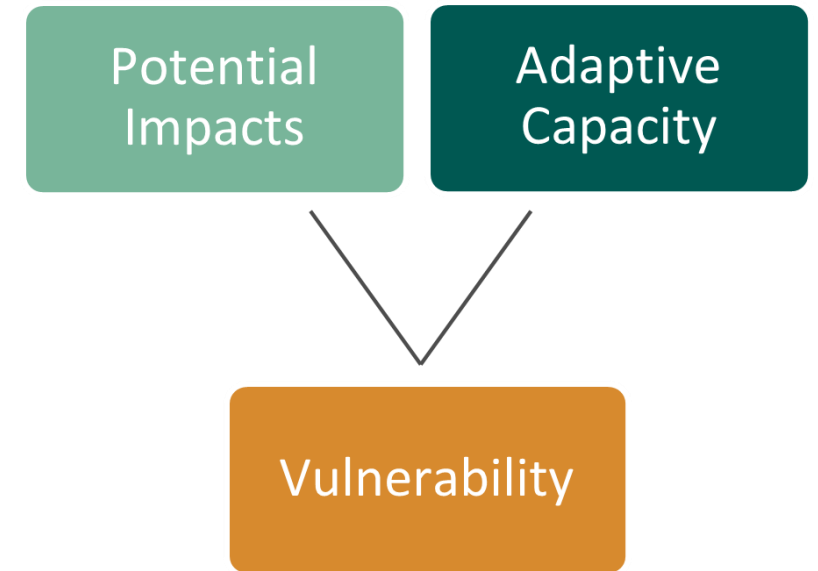
What is vulnerability?

Adaptive Capacity

Consider

How well the system can cope with the potential impacts.

i.e., how resilient is the system?
(assuming no change in management intervention)



Big question:
How **resilient** is the system to potential impacts?

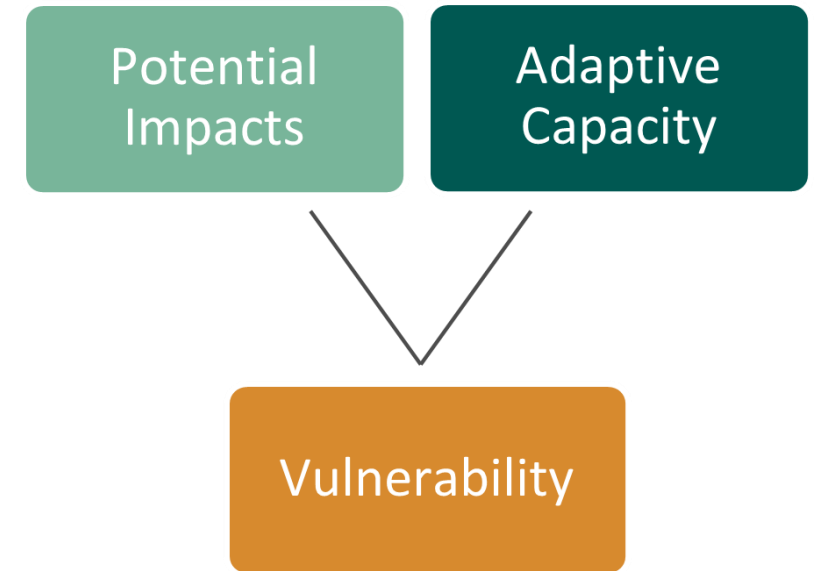
What is vulnerability?

Adaptive Capacity

Consider

How well the system can cope with the potential impacts.

i.e., how resilient is the system?
(assuming no change in management intervention)



Example

A forest containing many species may have a greater capacity to adapt to warming than a forest containing one species.

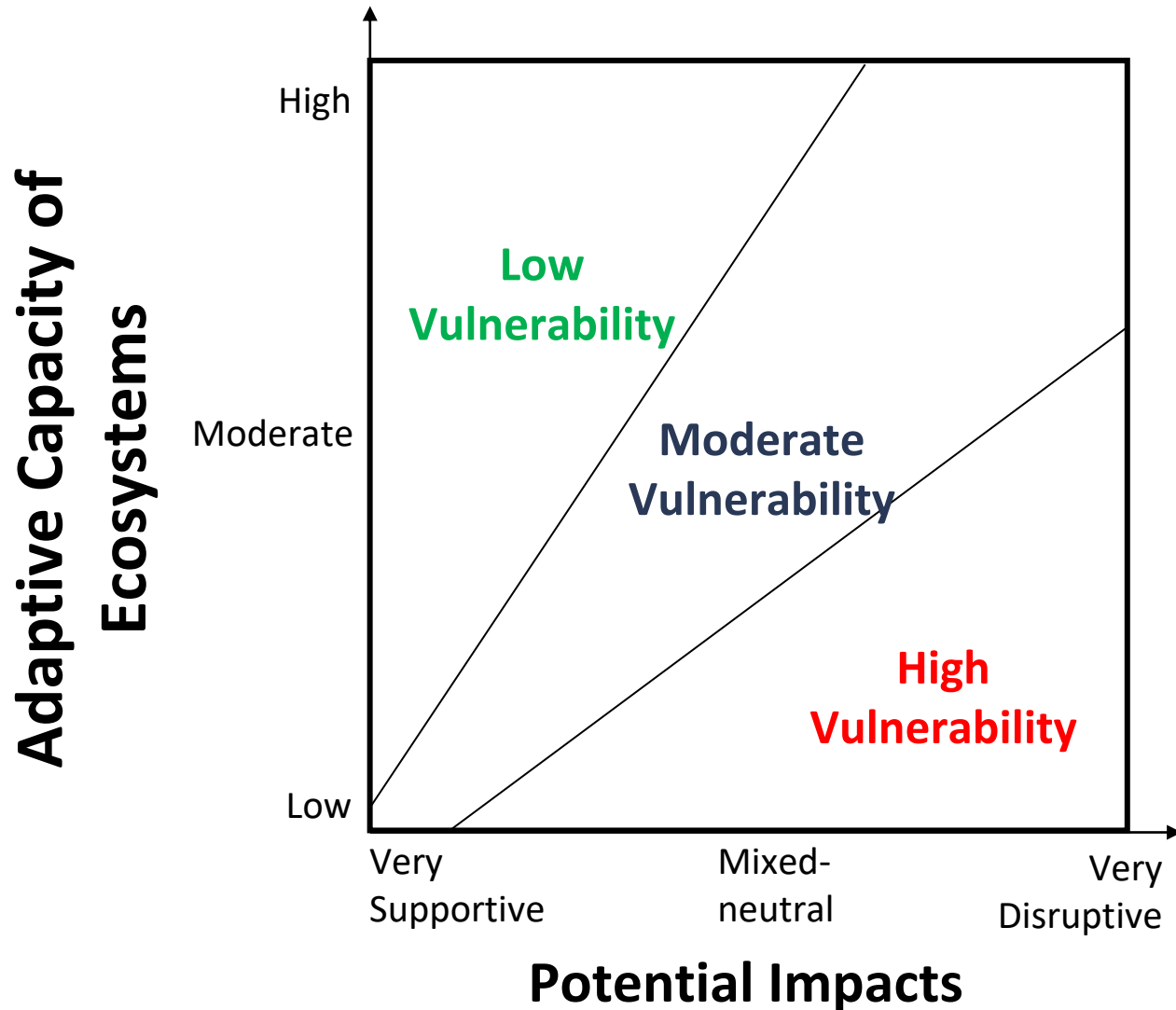
Activity: Assess VULNERABILITY

2. How vulnerable is your project area to climate change?

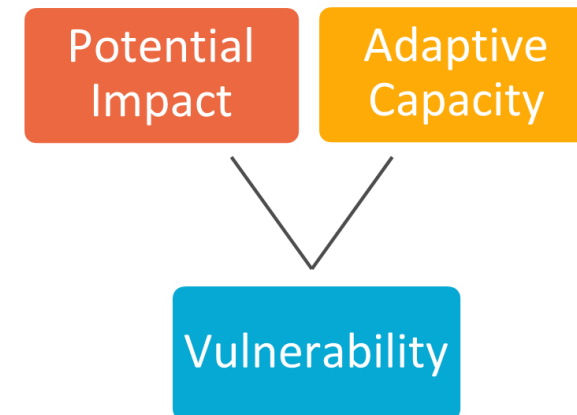
Vulnerability Ratings (pick one per time period)

	<i>Nearer term (10-30 years)</i>	<i>Long term (50+ years)</i>
Low – Ecosystems are expected to readily cope with potential climate change impacts. Climate change is more beneficial to ecosystems than disruptive.		
Moderate – Climate change impacts are expected to alter ecosystems, but ecosystems will be able to cope with some impacts.		
High – Climate change impacts are expected to exceed the ability of the ecosystem to cope with impacts. Ecosystems may undergo changes that will disrupt important ecosystem functions and key environmental benefits.		

Select Your Project's Vulnerability Determination



- How will the **potential impacts** from climate change affect this particular location?
- How much **adaptive capacity** (i.e., resilience) does this system have to bounce back from climate change or disturbance?



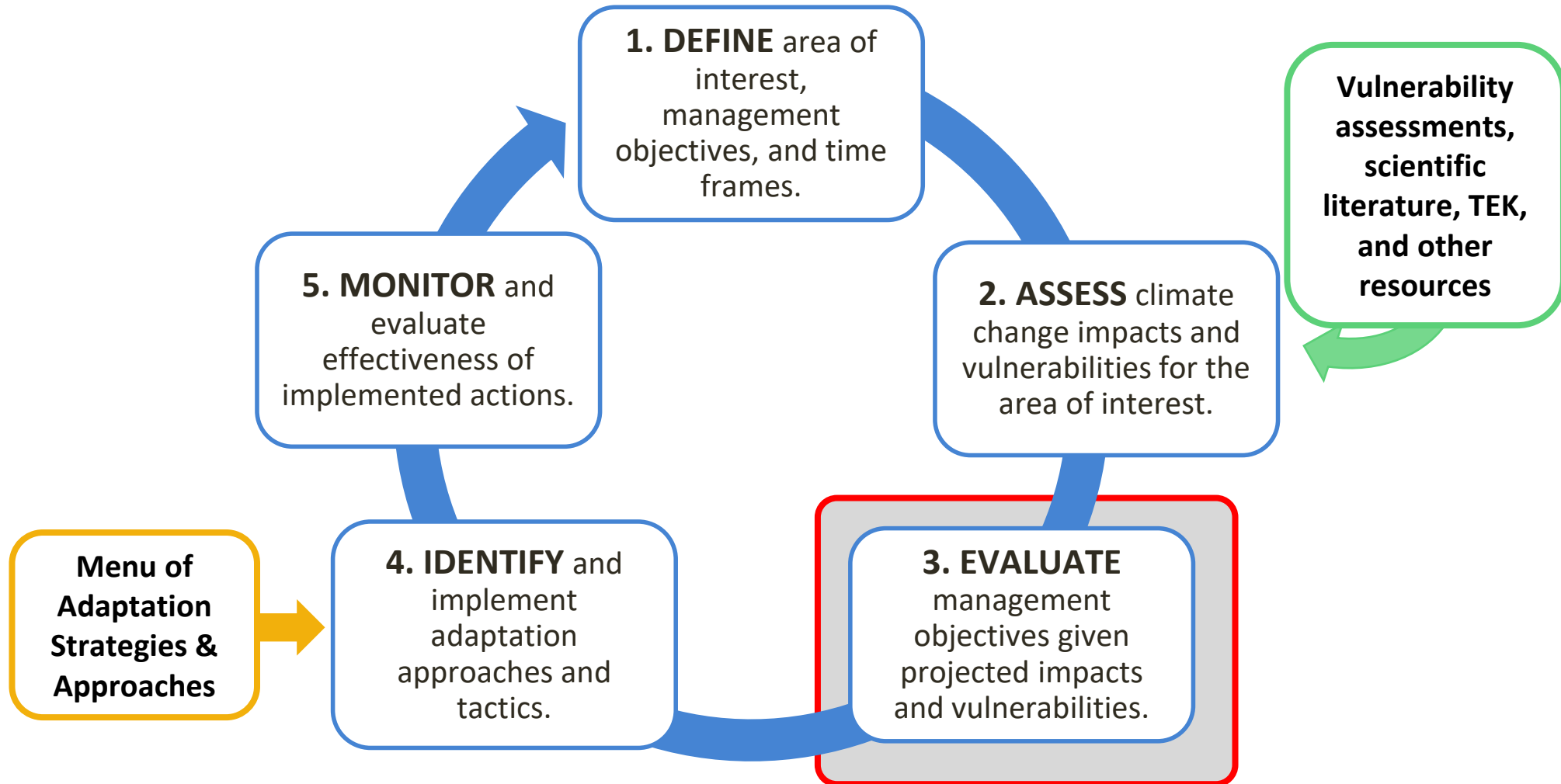
Step 3: EVALUATE
management objectives
given projected impacts
and vulnerabilities



An aerial photograph of a vast, forested valley. In the foreground, a dense forest of trees with green and yellow foliage is visible. In the middle ground, a large, irregularly shaped lake or reservoir is situated, surrounded by more forested land. The background shows rolling hills and mountains under a clear blue sky. A semi-transparent white rectangular box is overlaid on the center of the image, containing the text "Break (15 minutes)".

Break (15 minutes)

Step 3: Evaluate



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Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

Key Questions:

- What management challenges or opportunities might occur?
- Can current management meet goals?
- Do goals need to change?
- What specific challenges and opportunities exist for any impacted communities?

Site-level Vulnerability vs. Management Challenges

Step 2 = Describe how climate change may affect **your site**. Detailing Site characteristics that may present climate-related vulnerabilities

→
About "place"



Step 3 = Describe how climate change may affect meeting your management goals and objectives



Can we achieve goals and objectives given climate change?



Similar but different!

Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

Challenges to meeting objectives given climate change:

Specific ways in which climate change will make it harder to achieve objectives for each ecosystem/topic.

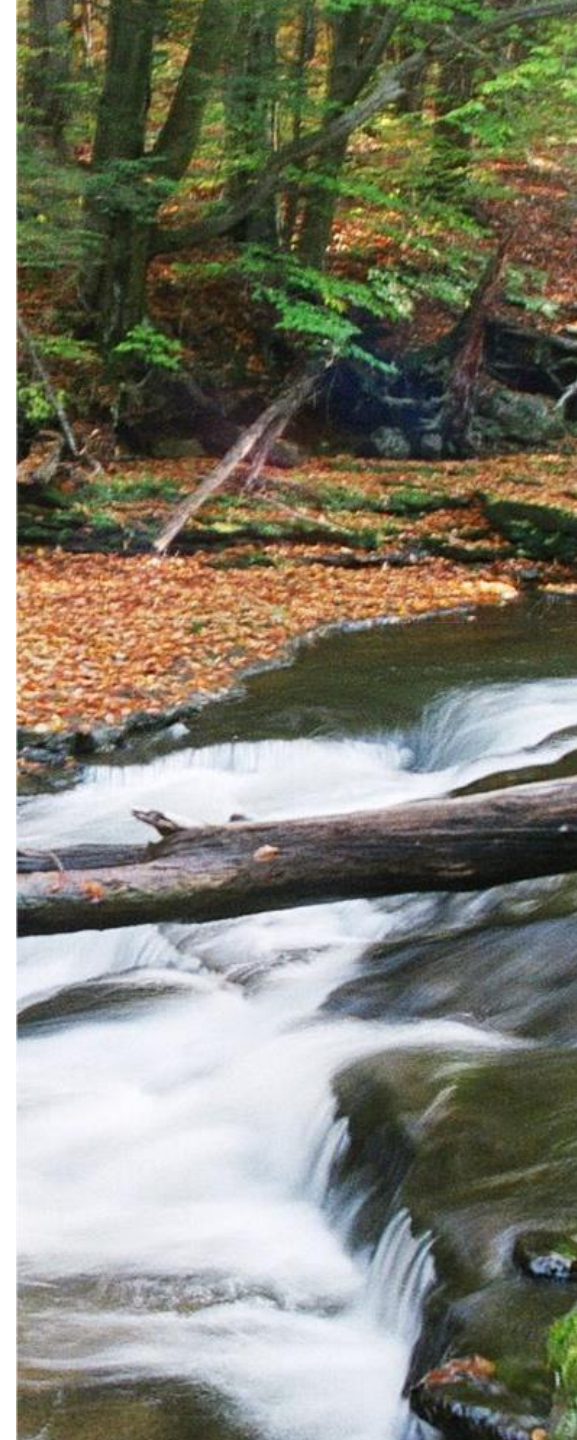
***Focus on challenges within the scope of the project (not global markets, policies, etc.)*



Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

Opportunities to meeting objectives given climate change

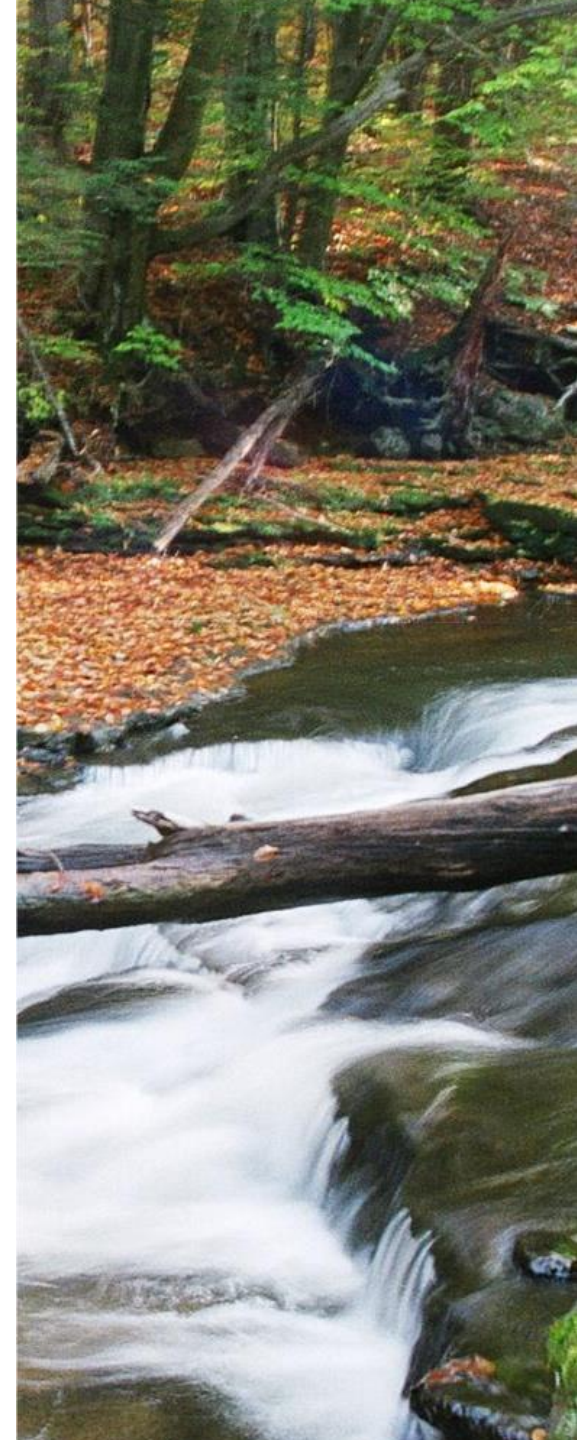
Specific ways in which climate change will make it easier to achieve objectives for each topic/ecosystem.



Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

Other Considerations

Social, financial, or other factors that also affect your ability to meet objectives.



Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

Objective	Challenge from Climate Change	Opportunity from Climate Change	Feasibility	Other considerations
Maintain closed forest canopy conditions.	Increased climatic stress and invasive pressure may threaten some of the key canopy species.	Shifting climatic conditions increase the available palette of trees for diversified plantings.	Medium	Climate change impacts on present and novel pest severity is highly variable and uncertain.
Improve breeding habitat for forest-interior birds by providing a variety of forest structures.	Projected declines in conifer species reduce that habitat component.	Many bird species focus on structure over species mix, and so changes in composition may matter less.	High	
Maintain existing and develop new walking trails.	Extreme precipitation may increase erosion or flooding. Extreme storms may increase windthrow and need for hazard tree removal	New trails could be designed to reduce impacts from extreme weather.	Low	Additional funding would be needed to make improvements.

Step 3 – EVALUATE the feasibility of achieving objectives under CURRENT management.

Feasibility – Is it possible to achieve objectives for each ecosystem using current (business-as-usual) management actions?

High: We can do it!

Opportunities > Challenges

Moderate: Somewhere in the middle

Low: We'll need more resources or effort.

Challenges > Opportunities

Challenges

More invasive species

Risk of erosion on exposed northern shore

Increase in damage from recreation

Opportunities

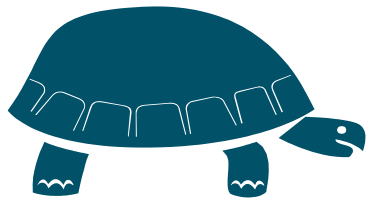
New species suitable for area

Longer growing season means more growth

Consider feasibility over time - **short-term** versus **long-term**.

Step 3. Complete Worksheet

Brainstorm climate-related **challenges** and climate-related **opportunities** for each objective.



Consider: Do goals and objectives need refinement?

Step 3: EVALUATE management objectives given projected impacts and vulnerabilities

ACTIVITY

Share 3-4 climate-related challenges

Share 3-4 climate-related opportunities

**WRITE out
ideas in large
text**

Be concise!

Activity: Feasibility Timeline

Is it possible to achieve objectives using **current** (business-as-usual) management actions?

- **Near term** – next 10-20 years
- **Long term** – next 50-75 years

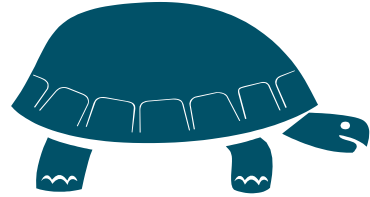
High: We can do it!

Opportunities > Challenges

Moderate: Somewhere in the middle

Low: We'll need more resources or effort.

Challenges > Opportunities



Slow down!

**Are you going to
continue with these
management objectives?**

*If there are significant challenges to achieving any
goals and objectives, consider revising in step 1*



Pre-work for Day 2

- **Continue thinking** and reflect on Session 1 activities and discussions.
- Document lingering thoughts, and ideas to discuss in Session 2.
- Review **reading list** provided as pre-work

Homework: Brainstorm potential adaptation actions/interventions

Browse adaptation strategies and approaches, and potential actions
(<https://forestadaptation.org/strategies>)

Tomorrow - Poster Time!

Project Name

Objective

Site-level Impacts

Challenges & Opportunities

Adaptation Tactics - label w Approach #

Monitoring – at least 1 idea to measure effectiveness



Be creative! DRAW, WRITE, DESIGN: What's your future vision, and how will adaptation help you get there?

Maine Climate Resilient Forest Management Workshop



May 2024



Day 2 agenda

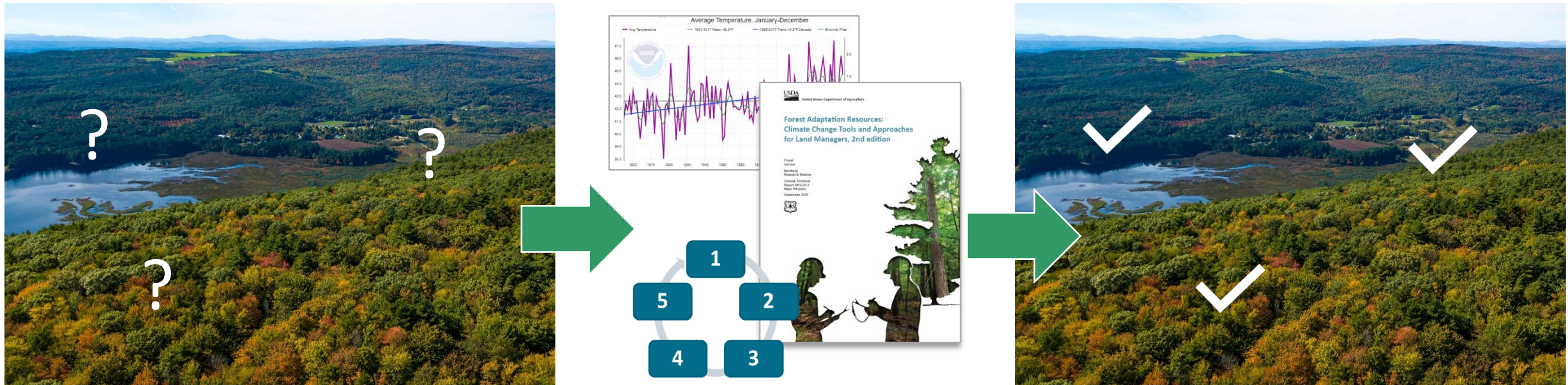
- 9:30 Recap of Day 1
- 9:45 Wolankeyutomuk: Wabanaki Inter-tribal Climate Change Adaptation Guidebook (Natalie Michelle, UMaine/NE CASC)
- 10:30 Identifying adaptation actions (Workbook Step 4)
- 12:00 Lunch (provided)**
- 12:45 Stories of Maine land stewardship in Eastern Maine (Sandy Walczyk, Blue Hill Heritage Trust)
- 1:15 Step 4 continued
- 2:00 Climate adaptation for western Maine land trusts (Rhyan Paquereau, Greater Lovell Land Trust)
- 2:30 Monitoring effectiveness of adaptation actions (Step 5)
- 3:00 Break**
- 3:15 Presentation of adaptation considerations by group
- 4:00 Wrap up
- 4:30 Adjourn

***This workshop was approved for 11.5 SAF CFE credits.
Please use the sign-in sheet to get credit!***



Workshop Objective

To intentionally integrate climate change considerations into management efforts across Maine's forests



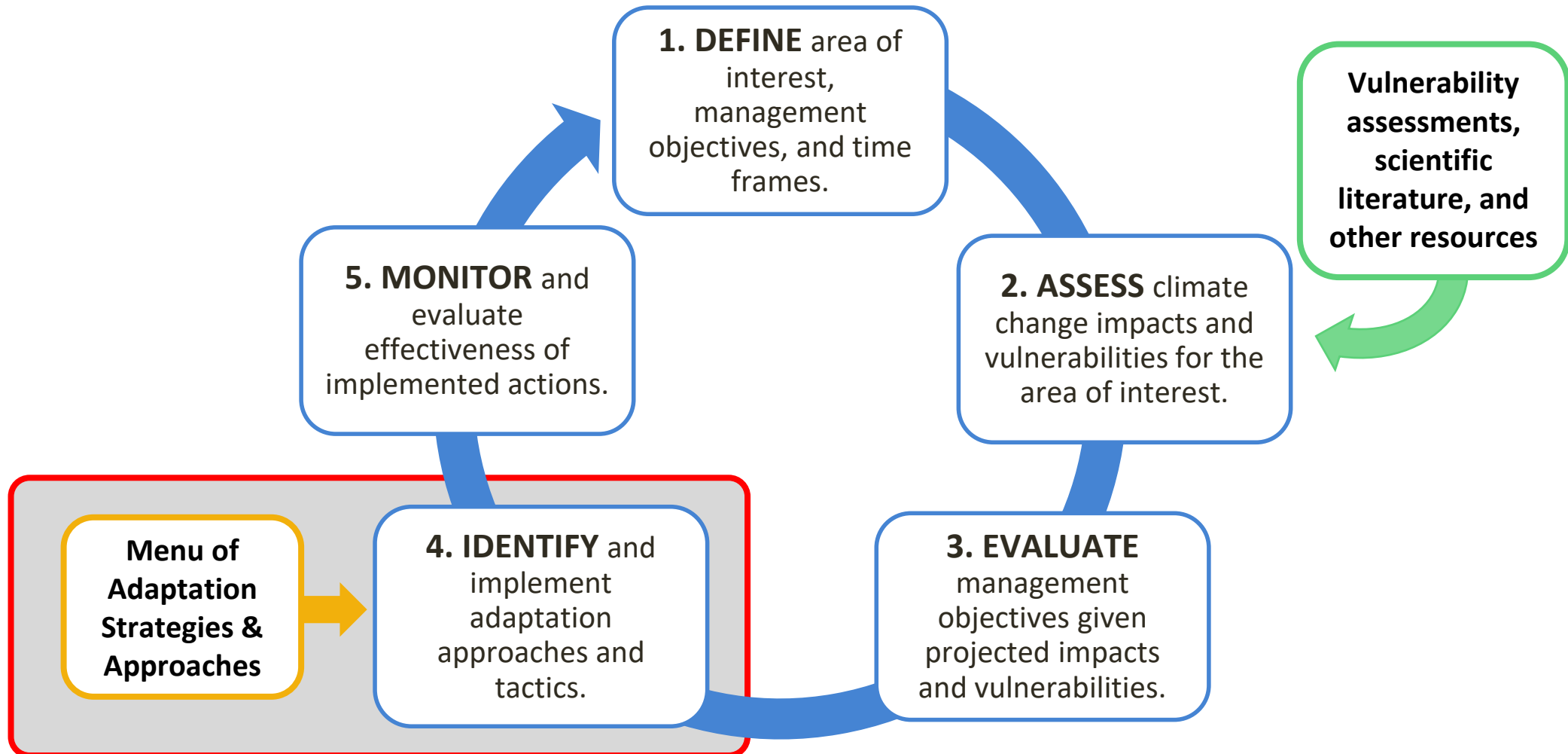


Presentation

Wolankeyutomuk: Wabanaki Inter-tribal Climate Change
Adaptation Guidebook

*Natalie Michelle, UMaine NE Climate Adaptation Science
Center Fellow*

Step 4!



The background of the slide features a vibrant autumn forest scene. On the left, there are tall trees with green and yellow leaves. On the right, there are dense bushes or smaller trees with bright orange and red foliage. The overall lighting is bright, suggesting a sunny day.

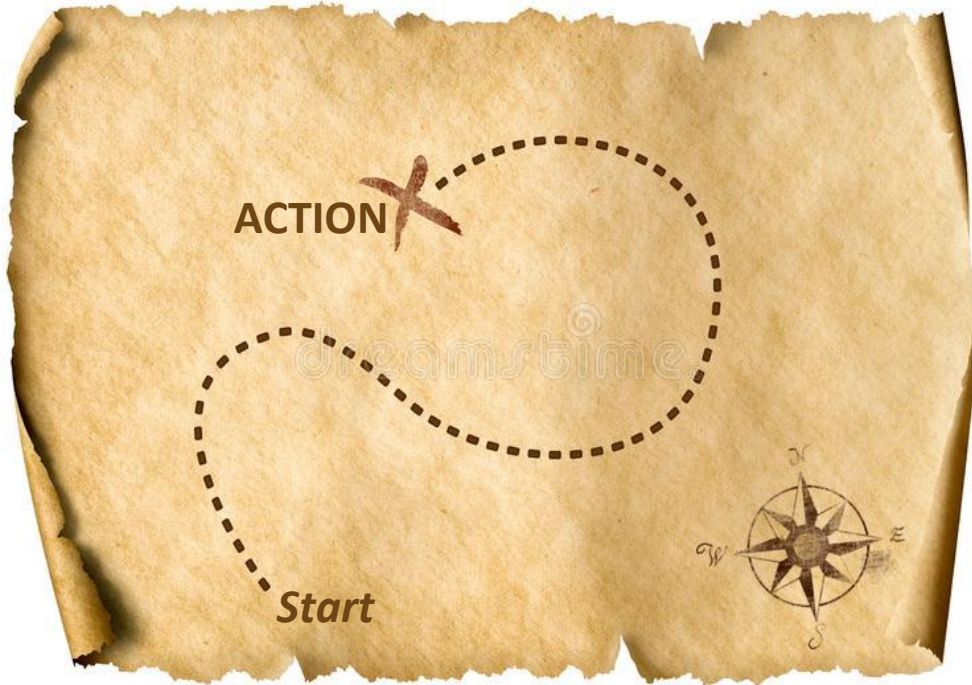
Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Key Question:

- What actions can enhance the ability of the project area to adapt to anticipated changes and meet management goals?
- How can your adaptation strategies address or be sensitive to the human/community impacts you have identified?

Time to get to work

How are you going to respond to climate vulnerabilities?



ForestAdaptation.org/strategies

Identifying Adaptation Actions

Connecting Broad Ideas to Specific Actions

RESISTANCE



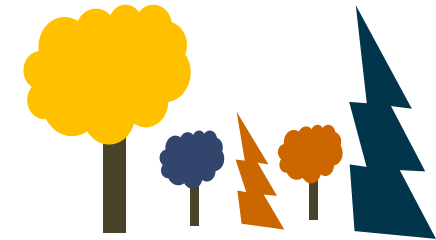
- Improve defenses of forest against change and disturbance
- Maintain relatively unchanged conditions

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

Identifying Adaptation Actions

Connecting Broad Ideas to Specific Actions

RESISTANCE



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



Road crossings that can withstand flood events (USFS, Monongahela NF)



Threatened Dwarf lake iris (FWS)



Invasive species management (USFS)

*Reduce impacts/maintain current conditions

*Forward-looking/promote change

Identifying Adaptation Actions

Connecting Broad Ideas to Specific Actions

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



Promoting a diversity of species during harvest.



Prescribed burning to regenerate fire-adapted species



Increasing setbacks to allow for fluctuating water levels.

***Reduce impacts/maintain current conditions**

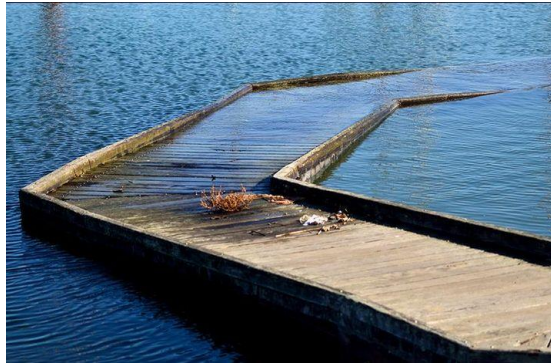
***Forward-looking/promote change**

Identifying Adaptation Actions

Connecting Broad Ideas to Specific Actions



Favoring native species that are expected to be adapted to future conditions.

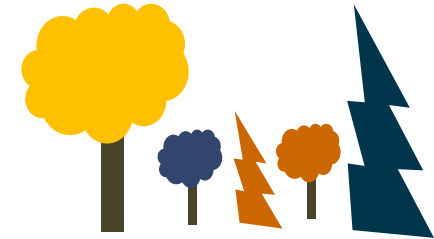


Relocate existing infrastructure to areas with less risk (P:Tom Hilton)



River & riparian area restoration in agricultural fields (P: Joann Kline)

TRANSITION



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

***Reduce impacts/maintain current conditions**

***Forward-looking/promote change**

Adaptation Planning

If you want a single “answer” for how to respond to climate change, it’s

“It depends”

It depends on **where** you are working and **what** you’re trying to achieve.

Adaptation Menus of Strategies and Approaches

A “menu” of **possible actions** that allows you to decide what is ***most relevant for a particular location and set of conditions.***



<i>Brunch Classics</i>	
Lemon Ricotta Pancakes Whipped Mascarpone Maple, Berries	15
Cornflake Crusted French Toast Berries, Maple Syrup	15
Bacon, Egg & Cheese	14
AJ's Omelet Fontal Cheese, Spinach, Mushrooms	14
Eggs Florentine Spicy Capicola, House-Made Cheddar Biscuit, Spinach	15
Porchetta Hash Poached Egg, Calabrian Chili Hollandaise	16
Chia Pudding Chia Seeds, Toasted Coconut, Banana, Strawberry	14
Farmhouse Breakfast Two Eggs, House-Made Cheddar Biscuit, Chicken Sausage	14
Chicken Kale Caesar Chicken, Kale, Croutons	16

<i>Eat Your Own Pasta Sauces</i>	
14 Marinara San Marzano tomatoes, Garlic, White Wine, Basil, Chili	
15 Arrabiata All-Purpose Flour, Durum Flour, Eggs, Ricotta	+1
15 Broken Meatball House Tomato Sauce with the Addition of Broken Meatballs	+4
16 Sunday Sauce House Tomato Sauce with Short Rib, Sausage, Veal	+4
15 Roasted Garlic Pecorino Sanolina Durum Flour Olive Oil	+2
	+3

<i>Cocktails</i>	
Horseradish	10/45
Sparkling Wine	12/55
	12/55
	12/55
Teche	10/45
Grenadine	12/55
Juice, Sparkling Wine	12/55

Adaptation Menus of Strategies and Approaches

A collection of plausible adaptation actions that are:

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

<i>Brunch Classics</i>			
Lemon Ricotta Pancakes Whipped Mascarpone Maple, Berries	15	AJ's Omelet Fontal Cheese, Spinach, Mushrooms	14
Cornflake Crusted French Toast Berries, Maple Syrup	15	Eggs Florentine Spicy Capicola, House-Made Cheddar Biscuit, Spinach	15
Bacon, Egg & Cheese Bacon, Two Eggs, Taleggio Cheese, Ciabatta	14	Porchetta Hash Poached Egg, Calabrian Chili Hollandaise	16
Avocado Toast Poached Eggs, Tomatoes, Chili Flakes, Sea Salt	15	Chia Pudding Chia Seeds, Toasted Coconut, Banana, Strawberry	14
Chicken Parmigiana Spicy Marinara, Fresh Mozzarella	22	Farmhouse Breakfast Two Eggs, House-Made Cheddar Biscuit, Chicken Sausage	14
Squid Ink fettuccine Vongole Little Neck Clams, Garlic, White Wine, Butter, Chili	22	Chicken Kale Caesar Chicken, Kale, Croutons	16

<i>Create Your Own Pasta</i>			
<i>Shapes</i>		<i>Sauces</i>	
Rigatoni Semolina, All-Purpose Flour, Olive Oil	14	Marinara San Marzano tomatoes, Garlic, White Wine, Basil, Chili	
Cavatelli All-Purpose Flour, Durum Flour, Eggs, Ricotta	15	Arrabiata All-Purpose Flour, Durum Flour, Eggs, Ricotta	+1
Tagliatelle All-Purpose Flour, Durum Flour, Eggs	15	Broken Meatball House Tomato Sauce with the Addition of Broken Meatballs	+4
Gluten-Free Rigatoni Gluten-Free All-Purpose Flour, Olive Oil, Eggs	16	Sunday Sauce House Tomato Sauce with Short Rib, Sausage, Veal	+4
Spaghetti Semolina, Durum Flour, Olive Oil	15	Roasted Garlic Pecorino Semolina, Durum Flour, Olive Oil	+2
Four Cheese Herb Ravioli Fontal, Ricotta, Parmesan, Pecorino	18	Carbonara Pancetta, Eggs, Peas, Pecorino	+3

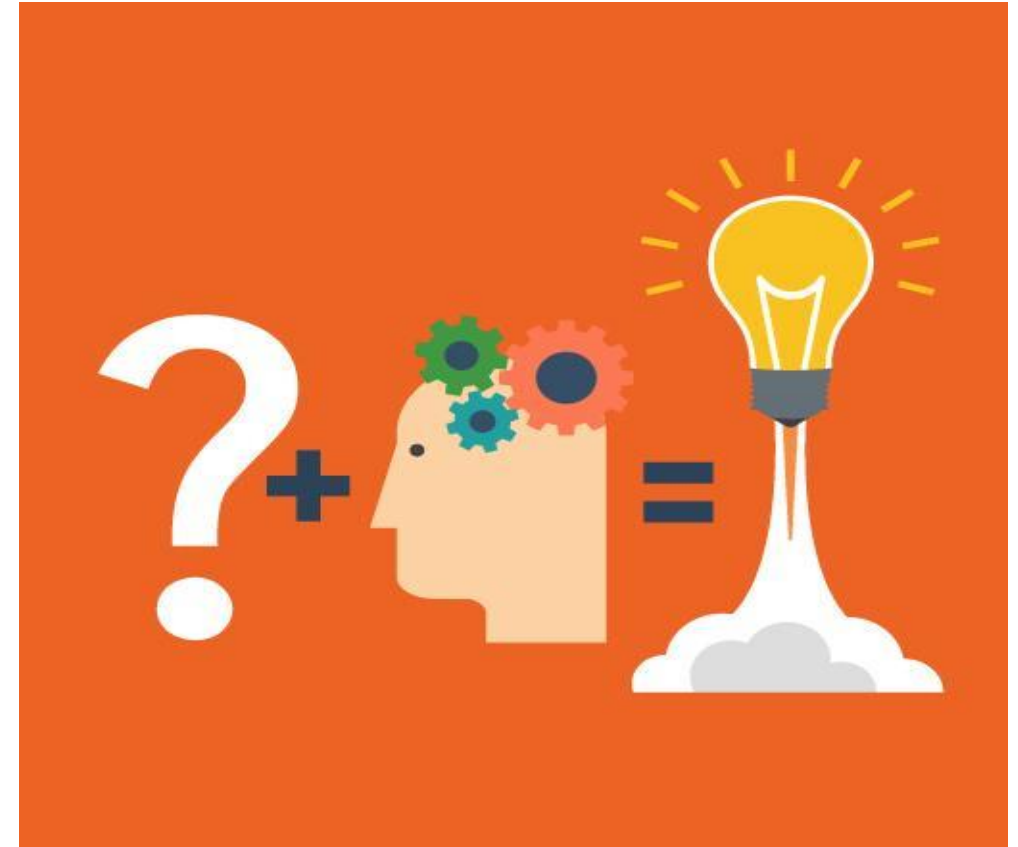
<i>Sides</i>		<i>Brunch Cocktails</i>	
Pecorino Truffle Fries	8	Bloody Mary Vodka, Spiced Fresh DOP Tomato Juice, Horseradish	10/45 5
Potato Hash	6	Cointreau Spritz Cointreau Spritz, Aperol, Crème de Peche, Sparkling Wine	12/55 5
Bacon	6	Green Side Reyka Vodka, Green Juice, Lemon	12/55 5
Turkey Sausage	6	Morning Derby Bourbon, Grapefruit, Ginger, Carrot Juice	12/55 5
Field Greens	7	Sangria Red Wine, Fresh Fruit, Pisco, Crème de Peche	10/45 5
Two Eggs Any Style	6	Firing Squad Milagros Tequila, Cointreau, Fresh Lime, Grenadine	12/55 5
Beignets	8	Tall Mimosa Reyka Vodka, Cointreau, Jake's Mimosa Juice, Sparkling Wine	12/55 5
Baked Goods	10		



Adaptation Menu of Strategies and Approaches

Benefits:

1. Connecting broad ideas to specific actions
2. Making actions intentional
3. Communicating your ideas
4. Boosting creativity



Adaptation Menu of Strategies and Approaches

CONCEPT

Option: Foundational adaptation concepts: resistance, resilience, and transition

Strategy: A strategy is a broad adaptation response that is applicable across a variety of resources and sites

Approach: An approach is an adaptation response that is more specific to a resource issue or geography

Tactic: The most specific adaptation response, providing prescriptive direction about actions that can be applied on the ground

ACTION

Adaptation Menus of Strategies and Approaches

Published:

- Forestry
- Urban Forestry
- Agriculture
- Forested Watersheds
- Tribal Perspectives
- Non-forested Wetlands
- Forest Carbon Management
- Recreation
- Wildlife Management
- Coastal Ecosystems
- Fire adapted ecosystems

Many of the menus listed here will be applicable to your work!

In Preparation:

- Grasslands

<i>Brunch Classics</i>			
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<i>Details</i>			
orseradish			10/45
iparkling Wine			12/55
			12/55
			12/55
he			10/45
enadine			12/55
ce, Sparkling Wine			12/55



Forest menu – sustainable forestry example: St. John River Forest

Management Goal: Sustainably manage forests to provide wildlife habitat and contribute to the region's economy

Climate Exposure: Increased and more variable precipitation; more frequent drought and icestorms

Resource Impact: Tree mortality and damage

What could be done to meet the management goals?

- Strategy 1: Sustain fundamental ecological functions.
 - 1.4. Reduce competition for moisture, nutrients, and light.
- Strategy 5: Maintain and enhance species and structural diversity.
 - 5.2. Maintain and restore diversity of native species.
- Strategy 9: Facilitate community adjustments through species transitions.
 - 9.1. Favor or restore native species that are expected to be adapted to future conditions.



TNC Maine

Carbon menu – managing for carbon and habitat: Green Mountain Audubon Center

Management Goal: enhance habitat value of forests for priority bird species while also managing for carbon benefits

Climate Exposure: Northern species modeled decline and greater risk from invasive pests due to warmer conditions

Resource Impact: Tree mortality, invasive plant spread, erosion

What could be done to meet the management goals?

- Strategy 1: Maintain or increase extent of forest ecosystems.
 - 1.1. Maintain current extent of forested area, including early successional and mature forest.
- Strategy 2: Sustain fundamental ecological functions.
 - 2.4 Maintain or improve the ability of forests to resist pests and pathogens.
- Strategy 3: Reduce carbon losses from natural disturbance, including wildfire.
 - 3.5 Alter forest structure to reduce the risk, severity, or extent of wind and ice damage.



Green Mountain Audubon Center

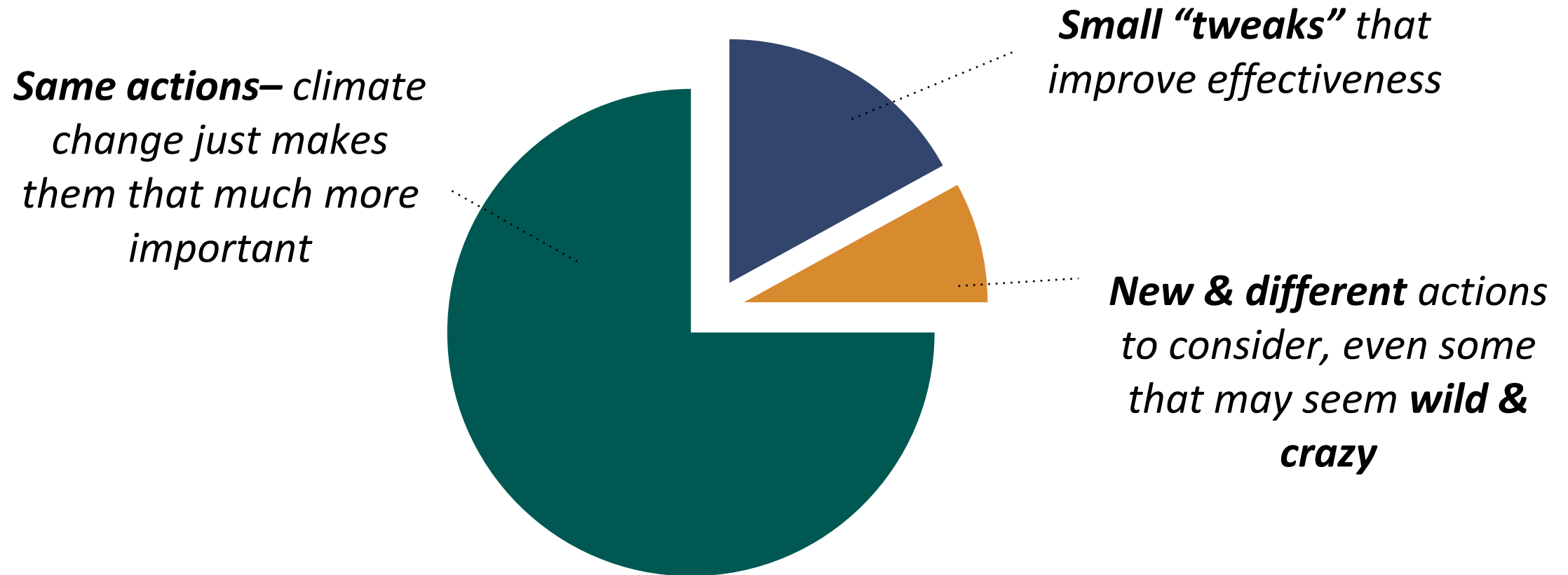
Step 4: IDENTIFY adaptation approaches and tactics for implementation.

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

Tactic – Describe a specific action you can take.

These details should ideally answer the **what, where, and how** you will implement the actions.

Adaptation Actions Can Be...



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

Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Timeframe – Specify when you will implement the tactic.

For example:

- Summer 2020
- Winter 2020-21
- Within 3 years of...
- After...
- If... then...



Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Benefits – Describe why the tactic is good.

For example:

- addresses biggest or multiple challenges
- is cheap and easy
- has co-benefits
- is likely to succeed



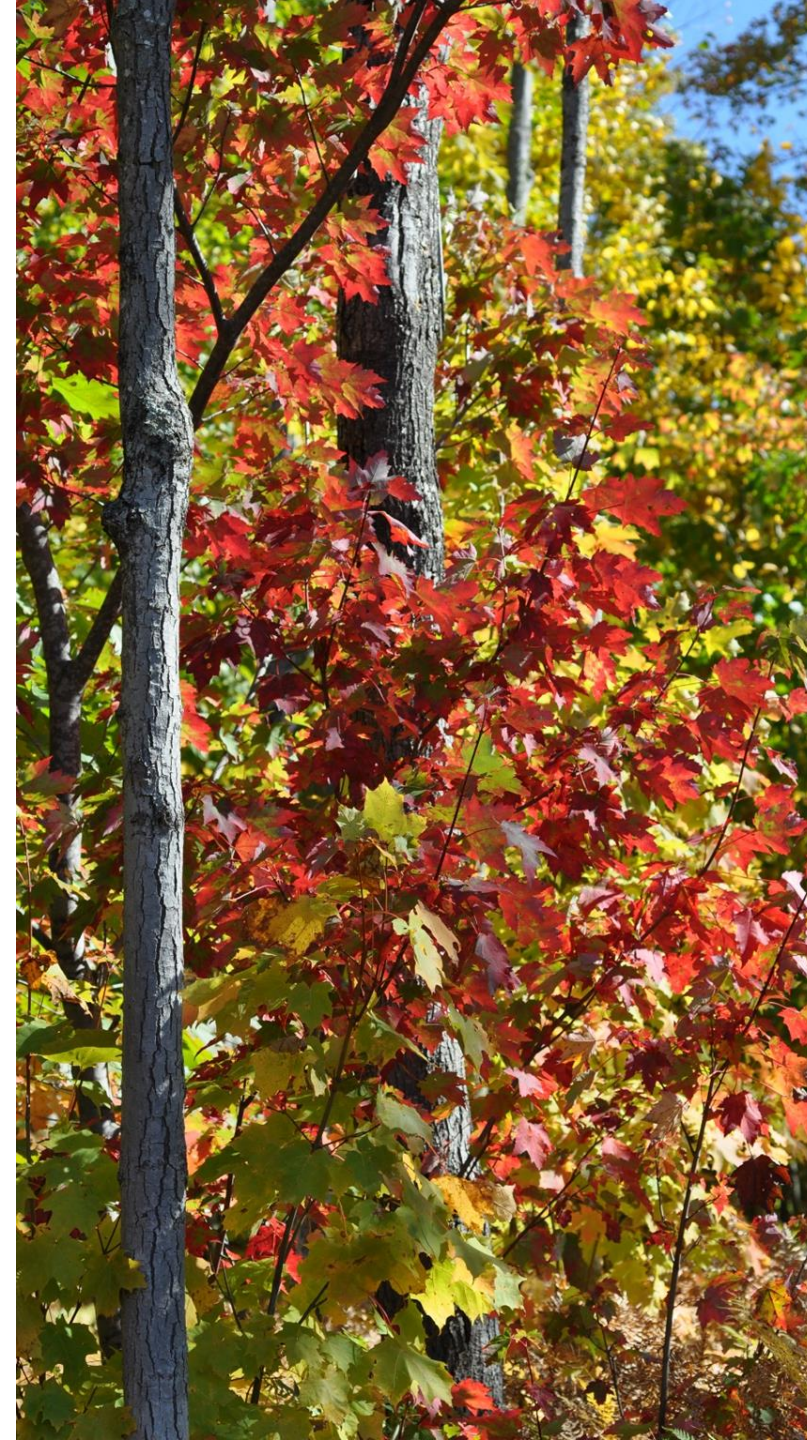
Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Drawbacks and Barriers

– Describe why it's not so good.

For example:

- it may have negative side effects,
- requires high cost or effort
- may not be successful
- has social, financial, or other barriers



Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Practicability – Is it both *effective* (will meet desired intent) and *feasible* (capable of being implemented)?

- **High:** Yes to both!
- **Moderate:** Yeah, but it will take some additional effort or planning...
- **Low:** No, the barriers/drawbacks seem too big or the benefits too small.



Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Recommend Tactic– Given all this, is this tactic likely to be helpful?

- *Also consider: trade-offs, urgency, likelihood of success, cost, and effort...*

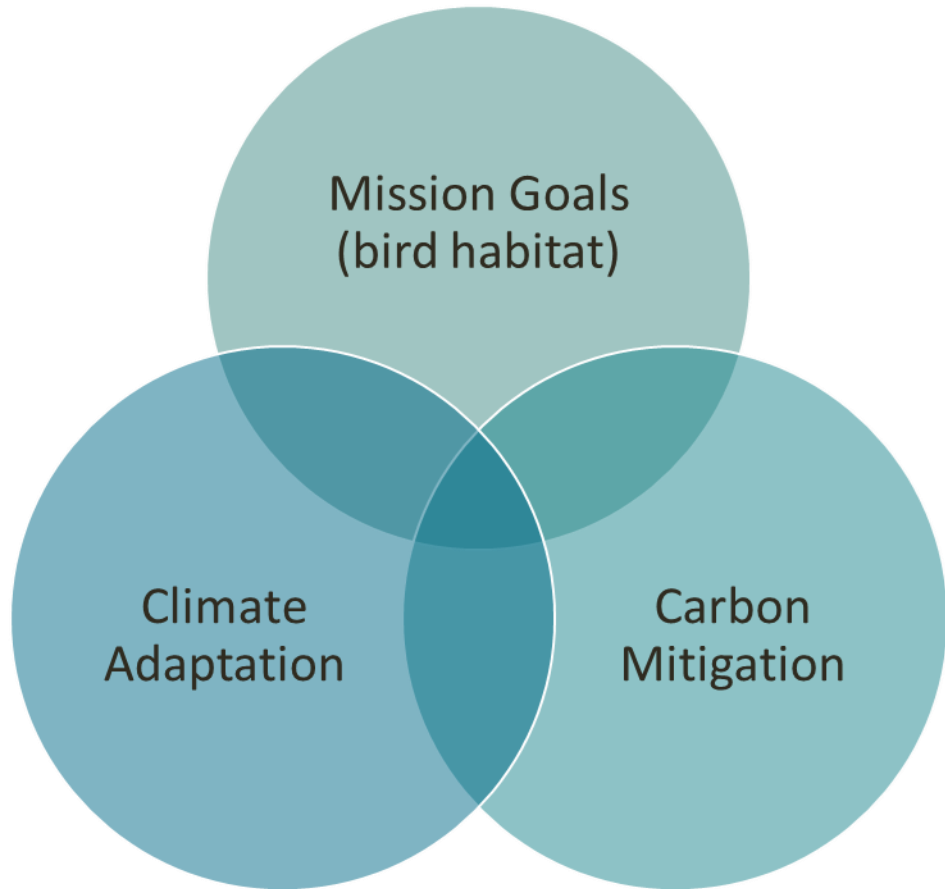
Yes: look to integrate into plan, prescription, or other activities

No: not useful at this time



EXAMPLE: GREEN MOUNTAIN AUDUBON CENTER

Wildlife habitat & carbon mitigation



Audubon Vermont/ Alberto Lopez

Audubon VERMONT

The Birder's Dozen

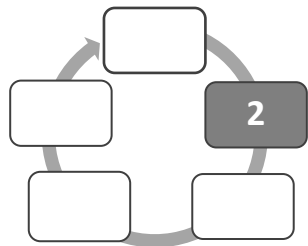
The Birder's Dozen includes twelve of the 40 forest birds that the Audubon Vermont Forest Bird Initiative is working to protect. These twelve birds:

- Have a high percentage of their global breeding populations in our Northern Atlantic Forest.
- Use a variety of forest types and conditions for feeding and breeding. Most nest in complex, diverse mature forest habitats.
- In the case of some species, including Wood Thrush and Canada Warbler, are showing serious, long-term declines in their global populations.
- Are simple to identify by sight or sound.

We encourage you to get to know the Birder's Dozen and to explore your woods to find out who is reading there!

Bird photos provided courtesy of the Townsend Arden Research Center, US Fish & Wildlife Service, Charley Eroman & Roy Picher.

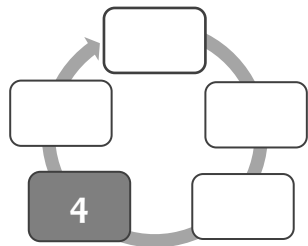
Audubon Vermont ©2013 vermont@audubon.org 802-434-3068 vt.audubon.org



2: ASSESS CLIMATE CHANGE IMPACTS & VULNERABILITIES

Priority Climate Change Impacts

Regional Climate Impact	Local and Project-Level Impacts
Shorter, warmer winters	<ul style="list-style-type: none"> • Expansion of non-native insect pests and changed native pest behavior • Increased pressure from deer herbivory • Increased challenges for winter harvesting and the risk of damage to soils and tree roots
More frequent heavy precipitation events	<ul style="list-style-type: none"> • Increased rates of soil erosion on site • Increased impact to educational/recreational infrastructure



4: IDENTIFY AND IMPLEMENT ADAPTATION OPTIONS

Adaptation Strategy or Approach (from menu)	Adaptation Tactic (your specific actions)	Benefits, Drawbacks, and Barriers
1.1 Avoid forest conversion to non- forest land uses	Maintain current extent of forested area, including early successional and mature forest	<p>Benefits: Maintains extent and quality of bird habitat; existing tree species diversity; and existing carbon sequestration</p> <p>Drawbacks: May limit timber production and early-succession habitat</p>
2.1 Reduce impacts to soils and nutrient cycling	Using forwarder during harvest operations and position landing sites adjacent to the road (rather than within forest)	<p>Benefits: reduces risk of erosion during extreme rain events and protects soil carbon stocks</p> <p>Drawbacks: May limit harvest season, layout, and sale</p>
2.3 Prevent the introduction and establishment of invasive plant species and remove existing invasives 2.5 Reduce competition for moisture, nutrients, and light	Control of non-native invasive plant populations using mechanical removal (preferred), herbicides, or targeted goat grazing	<p>Benefits: Native plant populations support greater insect food resources and higher-quality cover; may enhances forest resistance and resilience</p> <p>Drawback: Invasive management can be an additional disturbance and potential introduction of invasives</p> <p>Barrier: cost of personnel and resources to manage</p>

- <https://forestadaptation.org/adapt/adaptation-strategies>

The background of the slide features a vibrant autumn forest scene. On the left and right sides, there are vertical panels of trees with leaves in shades of red, orange, and yellow. The central area of the slide is white, providing a clean background for the text.

Step 4: IDENTIFY adaptation approaches and tactics for implementation.

Key Question:

- What actions can enhance the ability of the project area to adapt to anticipated changes and meet management goals?
- How can your adaptation strategies address or be sensitive to the human/community impacts you have identified?

Step 4: Brainstorm ideas!

Get creative!
Use your expertise
and judgement!

1. What **actions** can enhance the ability of the ecosystem to adapt to anticipated changes and meet management goals?
2. Describe **benefits, drawbacks, and effectiveness** of actions
3. Connect tactics to **adaptation strategies and approaches** (Menus: forests, carbon, wildlife, others)
4. **Denote urgency** for implementation of action



Lunch

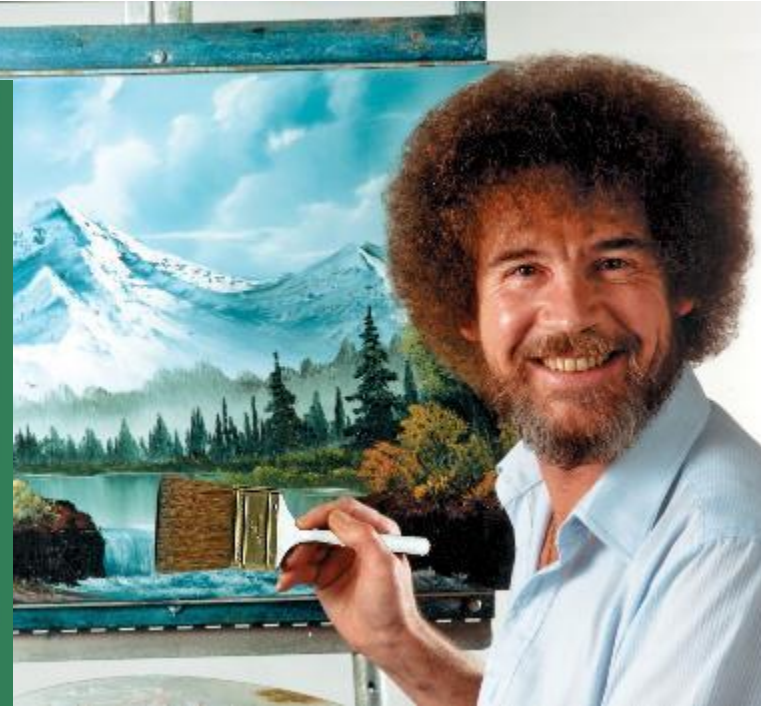


Presentation

Stories of Maine land stewardship: Eastern Maine

*Sandy Walczyk, Blue Hill Heritage Trust, Conservation
Forest Manager*

Poster Time!



Be creative! What's your future vision, and how will adaptation help you get there?

Poster Time!

Project Name

Objective

Site-level Impacts

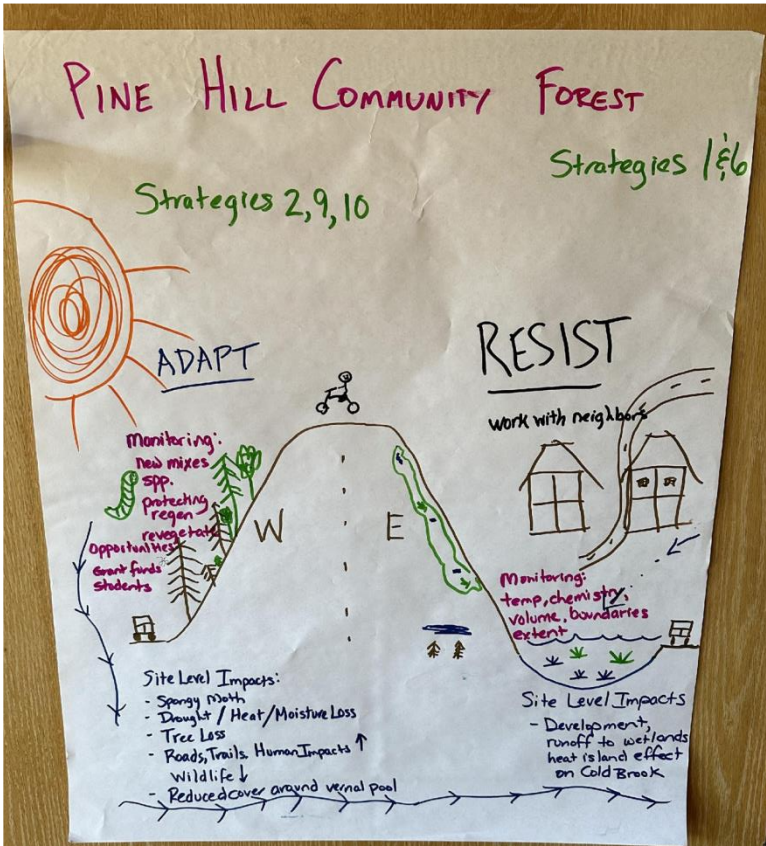
Challenges & Opportunities

Adaptation Tactics - *label w Approach #*

Monitoring – *at least 1 idea to measure effectiveness*

Be creative! What's your future vision, and how will adaptation help you get there?

Example posters



Be creative! What's your future vision, and how will adaptation help you get there?

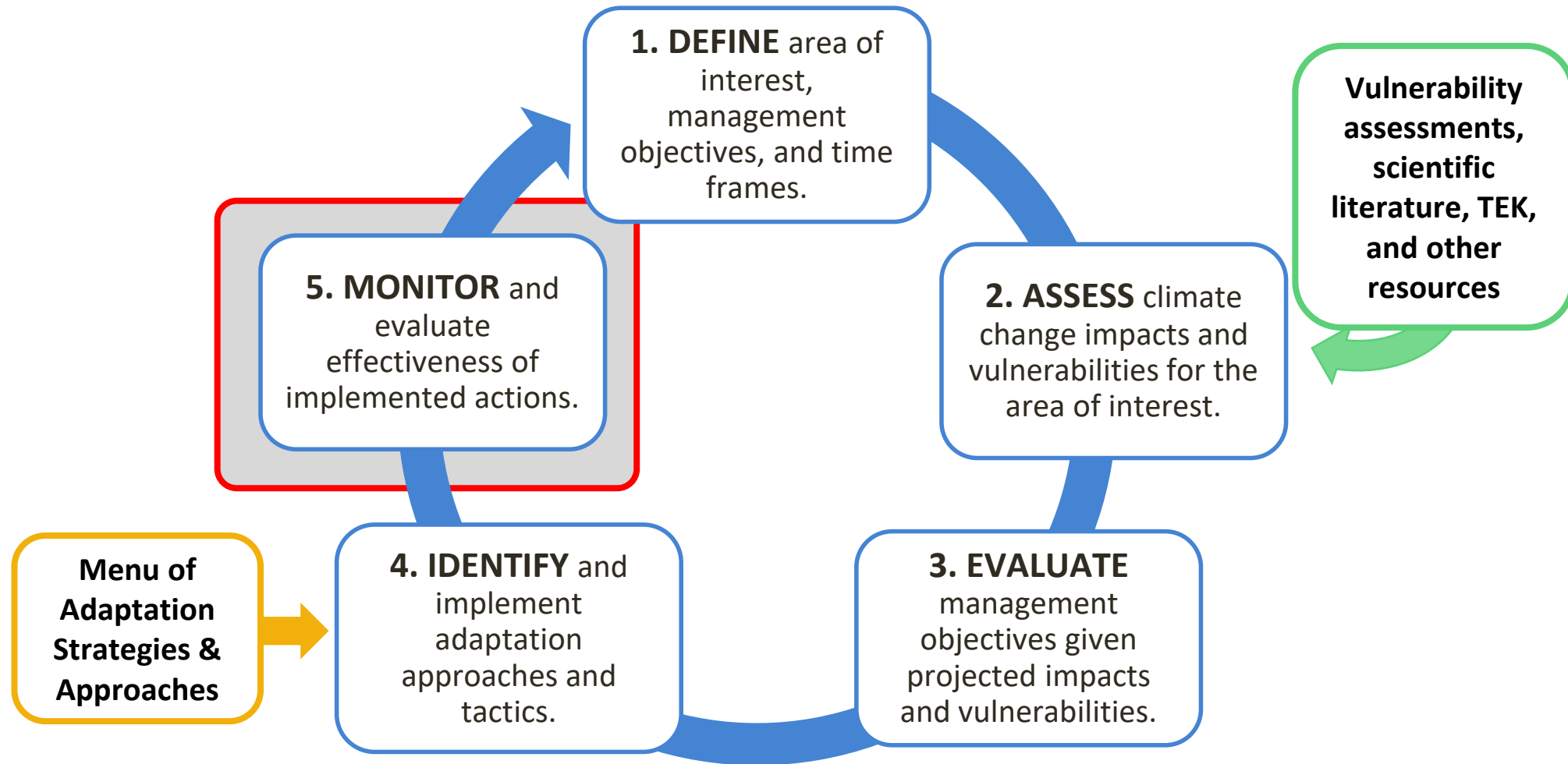
An aerial photograph of a vast, forested landscape. In the foreground, a dense forest of trees with green and yellow foliage is visible. In the middle ground, a large, calm lake reflects the sky. The background features rolling hills and mountains under a clear blue sky with some light clouds.

Presentation

Climate adaptation for western Maine land trusts

*Rhyan Paquereau, Greater Lovell Land Trust, Interim
Executive Director*

Step 5: Monitoring and Evaluation



The background of the slide features a vertical strip of autumn foliage on the left and right sides, showing trees with leaves in shades of red, orange, and yellow. The central area is white.

Step 5: MONITOR and evaluate effectiveness of implemented actions.

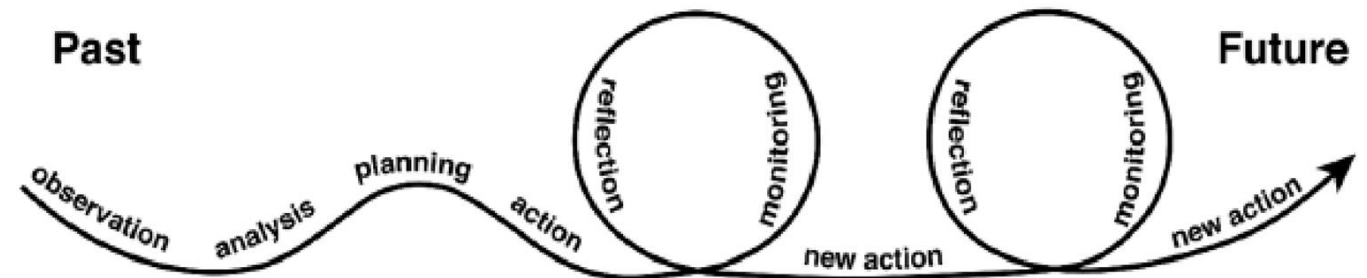
Key Question:

- How do we know if the selected actions were effective?
- What can we learn from these actions to inform future management?

WHY should I monitor, anyway?

Monitoring moves adaptation forward

- **Evaluate** if management actions are meeting our goals or if our actions need to change
- **Adapt** management actions based on new observations
- **Proof-of-concept** for novel adaptation actions
- **Communicate about specific outcomes** to stakeholders



Adapted from Colfer 2005.

Step 5: MONITOR and evaluate effectiveness of implemented actions.

Adaptation Monitoring Variable – What you will measure

- Items that can tell you whether you have achieved your management goals & objectives.
- If possible, use an item that also helps evaluate a particular tactic.

For example: Planted seedling survival

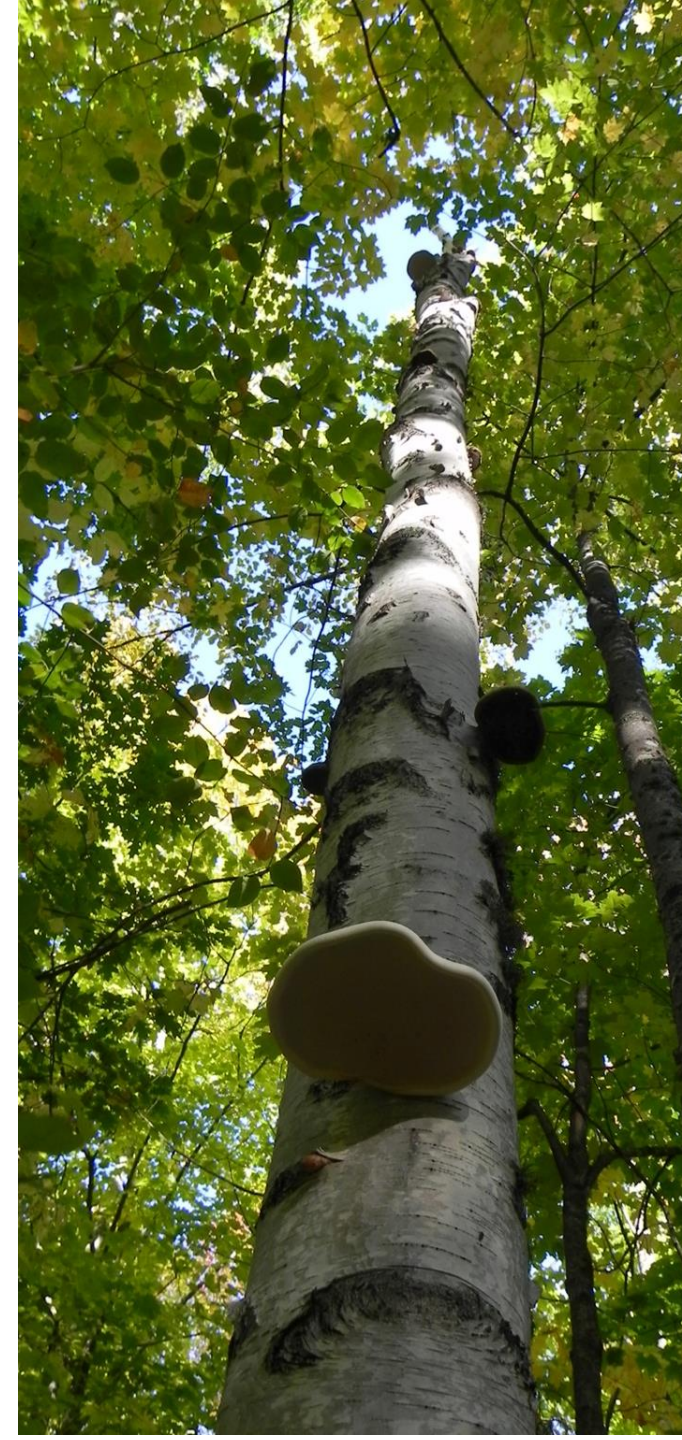


Step 5: MONITOR and evaluate effectiveness of implemented actions.

Criteria for Evaluation – a value or threshold that is meaningful for assessing effectiveness or informing future decisions

- What is success?
- What you're monitoring or measuring: What are the units on your data?

For example: 60% survival of future-adapted native species



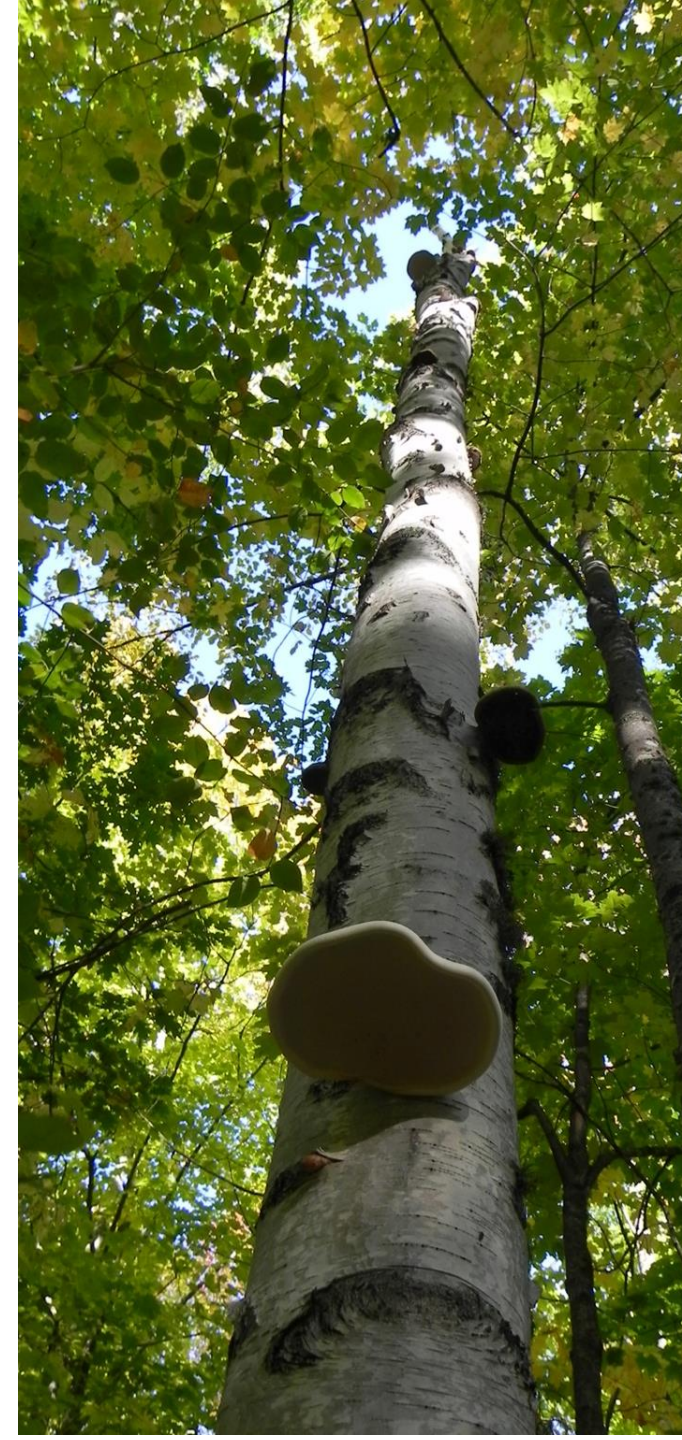
Step 5: MONITOR and evaluate effectiveness of implemented actions.

Monitoring Implementation– How you will gather the information

- How the monitoring will actually get done.
- Take advantage of existing monitoring when possible!

For example:

- Regular post-planting stocking surveys.
- Supplemental surveys at 10 years.



Thinking about approach & scale

Consider:

- Existing monitoring efforts
- New or existing partnerships
- Existing protocols
- Scale: Can I scale down my monitoring to fewer sites and still answer my monitoring question?

Prioritize: Select variables to monitor that can evaluate multiple management tactics or goals.



NY Audubon



Thinking about approach & scale

Qualitative monitoring

- Descriptive observations
- What will it look like when I achieve my goal?



Credit: Chronolog

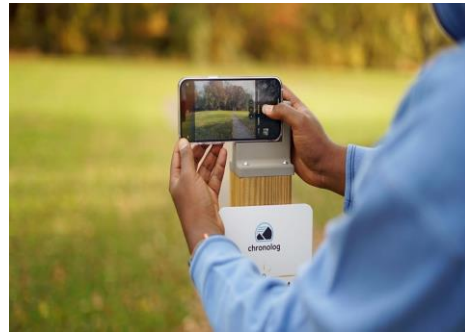
Quantitative monitoring

- Numerical measurements
- At what rate or amount will I know I have achieved my goal?



Thinking about approach & scale

Higher Effort



Lower effort

Qualitative monitoring

- Descriptive observations
- What will it look like when I achieve my goal?

Quantitative monitoring

- Numerical measurements
- At what rate or amount will I know I have achieved my goal?

Step 5: MONITOR and evaluate effectiveness of implemented actions.

Examples

Adaptation Monitoring Variable	Criteria for Evaluation	Monitoring Implementation
Invasive species cover	Areas identified for control have <20% cover from invasive species	Annual invasive species surveys (late-fall)
Regeneration success	More than 50% of desirable species in 0.5-2" class	Regeneration survey 2-4 years after harvest
Forest canopy cover	At least 60% canopy cover is maintained across all riparian areas	Forest inventory every 5 years
Public visitation	Increase visitation and trail usage by 50%	Monthly for first two years during peak season

OUTCOME

Realistic and feasible monitoring plan that can be used to help determine whether management should be altered in the future to account for new information and observations.

Connecting the Dots: A clear train of thought shows **intentionality**

**Management Goals &
Objectives**

Climate Change
Impacts

Challenges &
Opportunities

Intent of Adaptation
(**Option**)

Make Idea Specific
(**Strategy, Approach**)

Action to Implement
(**Tactic**)

Why it's important:
Helps connect the dots from
broad concepts to specific
actions for implementation.

Connecting the Dots: A clear train of thought shows **intentionality**

**Management Goals &
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Climate Change
Impacts

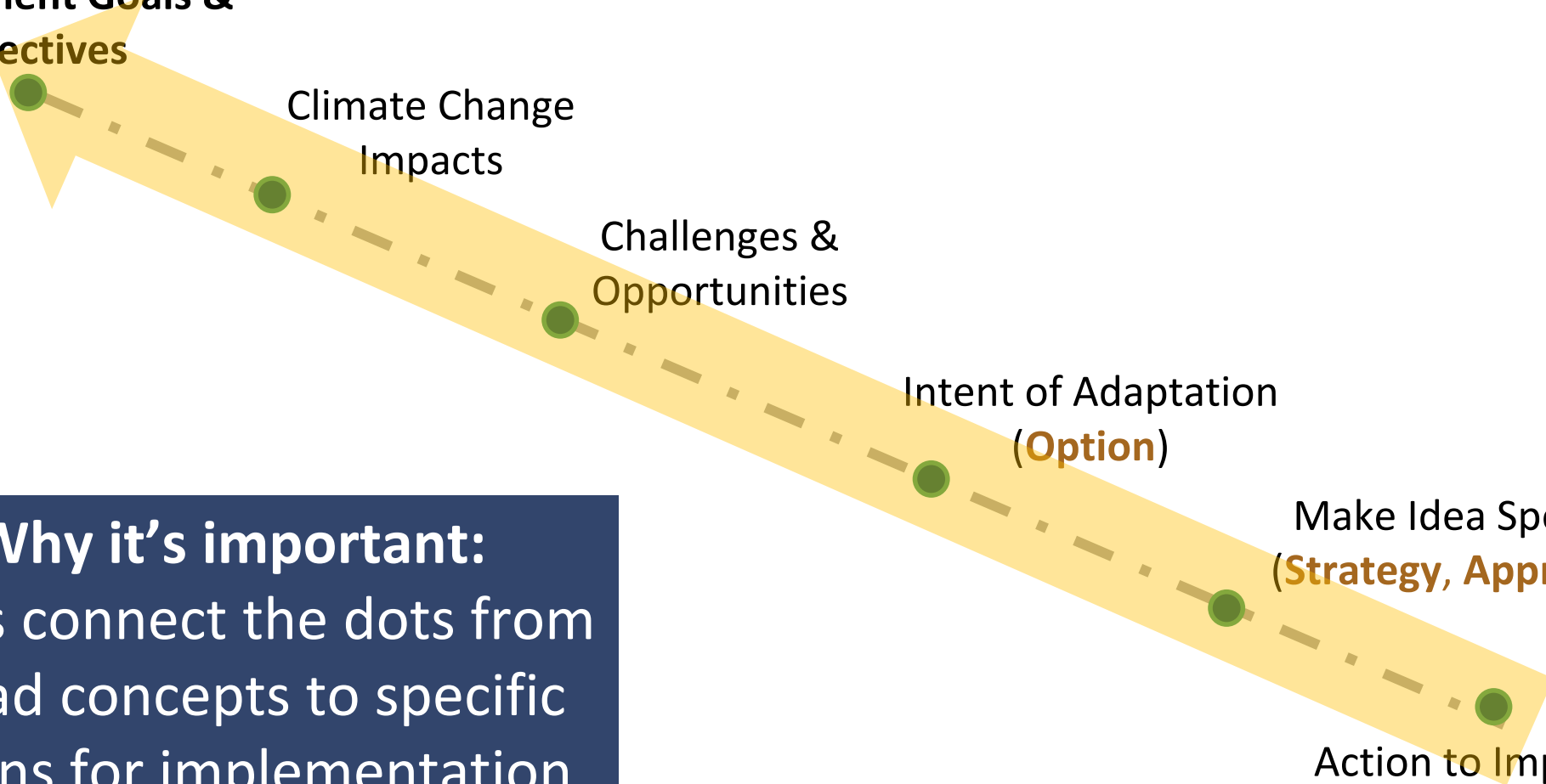
Challenges &
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Intent of Adaptation
(**Option**)

Make Idea Specific
(**Strategy, Approach**)

Action to Implement
(**Tactic**)

Why it's important:
Helps connect the dots from
broad concepts to specific
actions for implementation.



Discussion

- What are you currently monitoring that can inform your adaptation efforts?
- What new items do you plan monitor?
- Are there opportunities for partnerships to assist monitoring efforts?
- Did thinking about monitoring cause you to alter any adaptation tactics?



An aerial photograph of a vast, forested valley. In the foreground, a dense forest of trees with green and yellow foliage is visible. In the middle ground, a large, irregularly shaped lake or reservoir is situated, surrounded by more forested land. The background shows rolling hills and mountains under a clear blue sky. A semi-transparent white rectangular box is overlaid on the center of the image, containing the text "Break (5 minutes)".

Break (5 minutes)



Poster presentations

YOU MADE IT!
(Congrats!)



Next steps

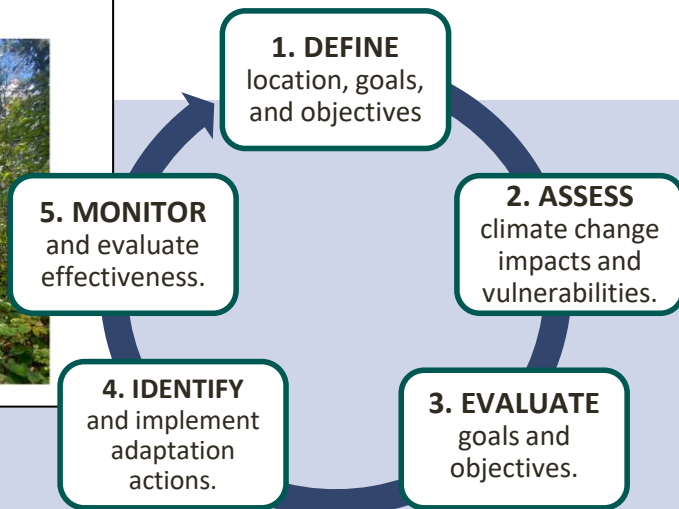
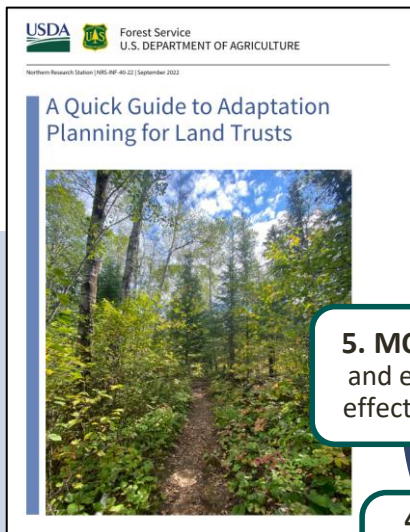
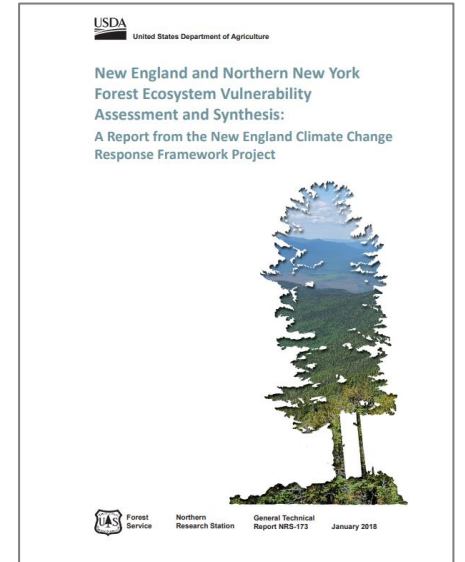
Next Steps: Discussion

- How can the team support you to complete your adaptation plans?
 - Additional technical capacity from the Guild
- What are the best ways for us to share the learning and help others with this work?
- If we developed a community of practice for the region, would that be helpful? What could this look like? Who else should be involved?
- Thinking more broadly about resilience related to your landscape, what have we **not** talked about that you think is important?

Resources to check out!

forestadaptation.org/new-england

- New England Ecosystem Vulnerability Assessment (access the full report & StoryMap)
- Presentation on Climate change in Northeast Forests
- Climate Change projections for Northern New England
- Northeast landowner climate scorecards



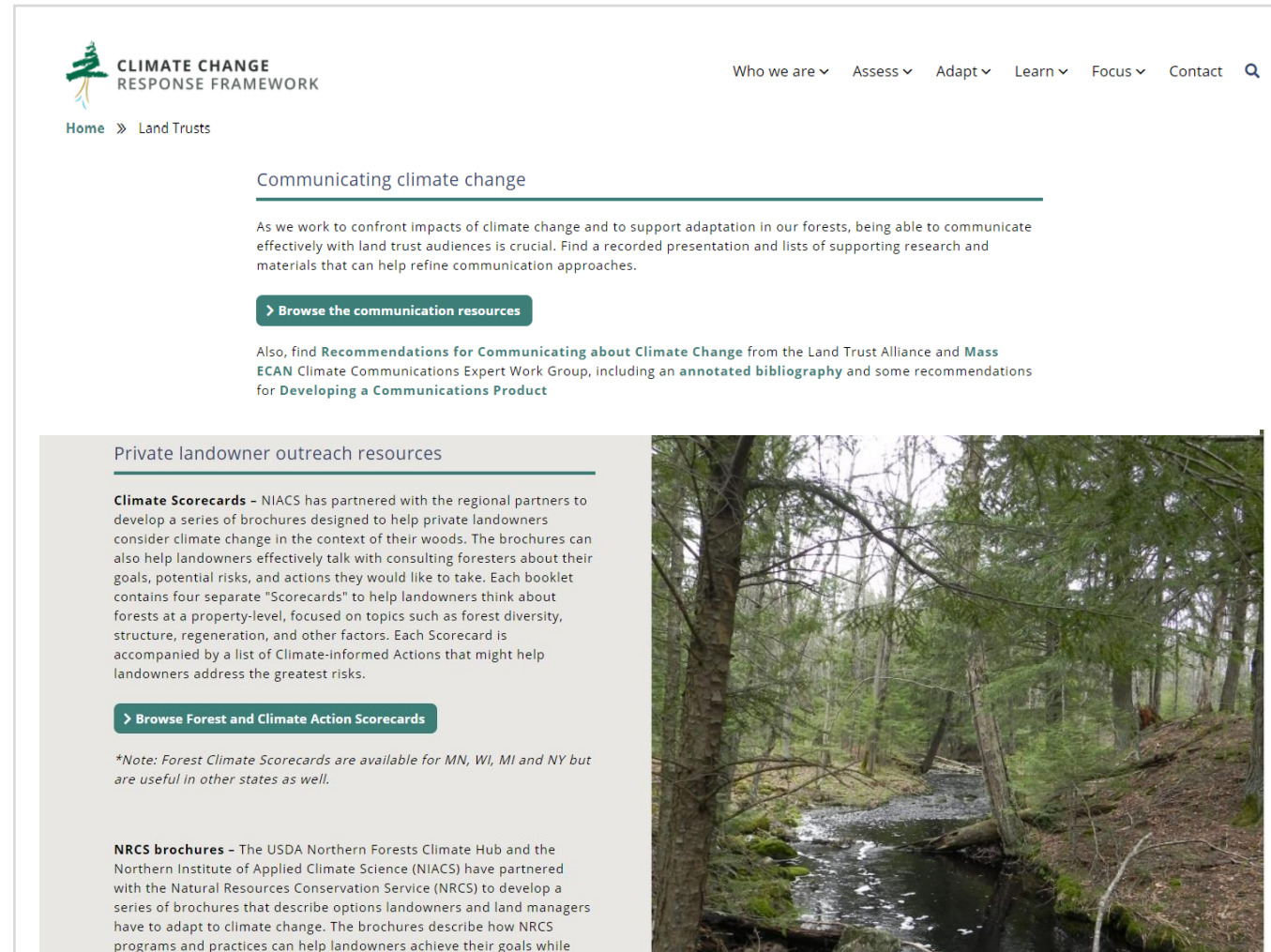
Continue your Adaptation Education

- Adaptation Planning and Practices 8-week online training
- Self-study (online at AdaptationWorkbook.com)
- Potential opportunities for one-on-one consultation

forestadaptation.org/quick-guides

Additional Resources for Land Trusts

- Adaptation Quick Guide for Land Trusts
- Communications- Private landowner outreach resources
- Climate-informed NRCS practices (brochures)
- Real-world land trust adaptation demonstration projects

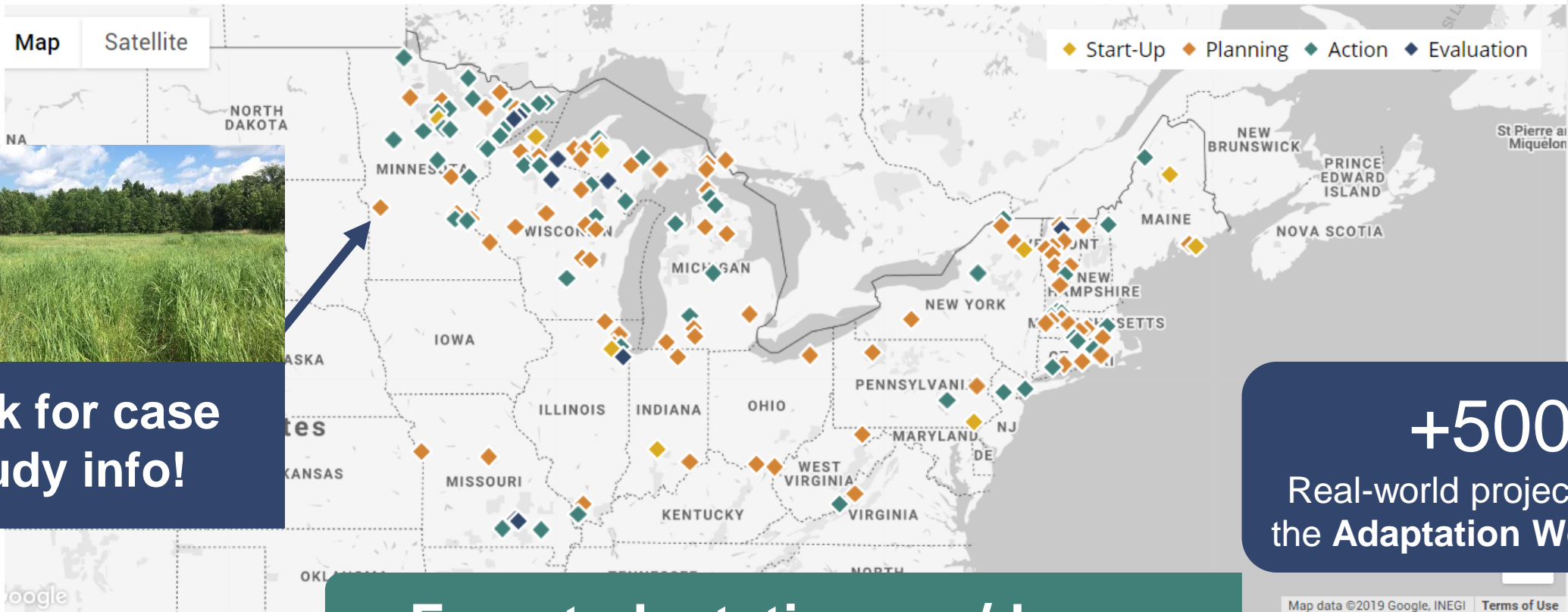


The screenshot shows the 'CLIMATE CHANGE RESPONSE FRAMEWORK' website. The navigation menu includes 'Who we are', 'Assess', 'Adapt', 'Learn', 'Focus', and 'Contact'. The breadcrumb trail is 'Home » Land Trusts'. The main heading is 'Communicating climate change'. The text states: 'As we work to confront impacts of climate change and to support adaptation in our forests, being able to communicate effectively with land trust audiences is crucial. Find a recorded presentation and lists of supporting research and materials that can help refine communication approaches.' Below this is a button: '> Browse the communication resources'. Further down, it says: 'Also, find **Recommendations for Communicating about Climate Change** from the Land Trust Alliance and **Mass ECAN Climate Communications Expert Work Group**, including an **annotated bibliography** and some recommendations for **Developing a Communications Product**'.

The second section is titled 'Private landowner outreach resources'. The text reads: 'Climate Scorecards - NIACS has partnered with the regional partners to develop a series of brochures designed to help private landowners consider climate change in the context of their woods. The brochures can also help landowners effectively talk with consulting foresters about their goals, potential risks, and actions they would like to take. Each booklet contains four separate "Scorecards" to help landowners think about forests at a property-level, focused on topics such as forest diversity, structure, regeneration, and other factors. Each Scorecard is accompanied by a list of Climate-informed Actions that might help landowners address the greatest risks.' Below this is a button: '> Browse Forest and Climate Action Scorecards'. A note follows: '*Note: Forest Climate Scorecards are available for MN, WI, MI and NY but are useful in other states as well.' The final section is 'NRCS brochures - The USDA Northern Forests Climate Hub and the Northern Institute of Applied Climate Science (NIACS) have partnered with the Natural Resources Conservation Service (NRCS) to develop a series of brochures that describe options landowners and land managers have to adapt to climate change. The brochures describe how NRCS programs and practices can help landowners achieve their goals while'. To the right of the text is a photograph of a forest stream.

Adaptation Demonstrations

Home » Adapt » Demonstrations



Click for case study info!

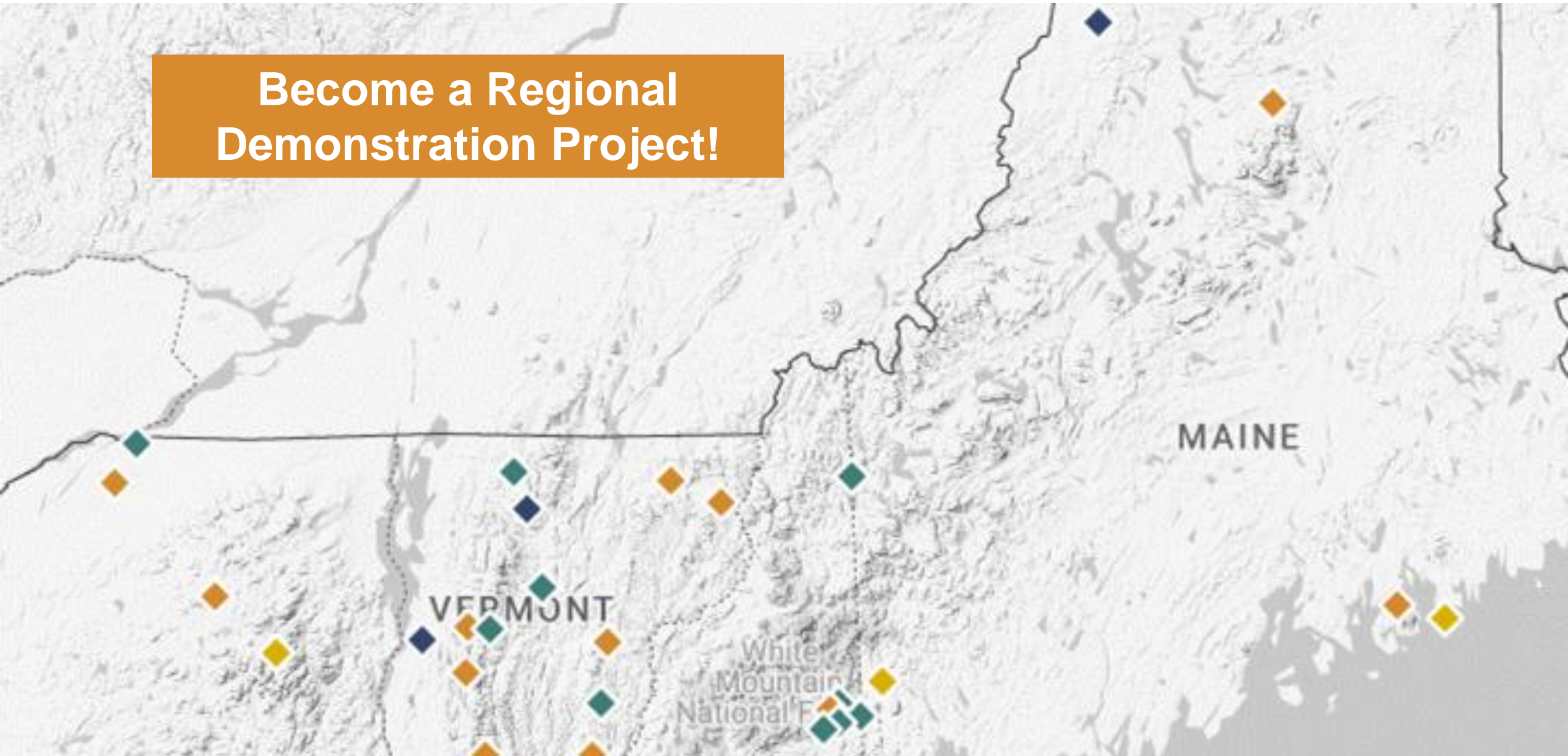
+500
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Forestadaptation.org/demos

Search on the map by location or filter by keyword

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Other Opportunities to Engage with Regional Adaptation Communities of Practice

- NH Climate Resilience Forest Management Network
- Upcoming NIACS Adaptation trainings:
forestadaptation.org/training
- Sign up for regional NIACS newsletter on
forestadaptation.org



To-do list:

You folks:

- We would like to take a photo of your workbook!
- Keep moving forward with these ideas! Follow up with questions or ideas.
- Let us know if you would like to become a demonstration project!

Facilitators will:

- Share contact list & presentations from today
- Check in soon!
 - Look for email from Maggie about technical support
- Other ideas?

Thanks everyone!