The *Office of Sustainability and Climate*
welcomes you to our webinar on:

Wildlife Conservation Society Climate Adaptation Fund: Supporting public-private partnerships

© Jason Kasumovic

AUDIO CONNECTION

1. Phone: mute your computer speakers and call 1-877-369-5243; access code: 0240625##

OR

2. Audio through the computer: Make sure your computer speakers are on and listen with speakers or headphones.

Note: Phone audio will allow you to both listen and speak up with questions. *If you listen through the computer, you will not be able to speak up with questions,* but will be able to type questions into the Q&A pod which will be answered by the appropriate speaker. Also, computer audio may not be as clear as the telephone audio option.

Dr. Cynthia West
Director,
Office of
Sustainability and
Climate
U.S. Forest Service

Dr. Dixie Porter
Deputy Director,
Office of
Sustainability and
Climate
U.S. Forest Service

Agenda

Moderated by Dixie Porter, USDA Forest Service, Office of Sustainability and Climate

2:00	**Introduction**– Cynthia West *(USDA Forest Service, Director of the Office of Sustainability and Climate)* and Rob Harper *(USDA Forest Service, Director Of Wildlife, Fish, Air & Rare Plants)*
2:15	**An Introduction to the WCS Climate Adaptation Fund, priorities, and examples of past funded projects** – Molly Cross *(Director of Climate Adaptation for the WCS Americas Program)*
2:40	**Questions and Answers**
2:55	**Tools and resources for designing climate-informed forest management projects** – Chris Swanston *(USDA Forest Service, Director of the Northern Institute of Applied Climate Science, and USDA Northern Forest Climate Hub Director)* and Stephen Handler *(USDA Forest Service, Climate Specialist for the Northern Institute of Applied Climate Science)*
3:20	**Questions and Answers**
3:30	**Conclude**

Wildlife Conservation Society
WCS Climate Adaptation Fund

Supporting public-private partnerships implementing adaptation projects for wildlife and ecosystems in the U.S.

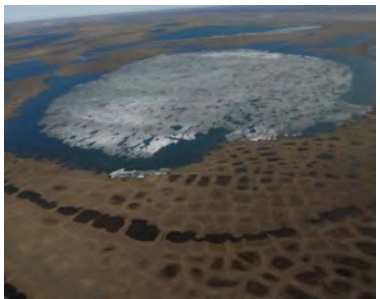
A program made possible by a generous gift from the Doris Duke Charitable Foundation

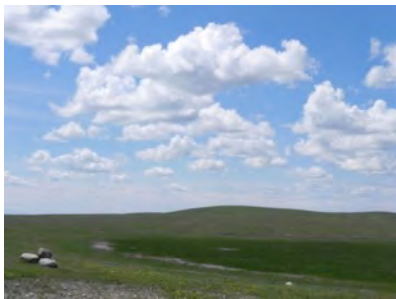
DORIS DUKE CHARITABLE FOUNDATION

Presentation Outline

- Proactively preparing for climate change
- WCS Climate Adaptation Fund
- Examples of funded projects
- 2018 Request for Proposal details







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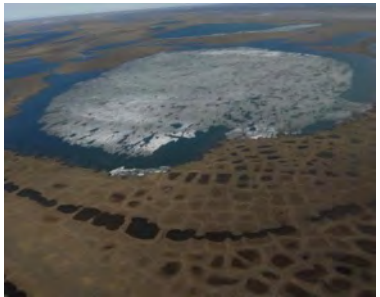


Climate change is already impacting wildlife and ecosystems


USFWS


Konstantin Lemeshev

Climate change is already impacting wildlife and ecosystems

A lot of bad news…

Roughly 4 in 10 Americans

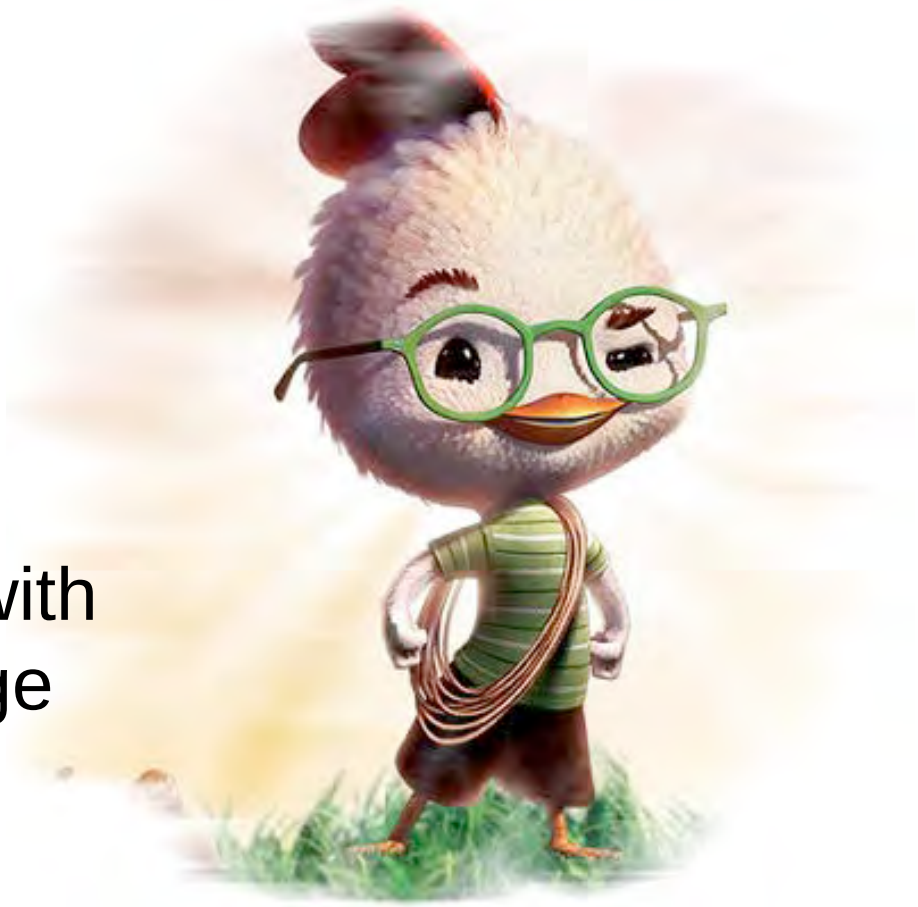
feel “sad” and “helpless”

about climate change

Yale Project on Climate Change Communications (2013)

The sky is falling!

Climate Adaptation =
Proactively preparing for, responding to and coping with the effects of climate change



WCS Climate Adaptation Program

Understand consequences of climate change

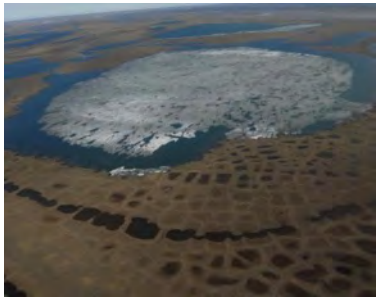
+

Plan for those consequences (goals, actions)

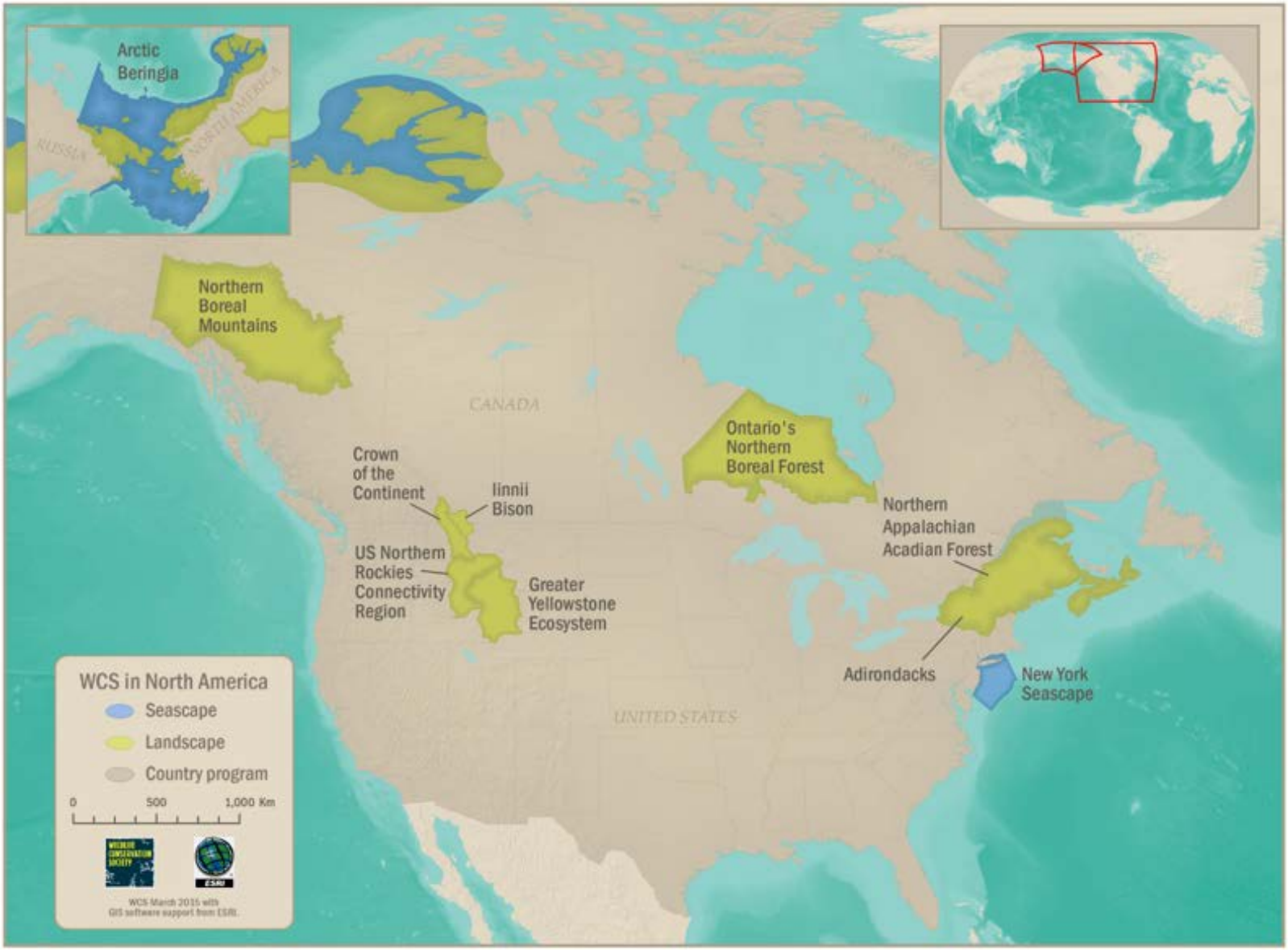
↓

Implement actions that help wildlife adapt to a changing climate





WCS Climate Adaptation Program



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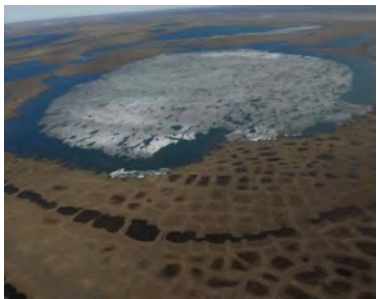
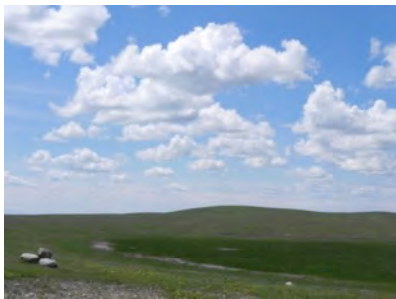


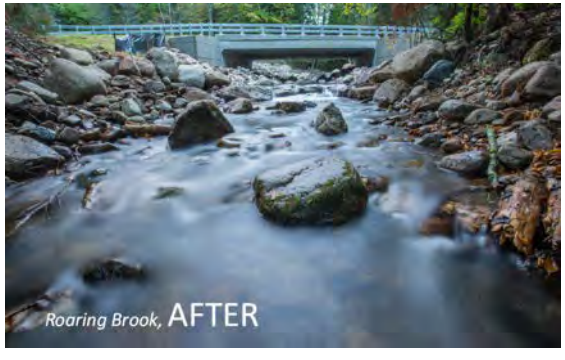


WCS Climate Adaptation Fund

Made possible by funding from the Doris Duke Charitable Foundation

Catalyze on-the-ground adaptation actions for wildlife and ecosystems

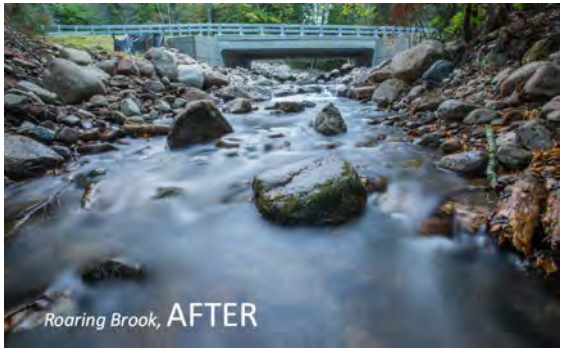
http://wcsclimateadaptationfund.org



WCS Climate Adaptation Fund

Create a paradigm shift in the conservation community

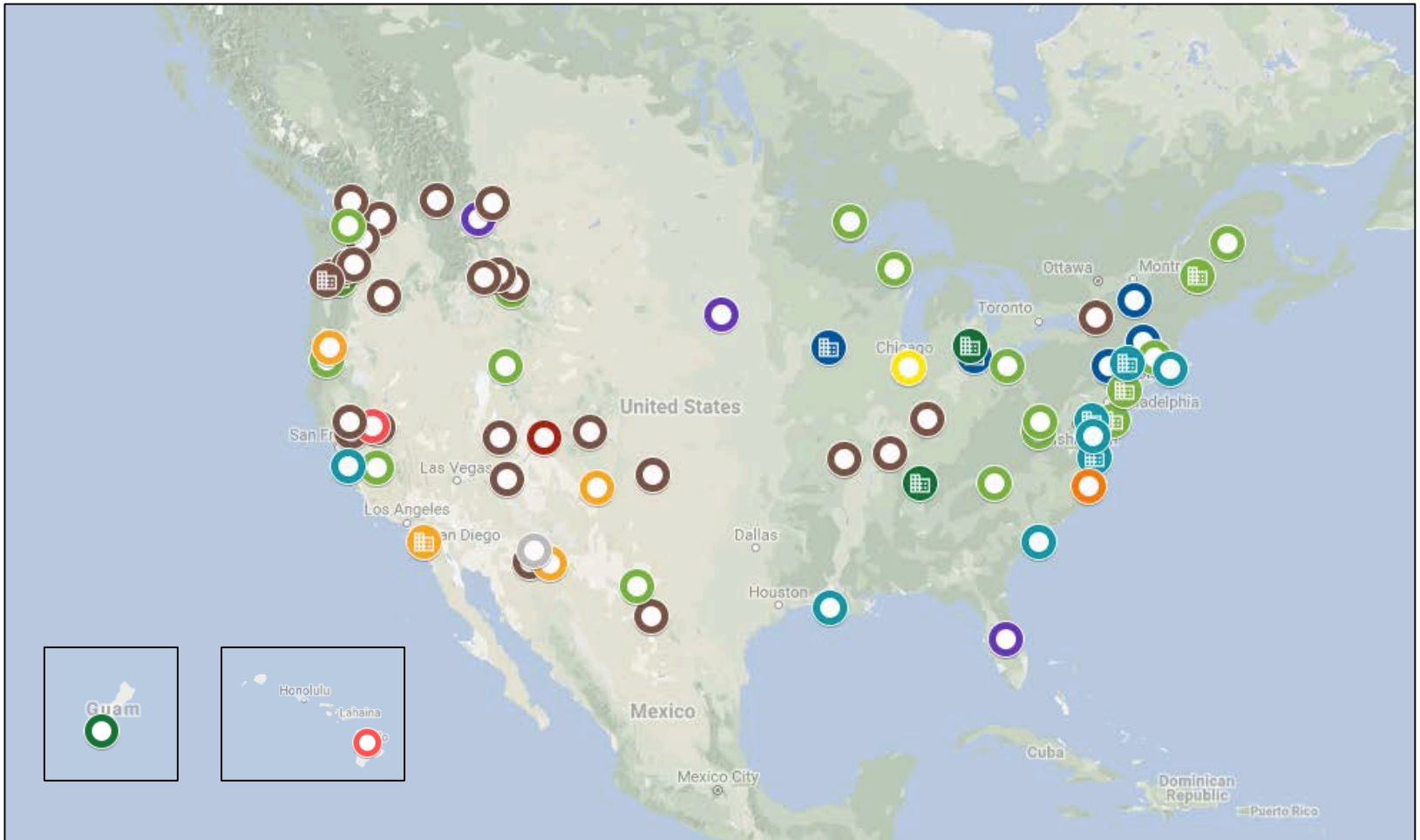
Spread the “adaptation gospel” through strategic storytelling



http://wcsclimateadaptationfund.org

WCS Climate Adaptation Fund

More than $14 million invested in 75+ adaptation projects since 2011



WCS Climate Adaptation Fund

Core focus = support projects that have incorporated climate science

WCS Climate Adaptation Fund

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Spell out the implications of climate change for current goals & actions → how the project is designed to address those impacts

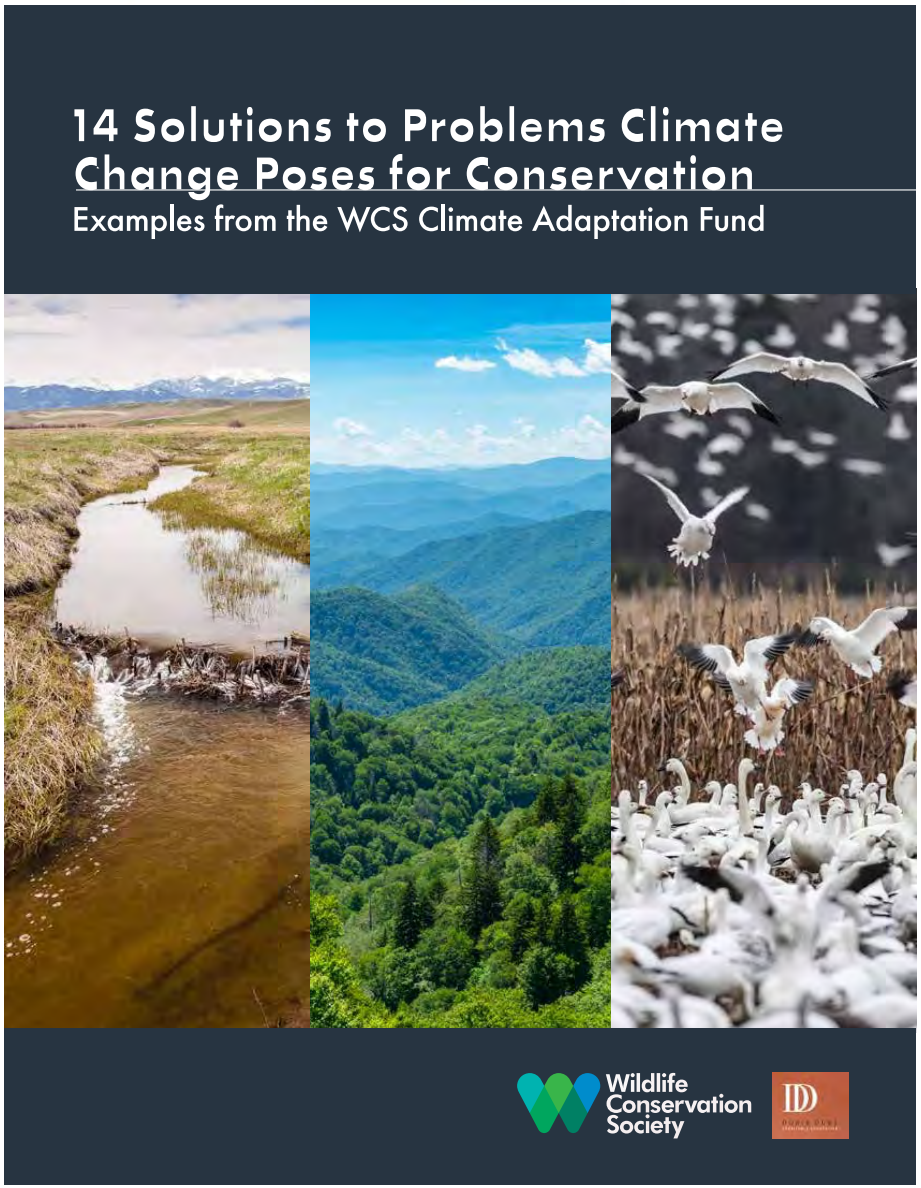
WCS Climate Adaptation Fund

Core focus = support projects that have incorporated climate science

Spell out the implications of climate change for current goals & actions → how the project is designed to address those impacts

Articulate what differentiates your project from a traditional conservation/management project without climate considerations

Adaptation strategies designed to address specific climate problems



- Less water, worse droughts
- Bigger floods
- Bigger and hotter fires
- Rising seas
- Direct effects on species
- Human responses

Doing conservation differently to address a changing climate

Integrating Climate Science into Conservation Planning

Doing conservation differently to address a changing climate

Integrating Climate Science into Conservation Planning

WHAT
Taking Climate-Informed Actions

WHERE
Working in Strategic Locations

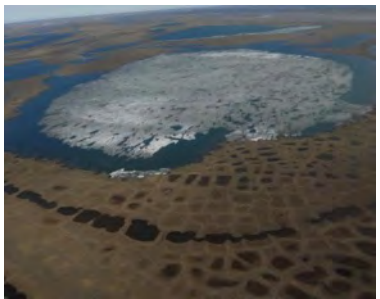
WHEN
Shifting the Urgency/Timing of Actions

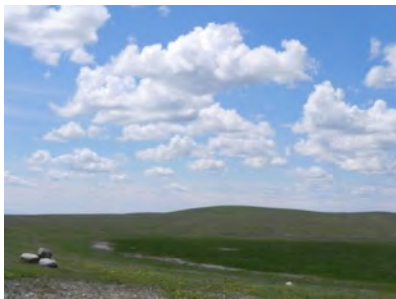
WHY
Striving for Forward-Looking Goals

Presentation Outline

- Proactively preparing for climate change
- WCS Climate Adaptation Fund
- Examples of funded projects (non-forest)
- 2018 Request for Proposal details







Example 1: Rising Seas →

Facilitating the in-land migration of coastal ecosystems

Facilitation Marsh Migration at Blackwater National Wildlife Refuge

Example 1: Rising Seas →

Facilitating the in-land migration of coastal ecosystems

What's Different?

WHAT = New actions – removing dying trees to prepare areas for marsh plants

WHERE = Further inland from where coastal marshes are currently located

Example 2: Bigger fires, Heavier rains →
Reduce risk of post-fire erosion and flash flood events

SKY ISLAND ALLIANCE
Protecting our Mountain Islands and Desert Seas

Installing erosion control structures in the Sky Islands, Arizona

Example 2: Bigger fires, Heavier rains →

Reduce risk of post-fire erosion and flash flood events

What's Different?

WHEN = Before a big fire and heavy rain event

Example 3: Less Water, Worse Droughts →

Restore natural water storage capacity of watersheds

Wildlife Conservation Society

Using beaver mimicry to improve hydrology and riparian habitat in southwest Montana

Example 3: Less Water, Worse Droughts →

Restore natural water storage capacity of watersheds

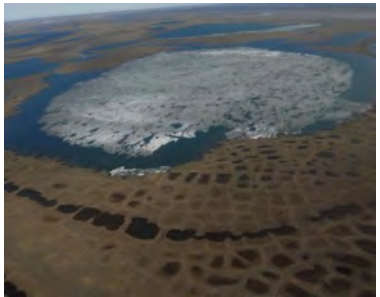
What's Different?

WHY = Off-set snowpack losses (not just wildlife habitat)

Presentation Outline

- Proactively preparing for climate change
- WCS Climate Adaptation Fund
- Examples of funded projects
- 2018 Request for Proposal (RFP)





2018 RFP Details

- $2.5 million available in 2018
- Download the RFP from our website: www.wcsclimateadaptationfund.org/program-information
- Also read the Applicant Guidance Document closely




2018 RFP Details

- Implementation – not science and planning
- Broader conservation benefits – not single species
- Include communications activities designed to scale-up the adoption of adaptation practices




2018 RFP Details

- 2018 RFP highlights a new category – Joint Mitigation and Adaptation projects




2018 RFP Details

- Eligible applicants are 501c3 non-profit conservation organizations
- Public-private partnerships encouraged



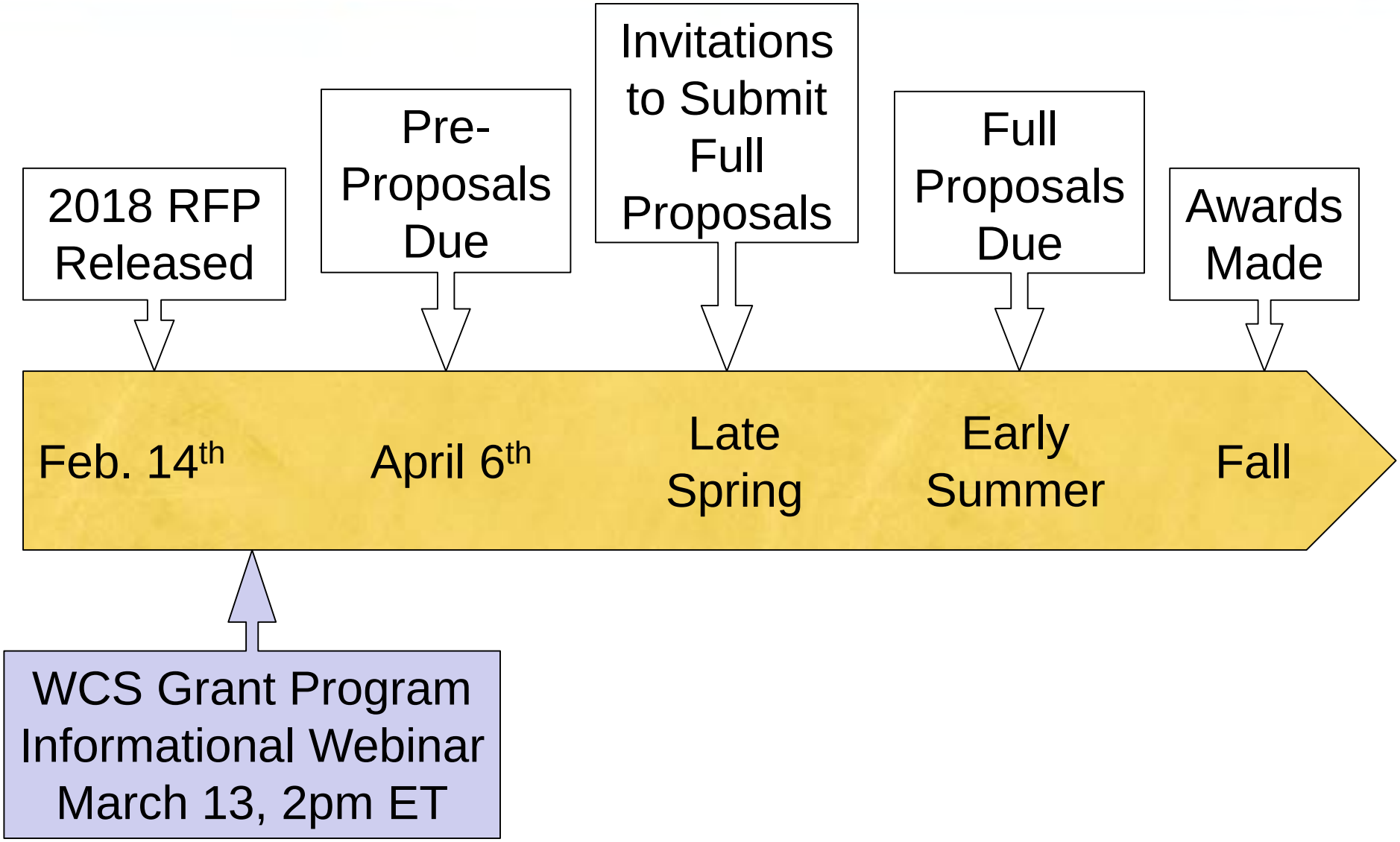

2018 RFP Details

- Eligible applicants are 501c3 non-profit conservation organizations
- Public-private partnerships encouraged

At least 12 projects are taking place on or adjacent to National Forest lands




Application Process and Timeline



WCS Climate Adaptation Fund

Program Staff Contacts

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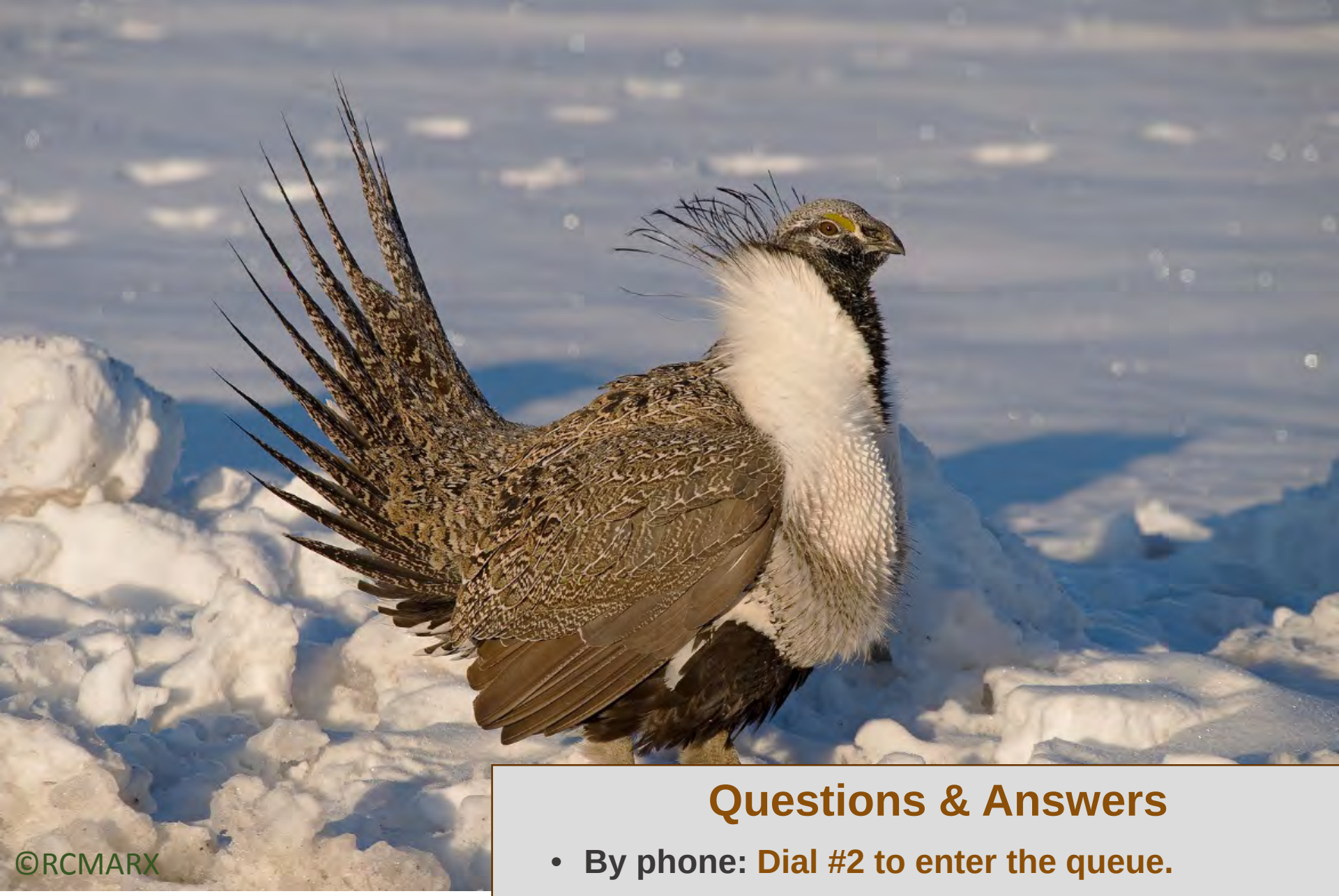
etully@wcs.org

Molly Cross
Program Science Advisor
mcross@wcs.org

For RFP, Guidance Document and other resources:

www.WCSClimateAdaptationFund.org

@WCSAdapts

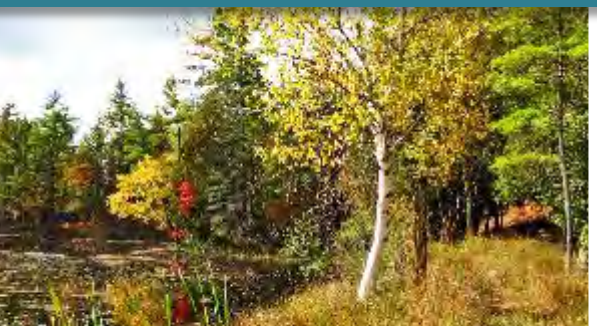


Questions & Answers

- **By phone: Dial #2 to enter the queue.**
- **On your computer: Type your question into the Q & A pod on the left side of your screen.**

USDA United States Department of Agriculture
Northern Forests Climate Hub

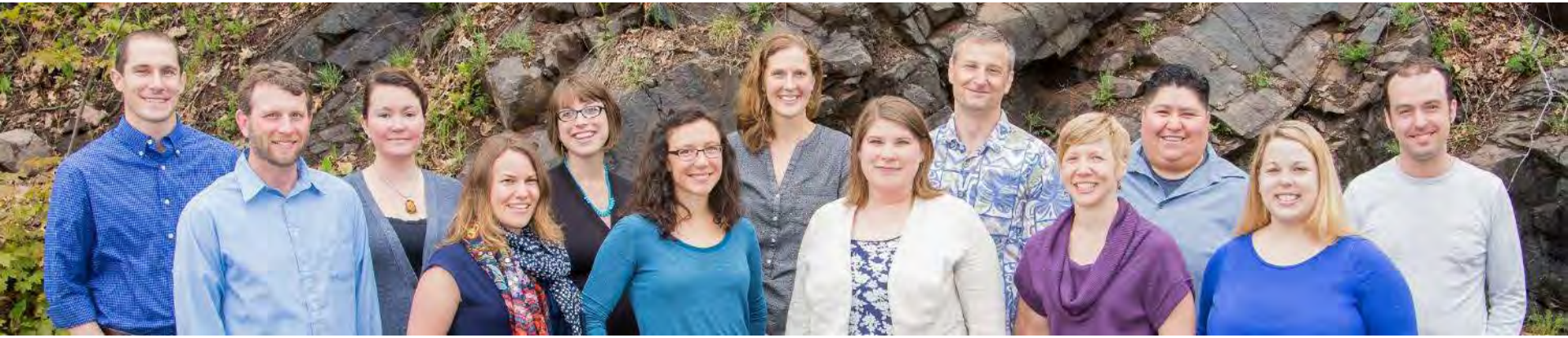
Tools and resources for designing climate-informed forest management projects



FOREST SERVICE US DEPARTMENT OF AGRICULTURE

NIACS Northern Institute of Applied Climate Science

Northern Institute of Applied Climate Science



Climate

Carbon

- Practical information
- Adaptation resources
- Technical assistance

NIACS
Northern Institute of Applied Climate Science

Regional multi-institutional partnership among:

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

1885 Michigan Technological University

THE TRUST FOR PUBLIC LAND

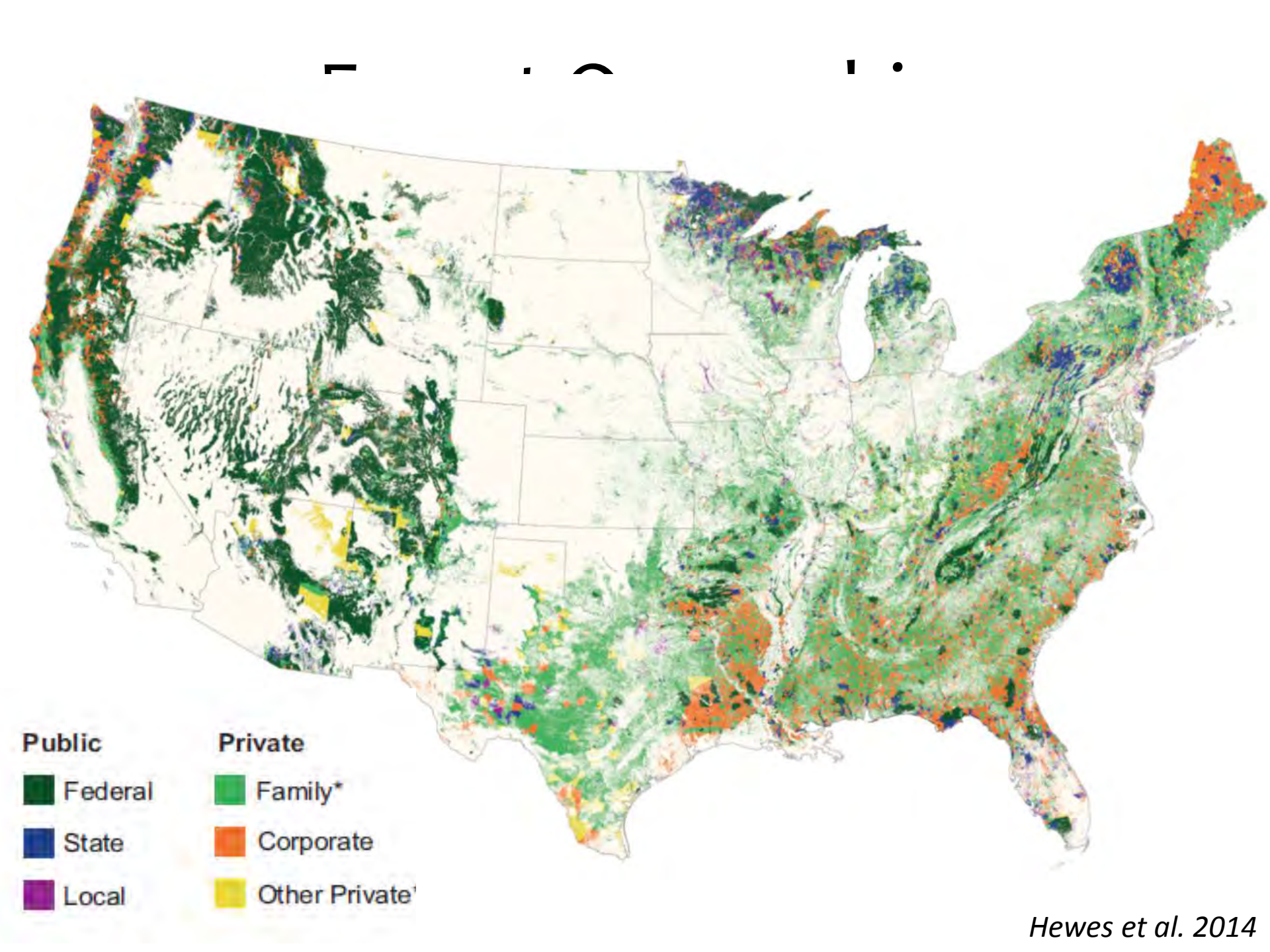
Great Lakes Indian Fish & Wildlife Commission

AMERICAN FORESTS

The UNIVERSITY of VERMONT

College of Food, Agricultural and Natural Resource Sciences
UNIVERSITY OF MINNESOTA

ncasi

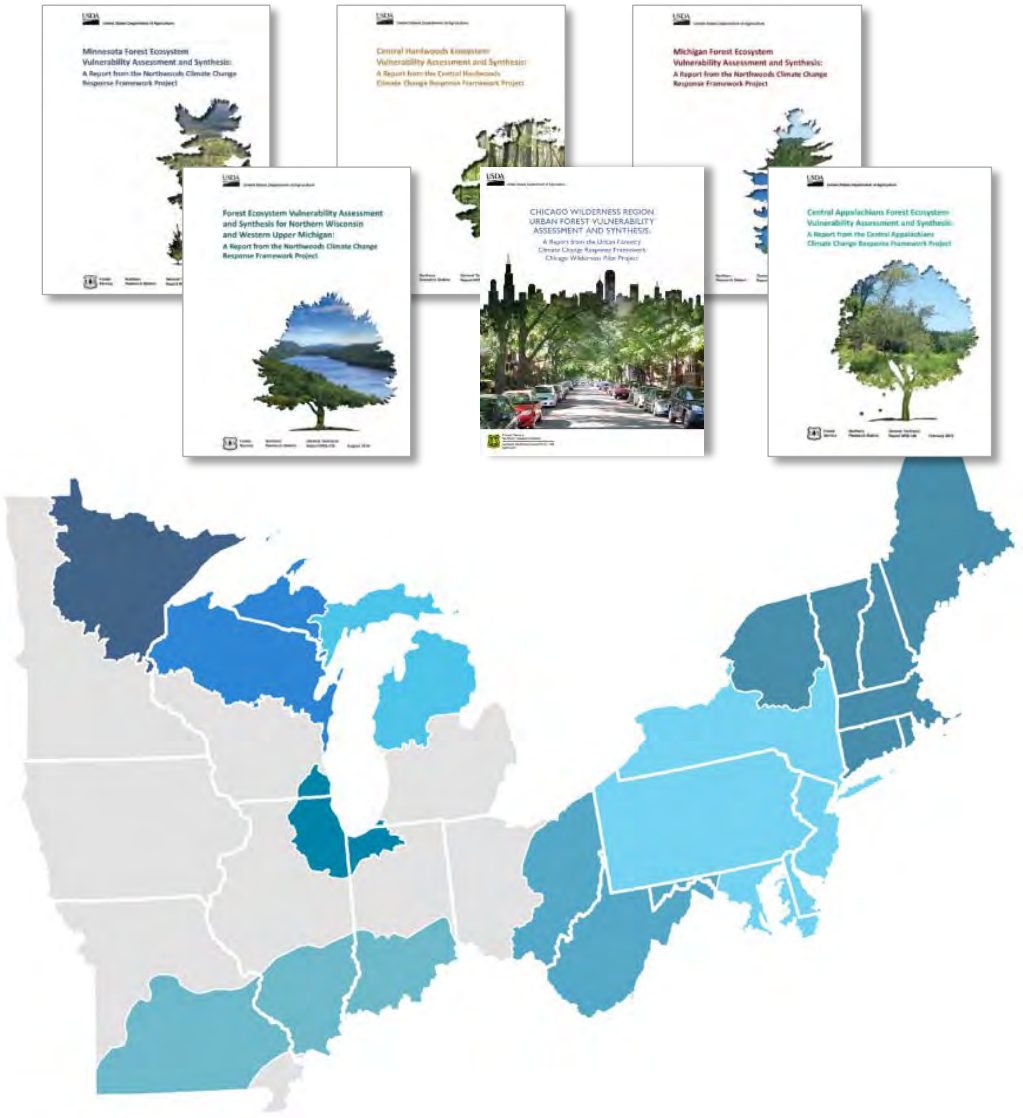


Hewes et al. 2014

Forest Ecosystem Vulnerability Assessments

Place-based, transparent Vulnerability Assessments

- Examine a **range** of future climates
- Do **not make recommendations**
- Sources of information:
  - Models
  - Published research
  - Local managers and experts



Download: http://climateframework.org/vulnerability-assessment

Forest Adaptation Resources

Swanston et al. 2016 (2nd edition)
www.nrs.fs.fed.us/pubs/52760

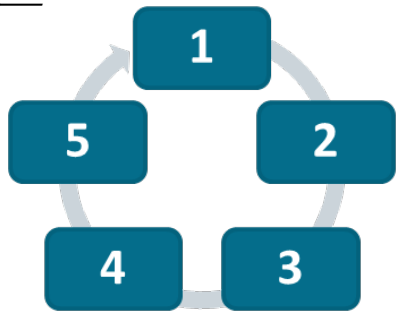
Strategies & Approaches

Menu of adaptation actions

Adaptation Workbook

Structured process to integrate climate change considerations into management.

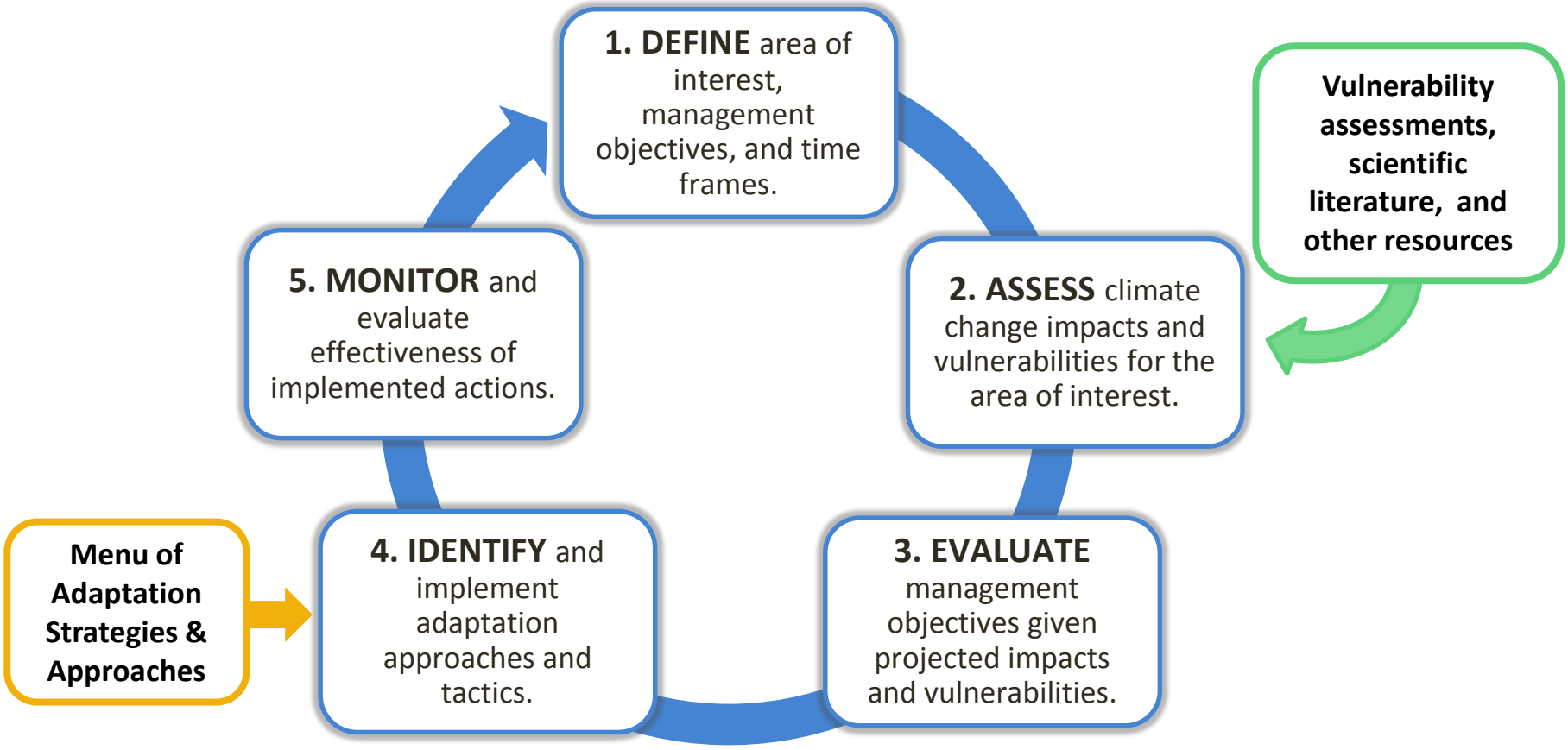
- Workbook approach



Also online: AdaptationWorkbook.org

Adaptation Workbook

Workbook provides "**structured flexibility**"



Swanston et al. 2016 (2nd edition) www.nrs.fs.fed.us/pubs/52760

Adaptation Workbook

Step-by-step Workbook for planning

Step 1 worksheet

Management Objectives	Challenges	Opportunities	Feasibility	Other Considerations

Step 4 worksheet

Adaptation Actions					
Approach (From Chapter 2)	Tactic	Time Frame	Benefits	Drawbacks/ Barriers	Recommend Tactic?

Worksheets! *Worksheets!* *Worksheets!*

Forest Adaptation Resources

The **Menu** helps you create **clear rationale** for your actions by connecting them to **broader adaptation ideas**.

- Intentionality
- Success

Based on - Swanston et al. 2016 (2nd edition) www.nrs.fs.fed.us/pubs/52760

“Menu” for Adaptation

- **Menus for:**
  - Forestry
  - Urban forestry
  - Agriculture
  - Watershed mgmt
  - Range mgmt
  - California ecosystems
  - California specialty crops
  - Tribal adaptation
  - Wildlife

Menu of Adaptation Strategies and Approaches

Strategy 1: Sustain fundamental ecological functions.

1.1. Reduce impacts to soils and nutrient cycling.
1.2. Maintain or restore hydrology.
1.3. Maintain or restore riparian areas.
1.4. Reduce competition for moisture, nutrients, and light.
1.5. Restore or maintain fire in fire-adapted ecosystems.

Strategy 2: Reduce the impact of biological stressors.

2.1. Maintain or improve the ability of forests to resist pests and pathogens.
2.2. Prevent the introduction and establishment of invasive plant species and remove existing invasive species.
2.3. Manage herbivory to promote regeneration of desired species.

Strategy 3: Reduce the risk and long-term impacts of severe disturbances.

3.1. Alter forest structure or composition to reduce risk or severity of wildfire.
3.2. Establish fuelbreaks to slow the spread of catastrophic fire.
3.3. Alter forest structure to reduce severity or extent of wind and ice damage.
3.4. Promptly revegetate sites after disturbance.

Strategy 4: Maintain or create refugia.

4.1. Prioritize and maintain unique sites.
4.2. Prioritize and maintain sensitive or at-risk species or communities.
4.3. Establish artificial reserves for at-risk and displaced species.

Strategy 5: Maintain and enhance species and structural diversity.

5.1. Promote diverse age classes.
5.2. Maintain and restore diversity of native species.
5.3. Retain biological legacies.
5.4. Establish reserves to maintain ecosystem diversity.

Strategy 6: Increase ecosystem redundancy across the landscape.

6.1. Manage habitats over a range of sites and conditions.
6.2. Expand the boundaries of reserves to increase diversity.

Strategy 7: Promote landscape connectivity.

7.1. Reduce landscape fragmentation.
7.2. Maintain and create habitat corridors through reforestation or restoration.

Strategy 8: Maintain and enhance genetic diversity.

8.1. Use seeds, germplasm, and other genetic material from across a greater geographic range.
8.2. Favor existing genotypes that are better adapted to future conditions.

Strategy 9: Facilitate community adjustments through species transitions.

9.1. Favor or restore native species that are expected to be adapted to future conditions.
9.2. Establish or encourage new mixes of native species.
9.3. Guide changes in species composition at early stages of stand development.
9.4. Protect future-adapted seedlings and saplings.
9.5. Disfavor species that are distinctly maladapted.
9.6. Manage for species and genotypes with wide moisture and temperature tolerances.
9.7. Introduce species that are expected to be adapted to future conditions.
9.8. Move at-risk species to locations that are expected to provide habitat.

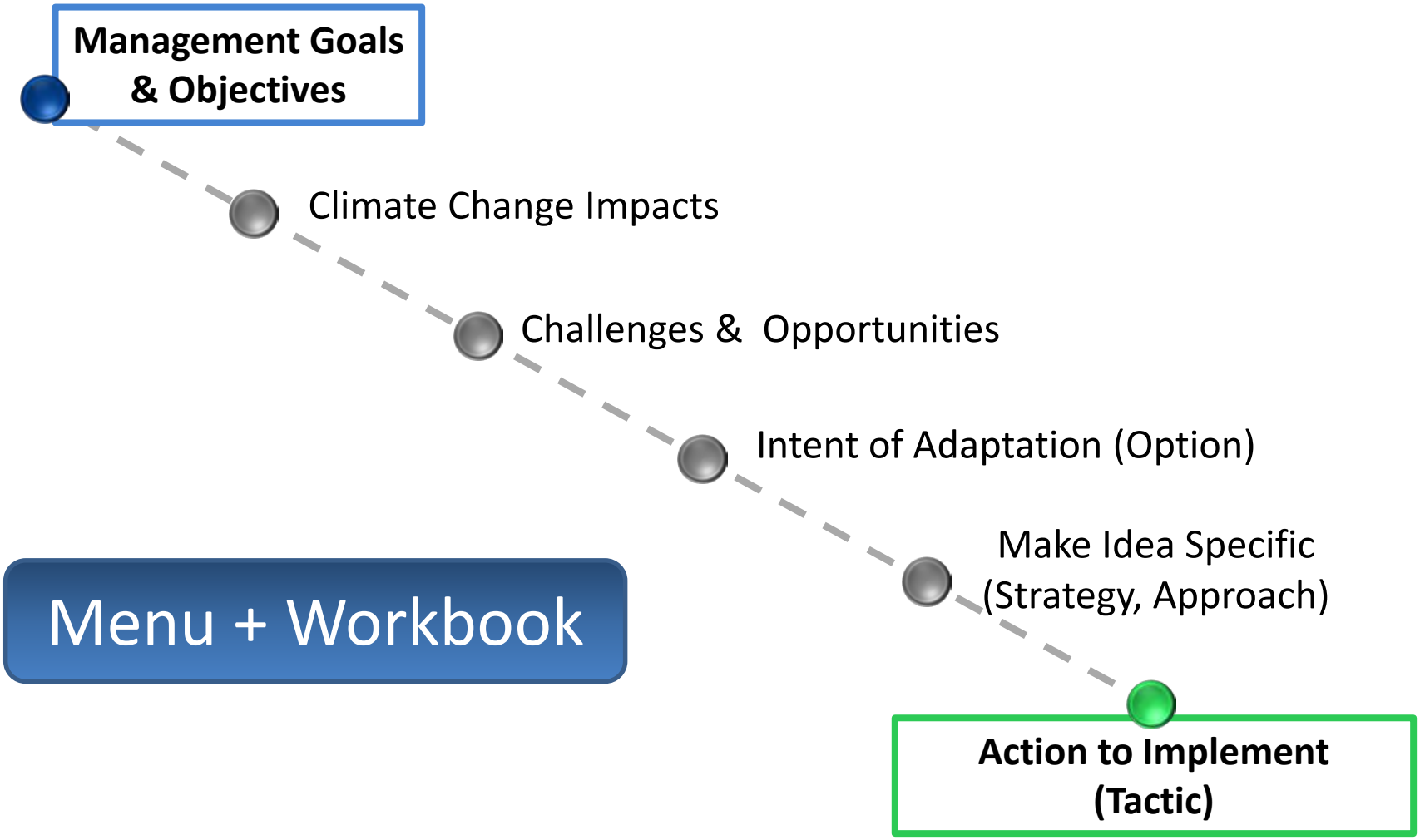
Strategy 10: Realign ecosystems after disturbance.

10.1. Promptly revegetate sites after disturbance.
10.2. Allow for areas of natural regeneration to test for future-adapted species.
10.3. Realign significantly disrupted ecosystems to meet expected future conditions.

www.nrs.fs.fed.us/pubs/52760

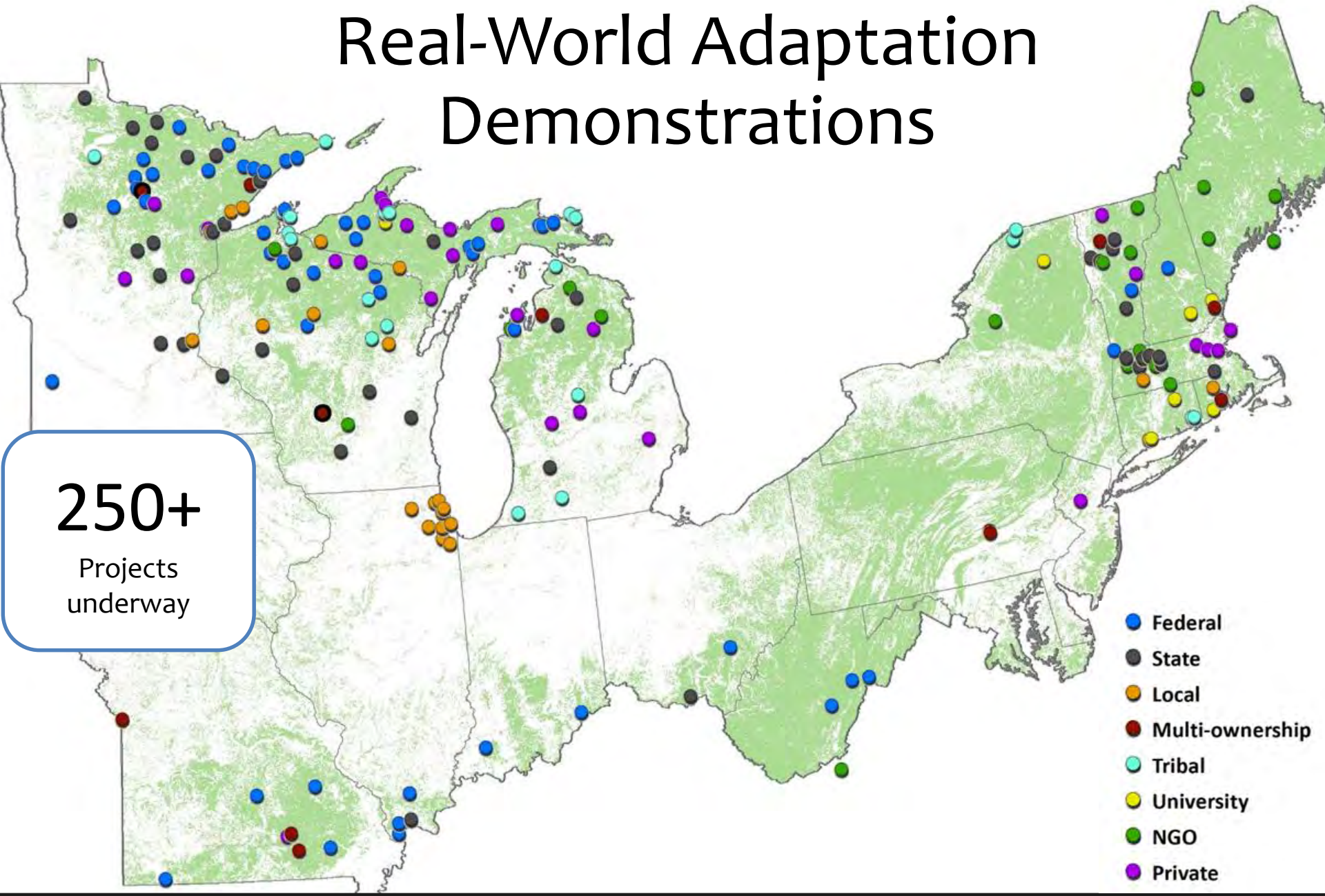
Connect the dots

Specify your ***intention***



Menu + Workbook

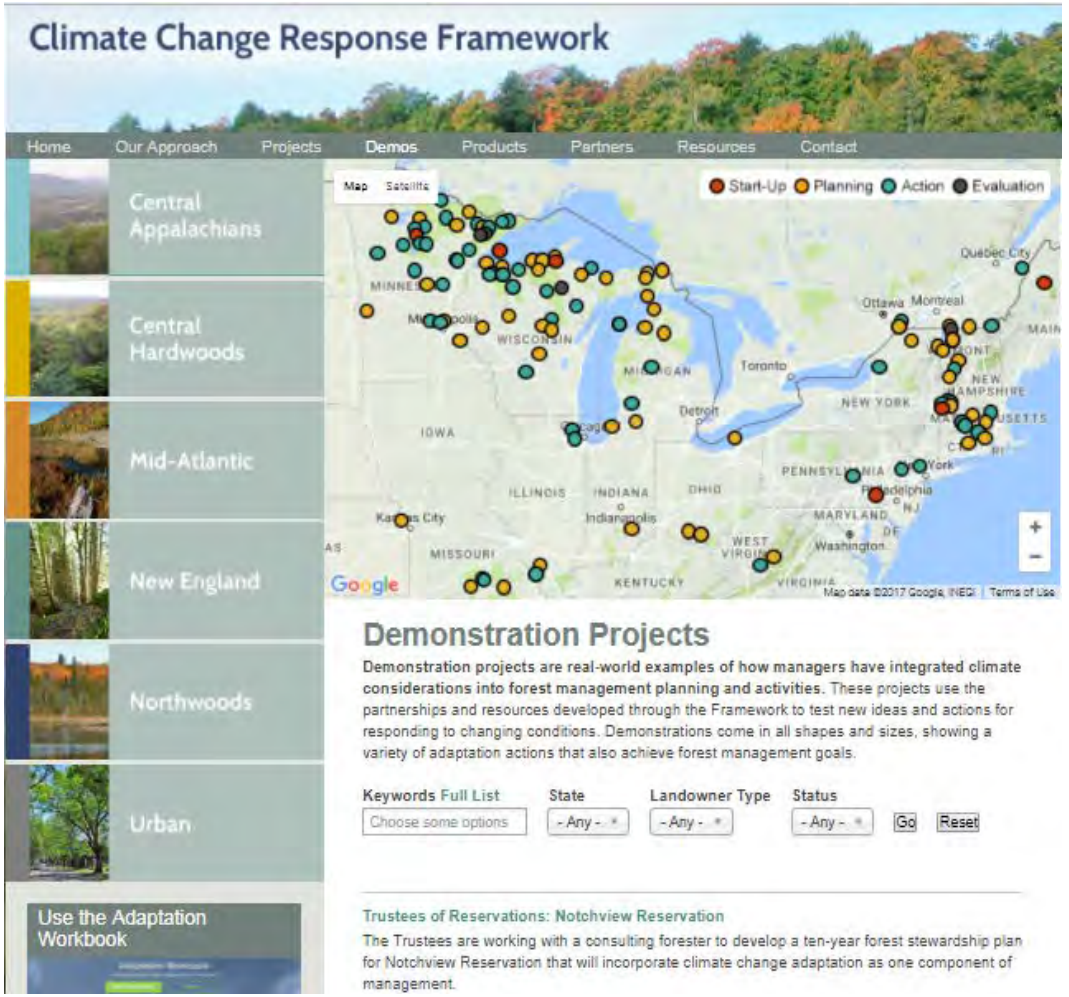
Real-World Adaptation Demonstrations



www.forestadaptation.org *Click 'Demonstration Projects'*

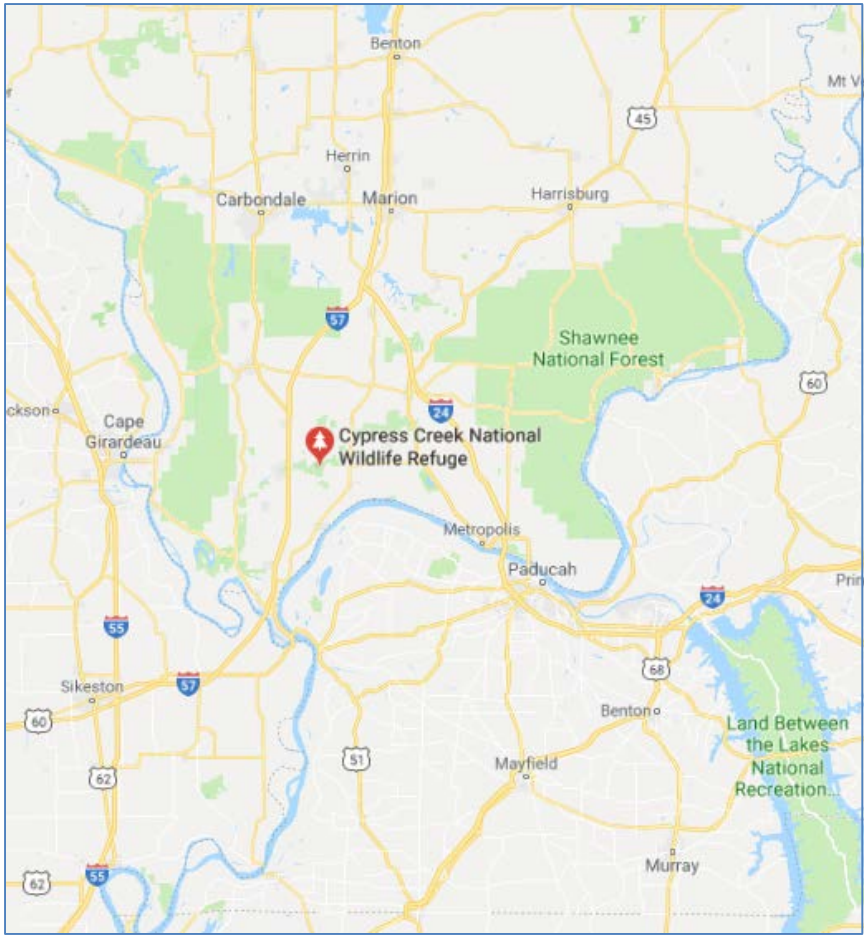
Adaptation Demonstrations

- Diverse lands
- Diverse objectives
- Acknowledge differences
- Demonstrate shared perspectives
- ~130 online



ForestAdaptation.org

Ducks Unlimited: Bottomland Hardwoods Resilience in the Central Hardwoods Region



The Place:

- Confluence of Mississippi and Ohio Rivers
- Cache River Bottoms (IL) and Patoka River Bottoms (IN)
- Multiple ownerships and partners: Ducks Unlimted, Shawnee NF, Cypress Creek NWR, state agencies, Wild Turkey Federation

WCS

DUCKS UNLIMITED

Ducks Unlimited: Bottomland Hardwoods Resilience in the Central Hardwoods Region

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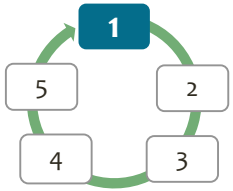
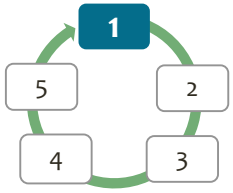


Step 1: DEFINE area of interest, management goals and objectives, and time frames.

Management Goals:

- Restore and maintain hydrologic conditions in bottomland hardwoods and floodplain wetlands
- Enhance natural regeneration of flood-tolerant hardwood species
- Restore higher-elevation bottomland forests old fields

Ducks Unlimited: Bottomland Hardwoods Resilience in the Central Hardwoods Region



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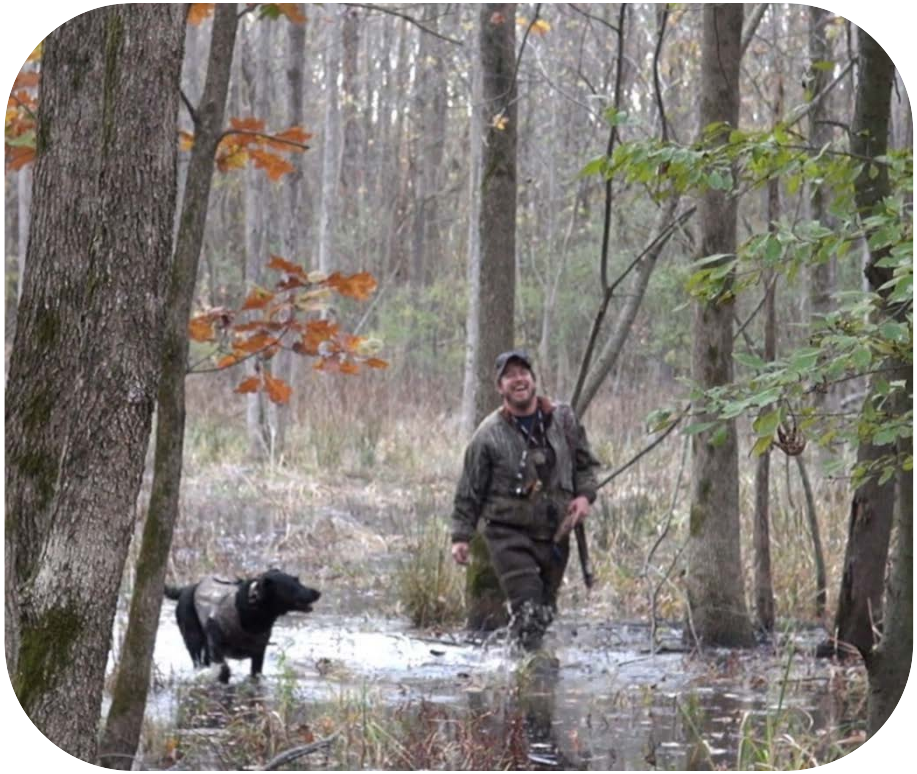

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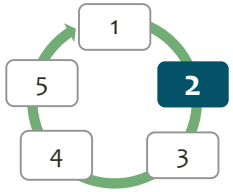
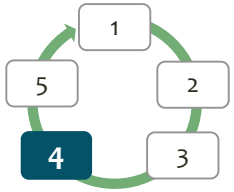


Step 2: ASSESS climate change impacts and vulnerabilities for the area of interest.

Climate Impacts and Site-level Concerns

- More heavy precipitation = flooding = erosion
- Increased runoff and peak flow in the winter and spring
- Low landscape positions may be more vulnerable

Ducks Unlimited: Bottomland Hardwoods Resilience in the Central Hardwoods Region

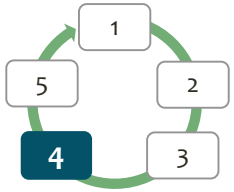


Step 4: IDENTIFY and adaptation approaches and tactics to implement.

Adaptation Actions

- Diversifying species composition and genetic stock of planted trees
- Enhance species and structural diversity – for example, create wetland openings
- Strategically shift habitats based on expected water levels
- Upgrade water management infrastructure, time artificial floods to coincide with different migration patterns for waterfowl

Ducks Unlimited: Bottomland Hardwoods Resilience in the Central Hardwoods Region



Step 4: IDENTIFY and adaptation approaches and tactics to implement.

Adaptation Actions

- Diversifying species composition and genetic stock of planted trees
- Enhance species and structural diversity – for example, create wetland openings
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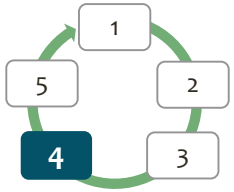

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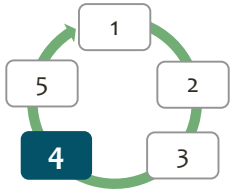

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The Nature Conservancy: Adaptation Forestry and Conifer Strongholds

The Place:

- Northeastern Minnesota
- Multiple ownerships and partners: TNC, Superior NF, Minnesota Dept of Natural Resources

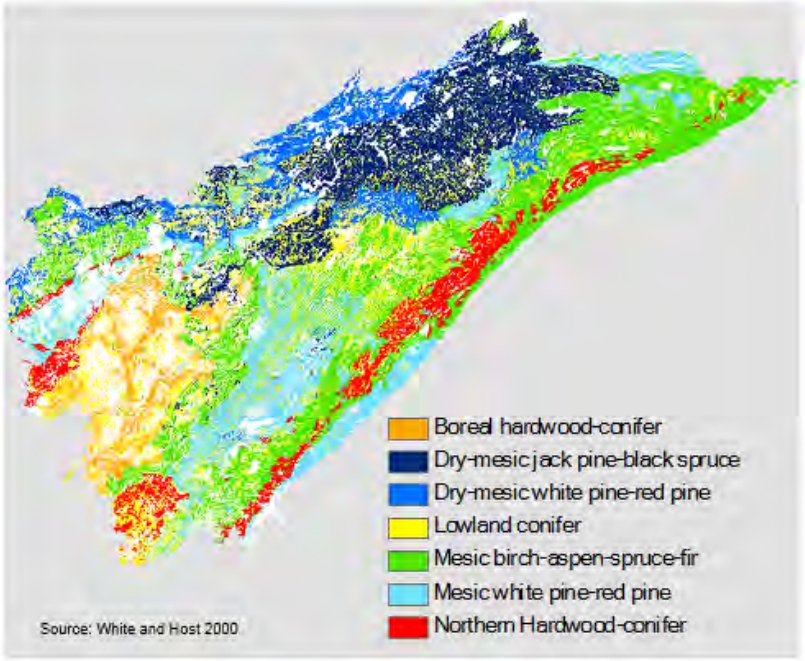
WCS

The Nature Conservancy

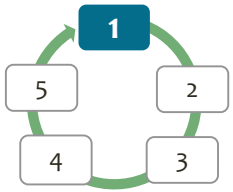
The Nature Conservancy: Adaptation Forestry and Conifer Strongholds

The Place:

- Forest management history = reduced conifers and complexity!



The Nature Conservancy: Adaptation Forestry and Conifer Strongholds

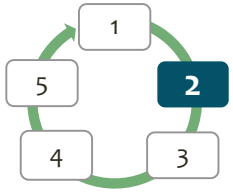


Step 1: DEFINE area of interest, management goals and objectives, and time frames.

Management Goals:

- Increase stand-level and landscape complexity
- Increase conifer component
- Provide examples of a cohesive climate-informed forest management vision across the region

The Nature Conservancy: Adaptation Forestry and Conifer Strongholds

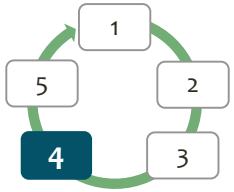


Step 2: ASSESS climate change impacts and vulnerabilities for the area of interest.

Climate Impacts

- Longer growing seasons
- Milder winters
- More drought stress
- Declines in boreal tree species – aspen, paper birch, white spruce, balsam fir
- Loss of forest cover

The Nature Conservancy: Adaptation Forestry and Conifer Strongholds

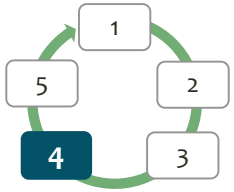


Step 4: IDENTIFY and adaptation approaches and tactics to implement.

Adaptation Project #1 – Adaptation Forestry

- Focus on stands with recent treatments to boost complexity
- Plant expected "winner" species
- Test local versus southern seed zones

The Nature Conservancy: Adaptation Forestry and Conifer Strongholds



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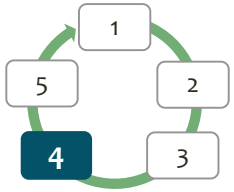
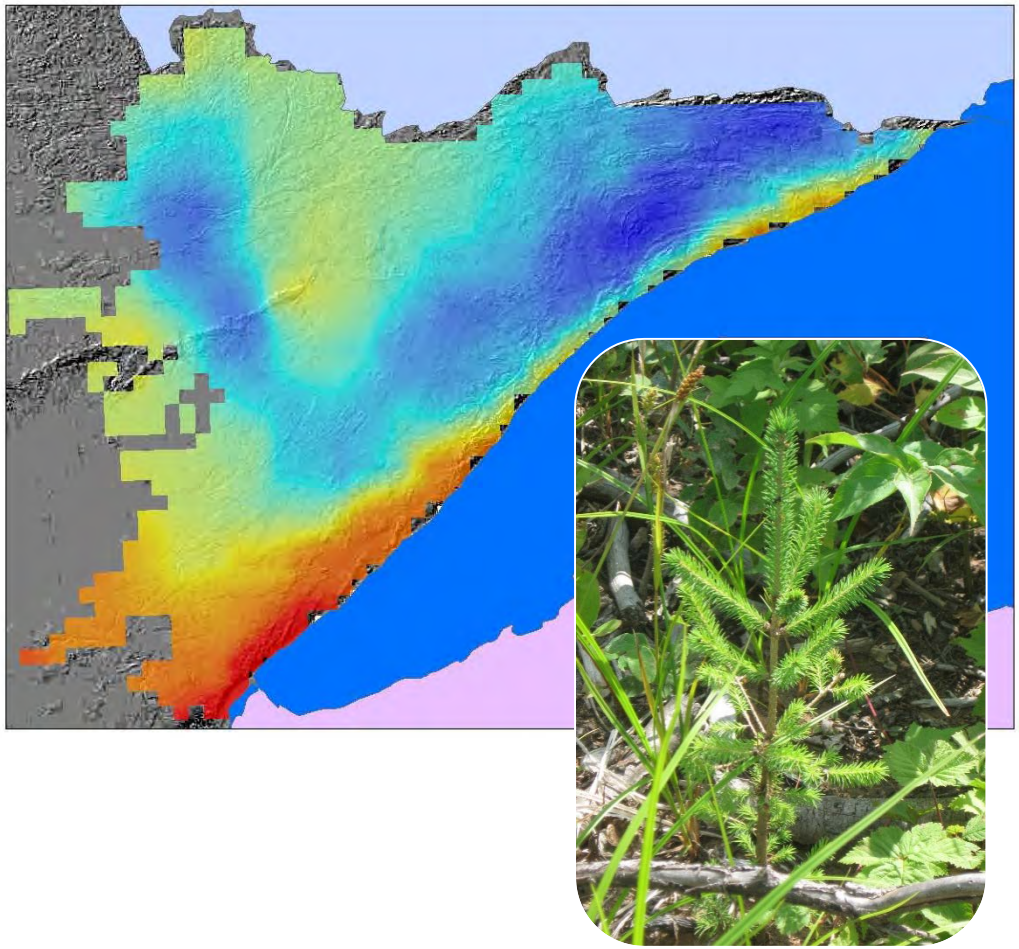


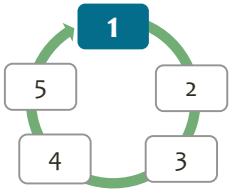
Step 4: IDENTIFY and adaptation approaches and tactics to implement.

Adaptation Project #2 – Conifer Strongholds

- Identify "resilient sites" / climate refugia on the landscape
- Plant northern and boreal conifers
- Compare growth and survival on stronghold sites versus conventional planting sites



Florence County (WI)



Step 1: DEFINE area of interest, management goals and objectives, and time frames.

The Place:

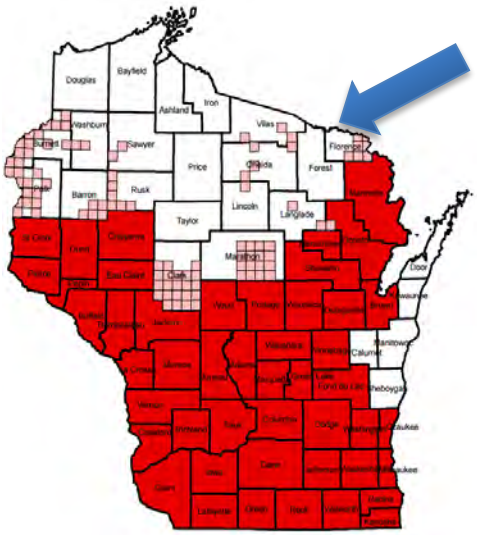
- Drought + forest pests
- +90% mortality in scrub oak
- Need to re-forest to satisfy multiple county objectives

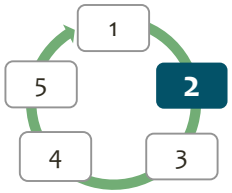
WCS

SRI

Florencecounty WISCONSIN

Florence County (WI)

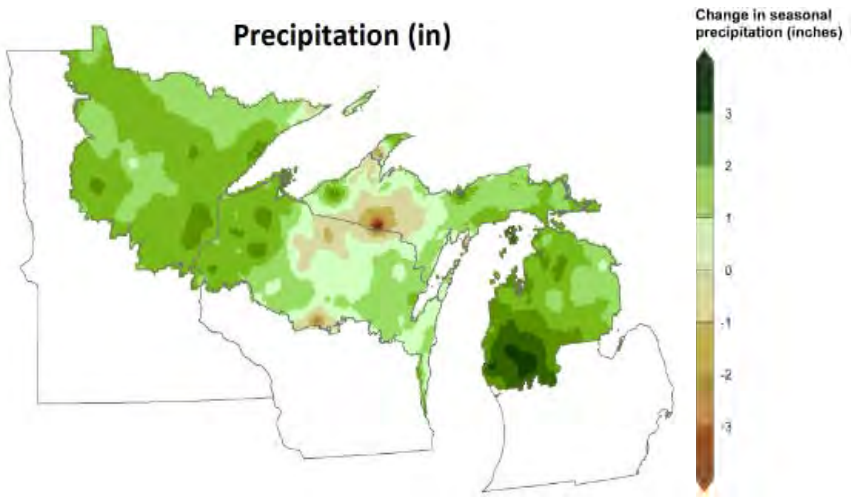




Step 2: ASSESS climate change impacts and vulnerabilities for the area of interest.

Site-level risks:

- Oak wilt looming
- Sandy soils
- Continued drought stress



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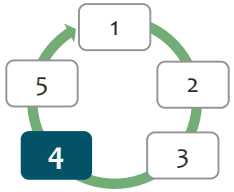


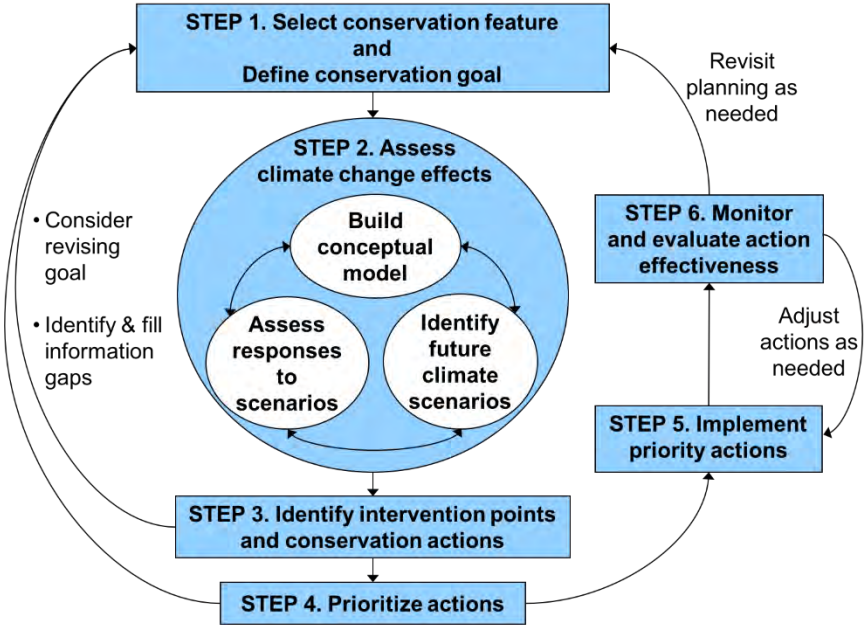
Step 4: IDENTIFY and adaptation approaches and tactics to implement.

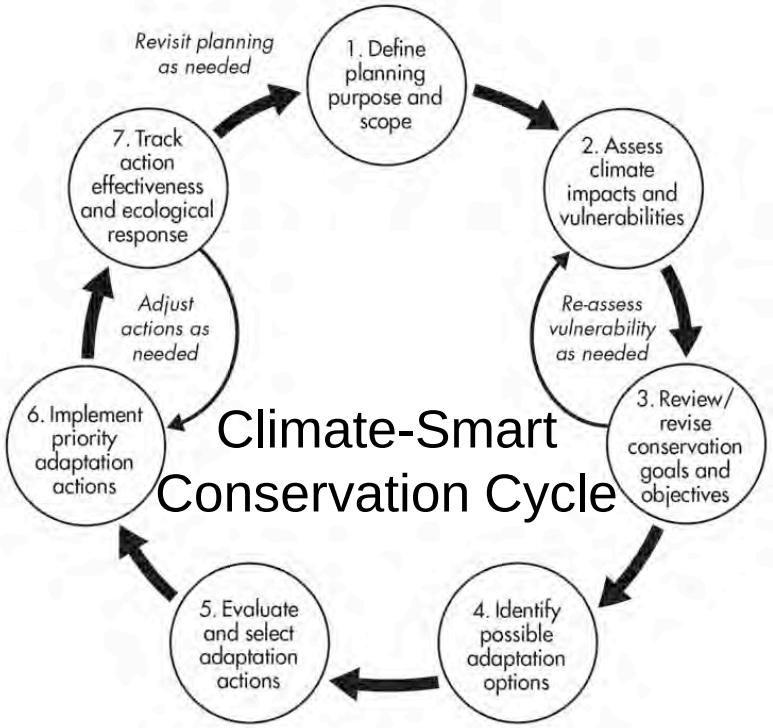
Adaptation actions:

- Switch from oak to pines (red, jack, white)
- Supplement with soft mast spp. for wildlife
- Wood-based soil amendments to improve soil water-holding capacity (experiment)

Adaptation Planning Approaches

USFS/ NIACS Adaptation Workbook





Adaptation for Conservation Targets (ACT) Framework

Table 5.1. Example adaptation planning approaches.

Approach	Purpose and key features	Spatial scale[a]	Starting point	Effort/Cost[b]	Institutional affiliation	References
Adaptation for Conservation Targets (ACT) Framework	Stepwise process for developing actions to achieve climate-informed conservation goals for specific species, ecological processes, or ecosystems	Site, Landscape	Management targets, goals, or activities	*Time:* low/moderate *Expertise:* moderate *Cost:* low/moderate	NCEAS Climate Change & Wildlife Conservation working group; Wildlife Conservation Society; Southwest Climate Change Initiative	Cross et al. 2012b, 2013
Awareness to Action (A2A)	Adaptation planning services to develop climate change adaptation plans focused on specific regions, species, or ecosystems	Site, Landscape	Either management concerns, or broad look at potential climate-related changes	Variable	EcoAdapt	Hansen and Hoffman 2011
Climate Change Adaptation Framework for Ecosystems	Stepwise process for integrating climate into natural resource management for many species and ecosystems	Landscape	Management targets, goals or activities	*Time:* moderate *Expertise:* moderate/high *Cost:* high	Ontario Centre for Climate Change Impacts & Adaptation Resources	Gleeson et al. 2011
Climate Change Response Framework	Stepwise process for integrating climate into forest planning and management for forest species and ecosystems	Site, Landscape	Management targets, goals or activities	*Time:* low/moderate *Expertise:* low/moderate *Cost:* low/moderate	U.S. Forest Service	Swanston and Janowiak 2012
Climate Project Screening Tool	Questionnaire-based tool to explore options for ameliorating climate effects on forest resource management projects	Site	Management targets, goals or activities	*Time:* low/moderate *Expertise:* low/moderate *Cost:* low	U.S. Forest Service	Morelli et al. 2012
Climate-Ready Estuaries Expert Elicitation Approach	Expert elicitation approach for assessing vulnerabilities and identifying adaptation options	Site, Landscape	Management targets and goals	*Time:* moderate *Expertise:* high *Cost:* moderate/high	U.S. Environmental Protection Agency	U.S. EPA 2012a, 2012b
Climate-Smart Coastal Restoration Planning	Stepwise framework for the design and implementation of climate-smart coastal restoration projects in the Great Lakes	Site	Management targets, goals or activities	*Time:* low/moderate *Expertise:* moderate *Cost:* low/moderate	National Wildlife Federation; EcoAdapt	Glick et al. 2011b
ClimateWise	Stepwise process for developing adaptation strategies and actions coordinated across local ecosystem and human community concerns	Site, Landscape	Broad look at potential climate-related changes	*Time:* moderate *Expertise:* moderate *Cost:* moderate	Geos Institute	Koopman and Journer 2011
Conservation Action Planning for Climate Change	Stepwise process for integrating climate into existing plans developed using the Conservation Action Planning (CAP) process for specific species or ecosystems	Site	Management targets, goals or activities from an existing CAP plan	*Time:* moderate/high *Expertise:* moderate *Cost:* moderate	The Nature Conservancy	Poiani et al. 2011

Table of adaptation planning approaches & resources

"Climate-Smart Conservation" guide to adaptation

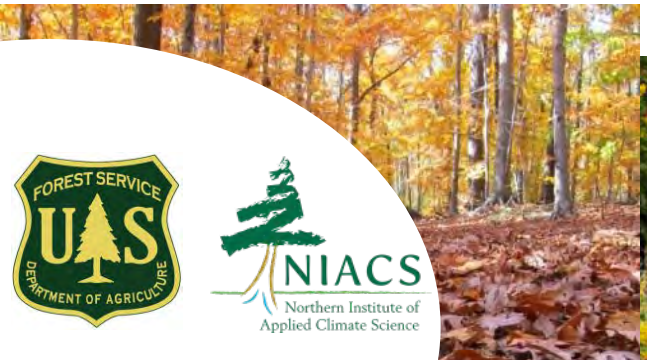
Excerpt from Table 5.1 starting pg. 80

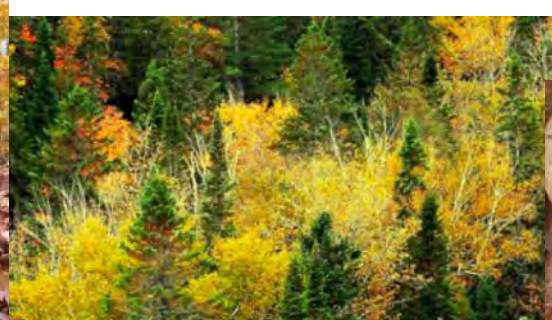
Final thoughts

Embrace uncertainty – it's here to stay

Find a planning process that works for you

Plan, then propose





Questions?

Let's keep in touch:

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Molly Cross
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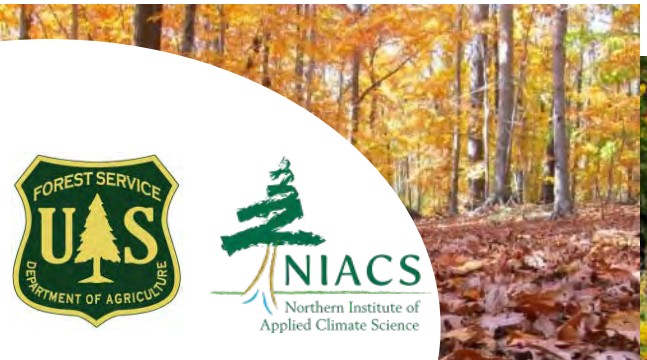
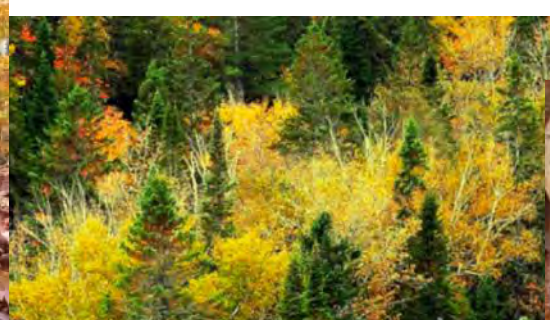
Stephen Handler
sdhandler@fs.fed.us

www.ForestAdaptation.org
www.wcsClimateAdaptationFund.org

Thank you!!


Adaptation Strategies and Approaches

Option: Resistance
(forestall change)

Adaptation Strategies and Approaches

Sustain fundamental ecological functions

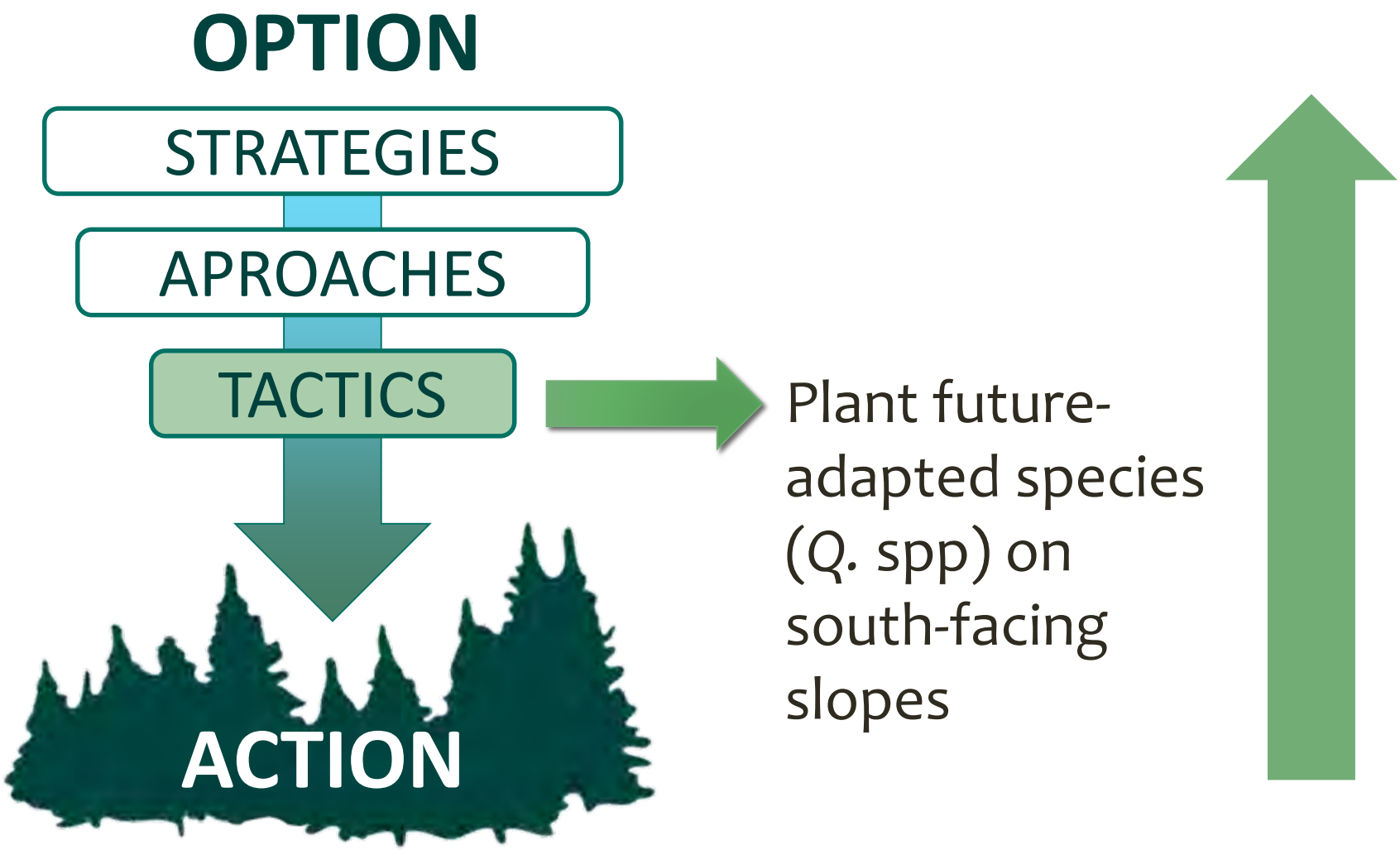
Adaptation Strategies and Approaches

Maintain or restore hydrology

Adaptation Strategies and Approaches

Use water control structures to maintain key wetland habitats

Adaptation Strategies and Approaches



Adaptation Strategies and Approaches

Emphasize drought- and heat-tolerant species & populations

Adaptation Strategies and Approaches

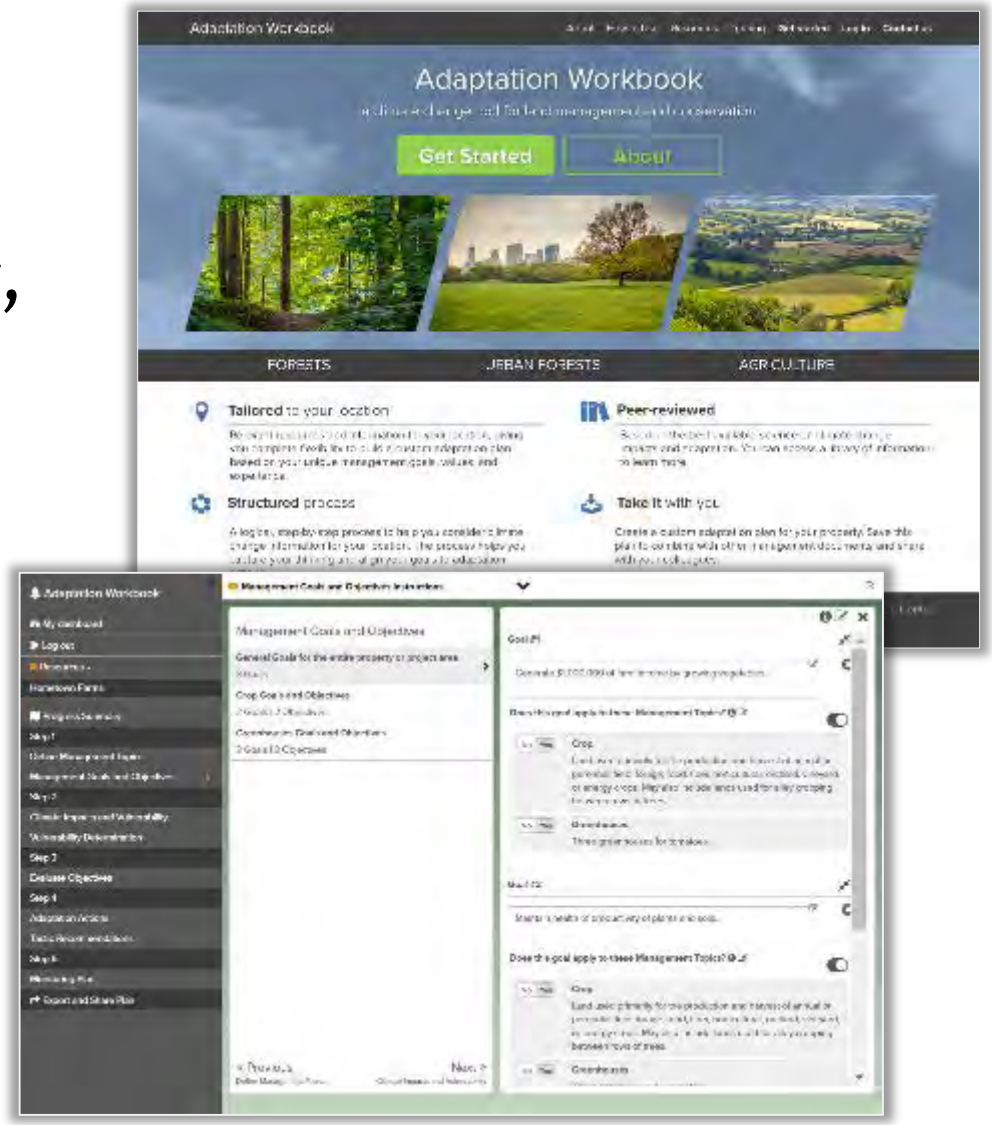
Facilitate community adjustments through species transitions

Adaptation Strategies and Approaches

Option: Transition
(facilitate change)

AdaptationWorkbook.org

- Self-guided, flexible
- Forestry, urban forestry, agriculture
- National - tailored by location
- Creates custom adaptation plan
- Distance learning courses



Questions & Answers

- **By phone:** Dial #2 to enter the queue.
- **On your computer:** Type your question into the Q & A pod on the left side of your screen.

Thank you for attending today's webinar!

A recording of this session will be available shortly at the Climate Science Webinar Portal:
http://www.climatewebinars.net/webinars/wcs-climate