Wisconsin County Forests Association
Climate Adaptation Workshops

February 2023
Climate Change: It’s everywhere you look
Why Should I Care?

“Sustaining Wisconsin’s economy and our forests through responsible management of a renewable resource.”
Why Should I Care?
Why Should I Care?

CLIMATE CHALLENGE

FIGHT CLIMATE CHANGE? CHOOSE SUSTAINABLE FOREST PRODUCTS.

Climate change is one of our most pressing global challenges, and sustainably managed forests are among our most important tools for addressing it. Over 375 million acres/152 million hectares of forestland are certified to the SFI Forest Management Standard. Sustainably managed forests at this scale absorb carbon at impressive rates, making them essential to reducing the impacts of climate change.

Certification is the best way to ensure that a forest is sustainably managed. Vigorous and healthy forests that are sustainably managed are more resilient to the impacts of climate change. SFI is implementing a new Climate Smart Forestry Objective that will require SFI-certified organizations to ensure forest management activities address climate change adaptation and mitigation measures.

Sustainably managed forests also produce wood products that sequester carbon for extended periods—often decades. SFI-certified wood products can replace the use of more carbon-intensive products like concrete and steel. That means sustainably managed forests fight climate change while they’re growing—and long after they’re harvested.

Companies are helping to mitigate climate change through the use of SFI standards. The SFI Forest Management Standard requires a number of practices with direct climate benefits, such as ensuring forests remain vigorous and healthy, requiring harvested areas to be promptly reforested, and requiring programs and practices that reduce the likelihood of wildfire and reduce the spread of damaging invasive species.

Vigorous and healthy forests are also resilient to threats such as fire and pests. Forest fires have long played a role in the evolution and function of natural ecosystems, but we are now seeing an increase in catastrophic fires that have dire consequences for our forests, wildlife, and communities. More than a billion acres/400 million hectares are at risk of fire each year in the U.S. In Canada, an average of about 2.5 million hectares/6 million acres of land burn every year. SFI provides practical solutions that can reduce the potential for damaging wildfires through careful management including a new SFI Fire Resilience and Awareness Objective. SFI-certified organizations will be required to limit susceptibility of forests to undesirable impacts of wildfire and to raise community awareness of fire benefits, risks, and minimization measures.

SFI is the only forest certification standard to require certified organizations to support research on forest sustainability. Since 1995, SFI-certified companies have directly invested nearly $1.8 billion in forest research that promotes resilient, sustainably managed forests.
2022 Forest Management Standard

• Objective 9 = “Climate-Smart Forestry”
  • Measure 9.1 = adaptation
  • Measure 9.2 = mitigation
  • Individual or cooperative efforts (State ICs)
  • Annual reporting for both measures
Performance Measure 9.1 = Adaptation

• Indicator 1: Based on the best scientific information, Certified Organizations shall identify climate change risks and prioritize them based on likelihood, nature, and severity. 

Today

• Indicator 2: Certified Organizations shall develop an adaptation plan to address priority climate change risks...

Today

• Indicator 3: Certified Organizations shall document how their adaptation plan objectives and strategies fit within broader regional climate adaptation strategies and plans, where they exist.

Soon

• Indicator 4: Certified Organizations shall report annually to SFI Inc. their progress towards achieving climate change adaptation strategies and plans.
Performance Measure 9.2 = Mitigation

• Indicator 1: Based on the best scientific information, Certified Organizations shall identify and address opportunities to enhance the climate benefits associated with forest management operations on the forests they own or manage...

• Indicator 2: Based on best scientific information, Certified Organizations shall identify and address opportunities to enhance ecosystem resilience for the forests they own or manage...

• Indicator 3: Based on best scientific information, Certified Organizations shall develop a program to identify and address greenhouse gas emissions within their operational control.

• Indicator 4: Certified Organizations shall report annually to SFI Inc. their measures to mitigate climate change associated with forest operations.

Not today, but we can discuss 9.2.1 & 9.2.2 later…
**SFI Implementation Committee “Playbook”**

**SFI IMPLEMENTATION COMMITTEE PLAYBOOK**
**CLIMATE SMART FORESTRY**
Updated July 7, 2022

**INTRODUCTION TO SIC PLAYBOOKS**

The requirements of the 2022 SFI Standards for Forest Management and Fiber Sourcing introduce new opportunities for engagement and collaboration via the SFI Implementation Committees (SICs). These opportunities focus on new or enhanced elements of the SFI Standards including Climate Smart Forestry, Fire Resilience and Awareness, and Conservation of Biodiversity (Forests of Exceptional Conservation Value – FECVs). In a recent survey conducted by SFI, an overwhelming majority of SFI certified organizations indicated interest in collaboration via the SICs on these requirements.

In response, SFI is developing a set of SIC Playbooks that provide resources and actionable tips for SICs. The SIC Playbooks draw from and build on the resources and information provided in the SFI Standard Guidance but go further in outlining specific steps and resources that could be mobilized by SICs. In addition to this SIC Playbook on Climate Smart Forestry (2022 Forest Management, Objective 9), an SIC Playbook on Biodiversity in Fiber Sourcing (2022 SFI Fiber Sourcing, Objective 1) is also available. A Playbook on Fire Resilience and Awareness (2022 Forest Management Objective 10) is in development. Others may also be developed in response to needs and requests of SICs.

**An Iterative Tool: Please Send Us Your Feedback + Suggestions**

In response to growing interest, this Climate Smart Forestry SIC Playbook is released as a resource that SICs can begin using immediately. However, it is a tool that will be refined as it gets utilized. SICs and certified organizations are encouraged to let the SFI team know what is helpful and what could be improved. We are also seeking suggestions for the best regional resources, as well as ideas and best practices that your SIC has identified in implementing the Climate Smart Forestry SIC Playbook in your region, state or province. Please provide feedback and suggestions to Nadine Block, SFI Senior VP Community and Government Relations, at nadine.block@forests.org.
Lake States SIC Climate Smart Forestry Regional Assessment

The SFI 2022 Forest Management Standard has incorporated opportunities for cooperative efforts involving SFI Implementation Committees to meet various indicators in this standard. SFI Inc. developed a playbook and hosted a national workshop on March 81 to discuss how Climate Smart Forestry indicators could be addressed collaboratively.

On August 24th, 2022, SFI hosted a Lake States Regional Workshop specifically to help SICs in that region meet Performance Measure 9.1.

Performance Measure 9.1. Certified Organizations shall individually and/or through cooperative efforts involving SFI Implementation Committees or other partners identify and address the climate change risks to forests and forest operations and develop appropriate adaptation objectives and strategies. Strategies are based on best scientific information.

And Performance Measure 9.2

Performance Measure 9.2. Certified Organizations shall individually and/or through cooperative efforts involving SFI Implementation Committees or other partners identify and address opportunities to mitigate the effects associated with its forest operations on climate change.

The workshop was facilitated by Stephen Handler, Climate Adaptation Specialist, US Forest Service Northern Research Station and Northern Institute of Applied Climate Science (NIACS). The workshop helped SICs.
Goals for Today

1. Learn about the Climate-Smart Forestry expectations in the SFI Forest Management Standard.
2. Identify and prioritize climate change risks for individual forest types on your county forest.
3. Develop practical adaptation actions to address expected impacts.
Expected Outcome

- Each county will be able to develop a custom climate adaptation plan
- Optional formats:
  - Amendment to 15-year County Forest Plan (Section 800)
  - Stand-alone document
  - Something else?
- We’ll create a template and help you build it!
Wisconsin Initiative on Climate Change Impacts

- Useful information!
- WGs: Forestry, Water Resources, Fisheries, Plants and Natural Communities, etc.
- Links to climate maps, recorded presentations, and more

www.wicci.wisc.edu/
Forest Adaptation Resources

**A flexible workbook and menu to address diverse needs**

- Designed for a variety of land owners with diverse goals
- Does not make recommendations
- Includes:
  - Menu of adaptation strategies and approaches for forest management
  - Adaptation Workbook

Swanston et al. 2016 (2nd edition);
Adaptation Workbook Process

Provides “structured flexibility”

1. DEFINE management goals and objectives.
2. ASSESS climate impacts.
3. EVALUATE management objectives.
4. IDENTIFY adaptation approaches and tactics.
5. MONITOR and evaluate effectiveness actions.
Adaptation Workbook Process

1. DEFINE management goals and objectives.
2. ASSESS climate impacts.
3. EVALUATE management objectives.
4. IDENTIFY adaptation approaches and tactics.
5. MONITOR and evaluate effectiveness actions.

Provides “structured flexibility”
Adaptation Workbook Process

1. DEFINE management goals and objectives.
2. ASSESS climate impacts.
3. EVALUATE management objectives.
4. IDENTIFY adaptation approaches and tactics.
5. MONITOR and evaluate effectiveness actions.

Provides “structured flexibility”

This morning!
Adaptation Workbook Process

Provides “structured flexibility”

1. DEFINE management goals and objectives.

2. ASSESS climate impacts.

3. EVALUATE management objectives.

4. IDENTIFY adaptation approaches and tactics.

5. MONITOR and evaluate effectiveness actions.

This afternoon!
Climate Change Impacts - Recap
Temperature Change - Observed

Historical Change in Annual TMEAN from 1950 to 2022

Source: Nelson Institute Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend

Dan Vimont, WICCI, UW-Madison
Temperature Change - Observed

**Winter**

**Historical Change in DJF TMEAN from 1950 to 2022**

Source: Nelson Institute
Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend

**Summer**

**Historical Change in JJA TMEAN from 1950 to 2022**

Source: Nelson Institute
Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend
Temperature Change - Observed

Historical Change in JJA TMIN from 1950 to 2022

Historical Change in DJF TMIN from 1950 to 2022

Historical Change in JJA TMAX from 1950 to 2022

Historical Change in DJF TMAX from 1950 to 2022

Summer Min  Winter Min  Summer Max  Winter Max
Precipitation Change – Observed

Historical Change in Annual PRCP (%) from 1950 to 2022

Source: Nelson Institute Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend

Annual
Precipitation Change – Observed

Historical Change in DJF PRCP (%) from 1950 to 2022

Source: Nelson Institute Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend

Winter

Historical Change in JJA PRCP (%) from 1950 to 2022

Source: Nelson Institute Center for Climatic Research
Data: NOAA NCDC nClimDiv
* Significant Trend

Summer
Heavy Precipitation - Observed

- Large rain events (2”+) have become more frequent

NOAA, www.statesummaries.ncics.org/
More Drought Stress

A
Cooler air can hold less water
Less moisture demand on plants

B
Warmer air can hold more water
More moisture demand on plants

50% relative humidity

Air water vapor
Deficit in air water vapor
Leaf tissue water vapor

National Climate Assessment 2018
More Drought Stress

Greater uncertainty about future precipitation, but great risk of summer moisture stress

Risk may be greatest:
- Sites with drought-prone or shallow soils
- South-facing ridges
- Mesic species on drier sites (marginal sites or off-site)
Interactions can trigger big changes:
- Stress
- Disturbance
- Invasive species
- Insect pests
- Forest diseases
Climate Change Field Guides

Climate Change Field Guide for Northern Wisconsin Forests: Site-level considerations and adaptation

Climate Change Field Guide for Southern Wisconsin Forests: Site-level considerations and adaptation
Impacts by Forest Type

OAK BARRENS
Related DNR Forest Cover Types: Oak, Jack pine, Red pine, White pine

Community Description
- Occurs on drought-prone sites with sandy, nutrient-poor soil, typically outwash or lake plains and sandy terraces or thin soils over bedrock.
- Trees are scattered or in groves, supporting sand prairie species, blueberry, or huckleberry.
- Regular surface fire was the primary disturbance driving open structure and composition (5-20 year interval).
- Major tree species: Black oak, with possible white, bur, and northern pin oak.

Climate Change Vulnerability
- Overall Vulnerability: Will this community experience declining health, reduced extent, or identity changes by 2100?
- Confidence: How much evidence is available from research and observations? Does the evidence tend to agree or conflict?

Climate Change Impacts: Neutral
- The primary tree species in oak barrens (black, bur, and white oak) are expected to maintain or gain suitable habitat over the next century.
- Increasing drought risk may slow or reduce the risk of mesic species encroachment in oak barrens.
- Species such as spotted knapweed, bluegrasses, brambles, or Pennsylvania sedge that can limit overall site diversity may benefit from longer growing seasons.
- Shifting conditions may make it more difficult to apply prescribed fire in this community using conventional approaches.

https://wicci.wisc.edu/forestry-working-group/
# Tree Species Info by EcoSection

## Table: Tree Species and Climate Change Impact

<table>
<thead>
<tr>
<th>Species</th>
<th>Adapt Abun</th>
<th>Low Climate Change (RCP 4.5)</th>
<th>High Climate Change (RCP 8.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mockernut hickory</td>
<td>+</td>
<td>-</td>
<td>*</td>
</tr>
<tr>
<td>Northern pin oak</td>
<td>+</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Northern red oak</td>
<td>+</td>
<td>+</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Northern white-cedar</td>
<td>-</td>
<td>+</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Osage-orange</td>
<td>+</td>
<td>-</td>
<td>*</td>
</tr>
<tr>
<td>Paper birch</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Pecan*</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Pignut hickory</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Pin cherry*</td>
<td>-</td>
<td>+</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Post oak</td>
<td>+</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Quaking aspen</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Red maple</td>
<td>+</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Red mulberry*</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Red pine</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>River birch*</td>
<td>-</td>
<td>+</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Sassafras*</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
<tr>
<td>Scarlet oak</td>
<td>-</td>
<td>-</td>
<td><img src="https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin" alt="Critical Change" /></td>
</tr>
</tbody>
</table>

### Legend:
- County lines
- Ecological Section borders
- Laurentian Mixed Forest Province (222)

https://forestandaptation.org/learn/resource-finder/tree-species-projections-ecological-sections-southern-wisconsin
Operations!
Identify & Prioritize Climate Impacts
Activity:

- Review field guides
- Select 3 high-priority climate impacts for each forest type
  - Climate impacts
  - Tree species information for your Ecosection
- Operations
- Other ideas!
## Climate Impacts for Priority Forest Types & Site-Level Considerations

<table>
<thead>
<tr>
<th>County:</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Type #1</td>
<td><strong>Climate Change Impacts and Vulnerabilities</strong>&lt;br&gt;Review information from field guide (forest type information, tree species projections, other information). What are the priority climate impacts for this forest type?</td>
</tr>
<tr>
<td>Lowland Conifer</td>
<td></td>
</tr>
</tbody>
</table>

### Impact #1: Pest outbreaks (ELB)
- Why is this a priority?
  - Native pests, already here

### Impact #2: Droughts + Warmer Temps
- Why is this a priority?
  - Peat layers decompose

### Impact #3: Extreme precip
- Why is this a priority?
  - Water level changes, already disrupted hydrology

**Bonus:**
Site-level Considerations

Climate change will play out differently across the landscape!
High or Low Risk?

- Diabetes
- Smoking
- Obesity and overweight
- Physical inactivity
- Hypertension
- Dyslipidemia
- Preterm delivery
- Hypertensive disorders of pregnancy
- Gestational diabetes
- Autoimmune disease
- Breast cancer treatment
- Depression
High or Low Risk?

Site-level Considerations Checklist

- Species diversity
- Structural diversity
- Regeneration
- Pests and diseases
- Prescribed fire
- Landscape position
- Drought risk/ soil moisture
- Access and operability
- Natural disturbances
- Past management
- Size and connectivity
Activity:

- Review field guides
- Take notes for each of your forest types
  - Which risk factors apply to your county?
  - Estimates of % or acres that have “high risk” conditions?
  - Do some locations have higher risk than others?
## Climate Impacts for Priority Forest Types & Site-Level Considerations

<table>
<thead>
<tr>
<th>County:</th>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lowland Conifer</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Forest Type #1</strong></td>
<td><strong>Site-Level Considerations</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact #1</th>
<th>Pest outbreaks (ELB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is this a priority?</td>
<td>Native pests, already here</td>
</tr>
<tr>
<td>Impact #2</td>
<td>Droughts + Warmer Temps</td>
</tr>
<tr>
<td>Why is this a priority?</td>
<td>Peat layers decompose</td>
</tr>
<tr>
<td>Impact #3</td>
<td>Extreme precip</td>
</tr>
<tr>
<td>Why is this a priority?</td>
<td>Water level changes, already disrupted hydrology</td>
</tr>
</tbody>
</table>

### Climate Change Impacts and Vulnerabilities
Review information from field guide (forest type information, tree species projections, other information). What are the priority climate impacts for this forest type?

<table>
<thead>
<tr>
<th>Factors that increase climate risk</th>
<th>Topic</th>
<th>Factors that decrease climate risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only a few species dominate the site</td>
<td>Species diversity</td>
<td>Site has a diverse mix of native tree species</td>
</tr>
<tr>
<td>Simple structure and a single age class</td>
<td>Structural diversity</td>
<td>A diversity of age classes on the site or across the landscape</td>
</tr>
<tr>
<td>Ditches, roads, dams or other changes have altered local hydrology</td>
<td>Natural processes</td>
<td>Natural hydrology has been maintained</td>
</tr>
<tr>
<td>Damage from forest pests or diseases such as tamarack sawfly or mistletoe</td>
<td>Pests and diseases</td>
<td>No looming threats, stand is vigorous and healthy</td>
</tr>
<tr>
<td>Small site that relies on precipitation inputs, prone to extreme water table changes</td>
<td>Water table fluctuation</td>
<td>Large wetland with groundwater inputs and a stable water table</td>
</tr>
<tr>
<td>Regeneration limited by deer or non-native species</td>
<td>Regeneration</td>
<td>Tree regeneration is not limited</td>
</tr>
<tr>
<td>Requires frozen ground or deep snow</td>
<td>Access and operability</td>
<td>Can occur in seasons other than winter</td>
</tr>
</tbody>
</table>
Adaptation taking action in preparation or in response to climate change.
Adaptation taking action in preparation or in response to climate change. (and still meeting your goals)
Adaptation actions are designed to intentionally address climate change impacts and vulnerabilities in order to meet goals and objectives. (and still meeting your goals)
Climate Change Adaptation

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 Options

- Resistance
- Resilience
- Transition

Promote change, reduce future risk.
Adaptation Menu

• A collection of possible adaptation actions

• Allows the user to choose actions that make sense for their situation.
Adaptation Menu

- Connects broad adaptation ideas to specific actions
Adaptation Menus

- Forests
- Urban Forests
- Agriculture
- Forested Watersheds
- Tribal Perspectives
- Forest Carbon Management
- Recreation
- Wetlands (non-forested)
- Wildlife
- Fire-adapted ecosystems

- Great Lakes Coastal Ecosystems
- Grasslands*

www.forestadaptation.org
Activity:

- Review adaptation menus
- Brainstorm adaptation actions for each of your forest types
  - Can you address each risk?
  - Common practice and new ideas!
  - Address site-level considerations
Check Your Work...

Do your adaptation ideas address:

- Your management Goals and Objectives?
- The priority climate change impacts?
- Special features/ considerations in your county?
- Stuff you’re already doing as well as new ideas?
- A range of different adaptation options? (R/R/T)
Forest Type Discussions!
Performance Measure 9.1 = Adaptation

• Indicator 1: Based on the best scientific information, Certified Organizations shall identify climate change risks and prioritize them based on likelihood, nature, and severity.

• Indicator 2: Certified Organizations shall develop an adaptation plan to address priority climate change risks...

• Indicator 3: Certified Organizations shall document how their adaptation plan objectives and strategies fit within broader regional climate adaptation strategies and plans, where they exist.

• Indicator 4: Certified Organizations shall report annually to SFI Inc. their progress towards achieving climate change adaptation strategies and plans.
Next Steps

- Gaps or information needs?
- Next steps for you?
- Next steps for us (workshop organizers)?
- What support do you need?

What we heard yesterday:

- Plan template
- Share statewide/regional resources
- Clearinghouse of research on climate impacts, management practices, etc.
- Presentations/ discussions with county boards
Thank you!