Beyond Forests
Developing menus of adaptation strategies & approaches to address diverse planning needs

Kristen Schmitt, Chris Swanston, Danielle Shannon, Sara Johnson, Ryan O’Connor, Olivia LeDee, Todd Ontl

National Adaptation Forum
April 23rd, 2019
Northern Institute of Applied Climate Science

Climate Carbon

Practical information Adaptation resources Technical assistance

Regional multi-institutional partnership among:

NIACS
Northern Institute of Applied Climate Science

Forest Service
US Department of Agriculture

Michigan Technological University

Great Lakes Indian Fish & Wildlife Commission

NCASI

University of Minnesota

American Forests

The University of Vermont
NIACS storefronts

• Climate Change Response Framework
  • ForestAdaptation.org
  • AdaptationWorkbook.org

• USFS Climate Change Resource Center
  • fs.usda.gov/ccrc

• USFS Tree and Bird Atlas

• USDA Northern Forests Climate Hub

• USDA Climate Hubs national website

• Adaptive Silviculture for Climate Change network
  • Led by Linda Nagel

• Radiocarbon Collaborative
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Address challenges in implementing adaptation:

• Connecting broad ideas to specific actions
• Making actions intentional
• Defining success
Adaptation Resources

Strategies & Approaches Menus
Menu of adaptation actions

Adaptation Workbook
Structured process to integrate climate change considerations into management.

Swanston et al. 2016 (2nd edition)
www.nrs.fs.fed.us/pubs/52760
(First ed, 2012)

Also online: AdaptationWorkbook.org
Workbook provides “structured flexibility”

1. DEFINE area of interest, management objectives, and time frames.
2. ASSESS climate change impacts and vulnerabilities for the area of interest.
3. EVALUATE management objectives given projected impacts and vulnerabilities.
4. IDENTIFY and implement adaptation approaches and tactics.
5. MONITOR and evaluate effectiveness of implemented actions.

Menu of Adaptation Strategies & Approaches

Vulnerability assessments, scientific literature, and other resources

forestadaptation.org/
Adaptation Strategies & Approaches

Translating broad **concepts** to **actions**

**Options (concepts):**
- Resistance, Resilience, Transition

**Strategies:**
- Regionally specific conditions

**Approaches:**
- Actions for a specific ecosystem

**Tactics:**
- Prescriptions for local conditions and mgmt. objectives

[forestadaptation.org/](http://forestadaptation.org/)
Example: Forestry Menu, Resistance

**Strategy 2:** Reduce the impact of biological stressors.

**Approach 2.1:** Maintain or improve the ability of forests to resist pests and pathogens.

**Sample Tactic:** Restrict harvest and transportation of logs near stands already heavily infested with known pests or pathogens.

forestadaptation.org/focus/forests
Example: Forestry Menu, Transition

**Strategy 9:** Facilitate community adjustments through species transitions.

**Approach 9.2:** Establish or encourage new mixes of native species.

**Sample Tactic:** Create large group openings to increase regeneration of shade intolerant species.
Management Goals & Objectives

Climate Change Impacts

Challenges & Opportunities

Intent of Adaptation (Option)

Make Idea Specific (Strategy, Approach)

Action to Implement (Tactic)

Adaptation Menus

Connecting the dots

Adaptation menus + Workbook
Adaptation Demonstrations

250+ Projects underway

forestadaptation.org/adapt/demonstration-projects
Menu Development

Vegetation - centric

2012

- Forestry

2016

- Forestry 2.0
- Urban forestry
- Agriculture

http://forestadaptation.org/adapt/adaptation-strategies
Menu Development

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2012
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2019/2020

Published
- Forested watersheds
- Tribal perspectives

Anticipated
- Carbon Management
- California ecosystems
- Open wetlands
- Wildlife
- Recreation
- Coastal ecosystems

forestadaptation.org/adapt/adaptation-strategies
Menu Development

Development

- Interest from users
- Partner on development
- Interviews with researchers/practitioners
- Literature review
- Collate & frame strategies/approaches

Testing

- Testing with Adaptation Workbook
- Revision/adjustment
- Scientific review/publication
Menu Development

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forestandadaptation.org/who-we-are/partners
On the Ground ...

Demonstrations

forestadaptation.org/adapt/demonstration-projects
Goals:
- Maintain cold water fish habitat
- Maintain healthy forests
- Improve stream connectivity

Climate Challenges
- Variable and extreme precipitation
- Erosion, sediment
- Forest pests in riparian areas

**Select Actions: Forested Watersheds Menu**
- Replace aged and failing culvert with reinforced ford.
- Use large woody material in stream to improve habitat structure
- Harvest selected trees within riparian areas to reduce the abundance of hemlock and increase species diversity.

[forestadaptation.org/tu-ne](http://forestadaptation.org/tu-ne)
Spur Lake State Natural Area - WI

Goals:
• Promote re-establishment of wild rice.
• Maintain shallow, muck-bottomed lake for wildlife resources.

Climate Challenges
• Increased water levels
• Current & potential invasives
• Altered water quality

Select Actions:

Tribal Adaptation Menu
• Gather TEK from local tribes to better understand Spur Lake and it’s history.
• Partner with GLIFWC to understand historical rice camps and past harvests.

Wetlands Menu
• Monitor and control perennial aquatic plants that compete with wild rice.
• Clear snow off ice to increase ice depth to suppress competitive perennial species.
• Collaborate on wild rice seedbank study.
• Work with downstream landowners to install an appropriately-sized culvert or a small bridge.

Spur Lake State Natural Area - WI

forestadaptation.org/SpurLakeSNA
Menus for Adaptation

Published
- Forestry
- Urban Forestry
- Agriculture
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- Tribal perspectives

Anticipated 2019/2020
- Carbon Management
- California ecosystems
- Open wetlands
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forestadaptation.org/adapt/adaptation-strategies
Questions?

Kristen Schmitt
kmschmit@mtu.edu
## Adaptation Workbook

Structured process to identify adaptation actions

<table>
<thead>
<tr>
<th>Step 1</th>
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<tbody>
<tr>
<td>Area of Interest/Location</td>
<td>Forest Type(s)</td>
<td>Management Goals</td>
<td>Management Objectives</td>
<td>Time Frames</td>
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<table>
<thead>
<tr>
<th>Step 4</th>
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<tbody>
<tr>
<td>Adaptation Actions</td>
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</tr>
<tr>
<td>Strategy/Approach (From Chapter 3)</td>
<td>Tactic</td>
<td>Time Frame</td>
<td>Benefits</td>
<td>Drawbacks/Barriers</td>
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