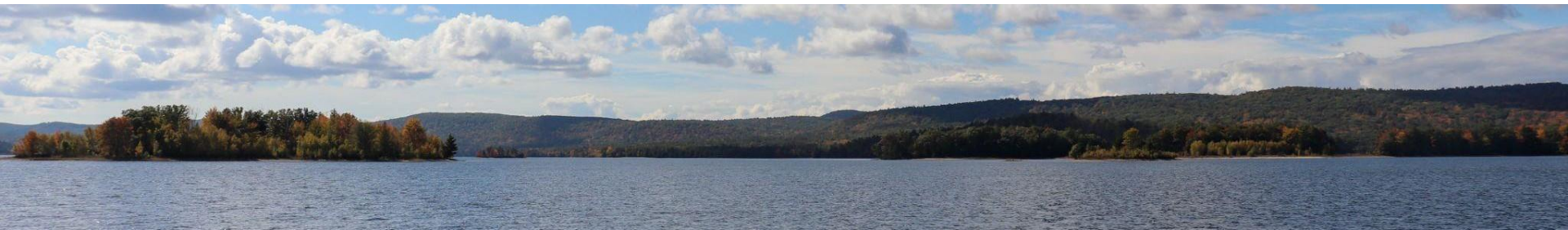
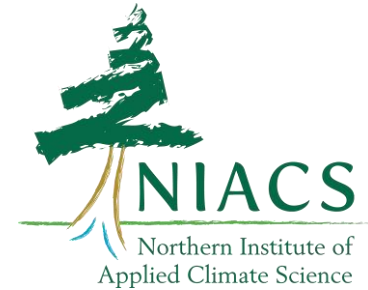


Oak Resiliency Assessment Tool

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Increasing Oak Resiliency in Southern New England

- 1) Increase forest **stewardship activities** that support oak resilience,
- 2) Empower **natural resource professionals** with tools for assessing oak forest health,
- 3) Build **landowner awareness** of regeneration challenges and solutions, and
- 4) Foster **communication** between states and agencies about strategies for addressing oak forest resilience and regeneration challenges.

Why Oak?

70% southern New England forests are dominated by oaks

- Face significant pressures that compromise health
 - Heavy deer herbivory
 - Defoliation by forest insects
 - Seasonal drought and climate change



About The Oak Resiliency Assessment Tool

- Developed by FEMC, Forest Stewards Guild and NIACS
- Designed for natural resource professionals
- Based on extensive literature review and input from practitioners



The screenshot shows the website for the Oak Resiliency Assessment Tool. At the top, there is a blue navigation bar with the title "Oak Resiliency Assessment" and a logo of an oak leaf. The navigation bar includes links for "Home", "Assessment", "Why Oak?", "Resources", "About", and "Contact". Below the navigation bar, a disclaimer states: "*This content is all preliminary, draft material that will be undergoing continuous review*". The main content area is divided into two columns. The left column contains a paragraph explaining the tool's purpose: "The Oak Resiliency Assessment Tool allows you to consider how resilient oak-dominated forest stands on your property or a property you manage are to climate change and various stressors. When you start an assessment, you will provide a brief description of the property and forest stand and locate the area you are assessing. You will then answer a series of questions about stressors that may be impacting the forest and characteristics that influence the adaptive capacity of the forest. Once you complete the assessment, the tool will generate a report with the forest's vulnerability and more information regarding the major forest stressors and potential management actions. You can then use this report to inform your management decisions and include it in the property's forest management plan." Below this text is a green button labeled "Start Stand Assessment". The right column is titled "Introduction" and features a video player. The video player has a title "Oak Resiliency Assessment Tool" and a subtitle "Tutorial Video". The video player includes logos for FEMC, Forest Stewards Guild, and the Climate Change Response Framework. The video player also shows a progress bar at 0:00 / 6:07 and standard video controls.

www.uvm.edu/femc/oak_resiliency/

Assessment: Impacts & Adaptive Capacity

Big question:

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

Big question:

How **resilient** is the system to potential impacts?

Potential
Impacts

Adaptive
Capacity

Vulnerability

```
graph TD; A[Potential Impacts] --- B[Adaptive Capacity]; A --- C[Vulnerability]; B --- C;
```

Impacts Assessment

Consider how disruptive specific impacts are for your site:

- Increase in extreme precipitation events
- Increases in storm frequency and intensity
- Elevated drought risk
- Elevated risk of wildfire
- Increases in invasive plants
- Increases in insect pests and forest pathogens
- Level of deer herbivory
- Reduced habitat for some northern tree species
- Higher sea levels
- Damage to forest roads and trails
- Overall rating

Oak Resiliency Assessment

Home Assessment Why Oak? Resources About Contact

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Impacts

The following questions will prompt you to think about how your particular site may be vulnerable to a variety of different disturbances and climate-related impacts. After you provide a rating for each impact, you'll be asked to rate the overall vulnerability of the site. You must select a rank for each of the items below, but can check **I do not know** if you do not know the risks/vulnerability.

1. **Increase in extreme precipitation events.** Extreme precipitation events are becoming more common and can lead to flooding, soil erosion, and sedimentation. ⓘ

Very Supportive Moderate Very Disruptive I do not know □

Heavier rain events will not greatly impact the site due to gentle topography and/or well-drained soils. Heavier rain events will greatly impact the site and lead to erosion on steep slopes and flooding in low-lying areas.

2. **Increases in storm frequency and intensity.** Climate change may increase the intensity, scope, ⓘ or frequency of stand-replacing weather events such as windstorms and ice storms.

Very Supportive Moderate Very Disruptive I do not know □

Increasing storm frequency and intensity is not expected to greatly impact the site due to favorable landscape position and/or soil depth. Increasing storm frequency and intensity is likely to impact the site due to vulnerable landscape position and/or shallow soils.

Adaptive Capacity Assessment

Consider how specific site characteristics may support adaptation:

- Forest condition given past land use
- Level of landscape connectivity
- Tree health
- Species and structural diversity
- Ability to compete with more shade-tolerant species
- Ability to compete with invasive plants
- Abundance of species adapted to current and expected future conditions
- Oak regeneration potential
- Stewardship planning and implementation capacity
- **Overall rating**

Oak Resiliency Assessment

Home Assessment Why Oak? Resources About Contact

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Adaptive Capacity

The following questions will prompt you to think about the adaptive capacity of your site, or how well it might tolerate impacts without undergoing significant change, based on a variety of characteristics. After you provide a rating for each question, you'll be asked to rate the overall adaptive capacity of the site. You must select a rank for each of the items below, but can check **I do not know** if you do not know the risks/vulnerability.

1. **Forest condition given past land use.** Degradation from previous and ongoing human influences, including fragmentation, fire suppression, and land-use, may reduce the adaptability of forests.

Very Low Moderate Very High

I do not know

Past land uses (e.g., grazing, forest clearing) or management have degraded the forest condition.

Forest has been minimally disturbed by historic land use or management, or has recovered favorably.

2. **Level of landscape connectivity.** Forests that are well connected within the landscape will be able to adapt to climate change more easily, whereas forests that are fragmented may struggle to adapt.

Very Low Moderate Very High

I do not know

Site is small and isolated or surrounded by agricultural or developed land.

Site is part of a large complex of forests or other ecosystems.

Vulnerability Report



Downloadable PDF Report

Oak Resiliency Assessment

Home
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Contact

This content is all preliminary, draft material that will be undergoing continuous review

Overall Site Vulnerability

Moderate

Vulnerability

[Generate Report](#)

Site Image

Score Feedback

Your **Overall Site Vulnerability** is **moderate** based on your rankings of Impact and Adaptive Capacity scores. Your **Impact** ranking is **high** and your **Adaptive Capacity** ranking is **high**. Below you will see *potential pathways* for management of your oak stand(s) and *issues of concern* that may need to be addressed. Please review the information on this page and then download your report.

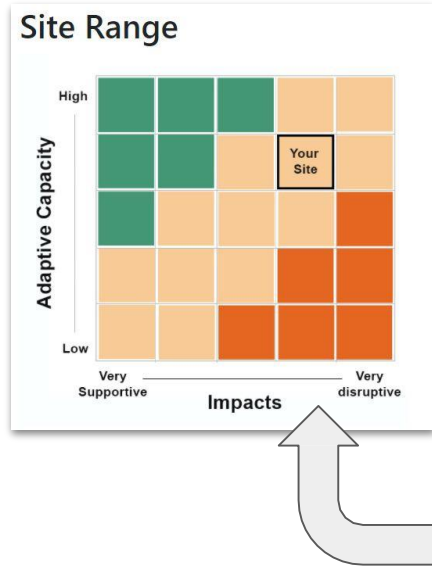
Site Range

Issues of Concern

Below are several issues you should consider when planning your management of your site.

If no issues appear than none with more specific information available were selected.

- Invasive Plants
- Herbivory
- Pests and Pathogens



Insect pests and forest diseases

[Download as PDF](#)

Forest insect pests and pathogens are expected to increase in occurrence and inflict more damage within Northeastern forests as the climate continues to change. This increase will contribute to tree stress and mortality, difficult management scenarios for landowners and managers, and potentially dangerous recreation conditions. A variety of forest adaptation practices may be able to prevent or ameliorate the negative effects of this increase in forest pests and pathogens.

[Climate Change Impacts \(click to expand\)](#)

[Adaptation Actions for Forests \(click to expand\)](#)

[Adaptation Actions for Recreation \(click to expand\)](#)

On-the-Ground Examples

- **South Central Connecticut Regional Water Authority: Matby Lakes Southern Pine Beetle Response**
 - Managers conducted a clearcut in this forested watershed in response to a southern pine beetle infestation that threatened to expand northward into other forests. Silvicultural techniques and supplemental planting were used to support the establishment of future-adapted tree species.
- **Saint Regis Mohawk Tribe: Forest Stand Improvements in Ash**
 - In response to the threat of an emerald ash borer infestation 1.5 miles from this forested area, the Saint Regis Mohawk Tribe conducted stand improvement cuts on 500 acres to reduce the density of ash to 20% and increase overall species diversity.

Potential Monitoring Items

- Evidence of pest and disease outbreaks
- Survey of actively infected trees
- Tree mortality
- Aerial survey of forest damage

Additional Resources

- The **Early Detection & Distribution Mapping System (EDDMapS)** is an innovative web-based mapping tool which can be used to document the distribution of invasive species across the United States and help identify leading edges of new infestations.
- The **Northeastern Forest Health Atlas (NEFHA)** hosted by the Forest Ecosystem Monitoring Cooperative. The NEFHA interface provides maps of forest damage collected from aerial surveys, as well as links to regional forest health research projects. NEFHA users can filter by damage agent, damage type, state, and year, as well as view graphs and tables.

Adaptation Actions & Resources

Adaptation 'pathways'

Potential Pathways

Resistance

Resistance actions are designed to work against the effects of climate change and maintain the forest in its current condition. You can find potential resistance pathways for your site here: [Oak Resistance Pathways](#)

Resilience

Resilience actions focus on increasing the capacity of the ecosystem to cope with climate change and other stressors while maintaining its fundamental character. You can find potential resilience pathways for your site here: [Oak Resilience Pathways](#)

Transition

Transition actions intentionally accommodate ecosystem change, rather than resist it. These actions work to move forests toward conditions that are expected to be better adapted to future conditions. You can find potential transition pathways for your site here: [Oak Transition Pathways](#)

No Action

Landowners and forest managers can intentionally decide to take no action in managing their forests, which allows forests to mature and be influenced by natural succession and disturbance dynamics rather than human intervention. You can find potential no action pathways for your site here: [Oak No Action Pathways](#)

Pathway: Resilience

Resilience actions focus on increasing the capacity of the ecosystem to cope with climate change and other stressors while maintaining its fundamental character. Resilience actions are designed to enable ecosystems to withstand a variety of stressors and to bounce back from disturbance. For example, greater diversity in ecosystems (in terms of species composition, species functional traits, or age distribution) is generally expected to increase resilience by allowing for multiple pathways for recovery after a disturbance. Resilience is a commonly discussed adaptation option and can be valuable in many systems, but it may not be appropriate in all situations. As with the resistance pathway, greater levels of impact and disturbance from climate change and other stressors will likely create greater challenges to maintaining the current ecosystems using resilience strategies alone.

Because oak forests are highly adaptable to many disturbances, resilience actions can be effective for many forests where conditions have not been too severely altered. You may also want to consider what capability you have to resist change in the current forest and compare this option with the **Resistance** and **Transition** pathways to determine what option best meets your management goals and objectives.

Actions for Forests Health and Productivity

Here are some examples of adaptation actions that can help maintain oak forests to meet objectives for general forest health to provide wood products and other benefits. The specific actions used in a particular location will vary based on local site conditions, management goals, and climate risks. Additional actions are described in the [Adaptation Strategies and Approaches for Forests](#).

Condition	Adaptation Approach	Example Action
Invasive plants are present at low levels or nearby.	<ul style="list-style-type: none">2.2 Prevent the introduction and establishment of invasive plant species and remove existing invasive species	<ul style="list-style-type: none">Remove existing invasive species with mechanical treatment to promote the current plant communityUse monitoring to support early detection and rapid response to eliminate new infestations
High levels of invasive plants are affecting the natural or desired plant community	<ul style="list-style-type: none">2.2 Prevent the introduction and establishment of invasive plant species and remove existing invasive species	<ul style="list-style-type: none">Remove existing invasive species with mechanical or chemical treatment to promote the current plant community
Site exposed to wind	<ul style="list-style-type: none">3.3. Alter forest structure to reduce severity or extent of wind and ice damage.	<ul style="list-style-type: none">Use thinning or other silvicultural treatment to reduce tree density and increase the windfirmness of

Oak Resiliency Assessment Report



Report generated on: 12/09/2021



Downloadable PDF Report

Workshop Opportunities

**Wednesday,
January 19, 2022,
at 4 pm**

**Join us for a one-hour in-depth
workshop on how to use the tool
and contribute data to this project**



Questions?

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