Helping your New Jersey woodland adapt to a changing climate

Your woods are always changing and adapting. Events like storms, droughts, insect and disease outbreaks, or other stressors can damage trees or slow their growth. A changing climate makes your woods more susceptible to the problems these events can cause.

Within the last 100 years the Delaware basin has experienced changes in temperature and rainfall patterns that can have future environmental and economic impacts on woodlands. These trends are expected to continue and intensify for the foreseeable future; climate change adds another layer of complexity to the already large topic of forest management. For more information, read the full report.

Key actions

Manage for a healthy density.
Keep trees vigorous to better resist pests and survive in the face of disturbances. Practices like thinning or timber stand improvement reduce stress and keep forests at reasonable densities for a mix of species.

Diversify species. If planting, consider species likely to be successful decades into the future, like white or red oak. If using natural regeneration, consider how different trees spread their seeds, and what those seeds need to germinate and thrive. Talk to a forester, especially about more intensive forest management.

Choose drought resistant species when planting in areas prone to drought. Climate change may bring more frequent or longer summer droughts, even if annual rainfall increases. Techniques like using root gels or watering newly planted seedlings during a dry summer can help improve survival.

Diversify stand ages and structure. Stands of different ages and species will not all be susceptible to the same damage. Structure refers to the pattern of vegetation across space: Are there leaves and branches at all heights, or just in the canopy? Are there open areas next to dense areas? Or does the forest look the same across the whole property? Timber stand improvement, thinning, regeneration harvests, and planting all provide opportunities to create diversity, both within and between stands.

Build connectivity. Connected woodland parcels allow tree species and wildlife to migrate more easily, which encourages greater diversity and adaptability. Areas along streams are good places to plant or maintain forested corridors.

Learn how to control invasive species. The species, season, and desired control method all matter.

Control invasive vines. All invasive plants compete for light, water, and nutrients, but vines bring special problems. Watch for bittersweet, English ivy, honeysuckle, and—especially as temperatures warm—kudzu.

Manage deer. Too many deer usually results in too few young trees and the loss of the forest understory. If you don’t hunt, consider a hunting lease to control deer populations. New York, New Jersey, and Pennsylvania all have Deer Management Assistance Programs that make it easy to manage hunters on your land.

Design for wind. Timely thinnings can keep trees less susceptible to windthrow.

Plan fuel breaks. Having fuel breaks like well-maintained roads or a thinned area can make it more difficult for fires to spread.

Assess conditions quickly after a storm or fire, and act wisely; some actions are only possible or cost-effective soon after the damage. Contact a forester first.

Monitor for disease and insects. A small problem is easier and less expensive to control. Check the underside of hemlock branches for hemlock adelgid eggs; watch ash trees for dieback in the crown, pale peeling bark sections, and small D-shaped holes on the trunk; monitor beech trees for white “woolly” patches or dark spots that indicate beech bark disease.

Consider the possibility of increased future flooding when investing in management or land purchases along rivers and streams.

Ask your forester about federal, state, county, or non-profit programs to help pay for management.
What you can do

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<thead>
<tr>
<th>Climate change impact</th>
<th>Management option</th>
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<tr>
<td><strong>Shifting species distribution</strong></td>
<td>Trees have been slowly migrating northward (and higher in elevation) in the U.S. This trend will continue as temperatures warm, bringing some southern species to your property and creating poor conditions for northern species. Consider current and future conditions; diversify stand ages and structure; plant diverse tree species; build connectivity; identify and maintain species at southern extent of their range; choose drought resistant species; Increase monitoring; control invasive species.</td>
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<td><strong>Flooding, water quality problems, and aquatic habitat degradation</strong></td>
<td>More rain will fall in heavy storm events, which can lead to flooding and overwhelm culverts and drains. Higher flows can carry more sediment and cause more erosion. Plant, maintain, and expand riparian buffers; size culverts for higher peak flows; retain woody debris in streams; use best management practices when building roads and stream crossings; restore damaged streambanks with partner assistance.</td>
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<td><strong>Increased temperatures, drought, and fire</strong></td>
<td>Rising temperatures and longer summer droughts increase the risk of forest fire. Woodlands will also be more stressed and more susceptible to disease and invasive species, contributing to the spread of any fire. Remove unhealthy trees and reduce overcrowding; increase tree species diversity; interplant species tolerant of drier, warmer conditions; avoid planting in severe drought or plant in the fall when soil is moister; reduce loss of soil moisture; use vented planting tubes; plan fuel breaks; practice Firewise landscaping around your house.</td>
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<td><strong>Invasive species, pests, and disease</strong></td>
<td>Longer growing seasons and warmer winters, rising carbon dioxide, and shifting species distributions associated with a changing climate allow invasive species, pests, and disease to impact your woodland more severely than they do today. Monitor and remove invasive plants; remove or kill unwanted, invasive vegetation before planting seedlings or harvesting; clean your equipment and clothing; reduce deer populations to healthy levels; monitor for disease and insects; diversify stand ages and structure; reduce overcrowding.</td>
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Manage your woods

**Step 1:** Identify your goals and objectives

**Step 2:** Learn more about your woods
- NJ Forest Service
- NJ Guide to private forest management
- Rutgers forestry extension resources
- Warren County Soil Conservation District
- Sussex County Soil Conservation District

**Step 3:** Find a forester
- NJ List of approved foresters
- Association of Consulting Foresters directory
- Society of American Foresters directory
- The Forest Stewards Guild directory
- US Department of Agriculture list of Technical Service Providers

**Step 4:** Develop and implement a forest stewardship plan

Storing carbon in woodlands and wetlands

Forests naturally capture carbon dioxide from the atmosphere which is then stored as carbon in live trees, woody debris like fallen branches and the soil. Some actions to take are:

- Work with your forester to evaluate carbon storage potential
- Keep forests as forests
- Plan for longer intervals between harvesting
- Harvest wood and store carbon within wood products; identify locations for reforestation; reduce overcrowding of trees
- Protect existing wetlands on your property

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Map courtesy of Digital Vector Maps