Healthy Forest Tool

A tool that can help you assess the health of your forest or woodland so that you can steward it more effectively.

Whether you spend time in your woods or enjoy its beauty from your window, you most likely want to keep your woods healthy and resilient (able to recover from disturbances). Forests face traditional challenges such as insect and pest outbreaks. In addition, our climate is changing in ways that we have never experienced before, resulting in varying weather patterns, rising temperatures, and shifts in precipitation. Actions that you take today can help your forest survive the challenges to be resilient, healthy, and productive for generations to come.

There is no exact formula that makes a forest healthy and resilient. Rather, forest management involves the goals of the landowner, the current forest condition, and the characteristics noted in this assessment. Forest management is a long-term process, and knowing which forest characteristics indicate higher risk and which indicate good health is an important step in developing management strategies.

We recommend taking a walk in your woods with your local forester or a peer, such a Master Forest Owner, as you fill out this field survey. The results can help you identify important next steps in keeping your woods healthy. For background on how to use the results of this assessment, see: ForestConnect | Connecting Woodland Owners with Knowledge (https://blogs.cornell.edu/cceforestconnect/forest-health-and-resilience/)

The Nature Conservancy | NIACS Northern Institute of Applied Climate Science | Cornell Cooperative Extension Onondaga County | Cornell Cooperative Extension Columbia and Greene Counties

Tips on Using This Tool

This tool is meant to guide conversations about forest management, not to provide a comprehensive woodlot inventory. Please use it as a starting point to make observations and facilitate conversations about forest health.

FOR LANDOWNERS: You can use this tool even if you are brand new to forest management. For example, although you may not be able to identify all the species in your forest, you can probably tell roughly how many different tree species there are and therefore estimate species diversity.

FOR MASTER FOREST OWNERS AND FORESTERS: The assessment can help direct and frame conversations with landowners. It can be helpful to point to forest conditions that are healthy, as well as identify areas that need attention. The tool can also highlight noteworthy conditions on the property, recognition of which can increase landowners' confidence and knowledge base.

The evaluation of forest health is an inexact science, and different people may interpret conditions and estimate risk differently. The following examples may help as you consider how to characterize your forest's health.

The top picture to the right shows a forest with at least a few different tree species, suggesting a medium risk rating for tree diversity and health. In terms of forest structure, there are not many age classes represented, but there is some large coarse woody debris, which is a positive feature. Characteristics that suggest higher risk include low regeneration (few seedlings and saplings) and a lack of structural diversity (few large trees).

The forest in this bottom picture has a diversity of tree sizes, including some large trees and saplings, and several different tree species. However, beech bark disease is present and is the main forest characteristic impacting this area's health and resilience.

Keep in mind that there are no right or wrong answers when using this tool, and your assessment may change over time due to your changing goals and knowledge or due to changes in the forest. This tool is a way for landowners and forest advisors to balance the complexities of forest management in a structured and consistent way. It is not meant to be prescriptive, but instead to serve as a guide. We encourage you to use the assessment as a way to explore your woodlot and to work with forest professionals to develop management strategies based on your goals.

TAKING ACTION

Now that you have completed the assessment, share this information with your forester. High-risk areas should be addressed first, and your forester can help identify the forestry practices that improve resilience and fit into your long-term plan. A forester can also help you prioritize activities over time. Remember, any action you take to address high-risk areas improves the health of your woodlot. Visit ForestConnect | Connecting Woodland Owners with Knowledge to read about specific strategies to address risks.

TOP TO BOTTOM © Anthony D'Amato; © Greg Sargis/TNC

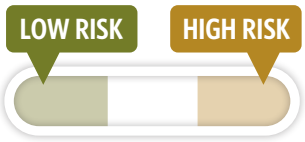
Forest Health Field Survey

TREE DIVERSITY AND HEALTH

A healthy forest contains a variety of tree species that are well suited to current local conditions and future climate conditions. This diversity tends to make it more resilient to insect pest and pathogen outbreaks and to climate changes. Check the box that describes your forest on the scale from low risk to high risk.

Species Diversity

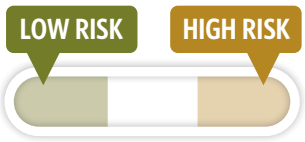
Many tree species are present,without a single species being dominant.



One or few tree species are present. The forest has low species diversity in the canopy or throughout the forest.

Tree Health and Growth

Most trees are healthy and free of insect and disease damage. There are no nearby outbreaks. A majority of trees seem to be growing without signs of stress.



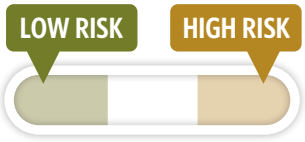
Many trees have been damaged by insect pests or diseases. There are looming threats such as nearby outbreaks. Many trees have poor growth form (split trunks, missing crowns, leaning) from past disturbances such as logging or ice/wind storms.

FOREST STRUCTURE

A healthy forest structure includes a diversity of tree species and sizes, varying number of trees per acre, and dead wood. Standing dead trees attract wildlife, while dead wood on the ground is forest soil in the making. These conditions also help a forest recover quickly from a disturbance. Check the box that describes your forest on the scale from low risk to high risk.

Tree Size and Age Class Diversity

The trees are all different sizes and there are many vertical layers (e.g., an overstory and an understory). Large legacy trees (>16 inch DBH*) are present throughout the woods.

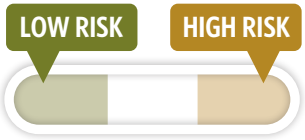


Most of the trees are a single age or size. There are no large legacy trees (>16 inch DBH*).

**DBH = diameter at breast height, a standard measurement for tree girth*

Tree Crowns and Spacing

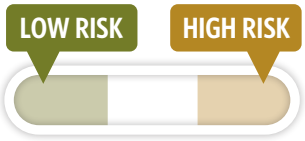
Trees have adequate growing space and have large, healthy crowns. Most trees have full crowns.



Trees are either crowded and competing for growing space, or they are too widely spaced.

Standing Dead Trees

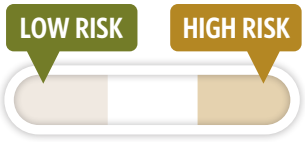
There are several standing dead trees per acre, and some are large (>16 inch DBH). There are signs of cavity-nesting birds such as woodpeckers.



There are no or few large (>16 inch DBH) standing dead trees.

Woody Material on the Ground

There are noticeable amounts of dead wood, especially large logs (>16 inch diameter), on the forest floor.



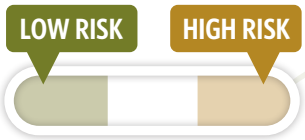
There is little woody material, especially large logs (>16-inch diameter), on the forest floor.

FOREST REGENERATION

Regeneration refers to the young trees that will grow into the future forest. These small trees are crucially important because they are the future future forest. Small sapling grow over the course of time (50 to 75 years) and are recruited into the forest canopy. Seedlings and saplings should be present in gaps in the forest canopy where light and growing space are available. It is important to protect them from challenges like invasive plants and deer browse. Check the box that describes your forest on the scale from low risk to high risk.

Regeneration Density and Growth

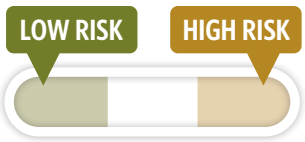
Tree seedlings and saplings are present, and the species mix is desirable.



Tree seedlings or saplings are absent.

Interfering Understory Plants

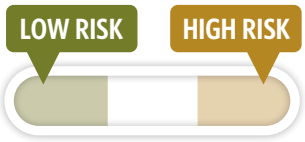
Interfering plants or invasive species are absent or are confined to small areas.



Plants such as buckthorn, multiflora rose, autumn olive, beech saplings and dense ferns, and garlic mustard are common in the forest and may impede the establishment and growth of natural regeneration.

Deer Browse

Deer browse does not pose a substantial challenge to tree regeneration.



Moderate to severe deer browse is creating substantial challenges for tree growth and recruitment.

Principles of Resilient Forest Management

1. KEEP FORESTS AS FORESTS.

Larger and more connected forest blocks tend to be more resilient and less impacted by stressors such as invasive plants. Aim for the long-term protection of your forest, soils and water resources on your land by considering long-term protection tools like conservation easements and legacy planning. Consider updating your forest management plant to include resilient characteristics. Ensure that rare or unique species and communities are managed and protected.

2. REDUCE STRESSORS.

The changing climate is expected to create more attractive conditions for invasive species and forest pests and pathogens that often outcompete native tree species or even render them functionally extinct, like Chestnut Blight. A diverse forest with strong, healthy trees may be able to withstand threats from pests and disease and provide a future seed source. Young tree seedlings are the future of the forest and often the tastiest morsels for your local deer population. By protecting younger trees, you will help your woodland to be more adaptable to changing conditions in the future.

3. ADDRESS VULNERABILITIES.

As the climate changes, conditions for current tree species will change, too. Hedge your bets and have a variety of native tree species present in your woods, so eventual “winners” will be ready to thrive. If your focus is on maintaining a single tree species, you run the risk of that species being unable to handle future conditions – and your whole forest may lose out. A diverse forest structure is just as important as the individual species. A woodland with all the same size trees can also be at risk. Keeping a good population of young trees, middle-aged trees and old trees will not only provide diverse places for wildlife to live today, but it will also enable your woods to handle a variety of situations in the future.