

The **eastern white pine** tree is a crucial ecological and economic component of forests in the eastern U.S.

*White pines provide critical food and shelter for wildlife and store carbon. They also provide valuable lumber and are commonly used for reforestation, landscaping, and Christmas trees. The potential economic value of standing white pine is \$18.6 billion.*

Eastern white pines have experienced **unprecedented damage** in recent years due to pests, pathogens, climate change, and more. Stressors vary from region to region, and many stressors have received little or no attention. Symptoms can be difficult to recognize and quantify because they often emerge slowly and can have multiple causes.

*Through aerial surveys, scientists mapped thousands of acres of eastern white pine trees damaged by foliar diseases. In one region of Georgia's Chattahoochee National Forest, nearly half of the eastern white pine trees are dead.*

To tackle the complexity and extent of eastern white pine health issues, collaboration is needed. A team of **scientists from land-grant universities and the U.S. Forest Service** is making a targeted effort to recognize and quantify eastern white pine health issues and test and recommend treatments and preventative practices now and for the future. This work helps sustain eastern white pine forests--and the services and products they provide.

*Multistate collaboration provides the expertise needed to assess species-wide issues and the opportunity to identify knowledge gaps, guide research and Extension, standardize protocols, share tools and facilities, leverage funding, and avoid duplication. In these ways, collaboration increases efficiency, productivity, and reliability. It also fosters widespread outreach so solutions can be applied everywhere white pines grow.*



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## Research Highlights

Using aerial and on-the-ground surveys, researchers **measured** the incidence, range and severity of disease symptoms and damage in white pine trees in the eastern U.S. and **monitored** the fate of symptomatic trees. Scientists assessed how site conditions, such as forest structure and composition, topographic features, land use history, soil conditions, and climate, affect tree health. They also examined interactions between insects, fungal pathogens, cankers, and tree health.

Researchers **estimated economic losses** due to eastern white pine health issues. In particular, researchers quantified reduction in lumber yield and grade due to health issues and incorporated these data into **market models**. These models have been used extensively by the lumber mill operators nationwide to understand how various factors (like specific pests and diseases) affect wood supply. These models help the industry prepare for possible future scenarios and help legislators assess the potential impacts of proposed policies.

This committee **developed and shared management recommendations** to improve white pine resilience, mitigate disease outbreaks and damage, and reduce economic losses. **Field guides, educational materials**, meetings, special journal issues, and hands-on **trainings** helped scientists, forest managers, woodland owners, arborists, and the public understand eastern white pine health issues and how to prevent and ameliorate them. For example, **24 forest health specialists from 19 eastern states** received direct mailings from the committee. **Managers of 10 forests in eight states** (Maine, New Hampshire, Massachusetts, New York, Wisconsin, Minnesota, Virginia, and North Carolina) have agreed to consider options for improving eastern white pine health in their forests. The committee also encouraged state agencies to host demonstrations that show how to improve eastern white pine management.

## Project Funding

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