

FOREST CARBON MANAGEMENT PRINCIPLES

Bureau of Forestry



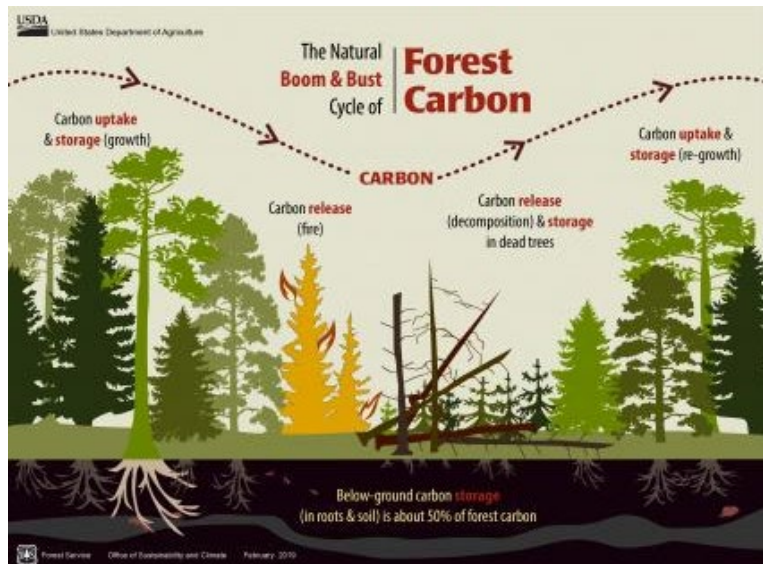
Forests actively capture and store carbon from the atmosphere and are a critical resource for addressing climate change. Pennsylvania's forests hold approximately 1.5 billion tons of carbon. The Department of Conservation and Natural Resources (DCNR) Bureau of Forestry recommends the following principles for managing forests to enhance their capacity to store and sequester carbon, while keeping them healthy and resilient.

Keep Forests As Forests

Minimizing the changing of forests to non-forests is important to maintaining large carbon pools across the landscape.

Healthy Forests Sequester and Store More Carbon

Forest longevity and resiliency depends on health. Prescribed fire, sustainable timber harvesting, and practices to address forest threats such as invasive plants, insects, diseases, and wildfires all help keep our forests healthy, resilient, and sequestering and storing carbon.



Plant Trees

Planting trees anywhere, but especially in urban areas, along streams, and abandoned mine lands, is one of the best ways to promote many environmental and social benefits, including carbon storage.

Conserve and Enhance Wetlands

Wetlands capture atmospheric carbon and store it in their living and dead plants and soils. It is important to conserve wetlands and restore them when possible. Healthy, functioning wetlands store carbon in their vegetation, peat, litter, soils, and sediment.

Regenerate and Restore Vigorous Young Forests

Regenerating and growing new forests is important in keeping sites productive. Young forests capture carbon quickly. These young trees and forests also enhance or restore a variety of habitats.

Conserve and Enhance Old Growth and Late-Successional Forests

Mature trees and forests continuously capture carbon, which is stored in wood, roots, and soils. The older and healthier a forest, the more carbon it can sequester and store. Conserving old growth forests and enhancing the growth of late-successional forests can increase carbon benefits. A mix of older forests and younger forests across the landscape is vital for forest health and habitat benefits. In some cases, extending harvest rotations of healthy, mature forests can enhance carbon storage.

Support the Use of Durable Wood Products

Durable wood products such as construction materials, cabinets, furniture, and flooring continue to store carbon for the life of those products. Durable wood products can be a better alternative to more carbon-intensive products like steel or concrete.

Practice Sustainable Forest Management for Carbon Benefits

Sustainable forestry (silviculture) and industry-accepted best management practices (including third-party certification), increase forest health and resilience and promote the use of durable wood products.

Protect Soil Health

Soils are a significant carbon pool and should be managed carefully. Limiting soil disturbance or loss during forest operations and restricting activities in riparian buffer zones protect soil health.

Learn, Plan, Monitor, and Adapt

The science of carbon management continues to evolve. Learning more about our forests, planning for success, monitoring impacts, and continuously adapting will help our forests remain healthy, resilient, and storing carbon in the long term.

The Bureau of Forestry is taking action to enhance carbon storage on state forest and private forest lands with these tools and actions:

DCNR's Climate Change Adaptation and Mitigation Plan

Developed with the Northern Institute of Applied Climate Science (NIACS), the Climate Change Adaptation Plan outlines 123 action steps to be undertaken to make the Commonwealth more resilient to potential impacts from a changing climate.

Protecting Forest Health

A healthy forest sequesters and stores more carbon than an unhealthy forest. The bureau aggressively treats forest health threats, such as spongy moth, hemlock woolly adelgid, and invasive plants, to ensure the longevity, resiliency, and carbon storage capacity of our forests.

Resilience-Enhancing Land Conservation

The bureau purchases forest land to add to the state forest system. Parcels that help build connected and resilient landscapes are prioritized for acquisition.

Restoration and Renewal

The bureau actively restores degraded lands, such as riparian areas, abandoned oil and gas infrastructure, and mine lands. Restoring these areas with trees builds roots, healthy soils, and vegetation. The bureau also creates and restores approximately 15,000 acres of young forests each year as part of its sustainable timber harvesting program.

Old Growth Conservation, Inventory, and Assessment

The bureau protects old growth and older forests on state forest lands, including more than 500,000 acres of projected old growth areas. The Pennsylvania Natural Heritage Program is producing a rapid identification protocol of old growth characteristics in Pennsylvania forests. The protocol will help define and improve inventory of forests with old growth characteristics across the state.

Collaborative and Sponsored Carbon Research

The bureau actively collaborates and sponsors carbon research. Through grants from the USDA Forest Service, NE Climate Hub, US Climate Alliance, and internal research funds, the bureau is engaged in modeling management practices to determine the environmental and economic impact of carbon strategies and developing carbon quantification models for the state of Pennsylvania.

Wetland Conservation Plan

Wetlands are critical carbon sinks as they store carbon in their living and dead plants and soils. The bureau protects wetlands on state forest lands and is developing a comprehensive wetland plan to protect and enhance wetlands and thus enhancing carbon storage potential.

Enhancing Carbon Benefits Through Silvicultural Practices

The bureau is working with certifying entities such as the Sustainable Forestry Initiative and Forest Stewardship Council to adjust management practices on state forest to maximize forest health, resilience, and carbon storage.

Carbon in Our Communities

Trees and forests capture and hold carbon not only in our expansive forested rural regions, but in our suburban and urban communities as well. The bureau administers several key programs, such as the Urban and Community Forestry program and the Keystone Tree Fund, to connect communities with resources to plant trees and experience the carbon and other benefits that come from having trees and forests in our built environments.

Partnerships on Private Land

Much of the bureau's work on private lands is done alongside partner organizations, such as reforesting streamside buffers and urban green spaces. The bureau also promotes carbon storage using many of the approaches used on state forest lands. One example is The Nature Conservancy's Working Woodlands Program, which develops management plans for private landowners to sustainably manage their forests.

For more information:

Visit www.dcnr.pa.gov or email PaForester@pa.gov

[DCNR's Climate Adaptation Plan](#)

[Northern Institute of Applied Climate Science](#)

[Working Woodlands Program](#) (The Nature Conservancy)

[Family Forest Carbon Program](#) (American Forest Foundation and The Nature Conservancy)
