



Virginia Master Naturalist Program Basic Training: Forest Ecology and Management Presentation Handout

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Overview

This handout is meant to be used with Forest Ecology and Management training as part of the Virginia Master Naturalist Basic Training Course. It is designed to align with other [Forest Ecology and Management curriculum materials](https://www.virginiamasternaturalist.org/training/basic-training/forest-ecology-and-management/) (<https://www.virginiamasternaturalist.org/training/basic-training/forest-ecology-and-management/>).

Forest Basics

Forest Benefits

Some of the many benefits and ecosystem services forests provide include improving air quality, sequestering carbon, buffering waterways, protecting drinking water, reducing erosion, providing storm surge protection, providing wildlife habitat, providing lumber and wood products, and providing recreational and economic opportunities.

Forest Ecology Basics

- Vertical structure — Forests have layers that include the forest floor, herbaceous plants, shrubs, understory trees, and the canopy.
- Age structure — May be even-age, two-age, or uneven-age.
- Factors that influence where forests grow and the distribution and diversity of trees within them: soils, slope degree and aspect, light penetration, and disturbance such as fire, disease, timber harvesting, and deer browsing.
- Forest communities are always changing through a process called *succession*, which is the change in species composition over time.

Forest Types in Virginia

Approximately 62% of Virginia is covered in forest, 60% of which is privately owned by individuals or families.

Oak-hickory

- Most extensive type of upland hardwood community (Figure 1).
- Dominant trees — various oaks and hickories, as well as beeches, maples, and tulip poplars.
- Understory trees/shrubs — dogwood, sassafras, redbud, serviceberry, spicebush, mountain laurel, rhododendron

Bottomland hardwoods

- Throughout Virginia on floodplains, riparian areas, and low-lying wet areas.
- Dominant trees — willow oak and other oaks, tupelos, and bald cypress on the coastal plain; sycamores, ashes, and red maples further west.
- Understory trees/shrubs — buttonbush, sweetspire, greenbrier, poison ivy

Southern pine

- Found throughout much of the coastal plain and piedmont.
- Dominant trees — loblolly and shortleaf pines; longleaf pine restoration efforts are underway
- Understory trees/shrubs — Sparse, but may include viburnums, dogwood, young hardwoods

White pine

- Found from the Blue Ridge west, sometimes in pure stands.
- Dominant trees — white pines, sometimes with tulip poplars, oaks, hemlocks, hickories.

- Understory trees/shrubs — Sparse, but may include blueberries, mountain laurel, wild azaleas

Oak-pine

- Transitional stage between early successional pines and later successional hardwood forest that can be maintained with fire.
- Dominant trees — various pines and oaks, as well as tulip trees, maples, and gums.
- Understory trees/shrubs — sourwood, dogwood, hollies, mountain laurel, blueberries.

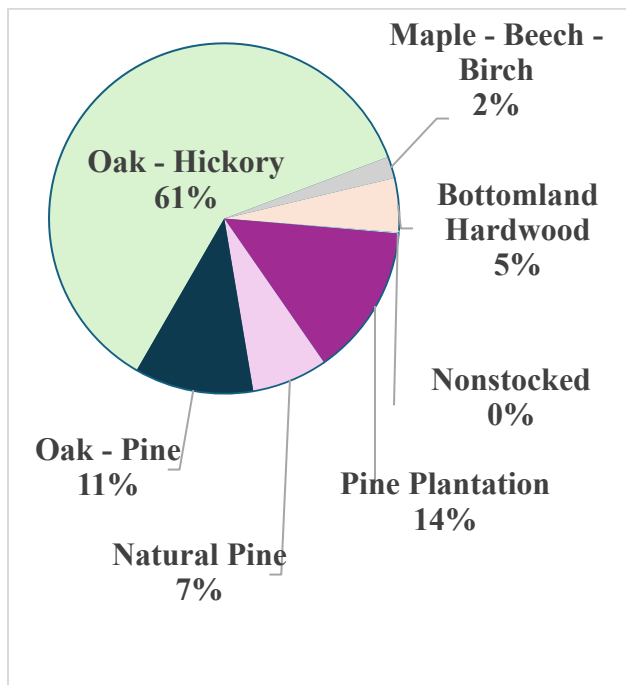


Figure 1. Forest types in Virginia. (2024 Virginia Department of Forestry State of the Forest Report.)

Threats to Virginia's Forests

- Development — Parcelization and fragmentation and conversion of forest to non-forest uses are decreasing the amount of forestland in Virginia.
- Climate change — Changing temperatures and rainfall patterns will likely lead to range shifts for tree species and potential stressors that may affect disease susceptibility.
- Invasives — Exotic plants, insect pests, and diseases are significant threats to forest health.

- Historical extraction — High grading or selective cutting removes the best trees and leaves a degraded forest.

Forest Management

- Silviculture is the art and science of managing a stand of trees to meet specific objectives.
- Forest management begins with a plan that is based on the objectives of the landowner. Those objectives could include any manner of forest uses (e.g., harvesting timber, recreating) and conservation goals (e.g., providing wildlife habitat, protecting a water source.)
- Silvicultural systems focus on the future of the stand, rather than what you are removing. They may include site preparation, regeneration, intermediate treatments such as thinning, and harvesting.
- The intensity of the management needed depends on the objectives. Some objectives, such as enhancing biodiversity, may require little or no input. Other objectives, such as producing timber quickly, may require high inputs.

Example Forest-related Service Projects for Virginia Master Naturalist Volunteers

- Educational programs and interpretive walks about the importance of forests, forest ecology, or forest management for any audience
- Planning and installing interpretive trails and signs about forests
- Stewardship, education/interpretation, and citizen science at VDOF State Forests
- Monitoring and reporting of emerging invasive species and diseases (specific projects vary over time)
- Project Learning Tree environmental education or facilitation
- American Chestnut surveys and stewardship with The American Chestnut Foundation
- Invasives management or other stewardship in forests
- Urban forestry projects such as tree plantings

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