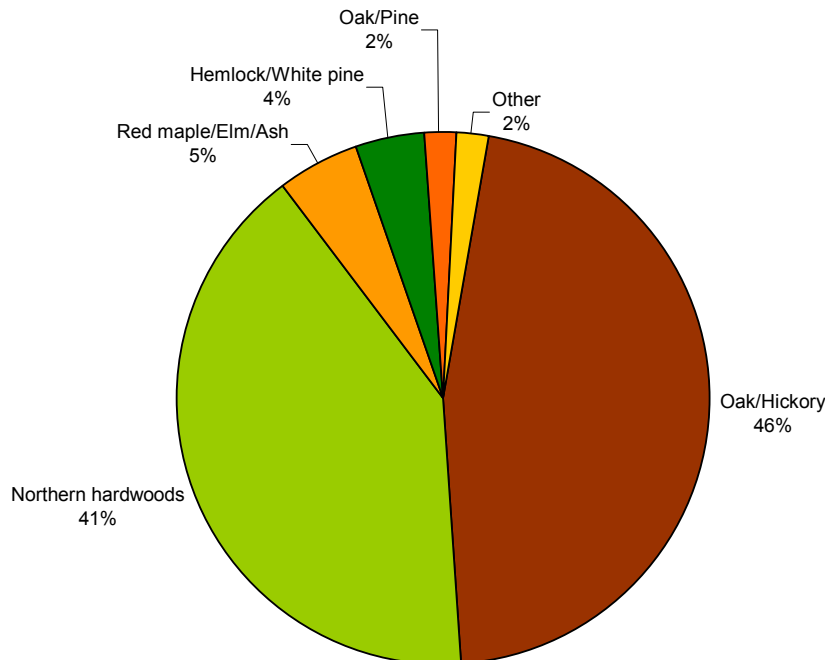


Forest Types of Pennsylvania

A forest is a community of many plant and animal species along with fungi, bacteria and other microorganisms interacting in complex ways with each other and their physical environment. Forest plant communities are, by definition dominated by one or more tree species.

Each forest site is unique. But for practical study, researchers sort the complicated diversity of nature into artificial categories called forest types. Different publications have delineated as few as five to over fifty Pennsylvania forest communities for different purposes. For our purposes, we will focus on three very general forest types: Northern hardwoods, (also called maple-beech-birch), oak-hickory and oak-pine. As the names imply, these types are based on the species of trees that form the majority of the highest canopy in a forested area.

Major Forest Types of Pennsylvania



Based on USDA Forest Service Resource Bulletin NE-158 Nov. 2002

Northern hardwoods (maple/beech/birch) are forests in which sugar maple, American beech, sweet birch and yellow birch, black cherry, and red maple, singly or in combination, make up most of the canopy. Other trees common, but found in smaller numbers include white ash, eastern hemlock, white pine, basswood, aspens, and northern red oak.

Common shrubs of the northern hardwood forest include rhododendron, moosewood, witch-hobble and mountain holly. Canada mayflower, starflower, and painted trillium bloom in the understory. Black-throated blue warbler, northern saw-whet owl and solitary vireo prefer the northern hardwood forests. Emblematic mammals include snowshoe hare, northern flying squirrel and porcupine.

Stands of northern hardwoods cover about 41% of the Commonwealth, occurring in the cooler northern counties and at higher elevations along the Allegheny plateau in Jefferson, Clearfield, Indiana and Cambria Counties. The northern hardwoods community tolerates cooler and moister conditions than the oak/hickory type but there is considerable mixing of the two in some areas. The average number of days without a killing frost seems important in separating the groups. In

Forest Types of Pennsylvania

Pennsylvania the oaks dominate where there are more than 140 day frost free days in the growing season.

Oak / hickory forests are the most abundant types in Pennsylvania, making up about 46% of the total forested land. Oak forests cover rolling hills and ridges in most of the southern two-thirds of the Commonwealth and follow the North Branch of the Susquehanna and Allegheny River valleys north into New York. The dominant trees on the drier soils of the ridges are chestnut oak, scarlet oak and black oak mixed with pignut hickory, black gum, sugar maple and red maple. On moist lower slopes, northern red oak and white oak are more common with tuliptree, white pine, sweet birch, red maple, mockernut and shagbark hickories in significant numbers in many areas. Pines or eastern hemlock make up less than 25 percent of the canopy.

The shrub layer on drier upper slopes is commonly dominated by mountain laurel, huckleberries and blueberries. Viburnum species and spice bush are more common on moist sites.

The herbaceous layer is highly variable. Most of the wildflowers of this forest community bloom in the spring before the oaks leaf-out and shade the forest floor. Wild turkey and bluejays, gray squirrels, chipmunks and many other creatures feed on the acorns and hickory nuts produced by the mixed oak forest.

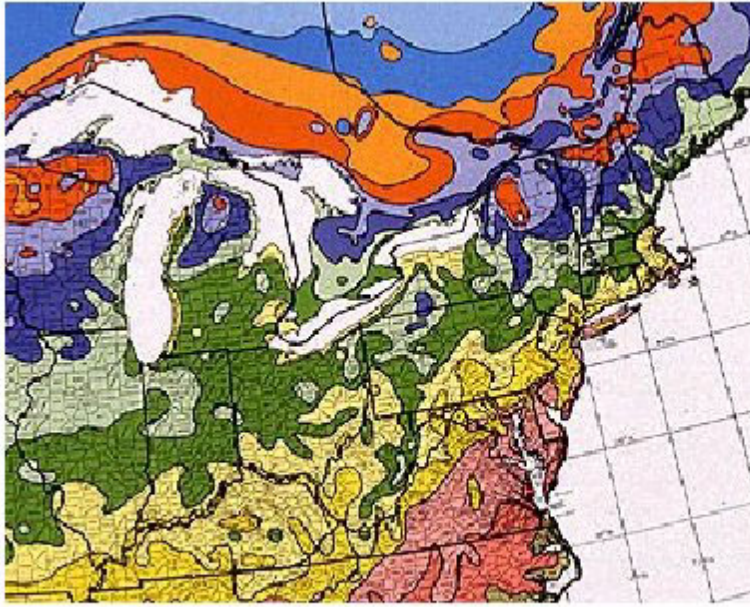
Oak / pine forests are found on acidic sandy soils on ridgetops from 1200-2200 feet elevation, and dry southern exposures across the Ridge and Valley Physiographic Province and on the Pocono plateau. They make up only two percent of the State's forested land. Chestnut oak, scarlet oak and black oak are dominant canopy trees. Pitch pine, eastern white pine, and Virginia pine sometimes with small numbers of table mountain pine, short-leaf and red pines contribute 25 to 50 percent of the canopy. Scrub oaks and heaths often form the understory. Pine warblers and prairie warblers favor these sites.

The interaction of three major factors determine the type of forest cover that develops on any particular site: temperature, precipitation and topography.

Temperature. For plant communities the most important temperature factors are the minimum winter temperatures and the length of the growing season between the last spring freezes and the first frosts of autumn. Plant biologists combine these factors into indices called "plant hardiness zones". An example from the USDA Plant Hardiness Zones map is shown.

Note that conditions in the plant hardiness zones become harsher as one progresses further north in latitude or higher in elevation. These two elements combine to determine the extent of the various zones in Pennsylvania.

Forest Types of Pennsylvania



| Average Annual Minimum Temperature | |
|------------------------------------|------|
| Temperature (F) | Zone |
| Below -50 | 1 |
| -45 to -50 | 2a |
| -40 to -45 | 2b |
| -35 to -40 | 3a |
| -30 to -35 | 3b |
| -25 to -30 | 4a |
| -20 to -25 | 4b |
| -15 to -20 | 5a |
| -10 to -15 | 5b |
| -5 to -10 | 6a |
| 0 to -5 | 6b |
| 5 to 0 | 7a |
| 10 to 5 | 7b |
| 15 to 10 | 8a |
| 20 to 15 | 8b |
| 25 to 20 | 9a |
| 30 to 25 | 9b |
| 35 to 30 | 10a |
| 40 to 35 | 10b |
| 40 + | 11 |

From The 2003 US National Arboretum "Web Version" of the USDA Plant Hardiness Zone Map
USDA Miscellaneous Publication No. 1475, Issued January 1990

Precipitation. Pennsylvania averages about 42 inches of rain each year with promotes forest growth statewide. The prairie states of the Midwest average less than 35 inches per year. What happens to the precipitation as it interacts with soil and topography determines which species of trees dominate a site.

Topography. Elevation, slope and the direction a slope faces all effect the microclimate for plants on any site. As discussed above, the height above sea-level will effect the temperature. Growing conditions also vary from the top of a hillside to the valleys surrounding it. The ridge top is exposed to drying winds and the soils are typically thinner and drier. Eroding soil and water both move down slope with gravity, so that soils will be deeper and moister at the base of the slope than further up. South facing slopes receive more direct sunlight than north facing ones and so are warmer and drier. As a result, chestnut oaks are more common on the upper slopes and south facing hillsides while hemlocks and birches are more typical of valley bottoms. In the valleys, depressions in the topography collect water leading to the formation of wetlands.