MANAGEMENT ACTIVITY SCHEDULE (by Year)

Year Planned	Mgmt Unit #	Location #	Sequence	Practice Description	Acres	Fence Perimeter (lin.ft)	NRCS Practice Code	NRCS Scenario #
2017	1			ADA accessible walkway and platform				
2017	2	1 and 2	1	Low Shade Removal	42.2		647	6
2017	4		1	Low Shade Removal	5.8		647	6
2017	4		3	pre-emergent herbicide for MAM, stiltgrass and garlic mustard seedbank	5.8		490	5
2017	6	b		Determine needs of fence "b" and implement asap				
2018	2	2 and 3	1	Low Shade Removal	48		647	6
2018	4		4	Herbicide spicebush, witch-hazel, bb, rm, fern and invasives before	5.8		490	3
2018	5		1	Herbicide intefering understory vegetation and invasives	58		490	3
2018	5		2	Fence	32	7,100	382	50
2018	6	a,c		Dismantle fences "a" and "c"				
2019	2	1	2	Fence	33	6,000	382	50
2019	2	1	3	Herbicide fern, spicebush, pawpaw, invasives before planting	40		490	3
2019	2	3 and 4	1	Low Shade Removal	48		647	6
2019	4		2	Fence	5.8	2,000	382	50
2019	4		5	Planting : shade-tolerant species (200 seedlings/acre)	3		612	40
2019	5		3	Plant 2000 conifers	10		612	40
2020	2	1	4	Planting : shade-tolerant species (200 seedlings/acre)	8		612	40
2020	2	2	2	Fence	16	3,700	382	50
2020	2	2	3	Herbicide fern, spicebush, pawpaw, invasives before planting	21		490	3
2020	2	4 and 5	1	Low Shade Removal	48		647	6
2020	2	4	3	Herbicide fern, spicebush, pawpaw, invasives before planting	49		490	3
2021	2	2	4	Planting : shade-tolerant species (200 seedlings/acre)	5		612	40
2021	2	3	2	Fence	59	7,100	382	50
2021	2	3	3	Herbicide fern, spicebush, pawpaw, invasives before planting	68		490	3
2021	2	5	1	Low Shade Removal	23.8		647	6
2022	2	3	4	Planting : shade-tolerant species (200 seedlings/acre)	13		612	40
2022	6	d,e		Assess progress of regeneration in fences "d" and "e" / update dismantle date				
2022	7			Evaluate and update desired course of action for this mgmt unit				
2026	2	1	5	Mast Tree Release	33		TBD	
2026	2	2	5	Mast Tree Release	16		TBD	
2026	2	3	5	Mast Tree Release including group selections around white pine	59		TBD	
2026	2	4	4	Mast Tree Release including all White Pine	49		TBD	
All	1			trail system - determine location and amount on a yearly basis				
All	1			Catelog and label 100-200 high risk trees over next 10 years				
All	1			Underplant cateloged trees with seedlings, protect with fencing				
All	1			Encourage shade-tolerant species - determine location and amount on a yearly basis				
All	2	All		Maintain fence perimeters as needed				
All	3			Standard activities when appropriate				
All	5		4	herbicide and plant as resources allow - determine location and amount on a yearly basis			TBD	
All	6			Maintain fence perimeters as needed				
All	6			monitor and continue to remove problem vegetation - determine location and amount on a yearly basis			TBD	
All	7			Standard activities when appropriate				
All	8		1	Standard activities when appropriate				
Any	9		1	"Environmental Corridor" Project				
TBD	2	4	2	completion of pervious fences	TBD	TBD	382	50

APPENDIX A

STRATEGIC PLAN

The Clarence Schock Memorial Park at Governor Dick

Strategic Plan

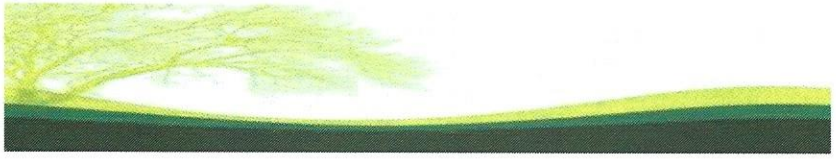
2016-2021

Summary

This five-year strategic plan was developed by the Clarence Schock Memorial Park at Governor Dick Strategic Planning Committee in June, 2016. The committee received oversight from the Clarence Schock Governor Dick Trust Board of Directors: Raymond Bender, Chairman; Dave Eichler, Vice-chairman; Frank Eichler; Harrison Diehl; Charles Allwein and Tom Harlan. The committee members were Jane Gockley, Diana Sprucebank, Adam Hartman, Fred Long, and Audrey Wells.

The purpose of the strategic plan is to build on Clarence Schock Memorial Park's strengths and assets and to provide guidance to the board and staff during the upcoming five years. By following the *Director's Guide to Best Practices* and referring to the *Peer-to-Peer Consult Final Report* by DCNR Peer-to-Peer Consultant Francis Velasquez the Strategic Planning Committee identified four priority goals that will guide the organization's future activities.

The planning process included reviewing Francis Velasquez' assessment of our strengths, weaknesses, opportunities, and threats (SWOT) and comparing that assessment to the SWOT analysis done by each committee member. Current mission and vision statements were reviewed and updated with better wording while a brand-new values statement was drafted. This review led to the development of four strategic goal areas: Environmental Education, Recreation, Conservation, and Funding. The committee subsequently has drafted objectives for each of these goals.



Mission, Vision, and Values Statements

Mission: Clarence Schock Memorial Park at Governor Dick provides use of park land as a public park and playground while maintaining and preserving it as a forest forever in accordance with the terms of the Clarence Schock Deed of Trust. In this capacity, it conserves and manages park lands and offers a variety of recreational and educational opportunities.

Vision: Clarence Schock Memorial Park at Governor Dick strives to be the county leader in environmental and conservation education, local history interpretation, and outdoor recreation. Programs in these areas reflect strong stewardship principles and sound management of resources with a commitment to public service.

We value:

- Integrity and honesty.
- Commitment from the board, staff, volunteers, and visitors to do what is best to promote and maintain the park.
- Sound and authentic environmental education programs that cultivate attitudes of responsibility for and conservation of our natural resources.
- Respect for all life.
- Personal experience in nature. This promotes the physical, emotional, intellectual, and spiritual health of people of all ages and encourages a lifelong conservation ethic.
- Good stewardship that will ensure the sustainability of our park's resources, local resources, and the earth.
- Safe and responsible use of park resources.

Strategic Plan 2016-2021

Clarence Schock Memorial Park at Governor Dick, Mt. Gretna, PA

GOAL I: Be Lebanon County's leader in environmental and conservation education.

Objectives:

a. Expand our educational programs and services to reach broader audiences of all ages.
b. Build our capacity, i.e., board, staff, and funding, to serve the community, schools, future members, and others.
c. Expand educational programs with an emphasis on environmental ethics and respect for the natural world.
d. Incorporate high-quality interpretive displays in the Environmental Center and on the trails.
e. Increase involvement and visibility in the local communities by participating in community-wide events.
f. Develop partnerships with local businesses and community groups to support large events.
g. Improve facilities to accommodate large groups, i.e., provide more restrooms.
h. Promote awareness and knowledge of the natural world through digital and electronic media, particularly with QR codes on trail signs.
i. Revitalize all school programs, on campus and off, to be developmentally appropriate, to meet state academic standards, and to accommodate more school groups from Lebanon County and neighboring counties.
j. Place directional signs at roads leading to the Environmental Center.

GOAL II: Provide a safe natural area where people can connect to the natural world.

Objectives:

a. Maintain the trail system with vigilance as use increases.
b. Develop programs that encourage the use of trails for nature study as well as for physical, mental, and spiritual fitness.
c. Broaden community awareness about the relationship between a high-quality life and a healthy environment.
d. Pursue new recreational opportunities within the park.
e. Provide safe and ample parking near route 72. (Ray)

GOAL III: Set the example for environmental stewardship and conservation by protecting our natural resources.

Objectives:

a. Promote recreational uses that are compatible with the sustainability of the natural resources at Governor Dick Park.
b. Follow the recommendations of the Forest Stewardship Plan prepared by a certified forester.
c. Provide programs that explain forest management and its benefit to wildlife and the forest.
d. Increase the involvement of volunteers for trail maintenance.

GOAL IV: Develop capital and revenue streams that support our mission, operation, and longevity.

Objectives:

a. Increase funding through a membership program whereby individuals may financially support our mission.
b. Increase funding through sales of climbing gear, tee shirts, and other items.
c. Hold an annual fundraising event.
d. Incorporate large events for fundraising, i.e., night bike rides, 5K race, a summer day camp, and others.
e. Explore increasing support from the community and corporations.
f. Develop annual sources of income to grow the principle of our endowment.

APPENDIX B

SILVAH – DEFINITION

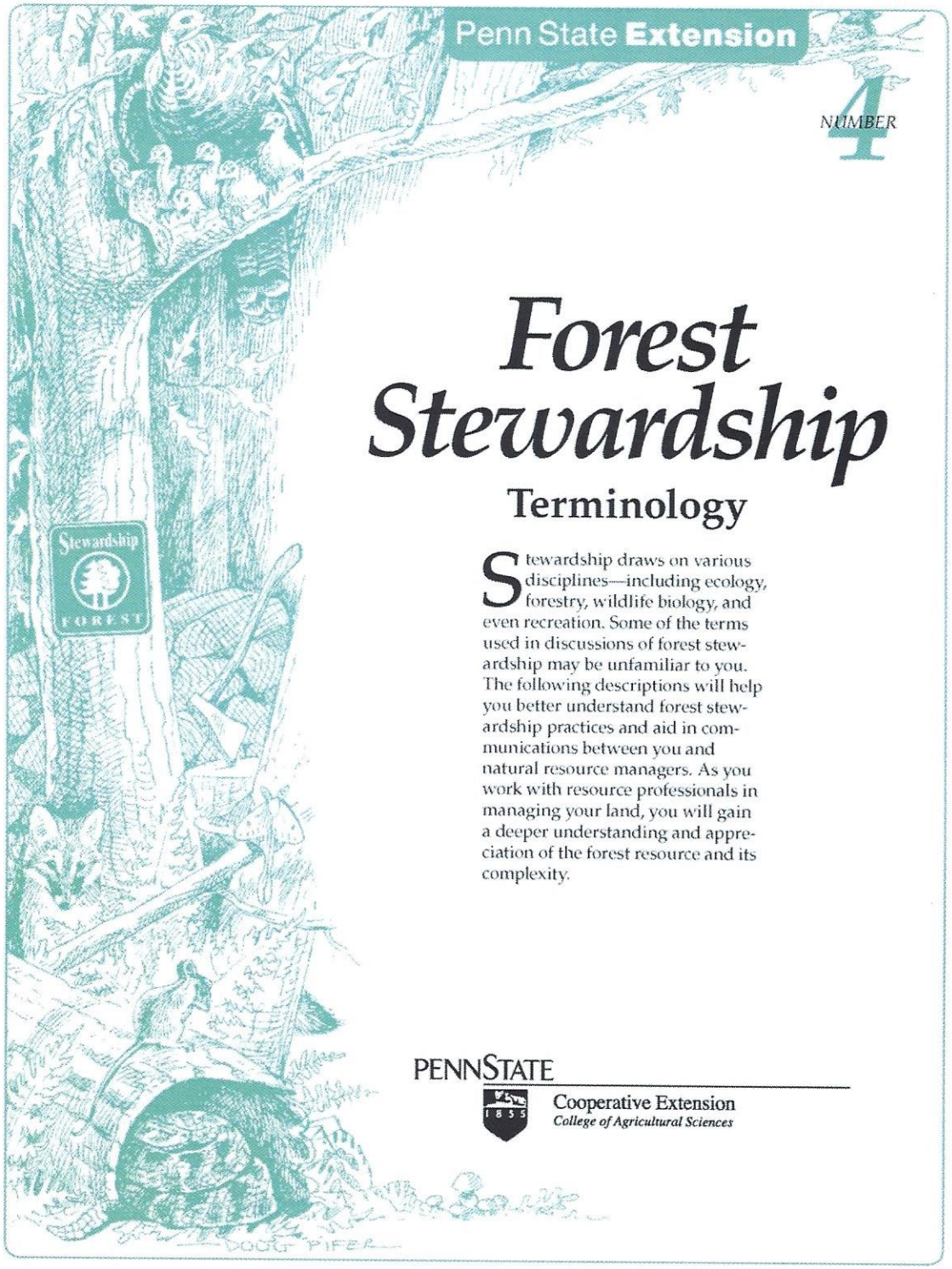
A computer program developed by the US Forest Service Northern Experimental Station that quantifies, analyzes, and recommends silvicultural decisions for hardwood stands. The latest version of the software is entitled "SILVAH 7 – Decision Support for Managers of Allegheny Hardwood and Mixed Oak Ecosystems." The USFS website describes SILVAH as:

SILVAH (short for **Silv**iculture of **A**llegheny **H**ardwoods, but now also applicable to mixed oak forests) is a computer tool for making silvicultural decisions in hardwood stands of the mid-Atlantic and upper Appalachian region. It is an "expert system" in that it recommends appropriate treatments based upon user objectives and overstory, understory, and site data provided by the user. SILVAH also contains a wildlife attributes report, forest stand growth simulator, provides the ability to test alternative cuts, enables development of a forest-wide inventory database, and facilitates other forest management planning functions.

SILVAH is the computerized implementation of a systematic approach to silviculture, in which current conditions are identified through a systematic inventory of overstory and understory. These conditions are evaluated using an objective set of research-based standards and the constraints and objectives of the land-manager. Then a prescription is recommended to move the stand closer to the manager's objectives. The silviculture behind the SILVAH system in Allegheny, northern hardwood, and mixed-oak forests is described in two publications titled Prescribing silvicultural treatments in hardwood stands of the Alleghenies and Prescribing regeneration treatments for mixed-oak forests in the Mid-Atlantic region.

APPENDIX C

FOREST STEWARDSHIP TERMINOLOGY



Advanced regeneration—seedlings or saplings present in the understory before harvesting mature trees in the overstory.

Aesthetics—forest value, rooted in beauty and visual appreciation, affording inspiration, contributing to the arts, and providing a special quality of life.

Afforestation—the establishment of forest trees by planting or seeding an area not previously forested.

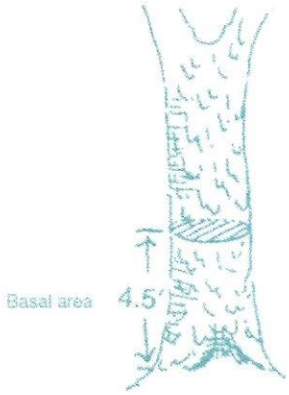
Agroforestry—a cultivation system combining agriculture and forestry where trees and crops are interplanted; not common to Pennsylvania.

Allegheny hardwood type—a portion of the northern hardwood forest in Pennsylvania, of which black cherry, white ash, and tulip poplar are major components.

Area sensitive species—plants or animals with very specific habitat requirements that are susceptible to population decline when their habitat is altered.

Aspect—the orientation of a slope with respect to the compass; the direction toward which a slope faces; north facing slopes are generally cooler than south facing slopes.

Basal area—a measurement of the cross-sectional area of a tree trunk in square feet at breast height. Basal area (BA) of a forest stand is the sum of the basal areas of the individual trees, and is reported as BA per acre.



Best management practices (BMPs)—practices recommended by agencies or organizations to control pollution and erosion off a harvested site.

Biological diversity—the variety of plants and animals, the communities they form, and the ecological functions they perform at the genetic, stand, landscape, and regional levels.

Biological maturity—the point in the life cycle of a tree at which there is no net biomass accumulation; the stage before decline when annual growth is offset by breakage and decay.

Biological simplification—the reduction of biological diversity that results from altering the environment in ways that favor, either directly (e.g., through management) or indirectly (e.g., through pollution), certain species over many others.

Biomass—the total weight of all organisms in a particular population, sample, or area; biomass production may be used as an expression of site quality. Biomass is also defined as a wood product, usually in the form of wood chips, for energy production.

Biome—the largest ecological unit, distinguished by an extensive complex of terrestrial communities, corresponding to a particular climatic zone or region, and associated with an environmental region such as the northern coniferous forest, the Great Plains, the tundra, or as in Pennsylvania, the eastern temperate hardwood biome.

Board foot—a unit of wood 1 inch thick, 12 inches long, and 12 inches wide. One board foot contains 144 cubic inches of wood.

Bole—the main trunk of a tree.

Browse—portions of woody plants including twigs, shoots, and leaves used as food by such animals as deer.

Buffer strips—forestland left relatively undisturbed to lessen visual or environmental impacts of timber harvesting, usually along a road or waterway.

Canopy—the upper level of a forest, consisting of branches and leaves of taller trees. A canopy is complete (or has 100 percent cover) if the ground is completely hidden when viewed from above the trees.

Carrying capacity—the maximum amount of animal or plant life that a particular forest environment can support indefinitely without ecosystem degradation, given the limitations of food, shelter, competition, predation, and other available resources; usually expressed in terms of an individual species.

Clearcutting—a harvesting and regeneration technique that removes all the trees, regardless of size, on an area in one operation. Clearcutting is most often used with species like aspen or black cherry, which require full sunlight to reproduce and grow well, or to create specific habitat for certain wildlife species. Clearcutting produces an even-aged forest stand.

Commercial forestland—see *timberland*.

Community—a collection of living organisms in a defined area that function together in an organized system through which energy, nutrients, and water cycle.

Conservation—the wise use and management of natural resources to ensure its existence and function in perpetuity.

Consumptive activities—forest uses which involve the removal of something from the site (hunting, fishing, timber harvesting). Nonconsumptive activities include hiking, bird watching, and nature study.


Clearcutting

Corridor—a strip of wildlife habitat, unique from the landscape on either side of it, that links one isolated ecosystem "island" (e.g., forest fragment) to another. Corridors allow certain species access to isolated habitat areas, which consequently contributes to the genetic health of the populations involved.

Covert—a geographic unit of cover for wildlife (usually game); for example, a thicket or underbrush sheltering grouse or deer.

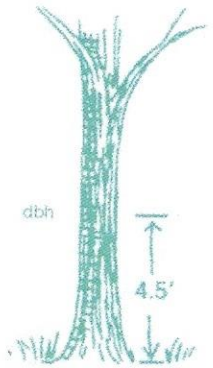
Crop tree—a term traditionally reserved to describe a tree of a commercially desirable species, with the potential to grow straight, tall, and vigorously. However, a crop tree can be one selected for nontimber purposes (varying with landowner objectives), such as mast production or den tree potential.

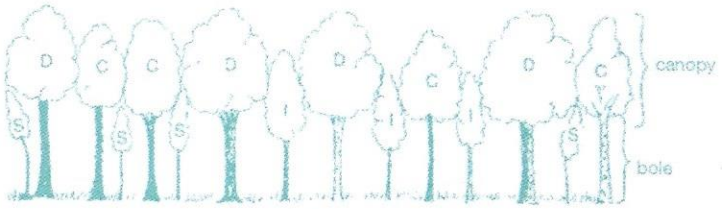
Crown class—an evaluation of an individual tree's crown in relation to its position in the canopy and the amount of full sunlight it receives. The four recognized categories are: dominant (D), codominant (C), intermediate (I), and overtopped or suppressed (S). (See figure above.)

Cull—a tree of such poor quality that it has no merchantable value in terms of the product being cut. However, a timber cull tree may have value for wildlife or aesthetics.

dbh—see *diameter at breast height*.

Deforestation—the unintentional or intentional conversion of land use from forest to nonforest. Associated with nonrenewable timber harvesting practices in ecologically sensitive areas, such as tropical rainforests.





Crown classes

Den tree—a tree with cavities in which birds, mammals, or insects such as bees may nest (also known as cavity tree).

Diameter at breast height (dbh)—the diameter of the tree measured at 4.5 feet above ground level. The abbreviation generally is written without capital letters and without periods.

Diameter-limit cut—a timber harvesting treatment in which all trees over a specified diameter may be cut. Diameter-limit cuts often result in high-grading.

Disturbance—a natural or human-induced environmental change that alters one or more of the floral, faunal, and microbial communities within an ecosystem. Timber harvesting is the most common human disturbance. Windstorms and fire are examples of natural disturbance.

Easement—the transfer of rights (usually development) associated with the land to a conservancy or public agency through purchase or donation. Easements are used as a conservation tool to retain the natural resources on land and reduce its likelihood to be used in undesirable ways.

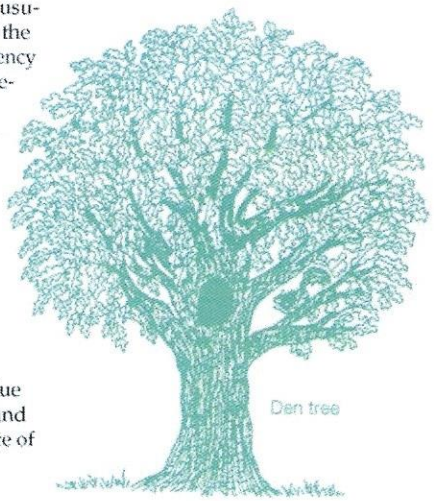
Ecology—the study of interactions between living organisms and their environment.

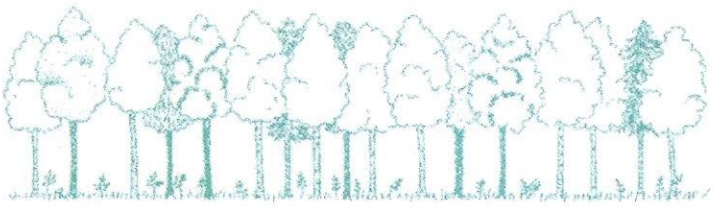
Economic maturity—the point in the life cycle of a tree or stand when harvesting can be be most profitable, i.e., when the rate of value increase of an individual tree or stand falls below a desired alternative rate of return.

Ecosystem—a natural unit comprised of living organisms and their interactions with their environment, including the circulation, transformation, and accumulation of energy and matter.

Ecotype—a genetic subdivision of a species resulting from the selective action of a particular environment and showing adaptation to that environment. Ecotypes may be geographic, climatic, elevational, or soil related. Red maples and northern red oaks are both adapted to moist soils, but can also be found on drier sites where the genetic difference is their enhanced ability to retain water.

Edge—the boundary between open land and woodland or between any two distinct ecological communities. This transition area between environments provides valuable wildlife habitat for some species, but can be problematic for sensitive species, due to increased predation and parasitism.





Even-aged stand

Emergent wetlands—a class of wetland dominated by grasses, sedges, rushes, forbs, and other rooted, water-loving (possibly broad-leaved) herbaceous plants that emerge from the water or soil surface; marshes are an example.

Endangered species—species in danger of extinction throughout all or a significant part of their range. Protection mandated by the United States Endangered Species Act, 1973.

Epicormic branching—branching that occurs on the tree trunk after other branches have developed higher; usually occurs from drastically modified environmental conditions, such as increased sunlight.

Even-aged stand—a group of trees that do not differ in age by more than 10 to 20 years or by 20 percent of the rotation age.

Extirpation—the eradication of a species from a portion of its natural range.

Forest—a biological community dominated by trees and other woody plants.

Forest health—the condition of a forest, taking into consideration its age, structure, vigor, and the presence of insects and diseases.

Forest interior dependent species—animal species that depend upon extensive areas of continuous, unbroken forest habitat to live and reproduce, and are susceptible to higher rates of predation and population decline when interior forest habitat is fragmented or disturbed.

Forest inventory—the survey of a forest landowner's property. Inventories are conducted by sampling plots to estimate average conditions across forest stands. The summation of stand data represents the inventory. (See *stand analysis*.)

Forest recovery—the complex natural process by which floral, faunal, and microbial communities respond to disturbance in the forest ecosystem. More resilient ecosystems respond rapidly to disturbance, returning to the pre-disturbance ecological state within a relatively short time period (perhaps decades as opposed to centuries).

Forest stewardship—the wise care and use of forest resources to ensure their health and productivity for years to come.

Forest types—associations of tree species that commonly occur because of similar ecological requirements. Pennsylvania's three major forest types are oak-hickory, northern hardwoods, and Allegheny hardwoods.

Forested wetland—an area characterized by woody vegetation over 20 feet tall where soil is at least periodically saturated with or covered by water.

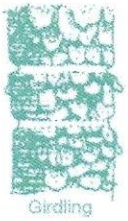
Fragmentation—the segmentation of a large tract or contiguous tracts of forest to smaller patches, often isolated from each other by nonforest habitat. Results from the collective impact of residential and commercial development, highway and utility construction, and other piecemeal land use changes.

Genotype—growth or development characteristics dependent on genetic information. The genetic constitution of an organism or a species in contrast to its observable characteristics.

Girdling—a method of killing unwanted trees by cutting through the living tissues around the bole. Can be used instead of cutting to prevent felling damage to nearby trees. Girdled trees can provide cavities and dead wood for wildlife and insects.

Guild—species similar in their habitat needs as well as their response to habitat changes (e.g., ovenbird and woodthrush). One species in a guild is often used to represent the others when developing a stewardship management plan.

Habitat—the geographically defined area where environmental conditions (e.g., climate, topography) meet the life needs (e.g., food, shelter) of an organism, population, or community.



Girdling

Harvesting—the process of cutting, removing, and processing trees from the forest.

High-grading—a type of timber harvesting in which larger trees of commercially valuable species are removed with little regard for the quality, quantity, or distribution of trees and regeneration left on the site; often results when a diameter-limit harvest is imposed.

Horizontal structure—the spatial arrangement of plant communities; a complex horizontal structure is characterized by diverse plant communities within a given geographic unit.

Improvement cut—any cutting treatment used to alter species composition and tree spacing to realize ownership objectives. Thinning is a type of improvement cut.

Indicator species—species with such specialized ecological needs that they can be used for assessing the quality, condition, or extent of an ecosystem on the basis of their presence and density, or the accumulation and effect of materials in their tissues.

Interfering plants—competing plants that interfere with the germination and growth of desirable seedlings by casting dense shade across the forest floor.

Land ethic—the principles and values guiding our use and treatment of the land. Forest stewardship is a land ethic. (See *forest stewardship*.)

Logger—the professional hired to harvest trees from the forest.

Management plan—a document prepared by natural resource professionals to guide and direct the use and management of a forest property. It consists of inventory data and prescribed activities designed to meet ownership objectives.

Mast—all fruits of trees and shrubs used as food for wildlife. Hard mast includes nutlike fruits such as acorns, beechnuts, and chestnuts. Soft mast includes the fleshy fruits of black cherry, dogwood, and serviceberry.

Maturity—see *economic maturity* and *biological maturity*.

Microsite—the environment at a small, localized area; includes biotic, climatic, topographic, and soil conditions at the specific site.

Multiple use and value—a conceptual basis for managing a forest area to yield more than one use or value simultaneously. Common uses and values include aesthetics, water, wildlife, recreation, and timber.

Natural resources professionals—specially trained and educated natural resources managers who work with landowners and the land to achieve sustainable goals from wildlife to harvesting and regeneration.

Neotropical birds—birds that breed in the northern hemisphere during summer months, and winter in tropical regions (e.g., woodthrush or barn swallows). One-third of Pennsylvania's breeding birds are neo-tropical migrants.

Niche—the physical and functional location of an organism within an ecosystem; where a living thing is found and what it does there.

Nonindustrial private forestland (NIPF)—see *private forestland*.

Nonrenewable resource—a naturally occurring resource whose quantity is diminished by use.

Old-growth—forests that approximate the structure, composition, and functions of native forests prior to European settlement. They vary by forest type, but generally include more large trees, canopy layers, standing snags, native species, and dead organic matter than do young or intensively managed forests.

Patch—a small area of a particular ecological community surrounded by distinctly different ecological communities, such as a forest stand surrounded by agricultural lands or a small opening surrounded by forestland.

Patch dynamics—the process of recolonization by plant and wildlife species following the creation of a patch. Small patches and ones close to a source of plant and animal species will be recolonized faster than larger, more isolated patches.

Phenotype—outward appearance or physical attributes of an organism resulting from both the effects of the environment and genetic makeup.

Pole stand—a stand of trees with dbh ranging from 5 to 9 inches.

Population—a group of individuals of one plant or animal taxon (species, subspecies, or variety).

Precommercial thinning—the removal of trees (sapling to pole stage) to concentrate growth on desired trees; usually does not generate financial return.

Preservation—a management philosophy or goal which seeks to protect indigenous ecosystem structure, function, and integrity from human impacts. Management activities are generally excluded from "preserved" forests.

Private forestland (PFL)—forestland owned by a private individual, group, or corporation not involved in wood processing.

Rare species—species which exist only in one or a few restricted geographic areas or habitats or occur in low numbers over a relatively broad area.

Reforestation—the reestablishment of forest cover by natural or artificial means on areas recently supporting forest cover.

Regeneration—the replacement of one forest stand by another as a result of natural seeding, sprouting, planting, or other methods; also young trees which will develop into the future forest.

Regeneration cut—a timber harvest designed to promote and enhance natural establishment of trees. Even-aged stands are perpetuated by three types of regeneration cuts: seed tree, shelterwood, and clearcutting. Uneven-aged stands are perpetuated by selecting individual or small groups of trees for removal (e.g., the selection system).

Release—removal of overtopping trees to allow understory or overtopped trees to grow in response to increased light.

Renewable resource—a naturally occurring resource that is not reduced in quantity and ability for future use as a result of current use.

Renewal—growth of a new forest plant community.

Residual stand—trees remaining following any cutting operation.

Riparian zone—an area adjoining a body of water, normally having soils and vegetation characteristic of floodplains or areas transitional to upland zones. These areas help protect the water by removing or buffering the effects of excessive nutrients, sediments, organic matter, pesticides, or pollutants.

Rotation—the planned time interval between regeneration cuts in a forest.

Salvage cut—the removal of dead, damaged, or diseased trees with the intent of recovering value prior to deterioration.

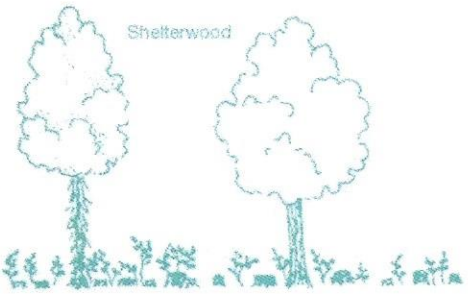
Sapling—a small tree, usually defined as being between 2 and 4 inches dbh.

Sawlog—a log large enough to yield lumber. Usually the small end of a sawlog must be at least 6 to 8 inches in diameter for softwoods and 10 to 12 inches for hardwoods.

Second growth—the forests reestablished following the removal of virgin (i.e., previously unharvested) or

old-growth stands. Most of Pennsylvania's forests are either second or third growth.

Seed tree cut—a regeneration cut where mature trees are left standing in a harvested area to provide seed for regeneration of the cut-over site.



Seedling—a young tree originating from seed that is less than 4 feet tall and smaller than 2 inches in diameter at ground level.

Selection cut—a regeneration cut designed to create and perpetuate an uneven-aged forest. Trees may be removed singly or in small groups. A well-designed selection cut removes trees of lesser quality and trees in all diameter classes along with merchantable and mature high-quality sawlog trees. Should be differentiated from "select" or "selective" cuts, which often equate to high-grading.

Selective cut—a timber harvesting treatment in which the largest, most valuable trees are removed. Selective cuts often result in high-grading.

Shelterwood—a regeneration cut designed to stimulate reproduction by removing all overstory trees. This is achieved by a series of cuts over several years. Gradual reduction of stand density protects understory trees and provides a seed source for stand regeneration.

Silviculture—the art, science, and practice of establishing, tending, and reproducing forest stands.

Site—the combination of biotic, climatic, topographic, and soil conditions of an area; the environment at a location.

Site quality—the inherent productive capacity of a specific location (site) in the forest affected by available growth factors (light, heat, water, nutrients, anchorage); often expressed as tree height at a given age.

Skid road—roads incorporating water control and erosion structures designed for frequent use by skidding equipment.

Skid trail—trails used infrequently to drag logs to skid roads.

Slash—branches, tops, and cull trees left on the ground following a harvest. Although some of this material can be used for firewood, slash may be arranged in brush piles to provide wildlife cover. Left scattered, slash can protect seedlings and sprouts from deer browsing and reduce soil erosion.

Snag—a standing dead tree with few branches, or the standing portion of a broken-off tree. Snags may provide feeding and/or nesting sites for wildlife.

Species—a subordinate classification to a genus; reproductively isolated organisms that have common characteristics, such as eastern white pine or white-tailed deer.

Species richness—the number of species present in a community or a defined area.

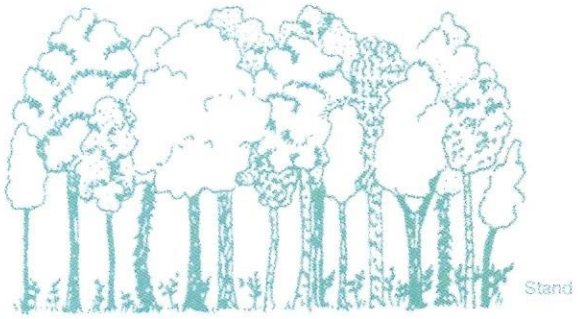
Spring seep—a class of wetland created by groundwater emerging on lower slopes in small pools surrounded by vegetation. These create snow-free zones critical for wildlife feeding during winter.

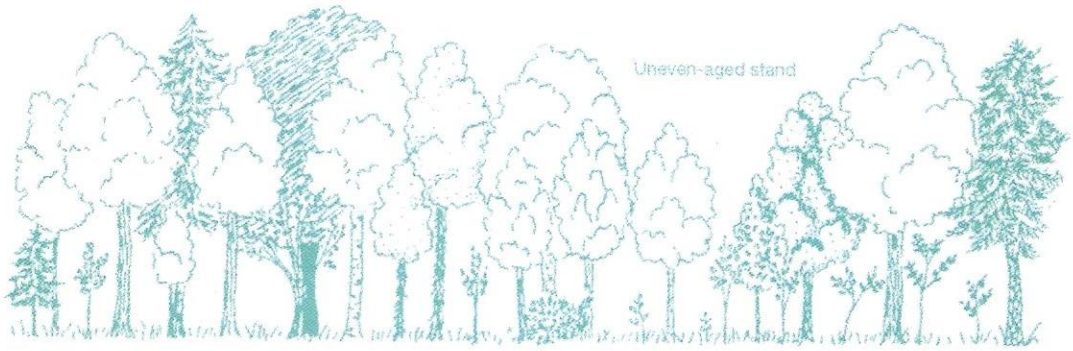
Stand—a grouping of vegetation sufficiently uniform in species composition, age, and condition to be distinguished from surrounding vegetation types and managed as a single unit.

Stand analysis—the inventory of stands by species composition, average diameter, basal area, crown closure, regeneration, interfering plants, and tree quality to establish a baseline for silvicultural prescriptions. Stand analysis should occur before harvesting takes place.

Stewardship plan—a guide prepared by an approved natural resources professional that tells landowners what their resources are, what conditions they are in, and what can be done to help them achieve their goals.

Stream management zones—areas adjacent to waterbodies where unique management strategies are applied to protect water quality and maintain stream temperature through shading. Zone width is normally 50 feet, but varies according to site.





Stumpage—the commercial value of standing trees.

Succession—the natural series of replacements of one plant community (and the associated fauna) by another over time and in the absence of disturbance.

Sustainability—caring for the water and wildlife that rely on forests and working to ensure continuant and improved health of forest resources so that future generations receive the same or increased benefits.

Sustained yield—historically, a timber management concept in which the volume of wood removed is equal to growth within the total forest. The concept is applicable to nontimber forest values as well.

Tending—the process of caring for the forest in such a way to ensure its sustainability while advancing the owner's objectives.

Thinning—removal of trees to encourage growth of other selected individual trees. May be commercial or precommercial.

Threatened species—a species likely to become endangered in the foreseeable future, throughout all or a significant portion of its range, unless protected.

Timber cruise—the process of estimating the quality, quantity, and characteristics of trees in a forest.

Timberland—forestland producing or capable of producing crops of industrial wood (more than 20 cubic feet per acre per year), and not withdrawn from timber utilization. Formerly known as commercial forestland.

Timber stand improvement (TSI)—a combination of intermediate treatments designed to improve growth and composition of the forest; often spoken of as TSI.

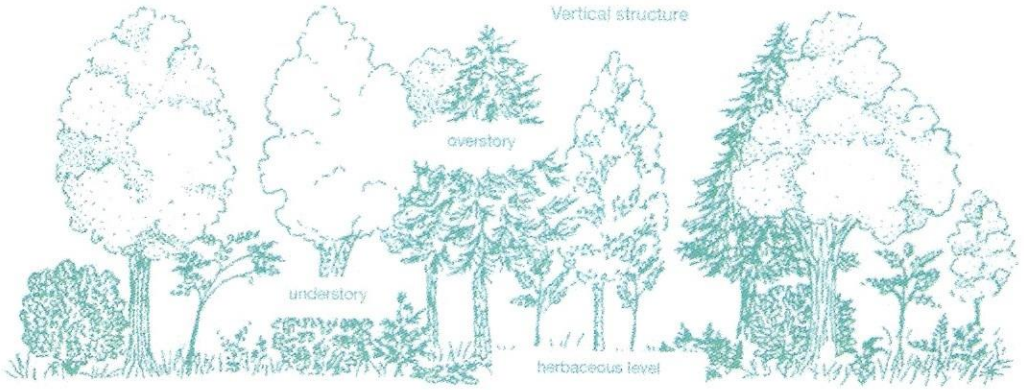
Tolerance—a characteristic of trees that describes the relative ability to thrive with respect to the growth factors (light, heat, water, nutrients, anchorage). For instance, a "shade-tolerant" species may thrive at low light levels.

Understory—the smaller vegetation (shrubs, seedlings, saplings, small trees) within a forest stand, occupying the vertical zone between the overstory and the herbaceous plants of the forest floor.

Uneven-aged stand—a group of trees of various ages and sizes growing together on a site.

Urban forestry—the professional management of natural resources in and around urban areas, including trees and associated vegetation, wildlife, and open space.

Vernal or autumnal ponds—a class of wetland characterized by small, shallow, temporary pools of fresh water present in spring and fall, which typically do not support fish but are very important breeding grounds for many species of amphibians. Some species completely depend on such ponds; examples are spring peepers and mole salamanders.



Vertical structure—the arrangement of plants in a given community from the ground (herbaceous and woody shrubs) into the main forest canopy; a complex vertical structure is characterized by lush undergrowth and successive layers of woody vegetation extending into the crowns of dominant and codominant trees. (See *crown class*.)

Virgin forest—a forest that has never been harvested or altered by humans.

Watershed—a region or area defined by patterns of stream drainage. A watershed includes all the land from which a particular stream or river is supplied.

Wetlands—areas which are either transitional between land and water (where the water table is at or near the land surface) or areas of land which are covered by shallow water (such as marshes, swamps, bogs, and fens). Although only 2 percent of Pennsylvania remains as wetlands today, these areas fulfill an essential role in our landscapes by maintaining water quality, stabilizing shores and stream banks, controlling floods and erosion, and providing critical habitat to many plant and animal species.

Wolf tree—a large, excessively branchy tree which occupies more space in the forest than surrounding trees. Wolf trees have high wildlife and aesthetic value, but little if any timber value.

Woodland—see *forest*.

Prepared by Lynnette S. Wimer, graduate assistant; James C. Finley, assistant professor of forest resources; Steven B. Jones, associate professor of forest resources; and Ellen M. O'Donnell, stewardship associate. Revised by Allyson Muth, stewardship associate.

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The Forest Stewardship Program is administered nationally by the USDA Forest Service and is directed in Pennsylvania by the DCNR Bureau of Forestry with assistance from a statewide steering committee. The Forest Stewardship Program assists forest landowners in better managing their forestlands by providing information, education, and technical assistance. For more information about program services, contact the Pennsylvania Forest Stewardship Program, DCNR Bureau of Forestry, PO Box 8552, Harrisburg, PA 17105-8552; phone: 717-787-2160. For more information about publications, contact the Pennsylvania Forest Stewardship Program, Department of Ecosystem Science and Management, 416 Forest Resources Building, University Park, PA 16802-4705; phone: 800-235-9473.

APPENDIX D

FOREST COVER TYPES

CAP 106 FMP LAND CLASSIFICATIONS (FOREST COVER TYPES)

The land classification describes the dominant forest type of an area. The land classification is the smallest unit of land that will be inventoried and represents some degree of homogeneity. Subclasses have been established for forested land classes to better describe the unit of land. Many land classification units are based on plant community types recognized in *Pennsylvania's Community Classification* (1999). Scientific names are those used in the *Vascular Flora of Pennsylvania: Annotated Checklist and Atlas* (1993). Other types are based on specific anthropogenic use or aquatic systems.

The plant community types found on this property (by category) are:

Terrestrial Forests:

AH Dry Oak – Heath Forest
BB Northern Hardwood Forest
TM Tuliptree – (Beech) – Maple Forest

Terrestrial Herbaceous Openings:

O2 Cultivated Herbaceous Area
OM Miscellaneous Herbaceous Area

Terrestrial Forests

are uplands (non-wetlands) dominated by tree species that form at least 30% of the main tree canopy of the area. Terrestrial Forest communities are classified using the following two-digit alphabetical system for forest community type, followed by a numerical digit for site, then a numerical digit for size and stocking class, followed by an alphabetical digit for commercial / non-commercial availability. Terrestrial forest communities should be a minimum of five acres or larger for delineation. Unique forest communities, less than five acres, may be delineated.

Code	Forest Community Type
AH	**Dry Oak - Heath Forest:** This is a fairly broadly defined type. These forests occur on xeric to moderately dry, acidic sites, often on shallow or sandy soils and/or steep slopes. The most characteristic tree species for this type is *Quercus montana* (chestnut oak), usually occurring with a mix of *Q. velutina* (black oak), *Q. coccinea* (scarlet oak), and/or *Q. alba* (white oak). Other tree species include *Sassafras albidum* (sassafras), *Nyssa sylvatica* (black-gum), *Betula lenta* (sweet birch), *Acer rubrum* (red maple), *Carya glabra* (pignut hickory), *Pinus rigida* (pitch pine), *P. virginiana* (Virginia pine), and *Pinus strobus* (eastern white pine). Total cover by conifers generally does not exceed 25% of the canopy. *Castanea dentata* (American chestnut) stump sprouts are not uncommon. The shrub layer is dominantly ericaceous; common species include *Kalmia latifolia* (mountain laurel), *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (lowbush blueberry), *V. angustifolium* (low sweet blueberry), *Viburnum acerifolium* (maple-leaved viburnum), and in more open areas, *Comptonia perigrina* (sweet fern). Owing largely to the thick, resistant oak/ericad leaf litter, the herbaceous layer is generally sparse. Common constituents include *Maianthemum canadense* (Canada mayflower), *Carex pensylvanica* (Pennsylvania sedge), *Carex communis* (a sedge), *Chimaphila maculata* (pipissewa), *Epigaea repens* (trailing arbutus), *Gaultheria*

procumbens (teaberry), *Aralia nudicaulis* (wild sarsaparilla), *Pteridium aquilinum* (bracken fern), and *Cypripedium acaule* (pink lady's-slipper).

Related types: The "Dry oak - mixed hardwood forest" type is similar but occurs on less acidic (and often less dry) sites and does not have an overwhelming dominance of heaths in the shrub layer. As one moves up-slope or toward a drier exposure, the evergreen component may increase and this type may grade into the "Pitch pine - mixed hardwood forest" type. Where the canopy becomes open, with trees over five meters high covering less than 60% of the site overall, this becomes the "Dry oak - heath woodland" type.

Range: Entire state.

BB **Northern Hardwood Forest:** Dominant trees usually include Fagus grandifolia (American beech), Acer rubrum (red maple), A. saccharum (sugar maple), *Prunus serotina* (black cherry) at less than 40% relative cover, *Betula lenta* (sweet birch), *B. alleghaniensis* (yellow birch), *B. papyrifera* (paper birch), *Q. rubra* (northern red oak), and *Fraxinus americana* (white ash). This type may contain scattered *Pinus strobus* (eastern white pine) and/or *Tsuga canadensis* (eastern hemlock), but combined conifer cover does not exceed 25% of the canopy. *Rhododendron maximum* (rosebay) may be locally abundant. Other common shrubs include *Hamamelis virginiana* (witch-hazel), *Acer pensylvanicum* (striped maple), *Viburnum lantanoides* (witch-hobble), *Ilex montana* (mountain holly), *Amelanchier laevis* (smooth serviceberry), *A. arborea* (shadbush), and *Carpinus caroliniana* (hornbeam). The herbaceous layer is generally sparse and reflects a northern affinity; common components include *Maianthemum canadense* (Canada mayflower), *Trientalis borealis* (starflower), *Thelypteris novaboracensis* (New York fern), *Dryopteris carthusiana* (fancy fern), *Lycopodium lucidulum* (shining clubmoss), *Gaultheria procumbens* (teaberry), *Mitchella repens* (partridge-berry), *Aralia nudicaulis* (wild sarsaparilla), *Medeola virginiana* (Indian cucumber-root), and Maianthemum canadense (Canada mayflower).

Related types: If combined relative cover by conifers approaches or exceeds 25%, please read description for the "Hemlock (white pine) - northern hardwood forest." If cover by *Prunus serotina* (black cherry) approaches or exceeds 40% of canopy, please read description for the "Black cherry - northern hardwood forest" types is a fairly broadly defined type. These forests occur on xeric to moderately dry, acidic sites, often on shallow or sandy soils and/or steep slopes. The most characteristic tree species for this type is *Quercus montana* (chestnut oak), usually occurring with a mix of *Q. velutina* (black oak), *Q. coccinea* (scarlet oak), and/or *Q. alba* (white oak). Other tree species include *Sassafras albidum* (sassafras), *Nyssa sylvatica* (black-gum), *Betula lenta* (sweet birch), *Acer rubrum* (red maple), *Carya glabra* (pignut hickory), *Pinus rigida* (pitch pine), *P. virginiana* (Virginia pine), and *Pinus strobus* (eastern white pine). Total cover by conifers generally does not exceed 25% of the canopy. *Castanea dentata* (American chestnut) stump sprouts are not uncommon. The shrub layer is dominantly ericaceous; common species include *Kalmia latifolia* (mountain laurel), *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (lowbush blueberry), *V. angustifolium* (low sweet blueberry), *Viburnum acerifolium* (maple-leaved viburnum), and in more open areas, *Comptonia perigrina* (sweet fern). Owing largely to the thick, resistant oak/ericad leaf litter, the herbaceous layer is generally sparse. Common constituents

include *Maianthemum canadense* (Canada mayflower), *Carex pensylvanica* (Pennsylvania sedge), *Carex communis* (a sedge), *Chimaphila maculata* (pipissewa), *Epigaea repens* (trailing arbutus), *Gaultheria procumbens* (teaberry), *Aralia nudicaulis* (wild sarsaparilla), *Pteridium aquilinum* (bracken fern), and *Cypripedium acaule* (pink lady's-slipper).

Range: Glaciated NE, Glaciated NW, Pocono Plateau, Unglaciated Allegheny Plateau

TM **Tuliptree - (Beech) - Maple Forest:** These woods occur on fairly deep, not strongly acidic soils, at a mid- to lower-slope position. The most consistent tree species for this often very mixed type are *Acer rubrum* (red maple) and *Liriodendron tulipifera* (tuliptree). *Fagus grandifolia* (American beech) is often present and, when present, is often codominant. In successional, lower slope situations, *Liriodendron tulipifera* (tuliptree) may occur in nearly pure stands. The long list of possible associates includes various oaks, mostly *Quercus rubra* (red oak), as well as *Nyssa sylvatica* (black-gum), *Acer saccharum* (sugar maple), *Carya tomentosa* (mockernut hickory), *C. ovata* (shagbark hickory), *Betula lenta* (sweet birch), *Tsuga canadensis* (eastern hemlock)□ less than 25% relative cover□ and in western Pennsylvania, *Magnolia acuminata* (cucumber-tree). Common shrubs include various viburnums, *Carpinus caroliniana* (hornbeam), *Cornus florida* (flowering dogwood), *Ostrya virginiana* (hop-hornbeam), *Hamamelis virginiana* (witch-hazel), and *Lindera benzoin* (spicebush). This type has different expressions in different parts of the state as well as according to disturbance history etc. There may be a rich herbaceous layer, especially in the vernal flora. On richer sites that are not over-browsed, this may include species like *Podophyllum peltatum* (may-apple), *Sanguinaria canadensis* (bloodroot), *Botrychium virginianum* (rattlesnake fern), *Dicentra cucullaria* (dutchman's-breeches), *D. canadensis* (squirrel corn), *Allium tricoccum* (wild leek), *Claytonia virginica* (spring-beauty) etc.

Related types: This type is closely related to the "Red oak - mixed hardwood forest" type. They share many species in common. The "Red oak - mixed hardwood forest" type is much more widespread, occurs across a broader ecological range, and is usually dominated by oaks and hickories. This type is much more restricted, generally occurring on toeslopes, or north-facing lower and midslopes. The dominance of beech, tulip, and maple and the near-absence of heaths, such as *Gaultheria procumbens* (teaberry) and *Kalmia latifolia* (mountain laurel), distinguish these forests from the oak-dominated type.

Range: Piedmont, Pittsburgh Plateau, Ridge and Valley.

Code	Herbaceous Opening Type
O2	**Cultivated herbaceous areas**: Dominated by cultivated herbaceous vegetation (seeded or planted usually for habitat improvement).
OM	**Misc. herbaceous areas:** Other herbaceous openings (e.g., lawns, golf courses, etc).

Site, Size, Stocking

Site classes denote the quality of the growing site from a statewide perspective from good-medium-poor. Size denotes the diameters of trees. Stocking is used to determine if the forest community is fully stocked with trees. The appropriate site, size and stocking codes should follow the forest community type for all forest communities.

Code	Site Class
1	**Site 1**: Characterized by moist, well-drained, fairly deep soils that usually occur in protected coves, along streams, or in bottomlands that remain moist throughout the year. On northern exposures, Site 1 may extend higher up a slope than on southern exposures because of more favorable soil moisture conditions. In addition to the usual beech-birch-maple-cherry of northern and Allegheny hardwoods, white pine, hemlock, ash and basswood are generally present. In the oak types where red oak and white oak along with hemlock form the major portion of the stand, the presence of tuliptree (yellow poplar) and ash indicates Site 1. Dominant and co-dominant trees have a projected merchantable main stem of > 50 feet at maturity (> three 16-foot logs). Total tree heights average > 80 feet at maturity.
2	**Site 2**: Characterized by soil intermediate in moisture, depth, drainage and fertility that may dry-out for short periods during the year. Usually located on slopes between the ridge tops and the coves and bottomlands. In the northern and Allegheny hardwood types, Site 2 is primarily a beech-birch-maple-cherry mixture with shorter heights than on site 1. In the oak types, site 2 has a preponderance of red oak, black oak, white oak and, to a lesser extent, scarlet oak and chestnut oak. Dominant and co-dominant trees have a projected merchantable main stem of 30-40 feet at maturity (2-2½ 16-foot logs). Total tree heights average > 65 feet but < 80 feet at maturity.
3	**Site 3**: Characterized by shallow, rather dry, stony or compact soils which usually occur on ridges or broad flat plateaus. Dominant and co-dominant trees have a projected main stem less than 30 feet at maturity (< two 16-foot logs). Pitch pine and white pine may yield 30+ feet of projected main stem at maturity (two 16-foot logs). Total tree heights average < 65 feet at maturity.

Code	Size / Stocking Class
1	Majority of the dominant and co-dominant trees are > 18" Dbh and > 50% stocked.
2	Majority of the dominant and co-dominant trees are12-18" Dbh and > 50% stocked.
3	Majority of the dominant and co-dominant trees are 6-12" Dbh and > 50% stocked.
4	Majority of dominant and co-dominant trees are < 6" Dbh and > 50% stocked.
5	Majority of the dominant and co-dominant trees are > 18" Dbh and < 50% stocked.
6	Majority of the dominant and co-dominant trees are12-18" Dbh and < 50% stocked.
7	Majority of the dominant and co-dominant trees are 6-12" Dbh and < 50% stocked.
8	Majority of dominant and co-dominant trees are < 6" Dbh and < 50% stocked.

Size/stocking classes 5 through 8 are to be used for areas that have experienced heavy mortality and are grossly understocked. Use the fifty-percent stocking line on the oak-stocking chart as a guide for determining whether or not an area should be designated as understocked. Appropriate stocking charts can be referenced to determine basal area / stocking equivalents. Total species composition should be used to determine stocking levels. Forest community types falling below the 30% level should be delineated as Woodlands (O5).

NOTES:

*Each forest community type consists of a total of **four digits**. For example, AH21 denotes; AH (Dry Oak – Heath Forest), 2 (Site 2), 1 (Size/Stocking Class 1).*

*All other land classification units will consist of **two digits**: For example, O2 denotes; O2 (Cultivated Herbaceous Area).*

Commonly used forest types in Pennsylvania include the following: AD, AR, AH, CC, BB, TM, FF, FR, FA, BC, and DD. Other types represented for terrestrial and upland areas may also appear on the landscape. Care should be taken by the forester to correctly identify each forested stand by the most appropriate type present in this classification document.