This project was funded in part by a grant from the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation, Growing Greener Environmental Stewardship Fund, administered by the D&L NHC, Inc.

Cover photo courtesy of Tom Gettings.
# TABLE OF CONTENTS

- INTRODUCTION .......................................................................................................................... 1
- REGULATING TREE PROTECTION ................................................................................................. 3
- LOCAL REGULATION .................................................................................................................... 4
- TREE BASICS .............................................................................................................................. 4
- HOW CONSTRUCTION ACTIVITIES CAN AFFECT TREES ............................................................ 5
- TREE PROTECTION METHODS .................................................................................................... 7
- TIMBER HARVESTING .................................................................................................................. 8
- FOREST COMPOSITION ............................................................................................................... 8
- THE HEALTH OF THE FOREST AND HOW IT AFFECTS THE TIMBER HARVEST .................... 9
- REGULATING FORESTRY ............................................................................................................. 11
- STATE REGULATION .................................................................................................................. 11
- LOCAL REGULATION .................................................................................................................. 12
- TYPES OF TIMBER HARVESTS ................................................................................................... 13
- A NOTE ABOUT THE MODEL REGULATIONS ............................................................................ 17
- THE MODEL REGULATIONS ........................................................................................................ 17
- MODEL REGULATIONS: TREE PROTECTION AND TIMBER HARVEST MANAGEMENT ............ 19
- BIBLIOGRAPHY .......................................................................................................................... 28
LIST OF FIGURES

1. Anatomy of a Tree .......................................................................................................................... 5
2. Construction/Building Activities that Harm Trees ................................................................. 6
3. Even Aged and Uneven Aged Forest .......................................................................................... 9
4. How Highgrading Affects the Health of the Forest .............................................................. 10
5. Types of Timber Harvest .......................................................................................................... 14
6. The Crop Tree Method ............................................................................................................. 15
7. Basic Steps in a Timber Harvest .............................................................................................. 16
8. Measurement of Diameter at Breast Height (DBH) .............................................................. 18
9. Relationship Between a Tree Drip Line and the Tree Protection Zone ............................... 19

LIST OF MAPS

1. Woodlands of the Lehigh Valley .............................................................................................. 2
INTRODUCTION

The benefits of woodlands and trees are well known. Trees stabilize the soil, control water pollution, improve air quality by removing carbon dioxide ($\text{CO}_2$) and airborne pollutants, remove visual and noise pollution, and provide a natural habitat for wildlife.

The Lehigh Valley contains over 168.5 square miles of woodlands greater than five acres in size. (Map 1, page 2) Many of these are located along mountain ranges and adjacent to major stream and river corridors. Adding to their need for protection, many types of woodland are located on steep slopes or in floodplains, and are a mixture of uneven aged and even aged forest, which plays a significant role in timber harvesting. As many Lehigh Valley municipalities will continue to grow during the next decade, sustaining healthy forests becomes important to the quality of life people experience. The role of forests in enhancing the environment and increasing community attractiveness and livability is significant as municipalities look to balance growth with the preservation of environmental features. The Comprehensive Plan The Lehigh Valley … 2030 has a goal of protecting and managing the region’s woodland resources. To implement that goal, the LVPC has created model regulations that control the cutting and removal of trees.

There are two approaches to regulating woodland protection.

The first approach is the adoption of tree protection requirements for new development. Tree preservation and protection requirements can require that a majority of existing trees in proposed subdivisions or land developments be maintained or replaced, except those whose removal is necessary for proposed development. Without regulations in place, development and the construction of driveways and houses can lead to tree loss and damage to trees not removed as part of site clearing and preparation. Often, trees are damaged during the construction process by soil compaction, grade changes, root crushing and pruning, damage to bark, improper pruning, incorrect storage of construction ma-
terials, and dumping of construction wastes. Minimizing impacts to trees during the development of a site is as important as their preservation. Some trees should not be preserved. Trees that are structurally unstable, in poor health, or unable to survive effects of construction become a liability to the project and should be removed. A realistic tree preservation plan acknowledges that conflicts between trees and development may sometimes result in the removal of trees.

The second approach regulates the timber harvest of private property. A timber harvest or forestry regulation does not prevent harvesting, but rather defines best management practices, limits damage to roads and surrounding lands, and defines the range of timber that can be removed from a property.

These guidelines are designed to give a brief overview of how a tree functions, the parts of the tree, how various activities may cause significant damage to trees and some of the issues related to the harvesting of trees. This guide does not represent a comprehensive examination of the biology or function of trees, nor a comprehensive examination of timber harvesting in Pennsylvania. The intent of this guide is to provide a general background of some of the issues and terms that a local municipal official may come across in the development of regulations relating to trees. The LVPC strongly recommends that municipalities consult with a Department of Conservation and Natural Resources (DCNR) forester in the preparation of regulations related to trees or the harvesting of trees.

REGULATING TREE PROTECTION

The legal basis for enacting municipal tree protection regulations is found in the federal statutes, the Commonwealth’s Constitution and in the Pennsylvania Municipalities Planning Code (MPC).

While federal legislation indirectly permits the regulation of trees, the Commonwealth’s Constitution, and more specifically, the MPC, clearly authorizes local municipalities to adopt tree protection regulations. The “Environmental Rights Amendment” of the Pennsylvania Constitution (Article 1, Section 27) has been interpreted by the courts as a responsibility equally shared by the Department of Environmental Protection (DEP) and municipalities. Pennsylvania’s municipalities have the responsibility to apply Section 27 in planning and regulation of land use. Section 27 states:

“The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania’s public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.”

Section 27 provides a right, in very broad terms, to environmental quality and specifies the Commonwealth as “trustee of these resources.” Because of its broad language, Section 27 has not had important effects in litigation.

The most direct authority, however, can be found in the MPC. The MPC, in effect since 1969 and updated several times since, provides the enabling legislation for municipal land use planning with mechanisms such as the creation of comprehensive plans, and zoning and subdivision ordinances. The intent of the MPC is to give municipalities the ability to guide coordinated development such as uses of land, structures, streets, and public facilities; and to promote preservation of natural and historic resources. The MPC provides the authority for municipalities to adopt regulations relative to trees. These sections are specifically:

Section 301(a) (6). “The municipal comprehensive plan shall include a plan for the protection of natural and historic resources to the extent not preempted by federal or state law. This clause includes, but is not limited to, wetlands and aquifer recharge zones, woodlands, steep slopes, prime agricultural land, floodplains, unique natural areas and historic sites.”
Section 503(2) (v). “A subdivision and land development ordinance may include provisions for ensuring that land, which is subject to flooding, subsidence, or underground fires, either shall be safe for the proposed use or that these areas shall be set aside for uses that do not endanger life or property.”

Section 603(c) (7). “Zoning ordinances may contain provisions to promote and preserve prime agricultural land, environmentally sensitive areas, and areas of historic significance.”

Section 605(2) (ii), (iii), and (vii). “Where zoning districts are created, all provisions shall be uniform for each class of uses or structures, within each district, except that additional classifications may be made within any district for the regulation, restriction, or prohibition of uses or structures at, along, or near natural or artificial bodies of water, places of relatively steep slope or grade, or other areas of hazardous geological or topographical features, floodplain areas, agricultural areas, sanitary landfills, and other places having a special character or use affecting or affected by their surroundings.”

Section 606. “The zoning ordinance shall include or reference a statement of community development objectives relating to the need for protecting natural resources.”

Section 609.1(c) (3) and (4) and Section 916.1(c) (5) (iii) and (iv). “In evaluating a substantive challenge to the validity of a zoning ordinance by a landowner, the governing body or the zoning hearing board shall determine the suitability of the site for the intensity of use proposed by the site’s soils, slopes, woodlands, wetlands, floodplains, aquifers, natural resources, and other features. It shall also evaluate the impact of the proposed use on the site’s soils, slopes, woodlands, wetlands, floodplains, natural resources, and natural features, the degree to which these are protected or destroyed, the tolerance of the resources to development, and any adverse environmental impacts.”

LOCAL REGULATION

Local municipalities have increasingly regulated tree removal through their zoning ordinances, since enactment of the first generation of zoning ordinances during the 1960s. Today, the majority of Lehigh Valley municipalities have regulations pertaining to tree protection. Local municipalities typically include a goal of tree protection in a comprehensive plan and specifically address tree protection by regulation through the zoning ordinance, subdivision ordinance or a stand alone ordinance. Regulations generally require a percentage of trees on a site to be preserved, or require replacement of trees that were removed.

There are limits, however. Municipalities should be careful in not requiring offsite tree replacement. In John Trojnacki v. Solebury Township Board of Supervisors, No. 1389 C.D. 2003 (Pa Cmwlth 2003), the Commonwealth Court held that the offsite tree replacement provision of the Solebury Township Tree Replacement Ordinance was invalid under the MPC. The provision that was challenged stated “where development takes place in fully wooded lots, the Township may designate offsite areas where replacement trees shall be planted.” The Court explained that “public capital improvements” stated within the definition of “offsite improvements” is not defined in the MPC, however, the plain meaning of the term would include planting trees “in order to maintain the arboreal status quo of a township.” Section 503-A allows municipalities to condition subdivision approval on onsite improvements, or even fees in lieu thereof, but the statute disallows such practices with regard to offsite improvements.

TREE BASICS

All of the various parts and functions of a tree are interdependent, and understanding these parts and functions is important to prevent damage. The trunk, crown and roots function together in a healthy tree. (Figure 1) Any damage to the above or below ground tree parts will reduce overall tree health.
The primary impact of construction around a tree is to the unseen portion, the root system. Tree roots, although primarily underground and not visible, comprise a large portion of a tree’s mass and are essential to tree health and safety. Roots anchor the tree, providing stability. They absorb water and nutrients, providing the essential elements for tree growth and survival. Roots are also a primary storage place for food (carbohydrates) produced by the tree.

Very few trees have the vertical downward thick root, commonly known as a taproot. Most trees begin life with a taproot, but after one to a few years the main root system changes to a wide-spreading root system. Roots spread to where soil conditions provide nutrients and moisture, which is usually near the surface. Approximately 85% of a tree’s roots are within the top eighteen inches of soil.

Damage to trees cannot be repaired. Trees are living organisms, but they do not heal. Damaged tissues are not replaced and restored with new cells. Damaged areas are physically closed off from the undamaged areas, and the damaged tissue remains within the tree for the rest of its life.

The defensive reaction to wounding and the spread of decay requires a redirection of energy. Each response to wounding results in a loss of energy that could have been used for healthy, normal growth of new limbs. Extensive wounding can stress a tree to the point of decline and death.

**HOW CONSTRUCTION ACTIVITIES CAN AFFECT TREES**

Many construction activities cause above ground damage to trees. Damage above ground can be a result of direct impacts with construction equipment and storage of construction materials against trees. (Figure 2)

Trunk and branch wounding can range from minor outer bark damage to total structural failure of the trunk. Trees must also redirect resources to close the wound, furthering net energy loss. The exposed tissue provides open access for fungus and decay. Because of this, trees stressed or weakened by construction damage may also be predisposed to insect and disease infestations.

When large branches are torn away from a tree, the damage is substantial. Loss of major limbs reduces the quantity of leaf area, which reduces the tree’s photosynthesis capability. Total leaf area is also reduced by leaf
Woodlands

6

Figure 2
CONSTRUCTION/BUILDING ACTIVITIES that HARM TREES

- Bark wounds
- Material storage
- Tree/building incompatibility
- Raising and lowering of soil levels
- Soil pollution
- Trenching for drains and utility lines
- Excavation and stripping of topsoil

scorch and twig death. This occurs when hot exhaust gases vent from equipment operating beneath tree crowns. Heat and fumes can kill or injure the trunks, branches and leaves, reducing the tree’s ability to survive.

Tree roots often suffer extensive injury and loss as a result of construction work happening around them. The soil within the root zone of a tree can suffer compaction damage by general construction traffic, operation of heavy equipment and by the storage of construction materials within the root zone. The soil may also be intentionally compacted as an engineering requirement of construction. A tree can survive for years after damage to its root system has occurred. The tree will continue for a time, sprouting new leaves and then appear to die suddenly. The tree was in decline for sometime, staying alive and looking relatively healthy by using its stored energy. Once that energy has been depleted, and with the root system damaged, the tree dies.

Compaction of the soil changes soil structure and increases bulk density. The compaction of the soil from the weight of the equipment causes a decrease in supplies of necessary oxygen and creates an accumulation of carbon dioxide and other gases.

Compaction can affect water infiltration rates. Some soil types become more impervious to water and others retain more water. This leads to either drying or water-logging of soils surrounding tree roots. Such changes in soil moisture can cause root damage or death. Abnormal soil moisture and compacted soil structure can also prevent roots growing into new areas. Symptoms of compaction may not be immediately obvious and trees may die several years after compaction damage has occurred.

Mature trees may be killed by new pavement. If a tree is completely surrounded by a paved area, there is little room for water and air exchange in the soil, resulting in a buildup of carbon dioxide.

Excavating and trenching machines are commonly used in construction. Roots can be severed, torn away or crushed causing serious wounding and loss of normal structural stability. This can lead to tree death and/or uprooting. Less severe damages may lead to drying out and death of exposed roots. Roots that are badly damaged are prone to decay. The physical loss of roots will affect the trees stability and ability to survive and may lead to a decline in tree health.
Leveling, filling and cutting of soil grades will result in the same types of damage associated with excavating, trenching and soil compaction. Grading may also remove the nutrient-rich topsoil that supplies the basic elements trees require for growth. Lowering or cutting grades can remove a large percentage of feeder roots. Raising or filling grades around trees reduces air diffusion and exchange in the root zone.

**WHY TOPSOIL IS IMPORTANT**

While the major thrust of tree protection and preservation is the tree itself, it is also important to protect the topsoil that surrounds the tree. Topsoil is the upper, outermost layer of soil, usually the top ten inches. Topsoil has the highest concentration of organic matter and microorganisms and is where most of the tree’s biological activity occurs. Trees will concentrate their roots in, and obtain most of their nutrients from, this layer. Without topsoil, tree growth is nearly impossible. It takes approximately 100 years for one inch of topsoil to be deposited, so it’s a valuable resource and commodity that developers and landowners should strive to keep on the site.

Even if grade changes are not made directly in the root zone they may be close enough to root systems to affect water drainage. Again, this may cause root dieback due to changes in soil moisture content.

Leaking or spilling of fuel, lubricants or hydraulic oils, or intentional dumping of paints, acids, solvents or any other toxic substances, may kill or damage roots.

**TREE PROTECTION METHODS**

In the majority of municipal tree protection regulations, a municipality requires the landowner or developer to create a plan to determine which trees can and should be saved on the site. The trees that are well-located, vigorous and have desirable characteristics are those trees that are generally selected. Trees that are often removed include those located in the immediate construction area and will be damaged by soil compaction, cutting of roots, or grade changes. Trees in poor condition should not be saved. It may be safer and cheaper to remove old, slow growing trees and those with extensive rot or disease before construction begins.

Out in the field, trees designated for protection should be marked. Most municipalities require the construction of barricades made of wood or fencing around trees to establish a tree protection zone. In some cases, these barricades can be out as far as the drip line of the trees. It is important to place heavy equipment, materials, ditches and underground utility lines outside the tree protection zone. If an underground line must go near a tree, require the contractor to tunnel or auger underneath major roots without cutting them.

*Examples of where trees were preserved despite the close proximity of development. Photos courtesy of Olev Taremäe*
A municipality can require the inclusion of a tree protection clause on the land development plans forbidding grading, filling, ditching, equipment parking or material storage within the tree protection zone and designate one corridor for site access, preferably where the driveway or parking area will be located.

TIMBER HARVESTING

Timber harvesting is big business in Pennsylvania, with over 60% of the state in forest cover. Pennsylvania is the largest producer of hardwood lumber. Payments to private landowners for timber sales exceed $350 million on average per year. These private landowners own 75% (12.5 million acres) of forestland across the state. Due to modern forest management techniques, the state’s forest cover is increasing and at its highest level since the late nineteenth century.

TIMBER IN EVERYDAY LIFE

Timber is used in the production of numerous household goods, such as:

- **Clothing.** Cellulose is used to produce rayon and acetate, which can be used to make a vast array of clothing such as ties, shirts, dresses and suits.
- **Cough Syrup.** Cellulose products, used for their even-flowing consistency, often thicken cough syrups and other liquid oral medicines.
- **Crayons.** Gum extracted from trees can help make crayons.
- **Football Helmets.** Ethyl cellulose is responsible for making the hard, impact-resistant plastics found in football helmets.
- **Gum.** Gum and synthesized essential oils from trees can be used to make chewing gum.
- **Lipstick.** Cellulose can help give lipstick its easy-apply texture.
- **Paint.** Methylcellulose, a product made from cellulose, gives paints their thick consistency.
- **Parmesan Cheese.** Cellulose powder is sometimes used to help keep grated Parmesan cheese pieces from caking together.
- **Toilet Paper.** Wood pulp makes paper products such as toilet tissue, paper towels, napkins and facial tissue.
- **Toothpaste.** Cellulose can be used in toothpaste to give it a paste-like consistency.

Timber may be harvested to salvage its value. Such a harvest is done to salvage the value of trees that have been damaged to such an extent that they will not recover or when the potential for such damage is extremely high. Wind, ice, snowstorms, fire and insects (gypsy moths, for example) can cause enough damage, and harvesting is necessary.

The most common types of harvested trees in the Lehigh Valley are poplar, oak, maple, birch and hickory. Timber is generally sold either on a lump sum basis or under a pay-as-cut agreement. In a lump sum sale, the landowner receives a set price (lump sum) for the stand of timber. Under a pay-as-cut agreement, the landowner is paid as the timber is cut and for only that timber that is harvested.

FOREST COMPOSITION

A stand is an area of forest with similar species composition, age and site conditions. A stand can be **pure** (at least 90 percent of the dominant trees are of one species) or **mixed**. It also can be **even aged** (all the trees in the stand are approximately the same age) or **uneven aged** (trees in the stand are of different ages). (Figure 3) A pure, even aged stand has the simplest structure, while a mixed, uneven aged stand has the most complex. The forest is the sum of its stands. Keeping that in mind, it is easy to understand that the forest, as a whole, can be
sustained even while timber harvesting and other regeneration practices are being carried out on individual, particular stands in different locations in the forest.

**FIGURE 3**

**EVEN AGED and UNEVEN AGED FOREST**

An uneven aged stand is a group of trees that differ significantly in ages. In uneven aged timber management, mature trees, or groups of them are harvested, leaving gaps and young trees to grow, allocating a portion of the growing space to regeneration.

An even aged stand is a group of trees that do not differ significantly in ages, and are usually about the same height. In even aged timber management, all of the trees are harvested in order to allocate all of the growing space to regeneration of new forest.

**THE HEALTH OF THE FOREST AND HOW IT AFFECTS THE TIMBER HARVEST**

The practice of “highgrading” has contributed to the loss of valuable tree species and the deterioration of a forest. Highgrading, which was practiced for decades until 20th century forest management practices were implemented, is removing the best timber and leaving the poorest trees behind, regardless of quality, condition or position in the stand (Figure 4, page 10). If a forest is highgraded several times, the forest is left with trees that will never become timber, and invasive species such as shade tolerant ferns and plants take over as the forest becomes even aged.

Between about 1880 and 1920, the demand for wood products — saw timber for boards, bark for tanning leather, pulp for other products — led loggers to level an estimated 18 million acres of Pennsylvania forest. This ultimately created even aged forests, since the regeneration of trees occurred generally at the same time. Under this condition, crowding and competition begin to influence tree growth. Some trees will show dominance because of more favorable growing conditions or genetic factors. Other trees will grow more slowly, and they will be suppressed.
FIGURE 4
HOW HIGHGRADING AFFECTS
the HEALTH of the FOREST

The original stand before a timber harvest.

The stand after a high grade cut. Note that only the well formed trees were removed. The only trees left are of poor quality, irregularly spaced, poorly formed or overtopped. The defective trees will promote disease and insect infestation and will lead to a deterioration of other stands around it.

The stand after harvest using a proper harvesting technique. Some healthy trees remain and are well spaced.
Currently, Pennsylvania forests are subject to attack by insects, diseases and fire. Forests in the Lehigh Valley are under attack from invasive plants such as the Autumn Olive, Garlic Mustard Tartarian Honeysuckle and the Asian Bittersweet. Autumn Olive remains a significant problem on the hillsides of the Trexler Game Preserve (Lehigh Valley Zoo) in North Whitehall Township. In cases where insects have caused considerable damage, a timber harvest and ground foliage elimination may be required in an effort to reestablish the forest. Dead and dying trees are removed, and then seedlings are planted to start the regeneration process. In many areas of the state, tree seedlings, shrubs and wildflowers are lost due to over-browsing by whitetailed deer. Severely over-browsed forests lose their intermediate vegetation layers including shrubs, seedling and sapling trees, and forest floor plants including wild flowers, grasses, sedges and other low-growing plants. In addition, the diversity of species declines. Loss of seedling and sapling trees threatens the ability of forests to regenerate; trees that die or are cut are not replaced by new trees. The forest is reduced to a few species of canopy trees and a ground layer of plants that deer generally do not eat. DCNR’s Bureau of Forestry considers deer over-browse as having the greatest impact on the health of the forest. Wind, snow, ice, drought and fire also take their annual toll on forest vegetation.

REGULATING FORESTRY

The basis for enacting municipal timber harvesting regulations is most specifically in the Pennsylvania Municipalities Planning Code (MPC).

STATE REGULATION

The Pennsylvania Municipalities Planning Code defines “forestry” as the management of forests and timberlands when practiced in accordance with accepted silvicultural principles, through developing, cultivating, harvesting, transporting and selling trees for commercial purposes, which does not involve any land development.

It further mandates that zoning ordinances cannot unreasonably restrict forestry activities in a municipality, and that all zoning districts permit forestry activities by right. These sections are specifically:

Section 105. “...and wherever the provisions of this Act promote, encourage, require, or authorize governing bodies to protect, preserve, or conserve open land, consisting of natural resources, forests, and woodlands, any actions taken to protect, preserve, or conserve such land shall not be for the purposes of precluding access for forestry.”

Section 603(f). “Zoning ordinances may not unreasonably restrict forestry activities. To encourage maintenance and management of forested or wooded open space and promote the conduct of forestry as a sound and economically viable use of forested land throughout this commonwealth, forestry activities, including, but not limited to, timber harvesting, shall be a permitted use by right in all zoning districts in every municipality.”

CHAPTER 102, EROSION CONTROL RULES AND REGULATIONS

Chapter 102 requires that an erosion control plan be developed, implemented and maintained for every earth disturbing activity within the Commonwealth. The plan must consider the control of erosion and sediment during the activity, as well as proper restoration after the activity. The plan should consider the control of all factors that relate to the causes of erosion and sediment. Timber harvesting operations that involve earth disturbance of more than 25 acres require a permit from DEP.

CHAPTER 105, DAM SAFETY AND WATERWAY MANAGEMENT RULES AND REGULATIONS

Chapter 105 requires proper planning, design, construction, maintenance and monitoring of all dams, reservoirs, water obstructions and encroachments to protect water quality, and the natural regime and carrying capacity of water courses.
THE INVOLVEMENT OF DCNR

Municipalities generally require a timber harvesting plan, which is a description of the proposed actions involved in the harvesting of the trees. The municipality may require the landowner to obtain a review of the plan by the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry. The Bureau of Forestry does not have regulatory power, and acts in an advisory role. However, much like how municipalities seek the input of the Lehigh Valley Planning Commission on matters of subdivision and land development, a municipality can require a developer to seek the opinion of the Bureau of Forestry on a forest stewardship plan. The plan is prepared by a forester with demonstrable expertise in forest management. The plan documents measures to be taken to: protect water quality; minimize impacts from skid trails and logging roads, land areas and the tree removal process; and ensure site restoration. These plans are usually reviewed and approved by the municipal engineer. Municipalities generally require the owner of the timber to provide a bond to ensure that any damage to municipal roads as a result of the harvesting operation is repaired by the owner.

PENNSYLVANIA CODE

Title 75 Pennsylvania Consolidated Statutes, Chapter 49; and Title 67 Pennsylvania Code, Chapter 189, states “the operator and/or the owner of timber rights shall be responsible for repairing any damage to Township roads caused by traffic associated with the timber harvesting operation to the extent the damage is in excess of that caused by normal traffic. The operator and/or owner of timber rights may be required to furnish a bond to the Township to guarantee the repair of such damages.”

LOCAL REGULATION

Eight municipalities in Lehigh County and fourteen municipalities in Northampton County currently have detailed standards to regulate forestry. One of the most important court cases relative to municipal regulation of forestry occurred locally. In Chrin Brothers, Inc v. Williams Township ZHB, No. 854 C.D. 2003 (Pa. Cmwlth. 2003), the landowner, Chrin Brothers, Inc., sought to “clear-cut” the trees on five separate properties. The owner filed applications for zoning permits, and the zoning officer denied the requested permits in light of provisions in the Township Zoning Ordinance regulating forestry activities with which the zoning officer determined clear-cutting operation would not comply. The zoning ordinance regulated commercial forestry activities by (1) requiring a forestry management plan consistent with the timber harvesting guidelines of the Pennsylvania Forestry Association; (2) prohibiting clear-cutting (except on tracts of less than two acres); (3) requiring that at least 30% of the forest cover (canopy) be kept intact, with the residual trees being well distributed and of higher value species; (4) requiring the submission of an erosion and sedimentation control plan; (5) prohibiting clear-cutting on slopes greater than 25% or within a 100-year floodway; and (6) requiring reforestation of areas timbered.

The landowner challenged portions of the ordinance requirements, particularly those which limited clear-cutting on sloped or floodway areas, and those which required the maintenance of 30% of the forest cover (thus prohibiting clear-cutting). Commonwealth Court concluded that these restrictions were not unreasonable, and did have the requisite relationship to protection of public health, safety and welfare. The Commonwealth Court reaffirmed the validity of regulations designed to protect environmentally sensitive topography. The prohibition against clear-cutting on steeply sloped areas (even categorizing 15% to 25% slopes as within the steep slope category) was within the authorization of Section 605(2)(ii) of the MPC, which authorizes additional restrictions along or near “places of relatively steep slope or grade, or other areas of hazardous geological or topographic features.”

In another case, Levi K. Stoltzfus v. Eden Township, Lancaster County ZHB, No. 343 C.D. 2007 (Pa. Cmwlth 2007), the landowner, Levi Stoltzfus, sought to operate a log processing business on his property, a sixty-seven acre farm in an area zoned for agriculture. Trees were brought to the property, where they were cut and then
Woodlands

loaded onto trucks. The landowner requested that the log processing business be considered a permitted use in
the agricultural zone, and in the alternative, a use variance for the log processing business. The zoning officer
denied both requests. The Zoning Hearing Board determined that the landowner’s log processing business did
not constitute a forestry use. The landowner appealed to Lancaster County Court of Common Pleas, which af-
affirmed the order of the Board, and then appealed to Commonwealth Court. The Commonwealth Court found
that the log processing business was not a forestry use as “the landowner did not claim to own a forest and does
not allege to maintain or manage a forest, nor does he allege to practice accepted silvicultural principles on his
land and/or claim to develop, cultivate, harvest, transport or sell trees from his land. The landowner’s claim
that the definition of forestry encompasses a business contained on land without trees, where trees are merely
transported via trucks in order to be cut, is an absurdity.”

TYPES OF TIMBER HARVESTS

In Figure 5 on page 14, the types of timber harvests are illustrated.

The single-tree selection and group selection methods mimic the natural processes of single trees or relatively
small groups of trees dying and falling. Both methods favor the regeneration of shade-tolerant species. Under
both methods, establishing areas of advanced regeneration is an ongoing process, from the time of the first cut
through each successive cut. The single-tree selection method removes individually selected trees, creating
small gaps in the canopy to assist in regeneration. This method is generally the most expensive method of har-
vesting and requires the greatest amount of care and skill on the part of the forester and the logger.

The group selection method removes trees in a number of small areas to create openings in the forest canopy.
The larger the opening, the more likely that regeneration of sun-loving (shade-intolerant) species will develop
and persist in the openings. Shade-tolerant species are more likely to sprout and survive near the edges of the
opening and in the uncut forest between the openings. For shade-tolerant species to compete successfully with
shade-intolerant species in the openings, they should be present as advanced regeneration before the harvest.

The shelterwood method leaves a large number of trees standing long enough to establish and protect “advanced
regeneration” sites until the seedlings and saplings are well established. (Because the residual trees also serve
as a continuing seed source, the shelterwood method is desirable when insufficient advanced regeneration is
present.) After regeneration is well established, the sheltering trees are harvested, letting regeneration occur
across the entire site.

The seed tree method leaves a few of the best trees standing to become the parent trees of the new forest. This
method has limited application in Pennsylvania forests.

The clear-cut method removes all the trees in a large area in a single cut. However, as management plans have
evolved to include multiple objectives, it is not unusual to find that even in a clear-cut area, some tree species are
reserved in the interests of biodiversity, wildlife habitat or aesthetics. These include rare or slow growing spe-
cies. This method is the most controversial and often the target of criticism. Clear-cutting may be the best way
to promote early successional forests that are essential for numerous plant and wildlife species. Clear-cutting is
the best method for regenerating those tree species (such as black cherry, aspen and yellow poplar) that require
full sunlight.
FIGURE 5
TYPES of TIMBER HARVEST

SINGLE-TREE SELECTION

GROUP SELECTION

SHELTERWOOD

SEED TREE

CLEAR-CUT
The crop tree method is a relatively new way of harvesting selected trees in a stand. (Figure 6)

**HARVESTING SYSTEMS**

Harvesting systems are named based on the form in which the wood arrives at the landing. The three general types of harvesting systems include shortwood, tree-length and full-tree.

We will focus our discussion on the tasks of marking the tree for harvest, felling the tree (cutting it down), delimbing (removing the branches), skidding (transporting the tree to a landing using equipment), bucking (cutting the tree into segments) and then loading it onto a truck. Figure 7 (page 16) shows these basic steps of a timber harvest.

**Shortwood** (also known as cut-to-length): Trees are felled, delimbed and bucked (cut to specific lengths) directly in the stump area and then transported to the landing or roadside.

**Tree-length**: Trees are felled, delimbed and then transported to the landing. At the landing, the tree length sections are processed into individual products or hauled as is to a central processing yard or mill.

**Full-tree**: Trees are felled and transported to the landing with the branches and top still intact. At the landing, the full trees are processed into individual products or hauled as full trees to a central processing yard or mill.

**TIMBER HARVEST TERMINOLOGY**

**Felling** is the act of cutting a tree.

**Skidding** is the dragging of the tree to a landing.

**Delimbing** is the process of removing branches from the stem of a felled tree.

**Bucking** is the cutting of a felled tree into specified log lengths for loading and transport.
FIGURE 7
BASIC STEPS in a TIMBER HARVEST

Marking
Source: northernwoodlands.org/articles/marking_timber

Felling
Source: office.microsoft.com/clipart

Skidding
Source: www.redsox.com/photos-audio/

Delimbing
Source: fotosearch.com/photos-images, stock photo: Royalty-Free images

Bucking
Source: fotosearch.com/photos-images, stock photo: Royalty-Free images

Loading
Source: office.microsoft.com/clipart
A NOTE ABOUT THE MODEL REGULATIONS

The model regulations are designed as a section in a zoning ordinance. By including it in the municipal zoning ordinance, a municipality can regulate tree protection and timber harvesting within their community. The model regulations are provided here only for review, reference and example purposes. This is not a legal document or the provision of legal advice. For the model regulations to be valid and legally enforceable, they may need to be modified and reviewed by the municipality.

THE MODEL REGULATIONS

The LVPC model regulations accomplish tree preservation in four ways.

1. The regulations require that every tree with a caliper of eight inches or more (measured at 4.5 feet off the ground, this is the definition of diameter at breast height) (Figure 8, page 18) that is removed from the site be replaced on a 1:1 basis with a native tree that has the same estimated maximum height and growth rate of the tree to be removed. The replacement trees shall have a minimum two (2) inch caliper.

2. There is a fundamental difference between the terms “diameter at breast height” and “caliper”. Both are used in the model regulations. Diameter at breast height is trunk diameter 4.5 feet from the ground. This remains the standard method for recording trunk diameter of existing, mature trees. However, when it comes to measuring replacement trees, which are usually acquired from a nursery or landscaping business, the standard for measuring trunk diameter is trunk caliper, not DBH. Trunk caliper is the measurement of trunk diameter six (6) inches from the ground. If trunk diameter measured six (6) inches from the ground is greater than four (4) inches, then measure the diameter twelve (12) inches from the ground.

3. The regulations require that the roots of trees remaining on the site in the area of land disturbance be protected and that a “tree protection zone” be established during construction around these trees. (Figure 9, page 19) The tree protection zone is five (5) feet outwards from the tree’s dripline. The tree’s dripline is the greatest extent of the branches.

4. The regulations set forth requirements for timber harvesting.

An example of mature, existing trees. You would measure these trees at diameter at breast height (DBH). Note the good buttressing (flaring-out) of the roots all the way around the base of the tree trunk. This is evidence of healthy, preserved trees. 
Photo courtesy of Michael Kaiser
**Figure 8**

**Measurement of Diameter at Breast Height (DBH)**

- Tree on Level Ground
- Tree on Slope
- Leaning Tree
- Tree with branch/deformity at breast height
- Tree forked below breast height
- Tree forked above breast height
SECTION 100. PURPOSES

The purpose of this Article is to preserve, protect, replace and properly maintain trees within (Municipality) to aid in the stabilization of soil by the prevention of erosion and sedimentation; reduce storm water runoff and the costs associated therewith and replenish ground water supplies; aid in the removal of carbon dioxide and generation of oxygen in the atmosphere; provide a buffer and screen against noise pollution; provide shade; provide protection against severe weather; aid in the control of drainage and restoration of soil subsequent to construction or grading; conserve and enhance (Municipality) physical and aesthetic environment; promote good forest stewardship; avoid unreasonable and unnecessary restrictions on the right to practice forestry; and generally protect and enhance the quality of life and welfare of (Municipality).

SECTION 200. APPLICABILITY

A. For purposes of this Article, trees shall include all trees now or hereafter growing in any public right-of-way or on public or private lands within (Municipality).

B. Trees within existing conservation and other protective easements, floodplains or wetlands shall be preserved unless the removal of trees is for the purpose of managing or improving the natural habitat with approval of the municipality.
C. Except as otherwise provided herein, it shall be unlawful for any person to cut down any tree in (Municipality) that measures eight (8) inches or more in diameter at breast height (DBH).¹

SECTION 300. EXEMPTIONS

A. The following shall be exempt from this Article:

1. Commercial nurseries and fruit orchards.

2. Christmas tree farms.

3. Trees directed to be removed by municipal, county, state or federal authority pursuant to law.

4. Removal of trees that appear to cause structural damage to buildings or foundations.

5. Tree maintenance and landscaping on residential and commercial lots.

6. Any tree determined to be causing a danger or be in hazardous condition as a result of a natural event such as tornado, storm, flood or other act of God that endangers the public health, welfare or safety and requires immediate removal.

7. Any tree growing on or over a public right-of-way.

8. Pruning or removal of trees within the right-of-way by utility companies for maintenance of utility wires or pipelines and the pruning of trees within sight easements.²

9. Those projects that have received major subdivision or site plan approval prior to the effective date of this Article and amended major subdivision and site plans.

SECTION 400. CONSTRUCTION-RELATED TREE CUTTING

A. Every existing tree, eight (8) inches or more in DBH, that is removed because of a land disturbing or land developing activity shall be replaced on a 1:1 basis with a native tree that has the same maximum height and growth rate of the tree to be removed. Where large maturing trees are required and overhead utility lines exist, smaller native trees shall be substituted. If the number of trees removed that are at least eight (8) inches DBH cannot be identified, each stump (if available) will be inspected and the width of each tree removed will be determined by an ISA certified arborist.³

¹ The model regulations use the DBH as specified in the Lehigh/Northampton County Subdivision and Land Development Ordinance.

² Tree trimming is very important. For example, the August 14, 2003 blackout that affected the Northeastern United States was caused in part by lax tree trimming near and under high voltage power lines. Three of First Energy’s major 345-kV lines in Ohio malfunctioned due to hitting an overgrown tree that should have been trimmed. Utility companies can trim trees under franchise and easement agreements with the municipality. If municipalities are concerned with how utility companies trim existing trees in the right-of-way, they can add design standards to their ordinance. An excellent reference on the subject is “Pruning Trees Near Electric Utility Lines: A Field Pocket Guide For Qualified Line-Clearance Tree Workers” by Dr. Alex L. Shigo.

³ The International Society of Arboriculture (ISA) identifies professional arborists who have a minimum of three years full-time experience working in the professional tree care industry and who have passed an extensive examination on several significant areas of arboriculture.
B. The replacement trees shall be selected from the (Municipality) Subdivision and Land Development Ordinance. The trees shall be not less than two (2) inches caliper. The trees shall be at least ten (10) feet tall after planting and trimming. Trees shall not be planted within the tree protection zone of another tree. A maximum of 30% of the required trees may be replaced as evergreen trees.

C. Where ten (10) or more replacement trees are required, not more than fifty (50) percent of the replacement trees shall be of the same species of tree without the approval of (Municipality).

D. The replacement trees may be placed on the site at any location selected by the property owner as long as such location does not violate any other provision of this Article.

E. Any replacement tree which is not alive or healthy, as determined by (Municipality), or which subsequently dies due to construction activity within one (1) year after the date of project closure, shall be removed by the Applicant and replaced with a new healthy tree meeting the same minimum size requirements within six (6) months of removal.

SECTION 500. TREE PROTECTION STANDARDS

A. No change in existing grade shall be permitted within the tree protection zone. Appropriate fencing or other means of demarcation acceptable to (Municipality) shall be placed for the duration of construction at the tree protection zone of trees being retained and that are adjacent to construction. Roots of trees being retained shall not be cut.

B. No boards or other materials shall be nailed or otherwise attached to trees during construction.

C. Construction materials, equipment, soil and/or debris shall not be stored nor disposed of within the tree protection zones of trees being retained, except for mulched vegetative matter used to prevent soil compaction.

D. Tree trunks, limbs and exposed roots damaged during construction shall be protected from further damage by being treated immediately in accordance with ISA standards.

E. Any clearing within the tree protection zone shall be done by hand-operated equipment.

4 Guidance on the “type” of tree can usually be found in the municipal Subdivision and Land Development Ordinance.

5 Larger trees take longer to establish than smaller ones. Many people assume that the larger the tree, the better. While larger, more expensive trees create an instant landscape, they are slower to establish and grow. While roots of large and small trees grow at the same rate (roughly 18 inches a year), it takes the large tree several years longer to regain the size of its original root system. The larger the tree, the longer the period of slow top growth after replanting. For example, a 2-inch caliper tree will reestablish its root system in two years; a 4-inch caliper tree will take four years. A 4-inch caliper tree will not grow much in the first few years. During that time, it allocates all of its energy to root development. In most cases it is better to require a smaller tree that will quickly establish and grow to the size of the bigger, more expensive tree.

6 A municipality should not require a landowner to plant replacement trees offsite. It should be voluntary. In John Trojnacki v. Solebury Township Board of Supervisors, No. 1389 C.D. 2003 (Pa Cmwlth. 2003), the Commonwealth Court ruled that the required offsite tree replacement is invalid under the Pennsylvania MPC. We discuss this case in the narrative.
SECTION 600. TIMBER HARVESTING GENERAL REGULATIONS

A. When a property owner wishes to conduct, or permit to be conducted, a timber harvesting operation on his or her property, such owner shall obtain a timber harvesting permit from (Municipality).

B. A timber harvesting permit shall not apply to:

1. Work performed on clearing subdivision roads and rights-of-way approved by (Municipality).

2. Work performed in accordance with a land development plan approved by (Municipality).\(^7\)

3. The cutting of trees for the personal use of the landowner or for pre-commercial timber stand improvement\(^8\) on lots less than one acre in size. Timber harvested for the above stated purposes will not leave the site.

C. (Municipality) shall be notified in writing before any timber harvesting operation begins and terminates. (Municipality) shall be notified five (5) business days prior to starting the timber harvest and five (5) business days prior to terminating the operation.

SECTION 700. SUBMISSION REQUIREMENTS FOR PERMIT APPLICATION FOR TIMBER HARVESTING OPERATIONS

A. Any timber harvesting operation shall be undertaken in accordance with a Timber Harvesting Plan approved by (Municipality). All Timber Harvesting Plans shall be submitted to (Municipality) for review for compliance with the standards for timber harvesting operations set forth herein not less than forty-five (45) days prior to commencement of the timber harvesting operation. Within thirty (30) days of submission to (Municipality), a Timber Harvesting Plan shall be approved, denied or approved subject to reasonable conditions and the Applicant so notified in writing.

B. Any Timber Harvesting Plan submitted to (Municipality) for review and approval shall include a plan or plans indicating the following information:

1. Purpose of the proposed operation.

2. Name, address and telephone number of forestry operator.

3. Total land area involved in the proposed timber harvesting operation.

4. Total number of trees selected for harvesting.

5. Erosion and sedimentation plan.

---

\(^7\) Article I, Section 107 of the Pennsylvania Municipalities Planning Code defines “forestry” as the management of forests and timberlands when practiced in accordance with accepted silvicultural principles, through developing, cultivating, harvesting, transporting, and selling trees for commercial purposes, which does not involve any land development.

\(^8\) The regulations have been drafted with commercial timber harvesting in mind, and on small sites, timber harvesting is generally reserved for personal uses such as firewood and limited cutting associated with stand improvement, the impacts of which are minimal on the municipality. If a municipality is concerned, for example, that a property owner is in the business of selling firewood for profit, the municipality could enforce the onsite provision.
6. Reforestation narrative outlining the revegetation of the land area, skid trails and harvest areas.

7. A chart indicating the quantity of trees and the species of trees selected for harvesting.

8. Site location and boundaries of both the entirety of the property upon which the timber harvesting operation shall occur and the specific area proposed for timber harvesting.

9. The general location of the proposed operation in relation to municipal and state roads and any proposed accesses to those roads.

10. Existing watercourses, floodplains and wetlands.

11. The required fifty-foot (50) buffer along any harvesting area, landing area, public road, watercourse or wetland as specified in Section 800 (A).

12. Topography of the property, including all slopes of 25% or greater.

13. Earth disturbance locations, including skid trails and landing areas.

14. Design, construction, maintenance and retirement of the access system, including haul roads, skid roads, skid trails and landings.

15. Design, construction and maintenance of water control measures and structures.

16. Design, construction and maintenance of proposed stream and wetland crossings.

C. Before any permitted timber harvesting operation begins, all trees that are at least eight (8) inches DBH to be felled in connection therewith shall be clearly marked on the trunk and the stump so that the same may be easily identified both before and after a tree has been felled. No tree or stand of trees shall be felled that has not been designated for removal on the approved Timber Harvesting Plan.

D. Any permits required by any other agency under any applicable regulation shall be the responsibility of the landowner or timber harvesting operator as applicable. Copies of all required permits shall be submitted to (Municipality) at least twenty (20) days prior to commencement of the timber harvesting operation.

SECTION 800. TIMBER HARVESTING OPERATION REGULATIONS

A. A fifty-foot (50) buffer zone, within which no timber harvesting shall occur, shall be required between the boundary of any timber harvesting area and any public street, road, or watercourse or wetland.

B. Timber harvesting is prohibited within a floodplain and wetlands.

C. Clear-cutting is permitted on slopes of 15% but less than 25% where it is done for the purposes of managing or improving the natural habitat. Clear-cutting is prohibited on areas with slopes of 25% or greater.⁹

⁹ This particular regulation is discussed on page 12 in our summary of Chrin Brothers, Inc. v. Williams Township ZHB. The regulation is consistent with our model regulations on steep slopes. Clear-cutting is only one method to harvest timber on a site. Other methods are available and are discussed on pages 13-15.
D. Trees falling on adjacent properties as a result of a timber harvesting operation shall be returned immediately to the landowner’s property, who shall be responsible for any damage, cost or restoration to the affected adjacent property.

E. Felling or skidding on or across any public road or right-of-way is prohibited without the express written consent of (Municipality) or the Pennsylvania Department of Transportation, whichever is responsible for maintenance of such public road or right-of-way.

F. No treetops or slash shall be left:
   1. Within fifty (50) feet of any public road, street, adjacent property or private roadway providing access to any adjoining property.
   2. On or across the boundary of any property adjoining the timber harvesting operation without the written consent of the owner thereof.
   3. In a floodplain or wetland.

G. All tree tops, limbs and slash shall be cut to a height of no more than four (4) feet above ground level.

H. The stumps of all felled trees shall be permitted to remain for soil stabilization provided that they extend no more than two feet (2’) above grade.

I. Littering is prohibited and litter resulting from a timber harvesting operation shall be removed from the site on a daily basis.

J. During the periods of abnormal forest fire danger, as determined by (Fire Company that serves the site of the timber harvest), (Municipality) shall have the authority to order a suspension of timber harvesting operations until the danger subsides.

K. (Municipality) shall have the authority to order the suspension of any timber harvesting operation if, in the opinion of (Municipality), conditions created by the spring thaw, adverse weather or any other cause makes soil erosion likely.

L. Upon completion of the timber harvesting operation, all disturbed areas including, but not limited to, the landing areas and skid trails shall be revegetated pursuant to the Timber Harvesting Plan approved by (Municipality).

M. A timber harvesting operation shall not include any onsite processing of harvested trees or manufacturing except as defined in a Timber Harvesting Plan approved by (Municipality).10

N. Pursuant to Title 75 of the Pennsylvania Consolidated Statutes, Chapter 49, and Title 67 Pennsylvania Code, Chapter 189, the landowner and the operator shall be responsible for repairing any damage to (Municipality) roads caused by traffic associated with the timber harvesting operation, to the extent the damage is in excess of that caused by normal traffic, and shall be required to furnish a bond to guarantee the repair of such potential damages, as determined by the (Municipality) with advice from the Municipal Engineer.

---

10 The definition of forestry in the MPC does not include onsite processing of the harvested trees or manufacturing of wood products from those trees. Municipalities should define these activities as separate uses, with design standards, and when defining timber harvesting, to exclude tree processing and manufacture of wood products.
SECTION 900. RIGHT TO INSPECT

A. (Municipality), by its own personnel or outside agent, may enter upon the site of any proposed timber harvesting operation after an application to conduct such operation has been filed for the purpose of reviewing the plans for the proposed operation and thereafter recommending or opposing the proposed operation or recommending or requiring changes or modifications thereto.

B. After a permit for a timber harvesting operation has been issued, (Municipality) shall have the right by its own personnel or agent, to enter upon the site before, during and after the timber harvesting operation to ensure and require compliance with both the plans for said operation as finally approved and all of the terms and provisions of this Ordinance.

SECTION 1000. VIOLATIONS

A. Upon finding that a timber harvesting operation is in violation of any provision of this Article, (Municipality) shall issue the logging operator and the landowner a written notice of violation in accordance with the provisions of this Ordinance regarding enforcement notices\textsuperscript{11}, describing each violation and specifying a date by which corrective action must be taken.

B. (Municipality) may order the immediate suspension of any timber harvesting operation and may institute any appropriate action to prevent, restrain, correct or abate the violation of this Article upon finding that:

1. Corrective action has not been taken by the date specified in a notice of violation.

2. The operation is proceeding without a Timber Harvesting Plan.

C. Suspension orders shall be in writing and shall be issued to the forestry operator and the landowner and shall remain in effect until the timber harvesting operation is brought into compliance with this Article or other applicable statutes or regulations.

SECTION 1100. DEFINITIONS

Caliper. The diameter of a tree trunk measured in inches, six (6) inches above ground level for trees up to four (4) inches at DBH and twelve (12) inches above ground level for trees over four (4) inches at DBH.

Diameter at Breast Height or DBH. The diameter of a tree is measured at a height of 4.5 feet above the ground, on the uphill side of the stem, using a tree caliper, a diameter tape or a Biltmore stick.

Dripline. The outside edge of the area located directly beneath the canopy of a plant upon which rain is intercepted before it falls to the ground.

Evergreen tree. A tree having foliage that persists and remains green throughout the year.

Felling. The act of cutting a standing tree so that it falls to the ground.

Forestry Operator. An individual, partnership, company, firm, association or corporation engaged in timber harvesting, including the agents, subcontractors and employees thereof.

\textsuperscript{11} This section provides some specific language relative to violations of a timber harvesting permit. A zoning ordinance usually has a section on violation notices and enforcement procedures that should be followed or referenced. Any enforcement action taken by the municipality should be consistent with Section 616.1, 617 and 617.2 of the Pennsylvania MPC.
**Haul road.** A constructed road of dirt and/or gravel utilized for moving cut trees from the point where they are loaded on a truck to exit from the site.

**Invasive Species.** Any species of tree that has been introduced to an environment where it is not native, and that has since become a nuisance through rapid spread and increase in numbers, often to the detriment of native tree species.

**ISA.** International Society of Arboriculture.

**Land disturbing activity.** Any change of the land surface including removing vegetative cover, excavation, filling, grading and/or the construction of any structure. An agricultural activity such as the planting, growing, cultivating and harvesting of crops is exempt from this definition.

**Landing.** The place where logs, pulpwood or firewood are assembled for transportation to a processing facility.

**Landscaping.** The design, location, planting and removal of vegetation on a lot by a landowner for the purposes of achieving a desirable appearance.

**Landowner.** The legal or beneficial owner or owners of land.

**Litter.** Discarded items not naturally occurring on the site.

**Personal Use.** A good, product or resource used for personal consumption and not in a trade or business.

**Pre-Commercial stand improvement.** A forest practice such as thinning or pruning that results in better growth, structure, species composition or health for the residual stand but that does not yield a net income to the landowner.

**Skid road.** An improved road that is used by forestry equipment to transport felled trees to the landing site and can be used by other vehicles.

**Skid trail.** A path travelled by ground skidding equipment while moving trees or logs to a landing.

**Skidding.** The dragging of felled trees on the ground from the stump to the landing by any means.

**Slash.** Woody debris left in the woods after timber harvesting, including logs, chunks, bark, branches, uprooted stumps, and broken or uprooted trees or shrubs.

**Stand.** Any area of forest vegetation whose site conditions, past history and current species composition are sufficiently uniform to be managed as a unit.

**Stump.** The base part of a tree that remains standing after the tree has been felled.

**Thinning.** The systematic removal of selected trees to improve the health and growth of the residual stand.

**Timber Harvesting Operation.** Process of cutting down trees, removing logs from the forest for the primary purpose of sale or commercial processing into wood products.

**Tree.** Any self-supporting woody plant, not less than a two (2) inch caliper.

**Tree maintenance.** An operation performed on a tree for the removal of any branches, alive, diseased, or dead, in order to prevent or suppress diseases or to balance or shape the tree for any reason.

**Tree Protection Zone.** An area that is radial to the trunk of a tree in which no construction activity shall occur. The zone shall be at least five (5) feet beyond the dripline of the tree. Where there is a group of trees or woodlands, the zone shall be the aggregate of the protection zones of the trees.

**Treetop.** The upper portion of a felled tree that is not merchantable because of small size, taper or defect.

**Vegetation.** Trees, shrubs, ground cover and other plants that stabilize the soil.
BIBLIOGRAPHY


Lehigh Valley Planning Commission
Attn: Dave Berryman
961 Marcon Blvd., Suite 310
Allentown, PA 18109

Mr. Berryman:

We have reviewed the Lehigh Valley Planning Commission’s Guide-Model Regulations for Woodlands and found it to be a comprehensive document. The use of this Guide should encourage municipalities and landowners to manage their forestland in a sustainable fashion and protect trees properly during a disturbance. This document describes and details the essential areas that should be found in woodlands-related zoning ordinances.

We commend you on your commitment to providing well-prepared documents and, on behalf of the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry; we support the content of the LVPC’s Woodlands Guide-Model Regulations.

Please feel free to contact me with any questions or concerns.

Sincerely,

Timothy R. Dugan
Forester

Cc: Joe Frassetta