

## PREREQUISITES

1. The municipal Master Plan should be amended to identify existing woodlands within the municipality and prioritize them (as "Priority Woodlands") in terms of their types and relative values. This will require the municipality to determine and balance the often competing goals of woodlands retention and retention of agricultural lands. Potential publicly owned lands suitable for woodlands mitigation plantings should also be identified in the Master Plan.
2. The municipal Zoning Ordinance should accommodate the preservation of woodlands by establishing uses and densities/intensities and development alternatives that permit development to occur without necessitating the destruction of prioritized woodlands. In some zones (such as commercial and industrial zones) it may not be possible to achieve both land use goals and woodland conservation goals. The Master Plan should anticipate this and establish guidelines for addressing the conflict or recommend appropriate zoning changes. The municipality should decide whether this Ordinance will be applicable to all developments or only to "major developments" as defined by the municipality.
3. Municipality will also need to adopt a separate Tree/Woodland Protection Ordinance as a regular police power ordinance to cover tree removal on properties that are not the subject of a development application.
4. Municipality may wish to adopt a separate ordinance establishing the position and responsibilities of the Woodlands Advisor who will advise the municipal agencies reviewing site plans and subdivisions and who would also be charged with enforcing any separate Tree/Woodland Protection Ordinance, overseeing construction activities, monitoring the implementation of mitigation plans and policing conservation easements.
5. The checklist requirements for complete applications will need to include the information described in Sections IV and V of the attached Ordinance. Please note that many of the requirements of Section IV are already required by the municipality as part of the submission requirements for an Environmental Impact Statement. If so, the requirements of Section IV should be used to amend and supplement the existing EIS requirements so that the additional data needed for woodlands preservation are provided.
6. The municipality has the responsibility for enforcing the terms of any conservation easements relating to woodlands preservation. The municipality must be willing to accept this responsibility and develop a plan for executing it.
7. A Reference List of technical resources should be appended to both the Master Plan and the Zoning Ordinance. A suggested Reference List of technical resources to be included is attached to the back of this Ordinance.
8. The municipal fee schedule should be amended to include fees for optional pre-application meetings with and site inspections by the Woodlands Advisor. It is anticipated that escrow fees, paid by the applicant at the time of the submission of a formal site plan or subdivision application, will cover all services performed by the Woodlands Advisor thereafter.

## WOODLANDS RETENTION ORDINANCE

AN ORDINANCE ESTABLISHING REQUIREMENTS AND PROCEDURES  
FOR THE RETENTION AND PROTECTION OF TREES AND WOODLANDS  
IN THE DEVELOPMENT OF LAND

I. Purpose

The purpose of this Ordinance is to promote the intent of the municipal Master Plan and the purposes of the Municipal Land Use Law (set forth at N.J.S. 40:55D-2) by protecting critical environmental resources, including air quality, water quality, soil cover, animal and plant habitat and viewsheds, that are negatively affected by the removal of woodlands. Retention of woodlands helps to control the velocity and amount of stormwater runoff, thereby reducing flooding; filters sediments and pollutants before they reach streams; promotes groundwater recharge; stabilizes the soil and reduces soil erosion; improves air quality by filtering pollutants from the air; preserves viewsheds; offers a stable habitat for associated plant species and for animal wildlife; and provides shade and windbreaks that help moderate the effects of climate conditions. Protection of woodlands along a stream corridor is essential to the maintenance of stream biota, and protection of woodlands on steep slopes is essential to soil stabilization. The retention of woodlands is essential to the scenic quality of a community and helps to preserve the diversity of native plantlife and animal species. The protection of woodlands is consistent with New Jersey's Stormwater Management Rules and Best Management Practices. The protection of woodlands also has an intrinsic value. Once removed or mismanaged, the restoration or replacement of woodlands can be a lengthy, delicate, complex and expensive process. The time, difficulties and costs inherent in this process render existing woodlands tantamount to a non-renewable resource in a community.

*The purpose section of this Ordinance establishes the legal basis for adopting the Ordinance by tying it to the health, safety and welfare of the community. The purpose section can draw from the municipality's master plan, restating specific environmental, health and aesthetic benefits of woodlands that relate to health, safety and welfare.*

II. Definitions

- A. Caliper - The diameter of a balled and burlapped or bare root nursery stock tree trunk taken 6 inches above the ground for trees up to 4 inches in diameter and taken 12 inches above the ground for trees larger than 4 inches in diameter.
- B. Critical Root Zone - The region measured outward from the trunk of a tree to and beyond the dripline to include the entire area within which the tree's feeder roots are located, as determined by probing of the soil around the tree to a depth of 18 inches by a qualified tree care professional.

- C. Diameter at Breast Height (dbh) - The measurement of the diameter of the trunk of a tree planted in the ground taken 4.5 feet from the ground level on the uphill side of the tree.
- D. Determination of Inapplicability - A determination by the Municipal Agency or its designee that the criteria of Section III.C. herein have been satisfied and that the applicant is thereby relieved of all other submission requirements and procedures of this Ordinance.
- E. Dripline - A vertical line extending from the outermost edge of the tree canopy or shrub branch to the ground beneath.
- F. Forest - A biological community dominated by trees having an average canopy height greater than 20 feet and other woody plants covering a land area of at least 10,000 square feet (.23 acres) and generally characterized by a tree density of 100 or more trees per acre with at least 50 percent of such trees having a dbh of two (2) inches or greater. A forest may have been cut (but not cleared) in conjunction with an approved forestry management plan or may be intact. An orchard or a tree nursery is not a forest. The term "woodland" is used interchangeably with the term "forest" in this Ordinance.
- G. Forest Stand - A contiguous grouping of trees growing on a site that are sufficiently uniform in age-class distribution, composition and structure and are of sufficiently uniform quality to be a distinguishable unit.
- H. Forest Stewardship Management Plan - A plan prepared for qualifying property owners participating in the federally funded Forest Stewardship Program. The Management Plan and Program are intended to encourage management of private forests for their non-commodity benefits, such as wildlife, recreation, aesthetics and water quality, in addition to or in lieu of their traditional commodities such as timber and wood products. Forest stewardship promotes long-term active management while emphasizing consideration of all resources and benefits associated with forests.
- I. Municipal Agency - The Planning Board, Zoning Board of Adjustment or Land Use Board of the municipality having jurisdiction to review and approve an application for development pursuant to N.J.S.A. 40:55D-1, *et seq.*
- J. Specimen Tree - A tree in good health of unusual or exceptional form, size, age or shape for its species and/or occupying a significant position within the landscape. A Specimen Tree would necessarily include, but not by way of limitation, any tree included on the "Big Tree List" of the New Jersey Bureau of Forestry, Community Forestry Program; any endangered species of tree; or any tree that has been identified or would qualify as a "heritage tree" having significant historical or cultural value to the community.

- K. Woodlands Advisor - An expert qualified in woodlands management and forestry retained by the Municipal Agency for the purposes of offering advice and recommendations concerning the implementation of this Ordinance. The Woodlands Advisor should be a New Jersey Approved Forester, New Jersey Certified Landscape Architect or New Jersey Certified Tree Expert.

*Definitions of terms that specifically relate to the Woodland Retention and Preservation Ordinance can be listed separately within the Woodland Retention and Preservation Ordinance or included under general definitions found in the municipality's land development regulations. Alternatively, they can be restated in both places. If they are included in more than one section of the municipality's land development regulations, definitions must be consistent.*

*All technical terms should be adopted from reliable sources (see references provided in Appendix A for sources from which definitions in this model ordinance were derived). The term "caliper" is used in the nursery industry to define the size class of a tree when purchasing nursery stock for landscaping purposes. The term "Diameter at Breast Height" or "dbh" is used when classifying trees in a forest.*

*The definition of "Specimen Tree" is intentionally left broad. Each municipality is encouraged to develop a comprehensive list and associated map of known Specimen Trees within the municipality and/or a set of guidelines for determining that a tree qualifies as a Specimen Tree. This information should be included in the municipal Master Plan and should be developed in consultation with the Woodlands Advisor and other municipal agencies; the "Big Tree List" of the New Jersey Bureau of Forestry, Community Forestry Program; lists of endangered tree species; lists of "heritage trees" (trees having historic or cultural value within the community); and consideration of the extraordinary characteristics of particular trees, such as their size relative to other members of the same species or their significant placement within the landscape.*

*The municipality should adopt a separate ordinance establishing the position of a "Woodlands Advisor." This individual may advise the municipal reviewing agencies not only as per the provisions of this Ordinance, but also regarding: 1) any separate police power Tree/Woodland Protection Ordinance; 2) overseeing the implementation of this Ordinance during construction activities; 3) monitoring implementation of mitigation plans; and 4) policing woodland conservation easements.*

### III. Applicability

- A. The regulations set forth herein shall apply to any tract of land that is the subject of an application for site plan or subdivision approval.
- B. The removal of trees on a lot or tract of land that is not the subject of an application for site plan or subdivision approval shall be governed by the regulations of Chapter \_\_\_\_, Tree Protection Ordinance.

C. An applicant, after submitting the information required in Section IV.B.1. of this Ordinance to the Municipal Agency, may thereafter request a determination of inapplicability by the Municipal Agency if all of the following apply:

1. If the application proposes no encroachment into forested areas;
2. If the application proposes no removal of specimen trees; and
3. If the Woodlands Advisor concurs that conditions 1. and 2. above exist.

A determination of inapplicability shall relieve the applicant of all other submission requirements and procedures of this Ordinance.

In the event an applicant proposes the development of only a portion of a tract, the balance of which is proposed to remain in agricultural use or agricultural woodland management use, a determination of inapplicability shall be rendered with respect to the portion of the tract that is proposed to remain in agricultural use or agricultural woodland management use.

D. It is strongly recommended that each prospective applicant schedule a pre-application meeting with the Woodlands Advisor prior to submitting a formal application for development to the Municipal Agency for the purpose of evaluating the impact of this Ordinance on the plans for development. The fees for such pre-application meeting are set forth in Article \_\_\_\_\_ of the municipal Code.

*The Model Woodland Retention and Preservation Ordinance applies to all subdivisions and site plans including major and minor, residential and nonresidential. Each municipality must determine how broadly it chooses the Ordinance to apply. Ideally, each municipality should also adopt a Tree/Forest Removal Ordinance as part of the municipality's police power regulations to address tree/forest removal on properties not subject to a subdivision or site plan application. This ensures forest conservation not only at the time a property is being developed, but also in a variety of other situations. These may include routine tree removal activities by landowners for septic system replacement, construction of a deck or other accessory structures, or other land disturbance activities that do not constitute a subdivision or site plan but potentially affect tree/woodland resources.*

*Please note that the municipal fee schedule should be amended to include fees for development reviews conducted by the Woodlands Advisor.*

#### IV. Environmental Resource Inventory

A. Each application for site plan or subdivision approval shall be accompanied by an environmental resource inventory documenting the existing natural features on the site. The purpose of the environmental resource inventory is to permit the Municipal Agency to evaluate the importance of

the existing woodlands to the preservation of high priority natural resources and ecosystems. The environmental resource inventory shall be prepared by one or more qualified professionals such as an engineer, forester, ecologist or landscape architect and shall be site specific. The environmental resource inventory requirements set forth herein may be submitted as part of the environmental resource inventory required for the development application as a whole.

- B. The inventory shall consist of a natural resource inventory map, an aerial photograph and a report.
1. The natural resource inventory map shall show the following on the tract and within 500' of the tract boundary at a scale of 1" = 100' or larger and at the same scale as the rest of the site plan or subdivision submission:
    - a. Topography at two-foot contour intervals;
    - b. A critical slope analysis showing areas of steep slope in each of the following ranges: >12%-15%, >15%-20%, >20%-25% and >25%, as well as areas of highly erodible soils on slopes of 12% or less and on slopes of >12%-15% (based on the Natural Resources Conservation Service, Soil Survey data);
    - c. State-designated Forested Natural Heritage Priority Sites;
    - d. Woodlands identified in the New Jersey Landscape Project as either Forests or Forested Wetlands that create a habitat having a ranking of 3, 4 or 5 for rare, threatened or endangered species;
    - e. Intermittent and perennial streams, lakes, and other water bodies;
    - f. 100-year floodplains;
    - g. Wetlands, with legend, and required wetlands transition areas and vernal pools;
    - h. Required stream corridor buffers;
    - i. Soils with a legend showing soil names and characteristics, including the limitations and potential for forest growth and the types of native forest species typically associated with each soil type, based on the Natural Resources Conservation Service, Soil Survey;
    - j. Areas of groundwater recharge equal to or greater than the median groundwater recharge rate for the municipality as a whole, based upon the New Jersey Geological Survey or municipally-approved alternate data source, if available;

- k. Locations of sinkholes, disappearing streams and other features associated with the presence of carbonate rock and any other unusual geological features of the tract;
  - l. Aerial extent of forest and tree cover which shall encompass the outside perimeter of the canopy of individual trees;
  - m. Forest stand data: the forested portions of the property shall be divided into separate forest stands for the purpose of describing the different forested areas of the tract as required in Sections 3.a. and b. below; stands smaller than five (5) acres shall be fully described; stands of five (5) acres or larger shall be sampled, and the stand shall be statistically described based on the sample data; (See *Technical Appendix for Forest Stand and Sample Data Sheet*)
  - n. Locations, species and sizes of all specimen trees and of all individual trees that are not located in a delineated forest stand; and
  - o. Existing man-made structures.
2. The most current and readily available aerial photograph of the tract and the area within 1000 feet thereof at a scale of 1" = 400' or larger and preferably at the same scale as the natural resource inventory map.
3. The natural resource inventory report shall include the following:
- a. A description of each forest stand on the site including, for each stand, the dominant and codominant species, understory vegetation, range of sizes in diameter at breast height (dbh), the health and condition of the trees in the stand, and the extent and nature of invasive species within the stand; and
  - b. Copies of the sampling point data sheets and summaries.

*The elements of an Environmental Resource Inventory (ERI) outlined in Section IV.B.1. are meant to supplement the ERI requirements that may already be contained in a municipality's land development regulations. Items IV.B.1.d., l., m. and n. are specifically required for the implementation of this Ordinance and may not already be included among the submission requirements the municipality has in place.*

*The qualifications of the professional(s) preparing the various components of the ERI should be carefully scrutinized by the Municipal Agency. Experts qualified to undertake items IV.B.1.d., l., m. and n. and to prepare the natural resource inventory report include: New Jersey Approved Foresters, New Jersey Certified Landscape Architects and New Jersey Certified Tree Experts.*

*Item 1.d., New Jersey Landscape Project, spearheaded by the New Jersey DEP Endangered and Nongame Species Program, is a project to protect New Jersey's biological diversity by mapping and maintaining critical habitats of rare wildlife populations. Upland forests and forested wetlands are two such critical ecosystems that have been mapped statewide. The rankings of 3, 4, and 5 refer to habitats of state-listed threatened species, state-listed endangered species and federally-listed threatened or endangered species respectively. This information is available at <http://www.nj.gov/dep/fgw/ensp/landscape/download.htm>*

*Note that all information required to be submitted under Sections IV and V of this Ordinance should also be included in the municipal site plan and subdivision checklist requirements for determining the completeness of an application.*

V. Woodland Retention and Preservation Plan

- A. A woodland retention and preservation plan shall be submitted for approval. The plan shall include a report articulating how the requirements of Section VI of this Ordinance will be met by the proposed woodland retention and preservation plan; how the proposed development will affect the existing natural resources on the tract; the quantity of existing woodlands, and of individual trees not located within a designated forest stand, that will be removed and that will be retained; and what specific techniques will be used to protect woodlands and individual trees during the construction process.
- B. The woodland retention and preservation plan shall be prepared using the information requested in Section IV of this Ordinance and shall be certified by a New Jersey Approved Forester, A New Jersey Certified Landscape Architect or a New Jersey Certified Tree Expert.
- C. The woodland retention and preservation plan shall include all of the information provided on the natural resource inventory map as well as:
  - 1. Proposed topography as shown on the proposed grading plan;
  - 2. Surveyed locations of the following:

- a. All individual trees 6" dbh or larger that are not located in a delineated forest stand but are nevertheless proposed to be retained and are located within the proposed areas of disturbance; and
  - b. If a forest stand or portion thereof is proposed to be retained, all individual trees 6" dbh or greater located within the first 25 feet of such area, measured toward the interior of the woodland from its proposed perimeter.
3. Cultural features, historic sites, and critical viewsheds as identified and/or mapped in the Township Master Plan;
  4. Existing man-made structures to be removed and to remain;
  5. All proposed development including buildings, roads, driveways, utilities and other improvements;
  6. A table listing the tract area in square feet; the square footage of existing and proposed woodlands located within the tract, classified according to the priority categories listed in Section VI.A. of this Ordinance; and the percentage of the net tract area covered by existing and proposed woodlands, classified according to the priority categories listed in Section VI.A. of this Ordinance;
  7. A clear, graphic indication of the woodland preservation areas on the site;
  8. A clear, graphic indication of the proposed limit of disturbance line, "tree save" fencing and other proposed tree protection measures;
  9. Locations of proposed soil stockpile areas; and
  10. A clear written and graphic indication of all proposed methods to be employed in protecting existing trees that are proposed to be retained but lie within the limits of disturbance during construction.
  11. Existing preservation/conservation easements on the tract.

*The Woodland Retention and Preservation Plan is critical. It is in this Plan that the applicant assesses the impact of proposed activities on the site's natural features and the proposed means of addressing these impacts. The requirements under Subsection A are especially important. Although the Municipality's Woodlands Advisor will be able to assess the impact of proposed activities on the site's trees/woodlands according to the mapped information and supportive technical materials that are submitted by the applicant, the report requirement under Subsection A integrates the information from Sections IV, V and VI into a cohesive package that can be reviewed and understood by the Municipal Agency.*

*Subsection C.2. requires certain trees 6" or greater that are targeted for preservation to be surveyed as part of the inventory process. The purpose for doing this is to evaluate the impacts of the proposed site design on individual trees and to ensure proper protection measures are utilized during the construction process to protect these trees. For example, tree roots that extend into the proposed area of disturbance can be harmed by soil compaction unless proper measures are taken to avoid this.*

#### VI. Woodland Retention Requirements

- A. The intent of this Ordinance is to retain rather than to replace existing woodlands. To that end, development shall be designed to maximize the area of existing woodlands to be retained. If woodlands are to be disturbed or removed, the applicant shall design the development in such a way as to avoid or minimize removal of priority woodlands, which shall consist of woodlands in any of the following priority categories:
1. Any woodlands prioritized in the municipal Master Plan;
  2. Any woodlands within required stream corridor buffers, wetlands, wetland transition areas or floodplains;
  3. Woodlands on slopes of 15% or more or woodlands located in highly erodible soils on slopes of less than 15%, with the steepest slopes having the highest priority;
  4. Woodlands associated with a critical groundwater recharge area, defined as having a recharge rate greater than or equal to the median recharge rate for the municipality as a whole.
  5. Woodlands associated with a critical viewshed identified in the municipal Master Plan;
  6. Woodlands identified in the New Jersey Landscape Project as either Forests or Forested Wetlands that create a habitat having a ranking of 3, 4 or 5 for rare, threatened or endangered species;

7. Woodlands that are connected to a larger woodlands corridor extending beyond the tract boundaries; and
8. Woodlands and hedgerows that provide visual screening, are associated with an historic site or line a rural roadway.

Not more than ten (10) percent of priority woodlands existing on the site prior to its development shall be removed or otherwise disturbed for development. Any removal of priority woodlands shall require mitigation, irrespective of the exemptions set forth in Sections VI.D. and E. below.

- B. All woodland areas designated for retention shall be protected by a Conservation Easement in accordance with Section VIII of this Ordinance. *(See also Technical Appendix for model Conservation Easement)*
- C. To the extent that the use of the clustering or lot averaging techniques permitted in the applicable zoning district will maximize the retention of woodlands in the development of the tract, such techniques shall be used.
- D. Subject to the provisions of Section VI.A. above, if the application is for a subdivision, a portion of the woodlands existing on the tract prior to development may be permitted to be removed for development as follows:
  1. Up to 10 percent of the woodlands existing on the tract prior to development may be removed for the construction of necessary public and private streets, public utilities and common or public stormwater management facilities; and
  2. Reasonable and necessary removal of woodlands shall also be permitted on each new residential lot within the subdivision provided that such removal shall not exceed the following:
    - a. To allow the construction of a dwelling, with an average of up to 30 feet of clearance around the dwelling, and permitted accessory building(s);
    - b. To allow a driveway with up to 5 feet of clearance on each side of the driveway;
    - c. To allow a septic bed with up to 20 feet of clearance around the perimeter of the septic bed; and
    - d. To allow underground utility lines with a maximum corridor width of 20 feet.
  3. All improvements on new residential lots shall be located so as to retain any specimen tree or any other desirable healthy individual tree as identified by the Woodlands Advisor.

Improvements must also be located and designed to minimize forest removal and fragmentation.

4. The above criteria for permitted removal of woodlands on new residential lots shall not result in the removal of woodlands on any lot in excess of the following:

<u>Acreage of Lot<sup>(1)</sup></u>	<u>Maximum Area of Woodlands Removed<sup>(2)</sup></u>
1	20,000 sq. ft.
2	30,000 sq. ft.
3	40,000 sq. ft.
4	50,000 sq. ft.
5 acres and over	60,000 sq. ft.

Notes: <sup>(1)</sup> For lots with a lot area less than or between these size ranges, interpolation shall be used.

<sup>(2)</sup> **Or an area equal to twice the impervious surface coverage permitted in the zone, whichever is less.**

- E. Subject to the provisions of Section VI.A. above, if the application is for site plan approval, up to \_\_\_\_ percent (*to be determined by the municipality based upon appropriate zoning and the characteristics of the district*) of the woodlands existing on the lot prior to development may be removed for development, provided, however, that all improvements shall be located so as to retain any specimen tree or any other desirable healthy individual tree as identified by the Woodlands Advisor.

For developments involving both site plan and subdivision approval, the requirements of Sections VI.D. shall apply to the development of the tract as a whole and to the development of any new residential lots within the development, and the requirements of this Section VI.E. shall apply only to the development of any nonresidential lots within the development.

- F. If the approval of the application and of any permits issued pursuant to such approval will result in the removal of more woodlands than the limits set forth in Sections VI.D. and E. above, or will result in the removal of any priority woodlands identified in Section VI.A. above, mitigation shall be required on an acre for acre basis to the extent of such excess removal or removal of priority woodlands. Mitigation shall be undertaken in accordance with Section VII of this Ordinance. Prior to approving a plan for mitigation, the Municipal Agency shall first determine that the proposed design cannot reasonably be modified to reduce woodlands removal or to locate improvements outside of priority woodlands.
- G. The following procedures and requirements for the protection of the woodlands and individual trees to be retained shall be adhered to in the construction phase of the development:

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1. During construction, no permanent or temporary material, including soil, shall be placed or deposited within the critical root zone or within six (6) feet, whichever is greater, of any tree to be retained or of the trees at the perimeter of any forest stand to be retained. Such area shall be protected by orange blazed fencing placed outside of such area during construction, and the fencing shall be inspected and approved by the Woodlands Advisor prior to the start of any site disturbance. Permanent monuments and signs, if required by the municipality for the demarcation of conservation easements, must be installed prior to the start of construction.
2. Where necessary, pursuant to an approved grading plan, to fill or remove soil within an area that encompasses either the critical root zone or the area within six (6) feet, whichever is greater, of any individual tree to be retained in the area of disturbance or of the trees within the perimeter of any forest stand to be retained, the existing grade around each such tree shall be maintained to the extent of the critical root zone or six (6) feet, whichever is greater, by a tree well and extension tiles (in the case of fill) or by a retaining wall (in the case of a cut).
3. No chemicals shall be disposed of and no concrete trucks shall be rinsed within the critical root zone of any tree or of the trees at the perimeter of any forest stand to be retained.
4. During construction, individual trees to be retained and trees located at the perimeter of a forest stand to be retained shall be maintained in accordance with a maintenance schedule and plan under the direction of the Woodlands Advisor.
5. If equipment must temporarily invade the critical root zone of any individual tree to be retained or of any tree(s) located at the perimeter of a forest stand to be retained, the Woodlands Advisor shall approve and inspect the installation of required critical root zone protection measures within the path of such equipment, shall inspect the invasion of the critical root zone and shall thereafter inspect the removal of all temporary protective measures and the replacement of the protective fencing.
6. If the approved plan calls for the installation of any pavement or utilities within the critical root zone of any individual tree to be retained or of any tree(s) located at the perimeter of any forest stand to be retained, special techniques for such installation shall be employed to minimize the impact on the critical root zone(s), and such installation shall be directed, inspected and monitored by the Woodlands Advisor.
7. In the event any of the foregoing procedures and requirements for construction are violated, the Municipal Engineer or Construction Official shall issue a stop work order until the violation is remedied.

*This Ordinance addresses the protection of existing woodland resources only. There are other types of ordinances that are designed not only to minimize impacts to existing forests on site but also to plant new forests (afforestation) where they are absent or where they once existed (reforestation). One example of this approach is Ordinance # 103.53, Natural and Cultural Resource Conservation of Washington Township, Mercer County, NJ. An advantage of the latter approach is that it discourages landowners from deforesting their properties prior to making a subdivision or site plan application. Another advantage is that it fosters reforestation or afforestation of areas where woodland resources would provide a public health, safety and welfare benefit such as enhanced ground water recharge, water quality protection, etc. However, afforestation and reforestation requirements can result in significant financial impacts on property owners. Therefore, municipalities should carefully weigh the costs and benefits of such requirements before proceeding.*

*In order for a Woodland Retention and Preservation Ordinance to be effective in protecting existing woodland resources, the municipal zoning regulations must work in concert with this objective. Specifically, they should accommodate the preservation of woodlands by establishing uses, densities/intensities, development alternatives (such as clustering or lot size averaging) and site design regulations (such as reduced setback requirements, impervious coverage limits, etc.) that permit development to occur while minimizing destruction of woodlands. Conversely, in some zones, such as commercial and industrial zones, it may not be possible to achieve both land use goals and woodland conservation goals because site improvements may necessitate extensive forest removal. In other zones, where preservation of farmland is a priority, forest resources may have to be sacrificed in order to achieve this overriding goal.*

*For this Ordinance to be most effective, the municipal Master Plan should identify and map existing woodlands in the community and then prioritize them according to their types and relative value. This will require the municipality to determine and balance the often competing goals of woodland retention and retention of agricultural lands. The Master Plan then becomes the basis for establishing priority woodland resources and assigning the appropriate mitigation requirements accordingly.*

*According to Sections VI.A.1.-A.3. of this Ordinance, no more than 10% of priority woodlands may be cleared and any such clearing requires mitigation on an acre-for-acre basis.*

*Section VI.D. establishes the design standards for improvements that necessitate forest removal. Only the minimum necessary forest removal is permitted according to the criteria spelled out in Sections VI.D.1. and 2., providing said clearing results in removal no greater than that set forth in Section VI.D.4. These criteria and thresholds were established based on an examination of several residential subdivision plats and discussions with municipal and county engineers. The thresholds established under Section IV.D.4. were tested on lots of varying sizes and found to be reasonable. Each municipality should carefully review said standards, however, and adjust them as needed to fit its own unique complexion.*

*Section VI.D.3. ensures that Specimen Trees and other noteworthy trees not within a forest stand are protected as well. Many local ordinances specify that trees of a certain size be protected. This Ordinance does not specify a minimum size. Health, form, size relative to other members of the same species, age, shape or position within the landscape are generally more important to the desirability of maintaining a given tree than size alone. Thus, the Ordinance directs the municipal Woodlands Advisor to work with the applicant to identify and protect Specimen Trees and any other trees that the Advisor deems desirable based on species, health, size and any other relevant factors.*

*Subsection E. above applies primarily to nonresidential developments. Each municipality must determine the appropriate threshold for maximum forest removal in its nonresidential zones based on its own zoning requirements, extent of existing forest cover, priority forest resources, and local forest protection objectives.*

VII. Woodlands Mitigation

- A. If mitigation is required, a woodlands mitigation plan shall be presented which shall consist of one or more of the following alternative approaches (in descending order of desirability):
1. Mitigation planting on-site.
  2. Mitigation planting off-site on public land (including County or State land) or on other land designated in or meeting the requirements identified in the municipal Master Plan that is, to the extent practicable, located within the same subwatershed as the woodlands being removed.
  3. Mitigation planting off-site on privately-owned land to be permanently deed-restricted for that purpose that is, to the extent practicable, located within the same subwatershed as the woodlands being removed.
- B. Requirements for mitigation planting on and off-site:
1. Landscaping in accordance with an approved landscaping plan may be credited as mitigation if the landscaped area has a width of 35 feet or more in all directions and equals or exceeds 2,500 square feet in area and if the quantity of plantings per each 2,500 square foot area is at least 7 trees and 20 shrubs.
  2. A woodlands mitigation planting plan that is not part of the approved landscaping plan shall be reviewed and approved by the Municipal Agency based on the recommendations of the Woodlands Advisor. All of the following shall ordinarily be planted on each acre of woodlands mitigation area:
    - a. 35 trees per acre at a 2" caliper size; and
    - b. 70 trees per acre at a 1" caliper size; and
    - c. 100 trees per acre installed as whips (5' to 6' in height); and

- d. 40 woody shrubs per acre, to be located at the edges of the planting area; and
- e. A native grass mix shall be seeded over the entire planting area.

A diversity of native species shall be planted in each of the above categories. The species selection shall be informed by the information collected in the natural resource inventory required at Section IV of this Ordinance and shall be subject to the approval of the Woodlands Advisor, who shall also inspect and approve all planting materials upon delivery to the site and prior to and following their installation.

- 3. The applicant's Landscape Architect or New Jersey Certified Tree Expert or New Jersey Approved Forester shall prepare the cost estimate for the woodlands mitigation planting plan. Such estimate shall be separate and apart from the estimate pertaining to the approved landscaping plan. The cost of the woodlands mitigation planting plan shall include all materials, installation costs and continuing costs associated with the implementation of the maintenance plan. The cost estimate for the woodlands mitigation planting plan shall be reviewed and approved by the Woodlands Advisor and shall thereafter be transmitted to the municipal engineer for inclusion in the cost estimate for the performance guarantee for the entire project.
- 4. Prior to the release of any portion of the performance guarantee covering the woodlands mitigation planting plan, the Woodlands Advisor shall inspect the plantings and shall make a recommendation to the municipal engineer as to whether the plantings have been installed in accordance with the approved woodlands mitigation planting plan. The applicant shall post a maintenance guarantee following the inspection and approval or acceptance by the municipality of the installation of the plantings included in the woodlands mitigation planting plan. The amount and timing of the maintenance guarantee shall be in accordance with N.J.S. 40:55D-53.
- 5. Prior to the release of the maintenance guarantee or portion thereof covering the woodlands mitigation area, the Woodlands Advisor shall inspect the mitigation area. The maintenance guarantee shall not be released unless the following conditions have been met:
  - a. Survival of 100% of the trees installed at 2" caliper size and 100% of the woody shrubs;
  - b. Survival of 85% of trees installed at 1" caliper size;
  - c. Survival of 75% of trees installed as whips;

- d. All surviving plant material shall be found to be in good health and free of diseases and pests; and
  - e. There shall be no evidence of exotic and invasive plant material.
6. To ensure the survival rates and conditions in paragraph 3. above, a maintenance plan shall be submitted to the Woodlands Advisor for approval prior to the grant of final approval by the Municipal Agency. The maintenance plan shall include, but not by way of limitation, the following: plans and schedules for weeding, watering and deer protection (including fencing or tree shelters). For individual trees, the maintenance plan may also be required to include mulching, fertilizing, and treatments for pests and diseases. The Woodlands Advisor shall inspect the premises periodically following the installation of the woodlands mitigation planting to ensure that the maintenance plan is being implemented and to recommend additional maintenance requirements, if necessary, to ensure the health and survival of the woodlands mitigation area.
7. A preservation/conservation easement shall be placed on the woodlands mitigation area. The preservation/conservation easement shall allow for continued maintenance of the woodlands mitigation area by the owner via the removal of hazardous or diseased trees or tree limbs, removal of exotic and invasive planting species, erection of protective fencing, and the installation by hand of new plantings intended to replace dead trees or supplement existing growth, but only with the approval of the Woodlands Advisor.
- C. Information to be provided for mitigation planting on and off-site:
- 1. A table and description of soil preparation methods, species, sizes and spacing to be utilized for the new plantings;
  - 2. A binding two-year maintenance and management agreement that details how the area(s) designated for new plantings will be maintained to ensure satisfactory establishment of the new woodland including:
    - a. Regular watering;
    - b. Regular removal of invasive plant species;
    - c. Protection from deer grazing; and
    - d. Contact name and phone number for party responsible for maintenance.

3. A mitigation table identifying the percent of the tract area in woodlands that is proposed to be cleared as a result of the proposed development; the number of acres of existing woodlands to be cleared; the applicable replacement requirements; and the number of acres of mitigation plantings proposed.

*Section VII of this Ordinance establishes the criteria and procedures for replanting forests (mitigation) when required. The first priority is to plant forests on the same site where forest cover was removed in excess of the maximums established in Sections VI.D. and E. If mitigation cannot occur on site due to site constraints or other limitations, then the next priority is to plant off-site on public lands or on other lands either designated for this purpose in the municipal master plan or satisfying the criteria outlined in the municipal master plan for mitigation planting.*

*This Section also provides that the applicant post performance and maintenance guarantees and establishes the requirements for the condition of the mitigation plantings upon completion of the two-year maintenance period. This two-year period is the maximum permitted by the Municipal Land Use Law. Municipalities will need to develop maintenance strategies that will cover the time beyond this two-year period, to ensure the long-term health and survival of mitigation plantings.*

*In addition, this Section requires that conservation easements be placed on retained woodlands or on woodlands mitigation areas to ensure their long-term protection. Section VI.G.1. had suggested that the municipality mandate the placement of monuments and signs demarcating such protected areas prior to construction. Monuments and/or signs are also a means of notifying landowners of the existence of conservation easements with special requirements that must be adhered to, even on private property.*

#### VIII. Conservation Easement

- A. A conservation easement shall be placed on any portion(s) of a lot or tract on which woodlands are proposed to be retained and on any areas designated for woodlands mitigation. The conservation easement shall be shown on the filed plat, if applicable; shall be referenced by legal description in the deed to the lot or tract; and shall be filed with the County Recording Officer. Monuments and signs shall be placed to demarcate the conservation easement as required by the Municipal Agency.
- B. The conservation easement shall identify those activities and improvements that are specifically permitted (for example, walking paths, fences and play structures), the maximum sizes of, or areas to be covered by, permitted improvements and those activities and improvements that are specifically prohibited within the affected area.
- C. The conservation easement shall include the following limitations:
  1. No tree with a diameter greater than six (6) inches dbh or more than thirty (30) feet in height may be cut down, removed or destroyed within the conservation easement area

without cause and without the prior written consent of the Woodlands Advisor. Diseased or hazardous trees or tree limbs may be removed to prevent personal injury or property damage provided notice is served upon the Woodlands Advisor at least ten (10) days prior to such removal. Where an emergency situation renders the giving of notice impracticable, the tree or limb may be removed without prior notice, but a notarized statement from the owner of the underlying title giving the reasons for such removal shall be submitted to the Woodlands Advisor within seven (7) days thereof, along with appropriate documentation of the reasons in the form of photographs, corroborative letters or other evidence.

2. Understory plant materials, including, but not limited to, brush, shrubs, saplings, seedlings, undergrowth and vines may not be cut down, removed or destroyed within the conservation easement area except to control exotic or invasive species, and then only with the prior written consent of the Woodlands Advisor.
  3. Fences may be erected within or around the conservation easement area if approved by the municipal agency initially or, thereafter, with the prior written consent of the Woodlands Advisor, if the approved deer control measures have proven to be ineffective.
  4. New plantings may be installed within the conservation easement area if needed to supplement existing vegetation or to replace dead trees or other vegetation, provided such plantings are characteristic of native growth and with the prior written consent of the Woodlands Advisor.
- D. The following activities shall be specifically prohibited within the conservation easement area once it has been legally established:
1. Construction, excavation, grading or the erection of retaining walls, buildings or other structures, roads, driveways, fences or utilities.
  2. Any grading or other activities that would or might impair soil or slope stability or alter drainage patterns on or off the site.
  3. Commercial timber cutting or harvesting of vegetative products for commercial purposes.
  4. Maintenance or grazing of livestock.
  5. Excavation, grading, dredging or removal of topsoil, sand, gravel, loam, rock or other materials.
  6. Dumping or composting of soil, grass clippings, garden waste, household waste, sawdust, ashes, trash, construction materials or other debris of any kind.

7. Operation of any mechanical equipment of any kind, including recreational vehicles such as ATVs and snowmobiles, except as needed to undertake approved activities identified herein or in the conservation easement itself.
  
- E. The conservation easement may provide for a municipally approved forest stewardship program that may also be used to satisfy the requirements for a Forest Stewardship Plan to be approved by the State Forester.
  
- F. The conservation easement language shall specifically provide for the right of the municipality through any of its officers or agents to enter and inspect the conservation easement area to determine that the terms of the conservation easement are being adhered to and that necessary maintenance is being undertaken. The municipality shall have the right, and the conservation easement shall so state, to issue citations for any violations of the terms of the conservation easement or of this Ordinance or of the development application approval pursuant to which the conservation easement was established.

*The Technical Appendix provides model language for conservation easements placed on woodlands. A conservation easement is a legal covenant restricting the use of land and/or natural features of the land that is described in the property deed and shown on a filed plat. In this case, the restrictions stipulated in the conservation easement ensure proper long term protection, maintenance and health of the woodlands. The conservation easement is held by a third party – typically a land trust or government entity. This party is responsible for the enforcement of any restrictions stipulated in the easement. Land held in a conservation easement may still be able to be used by the land owner, subject to the restrictions in the easement.*

XI. Fees, Violations and Penalties

- A. Fees:
  1. The fees charged for inspections undertaken and other services provided by the Woodlands Advisor shall be established by the municipal governing body by ordinance at the time of the appointment of the Woodlands Advisor. Such fees may, from time to time, be amended by ordinance.
  2. All charges made against escrow accounts for the services of the Woodlands Advisor shall be in accordance with N.J.S. 40:55D-53.2.
  
- B. Violations and Penalties:

1. Any violation of the provisions of this Ordinance shall be punishable by a fine not exceeding \$1,000.00 or by imprisonment or community service not exceeding 90 days, or both, for each separate offense.
2. Each day on which a duly noticed violation is continued or remains unremedied while work is progressing shall constitute a separate offense, punishable as set forth herein.
3. Upon notification by the municipality or its agent of the existence of a violation, the violation shall be immediately remedied. If a violation cannot be remedied immediately, the municipality or its agent may issue a "Stop Work Order" until the violation is remedied. If a violation causes irreversible damage to a tree or woodland slated for retention, the municipality or its agent shall issue a "Stop Work Order" and the developer shall be required to submit a new preliminary and final plan to the municipal agency for its approval before resuming work.
4. The Municipal Agency shall reserve the right to revoke or withdraw any approval granted for subdivision or site plan upon notice to the applicant and public hearing, in the event that there is any deviation from, or alteration of, the approved woodlands retention and preservation plan, unless prior written approval for such deviation or authorization has been obtained from the Municipal Agency. Minor deviations and field changes may be authorized solely by the Woodlands Advisor in writing and only after consultation with the Chairman of the applicable Municipal Agency to determine if the proposed minor deviations and field changes deviate from the intent of the original approval with respect to the woodlands retention and preservation plan. If it is determined by this consultation that the changes proposed are not minor, the matter must be referred to the full Board, and no changes may be effected until such Board gives its approval.
5. Each of the terms and conditions of any approval relating to woodlands retention and preservation are material elements of the development approval based upon the submission of the application in its entirety, and the non-compliance with any term or condition by the applicant or its successors or assigns shall be deemed a material default subjecting the applicant to revocation of such approval. The request to change any single condition, since all conditions are integrally related, shall open the entire application to the applicable Municipal Agency for reconsideration, possible re-approval, and new terms and conditions in addition to those terms and conditions contained in the original approval.

*The ability to impose penalties and issue Stop Work Orders is needed to address those situations in which the provisions of this Ordinance are found to have been violated.*

## **TECHNICAL APPENDIX**

## SAMPLE WOODLANDS CONSERVATION EASEMENT

THIS INDENTURE dated \_\_\_\_\_  
between \_\_\_\_\_  
residing at \_\_\_\_\_  
hereinafter referred to as GRANTOR, and \_\_\_\_\_, a  
municipal corporation of the State of New Jersey, having its principal office at  
\_\_\_\_\_ in \_\_\_\_\_, New  
Jersey, hereinafter referred to as GRANTEE,

WITNESSETH:

WHEREAS, Grantor, in order to comply with the applicable provisions of the Woodlands Retention Ordinance of Grantee (and for no money paid by Grantee), does by these presents grant and convey to the Grantee a conservation easement over premises in \_\_\_\_\_, County of Hunterdon and State of New Jersey, as more particularly described and set forth in Schedule "A" annexed hereto, and hereinafter referred to as THE PROPERTY.

Within the conservation easement, the following terms and conditions shall apply:

1. No tree with a diameter greater than six (6) inches dbh or more than thirty (30) feet in height may be cut down, removed or destroyed on The Property except for selective cutting and thinning required for woodlands management in connection with a forest stewardship or woodlands management plan to be approved by the Grantee, which plan may also be used to satisfy the requirements for a Forest Stewardship Plan to be approved by the State Forester. Notwithstanding the foregoing, diseased or hazardous trees or tree limbs may be removed to prevent personal injury or property damage provided notice shall be served upon the Grantee at least ten (10) days prior to such removal. Where an emergency situation renders the giving of notice impracticable, the tree or limb may be removed without prior notice, but a notarized statement from the owner of the underlying title giving the reasons for such removal shall be submitted to the Grantee within seven (7) days thereof, along with appropriate documentation of the reasons in the form of photographs, corroborative letters or other evidence.
2. Understory plant materials, including, but not limited to, brush, shrubs, saplings, seedlings, undergrowth and vines shall not be cut down, removed or destroyed within The Property, except as needed to control exotic or invasive species in connection with a forest stewardship or woodlands management plan to be approved by the Grantee, which plan may also be used to satisfy the requirements for a Forest Stewardship Plan to be approved by the State Forester.

3. Fences for deer control may be erected within or around The Property, if approved as part of the woodlands maintenance plan or with the consent of the Grantee if previously approved deer control measures have proven to be ineffective.
4. New plantings may be installed within The Property if needed to supplement existing vegetation or to replace dead trees or other vegetation, provided such plantings are characteristic of native growth and have been approved by the Grantee.
5. The following activities shall be specifically prohibited within The Property:
  - a. Construction, excavation, grading or the erection of retaining walls, buildings or other structures, roads, driveways or utilities.
  - b. Any grading or other activities that would or might impair soil or slope stability or alter drainage patterns on or off the site.
  - c. Commercial timber cutting or harvesting of vegetative products from The Property for commercial purposes.
  - d. Maintenance or grazing of livestock.
  - e. Excavation, grading, dredging or removal of topsoil, sand, gravel, loam, rock or other minerals from The Property.
  - f. Dumping or composting of soil, grass clippings, garden waste, household waste, sawdust, ashes, trash, construction materials or other debris of any kind on The Property.
  - g. The operation of any mechanical equipment of any kind, including recreational vehicles such as ATVs and snowmobiles, except as needed to undertake approved activities identified in this conservation easement.
6. Although the conservation easement granted and intended to be granted hereby has been created for the benefit of the general public through the retention and maintenance of existing woodlands or the protection of a woodlands mitigation area, nothing herein contained shall be construed to convey to the public any right of access to or use of The Property, and Grantor, his heirs, successors and assigns shall, subject to paragraph 7 hereof, retain the exclusive right of access to and use of The Property.

7. The municipally-approved forest stewardship program/woodlands management plan for The Property shall be as follows: *(to be filled in for the particular site after consultation with the Woodlands Advisor.)*
8. Grantee and its agents shall be permitted limited access to enter upon The Property at all reasonable times for the purpose of inspection in order to assure compliance with the terms and conditions herein contained. In the event of non-compliance with the terms hereof, the Grantee shall have the right to enter the premises and fulfill the obligations imposed herein and charge the reasonable cost thereof to the Grantor or to issue citations for any violations of the terms and conditions of this conservation easement or of the development application approval or ordinance pursuant to which this conservation easement has been established.
9. Nothing herein contained shall be deemed to restrict the right of Grantor to maintain all trails and strictures existing upon The Property on the date hereof.
10. Grantee may at any time transfer and assign the easement and interest created hereby to any succeeding public corporation or entity.
11. It is understood that this instrument imposes no obligation on the Grantor and no restrictions on the use of The Property except as specifically set forth herein and nothing herein contained shall be construed to interfere with the right of the Grantor, its heirs, successors and assigns and their licensees and any party claiming rights under them to utilize The Property in such manner as they or any of them may deem desirable, subject to the terms and conditions hereof.
12. This instrument shall be binding upon the Grantor, its heirs, successors and assigns and upon the Grantee, its successors and assigns.

IN WITNESS WHEREOF Grantor and Grantee have duly executed this instrument as of the date first above written.

\_\_\_\_\_

For Grantor

\_\_\_\_\_

For Grantee

Attested by: \_\_\_\_\_

## Site Plan Review - The Right Questions To Ask

1. Do plans include a tree stand delineation identifying one or more tree stands (groups of similar trees) by species and locating "specimen" trees?
2. Do plans include a tree survey identifying trees that will be impacted by construction and describing their existing size, species, health and overall condition?
3. Do soil erosion and sediment control plans and grading plans indicate tree save areas? Do soil erosion and sediment control plans and grading plans complement or conflict with tree save areas?
4. Is protective fencing delineated around tree save areas?
5. Is protective fencing placed around the tree using either the dripline method (at the dripline for broad-canopied trees and up to 1.5 times the dripline for narrow-canopied trees) or the critical root zone method?
6. Do plans include proposed measures to protect and/or enhance tree save areas as needed (e.g. management of invasive species, wind protection, planting of new species to increase species diversity within protected tree stands)?
7. Do plans include language prohibiting grading, trenching or equipment storage within designated tree save areas?
8. Do plans require erection of tree protection fencing prior to any clearing, demolition, grubbing, grading or construction on site?
9. Do plans require that protective fencing remain in place until all construction is complete?
10. Do soil erosion and sediment control plans show installation of silt fences sufficient to keep excess soil away from roots of trees to be saved?
11. Where root loss will affect trees in tree save areas, are adequate measures indicated on the plans to properly prune roots and trees and otherwise minimize damage to trees?
12. Where temporary construction roads must pass over root areas of trees to be retained, are adequate measures proposed to minimize soil compaction? (e.g., a temporary road bed of 6 inches of mulch or gravel)?

13. Are methods indicated in plans for remedying unintended damage to trees in tree save areas?
14. Where cuts or fills affect roots of trees in tree save areas, are appropriate stabilizing measures indicated on plans (e.g. retaining walls, tree wells)?
15. Where barriers are not possible to keep vehicular or foot traffic away from tree roots, do plans indicate protective methods to be employed (e.g., spreading several inches of wood chips; pumping concrete through conveyor pipes instead of driving trucks over root systems; bridging root areas with plates of steel)?
16. Are underground utilities proposed to be installed by tunneling rather than trenching to avoid damaging tree roots?
17. As a general rule of thumb, are all of the existing trees that are proposed to be saved at least 5 feet from any proposed new structure?
18. How will the forested area(s) to be retained be cared for?
19. What are the stewardship needs of the retained forested area(s) and of any proposed mitigation area(s)?
20. How will the health and vigor of the retained forested area(s) be sustained?
21. How will the health and vigor of any proposed mitigation area(s) be assured?

## FOREST STAND SAMPLE DATA SHEET

NAME OF DEVELOPMENT Woodlands Stand Descriptions					
Map Key	Size (Acres)	Species	Size Range in DBH	Condition <sup>(1)</sup>	Priority <sup>(2)</sup>
A					
B					
C					
D					

NAME OF DEVELOPMENT Specimen Trees				
Map Key	Species	DBH	Condition <sup>(1)</sup>	Comments <sup>(3)</sup>
001				
002				
003				
004				
005				
006				
007				
008				
009				
010				
011				
012				
013				
014				
015				
016				
017				
018				
019				
020				
021				
022				
023				
024				
025				
026				
027				
028				
029				
030				

**NOTES:**

- (1) Rank as "Good", "Fair", "Poor" "or "Dead".
- (2) Priorities refer to those set forth in the Woodlands Retention Ordinance and the municipal Master Plan.
- (3) Expand upon description of condition; indicate if remediation of a poor or fair condition is possible/advisable.

## **How to Hire a Woodlands Advisor for your Community**

Communities adopting the model Woodlands Retention Ordinance developed through the Hunterdon County Woodlands Toolbox Advisory Committee will need to employ a "Woodlands Advisor" to provide advice and recommendations concerning the implementation of the ordinance on behalf of the municipality. The ordinance defines a "Woodlands Advisor" as an expert qualified in woodlands management and forestry.

### **Woodlands Advisors must have technical expertise to:**

- Complete forest stand assessments describing forest complex groupings, dominant and co-dominant species, range of size in diameter breast height (dbh), health and condition, and extent and nature of invasive species, all in accordance with approved statistical point sampling techniques as well as visual observations and descriptions.
- Assess forest health issues including: insect and disease identification and control, invasive species impacts and deer impacts on forest health and regeneration. Knowledge of appropriate remedies to improve or address forest health issues is necessary.
- Prepare and review reforestation plans (woodlands mitigation plans) and assess such plans when submitted for consideration by a municipal agency for: compatibility with onsite forest characteristics; invasive species management; elimination, mitigation and/or best management of grade changes (cuts and fills planned for the site); wind protection at edges of cleared areas; and soils, drainage and soil erodibility conditions.
- Design and direct the installation of tree protection measures such as tree wells, tree shelters and tree protection fencing.
- Identify critical root zones and undertake and direct the implementation of techniques to minimize and mitigate root loss and damage, including root pruning, tunneling and placement of root barrier materials, soil compaction mitigation and temporary root protection best management practices.
- Undertake and advise as to proper arboricultural practices and standards for tree care.

### **Qualified Woodlands Advisors must hold a license or be duly accredited in at least one of the following fields:**

**State of New Jersey Approved Foresters:** To be included on the list, an approved forester must have graduated from a four year college or university accredited by the Society of American Foresters with a major course in Forest

Management or have completed the Cook College-Rutgers University Forest Management option within the Natural Resource Management curriculum or have a graduate degree that the DEP determines to be equivalent to the aforementioned major course work in Forest Management; must have two years of experience in the preparation of woodland management plans or the implementation of forestry practices for the protection, development, marketing and utilization for forest land resources; and must abide by the Society of American Forester's Code of Ethics. The Society of American Foresters (SAF) is the national scientific and educational organization representing the forestry profession.

**Landscape Architects:** Landscape architects in New Jersey are licensed professionals. Landscape architecture encompasses the analysis, planning, design, management and stewardship of the natural and built environments. Most landscape architects maintain a membership in the American Society of Landscape Architects, a national professional association representing landscape architects.

**New Jersey Certified Tree Experts:** New Jersey Certified Tree Experts (CTE's) are experts in arboricultural practices and tree care. Many CTE's maintain membership in The International Society of Arboriculture (ISA), a scientific and educational organization serving tree care professionals.

## REFERENCE LIST

American National Standards Institute, Inc., American Standard for Nursery Stock, ANSI Z60.1-1986, Revision of Z60.1-1949 (R1980), published by the American Association of Nurserymen, Inc., Washington, D.C., May 2, 1986.

Carter, Marybeth H., ASLA, AICP, Building Greener Communities, Planning for Woodland Conservation, North Jersey Resource Conservation and Development Council and Hunterdon County Planning Board, June, 2003.

Duerksen, Christopher J., with Suzanne Richman, Tree Conservation Ordinances, Planning Advisory Service Report Number 446, American Planning Association, Chicago, Illinois, and Scenic America, Washington, D.C., August, 1993.

Helms, John A., editor, The Dictionary of Forestry, Society of American Foresters, Bethesda, Maryland, 1998.

Kuser, John E., editor, Handbook of Urban and Community Forestry in the Northeast, Cook College, Rutgers University, Kluwer Academic/Plenum Publishers, New York, New York, 2000.

Matheny, Nelda, and James R. Clark, Trees and Development, A Technical Guide to Preservation of Trees During Land Development, International Society of Arboriculture, Champaign, Illinois, 1998.

Miller, Robert W., Urban Forestry: Planning and Managing Urban Greenspaces, Prentice-Hall, Inc., A Division of Simon & Schuster, Englewood Cliffs, New Jersey, 1988.

New Jersey Big Tree Program,  
[www.nj.gov/dep/parksandforests/forest/community/bigtree.html](http://www.nj.gov/dep/parksandforests/forest/community/bigtree.html)  
Identifies and catalogues by species New Jersey's largest individual trees.

New Jersey Forest Stewardship Program,  
[www.nj.gov/dep/parksandforests/forest/stw\\_inc\\_prog.html](http://www.nj.gov/dep/parksandforests/forest/stw_inc_prog.html)  
Federally funded program promoting the management of privately owned forests for environmental benefits through technical and financial assistance to landowners.

Snyder, David, and Sylvan R. Kaufman, An Overview of NonIndigenous Plant Species in New Jersey, New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of Natural Lands Management, Natural Heritage Program, Trenton, New Jersey, 2004.