

**AN ORDINANCE AMENDING TOWN OF CARRBORO LAND USE ORDINANCE  
PROVISIONS RELATING TO TREE PROTECTION, SHADING AND CANOPY  
REQUIREMENTS**

\*Draft 10-12-2017\*

THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO ORDAINS:

Section 1. Section 15-314 (Board Findings and Declaration of Policy on Protecting Trees and Other Plants), subsection (a)(2) is amended and a new provision (a)(12) is added to read as follows:

(2) Trees, shrubs, and other plants appreciably reduce carbon emissions by shading buildings thereby lowering energy use to cool buildings, and also store carbon as biomass; and

(12) Certain flowering trees, shrubs, and other plants are important sources of pollen and nectar for pollinators.

Section 2: Section 15-314 (Board Findings and Declaration of Policy on Protecting Trees and Other Plants), subsection (b) is amended to read as follows:

(b) Based upon the findings set forth in subsection (a), the Board declares that it is not only desirable but essential to the health, safety, and welfare of all persons living or working within the town's planning jurisdiction, present and future, to protect certain existing trees and tree stands and, under the circumstances set forth in this article, to require the planting of new trees, especially larger trees, in certain types of developments, and to ensure the protection of those trees whether on individual lots or on common space.

Section 3. Section 15-315 of Article XIX, (Definitions) is rewritten as follows:

Section 15-315 Definitions

Unless otherwise specifically provided, or unless the context clearly indicates otherwise, the words and phrases defined below shall have the meaning indicated when used in this Part.

- (1) CANOPY TREE. A healthy evergreen or deciduous tree species that matures at a height of at least thirty (30) feet.
- (2) DRIPLINE. Perimeter formed by the points farthest away from the trunk of a tree where precipitation falling from the branches of that tree lands on the ground.
- (3) CLEARCUTTING. The large-scale, indiscriminate removal of trees, shrubs, and undergrowth with the intention of preparing real property for nonagricultural purposes.
- (4) HABITAT. The natural environment for animals and plants that is made up of physical factors such as soil, moisture, range of temperature, and availability of light as well as biotic factors such as the availability of food, nesting sites, and shelter.
- (5) SPECIMEN OR RARE TREE. Any healthy tree that:

- a. Has a trunk diameter at breast height (dbh) of twenty-four (24) inches or more for pine tree species; or
- b. Has a trunk dbh of eighteen (18) inches or more for any species besides pine tree species; or
- c. Has a trunk dbh of twelve (12) inches or more in the case of any of the species from the following list of North Carolina native canopy tree genera; or

<i>Chamaecyparis</i> (Atlantic White Cedar)	<i>Magnolia</i> (Magnolia)
<i>Carya</i> (Southern Shagbark Hickory)	<i>Pinus</i> (Longleaf pine)
<i>Diospyros</i> (Persimmon)	<i>Taxodium</i> (Bald cypress)
<i>Fagus</i> (Beech)	<i>Tsuga</i> (Hemlock)
<i>Juniperus</i> (Eastern Red Cedar)	<i>Ulmus</i> (American Elm)

- d. has a trunk dbh of six (6) inches or more in the case of the species from the following list of North Carolina native understory tree genera: or

<i>Amelanchier</i> (Serviceberry)	<i>Halesia</i> (Silverbell)
<i>Asimina</i> (Pawpaw)	<i>Hamamelis</i> (Witch-hazel)
<i>Carpinus</i> (Hornbeam)	<i>Ilex</i> (Holly)
<i>Cercis</i> (Redbud)	<i>Ostrya</i> (Hophornbeam)
<i>Chionanthus</i> (Fringetree)	<i>Oxydendrum</i> (Sourwood)
<i>Cornus</i> (Dogwood)	<i>Sassafras</i> (Sassafras)
<i>Crataegus</i> (Hawthorn)	

- e. is listed as a State or National Champion by the North Carolina Forest Service or the American Forestry Association; or
- f. provides unique habitat for any endangered or threatened wildlife species protected by Federal law; or
- g. has been cited by the Board of Aldermen as being historically significant; or
- h. any other tree species listed in the North Carolina Natural Heritage Program as being significantly rare, of special concern, threatened, or endangered.

- (6) TREE. A perennial woody plant, single or multiple trunks, with few if any branches on its lower part, which at maturity will obtain a minimum six (6) inch caliper.
- (7) TREE CANOPY. The combined area encompassing the drip zones of all canopy trees.
- (8) TREE PROTECTION PERIMETER. That area within a circle drawn with the tree's trunk as the center. Radius is dependent upon site conditions and the relative tolerance of tree species to construction damage. Standard accepted radius is 1-1.5 feet per diameter inch of tree to be retained.
- (9) TREE STAND. An aggregation of trees occupying a specific area and generally uniform in species composition, size, age, arrangement, and condition that distinguishes it from vegetation in adjoining areas.

Section 4. Section 15-317 (Retention and Protection of Specimen and Rare Trees), subsections (a) through (c) are rewritten to read as follows:

Section 15-317 Retention and Protection of Specimen and Rare Trees

(a) Every development shall retain all existing specimen and rare trees. When a site would be so unreasonably burdened by the retention of all such trees that a choice must be made as to which trees will be retained, the following criteria shall be used by the applicant, in consultation with the land use administrator and a landscape or forestry professional, who is a certified arborist, to evaluate the trees for the purpose of deciding which to retain:

- (1) The rareness of the species, relative to the species representation on the site and to the species representation within the region and the state. This shall be the most important criterion in the evaluation;
- (2) Size and age, large old trees being considered more valuable than smaller, younger trees of the same species;
- (3) The expected longevity of the tree, including such factors as the tree's relative health at the time of the evaluation;
- (4) The hardiness of the tree, including wind firmness, climatic requirements, susceptibility to insects and diseases;
- (5) Aesthetic values, including flowers, fruit, form characteristics, potential for autumn coloration;
- (6) Size at maturity; and
- (7) Potential to provide shading.

(b) Flexible approaches such as adjustments to lot layout, placement of buildings and paved surfaces and location of utilities should be pursued in order to save rare and specimen trees.

(c) Subsurface disturbance within the Tree Protection Perimeter around any tree to be retained in accordance with (a) above, shall be limited to the minimum extent practicable as determined by a certified arborist during construction or after completion of the development.

Section 5. Section 15-318 (Shade Trees in Parking Lots), subsections (a) is amended with an additional sentence added to the end of the subsection, and subsection (c) is amended with updated Land Use Ordinance section references and an additional sentence added to the end of the subsection, to read as follows:

(a) Vehicle accommodation areas containing more than four parking spaces that are required by Section 15-296 must be shaded by deciduous trees (either retained or planted by developer) that have or will have when fully mature a trunk at least twelve inches in diameter. When trees are planted by the developer to satisfy the requirements of this subsection, the developer shall choose trees that meet the standards set forth in Appendix E. As part of the redevelopment of an infill lot in the B-1(C), B-1(G) or B-2 districts, up to 25% of the shading

requirement may be from existing or proposed buildings providing shadow as identified in the provisions of Appendix A, A-6 (26).

(c) No paving may be placed within 15 feet (measured from the trunk) of any tree retained to comply with subsection (a), unless such tree is eighteen inches or greater in diameter or a very rare species as described in Section 15-315, in which case no paving may be placed within the Tree Protection Perimeter for such trees as described in 15-315(8). New trees planted to comply with subsection (a) shall be located so that they are surrounded by at least 200 square feet of unpaved area. Notwithstanding the foregoing, new trees planted on infill lots in the B-1(C), B-1(G) or B-2 districts may be surrounded by less than 200 square feet of unpaved area if installed with an urban tree planting system, specified by a professional engineer and landscape architect or certified arborist, that will ensure the survival of the tree for its typical life expectancy.

Section 6. Section 15-319 (Tree Canopy coverage Standards) is rewritten to read as follows:

Section 15-319 Tree Canopy Coverage Standards

(a) Minimum Canopy Coverage Standards. Subject to the remaining provisions of this section, the following minimum tree canopy coverage percentages are required within the boundaries of every lot or tract for which a zoning, special use, or conditional use permit is issued, exclusive of required cleared active recreation areas, water bodies, access easements, public and private right-of-way, stormwater and utility easements.

Table 1: Minimum Tree Canopy Coverage Standards

Land Use	Minimum Canopy Coverage
Residential	40%
Other than residential excluding districts (B-1(C), (B-1(G), (B-2)	30%
Other than residential in districts (B-1(C), (B-1(G), (B-2)	15%

When a tract is subdivided and pursuant to the provisions of Article XIII the developer sets aside open space areas or recreation areas that contain canopy trees (with a minimum caliper of six inches) or when a developer of a subdivision plants canopy trees to comply with the shading requirements of Article XIII, the total tree canopy area so preserved or established shall be credited against the minimum canopy coverage percentages set forth above. The remaining required tree canopy coverage area shall be allocated by the subdivider among the subdivided lots, and this allocation shall be shown on the recorded plat of such subdivision with a disclosure note that such trees, to fulfill the requirements of this section, shall be subject to maintenance and replacement.

(b) Implementation of Standards. Compliance with the tree canopy standards shall be achieved as follows:

- (1) Protection of existing tree canopy. The extent of existing tree canopy coverage retained at the time of permit application may be documented by survey or by using current aerial photographs available on the Town's web

page or similar resource. Protection of the existing tree canopy will be demonstrated by the tree protection plan required by Section 15-320.

- (2) Replacement of canopy. If the existing protected tree canopy is less than the minimum standard as shown in Table 1, the deficit shall be made up by the planting of additional trees as provided herein:
- a. One (1) or more replacement tree(s) shall be planted in accordance with an approved planting plan. When trees are planted by the developer to satisfy the requirements of this subsection, the developer shall choose trees that meet the standards set forth in Appendix E. Each tree shall be presumed to create a canopy circular area with the trunk of the tree as the center, and there must be sufficient trees so that, using this standard, the canopy requirements in 15-319(a) are met.
  - b. Canopy trees planted to meet the Town's screening and parking lot shading standards can be counted toward the replacement canopy tree calculation.
  - c. Supplemental canopy trees planted to complete the canopy coverage requirements shall be planted no less than twenty (20) feet from any other proposed or existing canopy tree.
  - d. Replacement trees that are planted in an adjacent right-of-way may count toward total tree canopy.
  - e. Replacement tree caliper shall be at least two and one-half (2.5) inches at installation.
  - f. Landscaped areas with shrubs of at least 100 square feet on an infill lot in the B-1(C), B-1(G) or B-2 districts. The developer shall choose shrubs that meet the standards set forth in Appendix E.

(c) Modifications to Canopy Coverage Standards. The permit issuing authority may approve a development application that does not fully comply with the canopy coverage standards when it finds that the application substantially (50 % or more) complies with these standards and that such a deviation:

- (1) Enables the development to better achieve other Town objectives such as: i) the promotion of solar access to encourage active and passive solar technology for water and space heating and renewable energy generation, ii) improved stormwater management, and iii) the preservation of established landscapes professionally designed and installed by an architect or landscape architect, or landscape designer; or
- (2) Is for property enrolled in the present use value taxation program or subject to a forest management plan; or
- (3) Is part of the redevelopment of an infill lot in the B-1(C), B-1(G) or B-2 districts, where the applicant is seeking a reduction of the shading requirement per Section 15-318, has planted trees in the right-of-way to count toward the

canopy coverage, and/or uses a landscaped area with shrubs of at least 100 square feet.

Large expanses of open space, meadowland (excepting a meadow consisting of species native to the Piedmont), or manicured lawn shall not satisfy the canopy coverage standards of this section.

(d) Exemption from Canopy Coverage Standards. Zoning permit applications for structures that are exempt from building permit requirements, or are the lessor of either i) additions to existing permitted structures that do not exceed 25% of an existing building footprint or ii) do not increase the footprint of the existing building by more than 250 square feet, shall be exempt from the tree canopy standards.

Section 7. Section 15-321.1 is amended by creating a new Section 15-321.1 (Payment in Lieu of Providing Shade or Canopy Cover Trees), as follows, and renumbering the existing Section 321.1 (Regulation of Forestry Activities) to 15-321.2.

(a) When the permit issuing authority determines that as part of the redevelopment of an infill lot in the B-1(C), B-1(G) or B-2 districts, it is physically impossible or impracticable for a development to satisfy the requirements of Section 15-318 (shading trees), or Section 15-319 (canopy coverage) of this Article, then the permit-issuing authority may allow the developer to pay a fee to a tree planting fund in accordance to an adopted tree planting master plan.

(b) The amount of the fee authorized by this section shall be determined by estimating the cost of providing the required trees (including the cost of the plant and labor for installation) that meets the requirements of this Article. This determination shall be made annually and the fee shall be included in the Miscellaneous Fees and Charges Schedule adopted by the Board of Aldermen.

(c) Any fees collected in accordance with this section shall be reserved and used exclusively to meet the purposes for which they have been obtained as specified above in subsection (a). The required fee shall be submitted to the Town prior to construction plan approval.

Section 8. Appendix A, Section A-5. (Existing, Natural, Man-Made and Legal Features) (b)(2), is rewritten to read as follows:

(b) Existing natural features:

(1) Tree line of wooded areas.

(2) The location and sizes of all trees which are to be retained in accordance with Section 15-317, and which are to be removed; a written justification for the need to remove any specimen or rare species trees protected by the provisions of Article XIX, along with a description of the extent of the hardship that would occur if such removal were not permitted to occur.

Section 9. Appendix A, Section A-6. (Proposed Changes in Existing Features or New Features), provisions (b)(23) and (b)(24) are rewritten to read as follows:

- (23) Proposed plantings or construction of other devices to comply with the screening requirements of Article XIX, Part I, as well as proposed plantings of trees to comply with the shading, street tree, and canopy requirements of Article XIX, Part II. Plans shall label shrubbery by common and scientific name, show the distance between plants and indicate the height at the time of planting and expected mature height and width. Plans shall label trees by common and scientific name, show the circles of the mature crowns (major trees shall be drawn at diameter = 30 feet; dwarf or decorative trees shall be drawn at their actual mature crown), and indicate the height at the time of planting.
- (24) A Tree Protection Plan, will be completed and stamped by a certified arborist or landscape architect, illustrating the methods proposed to be used to protect, during construction, the trees that are required to be protected under the provisions of Chapter XIX including specifications as to how the grade, drainage, and aeration will be maintained around the trees. The location of all rare and specimen trees to be retained on the site that will not be within the area to be disturbed by construction activities near a building site, or near roads within the development shall also be shown on the plan, along with a note stating that these trees will not be within the area to be disturbed by construction activities. The Administrator may recommend that applicants consult with experts in arboriculture, landscape architecture or forestry about appropriate tree protection methods for the particular conditions and species in question.

Section 10. Appendix E (Screening and Trees – Guide for Landscaping), provision title for E-3) shall be amended to read as follows:

**E-3 Formulas for Calculating Thirty-five Percent Shading of Paved Vehicle Accommodation Areas and Tree Canopy Deficit Replacement.**

Section 11. Appendix E-1 (Guide for Protecting Existing Trees), shall be amended to change the Section number from 15-316 to 15-317 in the first sentence and in subsection (b) to read as follows:

**E-1 Guide for Protecting Existing Trees**

Section 15-317 provides for the retention and protection of large trees when land is developed. In order to better ensure the survival of existing trees, the developer should heed the following guidelines:

- (b) Avoid excavations beneath the crown of the tree as required by Section 15-317(c).

Section 12. Appendix E-2 (Standards for Street and Parking Lot Trees), shall be amended to correct the references to other Sections, as follows:

Trees planted in compliance with the requirements of Sections 15-316, 15-318 and 15-319 should have most or all of the following qualities. The trees recommended in Section E-10 represent the best combinations of these characteristics.

Section 13. Appendix E-3 (Formulas for Calculating 35% Shading of Vehicle Accommodation Areas and Tree Canopy Deficit Replacement) shall be amended to include a new formula for determining the number of replacement trees required to presumptively satisfy the tree canopy requirements of Section 15-319, as follows:

**Formulas for Calculating the Number of Replacement Trees Required to Satisfy the Tree Canopy Deficit**

Following is an elementary formula for determining the number of replacement trees required to presumptively satisfy the tree canopy requirements of Section 15-319.

- |    |  |                        |
|----|--|------------------------|
| 1. | Enter square footage of the site to which canopy standards apply (15-319(a)):  | _____ sq. ft.          |
| 2. | Multiply (by 40%, 30%, or 15% depending on the Land Use)   | x .4, .3, or .15       |
| 3. | Canopy Required  | _____ sq. ft.          |
|    | *****  |                        |
|    | Add:   |                        |
| 4. | Canopy from existing trees to be retained:*  | _____ sq. ft.          |
| 5. | Canopy area of required screening trees, if any:   | _____ sq. ft.          |
| 6. | Canopy area of required shade trees, if any:   | _____ sq. ft.          |
| 7. | Subtotal (add lines 4-6)<br>(if line #7 is greater than line #3, then the canopy requirement has been met. If not, go on to line #8) | _____ sq. ft.          |
| 8. | Enter the difference between line #7 and line #3<br>Divide line #8:  | _____ sq. ft.<br>÷ 707 |
| 9. | Total number of replacement trees required**:  | _____ trees            |

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\*Existing trees retained will be credited according to their actual crown radius on the site as determined by survey or aerial photography.

\*\*The actual number of replacement trees to be planted will be determined as described below.

Trees planted that are generally recognized as canopy or overstory trees are credited with shading 707 sq. ft. (based on a crown radius of 15'). New trees planted within 5' of the lot line are credited for having only half a crown (e.g., new perimeter trees will be credited for 354 sq. ft.). When smaller trees generally recognized as understory trees such as Dogwoods are planted, the credited area will be adjusted downward to 314 sq. ft. for interior trees and 157 sq. ft. for perimeter trees (based on a crown radius of 10').



Section 14. Appendix E-9 (Guide for Planning Shrubs) is amended to read as follows:

### **E-5 Guide for Planting Trees**

After the pit is dug, observe sub surface drainage conditions. Most soils in the Carrboro area are poorly drained. Planting depth where poor drainage exists should be dependent upon the water needs of the tree species. If the species is more sensitive to poor drainage, the tree should be planted higher than existing grade, not to exceed  $\frac{1}{4}$  root of the ball above grade. If a wire cage surrounds the root ball, it should be removed prior to planting. Back fill should then be sloped gradually from top of root ball to existing grade. Gravel placed at the bottom of the hole will not improve drainage.

Section 15. Appendix E-9 (Guide for Planning Shrubs) is amended to read as follows:

### **E-9 Guide for Planting Shrubs**

Shrubs planted for screening purpose should be given a proper culture and be spaced based on expected size at maturity. Most soils in the Carrboro area are poorly drained. Planting depth where poor drainage exists should be dependent upon the water needs of the tree species. If the species is more sensitive to poor drainage, the shrub should be planted higher than existing grade, not to exceed one quarter of the root ball above grade. If a wire cage surrounds the root ball, it should be removed prior to planting. Back fill should then be sloped gradually from the top of the root ball to the existing grade. Gravel placed at the bottom of the hole, underneath the shrub, will not improve drainage. Many of the guidelines for tree planting listed in Section E-5 also apply to shrubs. However, because specific requirements vary considerably between shrub types, this Appendix does not attempt to generalize the needs of all shrubs.

Section 16. Appendix E-10 (Lists of Recommended Trees and Shrubs) is completely rewritten with the lists of trees and shrubs listed as under subsection E-10(A) through E-10(F) are reorganized into a table, as follows:

### **E-10 Table of Recommended Trees and Shrubs**

The following table, indicates plants which will meet the screening, shading, and tree canopy replacement requirements of Article XIX of the Land Use Ordinance. Additional desirable aspects of plants are also provided. The lists are not intended to be comprehensive or absolute, but rather are intended as guidance for species that are appropriate.

Plants were selected for inclusion on these lists according to two principal criteria in addition to providing the indicated service: i.) general suitability for the Piedmont of North Carolina and support of Piedmont ecosystems and food webs; and ii.) for a particular site, species native to the Piedmont of North Carolina which are thriving on or near the site should be favored. When trees are planted to replace native tree specimens removed, native tree species should always be selected. Plantings of multiple species are also recommended to increase biodiversity and provide resilience. Further information on recommended native plants is available from the North

Carolina Native Plant Society. The Land Use Administrator has the discretion to not approve of planting plans to comply with Article XIX that substantially deviate from the list provided

Sections E-11 through E-16 contain descriptions of the trees and shrubs listed here.

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E-10 TABLE OF RECOMMENDED TREES AND SHRUBS

Common Name ( <i>Latin name</i> )	Human Services						Ecological Services			
	Shading (1)		Screening (2)			Other		Rare/specimen (3)	Native (a)	Pollinator (b)
	Parking / VAA	Street	Partial	Evergreen	Broken	Planting Strip	Edible/Medicinal			
<b>Large Trees (4)</b>										
American Beech ( <i>Fagus grandifolia</i> )							*	*		
American Elm ( <i>Ulmus americana</i> )							*	*		
American Hemlock ( <i>Tsuga canadensis</i> )							*	*		
American Persimmon ( <i>Diospyrus virginiana</i> )			*		*		*	*	*	
Atlantic White Cedar ( <i>Chamaecyparis thyoides</i> )				*			*	*		
Bald Cypress ( <i>Taxodium distichum</i> )				*			*	*		
Basswood ( <i>Tilia americana</i> )	*							*		
Black Gum ( <i>Nyssa sylvatica</i> )			*					*		
Black Oak ( <i>Quercus velutina</i> )	*	*						*		
Blackjack Oak ( <i>Quercus marilandica</i> )								*		
Chestnut Oak ( <i>Quercus montana</i> ; <i>Q. prinus</i> )	*							*		
Cucumber Tree ( <i>Magnolia acuminata</i> )	*							*		
Eastern Red Cedar ( <i>Juniperus virginiana</i> )				*			*	*		
Laurel Oak ( <i>Quercus laurifolia</i> )				*				*		
Loblolly Pine ( <i>Pinus taeda</i> )				*				*		
Longleaf Pine ( <i>Pinus palustris</i> )							*	*		
Mockernut hickory ( <i>Carya tomentosa</i> )								*	*	
Ohio Buckeye ( <i>Aesculus glabra</i> )							*	*		
Post Oak ( <i>Quercus stellata</i> )								*		
Red Oak (Eastern) ( <i>Quercus rubra</i> )	*	*						*		
River Birch ( <i>Betula nigra</i> )	*	*				*		*		
Scarlet Oak ( <i>Quercus coccinea</i> )	*	*						*		
Shortleaf Pine ( <i>Pinus echinata</i> )				*				*		
Southern Catalpa ( <i>Catalpa bignonioides</i> )	*							*		
Southern Magnolia ( <i>Magnolia grandiflora</i> )				*			*	*		
Shagbark Hickory ( <i>Carya carolinae-septentrionalis</i> )							*	*		
Southern Sugar Maple ( <i>Acer saccharum</i> ; <i>A. barbatum</i> )	*							*		
Swamp Chestnut Oak ( <i>Quercus michauxii</i> )	*						*	*		
Swamp White Oak ( <i>Quercus bicolor</i> )	*				*			*		

Sycamore ( <i>Platanus occidentalis</i> )	*								*	
Tulip Poplar ( <i>Liriodendron tulipifera</i> )	*	*							*	*
Virginia Pine ( <i>Pinus virginiana</i> )				*					*	
White Oak ( <i>Quercus alba</i> )	*								*	
Willow Oak ( <i>Quercus phellos</i> )	*	*							*	
<b><u>Small Trees (5)</u></b>										
American Holly ( <i>Ilex opaca</i> )			*	*	*				*	*
American Hop Hornbeam ( <i>Ostrya virginiana</i> )			*						*	
American Hornbeam/Ironwood ( <i>Carpinus carolinia</i> )			*			*			*	
American Smoketree ( <i>Cotinus obovatus</i> )			*		*					
Carolina Cherry Laurel ( <i>Prunus caroliniana</i> )			*	*		*			*	
Crabapple (southern) ( <i>Malus spp.</i> )			*				*		*	
Eastern Redbud ( <i>Cercis canadensis</i> )			*						*	*
Flowering dogwood ( <i>Cornus florida</i> )			*						*	
Fringetree ( <i>Chionanthus virginiana</i> )			*		*				*	*
Loblolly Bay ( <i>Gordonia lasianthus</i> )			*						*	
Mock Orange <i>Philadelphius inodorus</i> (other native cultivars)			*						*	*
Paw Paw ( <i>Asimina triloba</i> )			*				*		*	*
Red Bay ( <i>Persea borbonia</i> )			*						*	
Sassafras ( <i>Sassafras albidum</i> )			*		*		*		*	
Serviceberry ( <i>Amelanchier canadensis/arborea</i> )			*			*	*		*	
Silverbell ( <i>Halesia carolina</i> )									*	
Sourwood ( <i>Oxyndrum arboreum</i> )			*			*			*	
Southern Wax Myrtle ( <i>Myrica cerifera</i> )			*	*					*	
Sumac ( <i>Rhus aromatica (fragrant); copallina</i> (Shining); <i>R. glabra</i> (Smooth); <i>R. typhina</i> (Staghorn))					*		*		*	*
Umbrella Magnolia ( <i>Magnolia tripetala</i> )									*	*
Washington Hawthorn ( <i>Crataegus phaenophyrum</i> )			*							
Witch Hazel (Common) ( <i>Hamamelis virginiana</i> )					*		*		*	
Witch Hazel (Vernal) ( <i>Hamamelis vernalis</i> )					*	*	*			
Yaupon Holly ( <i>Ilex vomitoria</i> )			*	*		*	*		*	
<b><u>Shrubs (6)</u></b>										
Anise Bush ( <i>Illicium anisatum</i> )			*	*		*				
Azaleas ( <i>Rhodendron calendulaceum, canescens,</i> <i>periclymenoides, prunifolium</i> )					*				*	*
Beautyberry ( <i>Callicarpa americana</i> )					*	*			*	
Blueberry ( <i>Vaccinium spp.</i> )					*		*		*	

Buttonbush ( <i>Cephalanthus occidentalis</i> )					*				*	
Carolina Allspice (Sweetshrub) ( <i>Calycanthus floridus</i> )					*				*	
Carolina Rose ( <i>Rosa carolina</i> )					*				*	
Clethra ( <i>Clethra alnifolia</i> )					*				*	
Devil's Walking Stick ( <i>Aralia spinosa</i> )					*				*	*
Flowering dogwood ( <i>Cornus florida</i> )										
Drooping Leucothoe ( <i>Leucothoe fontanesiana</i> )					*				*	
Fortune Tea Olive ( <i>Osmanthus fortunei</i> )			*	*						
Glossy Abelia ( <i>Abelia grandiflora</i> )			*	*						
Hearts-a-burstin ( <i>Eunonymus americanus</i> )					*				*	
Highbush Blueberry ( <i>Vaccinium corymbosum</i> )					*				*	
Inkberry ( <i>Ilex glabra</i> )			*	*					*	
Japanese Yew ( <i>Taxus cuspidata</i> )			*	*						
Magnolia "Little Gem" ( <i>Magnolia grandiflora</i> )		*		*					*	
Mountain Laurel ( <i>Kalmia latifolia</i> )				*					*	
Oakleaf Hydrangea ( <i>Hydrangea quercifolia</i> )					*					*
Poet's Laurel ( <i>Danae racemosa</i> )			*	*						
Possumhaw ( <i>Ilex decidua</i> )									*	
Savannah Holly ( <i>Ilex x attenuata</i> )	*	*		*		*			*	
Silky dogwood ( <i>Cornus amomus</i> )									*	
Spicebush ( <i>Lindera benzoin</i> )					*	*			*	
Viburnum ( <i>acerifolium, dentatum, nudum, rafinesquianum, prunifolium, rufidulum</i> )			*		*				*	
Virginia sweetspire ( <i>Itea virginica</i> )									*	
Winterberry Holly ( <i>Ilex verticillata</i> )			*	*					*	
<b><u>Vines</u></b>										
Carolina Jessamine ( <i>Gelsemium sempervirens</i> )			*	*						
Confederate Jasmine ( <i>Trachelospermum jasminoides</i> )			*	*						
Trumpet Honeysuckle ( <i>Lonicera sempervirens</i> )			*	*						
Virginia Creeper ( <i>Parthenocissus quinquefolia</i> )			*	*						

**Footnotes:** (1) See 15-316 & 15-318. (2) See 15-307. (3) See 15-317. (4,5) Trees that are credited with 707 sf (4) and 314 sf (5) towards canopy requirements per Appendix E (E-3). (6) Shrubs may be credited towards canopy requirements, see 15-319. (a) as defined by NC Cooperative Extension Service and Natural Resources Conservation Service; native plants are preferred for all plantings. (b): as identified by Pollinator Partnership, for southeastern region.

Section 17. Appendix E-11 (Small Trees for Partial Screening) is amended to read as follows:

### **E-11 Small Trees for Partial Screening**

The following trees are recommended for use in all types of screens. Though smaller than the trees listed in planting lists E-12 and E-13, each of these trees will reach a height of at least 20 feet. Selections marked with an (\*) are also recommended as shade trees and may be credited for meeting the 35% shading requirement for paved parking lots.

Section 18. Appendix E-13 (Large Trees for Shading) is rewritten to read as follows:

### **E-13 Large Trees for Shading (Amended 6/22/04)**

The following trees may be used for screening, but they are recommended especially for shading streets and parking lots. Unless otherwise noted, they will grow rapidly. Each species will attain a mature spread of at least thirty feet. The trees on the following list marked with an “\*” are appropriate selections to satisfy Section 15-315, Required Trees Along Dedicated Streets.

#### **\*BLACK OAK (*Quercus velutina*) Height: 50 to 60 feet; Spread: 40 to 50 feet**

A large, deciduous oak of the red oak group with a globular, spreading crown. This tree is primarily native to upland hills, slopes and ridges. It is similar in appearance to red oak with which it may on occasion hybridize. Bark is almost black on mature trunks with deep furrows. Inner bark is yellow to orange. Trunk matures to 3' in diameter. Leathery, shiny, dark green leaves (to 10" long) have 7-9 deeply incised lobes (each with 1-3 bristle tipped teeth). Leaves turn yellow to yellow-brown to dull red in fall. Easily grown in average, acidic, dry to medium moisture, well-drained soils in full sun.

#### **CHESTNUT OAK (*Quercus montana*; *O. prinus*) Height: 60 to 70 feet; Spread: 50 to 70 feet**

Chestnut oak is a medium-sized, native, deciduous, tree that is suited to dry, infertile, rocky upland sites, yet grows best on rich well-drained soils along streams. At maturity, it is a medium-sized long-lived tree with an irregular dense crown. The sweet acorns are an important food for many wildlife species including deer, turkeys, squirrels, chipmunks, and mice, while small birds, mammals, and bees use chestnut oak cavities for nesting.

#### **CUCUMBER TREE (*Magnolia acuminata*; *M. Fraserii*) Height: 50 to 80 feet; Spread: 50 to 80 feet**

Cucumber tree is the most widespread and hardiest of the eight native magnolia species. It grows fairly rapidly and well in rich, moist soils of slopes and valleys and matures in 80 to 120 years. This park-like tree is planted as an ornamental for its attractive leaves, flowers, and cucumber-shaped fruit, producing seeds that are eaten by birds and small mammals. Its shape is pyramidal when young, developing a straight trunk and a rounded crown.

**\*EASTERN RED OAK (Quercus rubra) Height: 50-70'; Spread: 40'+.**

This tree grows faster than any other Oak, two feet or more per year. It is prized as a street tree because its high branching habit gives it an ideal shape. The Red Oak grows in almost any average soil and presents no special maintenance problems.

**\*LAUREL OAK (Quercus laurifolia) Height: 40-60'; Spread: 30'+.**

The Laurel Oak grows more slowly than the other Oaks listed above, but it has the advantage of being nearly evergreen in Piedmont sections of North Carolina. It has proven to be a good street tree and does quite well under city conditions. It presents no special maintenance problems.

**POST OAK (Quercus stellata) Height: 40 to 50 feet; Spread: 35 to 50 feet**

Post oak is a small to medium-sized tree with a crown that has snarled and twisted branches and found on upland sites with full sun. This slow-growing drought resistant oak typically occupies rocky or sandy ridges and dry woodlands with a variety of soils. Acorns provide high-energy wildlife food during fall and winter for wild turkey, white-tailed deer, and squirrels, and provide habitat for birds and mammals. Post oak can be a beautiful shade tree for parks and to stabilize soil on dry, sloping, stony sites where few other trees will grow. It develops an attractive crown with strong horizontal branches.

**\*SCARLET OAK (Quercu Coccinea) Height: 60-80'; Spread: 40'+.**

This is a third Oak which grows rapidly and is easy to maintain. The Scarlet Oak is more difficult to transplant than the Red or the Willow, but it may be a worthwhile selection for its excellent foliage

**SOUTHERN CATALPA (Catalpa bignonioides) Height:25 to 40 feet; Spread: 20 to 30 feet**

Catalpa is a medium-sized tree with spreading branches, an irregular crown, and generally crooked bole that is suited to moist, well-drained soils with full sun. The flowers and leaves make this an interesting landscape tree but the fruit can be messy.

**SOUTHERN SUGAR MAPLE (Acer saccharum; A. barbatum) Height: 20 to 25 feet; Spread: 20 to 40 feet**

Sugar maple grows on moist, well-drained soils and is very tolerant of shade. Seeds are eaten by birds and small animals. A popular ornamental for the fall color, Sugar Maple at maturity is a medium to tall tree with very dense elliptical crown.

**SWAMP CHESTNUT OAK (Quercus michauxii) Height: 60 to 70 feet; Spread: 50 to 70 feet**

Swamp chestnut oak grows in full sun on moist and wet loamy soils of bottomlands, along streams and borders of swamps, tolerates saturated or flooded soils for a few days to a few weeks. The acorns are sweet and serve as food to wildlife. The crown is round, compacted, and narrow.

**SWAMP WHITE OAK (Quercus bicolor) Height: 50 to 60 feet; Spread: 50 to 60 feet**

Swamp white oak is a medium sized tree with an irregular crown suitable to river bottomlands, depressions, swamp borders, and along edges of streams. It is rapid growing and long lived, attaining 300 to 350 years. Many kinds of wildlife eat the acorns, particularly ducks. Swamp white oak is intermediate in shade tolerance but not very drought tolerant.

**SYCAMORE (*Platanus occidentalis*) Height: 70-100'; Spread: 60'+.**

The Sycamore is probably the fastest growing shade tree on this list. Within ten years, it can grow to a height of between thirty and forty feet. It is easily transplanted, but it needs plenty of space. As one of nature's most massive trees, Sycamores have been known to grow to a height of 170 feet with a trunk 10 feet across. The Sycamore is a native tree which typically grows in flood plains, but it thrives in a variety of situations. Its tolerance of severe conditions has long made it a favorite choice as a street tree. Sycamores are susceptible to fungi and leaf blight and their large leaves and seed balls may present a litter problem.

**\*TULIP POPLAR (*Liriodendron tulipifera*) - Height 60'-150'; Spread 30-40'.**

Very common in eastern woodlands, this is a rapidly growing tree with colorful yellow leaves in Fall. Spring flowers, however, are not very noticeable. Difficult to transplant except when young. Excellent street tree.

**WHITE OAK (*Quercus alba*) Height: 60 to 100 feet; Spread:50 to 90 feet**

White oak is found on fertile, moist, well-drained soils under partial sun. Acorns are eaten by game birds, deer, bear, and many small mammals. Pyramidal in youth, this species matures into a rugged, irregular crown that is wide spreading, with a stocky bole. While this species is potentially valuable for use in reforestation projects, it is not recommended near paved areas.

**\*WILLOW OAK (*Quercus phellos*) Height: 60-80'; Spread: 30'+.**

This is another rapidly growing Oak. It has proven to be quite successful as a street and parking lot tree in the Carrboro area. Its slender leaves give it a finer texture than that of other Oaks, but it still casts excellent shade. The Willow Oak is native to bottomland soils, and thus it needs plenty of moisture. It often spreads majestically as it matures so it should be given ample room to grow. No significant pests or diseases afflict the Willow Oak.

Section 19. Appendix E-14 (Small Shrubs for Evergreen Screening) is rewritten to read as follows:

**E-14 Small Shrubs and Vines for Evergreen Screening (Amended 6/22/04)**

The following shrubs and vines are recommended for informal (unclipped) hedges or screens. These are generally small species and appropriate for Semi-Opaque Screens.

**CAROLINA JESSAMINE\* (*Gelsemium sempervirens*) - Height up to 20'; Spread varies.**

A moderate growing, mostly evergreen vine that grows very well on fences. Fragrant yellow flowers in springtime. Prefers sun or partial shade. All parts of this plant are poisonous.

**CONFEDERATE JASMINE\* (*Trachelospermum jasminoides*) - Height up to 20'; Spread varies.**

Commonly called star jasmine, this is a twining, evergreen, woody vine. Axillary and terminal clusters of salverform, sweetly fragrant, starry, creamy white flowers appear in late spring with sporadic additional bloom in summer. Flowers are attractive to bees.



**GLOSSY ABELIA (*Abelia grandiflora*) Height: 4-6'; Spread: 3-5'.**

Abelia is quite common in local nurseries and tends to be less expensive than other shrubs on this list. It bears pale pink flowers throughout the summer. Although it has proven quite popular for informal hedges, it has several drawbacks. Abelia should be pruned and thinned to maintain its best form. It may drop its leaves due to low temperatures, lack of pruning, or starvation.

**INKBERRY (*Ilex Glabra*) Height: 5-10'; Spread: 4-8'**

Inkberry is an evergreen shrub with alternate leaves with a smooth or toothed margin. The bark is greenish brown and smooth. In early summer, small greenish white flowers mature. The shrub produces a black drupe that matures in the fall. It is a host plant for the Henry's Elfin butterfly. Fruits are eaten by birds and small mammals.

**JAPANESE YEW (*Taxus cuspidata*) Height: 4-6'; Spread: 5-7'.**

The versatile Yew is commonly available from local nurseries in a wide variety of sizes and shapes. The Japanese Yew serves as excellent screening material in either a clipped or unclipped form. It tolerates poor growing conditions and flourishes in almost any kind of soil. (Soggy soil may hamper its growth, however.) It is comparatively pest free and is hardy under trying winter conditions. The Yew's best feature is its rich shiny green needles which grow densely on all varieties.

**MOUNTAIN LAUREL (*Kalmia Latifolia*) Height: 6-10'; Spread: 5-8'**

A shrub that is abundant in the mountains with leaves that are alternate with a smooth margin, raised mid-vein, and yellow underside. The bark is thin, smooth, and dark brown-red in color in young trees. The bark shreds and splits as the plant ages. In late spring to early summer, very showy clusters of white to rose flowers mature.

**POET'S LAUREL (*Danae racemosa*) Height: 2 to 3 feet; Spread: 2 to 3 feet**

Poet's Laurel prefers partial to full shade, moist, well-drained soil enriched with organic matter; but does tolerate clay soils. It has an open growth habit with slender branches that arch up and away from center of crown. It can spread by rhizomes. While foliage discolors in sun; it can be long-lasting for flower arrangements.

**TRUMPET HONEYSUCKLE\* (*Lonicera sempervirens*) - Height up to 50'; Spread varies.**

A rapid growing, mostly evergreen vine with beautiful orange to red to yellow flowers occurring in late spring and throughout the summer. Best in full sun.

**WINTERBERRY HOLLY (*Ilex verticillata*) Height: 6 to 15 feet; Spread: 6 to 10 feet**

With a slow to moderate growth rate, this species is suited to partial to full sun on moist soils, but can tolerate drought. Early summer brings small white flowers that mature into dense clusters of bright red berries.

Note: \* Vines - which if grown on a trellis would make a nice evergreen screen.

Section 20. Appendix E-15 (Small Trees and Large Shrubs for Evergreen Screening is rewritten to read as follows:

**E-15 Small Trees and Large Shrubs and Trees for Evergreen Screening**

The following shrubs are recommended for high hedges or screens. Each species grows to a height of more than 6 feet and are generally appropriate for Opaque Screens.

**ANISE BUSH (*Illicium anisatum*) - Height 8-12'; Spread 8-10'.**

moderate growing, evergreen shrub with an open habit. Small flowers appear in mid-Summer. Prefers a fair amount of moisture, with partial to full sun. Subject to damage during very cold winters.

**CAROLINA CHERRY-LAUREL (*Prunus caroliniana*) Height: 20-30'; Spread: 15-20'.**

This tree is prized for its dense evergreen foliage. It may be trimmed as a hedge, but also serves as an excellent screen in its natural form. The Cherry-Laurel grows rapidly and has no pests. However, it may not be as cold hardy as other trees on this list.

**FORTUNE TEA OLIVE (*Osmanthus fortunei*) Height: 9-12'; Spread: 5-7'.**

This Osmanthus hybrid is a popular, though non-descript, shrub. With its vigorous growth, it will form an excellent screen or border. It is soil tolerant. The Fortune Tea Olive is most notable for its inconspicuous yet highly fragrant flowers.

**LOBLOLLY BAY (*Gordonia lasianthus*) Height 30 to 60 feet; Spread 10 to 15 feet**

Loblolly-bay is a small to medium-sized native, evergreen tree that grows on acid soils in flat woodlands or shallow depressions with little or no slope, slow runoff, and poor to very poor drainage. It has a narrow crown and straight trunk.

**MAGNOLIA "LITTLE GEM" Height 15 to 30 feet; Spread 15 to 20 feet**

'Little Gem' is a much smaller and slower growing Magnolia cultivar that typically grows as a compact upright multi-stemmed shrub or small tree. It features glossy green leaves (to 5" long) that are bronze-brown underneath. Fragrant white flowers (to 4" diameter) bloom in summer. It is effective as a screen, a small street tree or in containers.

**RED BAY (*Persea borbonia*) Height: 15 to 40 feet; Spread 10 to 20 feet**

Redbay is an attractive aromatic evergreen tree suitable for sites with partial to full sun and prefers drier soils. Birds and small mammals eat the fruit.

**SAVANNAH HOLLY (*Ilex X Attenuata* 'Savannah') Height: 25 to 40'; Spread 8 to 12 feet**

This holly grows quickly in full sun or partial shade on moist, acid soils. Plants in full sun can grow a dense canopy, those in partial shade are more open. Trees attract cedar waxwings, mockingbirds, robins and many other birds. This holly makes a fairly durable street tree. It is quite drought-tolerant once it becomes well-established. The crown grown with one central trunk is preferred, making it well-suited for urban areas having restricted vertical space. Savannah Holly has also performed well in sidewalk cutouts/small tree pits, in parking lots and median strip plantings and for screens.

**SOUTHERN WAX MYRTLE (*Myrica cerifera*) Height 40 feet; Spread 20 to 25 feet**

Southern wax myrtle is an erect, shade tolerant, ornamental, evergreen, small tree or shrub. Its flat leaves are aromatic when crushed and may repel. Underground runners extend the growth laterally and root nodules are capable of atmospheric nitrogen fixation.

**YAUPON HOLLY (*Ilex vomitoria*) Height: 5-15'; Spread: 6-12'**

This is another versatile Holly, slower growing than the Burford, but equally as adaptable to adverse conditions. It is a native shrub which has proven to be one of the most drought resistant of all Hollies. It may be clipped to maintain any desired height. The Yaupon Holly is very heavily fruited and will attract birds.

Section 21. Appendix E-16 (Assorted Plantings for Broken Screens) is rewritten to read as follows:

**E-16 Assorted Plantings for Broken Screens (Amended 6/22/04)**

The following is a sampling of shrubbery which would be appropriate in a Broken Screen. Because many of these plants are deciduous, they are not suitable for Opaque and Semi-Opaque Screens. (Note: Many of the evergreen shrubs described in planting lists E-14 and E-15 are also suitable for Broken Screens.)

**AZALEAS (*Rhododendron calendulaceum* (Flame); *R. nudiflora* & *R. periclymenoides* (Pinxterbloom); *R. prunifolium* (Plumleaf)) Height 3 to 10 feet; Spread 4 to 8 feet.**

These three azaleas are excellent naturalizing plants that do not require a lot of space. With great orange, pink, and red colors, these species attract hummingbirds and butterflies. Good for sites with full sun to part shade with medium moisture on well-drained soils with a southwest aspect.

**BEAUTYBERRY (*Callicarpa americana*) - Height 6'.**

Very colorful deciduous shrub with springtime flowers, followed by purple fruit which lasts into winter. Prefers full sun.

**\*BLUEBERRY (*Vaccinium ashei*) - Height 4-6'; Spread 3-5'.**

Also known as Rabbiteye blueberry, this is a heat tolerant, native shrub. White flowers in springtime followed by blue fruits that birds enjoy. Has a moderate growth rate. This shrub prefers well drained, acid soil.

**BUTTON BUSH (*Cephalanthus occidentalis*) Height: 6 to 10 feet Spread: 6 to 10 feet**

Buttonbush is a deciduous, warm-season, tall shrub or small tree that grows along swamps, marshes, bogs, ditches, and other riparian areas that are seasonally inundated for at least part of the year. Its base is often swollen, with green branches when young but turns brown at maturity. Tiny, white flowers occur in dense, spherical clusters at branch ends attract bees and butterflies with fruits arranged in a round cluster of brown, cone-shaped nutlets.

**CAROLINA ALLSPICE OR SWEETSHRUB (*Calycanthus floridus*) - Height 6-9'; Spread 5-8'.**

This is a deciduous shrub native to the Southeast. Fragrant, maroon flowers appear in late Spring. Takes sun or shade.

**CAROLINA ROSE (*Rosa carolina*) Height 3 to 6 feet Spread: 5 to 10 feet**

Best grown in average, medium-wet to wet, well-drained soil in full sun. Fragrant, showy flowers attract birds and butterflies, but this plant does have thorns.

**CLETHRA (*Clethra alnifolia*) - Height 10'.**

Another native of the Eastern United States, Clethra has fragrant white flowers in late Summer. Grows well in acid soils. Full sun, however in the Piedmont it would do best with some shade. Varieties are available with pink flowers.

**COMMON WITCH HAZEL (*Hamamelis virginiana*) Height: 8-15'; Spread 7-14'.**

This shrub is a larger version of Vernal Witch Hazel with many of the same qualities. It is another native woodland plant which has adapted well to landscaping uses. The Common Witch Hazel is recommended for shady areas, but when planted in the sun it grows to be a splendid well rounded specimen. It is especially useful in large areas.

**DROOPING LEUCOTHOE (*Leucothoe fontanesiana*) Height: 3-4'; Spread: 4-6'.**

Drooping Leucothoe is a moundlike shrub which is good for planting in front of and between other flora and beneath trees. It is hardy in city conditions and gives a natural effect when planted along borders. This native evergreen is graceful and attractive in all seasons. It is easy to transplant but requires a heavy mulch and should be provided with at least partial shade. Old branches should be pruned occasionally to stimulate new growth.

**EUONYMUS AMERICANA (*Hearts-a-Burstin; Strawberry Bush*) Height: 3-5'; Spread: 4-6'**

Strawberry Bush is a native deciduous shrub with leaves that are opposite with finely toothed margins. The bark is green, but does split and become darker as the tree ages. In early summer, small, 5-petaled, greenish purple flowers mature. The shrub produces 4-lobed capsules which when opened reveal an orange-red, warty seed.

**FRINGETREE (*Chioanthus virginicus*) Height: 10-30'; Spread: 8-10'.**

The Fringetree is known for its profusion of beautiful flowers. It is considered to be one of the most striking native American shrubs. It is relatively difficult to transplant, but once established it does well in cities as it endures heavy smoke and dust. The mature Fringetree's only drawback is that its leaves appear rather late in the Spring.

**HIGHBUSH BLUEBERRY (*Vaccinium Corymbosum*) Height: 8-15'; Spread: 8-12'**

Highbush Blueberry is a deciduous shrub with alternate leaves with a smooth or toothed margin and fuzzy underside. The bark is gray-brown to reddish brown and very shreddy. In early spring, small, white, bell-shaped flowers mature in clusters. The shrub produces a dark blue berry that matures in mid to late summer. It is a host plant for the Brown Elfin butterfly. Fruits are eaten by a variety of birds and mammals, including humans.

**INKBERRY (*Ilex Glabra*) Height: 5-10'; Spread: 4-8'**

Inkberry is an evergreen shrub with alternate leaves with a smooth or toothed margin. The bark is greenish brown and smooth. In early summer, small greenish white flowers mature. The shrub produces a black drupe that matures in the fall. It is a host plant for the Henry's Elfin butterfly. Fruits are eaten by birds and small mammals.

**OAKLEAF HYDRANGEA (*Hydrangea quercifolia*) - Height 4-6'; Spread 3-5'**

Deciduous shrub with large, white flower clusters during the Summer. Colorful crimson foliage in Fall. Makes an excellent specimen plant.

**SMOKETREE (*Cotinus coggygria*) - Height 10-15'; Spread 8-14'**

Large shrub or small deciduous tree with attractive round leaves. Colorful lavender panicles appear in Summer. Prefers well drained soil, but otherwise does well in poor soils. Full sun is best for this shrub.

**SPICEBUSH (*Lindera benzoin*) - Height 6-10'; Spread 4 -8'**

Spicebush is a deciduous shrub alternate leaves with a smooth margin that produce a spicy odor when crushed. The bark is brown to gray-brown and speckled with light colored lenticels. In early spring, small, yellow flowers mature in axillary clusters. The shrub produces a bright red drupe with a peppery taste and scent. The fruit matures in the fall. It is a host plant for the Spicebush Swallowtail butterfly. Fruits are eaten by songbirds, especially during fall migration.

**STAR MAGNOLIA (*Magnolia stellata*) Height: 10-12'; Spread: 8-10'**

This handsome specimen shrub is considered to be the hardiest of all the Magnolias. It forms a broad, rounded mass. It becomes tree-like with age but continues to branch to the ground. Early in the spring, it produces numerous fragrant white flowers. The Star Magnolia should not be planted adjacent to shallow rooting trees. It should be allowed plenty of sun.

**SUMAC (*Rhus copallina* (Shining); *R. glabra* (Smooth) *R. typhina* (Staghorn)) Height 7 to 40 feet; Spread 9 to 20 feet**

These species are perennial, deciduous, sun-loving, thicket-forming shrubs or small trees with branches that tend to be fairly sparse and stout. Sumac does well on dry to medium moisture sites. The tart fruits are eaten by birds and are very tart in taste. These species provide good fall color.

**\*\*\*\* SWAMP WHITE OAK (*Quercus bicolor*) Height: 50 to 60 feet; Spread: 50 to 60 feet**

Swamp white oak is a medium sized tree with an irregular crown suitable to river bottomlands, depressions, swamp borders, and along edges of streams. It is rapid growing and long lived, reaching 300 to 350 years. Many kinds of wildlife eat the acorns, particularly ducks. Swamp white oak is intermediate in shade tolerance but not very drought tolerant.

**VERNAL WITCH HAZEL (*Hamamelis vernalis*) Height: 4-6'; Spread: 2- 3'**

This rapidly growing native shrub is excellent for bordering and naturalizing. It assumes a dense, upright form, thriving in even the most polluted air. Other than plenty of watering, the Vernal Witch Hazel requires no special maintenance.

**\*\*\*Viburnum (Viburnum prunifolium; V. dentatum) Height: 12 to 15 feet; Spread: 8 to 12 feet**

Black Haw is a small tree with twisted trunk and arching branches with an overall round crown appearance. Does best on partially sunny sites on moist, well-drained soils.

Section 22. Appendix E-17 (List of Invasive Plant Species) is rewritten to read as follows:

**E-17 Invasive Plant Species**

Invasive plant species identified by the North Carolina Native Plant Society are prohibited from planting for all plantings to comply with Article XIX.

Section 23. All provisions of any Town Ordinance in conflict with this Ordinance are repealed.

Section 24. This Ordinance shall become effective upon adoption.

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