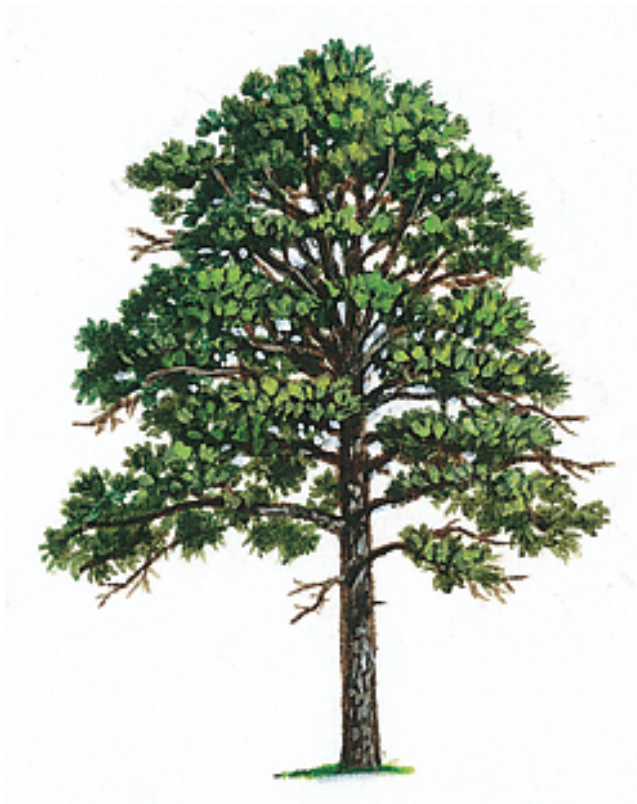


Lincoln County Tree Planting and Landscape Guide:



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This guide establishes a required list of tree species, and a recommended list of shrub species to be used as dictated by the Lincoln County Unified Development Ordinance landscape regulations. A suggested baseline for the planting, maintenance and care of trees and shrubs in landscapes is also included.

Table of Contents:

<u>Section Title:</u>	<u>Page #:</u>
• UDO section references.....	3
• Planting Guide with diagrams.....	4-5
• Maintenance Standards.....	6
• Explanation of Tree Matrix.....	7
• Required Tree Matrix/Planting List.....	8-15
• Explanation of Shrub Matrix.....	16
• Recommended Shrub Matrix/Planting List.....	17-21
• Disclaimer.....	22
• Procedure for Use of Plant Species Not Found Within This Document.....	22
• Sources.....	22

UDO Section References:

The Lincoln County Unified Development Ordinance (UDO) outlines the mandated regulations for landscaping, screening and buffering. The following referenced sections dictate the standards that need to be met for the corresponding regulations. These sections can be found in the UDO which can be obtained online at: <http://www.lincolncounty.org/index.aspx?NID=465> or by visiting the Lincoln County Planning and Inspections Department at:

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<u>Section Title:</u>	<u>Section #:</u>
Landscaping, Screening and Buffering	§3.4
Landscape Areas and Tree Canopy	§3.4.4
Foundation Plantings	§3.4.5
Buffers	§3.4.6
Trees	§3.4.7
Screening	§3.4.8
Parking Lot Landscaping	§3.4.10
General Provisions	§3.4.11

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Planting Guide:

The following is a step-by-step guide to placing trees and shrubs in the landscape.

1. Prepare the Site:

- Determine the planting location as determined through the landscape plan, site plan or as directed by the project manager. Mark the placement of the tree and shrub locations by use of marking paint. Draw a circle 3 times the size of the root ball or container of which the tree/shrub species is contained. Remove the sod or grass and till or break up the existing soil within the marked circle.

2. Dig Hole:

- Dig out a hole in the center of the circle that is at least 1 foot larger in diameter than the root ball itself. The hole should only be deep enough to place the collar of the tree at the same level as the finished grade. (The tree collar is the point at which the root ball stops and the tree trunk begins. Be sure to maintain undisturbed soil at the bottom of the hole. This will prevent the tree from settling any further, which would lower the height of the tree collar. *(See image A, on page 5)*)

3. Place Tree in Hole:

- Gently place the tree in the center of the hole. With plants that are found in containers, be sure to carefully remove them from the container. A gentle tapping on all sides of the container will make it easier to remove the tree/shrub. Trees and shrubs which are wrapped in burlap must have the burlap pulled down towards the bottom of the root ball to expose the top 50% of the root ball. This is done by first cutting the twine which holds the burlap and cage in place. Bend the cage sides downward towards the bottom of the hole, and then peel the burlap downwards over the cage. *(See image A, on page 5)*

4. Backfill:

- Once the tree is in place, be sure that it is upright and the collar is level with the surrounding grade. Using the soil that was removed from the hole, begin to place it back in the hole around the root ball, packing lightly as you backfill. Be sure to eliminate any air pockets that may occur when placing in the backfill. Continue to backfill to just below the tree/shrub collar. To prevent compaction, do not pack the soil after the tree/shrub has been watered. *(See image B, on page 5)*

5. Mulch:

- Once backfilling has been completed it is important to add a layer of 4 inches of mulch. It is important that this mulch does not go directly against the tree collar as this can lead to “collar rot” which could compromise the health of the plant. The mulch should reach the base of the tree trunk. *(See image B, on page 5)*

6. Prune and Stake:

- It is important to take this time after the tree/shrub is planted to remove any dead or damaged limbs. Staking should only take place if the area is susceptible to high winds or vandalism.

7. Water:

- Water is a necessity after planting, and is important to the health of the plant. Be sure to thoroughly soak the ground over the root ball and the surrounding area immediately after planting. Be sure to water each day for the first week, and less so as time goes on. In the event of dry weather it is important to water new plants to ensure that they take well to the new planting environment.

Image A:

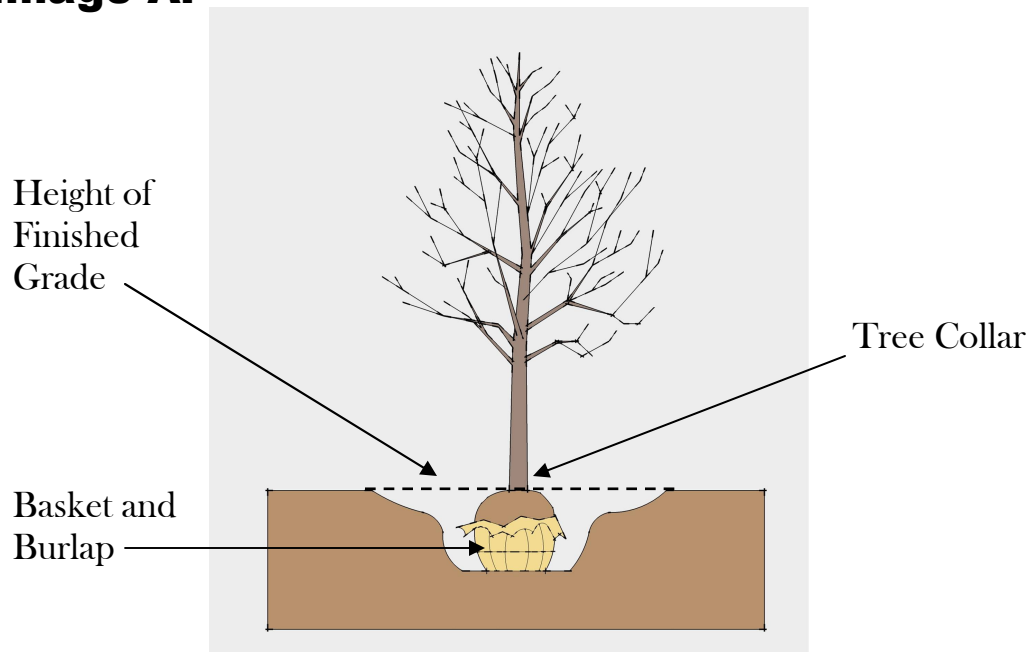
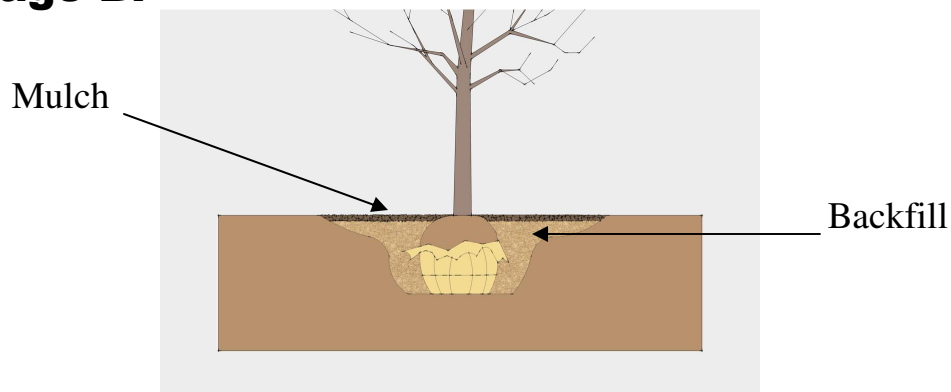


Image B:



Maintenance Standards:

The UDO outlines “Requirements for Maintaining Planted Areas” in section 3.4.11 C. The language that follows has been taken directly from this section.

3.4.11

C. Requirements for Maintaining Planted Areas

1. Responsibility

The responsibility for maintenance of a planted area shall remain with the owner, his or her successors, heirs, assignees or any consenting grantee. Maintenance is required in order to ensure the proper functioning of a planted area.

2. Maintenance

- (a) All plantings shall be maintained in an attractive and healthy condition. Maintenance shall include, but not be limited to, watering, mulching, fertilizing and pest management, mowing, weeding, removal of litter and dead plant material, and necessary pruning and trimming.
- (b) Necessary pruning and trimming shall be in accordance with the American National Standards for Tree Care Operations: Tree Shrub and Other Woody Plant Maintenance – Standards Practices (Pruning), and shall not be interpreted to include topping of trees through removal of crown material or the central leader, or any other similarly severe procedures such as “lollipopping” or “meatballing” that cause irreparable harm to the natural form of the tree, except where such procedures are necessary to maintain public overhead utilities. Any such activity shall be a violation of this UDO. Additional plant material shall be required to replace or supplement the damaged plant material.
- (c) Dead or diseased plantings shall be removed. Replacement plantings shall be provided for any required plants which die or are removed for any reason and shall meet all minimum standards and conform to these regulations.
- (d) Natural water courses shall be maintained in natural condition.
- (e) Landscape structural features such as walls, fences, berms or water features shall be maintained in a structurally safe and attractive condition
- (f) Where other uses, including pedestrian, bike or other trails, these uses shall be maintained to provide for their safe use.

3. Failure to Maintain

In the event that any owner of a planted area fails to maintain the planted area according to the standards of this section, the County shall have the right to recover the cost of enforcement, including reasonable attorney fees.

Explanation of Tree Matrix:

Lincoln County has prepared a list of required tree species to be used when landscaping sites within Lincoln County. The list of trees has been laid out in a matrix for ease of use, and identifying certain perimeters for tree species. The following categories can be found within the matrix, with accompanying description.

Common Name/Latin Name: The first category in the matrix lists the common name and Latin name of each species in the matrix. The tree species are further categorized by: Large Maturing (Deciduous), Large Maturing (Evergreen), Small Maturing (Deciduous Flowering), Small Maturing (Deciduous Non-Flowering), Small Maturing (Evergreen).

Height at Maturity: This is the average height that each tree species will obtain under normal growing conditions.

Spread at Maturity: This is the average spread that each tree species will obtain under normal growing conditions.

Recommended for Screening: A basic recommendation to use these specific species for screening due to characteristics that lend themselves well as specimens for buffers and screens. This is not a mandatory list to be used strictly for buffers or screens, as Lincoln County respects the decision of local experts as to what trees from the list they would like to use when planting buffers or screens.

Drought Tolerance: Drought has been an issue of concern in North Carolina and Southeast as a whole with the advent severe droughts. The drought category displays each species susceptibility to drought with a rating of High, Moderate or Low tolerance to drought.

Permitted as a Street Tree: This category was included to display whether the species is recommended by the North Carolina Department of Transportation (NCDOT) for planting as a street tree. More information on the regulations of street trees as dictated by NCDOT can be obtained from “Guidelines for Planting within Highway Right-of-Way” located at:
http://www.ncdot.org/doh/operations/dp_chief_eng/roadside/design/plantGuidelines/

Native to North Carolina: Species that are native to North Carolina are denoted in this category. The use of native species is encouraged by Lincoln County, although it is not mandatory.

Notes: Specific Information on each species relating to planting culture, pests and/or disease susceptibility, showy nature and other factors are contained within the notes.

Required Tree Matrix/Planting List:							
Common Name, Latin Name	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Canopy Trees (Deciduous)							
Red Maple, <i>Acer rubrum</i>	40' - 60'	25' - 35'	x	M	x	x	Can be susceptible to breakage. Is susceptible to some pest and disease infestation.
Sugar Maple, <i>Acer saccharinum</i>	50' - 75'	30' - 40'		H	x	x	Tree is useful in wet areas. Aggressive roots can impede septic systems. Difficult to plant shrubs under due to root structure.
Florida Maple, <i>Acer barbatum</i>	50' - 60'	25' - 40'	x	H		x	Strong limbs, wind tolerant. Works in a variety of soil types. Can be susceptible to wilt disease. Fairly pest resistant.
Norway Maple, <i>Acer platanoides</i>	40' - 60'	35' - 40'	x	H			Can be successful in urban areas with air pollution, poor drainage, compacted soils and drought. Susceptible to some pests.
Silver Maple, <i>Acer saccharinum</i>	60' - 80'	40' - 60'		H		x	Numerous pest and disease problems. Can grow well in wet areas and dry areas. Good choice for out of the way planting locations.
River Birch, <i>Betula nigra</i>	40' - 70'	25' - 30'	x	M	x	x	Can grow well in wet areas. Pest resistant, susceptible to leaf spot. Can be useful as a specimen in screens.
American Hornbeam, <i>Carpinus caroliniana</i>	20' - 30'	15' - 20'	x	M		x	Tree has outstanding ornamental features. Typically pest and disease resistant. Can deal with some wet soils.
Pecan, <i>Carya illinoensis</i>	60' - 100'	30' - 40'		H			Can be susceptible to breakage. Used mainly as a fruit tree. Can be planted in wet areas. Very sensitive to pest or disease.
Common Hackberry, <i>Celtis occidentalis</i>	40' - 55'	35' - 50'	x	H		x	Can be susceptible to breakage. Roots can interfere with sidewalks. Can grow in wet areas. Pest resistant. Some affects by disease.
American Beech, <i>Fagus grandifolia</i>	60' - 120'	40' - 60'		M		x	Roots can interfere with sidewalks. Pest and disease resistant.
White Ash, <i>Fraxinus americana</i>	60' - 80'	50' - 70'	x	M		x	Can grow in wet areas. Is susceptible to breakage. Very susceptible to one or more pests or diseases.
Green Ash, <i>Fraxinus pennsylvanica</i>	50' - 80'	50' - 70'	x	H	x	x	Can grow in wet areas. Susceptible to breakage. Very sensitive to one or more pests or diseases.
Ginkgo, <i>Ginkgo biloba</i>	40' - 70'	20' - 40'		H			Pest and disease free/resistant. Tolerant of urban soils and pollution.
Sweet Gum, <i>Liquidambar styraciflua</i>	60' - 100'	50' - 75'		M	x	x	Can grow in wet areas. Long term health usually not affected by pests. Can be affected by leaf spots and canker diseases.
Tulip Poplar, <i>Liriodendron tulipifera</i>	60' - 150'	30' - 40'		M	x	x	A large tree that generally needs space to grow. Can be affected by pests such as aphids. Diseases include leaf spot and cankers
Black Gum, <i>Nyssa sylvatica</i>	40' - 60'	20' - 30'	x	H	x	x	Can grow in wet areas. Pests include scales and tent caterpillars. Diseases like fungi and leaf spot can affect the tree.
London Plane-Tree, <i>Platanus x acerifolia</i>	70' - 100'	50' - 70'	x	H	x		Can grow in wet areas. Pests such as aphids can affect the tree. Diseases include leaf spot, anthracnose and canker stain.
Sycamore, <i>Platanus occidentalis</i>	70' - 100'	60' - 80'		H	x	x	Can grow in wet areas. Urban condition tolerant. Pests such as aphids & sycamore lace bugs affect tree. Several diseases effect tree.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Canopy Trees (Deciduous)							
Sawtooth Oak, <i>Quercus acutissima</i>	35' - 45'	35' - 50'	x	H	x		Outstanding ornamental features. Usually pest free. No diseases are of major concern.
White Oak, <i>Quercus alba</i>	60' - 100'	50' - 90'		M	x	x	Attracts squirrels and other mammals. No pests or diseases are normally serious.
Scarlet Oak, <i>Quercus coccinea</i>	60' - 80'	40' - 50'	x	M	x	x	Long-term health is usually not affected by pests. Besides oak wilt, the tree has few serious diseases.
Southern Red Oak, <i>Quercus falcata</i>	70' - 80'	60' - 70'		H	x	x	Attracts squirrels and other mammals. Long term health usually not affected by pests or diseases.
Laurel Oak, <i>Quercus laurifolia</i>	60' - 80'	35' - 45'	x	M		x	Grows in wet areas. Susceptible to breakage. Long-term health usually not affected by pests.
Water Oak, <i>Quercus nigra</i>	50' - 75'	30' - 40'	x	H		x	Grows in wet areas. Susceptible to breakage. Pests and disease are not usually a problem.
Pin Oak, <i>Quercus palustris</i>	60' - 80'	40' - 50'	x	M	x	x	Grows in wet areas. Susceptible to breakage. Pests are normally not a problem. Diseases can be present, especially in wet weather.
Willow Oak, <i>Quercus phellos</i>	60' - 80'	30' - 40'	x	H	x	x	Grows in wet areas. Handles urban conditions well. Pests and diseases are not usually serious.
Eastern Red Oak, <i>Quercus rubra</i>	50' - 70'	40' - 60'		L		x	Grows in wet areas. Provides habitat for squirrels and other mammals.
Shumard Oak, <i>Quercus shumardii</i>	40' - 80'	40' - 50'	x	H		x	Can handle the stress of urban environments. Pests and disease are usually not an issue.
Black Oak, <i>Quercus velutina</i>	60' - 80'	30' - 60'		M		x	Can be susceptible to breakage. Pests and disease can cause some problems, but in most cases they are not serious.
Japanese Pagoda Tree, <i>Sophora japonica</i>	50' - 70'	40' - 70'	x	H	x		Can be susceptible to breakage. Long-term health usually not affected by pests. Generally disease free.
Bald Cypress, <i>Taxodium distichum</i>	50' - 100'	20' - 30'	x	H	x	x	Grows in wet areas. Pests are usually not an issue. Diseases are not prevalent, but can be damaging during times of stress.
Lacebark Elm, <i>Ulmus parvifolia</i>	40' - 50'	35' - 50'	x	H			Outstanding ornamental features. Long-term health usually not affected by pests. Resilient to Dutch elm disease.
Japanese Zelkova, <i>Zelkova serrata</i>	55' - 80'	50' - 75'	x	H	x		Susceptible to breakage. Has proven successful in urban areas. Usually not affected by pests/disease.
Pignut Hickory, <i>Carya glabra</i>	50' - 65'	30' - 40'		H		x	Attracts squirrels and other mammals. Long-term health usually not affected by pests/diseases.
Southern Catalpa, <i>Catalpa bignonioides</i>	40' - 60'	20' - 40'	x	M			Thick foliage makes great screening. Provide good wildlife habitat. Usually not affected by pests/diseases.
Common Persimmon, <i>Diospyros virginiana</i>	40' - 60'	20' - 35'	x	H		x	Can grow in wet areas. Has been successfully grown in wet areas. No serious pests. Leaf spot disease can be troublesome.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Canopy Trees (Deciduous)							
Honey Locust , <i>Gleditsia triacanthos var. inermis</i>	50' - 75'	35' - 50'	x	H			Grows well in urban environments. Roots can lift sidewalks/interfere with mowing. Pests/diseases usually not a threat.
Empress Tree , <i>Paulownia tomentosa</i>	40' - 50'	40' - 50'		M			Susceptible to breakage. Not usually threatened by pests and disease.
Chinese Pistache , <i>Pistacia chinensis</i>	25' - 35'	25' - 35'	x	H	x		Proven to grow well in urban environments. No pests are of major concern. Occasionally affected by verticillium wilts/oak root fungus.
Lombardy Poplar , <i>Populus nigra 'Italica'</i>	40' - 50'	10' - 12'	x	H			Susceptible to breakage. Unique tree that grows tall with little spread. Very sensitive to one or more pests/diseases.
American Linden , <i>Tilia americana</i>	50' - 80'	35' - 50'	x	M		x	Susceptible to breakage. Long-term health usually not affected by pests. Affected by some diseases, rarely seriously.
Littleleaf Linden , <i>Tilia cordata</i>	40' - 60'	40' - 50'	x	M			Has been grown successfully in urban settings. No diseases or pests are usually a problem.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Canopy Trees (Evergreen)							
Deodar Cedar, <i>Cedrus deodara</i>	40' - 50'	30' - 40'	x	H			Outstanding ornamental features. Works well as a screen or buffer tree. No pests/diseases are of major concern.
Leyland Cypress, <i>Cupressocyparis leylandii</i>	60' - 70'	12' - 17'	x	H			Works well as screen or buffer tree. Is affected by bagworm "pest". Canker disease can affect foliage following a drought.
Eastern Red Cedar, <i>Juniperus virginiana</i>	40' - 50'	8' - 20'	x	H	x	x	Susceptible to breakage. Pests are usually not a problem. Do not plant near hawthorns, apples or crabapples due to disease issues.
Southern Magnolia, <i>Magnolia grandiflora</i>	40' - 60'	25' - 30'	x	M	x	x	Grows in wet areas. Flowers are particularly showy. Pests/diseases are usually not detrimental to long-term health.
Austrian Pine, <i>Pinus nigra</i>	50' - 60'	15' - 30'	x	H			Has proven successful in urban environments. Works well as a buffer/screen tree. Is susceptible to one or more pests/diseases.
Loblolly Pine, <i>Pinus taeda</i>	70' - 90'	30' - 40'		M	x	x	Works well at screening at a young age; however lower branches fall off as it matures. Susceptible to breakage. Pest/disease tolerant.
Japanese Black Pine, <i>Pinus thunbergiana</i>	50' - 70'	25' - 35'	x	H	x		Good choice for screening. Very sensitive to one or more pests/diseases, although none are usually serious.
Virginia Pine, <i>Pinus virginiana</i>	15' - 40'	20' - 35'		H	x	x	Can be used for partial screening due to irregular branching. No pests/diseases are usually serious.
Longleaf Pine, <i>Pinus palustris</i>	60' - 80'	30' - 40'		H		x	Susceptible to breakage. Good use as a shade tree. No pests/diseases are usually serious.
Eastern White Pine, <i>Pinus strobus</i>	50' - 80'	25' - 30'		M	x	x	Susceptible to breakage. Good use as a partial shade tree. Sensitive to one or more pests/diseases.
Scotch Pine, <i>Pinus sylvestris</i>	40' - 50'	25' - 30'		H			Susceptible to breakage. Good use as a partial shade tree. Sensitive to one or more pests/diseases.
Live Oak, <i>Quercus virginiana</i>	30' - 50'	30' - 50'		H	x	x	Proven tolerant to urban conditions. Can work as a screen/buffer tree if given enough room. Pests/diseases usually not a problem in NC.
Canadian Hemlock, <i>Tsuga canadensis</i>	30' - 80'	15' - 30'	x	M	x		Would work well as a screen/buffer tree. Is usually pest/disease free in NC.
Japanese Cryptomeria, <i>Cryptomeria japonica</i>	40' - 60'	15' - 20'	x	H	x		Very good screen/buffer tree. Sensitive to one or more pests/diseases.
China Fir, <i>Cunninghamia lanceolata</i>	50' - 75'	15' - 30'	x	H			Outstanding ornamental features. Very good screen/buffer tree. No pests/diseases are usually a problem.
Sweet Bay, <i>Magnolia virginiana</i>	40' - 50'	15' - 25'	x	M		x	Very showy spring/summer flowers. Pests/diseases usually not a problem.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Understory Trees (Deciduous Flowering)							
Serviceberry, <i>Amelanchier arborea</i>	20' - 35'	15' - 20'		M	x	x	Could be used in conjunction with other trees for screening. Pests/diseases usually don't affect long-term health.
Eastern Redbud, <i>Cercis Canadensis</i>	20' - 30'	12' - 25'		H	x	x	Could be used in conjunction with other trees for screening. Shouldn't be used in quantities due to pest/disease problems.
Flowering Dogwood, <i>Cornus florida</i>	15' - 30'	15' - 20'		M	x	x	Could be used in conjunction with other trees for screening. Sensitive to one or more pest/diseases.
Kousa Dogwood, <i>Cornus kousa</i>	15' - 20'	15' - 20'		M			Could be used in conjunction with other trees for screening. Long-term health not usually affected by pests/diseases.
Washington Hawthorne, <i>Crataegus phaenopyrum</i>	25' - 30'	20' - 25'	x	H		x	Susceptible to breakage. Sensitive to one or more pests/diseases.
Carolina Silverbell, <i>Halesia Carolina</i>	25' - 40'	15' - 30'	x	M	x		With multiple leader trunks it can be used well for screening. A single leader will allow use as a street tree. Pest/disease tolerant.
Mountain Silverbell, <i>Halesia monticola</i>	40' - 60'	20' - 30'	x	M		x	Can be used well as a screen/buffer tree in areas where it can receive partial sun. No pests/diseases are usually a threat.
Golden Raintree, <i>Koelreuteria paniculata</i>	20' - 30'	15' - 20'	x	H	x		Can grow in wet areas. Pests/diseases don't usually affect long-term health.
Crape Myrtle, <i>Lagerstroemia indica</i>	15' - 25'	5' - 15'	x	H	x		With multiple leader trunks it can be used well for screening. A single leader will allow use as a street tree. Pest/disease resilient.
Saucer Magnolia, <i>Magnolia x soulangiana</i>	15' - 25'	15' - 25'	x	M	x		Outstanding ornamental features. Long-term health usually not affected by pests.
Southern Crab Apple, <i>Malus angustifolia</i>	15' - 25'	10' - 20'	x	M	x	x	Outstanding ornamental features. Pests/disease don't usually affect long-term health.
Purpleleaf Plum, <i>Prunus cerasifera "Pissardii"</i>	15' - 30'		x	M	x		Outstanding ornamental features.
Kwanzan Cherry, <i>Prunus serrulata kwanzan</i>	20' - 25'	15' - 25'	x	M	x		Works well as a street tree when trimmed appropriately. Sensitive to one or more pests/diseases.
Yoshino Cherry, <i>Prunus yedoensis</i>	20' - 40'	20' - 30'	x	M	x		Outstanding ornamental features. Sensitive to one or more pests/diseases.
Callery Pear, <i>Pyrus calleryana</i>	30' - 40'	30' - 40'	x	H			Has proven to tolerate urban environments. Susceptible to breakage. Long-term health usually not affected by pests/diseases.
Pomegranate, <i>Punica granatum</i>	20' - 30'		x	H			Long-term health usually not affected by pests/diseases. Pests can infest the fruit of this tree, ruining an entire crop.
European Mountain Ash, <i>Sorbus aucuparia</i>	25' - 30'	15' - 25'	x	M			Susceptible to breakage. Sensitive to one or more pests/diseases.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Understory Trees (Deciduous Flowering)							
Russian Olive, <i>Elaeagnus angustifolia</i>	15' - 20'	15' - 20'	x	H			Color of foliage makes it unique in a landscape setting. Susceptible to pests/diseases; suggested to use sparingly.
Mimosa, <i>Albizia julibrissin</i>	15' - 25'	25' - 35'	x	H			Works well for screening in combination with shrubs. Sensitive to one or more pests/diseases.
Sourwood, <i>Oxydendrum arboreum</i>	40' - 60'	25' - 30'	x	M	x	x	Long-term health usually not affected by pests/diseases.
Peach, <i>Prunus persica</i>	15' - 25'	15' - 25'	x	M			Susceptible to one or more pests/diseases.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Understory Trees (Deciduous Non-Flowering)							
Trident Maple , <i>Acer buergeranum</i>	25' - 30'	20' - 30'	x	M			Has proven successful in urban environments. No pests/diseases are of major concern.
Hedge Maple , <i>Acer campestre</i>	15' - 35'	30' - 35'	x	H			Has proven successful in urban environments. Pests/diseases usually don't affect the long-term health.
Amur Maple , <i>Acer ginnala</i>	15' - 20'	18' - 20'	x	M			Low growing tree works well for screening. Long-term health usually not affected by pests/diseases.
Japanese Maple , <i>Acer palmatum</i>	15' - 25'	15' - 25'	x	M			Outstanding ornamental features. Works well for screening. Long-term health usually not affected by pests/diseases.
European Hornbeam , <i>Carpinus betulus</i>	40' - 60'	35' - 40'	x	H			Outstanding ornamental features. Low branching form makes a good screen. Pests/diseases usually don't affect health.
Chinese Elm , <i>Ulmus parvifolia</i>	30' - 40'	25' - 30'	x	H			Works well as screening or street tree. Resilient to Dutch Elm Disease, and pests don't usually cause long-term problems.
Weeping Willow , <i>Salix x sepulcralis</i>	45' - 70'	45' - 70'	x	H			Grows in wet areas. Roots can cause damage to underground utilities/septic tanks. Long-term health usually not affected by pest/disease
European White Birch , <i>Betula pendula</i>	40' - 50'	15' - 25'	x	M			Outstanding ornamental features. Sensitive to one or more pests/diseases.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Recommended for Screening	Drought Tolerance	Permitted as a Street Tree	Native to North Carolina	Notes:
Understory Trees (Evergreen)							
Foster Holly, <i>Ilex attenuata</i> "Foster"	20' - 30'	7' - 10'	x	H			Grows in wet areas. Outstanding ornamental features. Long-term health usually not affected by pests/diseases.
Savannah Holly, <i>Ilex attenuata</i> "Savannah"	20' - 30'	8' - 15'	x	H			Long-term health usually not affected by pests/diseases.
Nellie Stevens Holly, <i>Ilex</i> "Nellie R. Stevens"	15' - 25'	10' - 15'	x	H			Grows in wet areas. Successful in urban environments. No pests or diseases are of major concern.
American Holly, <i>Ilex opaca</i>	15' - 30'	10' - 20'	x	H		x	Grows in wet areas. Successful in urban environments. Long-term health usually not affected by pests/diseases.
Carolina Cherry Laurel, <i>Prunus caroliniana</i>	20' - 30'	15' - 20'	x	H		x	Proven successful in urban environments. Long-term health usually not affected by pests/diseases.

Explanation of Shrub Matrix:

Lincoln County has prepared a list of recommended shrub species to be used when landscaping sites within Lincoln County. The list of shrubs has been laid out in a matrix for ease of use, and identifying certain perimeters for shrub species. The following categories can be found within the matrix, with accompanying description. This list is recommended, and Lincoln County recognizes that species not found on the list can be used in landscape applications as determined by local experts.

Common Name/Latin Name: The first category in the matrix lists the common name and latin name of each species in the matrix. The shrub species are further categorized by: Evergreen (4-6ft), Deciduous (4-6ft), Evergreen (6ft or greater), Deciduous (6ft or greater).

Height at Maturity: This is the average height that each shrub species will obtain under normal growing conditions.

Spread at Maturity: This is the average spread that each shrub species will obtain under normal growing conditions.

Native to North Carolina: Species that are native to North Carolina are denoted in this category. The use of native species is encouraged by Lincoln County, although it is not mandatory.

Notes: Specific Information on each species relating to planting culture, pests and/or disease susceptibility, showy nature and other factors are contained within the notes.

Recommended Shrub Matrix/Planting List:				
Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Native to North Carolina	Notes:
Evergreen (4-6ft)				
Glossy Abelia, <i>Abelia grandiflora</i>	4'-6'	3'-5'		No pests/diseases are of major concern.
Glen Dale Azalea, <i>Azalea hybrida</i>	4'-6'	3'-4'		Showy flowers in Spring. Low maintenance. Susceptible to one or more pests/diseases.
Kaempferi Azalea, <i>Azalea kaempferi</i>	4'-6'	4'-6'		Heat tolerant. Low maintenance. Susceptible to one or more pests/diseases.
Wintergreen Barberry, <i>Berberis julianae</i>	4'-6'	2'-5'		Needs water regularly. Plant is attractive to bees, butterflies and/or birds. Plant has thorns.
Spreading Euonymus, <i>Euonymus kiautschovicus</i>	4'-6'	4'-6'		Good for mass planting. Not as susceptible to scale disease as other members of the genus.
Dwarf Burford Holly, <i>Ilex cornuta "Burfordii Nana"</i>	4'-6'	4'-6'		Long-term health usually not affected by pests/diseases.
Convexa Japanese Holly, <i>Ilex crenata "convexa"</i>	4'-6'	3'-5'		No diseases are of concern. Several pests can cause issues, although none are serious.
Hetzi Japanese Holly, <i>Ilex crenata "Hetzii"</i>	4'-6'	5'-7'		Very similar to boxwood in appearance. Not drought tolerant.
Roundleaf Japanese Holly, <i>Ilex crenata "Rotundifolia"</i>	4'-6'	4'-6'		Works well as a rounded screening plant. Prone to leaf scorch and mites if located in hot, dry sites.
Dwarf Horned Holly, <i>Ilex cornuta 'Rotunda'</i>	2'-4'	3'-4'		Prefers moist, well-drained soils, but can tolerate a variety of soil types.
Little Leaf Japanese Holly, <i>Ilex crenata "Microphylla"</i>	4'-6'	3'-4'		Resembles boxwood, although growth habit is lower and more spreading. Will not tolerate drought.
Pfitzer Juniper, <i>Juniperus Chinese "Pfitzeriana"</i>	5'-7'	8'-10'		Needs water regularly. Provides some winter interest.
Leatherleaf Mahonia, <i>Mahonia bealei</i>	5'-6'	3'-4'		No pests or diseases are of major concern.
Nandina, <i>Nandina domestica</i>	4'-6'	2'-3'		Showy foliage resembles bamboo. Can be invasive.
Japanese Andromeda, <i>Pieris japonica</i>	4'-6'	4'-6'		Can be tolerant of wet soils. Have some pest issues.
Narrow Leaved English Laurel, <i>Prunus laurocerasus angustifolia</i>	4'-6'	5'-6'		Relatively pest free.
Yeddo Hawthorn, <i>Raphiolepis umbellata</i>	4'-6'	4'-6'		Drought tolerant. Dense foliage.
Indian Hawthorn, <i>Raphiolepis indica</i>	3'-5'	3'-4'		Drought tolerant once established. Excellent for use as a low border/hedge.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Native to North Carolina	Notes:
Evergreen (4-6ft)				
Drooping Leucothoe , <i>Leucothoe fontanesiana</i>	3'-6'	3'-6'	x	Best in partial shade. Prefers moist soils. Pests usually not a problem.
Hybrid Rhododendron , <i>Rhododendron hybrida</i>	4'-6'	3'-5'		Low maintenance. Tolerates heat.
Japanese Yew , <i>Taxus cuspidata</i>	4'-6'	5'-7'		Pollution tolerant. No serious insect problems.
Leatherleaf Viburnum , <i>Viburnum rhytidophyllum</i>	4'-6'	4'-6'		Few insect or serious disease problems.
Sandankwa Viburnum , <i>Viburnum suspensum</i>	4'-6'	4'-6'		Works well as a screening shrub. Pest free and low maintenance.
Judd Viburnum , <i>Viburnum x juddii</i>	3'-4'	3'-5'		Low maintenance shrub. Tolerates heat and humidity.
Deciduous (4-6ft)				
Mentor Barberry , <i>Berberis mentorensis</i>	4'-6'	5'-7'		Pests/diseases are not a problem.
Flowering Quince , <i>Chaenomeles speciosa</i>	5'-6'	5'-6'		Very dense growth. Tolerant of dry soils. Works well in mass plantings. Scale, mites and aphids can be problematic.
Oakleaf Hydrangea , <i>Hydrangea quercifolia</i>	4'-6'	3'-5'		Does not tolerate wet areas. Can tolerate drought conditions once established. Very showy.
Reeves Spirea , <i>Spiraea cantoniensis</i>	4'-6'	3'-5'		Pleasant spring flowers and fragrance. Pests/diseases are not an issue.
Japanese Barberry , <i>Berberis thunbergii</i>	3'-6'	4'-8'		Withstands drought well. Proven successful in urban conditions. Generally trouble free.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Native to North Carolina	Notes:
Evergreen (6ft or greater)				
Indian Azalea, <i>Azalea indica</i>	6' - 12'	6' - 8'		Does not tolerate drought well. Used often in NC.
Camellia, <i>Camellia japonica</i>	7' - 12'	5' - 7'		Outstanding ornamental quality. Pests/diseases are not of major concern.
Cleyera, <i>Cleyera japonica</i>	8' - 10'	5' - 6'		Does not tolerate drought. Showy, billowing shrub.
Franchet Cotoneaster, <i>Cotoneaster franchetii</i>	6' - 10'	6' - 8'		Needs water regularly. Showy shrub.
Thorny Elaeagnus, <i>Elaeagnus pungens</i>	8' - 11'	6' - 10'		Can be an invasive spreading plant. Pests/diseases are not of major concern.
Evergreen Euonymus, <i>Euonymus japonica</i>	6' - 7'	3' - 5'		Susceptible to one or more pests/diseases.
English Holly, <i>Ilex aquifolium</i>	8' - 12'	7' - 12'		Will not tolerate wet sites. Use in protected locations.
Burford Holly, <i>Ilex cornuta</i> "Burfordii"	8' - 15'	6' - 8'		Grows in wet areas. Tea Scale can be a severe pest infestation. No diseases are of major concern.
Japanese Holly, <i>Ilex crenata</i>	10' - 12'	3' - 5'		No diseases are of major concern. Pest problems can be many, but are often minor in consequence.
Inkberry Holly, <i>Ilex glabra</i>	6' - 9'	4' - 7'	x	Can be used in wet locations. Does not tolerate drought. Susceptible to leaf spot disease.
Lusterleaf Holly, <i>Ilex latifolia</i>	8' - 12'	7' - 11'		Has a high drought tolerance. Pests/diseases are usually not an issue.
Little Red Holly, <i>Ilex</i> "Little Red"	10'	6'		Should be planted in an area that is protected from wind. Works well as a foundation planting.
Perny Holly, <i>Ilex pernyi</i>	9' - 12'	4' - 6'		Showy foliage and berries. Diseases are rare. Pests can cause problems.
Yaupon Holly, <i>Ilex vomitoria</i>	5' - 15'	6' - 12'		Can grow in wet areas. Has proven successful in urban environments. Pests/diseases are normally of little concern.
Dahoon Holly, <i>Ilex cassine</i>	20' - 30'	8' - 12'		Can grow in wet areas. Has proven successful in urban environments. No pests/diseases are of major concern.
Hetzi Juniper, <i>Juniperus chinensis</i>	10' - 12'	10' - 12'		Long-term health usually not affected by pests/diseases.
Hollywood Juniper, <i>Juniperus chinensis</i> "Kaizuka"	10' - 12'	6' - 8'		Does not grow well in wet soils. Great screening shrub.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Native to North Carolina	Notes:
Evergreen (6ft or greater)				
Laurel, <i>Laurus nobilis</i>	10' - 12'	8' - 10'		Grows well with abundant watering. Works well as a screening plant.
Japanese Privet, <i>Ligustrum japonicum</i>	6' - 10'	5' -6'		Requires pruning to develop strong structure. Long-term health usually not affected by pests/diseases.
Tall Glossy Privet, <i>Ligustrum lucidum</i>	8' - 12'	5' - 10'		Requires pruning to develop strong structure. Long-term health usually not affected by pests/diseases.
Loropetalum, <i>Loropetalum Chinensis</i>	6' - 10'	8' -9'		Plant has outstanding ornamental features. No serious pests/diseases affect this plant.
Wax-Myrtle, <i>Myrica cerifera</i>	10' - 12'	8' - 10'		Can be used as a street tree when lower branches are removed to form a canopy. Pests/diseases are usually not a problem.
Fortune Tea Olive, <i>Osmanthus fortunei</i>	9' - 12'	5' -7'		Needs pruning to develop a strong structure. Pests/diseases usually don't affect the long-term health of the tree.
Fragrant Tea Olive, <i>Osmanthus fragrans</i>	9' - 12'	5' -7'		No pests/diseases are of major concern.
Holly Osmanthus, <i>Osmanthus heterophyllus</i>	6' - 10'	3' -5'		Long-term health usually not affected by pests/diseases.
Chinese Photinia, <i>Photinia serrulata</i>	7' - 12'	5' - 12'		Outstanding ornamental features. Proven successful in urban environments. Leaf spot disease can be devastating.
Red Photinia, <i>Photinia x fraseri</i>	12' - 18'	8' - 12'		Requires pruning to maintain a strong structure. Sensitive to one or more pests/diseases.
English Laurel, <i>Prunus laurocerasus</i>	10' - 12'	8' - 11'		Does not tolerate drought well. Usually pest/disease free.
Oriental Arborvitae, <i>Thuja orientalis</i>	10' - 12'	8' - 10'		Does not do well in wet sites. Avoid planting where it will be susceptible to harsh winter winds.
Laurestinus Viburnum, <i>Viburnum tinus</i>	10' - 12'	10' - 12'		Outstanding ornamental features. Pests are normally not a problem. Disease potential from mildew, leaf spot and root rot can be an issue.
Podocarpus, <i>Podocarpus macrophyllus maki</i>	8' - 10'	3' -5'		Drought tolerant once established. Low maintenance.

Common Name, <i>Latin Name</i>	Height at Maturity	Spread at Maturity	Native to North Carolina	Notes:
Deciduous (6ft or greater)				
Winged Euonymus, <i>Euonymus alatus</i>	5' -8'	3' -5'		Drought tolerant. Very urban tolerant. Can be impacted by various pests.
Border Forsythia, <i>Forsythia x intermedia</i>	8' - 10'	7' - 10'		Tolerant of urban conditions. Works well as a screening shrub.
Common Witch Hazel, <i>Hamamelis virginiana</i>	20' - 30'	15' - 25'		Requires pruning to develop a strong structure. Pests/diseases are usually not serious.
Star Magnolia, <i>Magnolia stellata</i>	10' - 12'	8' - 10'		Does not handle drought well. Very showy.
Bridalwreath Spirea, <i>Spiraea prunifolia 'Plena'</i>	5' -7'	3' -5'		Protection from midday sun is recommended. Very showy.
Vanhoutte Spirea, <i>Spiraea x vanhouttei</i>	5' -7'	4' -6'		Does not grow well in wet areas. Extremely durable.
White Fringe Tree, <i>Chionanthus virginicus L.</i>	15' - 25'	10' - 20'		Very showy. Works well in screening plantings.
Vernal Witch Hazel, <i>Hamamelis vernalis</i>	8' - 10'	6' -8'		Tolerant of dry and wet soils. Dead foliage often persists through the winter.
Winter Honeysuckle, <i>Lonicera fragrantissima</i>	5' -8'	4' -6'		Drought tolerant. Can become invasive and spread from initial plantings.
Doublefile Viburnum, <i>Viburnum plicatum</i>	8' - 10'	10' - 12'		Prefers moist soils. Pests/disease are usually not an issue.
Smoke Tree, <i>Cotinus coggygria</i>	10' - 15'	10' - 18'		Long-term health usually not affected by pests/diseases.
Pussy Willow, <i>Salix discolor</i>	20' - 25'	18' - 20'		Will grow in wet areas. Showy buds and flowers.

Disclaimer:

The information found within this document is meant for information purposes only, and in no way is a guarantee of site suitability for specific plant species. Lincoln County does not guarantee the health of any plant species used in a landscape application, and is in no way responsible for the death, poor health or maintenance of any landscape plants.

As noted in section 3.4.11 C: The responsibility for maintenance of a planted area shall remain with the owner, his or her successors, heirs, assignees or any consenting grantee.

Procedure for Use of Plant Species Not Found Within This Document:

Lincoln County recognizes that there are species that would be desirable to use in specific landscape settings that may not be found within this document. In the event that a local expert would like to use a tree species not contained within the list, the following action must be taken.

Contact with the director or his/her designee must be made, and significant reason for the use of a particular species must be established. The reasoning can be made through the use of documentation on why the particular species would work well or be necessary to the site. The director will look at the information presented, and either grant or deny permission of use of the particular species based on factual evidence.

In the event that local experts feel a certain species should be added to the tree matrix for permitted use on any site, they should follow the same actions as above. This would entail providing evidence as to the hearty nature of the species in all planting conditions within Lincoln County, common usage of the species in neighboring counties and municipalities and any other relevant information that will allow for an informed decision.

Sources:

The following sources were used in the formulation of this document:

- Union County Tree Planting Guide
- Town of Huntersville Approved Tree and Shrub List
- NCSU Small and Intermediate Trees for NC
(<http://www.ces.ncsu.edu/depts/hort/hil/hil-637.html>)
- NCSU Large Trees for NC
(<http://www.ces.ncsu.edu/depts/hort/hil/hil-638.html>)
- NCSU Go Native
(<http://www.ncsu.edu/goingnative/index.html>)
- US Forest Service Fact Sheets
- Tree Trust “Community Tree Planting Guide”
(<http://www.na.fs.fed.us/spfo/pubs/uf/treeguidehtm/intro.htm>)