

Tree Preservation and Replacement



Overview

Trees are an important natural resource that provide numerous environmental, health, and community benefits to the National Capital Region (NCR). Individual trees and forest cover provide food and habitat for wildlife, filter groundwater, stabilize soils, and reduce surface runoff and erosion that is harmful to waterways. They sequester carbon and reduce energy consumption with the shade they provide to buildings and outdoor spaces. They also provide quality settings for outdoor gatherings and recreation, reduce pollutants, and improve air quality. Overall, the benefits of trees highlight the need to protect and restore tree canopy affected by development.

Development in the NCR is often necessary to further the missions of federal government agencies. The National Capital Planning Commission's Tree Preservation and Replacement Policy (Policy) establishes procedures that the federal government should follow to prevent and mitigate tree canopy loss due to development. The Policy prioritizes tree preservation and offers alternatives to mitigate tree canopy loss if preservation is not possible. Since development occurs on land in Washington D.C. and the environs in Maryland and Virginia, the Policy incorporates the strengths of tree preservation and replacement practices of multiple jurisdictions in the NCR, resulting in a progressive, consistent approach to preserving and replacing individual trees and forests on federal land throughout the region.

This guide is intended to summarize the tree preservation and replacement policies in the Federal Environment Element of the Comprehensive Plan for development project applicants and also serve as a reference for NCPC staff in review of federal development plans that will affect existing tree canopy.

Replacing Trees for Long-Term Success

As described above, trees are a valuable resource for a variety of reasons. In many cases, especially on federal land in the National Capital Region, development seeks multiple alternatives to plan and design around existing trees so that as few trees as possible are disturbed. Yet in some cases, the only way to produce a viable project is to eliminate the trees on the parcel in question.

This resource guide is for general information purposes, and is not a regulatory document.

The planning and design process implements tree removal mitigation methods that are driven by the policies outlined in the Comprehensive Plan. NCPC's tree preservation and replacement policies address preservation and replacement of both individual trees and forests. The method to replace individual trees is based on a formula developed by Arlington County to quantify the number of replacement trees based on the existing tree's size, species rating, and condition rating. For forests, the replacement method is a ratio based on the number of acres removed.

In regard to replanting, the size of the new tree is based on its type (e.g.; shade, evergreen, ornamental, etc.). The Comprehensive Plan policies recommend a minimum caliper size of 2.5 inches for new shade trees, 1.5 inches for ornamental trees, and a minimum six-foot height for evergreen and multi-stem trees. While trees of this size are easier to transplant, the ease of transport is not the main reason to plant smaller trees. They also will acclimate to the new site sooner than a larger tree would and will generally be healthier over their lifetime.



In addition, the nursery industry typically grows trees to be sold in certain size intervals. For trees more than seven-feet in height at the time of planting (such as shade trees), the most common sizes found in nurseries are 1 to 2.5-inch caliper, 3 to 4-inch caliper, and 4 to 6-inch caliper. Once the trees reach these sizes, their roots are balled and burlapped so the tree is ready to be transported to the development site for planting. A tree over a 6-inch caliper may have more difficulty reestablishing itself at a new site, resulting in additional maintenance to help the tree succeed. Sometimes even with the additional maintenance larger trees may not fully recover from the initial “shock” from being transplanted. Therefore, at the outset, planting several smaller trees on the same site where the mature tree was removed can cumulatively replace the canopy area that the mature tree was providing. The long-term result will be a net increase in the canopy area on that site as those smaller trees mature. As noted above, since these smaller trees will acclimate more easily than a large tree would, the odds of achieving this long-term benefit are increased.

This is not to say that transplanting trees larger than 6 inches is impossible. Whether the large tree is transplanted from a nursery specializing in growing large trees, another location on-site, or a location off-site, there are many factors to consider. The current and proposed location of the tree, as well as the soil conditions, available light, water, and the amount of the critical root zone that can be retained should all be considered. The critical root zone (or CRZ) is essentially a circle on the ground that corresponds to the dripline of the tree. It is usually 18 to 24-inches deep and contains the tree's most important roots for absorbing water and nutrients. Retention of the CRZ is a significant factor in the tree's establishment after it is transplanted. Another essential consideration for transplanting trees is aftercare maintenance. As discussed above, large trees have a harder time acclimating to a new site than smaller trees. Activities such as frequent watering, misting, mulching, and follow-up visits should be outlined in a maintenance manual prepared by an arborist or qualified tree care professional, and carefully followed to facilitate the tree's ability to get reestablished in a new location.



Robert Kneschke

What Does the Comprehensive Plan say about Tree Preservation and Replacement?

The federal government should:

FE.G.1 Preserve and protect existing trees, especially individual trees, stands, and forests of healthy, native or non-invasive species. Account for existing trees early in the planning and design processes when development occurs to maximize preservation and incorporate the natural landscape into the design. In addition:

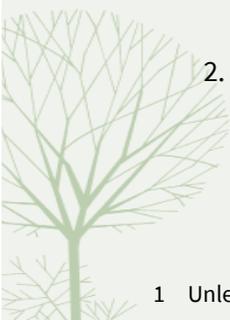
1. Trees 31.85-inches in diameter (100 inches in circumference) or greater may not be removed, unless:
 - a. Removal is critical to accomplishing the mission of the agency and planning/design alternatives that would preserve such tree(s) have been explored and determined incapable of accommodating program requirements, or
 - b. The tree(s) are considered invasive, hazardous, or high risk per an Arborist's evaluation.
2. All possible considerations should be taken to preserve and protect trees in areas determined to be critical to the health of tidal waters, tidal wetlands, and tributary streams of the Chesapeake Bay or Potomac River watersheds, and on sites with old growth forests and/or with significant ecosystems.

FE.G.2 Transplant or replace existing tree(s) when they are impacted by development and preservation is not feasible, according to the following procedures:

1. Transplant healthy, native, or non-invasive tree(s) where practicable. Consult an Arborist and consider the following factors when determining if transplanting is appropriate:
 - a. Tree species, size, and condition
 - b. Historic or cultural significance of the tree (e.g., "legacy tree or legacy vegetation" or those that contribute to historic city plans and cultural landscapes)
 - c. Current location of the tree(s) compared with the proposed location of the tree(s) (e.g., urban condition vs. open field; shade vs. sun)
 - d. Soil quality at the current and proposed locations (e.g., sandy loam vs. silty clay; availability of organic matter)
 - e. Percent of critical root area that can be retained
 - f. Maintenance of tree(s) after transplanting
2. Replace tree(s) when they require removal. Replacement tree(s) should increase biodiversity, be native species or non-invasive species ¹, and have a mature canopy spread equivalent to, or greater than, the tree(s) removed. Replacement tree(s) should be planted at a minimum caliper size of 2.5 inches for shade trees, 1.5 inches for ornamental trees, and six-foot height for multi-stem and evergreen trees.

1 Unless such specifications are inconsistent with the intent of culturally or historically significant landscapes.

Continued



Replace trees according to the following procedures:

- a. Tree(s) less than 10-inches in diameter: Replace one tree for every one tree removed (1:1)
- b. Tree(s) 10-inches in diameter or greater: Tree Diameter (in inches) x Species Rating (as percentage) x Condition Rating (as percentage) = Score

Tree(s) are replaced at the following rates, based on the Score:

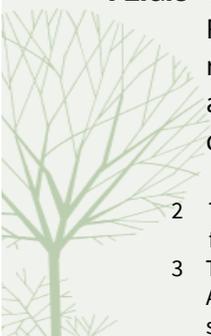
- 1 - 4.9 = one tree
- 5 - 9.9 = two trees
- 10 - 14.9 = three trees
- 15 - 19.9 = four trees
- 20 - 24.5 = five trees
- 25 + = six trees

Example: The replacement formula and score for a 25-inch diameter tree, with a Species Rating of 60% and Condition Rating of 75% is: $25 \times .60 \times .75 = 11.25$. The resulting score of 11.25 equates to three trees planted to replace the 25-inch tree.

- c. Forests and Stands of Trees: Plant 1 acre minimum for every 1 acre removed. Consult with federal and local stakeholders to determine the appropriate density, mixture, and size of replacement plantings.
3. Locate replacement or transplanted tree(s), in order of preference, on:
 - a. The project site (e.g., within or adjacent to the limits of disturbance)
 - b. The property where the project site is located
 - c. Another site within the agency's jurisdiction (authority) only if the preferred locations cannot accommodate the replacement trees without overcrowding, or
 - d. A combination of the above locations.
 4. Ensure the amount of planting soil volume is consistent with current industry best practices. Consult with federal and local stakeholders to determine the appropriate standards based on the type of tree (e.g., shade tree, ornamental, evergreen, etc.) and location (e.g., above structure, on-grade, etc.).
 5. Protect tree(s) to be preserved in accordance with the most current edition of ANSI-A300,² Part 5. Transplant, install, and maintain trees also in accordance with the most current edition of ANSI-A300, and specify replacement trees in accordance with the most current edition of ANSI-Z60.1.³

FE.G.3 Conserve tree canopy coverage and enhance the environmental quality of the National Capital Region by preserving existing trees, replacing trees where they have died, and transplanting or replacing trees where they require removal due to development. Tree preservation, transplant, and replacement should adhere to the provided herein to prevent a net loss of tree canopy in the development area.

- 2 The American National Standards Institute; ANSI-300 standards are generally accepted industry standards for tree care practices.
- 3 The American Standard for Nursery Stock as produced by American Horticulture Industry Association (formerly American Nursery & Landscape Association) accredited by the American National Standards Institute; ANSI-Z60.1 is a standardized system of sizing and describing plants to facilitate trade in nursery stock.



Legislation and NCPC Authorities

The Policy applies to master plans and projects on federal land in the National Capital Region, including commemorative works on land administered by the National Park Service and the General Services Administration.

The Policy does not apply to projects on District land or projects on land in Maryland purchased with Capper-Cramton funds. These projects should comply with the applicable policies and regulations of the local jurisdiction in which the project is located.

Some projects may have to comply with tree preservation and replacement measures included in local stormwater regulations, or they may have other existing agreements in place with the local jurisdiction regarding tree replacement. NCPC will evaluate these projects for compliance with the Comprehensive Plan's tree preservation and replacement policies on a case by case basis to ensure that the more stringent standard is met and identify opportunities to achieve the tree replacement goals in other ways if necessary.

NCPC's Submission Guidelines provide a list of four deviation criterion that applicants may use to request a deviation from the tree preservation and replacement policies. The criterion is not designed to provide an automatic pathway to circumvent NCPC's adopted policies. Rather, the criterion acknowledges conflicts that result from impractical application of the policies and provide a clear and predictable process for allowing deviations when necessary.

Key Definitions

Afforestation: The establishment of forest or planting of trees on an area that was not previously forested.

ANSI-A300: The American National Standards Institute; ANSI-300 standards are generally accepted industry standards for tree care practices.

ANSI-Z60.1: The American Standard for Nursery Stock as produced by American Horticulture Industry Association (formerly American Nursery & Landscape Association) accredited by the American National Standards Institute; ANSI-Z60.1 is a standardized system of sizing and describing plants to facilitate trade in nursery stock.

Arborist: A professional certified by the International Society of Arboriculture (ISA), or registered with the American Society for Consulting Arborists (ASCA).

Caliper: Refers to the tree trunk measurement (diameter) of nursery stock trees at 6 to 12 inches above the soil surface.

Condition Rating: A value from 0 to 100 rated in accordance with the 9th Edition of the Council of Tree and Landscape Appraisers (CTLA) Guide to Plant Appraisal. The value assigned indicates the observed condition of a tree according to factors such as wounds, decay, storm damage, or insect or disease damage.

Diameter: Refers to the diameter of a tree trunk measured at 4.5 feet above the ground. In cases where a tree is growing on ground that slopes, the measurement should be taken 4.5 ft from the ground on the upper side of the slope.

Forest: A biological community dominated by extensive tree cover and other woody plants, frequently consisting of stands of trees that are often characterized based on species, age, and size class.

Forester: A professional certified by the Society of American Foresters (SAF), or registered with the forester licensing board in the jurisdiction in which the service is provided.

Forest Stand Delineation (FSD): A plan that identifies existing forest cover and environmental features on a proposed development site. A FSD plan includes an accurate depiction of the forest species, composition, age, condition, location, acreage, and areas of natural regrowth that exist on a property.

Hazardous Tree: A tree that has a structural defect that makes it likely to fail in whole or in part.

High Risk Tree: The potential for a tree or one of its parts to fail and, in so doing, injure people or damage property.

Healthy: A tree with a condition rating of “Fair,” “Good,” or “Excellent” in accordance with the 9th Edition of the Council for Tree and Landscape Appraisal (CTLA) *Guide to Plant Appraisal*.

Invasive Species: Alien or exotic plant species whose introduction does or is likely to cause economic or environmental harm, or harm to human health.

Native Species: A plant species that occurs in a particular place without human intervention. For projects in the National Capital Region, “native” refers to plant species that are native to the Mid-Atlantic region.

Non-invasive Species: Naturally reproducing, non-native plants that do not invade areas dominated by native vegetation.

Oldgrowth Forest: As defined by the U.S. Forest Service, oldgrowth forests are ecosystems distinguished by old trees and related structural attributes that may include tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function.

Reforestation: The process of planting (or otherwise regenerating) and establishing a desired forest community on a given site.

Species Rating: A value from 1 to 100 rated in accordance with the *Mid-Atlantic Tree Species Rating Guide* published by the International Society of Arboriculture (ISA) Mid-Atlantic Chapter. The value assigned to a species is according to factors such as longevity, growth habit, durability, and appropriateness to the growing zone. Where the value offers a range (e.g.; Willow Oak 80 – 90), the average rating from the range should be used with the tree replacement formula in FE.G.2 (b).

Stand: An easily defined group of trees of sufficiently uniform species composition, age, size class, and condition and can be managed as a single unit.



Applicant Resources

American Horticulture Industry Association
<https://www.americanhort.org/>

American Society for Consulting Arborists
<https://www.asca-consultants.org/default.aspx>

Arlington County
<https://environment.arlingtonva.us/trees/support-trees/specimen-trees/tree-preservation-ordinance/>
<https://building.arlingtonva.us/resources/tree-replacement/>

Casey Trees
<https://caseytrees.org/>
<https://caseytrees.org/tree-species/>

City of Alexandria
<https://www.alexandriava.gov/hub.aspx?id=108269>

Comprehensive Plan for the National Capital – Federal Elements
<https://www.ncpc.gov/plans/compplan/>

District of Columbia
<https://ddot.dc.gov/page/tree-regulations>
<https://ddot-urban-forestry-dcgis.hub.arcgis.com>
<https://doee.dc.gov/node/1118761>
<https://doee.dc.gov/SWAP2006>
https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/GARGuidebook_FINAL_November2017_0.pdf

Environmental Protection Agency
<https://swcweb.epa.gov/stormwatercalculator/>

Fairfax County
<https://www.fairfaxcounty.gov/publicworks/trees/rules>

U.S. Fish and Wildlife Services
<https://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/endangered-species-act.html>

U.S. Fish and Wildlife Services cont.

<https://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php>

International Society of Arboriculture (ISA)

<https://www.isa-arbor.com/>

International Society of Arboriculture, Mid-Atlantic Chapter (MAC-ISA)

<https://www.mac-isa.org/>

Maryland National Capital Park and Planning Commission (M-NCPPC); Montgomery County

<https://montgomeryplanning.org/planning/environment/forest-conservation-and-trees/chapter-22a-revised-in-2018/>

Maryland National Capital Park and Planning Commission (M-NCPPC); Prince George's County

<https://www.mncppc.org/1564/Woodland-Conservation-Ordinance>

Montgomery County Department of Environmental Protection

<https://www.montgomerycountymd.gov/green/trees/laws-and-programs.html>

NCPC Submission Guidelines

<https://www.ncpc.gov/review/guidelines/>

Prince William County

<https://www.pwcgov.org/government/dept/development/ld/Documents/DCSM800.pdf>

Soil Quality and Volume Resources

<https://environment.arlingtonva.us/2015/11/soil-volume-and-urban-tree-canopy-finding-the-space-to-grow/>

<https://www.urbanforestry.frec.vt.edu/SRES/>

<https://www.urbanforestry.frec.vt.edu/SRES/documents/DayCityTrees2017.pdf>

<https://www.bartlett.com/resources/soil-density-analysis.pdf>

<https://www.bartlett.com/resources/soilforurbantreeplanting.pdf>

Tree Benefit Calculators and Tools

<http://www.treebenefits.com/calculator/>

<https://mytree.itreetools.org/#/>

<https://planting.itreetools.org/>

<https://design.itreetools.org/>

United States Department of Agriculture PLANTS Database

<https://plants.sc.egov.usda.gov/java/>

