

Ohio University Campus Tree and Landscape Care Procedures Latest Version Established October 29, 2018

The purpose of this Campus Tree and Landscape Care Procedure is to:

- 1.) Protect the campus canopy cover by ensuring that decisions involving the removal of all trees on campus are given proper consideration and to ensure tree replacement as a priority.*
- 2.) Protect campus trees by mitigating the impact of development and construction with regard to campus trees as well as to promote tree health through maintenance practices that follow the International Society of Arboriculture's best management practices.*
- 3.) Provide the Ohio University Tree Advisory Committee with the approved Ohio University Grounds Services tree care procedures on campus.*

The responsibility of enacting the Campus Tree and Landscape Care Procedures rests with Ohio University's Grounds Services, a division of Ohio University Facilities Management and Safety, with financial and supervisory support from Facilities Management and Safety.

Campus Tree Advisory Committee:

Member terms are one year in length, and have the potential for annual renewal. The committee will serve strictly as an advisory board to offer guidance and support to Ohio University Grounds Services and Facilities Management and Safety, when applicable.

Sustainable Landscape Management:

Ohio University Grounds Services strives to plant native and adaptive, drought tolerant, low maintenance plants throughout campus. Particular emphasis is placed on preservation of canopy cover to mitigate heat island effect, provide carbon sequestration, and to clean and absorb storm water. In locations where native plantings occur, signage is recommended for educational purposes. Invasive species are controlled by hand removal, mechanical removal and follow-up chemical treatment if necessary with special attention to species flowering cycles and timing of seed production.

Landscape Materials Management:

All landscape waste from Athens campus is sent to Ohio University's Class IV compost facility located on Dairy Lane. A portion of the landscape waste is turned into wood chips and utilized as a bulking agent in the Class II, in-vessel system, also located on the Athens campus. Wood chips from campus tree maintenance are also used on campus pedestrian paths, in the University's tree nursery and in secondary landscape beds. Purchased mulch is a ground hardwood bark harvested from temperate zone trees and utilized on tree bases, landscape and flower beds.

Soil Management:

Soil management is an important aspect of mature tree care. Urban landscape trees often exist in soils that lack the nutrients, proper pH (acidity or alkalinity), sufficient drainage, or pore space (air and water space) needed for growth and development of

the root system. Proper fertilization based on plant needs can correct many deficiencies that limit growth. Drainage systems or grading can help correct saturated soil conditions, although trenching or earthmoving activities within the tree's root zone is unacceptable. Compacted soils can be aerated or opened with compressed air to increase porosity and encourage root growth. Care must be taken when loosening soil in the critical root zone to avoid root damage. Avoid soil compaction by preventing vehicle, equipment and heavy pedestrian traffic on wet soils. Barriers such as posts and chain may be a tool to protect vulnerable areas.

When dealing with a mature tree that provides considerable benefit and value to the OHIO landscape, it is worth the time and investment to have the soil tested for nutrient content and texture.

Ohio University utilizes a nutrient-rich soil amendment produced at the Class II Compost Facility. This amendment is to be used on lawns, landscape and tree plantings, which reduces the need for chemical fertilizers by increasing the fertility of the soil, promoting good soil drainage and enhancing organic matter content in lawns and planting beds.

Fertilizer and Herbicides:

Trees and turf have different fertilizer and herbicide requirements. Given the close proximity of tree and turf roots, treatment of one plant can often have unintended impacts to nearby plants.

Many lawn/turf care products contain herbicides that can cause severe damage to trees. Herbicide drift on windy days and vaporization on hot days can cause damage to non-target woody plants. Thin barked trees are especially vulnerable to herbicides and use of herbicides within the mulch rings should be discouraged. Excessive fertilization of either trees or turf can result in rapid above ground growth which can translate to weak structure and a plant that is putting more energy into top growth at the expense of the root system.

Newly planted trees should not receive fertilization during the first growing season except in a situation where a soil test recommends its use. Soil amendment from the Class IV Compost Facility should be used around the tree basin. Established trees in poor condition should receive deep root fertilization. Trees can absorb supplemental nutrients from routine application of fertilizers from adjacent turf, shrubs and groundcover plantings.

Ice-Melt/Salt application:

Plant-friendly products should be applied at the lowest rate possible to achieve efficacy. Adding sand into the mix can reduce the quantity of salt-based materials required.

Mowing:

Allow turf to grow to the recommended mowing height to increase health and rooting depth and decrease irrigation, fertilization, and weed control requirements. When mowing, no more than one-third of the grass blade height should be removed. The

grass clippings should be mulched into the turf to increase the organic matter content of the soil and to recycle nutrients such as nitrogen. Mowers should never enter the mulch ring of any tree. Additionally, Grounds Managers should promote proper mowing techniques and training for all employees of Grounds Services to avoid inadvertent damage to trees and their root systems.

Watering:

Potable water should not be the main source of water utilized for landscape watering at Ohio University past the establishment phase. If large amounts of potable water are required, the appropriate Grounds Manager should alert the Office of Sustainability. The Office of Sustainability should be notified for reporting purposes, as well as to answer any inquiries from the public (student population or Athens community at large). As a policy, Grounds Services will actively pursue future non-potable water sources in order to eliminate or limit the need for potable water use in future instances.

Trees generally need the equivalent of 1 inch (2.5 cm) of rain every 7 to 10 days. Newly planted trees need to be carefully monitored and watered supplementally for several seasons. The use of Gator Bags can allow for efficient and slow watering of the root ball. Frequent, shallow watering does not meet the needs of either trees or turf, and can be harmful to both. When establishing turf, frequent watering is often required and this can be detrimental to nearby trees. Over watering turf near mature trees can promote root problems and fungal pathogens, which could lead to structural instability of the tree.

Watering turf or landscape plantings may be necessary when drought conditions impact the permanent health and/or aesthetic value of the plant. Ohio University Grounds Services will continue planting landscape and turf that, once established, are designed to thrive with minimal or no water inputs.

Tree Planting and Selection:

Tree selection will be based on site conditions with emphasis placed on native or adaptive, drought tolerant and disease resistant species. Best Management Practice guidelines covering proper ratios of species, genus and family distribution should be followed to encourage species diversity. Tree and plant selection associated with Architecture, Design and Construction projects shall be reviewed by Landscape Coordinator as plans are being developed. Landscape Coordinator or Grounds Department representative will have authority over species planted on all projects to ensure plant selection is appropriate and to prevent undesirable species from being introduced to the Ohio University campus landscape.

Tree loss can be attributed to many factors, including but not limited to: development/construction-related removal, disease, natural disaster, or natural decline. Tree replacement levels are currently set at a minimum of 1 to 1 ratio. New tree size shall be a minimum of 2" caliper and maximum of 4"-4 ½" caliper. Smaller caliper size may be acceptable when recommended size is not available; in addition, trunk protection for smaller trees such as wire mesh will be required to protect against deer antler damage.

Site Preparation and Planting Instructions:

The planting hole should be dug no deeper than the root ball when measured from the bottom of the root ball to the trunk flare. If the hole is deeper than the root ball, the plant will be set too deep possibly resulting in the formation of girdling roots and poor plant health. Width of the planting hole shall be at least 2 to 3 times the diameter of the root ball with sloping sides.

Plants shall be set with trunk flare 1"-2" above the existing grade. Once the plant is properly placed, all visible ropes and burlap at the top one-third should be cut away. The top 8"-16" of the wire basket should be removed once the root ball is stable in the planting hole; backfill the planting hole with the existing soil. If the existing soil is of a poor quality, addition of soil amendment as recommended by the soil analysis should be used. The backfill soil should be tamped firm enough to remove large air pockets, but not too firm as to remove all fine air spaces needed for a well aerated soil and root development. Complete the backfill by making sure that the trunk flare is exposed, spread mulch at 2-4" depth but not touching the trunk and water the root ball and the planting area deeply.

Containerized trees must be examined to ensure root flare exposure as well as removal of any circling roots. Root ball must be scarified and potentially cut open if root bound or circling roots are evident. Circling roots have the capacity to girdle the stem which will limit the life and stability of the tree.

Newly planted trees must receive adequate water weekly during the entire first growing season right up until dormancy in the fall. Some species will require additional monitoring for several seasons.

Mulching:

Mulching can reduce environmental stress by providing trees with a moderate root environment that has fewer temperature and moisture extremes than the surrounding soil. Mulch reduces competition from weeds and grass and prevents mechanical damage from lawn care equipment by providing a protective barrier around the base of the tree. Mulch also can reduce soil compaction and erosion. Mulches made from plant matter such as shredded leaves, pine straw, peat moss, or composted wood chips, add nutrients to the soil as they decompose and help improve overall soil biology. The use of coarse organic wood chips is preferable due to increased air and water penetration.

Mulch ring diameters should be a minimum of 3 feet or 3 times the trunk diameter, whichever is greater. However, site specific aesthetics should be considered when sizing mulch rings. Mulch depths should range from 2 to 3 inches deep and should never be applied to the trunk of the tree or the root crown. A mulch-free area around the tree base that is 1 to 2 inches wide is sufficient to avoid overly moist bark conditions. Avoid "volcano" mulch circles as this condition can restrict oxygen and water availability and may lead to stem girdling roots or root rot.

Current Architecture, Design and Construction Tree Protection Standards:

The design professional and contractor shall use due diligence in the protection of the existing trees and shrubs on Ohio University property. If there is any question as to whether limbs can be removed, or should bark or root damage occur during the construction project, the Project Manager shall be notified immediately with follow up notification to the Grounds Department Landscape Coordinator or other Grounds Manager.

Fencing of a protection area shall follow the ratio of 1' radius per 1" tree diameter at breast height (DBH). Posts shall be steel channel posts spaced 8'-0" on center. Snow fencing or orange polyethylene construction fencing, shall have a minimum above grade exposed height of 4'-0".

Construction activities shall not occur within the protected area. The protected area shall not be used for the storage of construction materials, nor used as a parking area or driven over with any vehicle or equipment. Where it is not practical to stay out of the tree protection area, the largest possible protection area should be designated, and appropriate measures used to minimize damage to the trunk, limbs, and roots. Required measures may include: adding coarse wood chips to prevent compaction by equipment, renting ground mats from Ohio University Grounds Department to protect from soil compaction, pruning roots or limbs ahead of time to avoid ripping tissues or temporarily wrapping trunk or limbs to protect from equipment. Protective materials shall not be nailed to the tree. All reasonable efforts should be made to minimize root damage. Minor roots (less than 2" diameter) that must be severed are to be clean cut with a saw. Major roots (2" diameter or more) are not to be severed unless specifically authorized by the Project Manager. Boring under major roots should be practiced where practical. Roots exposed for more than 2 days should be protected from desiccation.

Proposed Additional Tree Protection and Preservation Policies and Procedures:

New development activities shall plan to preserve and protect healthy trees in the construction zone. The Landscape Coordinator shall work with University Planning during early stages of site planning to review landscape impacts. Any tree on campus that must be removed to accommodate development or utility repair/ upgrade must be shown on the site plan and reviewed by Grounds Department prior to the start of construction.

Tree protection zones shall be established and maintained for all trees to be preserved in a construction site. A protective barrier for each tree or grouping shall be installed to protect the trunk and root systems within the Critical Root Zone (CRZ) prior to the start of any construction activities. The Critical Root Zone shall be defined as the area covered by 1 foot of root zone radius per inch of diameter at breast height (DBH). No equipment or vehicle shall be parked nor shall any construction material be stored within the CRZ. In addition, no foreign substances such as diesel fuel or any construction products can be allowed within the tree protection zone at any time during the project. No root raking shall be allowed within any tree protection zone during clearing, grading or construction of a project. To the extent possible, all site work shall

be planned and conducted in a manner that will minimize damage to protected trees from environmental changes such as altered site drainage or any other land disturbance within or immediately adjacent to the critical root zone of the tree. Should tree damage occur, the damage shall be assessed by Ohio University Grounds staff and appropriate fines levied to fund tree replacement. Levied fines shall be placed in a Foundation account so that the funds can be used from year to year for the purpose of tree planting and replacement only.

Activities to Avoid in the Care of Mature Trees:

- Placing fill soil around existing trees and grade changes. Fill soil is frequently added around existing mature trees to cover roots and re-establish turf. Fill soil can reduce soil oxygen levels and suffocate tree roots.
- Over watering newly planted turf near mature trees. This can lead to root problems and the development of fungal pathogens.
- Installation of irrigation or any other type of pipe or conduit requiring trenching through the critical root zone of mature trees. Other techniques such as directional boring should be utilized to minimize root damage where lines are unavoidable within the drip lines of trees.
- Driving any vehicle on wet soils within the proximity of tree roots. This activity will cause soil compaction.
- Heavy pedestrian foot traffic is also a contributing factor in creating soil compaction and may require pedestrian control via barriers such as posts and chain. Mechanical aeration will be required seasonally to alleviate compaction.
- Mulching too heavily/volcano mulching: Ensure proper mulch depth and proximity to trunk.

Hazard and Emergency Tree Removal:

The Ohio University Landscape Coordinator (occasionally in consultation with others such as the Regional Urban Forester at Ohio Department of Natural Resources Division of Forestry) will determine need for removal by identifying a tree as hazardous or in a state of significant decline. If the tree is considered to be hazardous, it will be scheduled for removal. Significant tree removal notifications will be made to Facilities Management and Safety, as well as the Tree Advisory Committee. A tree can be categorized as hazardous if there is a significant defect and there is a potential target below such as a building, car or pedestrian.

Managing for Catastrophic Events:

In the event of severe weather conditions, damaged trees will be removed by Grounds staff or an outside tree removal company. Ohio University Grounds staff shall clear roads and streets first, then provide access to critical buildings, administration centers, buildings with critical labs, Alden library, and Baker University Center prior to removing damaged trees during severe weather conditions. In advance of severe weather conditions, all necessary equipment shall be checked for readiness by staff.

Design Standards:

Design of any new construction or renovation project should include a green space and tree protection plan in the proposal. The Ohio University Landscape Coordinator and

Office of Sustainability, in coordination with other Grounds Managers, will continue to work to further develop overall grounds/landscape requirements.

Communication Strategy:

This document will be made available on the Ohio University Office of Sustainability's Website for the students and community to view. Furthermore, the principles of the Tree Care and Landscape Procedures will be incorporated into Architecture, Design and Construction Standards as these standards are updated.

Terminology:

The following terms come from the International Society of Arboriculture:

Adaptability--genetic ability of plants and other living organisms to adjust or acclimate to different environments.

Arboriculture--practice and study of the care of trees and other woody plants in the landscape.

Balled and Burlapped (B&B)--tree or other plant dug and removed from the ground for replanting, with the roots and soil wrapped in burlap or a burlap-like fabric. Contrast with bare root, container grown, and containerized.

Bare root--tree or other plant removed from the ground for replanting without soil around the roots. Contrast with balled and burlapped, container grown, and containerized.

Best Management Practices (BMP)-- a practice, or combination of practices, that is determined to be effective and practical (including technological, economic, and institutional considerations).

Branch collar--area where a branch joins another branch or trunk that is created by the overlapping vascular tissues from both the branch and the trunk. Typically enlarged at the base of the branch.

Carbon sequestration--capturing and long-term storage of carbon. Most often used in reference to the capturing of atmospheric carbon dioxide through biological, chemical, or physical processes. Trees sequester carbon through photosynthesis.

Composting--subjecting organic matter to decay and decomposition processes.

Conifer--cone-bearing tree or other plant that has its seeds in a structure called a cone.

Crown cleaning--in pruning, the selective removal of dead, dying, diseased, and broken branches from the tree crown.

Cultivar--cultivated variety of a plant. Cannot be reproduced without human assistance. Usually propagated asexually (cloned). Compared to variety.

Decay--(1) (noun) an area of wood that is undergoing decomposition, (2) (verb) decomposition of organic tissues by fungi or bacteria.

Deciduous--tree or other plant that sheds all of its leaves according to a genetically scheduled cycle as impacted by climate factors (usually during the cold seasons in temperate zones). Contrast with evergreen.

Defoliation--loss of leaves from a tree or other plant by biological or mechanical means.

Drip irrigation--method of minimizing evaporation and runoff by applying small amounts of water through small emitters.

Drip line--imaginary line defined by the branch spread of a single plant or group of plants.

Eradication--total removal of a species from a particular area. May refer to pathogens, insect pests, or unwanted plants.

Evergreen--tree or other plant that does not shed all of its foliage annually. Contrast with deciduous.

Fertilizer analysis--percentage of primary elements [nitrogen (N), phosphorus (P), and potassium (K)] in a fertilizer.

Foliage--leaves of a plant.

Fungicide--chemical compound that is toxic to fungi.

Growth rate--speed at which something grows.

Growth rings--rings of xylem that are visible in a cross section of the stem, branches, and roots of some trees. In temperate zones, the rings typically represent one year of growth and are sometimes referred to as annual rings.

Herbicide--chemical compound that kills vegetation.

Hybrid--plant resulting from a cross between two or more other plants that are more or less alike.

Infiltration--(1) downward entry of water into the soil. Contrast with percolation. (2) entry of fine particles into drainage or aeration systems; can lead to system clogging and failure. (3) downward entry of materials from one soil or fill layer to another, as when a gravel road surface mixes with underlying soil.

Insecticide--substance toxic to insects.

Integrated pest management (IPM)--method of controlling plant pests by combining biological, cultural, mechanical, physical, and/or chemical management strategies.

Leach (leaching)--(1) tendency for elements or compounds to wash down through the soil. (2) tendency for elements or compounds to wash into the soil. For example, alkaline compounds may leach from concrete, or heavy metals may leach from aggregates, and both many damage plants.

Mitigation—in tree risk management, reducing, alleviating, or minimizing risk of harm (damage or injury).

Native species—plants indigenous to a region. Naturally occurring and not introduced by man. Contrast with introduced species and naturalized species.

Naturalized species--non-native species that has become established in a region and propagates without human assistance. Contrast with introduced species and native species.

Pathogen--causal agent of disease. Usually refers to microorganisms.

Pesticides--any chemical used to control or kill unwanted pests such as weeds, insects, or fungi.

Pesticide resistance--ability to withstand certain pesticides; survival of just a few genetically resistant pests that reproduce can lead to populations that are resistant.

Risk assessment--process of evaluating what unexpected things could happen, how likely they are to happen, and what the likely outcomes are. In tree management, the systematic process to determine the level of risk posed by a tree, tree part, or group of trees.

Risk management--systematic application of management policies, procedures, and practices for identifying, evaluating, treating, monitoring, and communicating risk.

Root ball--soil containing all (e.g., containerized) or a portion (e.g., B&B) of the roots that are moved with a plant when it is planted or transplanted.

Root collar/root crown excavation--process of removing soil to expose and assess that root collar (root crown) of a tree.

Root crown--area where the main roots join the plant stem, usually at or near ground level. Root collar.

Site analysis--(1) consideration or evaluation of the conditions, restrictions, and environment of a plant site. (2) consideration or evaluation of a construction or development site requiring a tree conservation or preservation plant.

Site considerations—factors that must be taken into account when assessing a site for planting, tree conservation, or preservation or for any operation.

Soil analysis—analysis of soil to determine pH, mineral composition, structure, salinity, and other characteristics.

Species diversity--measure of the number and variety of different species found in a given area.

Standard of care--degree of care that a reasonable person should exercise in performing duty of care; a measurement used to assess whether an individual acted in a reasonable manner.

Tap root--central, vertical root growing directly below the main stem or trunk that may or may not persist into plant maturity.

Tree Protection Zone (TPZ) sometimes also known as the **Critical Root Zone (CRZ)**--defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

Tree inventory--record of each tree within a designated population; typically includes species, size, location, condition, and maintenance requirements.

Trenching--linear, open excavation, often used to install utilities or structural footings. Can cause tree root damage. Contrast with radial trenching and tunneling.

Tunneling--digging, often with special machinery and shoring or other supports, below the surface of the ground without an open trench. Alternative for installation of underground utilities that avoids cutting of tree roots or damage to hardscape or existing utilities. Contrast with radial trenching and trenching.

Variety--naturally occurring subdivision of a species having a distinct difference and breeding true to that difference. Compare to cultivar.

Volcano mulching—is an improper technique of mulching heavily, in which the root flare is covered and mulch is improperly piled against the trunk of a tree.

Portions of this document were developed with the help of Ann Bonner, Regional Urban Forester for Ohio Department of Natural Resources and the [Georgia Tech Campus Tree Care Plan](#).