

California State University, Fresno Arboretum Tree Care Plan

1. PURPOSE

The purpose of the California State University, Fresno Arboretum tree care plan is to identify the policies, procedures, and practices that are used in establishing, protecting, maintaining, and removing trees on the California State University, Fresno campus. The overall goal of the plan is to ensure a safe, attractive, and sustainable campus urban forest, currently consisting of more than 6000 trees. The specific objectives of the plan are:

- A. Ensure proper species selection, high-quality nursery stock acquisition, and industry-consensus planting procedures
- B. Promote species diversity and proper age structure in the tree population
- C. Protect historical, commemorative, and horticulturally significant campus trees during construction and renovation projects
- D. Promote tree health and safety by utilizing International Society of Arborists best management practices when maintaining campus trees
- E. Ensure that trees are reasonably replaced when there is mortality due to weather, pest infestations, injury, or construction displacement
- F. Encourage campus community members to respect and value the campus urban forest
- G. Fulfill the requirements for Arboretum accreditation through ArbNet – Morton Register of Arboreta

2. RESPONSIBLE DEPARTMENT

- A. California State University, Fresno Grounds Department located within the Facilities Department under the direction of the Associate Vice President for Facilities Management.

3. CAMPUS TREE ADVISORY COMMITTEE (ARBORETUM COMMITTEE)

- A. The tree advisory committee is formally known as the **Arboretum Committee**.
- B. The committee is comprised of faculty, staff, and students from numerous programs throughout the university. The committee meets monthly or as needed to review and evaluate the development of the Campus Arboretum, landscape plans and new plantings, safety, sustainability, and community involvement. The committee provides recommendations to the Campus Planning Committee (CPC).
- C. The composition of the committee shall be as follows:
 1. Members appointed by the Vice President for Administration (VPA) for a renewable three-year term:
 - a. Curator, recommended by the Provost
 - b. Four Faculty Members, recommended by the CPC: two from CPC and two at-large
 - c. Two Members, Friends of the Arboretum, recommended by the President

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- d. Staff Member, recommended by the Chair of Staff Assembly
- e. Staff Member representing Public Safety, recommended by the VPA
2. Member appointed by the VPA for a one-year term:
 - a. Student/Intern Member
3. Ex-Officio members (voting):
 - a. Manager of Grounds
 - b. Director of Facilities Planning (or designee)
 - c. Instructional Support Technician, College of Science and Mathematics
 - d. Instructional Support Technician, Jordan College of Agricultural Sciences and Technology
 - e. University Consulting Landscape Architect

4. ARBORICULTURAL CARE: PRUNING SCHEDULE

A. Pruning Schedule: The maintenance pruning schedule shall be dictated by tree species, age, function, and placement.

1. Trees less than 7 years old should receive structural pruning on an annual or biennial basis
2. Trees 7-20 years old should receive structural pruning every two to five years
3. Trees 20 years old and older receive maintenance pruning every five to seven years to clean dead, diseased, dying, and defective branches from the crown
4. Trees adjacent to roadways, walkways, signs, and streetlights are annually inspected for safety and clearance issues and maintenance pruned as necessary

B. Pruning Practices: To encourage the development of a strong, healthy tree, the following guidelines shall be followed when pruning.

1. General:
 - a. Pruning shall not be conducted without a clear objective or outcome.
 - b. Prune first for safety, next for health, and finally for aesthetics.
 - c. When removing branches, the pruning cut shall not damage the branch bark ridge and branch collar.
 - d. Internode (heading) cuts should not be used except in storm response and crown restoration procedures
 - e. Branch reduction or thinning should be used to achieve pruning objectives rather than making large (>8" diameter) branch removal cuts.

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2. Cleaning:

- a. Thinning shall be performed to remove dead, diseased, dying, and defective branches, which reduces hazards, promotes health, and improves appearance
- b. Large branches should be removed with the aid of ropes and rigging equipment to minimize the risk of tree injury from falling debris

3. Thinning:

- a. Thinning shall be performed to reduce the density of branches, which increases light penetration, improves visibility, and decreases wind load.
- b. Assess how a tree will be pruned from the top down.
- c. Favor branches with strong, U-shaped angles of attachment. Remove branches with weak, V-shaped angles of attachment and/or included bark.
- d. Ideally, lateral branches should be evenly spaced on the main stem of young trees.
- e. Remove any branches that rub or cross another branch.
- f. Make sure that lateral branches are no more than one-half to three-quarters of the diameter of the main stem to discourage the development of co-dominant stems.
- g. Do not remove more than one-quarter of the living crown of a tree at one time. If it is necessary to remove more, do it over successive years.

4. Raising:

- a. Raising shall be performed to provide vertical clearance from thoroughfares, signs, streetlights, and structures
- b. Always maintain live branches on at least two-thirds of a tree's total height. Removing too many lower branches will hinder the development of a strong main stem.
- c. Remove basal sprouts and vigorous epicormic sprouts.

5. Reduction:

- a. Reduction shall be performed to decrease the overall height of a tree or to decrease the length of an individual branch
- b. Use reduction pruning only when necessary. Make the pruning cut at a lateral branch that is at least one-third the diameter of the stem to be removed.
- c. If it is necessary to remove more than half of the foliage from a branch, remove the entire branch.

5. ARBORICULTURAL CARE: TREE GROWTH AND PROTECTION

A. Mulching and Irrigation:

1. Tree mulching shall be performed every two years for trees. Periodically, drip lines of larger trees and tree groupings are mulched extensively with waste wood chips.

B. Fertilization and Pest Management:

1. Trees are treated for pest problems as needed. There is regular systemic treatment of Hackberry, Crape Myrtle, and Red Oak tree for aphids.
2. There is no regular tree fertilization beyond treatment received because of lawn fertilization. Specimen or other horticulturally significant trees may receive prescription fertilization when severe nutrient deficiencies are diagnosed.

6. OTHER ARBORICULTURAL PRACTICES

A. Removals:

1. Live trees are generally removed only when required to protect the public safety or are detracting from the quality of the landscape.

B. Planting and Tree Diversity:

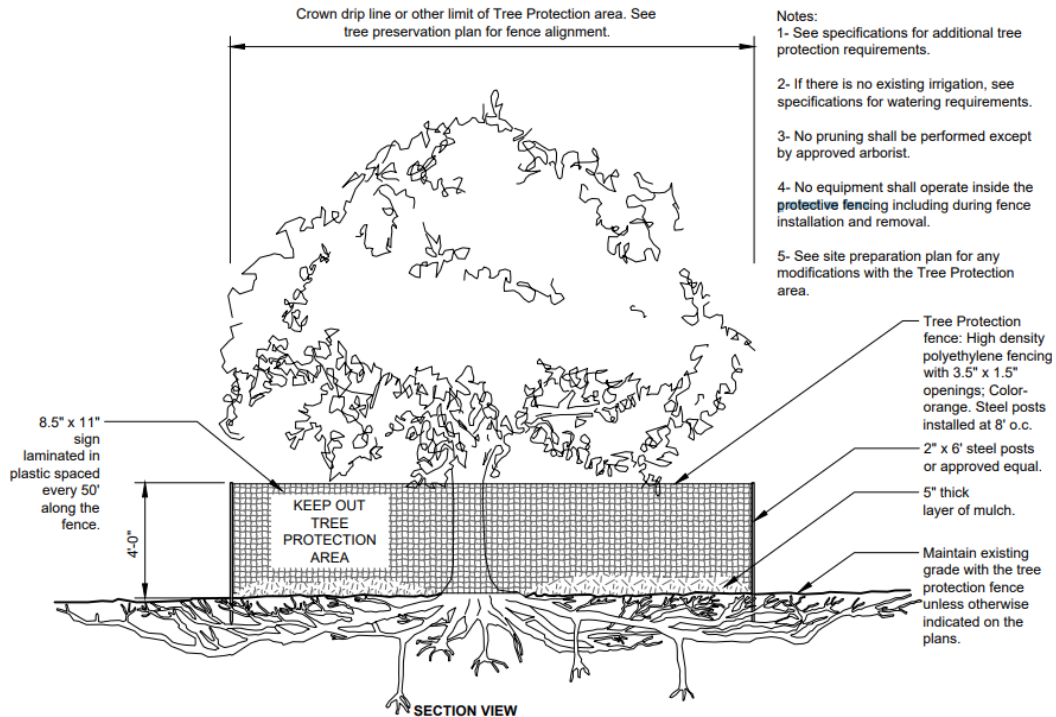
1. As the campus is used as a teaching lab, increasing the diversity of tree species is extremely important. However, species selection must be dictated by site conditions. Currently a "species list" for campus planting exists created previously by Dr. Art Olney. Refer to the Arboretum Website for a copy of this list.
2. The Arboretum Committee is often consulted to recommend species for specific site conditions and consider requests to plant new cultivars and species that are absent or underrepresented on campus to enhance the Arboretum.
3. Most landscapes will be planted in drought tolerant or native species while others may include non-native trees of special interest. Known invasive woody plants are prohibited in tree planting plans.

C. Storm Response and Recovery:

1. Storm response and recovery are generally accomplished in-house. In a crisis, the priority is to remove tree debris that blocks campus thoroughfares, disrupts campus operations, or poses hazards to the campus community.
2. Once these critical needs are addressed, a prioritized recovery plan is implemented. During which unsalvageable trees are systematically removed and salvageable trees are pruned to restore their health and structure.
3. Lost trees are strategically replaced to restore the structure and function of the campus urban forest in a reasonable time frame.

7. PROTECTION, PRESERVATION, HERITAGE TREES, REPLACEMENT PROCEDURES

A. Tree Protection Guidelines and Procedures:



TREE PROTECTION

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1. Tree Protection Zone (TPZ) fencing must be installed around all existing trees noted to remain on plans within the fenced staging area. Fencing shall extend a distance from the trunk of 1.25 feet per each inch of trunk diameter or 6", whichever is greater. For example, a tree with a 12" trunk diameter shall be fenced 15" from the trunk (30" diameter)
2. Area within tree protection fencing must be mulched with shredded hardwood or wood chips to depth of 4".
3. Fencing must be installed prior to any equipment arrival on the site. Work may not begin until fencing is installed.
4. Fence shall be maintained for the duration of the project and shall not be removed without the owner's permission.
5. No material storage, vehicles or any other activity shall occur at any time within tree protection fencing.
6. Contractor may be required to pay tree replacement and/ or soil compaction remediation costs if there is any incursion into tree protection zones.

B. Preservation procedures:

1. Planting new trees and the preservation of existing trees:

This shall be considered and addressed during the design phase of projects. The following 2008 Campus Master Plan Landscape Recommendations and Design Guidelines are included to provide guidance for implementation of the landscape master plan. It does not provide a comprehensive set of guidelines but addresses key issues and expands on the general intent of our goal to preserve trees in campus landscapes.

a. Hedgerows and Street Trees:

The campus includes the academic campus, Athletics, and the Farm Laboratory, and all should be visually connected by the landscape. Rows of street trees and hedgerows should connect into the perimeter of the academic campus. Hedgerows (also known as windrows in this context) comprise a double row of columnar trees limbed up six feet above ground level. Hedgerows may also have a trail beside them, or between the parallel rows.

b. Arboretum:

Supplement and expand the historic Arboretum with communities of specimen trees and replace diseased and removed specimens. Select plants with sufficient maturity to survive the rigors of a busy campus, and provide soil augmentation, support, protection, and irrigation until they become well established. Place trees with consideration for the overall effect of the expanded Arboretum and the influence that the trees will have on local spaces as they gain maturity.

c. Tree Species:

Select trees for general use (i.e., other than arboretum specimen trees) that are disease and drought-resistant; amenable to the campus climate; and capable of developing effective shade canopies in a relatively short time. Where soil compaction is probable, use specially structured soils to enhance root growth and longevity. Avoid reliance on a single species so that disease outbreaks can have limited effect on the campus.

d. Xeriscape:

Select plant materials, including trees, shrubs, decorative plants, and groundcovers that, when established, require little water and other maintenance.

e. Water Features:

Water features should demonstrate leadership in the responsible use of water, providing the sight and sound benefits of water with minimal evaporative loss. Water features should mark crossings of footpaths with the main east-west walkway across the campus. Each should have a distinct appearance. Water features should complement and blend well with the surrounding trees.

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2. Site survey map:

Shall identify all trees whose root systems are likely to be impacted by construction equipment, cut and fill activities, utility corridors, proposed sidewalks, roads, and potential construction staging areas; and whose branches may be damaged by equipment.

a. Trees that are not salvageable:

1. All trees that are within the footprint or near the footprint of a proposed building. (Note: alternative footprints to save large, valuable trees should be considered, provided that the alternatives maintain the desired features and costs of the proposed building).
2. Trees of undesirable species or in very poor health. Examples include but are not limited to species that have low landscape and educational value, and heavily diseased or damaged trees that have little chance of recovering desirable form and function, even if protected from construction damage.

b. Low priority for protecting:

1. Small trees (less than 10 inches DBH) that fall outside of the building footprint but are likely to be impacted by construction activities.
2. Larger trees outside of the building footprint with relatively low landscape value. Examples include but are not limited to, trees with poor form, species of relatively low landscape and educational value, or trees with inadequate space to accommodate current or future growth even if the site is ameliorated.

c. High priority for protecting:

1. Medium (> 10 inches DBH) to large (> 24 inches DBH) trees of desirable species with good form, good health, and room to continue to grow. May be referred to as Heritage Trees. Avoid locating the general construction site around all trees where possible by:
 - a. Planning all construction activities including new utility corridors, staging areas, new sidewalks, and new roads for a minimum clearance of 15 feet away from the base of trees, and not within the edge of the canopy drip line. Greater distances are desirable.
 - b. High importance trees should receive more consideration than low importance trees in planning corridors, staging areas, walks, and roads.

C. Heritage Tree Guidelines

1. Overview:

The Arboretum at California State University, Fresno desires to protect and preserve the beauty and natural environment of campus, serve as a “living laboratory” supporting teaching and research, and support urban and regional planning by engaging and leading our region in environmental stewardship and community engagement. Our trees serve to unify our campus by providing a central design element in the overall layout of the campus landscape, provide shade, prevent erosion of topsoil, counteract pollutants in the air and decrease wind velocities and noise.

The primary intention of this plan is to ensure that there will be a significant population of large, healthy trees over the long term. The Facilities Management Department is responsible for implementation and compliance of this plan.

2. Definition of a Heritage Tree:

- a. Any tree that has a trunk with a diameter of 24 inches or more measured at 4.5 feet above natural grade.
- b. Any oak tree native to California or any unique or rare specimen tree that has a trunk with a diameter of 10 inches or more measured at 4.5 feet above natural grade.
- c. A tree or group of trees specifically designated by the Arboretum for protection because of its historical, memorial, commemorative, or horticultural significance including those listed in the Campus Tree Walk and Memorial Tree Database.

Any tree with more than one trunk that falls under (1) or (2) shall be measured at the diameter below the main union of all multi-trunk trees. If the tree has more than one trunk and the union is below grade, each stem shall be measured as a standalone tree. Multi-trunk trees under 12 feet in height shall not be considered a heritage tree.

3. Maintenance and protection:

Heritage trees are required to be preserved and maintained in a state of good health. The intention of this plan is to require reasonable measures such as correct watering, periodic inspection, proper pruning and not engaging in practices that are detrimental to the tree. This plan also requires any person who conducts grading, excavation, demolition, or construction activity on campus to do so in a manner that does not threaten the health or viability or cause the removal of any heritage tree. Any work performed within the crown drip line or other specified limit of tree protection area (i.e., the tree protection zone) requires the submittal of a Tree Protection Plan for approval by the Facilities Management Department before issuance of any permit for grading or construction.

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D. Tree Replacement Requirements

All trees that are to be removed shall be replaced at the following ratios:

Diameter of Tree to be Removed (DBH)	Type of Tree to be Removed			Minimum Size of Each Replacement Tree
	General Landscape Tree	Memorial Tree	Heritage Tree	
24 inches or greater	2:1	No removal*	No removal*	36-inch box or larger
10 - 24 inches	2:1	2:1	2:1	24-inch box
less than 10 inches	1:1	1:1	1:1	24-inch box

x:x = tree replacement to tree loss ratio

DBH = diameter at breast height or 4.5 feet

*= no removal unless tree presents health and safety risk or direct conflict with primary infrastructure component. Specific size and number of replacement trees determined by Grounds Manager with approval from Arboretum Committee and Campus Planning Committee.

Note: Landscape trees greater than 24" diameter, Memorial Trees or Heritage Trees shall not be removed unless it has been approved for the removal of such trees through the Campus Arboretum Committee and/or Campus Planning Committee.

Mitigation trees should be above and beyond standard landscaping. The species and exact number of trees to be planted on the site will be determined in consultation with the Grounds Manager and the Campus Arboretum Committee.

Alternative Mitigation Measures

In the event the project site does not have sufficient area to accommodate the required tree mitigation, one or more of the following measures will be implemented at the project development stage:

- An alternative site will be identified for additional tree planting. Alternative sites may include all grounds within the main campus area to the approval of the Grounds Manager and Arboretum Committee.
- For general landscape trees under 10-inch DBH, a donation of \$500 per mitigation tree to the Fresno State Friends of The Arboretum. These funds will be used for tree planting and maintenance of planted trees for approximately five years.

8. GOALS AND TARGETS

A. Tree Inventory:

1. A digital tree inventory covering the core campus is being developed. The goal is to maintain this information on a web-based site. Updates will be performed by the Manager of Grounds, Arboretum Curator or participating Plant Science professor(s), and student assistants. The inventory may be used for campus planning purposes, tree management, academic exercises, and public information.
2. A Tree Survey was conducted in 2022 by West Coast Arborists to determine a total tree count for the campus. This included GIS mapping and species/variety count and condition assessment. 6020 trees were identified and included in this survey. This information is available by contacting the Grounds Manager and will be uploaded to the Arboretum website in the future.

B. Tree Canopy and Campus Sustainability:

1. A Tree Canopy Analysis was conducted during the summer of 2008 for the Campus Master Plan. The results show a tree canopy cover of 16.2% or 57.8. It also showed our amount of air pollution removed, carbon storage and totals of storm water savings. It also gives a projection of savings if we increase our canopy cover by 10%.
2. Increasing the campus tree canopy is an important component of the CSU Sustainability and Climate Action Commitment and AASHE STARS Initiative.

9. TREE DAMAGE ASSESSMENT, ENFORCEMENT, AND VIOLATIONS

A. Assessments on low to moderate importance trees are performed by the Manager of Grounds and the Arboretum Committee. Higher importance trees are assessed with the aid of a Consulting Arborist.

B. Enforcement of protection measures during campus construction projects is performed by project managers and on-site engineers. Overall enforcement of the Tree Care Plan is performed by the Grounds Manager.

C. Violation of any of these regulations is subject to intervention by the University. In the event of an alleged or perceived violation, those in violation will be asked to comply with the applicable regulations by the appropriate campus authorities.

10. PROHIBITED PRACTICES

A. Bike Locking:

1. Bicycles may be parked only at bicycle racks, except when permission has been granted to keep a bicycle inside a campus building.
2. No person is allowed to park a bicycle or moped on a sidewalk, at a tree or post, on a lawn, next to a building, in a roadway, at a utility pole, light post, banister, parking meter, or other available structure.
3. Bicycles or mopeds found parked and/or locked in areas other than those allowed may be impounded or immobilized by the University Police Department. The person responsible for the bike will receive a bicycle parking citation.

B. Topping of Trees:

Topping, heading, hat-racking, or any other form of inappropriate crown/branch reduction pruning shall not be permitted except in emergency situations or in executing a crown restoration procedure.

C. Attachment to trees:

Signs, banners, ribbons, lights, hammocks, slack lines, nets may not be affixed to trees.

11. COMMUNICATION STRATEGY

The Arboretum Tree Care Plan tree guidelines (with emphasis on Protection, Preservation, Heritage Trees, and Replacement Procedures) are communicated to project managers for inclusion into project specifications. The tree preservation categorizing process is used by the University's Consulting Architects for building siting and campus master planning.

Note: This plan reflects university policies, procedures, and practices currently in place and administered under the Buildings and Grounds Policy, Time, Manner and Place Policy, and Campus Signage Policy.

The Tree Care Plan may be viewed on-line following links from both the Arboretum and Facilities Management websites.

12. REFERENCES

- a. Campus Master Plan 2008
- b. Facilities Management Website
- c. Arboretum Task Force 2014
- d. Arboretum Website
- e. Arboretum – Olney Plant List
- f. 2014 CSU Sustainability Policy
- g. AASHE STARS Initiative
- h. Campus Planning, Design Construction – Landscape Standards
- i. Buildings and Grounds Policy
- j. Time, Manner, and Place Policy
- k. Campus Signage Policy
- l. International Society of Arborists – Best Management Practices
- m. Urban Tree Foundation – Tree Protection Guidelines
- n. ArbNet – Morton Register of Arboreta