

Urban Forestry



Practice Description

Urban forestry is the study of trees and forests located in and around towns and cities. Since trees absorb water, patches of forest and the trees that line streets can help provide some of the stormwater management required in an urban setting. Urban forests help break up a landscape of impervious cover, provide small but essential green spaces, and link walkways and trails.

Successful urban forestry requires a conservation plan for individual trees as well as forest areas larger than 10,000 sq ft. A local forest or tree ordinance is one technique for achieving conservation and, when specific measures to protect and manage these areas are included, urban forests and trees can help reduce stormwater management needs in urban areas. Guidance on conservation of natural areas in the Better Site Design handbook is useful for jurisdictions that wish to incorporate urban forestry in their stormwater management plan. Model development principles that apply to urban forestry include clearing and grading, tree conservation, riparian buffers, and stormwater outfalls (CWP, 1998).

Planning Considerations

From a stream preservation perspective, it is ideal to preserve as much contiguous forest as possible. However, this may not be an option in many urban areas. If forested areas are fragmented, it is ideal to retain the closest fragments together. In rapidly urbanizing areas, where clearing and grading are ongoing, tree preservation areas should be clearly marked.

Delineating lines along a critical root zone (CRZ) rather than a straight line is essential to preserving trees. It can also help reduce homeowner complaints about tree root interference into sewer or septic lines.

Numerous environmental and stormwater benefits result from urban forestry. Urban forests can act as natural stormwater management areas by filtering particulate matter (including pollutants, some nutrients, sediments, and pesticides) and by absorbing water. A study done by the U.S. Department of Agriculture’s Center for Urban Forest Research found that a medium-sized tree can intercept 2,380 gallons of rain per year (CUFR, not dated).

Trees also absorb carbon dioxide, decrease temperatures, and provide habitat for urban wildlife. Urban forestry reduces noise levels and provides recreational benefits. There are numerous economic benefits to urban forests, including proven increases in property values. In addition, by preserving trees and forests, the costs of clearing and grading as well as erosion and sediment control can be reduced during construction. Maintenance costs are also minimized by keeping areas as natural as possible.

Annual maintenance costs of different types of green spaces
(CWP, 1998)

Land Use	Approximate Annual Maintenance Costs
Natural Open Space <i>Only minimum maintenance, trash/debris cleanup</i>	\$75/acre/year ¹
Lawns <i>Regular mowing</i>	\$270 to \$240/acre/year ²
Passive Recreation	\$200/acre/year ¹
¹ “Economic Impacts of Protecting Rivers, Trails and Greenway Corridors,” 4th ed. 1995. Rivers, Trails and Conservation Assistance Program, National Park Service, Western Office, San Francisco, CA. ² “The Economic Benefits of Wildlife Habitat Enhancement on Corporate Lands.” 1992. Wildlife Habitat Enhancement Council, Silver Springs, MD.	

Design Criteria

An urban forestry plan should include measures to establish, conserve, or reestablish preservation areas. The basic building block of the plan is the critical root zone, or the area around a tree required for its survival. The CRZ is determined by tree size, species, and soil conditions. For isolated specimen trees, the CRZ can be estimated as 1/2 feet of radial distance for every inch of tree diameter. In larger areas of trees, the CRZ of forests can be estimated at 1 foot of radial distance for every inch of tree diameter, or a minimum of 8 feet.

Forest Preservation Ordinance

A forest preservation ordinance is one way to set design standards outlining how a forest should be preserved and managed. The ordinance should outline some basic management techniques and contain some of the following typical elements of a forest conservation plan:

- A map and a narrative description of the forest and surrounding area that includes topography, soils, streams, current forested and unforested areas, tree lines, critical habitats, and 100-year floodplain.
- An assessment that establishes preservation and reforestation areas.
- A forest conservation map that outlines forest retention areas, reforestation, protective devices, limits of disturbance, and stockpile areas.
- A schedule of any additional construction in and around the forest area.
- A specific management plan, including tree and forest protection measures.
- A reforestation and a forestation plan.

Site-Level Tree Preservation

An ordinance can also be developed that addresses tree preservation at the site level, both during construction and post-construction. This type of ordinance can be implemented on a smaller scale and integrated with a proposed development's erosion and sediment control and stormwater pollution prevention plans, which many communities require of new developments.

American Forests, a non-profit organization dedicated to preserving and restoring forests, adopted an ecosystem restoration and maintenance agenda in 1999. Their goal is to assist communities in planning and implementing tree and forest actions to restore and maintain healthy ecosystems and communities (American Forests, 2000). The agenda presents the organization's core values and policy goals as the basis for policy statements. It also provides information to help community-based partners prepare their own policy statements. Key policy goals include

- Increasing public and private sector investment in ecosystem restoration and maintenance activities;
- Promoting an ecosystem workforce through training, apprenticeship programs, and new job opportunities;
- Building support for innovative monitoring systems to ensure collaborative learning and adaptive management; and
- Encouraging a "civic science" approach to ecosystem research that respects local knowledge, seeks community participation, and provides accessible information for communities.

Common Problems

One of the biggest limitations to urban forestry is development pressure. Ordinances, conservation easements, and other techniques designed into management programs can help alleviate future development pressures. The size of the land may also limit the ability to protect individual trees. In such areas, a tree ordinance may be a more practical approach.

Forests may also harbor undesirable wildlife elements such as insects and other pests. If forests border houses, this may be a concern for residents.

Maintenance

Maintenance considerations for urban forests may require fringe landscaping and trash pickup. By using native vegetation and keeping the area as natural as possible, maintenance efforts can be minimized.