

Bureau of Recreation and Conservation Green Principles for Park Development and Sustainability

Principle #1: Maintain and Enhance Trees and Natural Landscaping

Natural landscapes provide vital undisturbed habitat for plant and animal species, some of which may be threatened or endangered. Projects of all types can incorporate natural landscaping into the site design by using an aesthetic variety of primarily native plantings well adapted to the local climate and soil. Preserving existing natural vegetation including valuable natural areas such as wetlands, grasslands, and woodlands is a fundamental purpose of natural landscaping.²

Designing with a variety of native trees, shrubs, grasses and wildflowers can help eliminate large areas of unnecessary or unused turf lawn providing. Minimizing the amount of turf lawn while maximizing the natural landscape increases water infiltration rates, reduces the maintenance requirement of expensive lawn equipment, reduces noise and emission pollution, minimizes the use of pesticides and fertilizers, and requires little to no watering. While not maintenance free, a well-established natural landscape requires less money for ongoing maintenance than conventional landscapes.

The following are some concepts to think about when designing natural landscapes:

Why Plant Native Vegetation?

Pennsylvania's native plants are those that were growing naturally in Pennsylvania prior to Europeans arriving. Pennsylvania has over 3,081 species of native trees, shrubs, flowers, and other forms of plants. Landscaping with native plants has several appealing factors. Native plants are:⁴

- Adapted to Pennsylvania's soils and climate thus reducing the need for supplementary watering and other horticultural amendments.
- Native plants are an integral part of the larger biological community involving beneficial and pollinating insects, wildlife and ultimately, all of us.
- Offer food and shelter for many species all year long and are the foundation for a healthy, diverse habitat.
- Require less care and watering when established.
- Thrive with less fertilizer. (Most native plants will not need fertilizer once they are established. When fertilizers are used, they should be of the organic or "slow-release" varieties, should be used no more than once or twice a year, and should be used in as small a quantity as possible.¹)
- Provide carefree beauty that enhance any garden or landscape and create a sense of place.
- Native plants growing in their home environment are naturally more resistant to diseases, pests, or physiological disorders.
- When planted along waterways, native plants protect ponds and streams by filtering pollutants and preventing erosion.

Grass Maintenance

Cool season turf grass, a staple of traditional parks, should be limited to human-use areas such as ball fields and picnic groves. Native cool season grasses, such as Canada and Virginia wildrye, should be used in place of non-native cool season grasses like Kentucky bluegrass and tall fescue. Warm season grasses can be used to establish a meadow to provide wildlife habitat or used as attractive landscaping. Native warm season grasses include big bluestem, little bluestem, and switchgrass.¹

Maintenance over a 20-year span for a non-native turf grass landscape can cost almost seven times more than the cumulative costs of maintenance for a native prairie or wetland.

~U.S. EPA, 2007

Even if you keep some area in lawn, much can be done to lessen environmental impacts:³

- Reduce or eliminate the need for pesticides by practicing [Integrated Pest Management](#).
- Use a mulching mower so that clippings can remain on the lawn and provide nutrients as they decompose.
- Where the lawn is small, use a non-powered reel mower. (Modern models of the reel mower are much easier to use than the older models.)
- Keep gas-powered mowers in efficient operating condition (well-tuned, sharp blades) and raise the cutting height to 3-3.5" during the hot summer months to keep the grass roots shaded and cooler, reducing weed growth, browning, and need for watering.
- If you don't use a mulching mower, compost excess grass clippings in your yard and later use it as a soil amendment around trees and shrubs.
- Learn to tolerate some weeds or a greater variety of plants in the lawn.
- Don't over-fertilize. A slow-release organic fertilizer applied once, in the fall, is usually sufficient.

Enhancing and protecting meadows that contain native grasses and wildflowers is a great way to attract wildlife and save on lawn maintenance equipment costs. Common meadow wildflowers include black-eyed Susan, sunflower, aster, and goldenrod. Warm season grasses are prime habitat for grassland and ground-nesting birds; birds such as bobolink, Eastern meadowlark, and grasshopper sparrow require at least 25 acres of grassland for survival. However, other birds, such as goldfinch, field sparrow, Eastern bluebird, Eastern phoebe, and Eastern kingbird, do occupy smaller grasslands.⁷

Protect Existing Features

Mature trees enhance air quality and reduce pollution, enhance water quality and reduce erosion, and can reduce energy costs when properly planted around a building. When appropriate, design the site to protect existing trees. During excavation of the project site be sure the trees' root zones are protected. Therefore it is recommended that any excavation occur outside the perimeter of the tree canopy.⁵

Topsoil is the most fertile portion of soil and the most valuable. "It requires 500 years under natural conditions to produce an inch of topsoil."⁶ The natural fertility of topsoil promotes healthier grass and reduces the amount of fertilizer required to establish landscape plantings. Therefore one of the most important steps during construction and planting projects is to retain as much existing topsoil as possible. The best option is to stockpile and reuse the topsoil instead of removing it from the site. Using the existing topsoil not only saves money, but also minimizes disturbance that could encourage the growth of invasive plants.

Undisturbed soil and vegetation provide important stormwater functions including: water infiltration; nutrient, sediment, and pollutant adsorption; sediment and pollutant biofiltration; water storage and transmission; and pollutant decomposition. These functions are largely lost when development strips away native soil and vegetation and replaces it with minimal topsoil and sod.¹¹

Local and regional greenways are excellent and appropriate locations for natural landscaping. Many greenways contain rivers, streams, or other waterways.² In these locations a variety of native trees, shrubs, grasses and wildflowers planted in *buffers* adjacent to the stream provide wildlife habitat, bank stabilization, filter pollutant and sediment runoff, and create a healthy stream ecosystem for fish and stream invertebrates. To provide the maximum benefits a buffer should be 100 feet or more on each side of the stream, although smaller buffers are better than nothing and will still provide some benefits.

Floodplains provide many important services and should be protected from development. Floodplains reduce flood velocities and flood peaks, reduce erosion potential and impacts, provide a broad area for streams to spread out and for temporary storage of floodwater, reduce sediment loads, filter nutrients, process organic and chemical wastes, and moderate water temperature. Maintaining native vegetation in floodplains helps absorb and slow flood waters reducing the impact a flood may have on downstream communities.⁸

Plant Trees

Trees have multiple benefits, they:

- Reduce CO₂ levels and increase oxygen in the atmosphere,
- Play an important role in stormwater management by reducing erosion and sediment runoff and storing water in their roots,
- Improve water quality,
- Help cool our planet by providing the service of carbon sequestration which happens when trees store carbon in their roots and trunks keeping it from entering the atmosphere,
- Save energy when properly planted around a building,
- Increase property values, and
- Studies have shown that trees can significantly reduce stress levels and accelerate healing time when they are visible from hospital windows.

Pennsylvania, through the Department of Conservation and Natural Resources (DCNR) the Bureau of Recreation and Conservation and the Bureau of Forestry has developed a public private partnership, through regional collaboration, to address the loss of tree cover in Pennsylvania. This program called *TreeVitalize* has established goals to plant 1 million shade trees, restore forests along streams and water protection areas, build capacity for long term urban forest management, establish strong urban forestry partnerships in all 14 metro areas in Pennsylvania, and train 10,000 citizens to plant and care for trees; over a 5 year period. To learn more about *TreeVitalize* and to find out how you can get involved visit <http://www.treevitalize.net/>.

Compost

Leaves, grass clippings and other yard debris clog landfills, taking up 20-40% of landfill space. This so-called waste is actually a valuable natural resource that once decomposed offers a nutrient rich organic matter that can be a source of mulch or can be added to soil as a natural fertilizer. Compost can also help soil retain some of its moisture content. Compost can be made on-site, or can be brought in from a municipal composting facility.³ To learn more about composting visit <http://www.howtocompost.org/>.

Invasive Plant Management

An invasive non-native plant is one that is not natural to the ecosystem under consideration, and when introduced cause or are likely to cause harm to the economy, to the environment, or to human health. Invasive plants can be trees, shrubs, vines, grasses, or flowers, and they can reproduce rapidly by roots, seeds, shoots, or all three.

Why are Invasive plants so detrimental?

- Natural predators and diseases can't compete when non-native plants are introduced. Most invasive plants are introduced from other continents, leaving behind in their native homeland natural controls like pests, diseases and predators, which serve to keep these species in check. Due to this absence of natural controls, invasive plants reproduce rapidly and can form stands that exclude nearly all other plants. In the process, they damage natural areas, altering ecosystem processes and displacing desirable native plant species.
- Plants like kudzu, purple loosestrife, Japanese knotweed, mile-a-minute, and garlic mustard are displacing native plants and degrading habitat for native insects, birds, and animals.
- Invasive plants endanger some rare and threatened native species of plants and animals, which are especially vulnerable because they occur in such small populations.
- Invasive non-native plants often do not provide as much food and other habitat value as native plants do.
- Invasive plants, even when grown in a cultivated yard, can spread, escape, and cause landscape maintenance weeding problems for years to come.
- Some invasive plants release toxic chemicals that kill other plants.

Land managers who are faced with the daunting task of managing or controlling invasive species on natural lands rely on resources like the "Invasive Exotic Plant Management Tutorial for Natural Lands

Managers” in order to implement effective management, control and education programs <http://www.dcnr.state.pa.us/forestry/invasivetutorial/index.htm>. This tutorial provides a "one-stop-shop" for natural resource managers who are interested in organizing on-the-ground efforts to prevent, manage and control invasive plants.⁹

References:

1. DCNR. Creating Sustainable Community Parks. A Guide to Improving Quality of Life by Protecting Natural Resources. <http://www.dcnr.state.pa.us/brc/publications/>
2. U.S. Environmental Protection Agency. A Source Book on Natural Landscaping for Public Officials. <http://www.epa.gov/greenacres/toolkit/chap1.html#PURPOSE>
3. U.S. Environmental Protection Agency. Mid-Atlantic Region Green Landscaping. <http://www.epa.gov/reg3esd1/garden/>
4. National Wildlife Federation. Native Plants. American Beauties- Why Use Native Plants? <http://www.abnativeplants.com/index.cfm/fuseaction/home.why/index.htm>
5. Franklin Soil and Water Conservation District Natural Resource Conservation Service and the U.S. Department of Agriculture, Natural Resource Conservation Service. Importance of Topsoil. http://www.druby.net/joomla/images/pdf_docs/topsoil.pdf
6. Natural Lands Trust. How to Guides: Meadows. <http://www.natlands.org/publications/publications/>
7. Ohio Department of Natural Resources. Division of Water Fact Sheet. Natural Benefits of Floodplains. <http://www.dnr.state.oh.us/Portals/7/pubs/pdfs/fctsh50.pdf>
8. Department of Conservation and Natural Resources (DCNR) Invasive Exotic Plant Tutorial for Natural Lands Managers. <http://www.dcnr.state.pa.us/forestry/invasivetutorial/index.htm>
9. Maryland Department of Natural Resources- Forestry. The Benefits of Urban Trees. Urban and Community Forestry: Improving Our Quality of Life. <http://www.dnr.state.md.us/Forests/Publications/urban.html>
10. Building Soil. Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 2009 Edition. http://www.soilsforsalmon.org/pdf/Soil_BMP_Manual.pdf

Additional Resources:

Arbor Day Foundation. The Value of Trees to a Community. <http://www.arborday.org/trees/benefits.cfm>

Earnst Seed Company. <http://www.ernstseed.com/>

National Wildlife Federation. Create a Certified Wildlife Habitat. <http://www.nwf.org/backyard/>

Pennsylvania Department of Conservation and Natural Resources. Landscaping with Native Plants in Pennsylvania. <http://www.dcnr.state.pa.us/forestry/plants/nativeplants/index.htm>

The Natural Lawn & Garden: Growing Healthy Soils. http://www.seattle.gov/UTIL/stellent/groups/public/@spu/@csb/documents/webcontent/growinghe_200311261701557.pdf