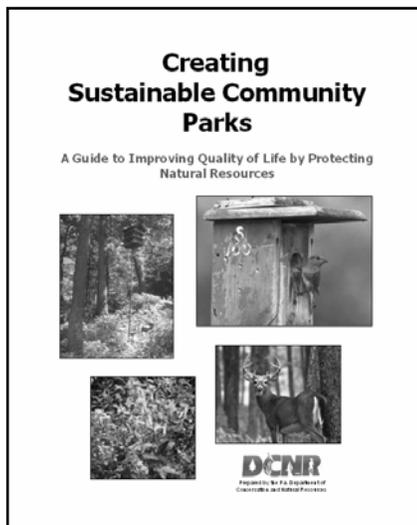


Trees in a Sustainable Community Park Setting: Enhancing Quality of Life for All

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In response to the reality that many parks are barren vistas of mowed turf grass and exotic ornamentals, the Department of Conservation and Natural Resources (DCNR), in conjunction with the Pennsylvania Recreation and Parks Society (PRPS), has developed a new publication, “Sustainable Community Parks: A Guide to Improving Quality of Life by Protecting Natural Resources,” available at www.dcnr.state.pa.us/brc/publications/Pubs/GreeningPennsylvania.pdf.



The publication outlines the environmental and societal impacts of maintaining traditional parks, and compares them to “sustainable community parks,” which balance recreational needs with natural resource protection. The publication provides a park design guide, a list of maintenance needs, a public outreach component, and a handful of examples of Pennsylvania parks that fit into the “sustainable community park” model.

This article provides a snapshot of the information found in the “Sustainable Community Parks” publication, with a specific focus on the use and benefits of native trees.

Pollution Reduction

Trees provide numerous benefits to environmental quality, and protect our valuable natural resources. For instance, the U.S. Forest Service estimates that one tree generates more



than \$60,000 in air pollution control, recycles \$37,500 worth of water, and controls over \$30,000 of soil erosion over a 50-year lifespan. Imagine what an entire forest can do!

Have you heard of carbon sequestration? This is the process through which the greenhouse gas carbon dioxide (CO²) is removed from the atmosphere. One way that this can be done is by using trees and other plants to absorb and store the carbon in their tissue. The Intergovernmental Panel on Climate Change estimates that 10 to 20 percent of the world’s projected fossil fuel emissions could be offset over the next 50 years through forest preservation, tree planting, and improved agricultural practices. If forests can reduce atmospheric CO² levels, the dangerous effects of global warming may be lessened as well.

In addition to CO², trees also remove pollutants like sulfur oxides (SO_x) and nitrous oxides (NO_x) from the air. This translates into a reduction in the incidences of asthma and other respiratory diseases, which diminish people’s quality of life and cost large sums of money to treat.

Quality of life is also enhanced by trees’ cooling effects. The U.S. Forest Service has found that the evaporation created by one large tree can produce the same cooling effect of 10 room-size air conditioners operating 24 hours a day. These cooling effects translate into as much as a 25 percent reduction in cooling costs when trees are properly sited near buildings, according to the American Evergreen Foundation. If we rely more on trees for our cooling needs, rather than using air conditioners and fans, we may reduce our dependence on fossil fuels for electricity, which will further diminish greenhouse gas emissions.

Riparian Forest Buffers

Additional environmental protection can come from native trees within riparian buffers (the land surrounding streams and rivers). These trees are much more effective than turf grasses at filtering out pollutants from surface water. Forested riparian buffers can reduce pollution and excess nutrients in surface and groundwater by 30 to 98 percent, according to the Chesapeake Bay Program. These same trees also provide shade to the streams and rivers that flow past them, which helps regulate water temperatures. This temperature regulation improves the level of dissolved oxygen in the water, which is necessary for aquatic plant and animal life. Riparian forest buffers, therefore, reduce pollution and erosion, benefiting quality of life for people and wildlife.

Unfortunately, thousands of miles of riparian buffers in Pennsylvania have been degraded or lost over the years, due in part to development, according to Pennsylvania Audubon. Planting native tree buffers, ideally 35 to 100 feet wide on each side of the stream, will help reclaim some of this lost habitat and help protect and clean our water resources.

For more information on riparian buffers and their benefits, visit <http://pubs.cas.psu.edu/FreePubs/pdfs/uh165.pdf>.

Wildlife Habitat

In many circumstances, parks focus so much of their time on facilities and infrastructure that they forget about the plants and animals that make their park unique. Instead of dismissing these natural resources, parks can benefit from them. One way to do this is by planting more wildlife-friendly native trees.

These native trees include:

- red and sugar maples
(*Acer rubrum*, *A. saccharum*)
- black and river birches
(*Betula lenta*, *B. nigra*)
- American beech
(*Fagus grandifolia*)
- Eastern white pine
(*Pinus strobus*)
- white, pin, and red oaks
(*Quercus alba*, *Q. palustris*, *Q. rubra*)
- sassafras (*Sassafras albidum*)
- silky, flowering, and alternate-leaved dogwoods
(*Cornus amomum*, *C. florida*, *C. alternifolia*)

These trees may provide wildlife with food, nesting sites, and cover from predators. In addition, they are attractive landscape plants that park visitors will enjoy.

For more information on trees and shrubs with wildlife benefits, visit, <http://pubs.cas.psu.edu/FreePubs/pdfs/UH128.pdf>.

When thinking about creating and preserving wildlife habitat, don't discount the value of standing and downed dead trees (snags). These trees provide habitat for over 35 species of birds, 20 mammal species, and various reptiles, amphibians, and insects in Pennsylvania. It is therefore important to remove these trees only if they pose a hazard to people or buildings.

More information on the benefits of snags can be found at <http://pubs.cas.psu.edu/FreePubs/pdfs/uh065.pdf>.

Invasive Species Management

When choosing trees, there are some out there that you definitely do not want in your parks and forests. These *invasive tree species* can have a negative effect on biodiversity – reducing quality wildlife habitat and outcompeting native plant and animal species.

Invasive species are defined as non-native to the ecosystem under consideration, and cause or are likely to cause harm to the economy, to the environment, and/or to human health.

Some invasive trees include:

- Siberian elm (*Ulmus pumila*)
- tree-of-heaven
(*Ailanthus altissima*)
- mimosa (*Albizia julibrissin*)
- empress/princess tree
(*Paulownia tomentosa*)
- Norway maple
(*Acer platanoides*)
- callery pear (*Pyrus calleryana*)

If you do have these species in your area, consider removing them and replacing them with some of the native trees mentioned previously.



Invasive Species: Tree-of-heaven (*Ailanthus altissima*)

For further information on invasive plant identification and control, visit the following site, www.dcnr.state.pa.us/forestry/invasivetutorial/index.htm.

Also be aware of the many invasive insects and pathogens in Pennsylvania that can wreak havoc on trees, such as hemlock wooly adelgid, *Sirex* wood wasp, gypsy moth, and *Armillaria* root disease. The emerald ash borer and Asian longhorned beetle are insect pests that could potentially kill thousands of trees in the state. These insects can hitch rides in firewood brought in from other states, so visitors should be strongly encouraged to buy wood locally.

For more information on forest pest insects and diseases, go to www.dcnr.state.pa.us/forestry/pests/index.aspx.

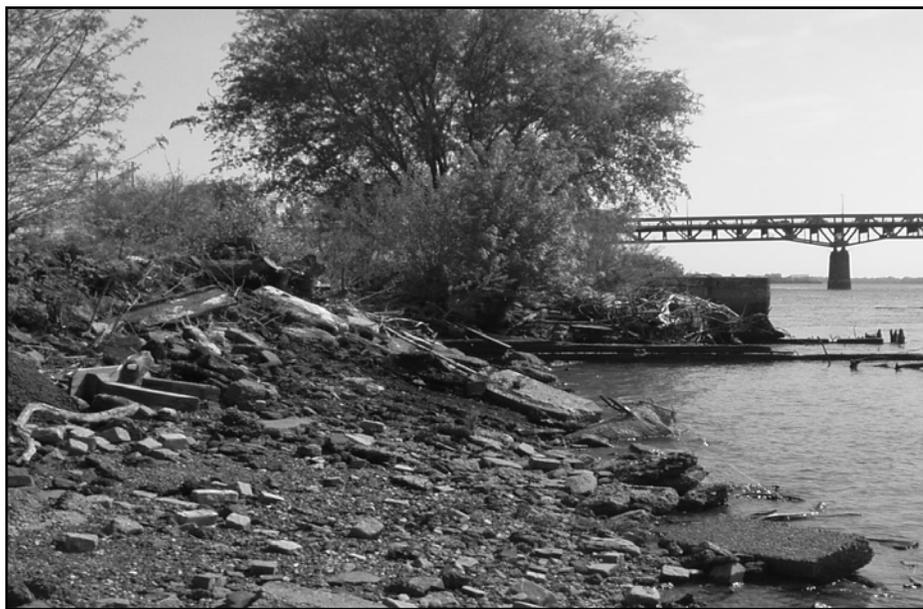
Sustainable Maintenance Practices

Every park and forest should maintain the trees and other vegetation in as environmentally-friendly a manner as possible. In sustainable community parks, doing so will be even more important, as there is a greater focus on creating and protecting habitat. Some of these maintenance practices are included below.

- Test the soil every three years and apply only those nutrients essential for plant growth. Too many nutrients can burn a plant out and encourage invasives.
- Do not use more than three inches of mulch, and do not pile it against a tree's trunk, or the mulch could rot the bark and kill the tree.
- Capture precipitation in rain barrels or cisterns for watering trees and other vegetation.
- Use pesticides only as a last resort, and ensure their proper use, storage, and disposal.

Example from Pennsylvania

One of the examples highlighted in “Sustainable Community Parks” is the Lardner’s Point Park greenway project in Philadelphia. This proposed greenway is part of roughly 300 acres of public open space and parkland, biking and walking trails, and fishing and boating facilities, all along the Delaware River. Lardner’s Point Park is a 5-acre city-owned parcel of land that was once used as a coal storage site. The riverbank is highly eroded and lacks a lot of vegetation (*see photo below*).



Trees will be planted on the highly eroded riverbank.

The Department of Environmental Protection (DEP) provided a Growing Greener grant to begin riverbank restoration in the park. The initial plans called for riverbank forest restoration. However, a large infestation of Japanese knotweed and invasive honeysuckles had to be removed before tree planting could begin (*see photo on right*). Some of the Growing Greener funds went to coordinate a volunteer invasive plant removal and tree planting day, using native trees and shrubs provided by DCNR’s TreeVitalize program.



Japanese knotweed lines the riverbank.

Lardner’s Point Park is an example of how creating a sustainable community park is not without its challenges. The priority of planting native trees was slowed by the extensive infestations of invasive plants along the river, which required many volunteers to remove. However, effective coordination, a dedicated volunteer work group, and a desire to improve the community and its natural resources made this project work, and can be used as a model throughout the state.

In Conclusion

With a few simple changes to design and maintenance practices, parks and forests can find balance between recreational uses and natural resource protection. This balance will provide the surrounding community and environment with many benefits, like cleaner air and water, monetary savings on heating and cooling bills, and protection of biodiversity.

How can you achieve this level of “sustainable community” for your park or forest? For a great start, follow the principles outlined in DCNR’s guidebook, “Sustainable Community Parks”: enhance wildlife habitat; conserve and protect water resources; remove invasives and use native plants when landscaping; use green building materials; reduce the use of chemical fertilizers and pesticides; and get the community involved through volunteer programs and education. Only your imagination and available resources of time and money limit where you go from there.

RESOURCES

American Evergreen Foundation,
www.usagreen.org

American Planning Association, *City Parks Forum*, www.planning.org/cpf/

Audubon at Home,
www.audubon.org/bird/at_home/

Chesapeake Bay Program,
www.chesapeakebay.net

National Wildlife Federation,
Community Wildlife Habitat Program,
www.nwf.org/backyardwildlifehabitat/community.cfm

TLC for Trees,
www.tlfortrees.info/home.htm

U.S. Forest Service, www.fs.fed.us