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## Tips to Create Biodiverse, Urban Communities

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## **Tips to Create Biodiverse, Urban Communities**

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**Abstract:** Urban landscapes dominated by non-native turfgrass and ornamental plants are contributing to the decline of biodiversity in both urban areas and surrounding natural areas. Given that a majority of people now live in and experience nature in urban areas, landscaping recommendations by Extension professionals should focus on practices that conserve native biodiversity. We present alternative landscaping approaches to help conserve urban biodiversity.

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### **Introduction**

Biodiverse communities are residential or commercial developments that conserve or restore land for the benefit of native organisms. Biodiversity includes species diversity, habitat diversity, and genetic diversity. Here, we focus on biodiversity in terms of native species. Native species are plants and animals present within a given area prior to European contact (e.g., Florida Native Plant Society, 2003). Non-native (or exotic) plants or animals are defined as those species that were not present before European contact. Endemic species are native organisms only found in a region and do not occur elsewhere in the world.

This article recommends practices that would conserve and restore biodiversity in urban communities. The tips below can be used for the creation of new, residential communities and also be used for "retrofitting" established yards and neighborhoods.

### **Why Conserve Urban Biodiversity?**

Some may question whether we should care if urban areas affect biodiversity. Biodiversity benefits people in many ways. In terms of a utilitarian value, food, fiber, medicines, and just about everything we use on a daily basis benefit from biodiversity. In addition to material goods, biodiversity provides other ecological benefits, such as clean air and water, recreational, social, and aesthetic benefits, and economic opportunities (Sterling, Bynum, Laverty, Harrison, Spector, & Johnson, 2003).

Social and health benefits are derived from the presence of local habitat and wildlife. From a national survey in 2001, nearly 41.8 million people indicated that they watched birds around their home (U.S. Department of the Interior, 2006). Even the sense of place is linked to the presence of wildlife; for example, over 80% of property owners near lakes in Wisconsin indicated that an element of satisfaction with the place they live was associated with the ability to view wildlife populations (Stedman, 2003). For many, a spiritual value is attached with the natural world. Coined *biophilia*, people regard the natural environment as a source of beauty, inspiration, and rejuvenation (Kellert & Wilson, 1993). Health benefits exist as well. For example, nearby natural areas help to protect children from the impact of life stresses— children with access to natural environments had superior cognitive functioning, fewer physical ailments, and speedier recovery from illness (Wells & Evans, 2003).

## Design and Management Practices for Biodiversity Conservation

For new developments or retrofitting neighborhoods, design, construction, and post-construction considerations are important. The design phase is typically where, among other aspects, lot size and open space are designated and roads are distributed throughout the site.

Next, during construction, built environment professionals (e.g., architects, contractors, and subcontractors) take whatever is on paper and implement this on the ground, constructing homes, streets, waste treatment systems, and landscaped areas (i.e., sections and parks). In the absence of fully trained or engaged contractors or landscapers, many things can happen during this phase that could affect the viability of onsite and nearby natural habitat (Hostetler, Jones, Dukes, Knowles, Acomb, & Clark, 2008). For example, the placement of fill dirt and routes used by heavy construction vehicles could impair the survival of conserved trees. Smothered tree roots may not be able to acquire nutrients, water, and oxygen, causing trees to die.

In post-construction, buyers purchase the homes, move into the community, and manage their homes, yards, neighborhoods, and common areas. It is then the responsibility of residents to manage their homes, yards, and neighborhoods in ways that do not compromise biodiversity conservation. Additional problems can arise if residents are not fully engaged— imagine residents moving in and planting invasive exotic plants in each of their yards.

Urban areas are dominated by non-native plants, such as turfgrass and ornamentals, and such landscaping can affect biodiversity in urban and nearby natural areas (Hostetler & Main, 2010). While an obvious recommendation is to reduce the amount of lawns and ornamental plants, we list other practices that are relevant to biodiversity conservation.

1. Reduce or eliminate the amount of turfgrass lawns. A number of native groundcovers and even low-maintenance (native) ground covers are available (Heflebower, Cerny-Koenig, Waters, & Ward, 2005). Consider mowing the reduced turfgrass area with a reel mower.
2. Plant the appropriate native vegetation. Be sure to inspect your soil and evaluate the shade/sun and water conditions of your site. Select native plants that provide food and shelter for wildlife and insects.
3. Increase vertical height diversity of vegetation. More plant structure between the tops of trees and the ground is beneficial.

4. Identify and remove invasive exotic plants in your yard. When buying an exotic plant, make sure it is not a listed invasive exotic plant.
5. With turfgrass, refrain from managing a total monoculture; allow other plants to coexist with the grass.
6. Reduce or eliminate the use of fertilizers, pesticides, and herbicides. Use integrated pest management techniques.
7. Use low-impact Development techniques, such as rain gardens, natural swales, and pervious pavements. These techniques help to effectively remove nutrients from stormwater runoff.
8. Organize neighborhoods to create larger patches of natural habitat. Many wildlife species need large patches in order to survive.
9. Mange pets responsibly. Do not release pets into the wild, and keep cats indoors and pets on leash because they can affect local wildlife populations.
10. Add wildlife landscaping components such as bird and bat houses, butterfly gardens, and water features to benefit wildlife.
11. Where irrigation is necessary, use smart irrigation controllers such as soil moisture sensors. Overuse of water can draw down local ground water levels, destroying nearby wetlands. Furthermore, over irrigation promotes runoff and nutrients entering waterbodies.
12. When creating a subdivision, conserve natural areas both on individual lots and as open space.
13. Minimize excessive lot clearing and grading. Fill dirt is not "good" soil for even native plants. Stemwall construction is a great way to reduce the use of fill dirt.
14. During construction, implement appropriate practices that protect trees and conserved natural areas.
15. To engage homeowners, have educational programs implemented within a neighborhood (Hostetler, Swiman, Prizzia, & Noiseux, 2008).

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