

BIODIVERSITY FACT SHEET

What is Biodiversity?

Short for biological diversity, biodiversity includes all organisms, species, and populations; the genetic variation among these; and all their complex assemblages of communities and ecosystems. It also refers to the interrelatedness of genes, species, and ecosystems and their interactions with the environment.

Usually three levels of biodiversity are discussed—genetic, species, and ecosystem Diversity.

- Genetic diversity is all the different genes contained in all individual plants, animals, fungi, and microorganisms. It occurs within a species as well as between species.
- Species diversity is all the differences within and between populations of species, as well as between different species.
- Ecosystem diversity is all the different habitats, biological communities, and ecological processes, as well as variation within individual ecosystems.

What are the Threats to Biodiversity?

The loss of biodiversity is a significant issue for scientists and policy-makers and the topic is finding its way into living rooms and classrooms. Species are becoming extinct at the fastest rate known in geological history and most of these extinctions have been tied to human activity.

The greatest threats to biodiversity are:

- Habitat loss and destruction, usually as a direct result of human activity and population growth, is a major force in the loss of species, populations, and ecosystems.
- Alterations in ecosystem composition, such as the loss or decline of a species, can lead to a loss of biodiversity. For example, efforts to eliminate coyotes in the canyons of southern California are linked to decreases in songbird populations in the area. As coyote populations were reduced, the populations of their prey, primarily raccoons, increased. Since raccoons eat bird eggs, fewer coyotes led to more raccoons eating more eggs, resulting in fewer song birds.
- The introduction of exotic (non-native) species can disrupt entire ecosystems and impact populations of native plants or animals. These invaders can adversely affect native species by eating them, infecting them, competing with them, or mating with them.
- The over-exploitation (over-hunting, over-fishing, or over-collecting) of a species or population can lead to its demise.
- Human-generated pollution and contamination can affect all levels of biodiversity.
- Global climate change can alter environmental conditions. Species and populations may be lost if they are unable to adapt to new conditions or relocate.

Why Does Biodiversity Matter to Urban Forests?

Twenty-five percent of U.S. forest resources are located in urbanized landscapes. These “urban forests” provide ecological services of great value to people, including clean air, clean water, cooler temperatures, and public health and economic benefits that lead to healthy and stable neighborhoods.

Local Sponsors

National Sponsors

Contributors





While urban systems are ecologically altered, urban natural resources represent a significant opportunity for supporting biodiversity and global sustainability. City residents and resource managers can play an important role in preserving and expanding species variation in urban landscapes, while reducing the potential for the spread of non-native or invasive plants and insects.

Here Are Ways To Support Biodiversity in Urban Areas:

- **Emphasize the planting of native trees wherever possible.** Urban settings pose special challenges for trees. Hardy street trees must tolerate salt, compaction, limited growing space, inadequate water supply and other factors. However, cities can strive to emphasize native trees wherever possible, especially in park and lawn situations where the growing environment is not constrained.
- **Ask retailers and wholesalers to broaden the supply of native trees available for purchase.** One challenge to planting native trees is the lack of supply and lack of variety for purchase. Seek out opportunities to collaborate with suppliers and retailers and tell them about the kinds of trees you would like to see available in the future.
- **Cultivate appreciation for diversity and native trees in your work with the public.** As resource managers, when we work with the public, we can help shape opinion, perception and acceptance of trees and plants that are unfamiliar to consumers. The organic and local food movement is an example of how persistent education can lead to increased consumer demand for variety in the marketplace.
- **Plan for no more than 10% of one genus to make up a city forest.** Many urban forest managers advocate for 5% or fewer trees representing one genus. Cities with diverse tree canopies are more resilient to catastrophic events such as fire, hurricanes, or invasion by invasive and exotic pests that consume trees. By not relying on too much of any one genus and species, your city is better prepared to manage the cost and devastation of outbreaks such as Dutch Elm Disease or the Emerald Ash Borer.
- **Monitor your city forest.** Cities are ports of entry for invasive and exotic pests, which hitch hike into the country in packing material from imports. Had the Emerald Ash Borer been detected and successfully contained early, as has been accomplished thus far with the Asian Longhorned Beetle, over \$6 billion in estimated losses could have been avoided.
- **Remember the rule of unintended consequences.** If it seems too good to be true, proceed with caution. Trees such as the Bradford pear were introduced with good intentions, but after years of use in the landscape, have proven to be problematic.
- **Consider the forest beyond the city.** Seemingly benign action in the urban landscape can lead to devastating results for forestlands. Like many potentially invasive, non-native plants, Norway maple did not emerge as a problem until many years after its initial introduction. Today this hardy European street tree has spread its seeds to forests, where it crowds out native flora and undermines the diversity and complexity of a healthy forest system.

Where Can I Get More Information?

Alliance for Community Trees, www.actrees.org

Ecological Society of America, www.esa.org

International Society of Arboriculture, www.isa-arbor.com