

The term “urban forests” has come to mean many things from street trees and landscaped parks to fragmented remnants of a forest. While much attention and resources have been directed to street trees and trees as infrastructure in urban environments, we must also focus our attention to patches of forests that remain surrounded by buildings in our cities. These fragmented urban forests are often highly stressed, many even degraded, but still render important ecological services for the human society as well as for wildlife.

What is an urban forest?

A forest is more than a group of trees, but a complex ecosystem. An urban forest may consist of various components and layers.

Soil

A forest ecosystem begins below the soil surface with the deep mineral layers including gravel, sand, silt and clays of the subsoil. Above that, the topsoil mixes mineral soil with organic materials and chemicals derived from plants and animals. The top most layer of forest soil is called humus, the black, crumbly, rich “compost” in which much of the soil life is concentrated.

Mycorrhizae

Mycorrhizae, components of the topsoil and humus, are associations between fungi and plant roots that increase the uptake of water and nutrients in dry, acidic soils.

Litter layer

Litter layer, above the humus, consists of dead leaves, sticks, animal droppings, and other decaying organic material. It helps insulate the soils, traps rainwater and provides habitat for many small animals. Fungi, bacteria

and invertebrates decompose the litter turning it into humus and releasing the nutrients that are taken back up by plants.

Above ground structures

The plants that create the structure of the forest above the soil are arranged, roughly, in layers: these are the herb/seedling, shrub/sapling, sub-canopy, and canopy layers.

Forests of New York City

When Europeans came to North America four hundred years ago, they found great expanses of unbroken forested land. They began to clear this land for timber and agriculture. Today’s remnant forests in New York City have regrown many times over, having been cleared, logged, burned, farmed, grazed, built over and abandoned.

The forests of New York City are particularly diverse since they occur both at the junction of northern and southern climate regions and at the intersection of two different geologic regions. Staten Island, in fact, constituted of four geologic formations and supports a number of rare plants. The forests of New York City are also some of the oldest in the regions since many have not been cut for timber or cleared for farming in over a century and a half. In the city, there are no deer, which often destroy the herbs, shrubs, and seedlings. Because of this, our forests have a very diverse understory.

Challenges to the health of urban forests

Urban forests are highly fragmented. Many are small remnant patches with a very high ratio of open edge to closed



Invasive plants management is critical in maintaining the health of Inwood Hill Park in northern Manhattan.

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canopy interior. This condition makes them highly susceptible to invasion by non-native species. Many of the exotic species were introduced to this country as ornamental or horticultural plants. Some were introduced accidentally in crop seeds.

Invasive plants decrease biodiversity by overwhelming native species. A healthy forest has a very diverse community of trees, shrubs, and herbs. Invasive plants destroy this diversity by crowding out, covering and shading out native herbs, wildflowers, tree seedlings, saplings and shrubs. Most often a degraded urban forest has a ground layer of only two or three weedy herbs rather than dozens found in a healthy forest.

Improper use of forests by people is



This forest has been overtaken by an invasive vine, XXXX, which has replaced native plants in the understory.

another challenge. Biking and hiking off-trail often destroy the herb layer. Without the herb layer, soil washes out with every rainstorm, causing soil to lose its structure and leaching nutrients out of the ecosystem. The eroded soil

often finds its way into streams where it compromises the water quality.

Proper management and restoration of forested parklands and education of the general public as park users are extremely important in maintaining the health of our urban forests. An educated public is particularly important in ensuring adequate funding for management and restoration, directing sound urban forest management policy, and providing volunteers.

For more thorough discussion on this topic, visit the web at our web site (see below) and download “Forest Ecosystems in New York City” and “Historic Context, General Principals and Local Conditions” by Dr. Margaret Gargiullo.

It is important to promote activities that do not damage the plants in the understory. Biking and hiking should only take place on designated trails.

