

Surviving the revolution, easier than withstanding human use and abuse

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Inwood Hill Park survived the drastic modifications of Revolutionary War patriots, but preserving this last bastion of large-growth, mature trees in New York City is difficult with the proliferation of invasive species and hard human use, according to biologists. They suggest the situation warrants a plan in collaboration with those studying the park.

"Performing plantings is a never-ending process unless the causes of plant losses are understood and addressed," says Robert Loeb, associate professor of biology and forestry, Penn State DuBois campus.

"Considering what is known about past species changes in Inwood Park and other New York City parks, the New York City Parks Department Natural Resources Group ecological restoration efforts would benefit from structured, scientific research on plantings survival through partnerships with scientists who have studied the ecology of New York City parks."

Inwood Hill Park, located in uptown Manhattan north of Dyckman Street on the Hudson River and the Harlem Ship Canal, (formerly Spuyten Duyvil) runs east to Payson and Seaman avenues and comprises 196 acres of hilly forest and a small salt marsh. Native Americans lived in the nearby caves before European occupation. Under the Dutch, Jan Dyckman farmed this part of New Amsterdam and planted apple orchards.

Both British and American forces controlled the area at various times during the Revolutionary War and both, to protect troops, practiced

vegetation clearing. After the war, in the first half of the 19th century, estate owners replanted with locally available indigenous plants. In the later half of the 19th century, non-native plants became available and estate owners used them.

Loeb and Judith M. Fitzgerald, lecturer in biology, Lehman College, divided the park into sections and surveyed the vegetation. They compared their findings with those surveys that exist from as early as 1867 and reported them in the most recent issue of the Journal of the Torrey Botanical Society.

Human impact on the park has continued since the Revolution. Although the land did not become a park until 1925, actions to make it one began in 1903 and many owners abandoned maintaining their estates and no information on the vegetation was preserved. The creation of the Harlem Ship Canal destroyed one marsh; debris from subway excavations filled another to create baseball fields in 1938. Later, another marsh became soccer fields.

The Henry Hudson Parkway, which runs through Inwood Hill Park required the felling of many old oak and poplar trees including a 160-year-old tulip poplar in 1935. The New York City Parks Department regularly cleared the underbrush and replanted trees and shrubs beginning in 1925 and ending in the 1960s when budget cuts caused the Parks department to abandon vegetation maintenance. All this human activity changed the face of the park.

Some native species went extinct, while non-native species thrived. Continual cutting of the under layers of the forest caused those plants to die off. Human disturbance killed established plants and soil compaction caused rainwater runoff, eroding the soils. Since the late 1980s, Parks Department workers planted thousands of native trees and shrubs, but many do not survive.

"Today's plantings for the ecological restoration of Inwood Park are similar to private estate plantings done following the American Revolution period which have been decimated by subsequent use and management of the land," says Loeb.

Grants supported plantings, erosion control and other efforts in Inwood Hill Park. These programs do not include funding for maintenance to assure the survival of plantings. Areas where insufficient watering occurs or where herbicides are used to reduce invasive plants become colonized by invasive species.

Currently, "the forest and wetland communities of Inwood Hill Park are more diverse and have a greater structural variation than revealed by previous research," say Fitzgerald and Loeb. However, alien species are spreading in forest canopy gaps in the past 80 years, the number of non-native and invasive plants has tripled. These plants include wineberry, various honeysuckles, rambler rose and oriental bittersweet. In just 20 years, garlic mustard spread from one forest to become the dominant, non-native species in all the Park's forests.

"Considering the results of this research on the long term ecology of the Inwood Park forest, the Natural Resources Group could avoid the problem observed by Spanish-born, American poet and philosopher George Santayana: 'Those who cannot remember the past are condemned to repeat it'," says Robert E. Loeb, professor of biology, Penn State Dubois campus.

The researchers suggest that beside long term monitoring, regular monitoring to assess how the new shrubs, forest canopy and other plantings are doing is essential to ensure the forest survives. They recommend creating a grid system to follow restoration and allow comparisons. Also recommended is monitoring of the effects of herbicides in controlling invasive species. Soil restoration and

maintenance of new plantings are also important, not just in the forest, but also in the marsh.

Source: Penn State

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