



VOLUME 27, NUMBER 1

PUBLISHED BY THE ENVIRONMENTAL LAW INSTITUTE®

JANUARY-FEBRUARY 2005

Urban Legend: Discovering Manhattan's Wetlands

Beneath Times Square, Broadway, and countless famous landmarks in the Big Apple lie the traces of a wetland-filled natural environment that few New Yorkers—or the city's many visitors—would recognize. An innovative landscape ecology program is trying to broaden those horizons.

BY ERIC W. SANDERSON

Anyone involved in wetland policy today knows the dire statistics. The United States has lost more than 50 percent of its wetlands in the last 200 years.¹ Farm states of the Midwest have been particularly hard hit, losing 36 million wetland acres since the 1780s. More than 90 percent of California's salt marshes have disappeared. Scientists have done an admirable job of describing the current trend of wetland destruction in calm, measured terms, and many have offered creative prescriptions for reducing wetland losses. Nonetheless, it is still hard for the American people to understand, in our hearts, what it means for our country to have lost at least 50 percent of our marshes, swamps, and bogs. Where were those wetlands? And what were they like?

Remembering Wetlands

The Mannahatta Project is trying to help folks remember. It seems unbelievable today, but Manhattan Island, the center of New York City, home of the *Today Show*, Broadway, and the New York Stock Exchange, was once home to black bears, lush forests, and sweeping wetlands that covered more than 10 percent of the island. In 1609, when Henry Hudson sailed up the mighty river that borders the island's west side and would one day bear his name, Manhattan was known by the local Lenni Lenape people as "Mannahatta," or the "island of many hills."² Hudson's first mate wrote that the land "was as pleasant with Grasse and Flowers, and goodly Trees, as ever they had seene, and very sweet smells came from them."³

At the Wildlife Conservation Society, a New York conservation organization headquartered in the Bronx Zoo, we want to help people appreciate the loveliness of nature—past, present, and future. We want to give New Yorkers a natural place that they can love as their very own. Through the Mannahatta Project, we are attempting to reconstruct the landscape of Mannahatta as the Native Americans, bears, trees, and *Spartina alterniflora* wetland grasses knew it in 1609, when they saw a strange winged beast—Hudson's ship, the *Half Moon*—sailing into the New York harbor.

The secret to Mannahatta is an old map, the *British Headquarters Map*,⁴ circa 1782, created by the British while they

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occupied New York during the American Revolution. The British held New York City and adjoining areas from the fall of 1776 through the end of the war in late 1783. They had eight years to prepare defenses against the major attack that never came, and drafted hundreds of maps on which they traced fortifications and potential avenues of attack. But the British military cartographers recorded more than roads and forts—they also mapped Manhattan's original shoreline, its hills and valleys, and its extensive marshes and wetlands, all at a scale of 6 inches to 1 mile. Today, when our landscape ecologists look at the headquarters map, the central repository for the data collected by those cartographers, the physical outlines of a landscape nearly lost emerges beneath sketches of earthworks and lines of defense.

Forensic Ecology

We have georeferenced the headquarters map to Manhattan's modern street grid with an average accuracy of 40 meters, allowing us to place map features within approximately one-half block of their modern locations. In the geographic information system we have created, streams flow down streets, ancient hills rise in Midtown, and wetlands of many kinds are scattered across the island. By closely studying the map's features, reviewing the surprisingly deep natural history legacy of Manhattan, and applying modern ecological knowledge, project researchers are beginning to build this historical landscape up from its roots in soil, rock, and water, to the landscape level, delineating the forests, streams, meadows, and wetlands that once graced the island.

Mannahatta was as remarkable for its biological diversity in the 1600s as the area is for cultural diversity today. When the community types described in the state of New York's ecological community guide⁵ are applied to the island as it was during the British occupation, 45–55 different ecosystems appear to have once existed there, including near-shore eelgrass beds, high and low salt marshes and ponds, herbaceous freshwater marshes, shrub swamps, red maple swamps, and Atlantic cedar bogs. New York City occurs at a profound biological crossroads, at the extremity of the last glaciation, straddling the boundary between the northern boreal and southern subtropical floras, temperate in climate, situated in a deep-water estuary, receiving the waters of a major inland river system, and located on the Atlantic flyway for migratory birds. Manhattan Island is truly one of earth's blessed places.

When the Dutch settled Manhattan in the 1620s, they were drawn to the low-lying hills and wet meadows in the lower part of the island. Beaver Street, Broad Street, and Maiden Lane in lower Manhattan mark small streams that drained the slightly higher hills of Broadway and Wall Street. Just south of where the Brooklyn Bridge stretches across the East River today, a shrub swamp, later called "Kripplebush" for its thick growth of tangled brambles, filled a small valley. The marshes to the north of the present-day bridge were known for their snipes and other "fly-about," and good hunting could be found along a nearby stream that flowed gently into the East River.

This same area had been popular with the Lenni Lenape, the "Ancient Ones" of Algonquin culture, for hundreds of years. The Lenni Lenape had a camp on the Collect Pond, a large kettle pond that filled the blocks behind the old city courthouse, not far from Foley Square. The pond was fed by underground springs and produced

clean, clear water for millennia before Hudson's visit, and for about 200 years afterward. In the evenings, the small amphitheater of hills that surrounded the Collect echoed with the love songs of frogs. A neighboring hill was covered by so many clam and oyster shells that the Dutch came to call it the "Kalck-Hoek," or the lime-shell point.⁶

In the 1700s, the Collect became highly polluted by nearby tanning operations. The city began filling the pond in 1800 and theoretically completed this effort in 1811. However, the rotting vegetation and other poor-quality fill the city used led to subsidence under buildings built over the old pond, and filled the air with a stench that drove away all but the poorest residents. The neighborhood became known as Five Points, named after the five streets that met above the buried lake. It was New York's most renowned slum of the era, recently popularized in the movie *Gangs of New York*.

The Collect originally drained eastward through the "fly-about" marshes and also westward to the Hudson River, creating a green corridor of fresh and saltwater marshes across the southern part of the island. A nineteenth-century description noted that

In seasons of heavy rains almost the whole district was flooded and in winter acres of its surface were traversed by skaters. . . . During the dry season this region provided important pastureland. . . . Boys fished in the creeks or regardless of the brambles waded through the swamps in search of bull-frogs and water snakes, joint inhabitants with the snipe and woodcock . . . while girls gathered berries and cattails.⁷

One can easily imagine the deer and elk of an earlier time, browsing in the twilight, wary of the passing Lenape hunter and the mountain lion. The marshes the author describes were ditched in the 1730s to provide better pastureland, and the central canal down the middle would later give its name to Chinatown's Canal Street.

The East River provided sheltered tidal waters for salt marshes, and must have been a welcome sight for the hundreds of thousands of shorebirds that once migrated up and down the Atlantic coast. Extensive salt marshes stretched behind a thin, sandy barrier beach from today's Williamsburg Bridge north to 12th Street, filling a goodly portion of the Lower East Side. Salt marshes also lined the East River's opposite shore, in Wallabout Bay, Brooklyn, and stretched further north into Queens. These wetlands interlaced with tidal channels that stretched northward 15 blocks from Gracie Mansion, the official residence of the mayor, located at a bend in the East River on East End Avenue, and as far inland as today's Harlem Meer, an 11-acre constructed lake in the northeast corner of Central Park.

A broad inlet broke these marshes at about 106th Street; the tract just to the north of the inlet was called Otter-spoor by the Dutch, who named it after the river otters that once sported there.⁸ The northern tip of the island, which retains the name "Inwood" to this day, was softened by salt marshes that surrounded its tall forested hills. The Round Meadow of Sherman Creek, and the extensive marshes of Papperimemin, wrapped themselves around the northern promontory of Marble Hill, where the white marble for which Inwood is known still peaks up from the earth. At low tide, these

northern marshes provided a soggy bridge for animals traveling to and from the mainland.

The marshes, woods, and cold spring waters of northern Manhattan were the site of Shorakapkok, a village home to a small community of Lenape.⁹ The Lenape people had many settlements on the island, which they used in seasonal rounds of fishing, hunting, and planting.¹⁰ One of their largest planting fields, Sapokanikan (translated as “wet field” or “tobacco plantation”), was located in today’s Greenwich Village.

Sandy beaches on deep blue waters dominated the Hudson River shore, extending from Chelsea in lower Manhattan north to Midtown. At 42nd Street, a salt marsh surrounded a small sandy hill and provided what must have been ideal habitat for diamondback terrapin. Several small streams and creeks emerged from springs at the center of the hilly island, dancing down to the Hudson through riparian strips and slow-

helping people understand what nature is all about and personally invest in its preservation and restoration.

The first “New Yorkers,” the Lenape, cared about Mannahatta’s natural environment because they understood that its abundance provided their food, their water, and all the things they needed to build their shelters, raise their families, and honor their communities. The salt marshes were nurseries for fish they caught in the harbor and rivers. Every fall the marshes contributed subsidies of nutrient-rich green material to the harbor and surrounding waterways, providing the base for the local marine food web and directly contributing to the seemingly endless supply of oysters, clams, and mussels. Marshes all over the island buffered flooding, slowed rushing waters, recharged aquifers, and filled springs with water. Wetlands held soil on the island, slowing erosion. These wetlands were filled with animals that supported magnificent hunts and rich traplines: deer, elk, bears,



The first image is a segment of the British Headquarters Map that shows the wetlands of the Lower East Side.



The second image shows the same map segment with an overlay of today's modern road network.

waltzing through reedy marshes and tree-lined swamps. The island’s center, in particular the hills and valleys that became Central Park, was wet and boggy; the headquarters map shows that this area was filled with coniferous trees, probably Atlantic cedar—a unique ecological community type much missed in modern times.

Realizing Urban Life’s Environmental Roots

This account is meant to show New Yorkers and the millions who visit the city each year that there is a direct link between the geography city-dwellers know so well—their own backyards, offices, townhouses, and favorite restaurants—and a far less familiar, natural and wild place. This “history before the history” isn’t taught in most books about New York. Manhattan as a wild environment is a basically unknown concept, but we believe that introducing this concept to the public is the crux of

beavers, muskrat, ducks, geese, curlews, plovers, and pigeons—not the rock doves from Gibraltar that populate the city today, but an abundance of passenger pigeons unknown in recent times.

Of course, the Dutch, the British, and all the others who came to North America a few short centuries ago held different views about Manhattan’s potential. Within 25 years of Dutch settlement—just one generation—the Lenape had largely abandoned the island they loved, driven out by the too-familiar sequence of disease, war, and exhaustion. As settlement and growth progressed, Manhattan’s wetlands were increasingly used as dumping grounds, and were the perceived and actual sources of disease, barriers to growth, and eventually the uncertain foundations of an urban landscape that filled, paved, and built over them. The island’s wetlands today have been reduced to a small bit of salt marsh at Sherman Creek, a tributary of the Harlem

River in upper Manhattan, and the reclaimed marshes at Inwood. A few streams still flow in some parks, sometimes supplemented by a tap that brings water from the Catskills Mountains, 200 miles away. A few wetland plants linger on, and many of the smaller things persist—dragonflies, bees, grubs, and some hardy lichens and mosses.

Manhattan is, after all, a small place. In the scheme of things, some local places will be sacrificed to the arc of history and the ambitions of the human race. The problem occurs when *all* the local places are gone or vanishing, and we are impoverished because we have forgotten the value these natural areas once gave our lives. This is precisely why wetland scientists and advocates press on, using measured position papers, detailed scientific articles, and books and lectures to bring attention to our country's ongoing wetland losses.

Fortunately, the living earth can be amazingly resilient when given half a chance. Some remarkable wetland restoration and conservation

protective public policy that has made it possible for wetlands, and the species that depend on them, to do their work. Few people, even the staunchest proponents of unlimited economic growth, desire that all wetlands be extinguished in the name of development. Most people generally believe that retaining wetlands, allowing them to recycle water, soil, and nutrients and provide a home to wildlife, is in the best interest of ourselves, our communities, and our country. What that receptive public needs now is a more concrete vision, a picture of what a world with wetlands is like, so that people can invest in the vision and actively encourage policymakers to protect and restore wetland areas. And as people interested in protecting wetlands, we need to go beyond our measured language and provide that engaging vision, showing Americans that a country with wetlands can be wealthy, productive, and full of life—just like Mannahatta. ■

—Eric W. Sanderson is associate director of the Landscape Ecology and Geographic Analysis Program at the Wildlife Conservation Society, headquartered in New York City's Bronx Zoo. Mr. Sanderson has a Ph.D. in ecology, with an emphasis on ecosystem and landscape ecology, from the University of California, Davis, and his research interests include applying landscape ecology to conservation problems and the historical and geographical context of conservation.



The third image is an aerial photo of the Lower East Side, taken in 1990, with the wetlands and other natural features in the map superimposed.

stories come directly from New York. Not long ago, only one generation past, the New York harbor was nearly dead, killed by a long assault of poisons, sewage, and overuse. Now, most metrics show that water quality and wildlife health are dramatically improving, though they still have far to go.¹¹ Though the wetlands of Mannahatta have mostly vanished, the outer boroughs—Queens, Brooklyn, the Bronx, and Staten Island—still have remnant salt marshes and freshwater wetlands, and even wildlife sanctuaries.¹² None of these habitats are perfect—all have been affected by sea level rise, pollution, and introduced species, among other problems—but they at least offer us something to work from.

The larger point is that such small successes have been possible not only because of the goodwill and hard work of New Yorkers, but because the American public has supported environmentally

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