

# URBAN FOREST ON 14<sup>TH</sup> STREET

Fourteenth Street stretches two miles straight across Manhattan from the Hudson River to the East River and so provides an ideal sample area—a transect—for surveying Manhattan's nature.

2009

Today this area is ecologically characterized as a 'Terrestrial Cultural' subsystem, meaning that it is created and maintained by human activities, or is substantially different from the character of the community as it existed prior to heavy human influence. Specific environments found all along 14<sup>th</sup> Street:

**PAVED ROAD/PATH:** a road or pathway that is paved with asphalt, concrete, brick, stone, etc. There may be sparse vegetation rooted in cracks in the paved surface.

**URBAN STRUCTURE EXTERIOR:** the exterior surfaces of metal, wood, or concrete structures (such as commercial buildings, apartment buildings, houses, bridges) or any structural surface composed of inorganic materials in an urban or densely populated suburban area. These sites may be sparsely vegetated with lichens, mosses, and terrestrial algae; some plants may grow in cracks. Nooks and crannies may provide nesting habitat for birds and insects, and roosting sites for bats. Characteristic birds include common nighthawk on rooftops, American robin on porches or under shelter, and exotic birds such as rock dove and house sparrow.

**BASEMENT/BUILDING FOUNDATION:** the biota of an underground structure that was built primarily as a support structure for a house, commercial building, or industrial building. This includes foundations of abandoned structures, as well as those that are actively used. Characteristic animals include a wide variety of insects and small vertebrates.

**SEWER:** the biota of a subterranean conduit constructed to carry off sewage and sometimes runoff from an urban or developed area. A characteristic rodent is the Norway rat.

**TUNNEL:** the biota of a subterranean passageway constructed to allow transportation routes to pass through rock or earth obstructions or underground, including tunnels for roads, footpaths, highways, railroads, and subways. Water-filled tunnels such as aqueducts and culverts are tentatively included here.



PEDESTRIAN & BIKE PATH

The Manhattan shoreline is not directly accessible on foot here, though there is the west side walking/biking path along the shore. Vehicle traffic is tricky for pedestrian crossing. Hudson River Park provides a nice island in the traffic.

HUDSON RIVER PARK



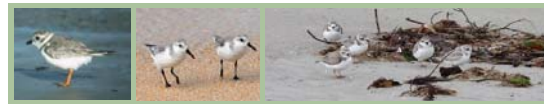
1609

Four hundred years ago, when Henry Hudson first encountered the island, it housed radically different ecological communities. The Mannahatta Project used old maps, known environmental factors, and ecological relationships to define what these communities are likely to have been. The map and descriptions below describe these communities for 14<sup>th</sup> Street. For more information see [www.themannahattaproject.org](http://www.themannahattaproject.org).

Ecological communities and landmarks from the 1609 era are color-coded and described here.

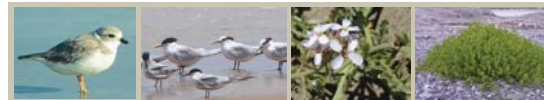


**MARINE DEEPWATER** is a broadly defined community that includes both quiet and rough waters of the open ocean below the lowest tide level and beyond the limits of vegetation. This community includes all bottom-dwelling species, as well as species in the overlying water column.



**MARINE GRAVEL/SAND BEACH** is washed by rough, high-energy waves, with sand or gravel that are well-drained at low tide. These areas are subject to high fluctuations in salinity and moisture. A relatively low diversity community. It provides feeding grounds for migrant and breeding shorebirds such as sanderling and plover.

1609 SHORELINE



**MARITIME BEACH** has extremely sparse vegetation that occurs on unstable sand, gravel, or cobble ocean shores above mean high tide, where the shore is modified by storm waves and wind erosion. Characteristic species include beachgrass, sea-rocket, seaside and seabeach atriplex, seabeach sandwort, salsola, seaside spurge, and seabeach knotweed. This community is an important nesting ground for birds such as piping plover, and terns.

COASTAL OAK-PINE FOREST

OAK-TULIP TREE FOREST





**THE HIGHLINE**

An elevated park created on the remnants of train tracks originally used for transport of goods (mainly meat) in this historic Ganesvoort District.

**10<sup>TH</sup> TO 9<sup>TH</sup> AVENUE:** largely commercial/industrial with few human residences, low pedestrian traffic, 13 trees and little other flora or fauna. The 9<sup>th</sup> Avenue bike path crosses the open area where 9<sup>th</sup> Avenue and Hudson Street intersect, where public tables, seating and planters have been introduced.



**OUR LADY OF GUADALUPE**



**VEGETATION**

**HUDSON STREET TO 8<sup>TH</sup> AVENUE:** Highly human-residential, 18 trees, and little other flora or fauna.

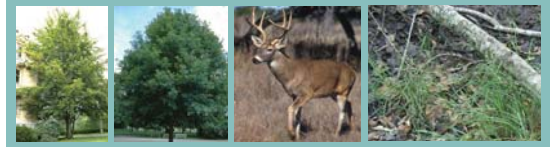
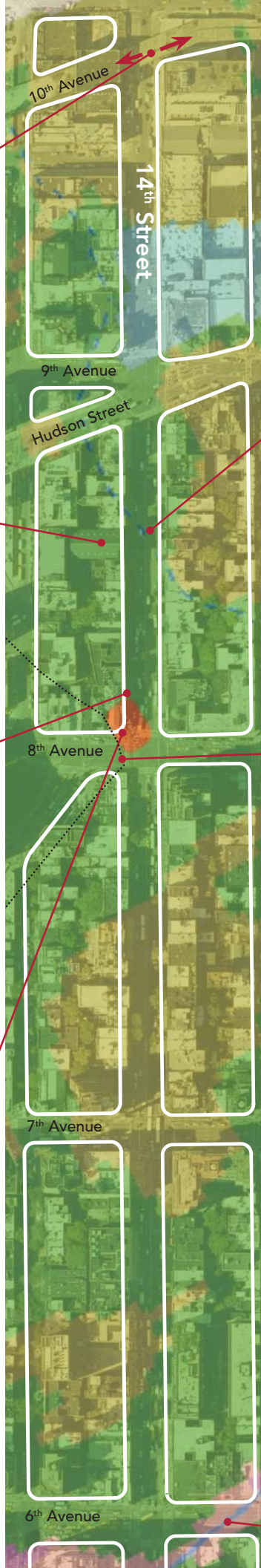


**NICKEL SPA FOR MEN**

**8<sup>TH</sup> AVENUE:** Major traffic thoroughfare, including the A,C,E subway station. Pedestrian traffic much more frequent—about 100 people counted in 5 min.

**8<sup>TH</sup> TO 7<sup>TH</sup> AVENUE:** Highly human-residential, 16 trees, and little other flora or fauna.

**7<sup>TH</sup> TO 6<sup>TH</sup> AVENUE:** Highly human-residential, 17 trees, and little other flora or fauna. More institutional and commercial land use than in previous two blocks.



**COASTAL OAK-BEECH FOREST** is a hardwood forest with oaks and beech codominant that occurs in dry well-drained, loamy sand. Some occurrences are associated with maritime beech forest. Beech can range from nearly pure stands to as little as about 25% cover. The forest is usually codominated by two or more species of oaks usually black oak and white oak. There are relatively few shrubs and herbs. Characteristic groundlayer species are Swan's sedge, Canada mayflower, white wood aster, beech-drops, and false Solomon's seal. Characteristic fauna include white-tailed deer.

**INTERMITTENT STREAM**



**COASTAL OAK-PINE FOREST** is a mixed forest that occurs on sandy soils, sandy ravines in pine barrens, or on slopes with rocky soils that are well-drained. The canopy is dominated by a mixture of oaks and pines. The oaks can include: black oak, chestnut oak, red oak, white oak, and scarlet oak. The pines are either white pine or pitch pine. Red maple, hemlock, beech, and black cherry are common associates occurring at low densities, and the shrublayer can contain blueberries and black huckleberry.

**LENAPE TRAIL**

**LENAPE ENCAMPMENT**

This Lenape habitation may have had 4 wigwam shelters and about 15 people, and likely varied depending on time of year. The overall Lenape population on the island is estimated to have been 300-1200 individuals.



**OAK-TULIP TREE FOREST** is a mesophytic hardwood forest that occurs on moist, well-drained sites. The dominant trees can include: red oak, tulip tree, beech, black birch, red maple, scarlet oak, black oak, and white oak. There is typically a subcanopy stratum of small trees and tall shrubs dominated by flowering dogwood; common associates include witchhazel, sassafras, red maple, and black cherry. Common low shrubs include maple-leaf viburnum, northern blackberry, and blueberries.



**SHALLOW EMERGENT MARSH** occurs on mineral soil or deep muck soils that are permanently saturated and seasonally flooded. Most abundant herbaceous plants include bluejoint grass, cattails, sedges, marsh fern, manna grasses, spikerushes, bulrushes, threeway sedge, sweet-flag, tall meadow-rue, marsh St. John's-wort, arrowhead, goldenrods, eupatoriums, smartweeds, marsh bedstraw, jewelweed, loosestrifes, and numerous other plants and shrubs. Amphibians can include frogs such as eastern American toad, northern spring peeper, green frog, and wood frog; and salamanders such as northern redback salamander. Birds can include red-winged blackbird, marsh wren, and common yellowthroat.

**MARSHY HEADWATER STREAM**



**STARBUCKS**

**6<sup>TH</sup> TO 5<sup>TH</sup> AVENUE:** Very human-residential, with about double the residences of the previous block. 21 trees, and little other flora or fauna. Increasing commercial use and pedestrian traffic, with about 230 people counted in 5 min.

**DUANE READE**

**5<sup>TH</sup> TO UNION SQUARE WEST:** Highly human-residential, 15 trees, and little other flora or fauna. About 135 people counted in 5 min.



**WHOLE FOODS MARKET**

**UNION SQUARE WEST TO 4<sup>TH</sup> AVENUE:** Highest pedestrian density along 14<sup>th</sup> Street, with about 375 people counted in 5 minutes. Minimal to no human residences; primarily park and commercial use in these two shorter blocks. Many trees in park, highest incidence along 14<sup>th</sup> Street of birds, animals, and vegetation.



**UNION SQUARE PARK**

A farmer's market operates here throughout the year on Mon, Wed, Fri and Sat.

**BIRDS COMMONLY SEEN IN UNION SQUARE PARK**

- EUROPEAN STARLING** - native to temperate Europe and western Asia
- AMERICAN ROBIN** - native to North America
- BLUEJAY** - native to North America
- NORTHERN MOCKINGBIRD** - native to North America
- CATBIRD** - native to North America
- MOURNING DOVES** - native to North America
- VARIOUS COMMON SPARROWS** - generally native to Europe and Asia
- ROCK DOVE (AKA PIGEONS)** - native to Europe, North Africa and western Asia

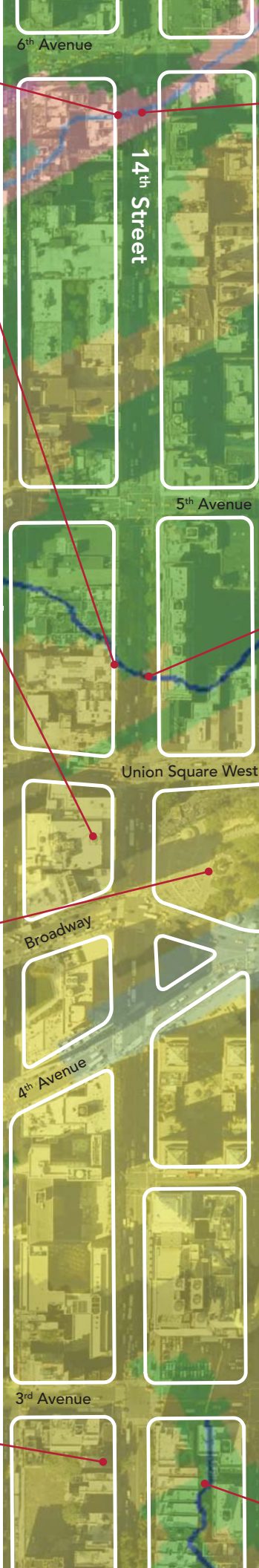
**4<sup>TH</sup> TO 3<sup>RD</sup> AVENUE:** Mixed-use block with high-rise residences, office buildings, and large stores. 9 trees.



**VACANT LOT**

Most vegetation in block.

**3<sup>RD</sup> TO 2<sup>ND</sup> AVENUE:** Mostly residential and small commercial. 10 trees.



**SHALLOW EMERGENT MARSH**

**MARSHY HEADWATER STREAM**



**COASTAL OAK-PINE FOREST**



**OAK-TULIP TREE FOREST**

**ROCKY HEADWATER STREAM**



**CHESTNUT OAK FOREST** is a hardwood forest that occurs on well-drained sites in glaciated portions of the Appalachians, and on the coastal plain. Dominant trees are typically chestnut oak and red oak. Common associates are white oak, black oak, red maple, and American Chestnut. Characteristic shrubs are black huckleberry, mountain laurel, and blueberry. Common groundlayer plants are Pennsylvania sedge, wild sarsaparilla, wintergreen, and cushions of moss.



**COASTAL OAK-HICKORY FOREST** is a hardwood forest with oaks and hickories codominant that occurs in dry well-drained, loamy sand of knolls, upper slopes, or south-facing slopes of glacial moraines. The forest is usually codominated by two or more species of oaks, usually white oak, black oak and chestnut oak and scarlet oak. Mixed with the oaks are one or more of the following hickories: pignut, mockernut, and sweet pignut. There is typically a subcanopy stratum of small trees and tall shrubs including flowering dogwood and highbush blueberry. The shrublayer and groundlayer flora may be diverse. Characteristic animals include eastern towhee, vireos, woodpeckers, and white-tailed deer.

**ROCKY HEADWATER STREAM**



BEAUTY BAR; BLIND PIG FINE FOOD & SPRITS

NEW YORK EYE & EAR INFIRMARY

2<sup>ND</sup> TO 1<sup>ST</sup> AVENUE: Mixed residential and institutions.



STUYVESANT TOWN

1<sup>ST</sup> AVENUE TO AVENUE C: Higher incidence generally of vegetation, with 198 trees. Stuyvesant Town; 80 acres of apartment complex in park-like setting, named for Peter Stuyvesant, whose farm occupied the site in the 1600s. Peter Stuyvesant was the last Dutch Director-General of the colony of New Netherland from 1647 until it was ceded provisionally to the English in 1664. Among the projects built by Stuyvesant's administration were the protective wall on Wall Street, the canal that became Broad Street, and Broadway.

PSYCHIC ADVISOR; KENNEDY FRIED CHICKEN; OTTO'S SHRUNKEN HEAD TIKI BAR & LOUNGE

SUN'S LAUNDRY; TRINITY STAR UNISEX SALON



VEGETATION

10 MOST COMMON STREET TREES IN NYC

-  **NORWAY MAPLE** - native to eastern and central Europe and southwest Asia
-  **RED MAPLE** - native to eastern North America
-  **SILVER MAPLE** - native to eastern North America
-  **GREEN ASH** - native to eastern North America
-  **HONEYLOCUST** - native to eastern North America
-  **LITTLELEAF LINDEN** - native to eastern North America
-  **CALLERY PEAR** - native to China
-  **PIN OAK** - native to eastern North America
-  **LONDON PLANETREE** - hybrid of the Oriental Plane and the American Plane, first recorded in Spain in the 17<sup>th</sup> century
-  **GINKGO** - native to China, a unique species of tree with no close living relatives

PEDESTRIAN ACCESS ENDS WITH CON EDISON GATE



**EUTROPHIC POND COMMUNITY** is the aquatic community of a small, shallow, nutrient-rich pond. The water is usually green with algae, and the bottom is mucky. The water is murky, with low transparency, and is rich in plant nutrients (especially high in phosphorus, nitrogen, and calcium), and has a weedy shoreline. Species diversity is typically high. Characteristic plants include coontail, duckweeds, waterweed, pondweeds, water starwort, bladderworts, naiad, tapegrass, algae, yellow pond-lily, and white water-lily. Leeches, plankton and other invertebrates and fishes are found; and characteristic animals of flow-through ponds may include beaver.

ROCKY HEADWATER STREAM

OAK-TULIP TREE FOREST

COASTAL OAK-HICKORY FOREST

COASTAL OAK-PINE FOREST

TIDAL CREEK



**SALT SHRUB** is a shrubland community that forms the ecotone between salt marsh and upland vegetation. Salinity levels are generally lower here than in the salt marsh and the elevation is higher. Characteristic shrubs are groundsel-tree, saltmarsh-elder, and pasture rose; salt-meadow grass, black-grass, and switchgrass are typical herbs. The landward side of salt shrub is usually the most diverse. A characteristic animal is marsh wren.



**HIGH SALT MARSH** is a coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide up to the limit of spring tides, and is periodically flooded by spring tides and flood tides. High salt marsh typically consists of a mosaic of patches that are mostly dominated by a single grassy species, such as either salt-meadow grass or a dwarf form of cordgrass; also common are large areas dominated by spikegrass, black-grass, and glassworts, or a mixture of salt-meadow grass and cordgrass. Characteristic species of the upper slope of the high marsh are blackgrass, switchgrass, sea-lavender, seaside gerardia, and slender saltmarsh aster. Characteristic animals include salt marsh mosquitoes, greenhead flies, coffeebean snail, sharp-tailed sparrow, marsh wren, eastern meadowlark, clapper rail, and American black duck. High salt marsh is one zone within a coastal salt marsh ecosystem.

1609 SHORELINE

MARINE INTERTIDAL MUDFLAT

MARINE EELGRASS MEADOWS





#### CON EDISON

The six-story boilers installed at 14<sup>th</sup> Street and East River were opened in 1926 with a 100,000 horsepower turbine generator. Today, Con Edison delivers electricity to more than three million customers through the world's largest system of underground electric cables, 94,000 miles, and 36,000 miles of overhead electric wires.

#### LOOK FOR FOREST & STREAM SIDEWALK LABELS ON OCTOBER 24<sup>TH</sup> (RAIN DATE: OCT 25)

In a collaboration with Art in Odd Places project 'Unfixed/Unfixable' artist Nicholas Fraser ([www.nicholasfraser.com](http://www.nicholasfraser.com)), ephemeral text drawings installed on the south sidewalk of 14<sup>th</sup> street will indicate the location of natural features from 1609 as described on this map.

*Urban Forest on 14<sup>th</sup> Street* was compiled and designed by Heidi Neilson ([www.heidineilson.com](http://www.heidineilson.com)).



Presented by Art in Odd Places 2009: SIGN, an annual festival exploring the odd, ordinary and ingenious in the spectacle of daily life ([www.artinoddplaces.org](http://www.artinoddplaces.org)).

Historical reconstructions were from the Mannahatta Project ([www.themannahattaproject.org](http://www.themannahattaproject.org)) at the Wildlife Conservation Society ([www.wcs.org](http://www.wcs.org)). Read more in Eric Sanderson's *Mannahatta: A Natural History of New York City* (Abrams, 2009).

Descriptions of ecological communities were taken from *Ecological Communities of New York State, Second Edition*, Edinger, G.J., et al., 2002, New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY ([www.dec.ny.gov/animals/29392.html](http://www.dec.ny.gov/animals/29392.html)).

Building types were found through the Open Accessible Space Information System Cooperative (OASIS NYC) ([www.oasisnyc.net](http://www.oasisnyc.net)).

The list of most common street trees was compiled from a 2005 NYC Street Tree Census by the City of New York Department of Parks and Recreation ([www.nycgovparks.org/sub\\_your\\_park/trees\\_greenstreets/treescount](http://www.nycgovparks.org/sub_your_park/trees_greenstreets/treescount)).



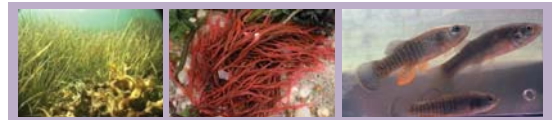
East River



**LOW SALT MARSH** is a coastal marsh community that occurs in sheltered areas of the seacoast, in a zone extending from mean high tide down to mean sea level or to about 6 ft below mean high tide, and is regularly flooded by semidiurnal tides. The vegetation of the low salt marsh is a nearly monospecific stand of cordgrass, a coarse grass that grows up to about 3 m (10 ft) tall. A few species of marine algae can form dense mats on the surface sediments between the cordgrass stems, including knotted wrack, and rockweed; sea lettuce, and hollow green weeds can be abundant, especially in early summer. Characteristic animals include clapper rail, willet, marsh wren, seaside sparrow, fiddler crabs, ribbed mussel, and at high tide mummichog, and several other small fishes that live in the tidal creeks at low tide.



**MARINE INTERTIDAL MUDFLAT** is a community of quiet waters, with substrates composed of silt or sand that is rich in organic matter and poorly drained at low tide. The substrate may be covered with algae. Characteristic organisms are polychaetes, mudsnail, softshell clam, and blue mussel. This community is an important feeding ground for shorebirds such as American oystercatcher, and willet.



**MARINE EELGRASS MEADOWS** has subtidal aquatic beds dominated or codominated by eelgrass and typically occurring in quiet shallow salty waters of temperate tidal embayments below the lowest tide level where fluctuations in salinity are minor. Characteristic associated plants include a diverse array of attached and unattached marine algae. Rooted red algae are especially common including graceful red weed, tubed weed, Grinnell's pink leaf, Agardh's red weed, pod weed, banded weed, and rough tangle weed. Abundant marine algae include barrel weed and tubed weed. Characteristic animals include fish such as fourspine stickleback, mummichog, northern pipefish, threespine stickleback, silversides, naked goby, menhaden, winter flounder, and northern puffer, marine mollusks such as bay scallop, common Atlantic slipper-shell, and northern quahog, crustaceans such as nine-spine spider crab, mud crabs, and broken-back shrimp, and other marine invertebrates such as short-spine brittle star, bamboo worms, and counterclockwise coiled worm. Comb jellies are common plankton species. Waterfowl known to extensively feed on eelgrass include brant and American black duck.