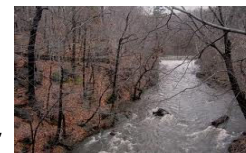


# THE NEW YORK BOTANICAL GARDEN

## Outdoor Self-Guided Visit: *Bronx River Walk*

### TEACHER GUIDE

Welcome to The New York Botanical Garden! What factors characterize our 50-acre native forest ecosystem? Conduct an ecology field study with your students as you navigate a self-guided visit through the forest and along the Bronx River. Use the information in this walking guide and the accompanying reproducible Student Field Guide to help connect students to an amazing natural resource in the city. *Recommended for use for grades 2—8.*



### ABOUT THE BRONX RIVER

The Bronx River, originally called "Aquehung," or "River of High Bluffs," by the Native Americans who lived and fished along it, begins near the Kensico Reservoir in Valhalla, N.Y. (Westchester County). The river winds 23 miles south through the Bronx, eventually emptying into the East River. It is the only fresh water river in New York City (the Hudson and East Rivers are tidal estuaries).

In Bronx County, the Bronx River flows for eight miles through various neighborhoods including Muskrat Cove, Bronx Park, NYBG, The Bronx Zoo, West Farms, Starlight Park, Concrete Plant Park, Hunts Point, and Soundview.

The Bronx River did not always flow through the Garden. Seven hundred million years ago this area lay at the bottom of a sea. Four hundred million years ago it was a chain of lofty peaks. Over the last 1.8 million years, four major glacial periods have occurred, each one covering the region with ice tall enough to bury most Manhattan skyscrapers. The last glacier receded 17,000 years ago, changing the course of the Bronx River, which once flowed farther north. As the massive ice sheets retreated, they dropped enough debris to divert the river to a gorge. Through time, the river has enlarged the gorge, producing the cliffs you see when you visit.

In the early 1600s the Bronx River was used for the purpose of powering mills with water power and continued into the 18th century. In 1792 Pierre II and George Lorillard purchased a dam, mill, and water rights on the Bronx River in the place that is now part of the Garden. The Lorillard family built two more mills and used the water power for grindstones which turned tobacco into a product called snuff. Snuff powder was

either tucked between the lip and gum or sniffed into the nasal cavities and was a fashionable habit during the times. You will see the original Snuff Mill on the riverbank during your *Bronx River Walk*. It is now known as the Lillian and Amy Goldman Stone Mill. Despite their industry, the Lorillards did little to alter the forested riverbanks and were the original stewards to this valuable resource until passing ownership to the Garden in 1895.

The waterfall you will see was the original industrial dam that the Lorillard family purchased. After the Garden assumed ownership of the forest and river, large boulders were piled against the downstream face of the dam in order to give it the more natural character of a Catskills waterfall than the artificial appearance of a mill dam.

### ABOUT THE FOREST

The Thain Family Forest, which borders the Bronx River to the west in the Garden, is a 50-acre native, old-growth forest. Much of New York City was once covered by forest such as this. When you walk through this forest, you will walk along Native American hunting trails; see marks left by glaciers, and pass under trees dating back to the American Revolution.

For thousands of years, this old-growth forest has changed, adapted, and survived. In its position next to the river, the forest serves as a floodplain, a natural sponge that absorbs and filters the river's overflow during periods of heavy precipitation, thus decreasing flooding in nearby areas of the Bronx and improving water quality. Floodplains also support diverse communities of plants and animals well-adapted to the river's periodic flooding.

### PLANTS AND ANIMALS

Some **animals** you might find in the Forest and along the Bronx River:

#### In the Trees:

- Great Horned Owl
- Red-tailed Hawk
- Northern Saw-Whet Owl

#### Near the River:

- Beaver (first wild beaver known to return to the City in over 200 years) Look for beaver-eaten trees!
- Muskrat (active in early morning and night, they are semi-aquatic)
- Mallards
- Heron
- Great Egret

#### Forest Floor:

- *Reptiles and Amphibians:* Salamanders, snakes, turtles, and frogs (in spring and summer, look on top of logs, among damp leaves, and in vernal pools)
- *Invertebrates:* Worms, millipedes, butterflies, moths, snails, ants, mites, crickets, cicadas, and spiders (look on leaves, decaying logs, and among leaf litter)

Some **plants** you might find in the Forest and along the River:

- Tulip Poplars
- Red Maple
- American Sycamore
- American Beech
- American Elm
- River Birch and Grey Birch
- Sweetgum
- Eastern Hemlock
- Shagbark Hickory
- Sassafras
- Pussy Willow
- Mapleleaf Viburnum
- Common Spicebush
- Poison Ivy

## BEFORE YOUR VISIT

An effective Garden field trip begins with careful planning and preparation.

Take advantage of the free “Teacher Pre-Trip Pass” to orient yourself with the Bronx River, Thain Family Forest, and many Garden collections before bringing your group.

The New York Botanical Garden is a museum of plants in beautiful displays. The Garden is lucky to have a river and forest on its property. As a group discussion, have students define a museum setting and implications of a river running through a forest in a city. Discuss the types of behaviors you use when visiting a museum.

Advise students that while visiting they will need to stay on Garden paths, not touch or pick parts of plants, and be mindful of other visitors. Please take care not to litter in the river or forest.

This is an outdoor walk of almost one mile and will take approximately 35 minutes at a moderate pace. Encourage students to wear comfortable footwear and to dress appropriately for spending time outdoors.

If you bring lunch, your group can eat at the Clay Family Picnic Pavilions located close to the Everett Garden Gate. Restrooms and water fountains are located close to the picnic area. (Plastic bag use is discouraged in the Garden—bags often fly away and get caught in trees and animal habitats.)

Download the *Bronx River Walk* Student Field Guide and Self-Guided Map. Make a **double-sided** copy for each student. Bring pencils on the day of your visit.

## AT THE GARDEN

If you arrive by bus, your group will check in at the Everett Garden Gate (School Group Entrance) and walk straight along Stone Mill Trail until just before you reach a bridge. Take the trail on the right just before the bridge which leads you in through a portion of the Forest toward a paved path next to the Bronx River. When you arrive at the River, you will notice that this wide path extends south toward Pelham Parkway and the Bronx Zoo and north leading under the bridge toward the Mill View Trail into the Forest. (*The estimated walking time is 10 minutes.*)

## SUGGESTED STUDENT ACTIVITIES

1. When you first arrive along the river’s

edge, ask students to look carefully at something around them. Then ask them what it means to observe. Lots of professions require careful observation skills—for example, a detective. Ask students what tools detectives use to make observations. Discuss the use of your senses as the crucial tools to make careful observations.

Ask students for other examples of professions that require careful observations, eventually arriving at the role of a scientist. Scientists make observations, ask questions, and record what they notice. Scientists have been making observations and performing investigative research at the Bronx River and New York Botanical Garden for more than 100 years.

2. Explain to students that during this field trip they will be using their senses and a field guide to explore life along the Bronx River. Distribute Student Field Guides, maps, and pencils. Briefly explain how to use the field guides and maps.

Provide students with a boundary and ask them to choose a spot to sit and look at the river for a given amount of time (3–10 minutes depending on the grade level and interest). Prompt students to:

- *List the things you see around the river. The quieter they are the better chance to see, smell, and hear. Animals in a forest are quiet because their lives depend on it. (That is why it may be rare to spot more than a few of them.)*

- *Write down the moving and non-moving things you see around you.*

3. Walk north toward the bridge. Choose another suitable spot to stop and listen. Prompt students to:

- *Close your eyes and listen for a given amount of time. List five things you heard in your booklets.*

4. Before continuing your walk north under the bridge toward the Mill View Trail, have students identify their location on their maps and indicate the direction which they will be heading.

5. When you reach the Mill View Trail, allow students time to walk and explore at their own pace whilst reading the informational signage throughout the trail. Use the Plant and Animal Key to identify life they notice along the path.

6. The Mill View Trail connects to the Sweet Gum Trail. Turn right (north) on this trail and continue walking over a small footbridge with more informational signage. Allow time for students to read the signs and notice how the small streams meet and join the Bronx River.

7. Continue walking until you reach the Hester Bridge, which spans over the river. Turn right (east) and walk over the bridge, allowing students time to view the waterfall.

8. Continue walking on the path and turn left down the hill stairs on to Waterfall Trail. Head to the waterfall to get a closer look at the waterfall.

9. After viewing the waterfall, take Waterfall Trail south along the river and head back under the Hester Bridge, toward the Old Stone Mill and Stone Mill Road.

10. When you reach Stone Mill Road, you can turn right to head back to where you started—the Everett Gate and Picnic Pavilions.

## PRE-/POST-VISIT ACTIVITIES:

1. Define a river.
2. Pre-Visit: Predict what students might observe when they visit the Bronx River.
3. Post-Visit: Compare actual observations about Bronx River ecology to support or reject predictions.
4. List questions you might like to answer by doing further research.

## RECOMMENDED TEACHER RESOURCES:

bronxriver.org

nybg.org

Youtube.com: Bronx River Restoration De Kadt, Maarten. *The Bronx River: An Environmental & Social History*. Charleston, S.C.: The History Press, 2011.

NYBG in Bloom iPhone App

## RECOMMENDED CHILDREN’S BOOKS:

### Non-fiction:

Frahm, Randy. *Rivers: Sculptors of the Land*. Mankato, Minn.: Creative Co., 2003.

Sweeney, Alyse. *Rivers*. Bloomington, Minn.: Capstone Press, 2010.

### Fiction:

Locker, Thomas. *Where the River Begins*. New York: Dial Books, 1967.