Disaster Zone: Ecology of a Floodplain
An Interpretive Guide to the unique ecosystem of the floodplain

OVER THE DECADES FLAT LAND BORDERING THE RIVER IS PRONE to regular flooding. This guide will help you explore how plants and animals have become adapted to this changing environment. You will also see how humans have impacted and changed the area.

BEFORE YOU BEGIN:
- The walk should last from one-half to one hour.
- All plants, animals and artifacts protected by law.
- Dogs must be on a leash.

Begin on the deck of the Visitor Center at the Reedy Creek Entrance at the Main Area of the park.

1 The Changing Environment
As you stand on the Visitor Center deck, look for a pile of logs in the river. Is this a beaver lodge? The large size of the logs and the jumbled placements tells you the answer. Floods carry dead trees from upstream and deposit them on rocks or at the tips of the island. You can tell
at least how high the water came by looking for the highest log. Remember, wood floats.

2 **Mother Nature’s Sneeze**

From your vantage point on the deck, look upstream and then downstream to find out whether floods knock down large numbers of trees. Note how the trees along the shore line are leaning as they grow, reaching out for sunlight. Even without a flood, these trees will ultimately fall into the river! Indeed, they would clog the channels without a cleansing pulse of water now and then. (A pulse of air does the same thing when you get pollen or dust in your nose and sneeze.) As you walk along the trails, beware of poison ivy growing as a low shrub or as a thick vine. “Leaves of three, let it be.” (There are no venomous snakes along the floodplain.)

**Walk along the deck towards the parking lot and the wildflower meadow, stopping at the cement ramp that leads to the building.**

3 **The Cradle of Civilization**

Flood waters carry mud from upstream fields and mountainsides. This leaves a thin, rich deposit which tends to smooth out bumps and make the land level. (The building is higher because it is built on an artificial hill of rocks and fill dirt.)

Notice that the railroad chose this flat land for its route. Plants grow very well here. (The earliest recorded civilization developed on a broad floodplain between two rivers; the Tigris and Euphrates in what is now Iraq.) Where the land rises up on the other side of the railroad tracks is a different environment…the ancient banks of the James River.

**Follow the trail back into the woods, past the trail sign marked “Riverside Trail East,” heading towards the river and take your first right.**

4 **Harvesting the Forest**

There are many small tree stumps and maybe a fallen tree or two. Welcome to the Beaver Super Market! Beavers cut trees here to get at the soft, sap-filled, energy-rich growing parts. Too fat too climb up to the tender twigs, they bring the entire tree down, gnaw off branches, and drag them into the river to eat, safe from bothersome animals like dogs, bobcats, and people. Their favorite part of the tree is the same as you like. Think breakfast…think pancakes…

Examine some of the stumps. Notice the teeth marks. Even though they cut down some of the trees (Whose roots would hold the soil and reduce erosion,) beaver actually make the land more protected against floods. When stumps sprout again, they grow back in a “bushy” form. This dense growth traps flood debris and slows down the flood waters. Take another look at some stumps and you will see that beavers often come back to harvest some of these new tender shoots in a process something like farming. Beavers do not make dams or lodges along the rivers, because flood waters would tear them away. Instead, they dig holes in the river bank. If you are visiting when the water is low, look for sign of their abandoned “high water homes” as you walk along the trail. Look for “beaver highways,” places where beavers drag branches and small logs to the water, Can you find ten of these sites along the edge of the trail?
Walk down the trail for about 5 minutes until you come to the sound of rushing water and the first good view of many rocks.

5 Shaping a Rock Garden

Before you is an interesting view of both human and natural history. The smooth, rounded rocks on the distant shore were shaped by moving water carrying fine sand. The more squared-off, sharp-sided rocks nearby were all cut by humans. This represents the remains of a small dam. Water was allowed to flow down a six- or eight-foot wide opening near the shore. It leads one-quarter mile down to a water-powered saw mill. The long narrow islands about 20 feet from shore are all that remain of this “millrace.”

Walk about 50 feet to a cement platform.

6 Footbridge Blowout

It is all that remains of a low footbridge that led out to one of the three lovely Goat Islands. It lasted only about a year when it was hit by a flood. Do you think the water alone knocked it out? A glance across the river will reveal what smashed against a structure. (What do you suppose knocked out the little dam we saw earlier?)

Continue east on the trail, about 200 paces from the bridge blowout, until you are opposite a footbridge connecting Goat Islands II and III.

7 Fooling the Floods

Be careful on the many sharp thorns on the blackberry bushes that stick out onto the trail. This bridge was built at the same time and in the same manner as the washed out bridge. However, this one has resisted many floods. Can you think of the reason why?

8 Fooling Around with Nature

Water comes over a low spot along the bank a few feet behind you. Racing down the trail, it gouged out a deep gully which had to be filled with rocks before a new island was formed. The erosion began when the trail surface was dug up with a tiller in order to plant grass. Since tree and shrub roots are the skeleton of the river bank, their removal caused the earthen skin to wash away during floods. What would have been a better way to make the trail?

9 Body Building

What the river takes, it also gives back. The islands in the channel to your left are growing in size. At low water times in the summer, it is easy to see that sand is deposited at the down-stream end of each island, part of the island that out of the current. Shrub and tree roots bind the loose sand and new land is formed. Certain trees are specially adapted to this new land with broad, shallow, net-like roots and fast growth. Two examples of this would be the River Birch with thin, peeling, reddish bark and Sycamore with bark falling off patches revealing white, green, and tan, camouflage-like bark below. Sycamores can grow much larger than most other trees here but develop rotten spots where limbs fell off, creating homes for many animals.

Neither the River Birch nor the Sycamore serves as a food tree for beavers. Instead, beavers prefer trees such as Cottonwood, Green Ash, and Ashleaf Maple.

Walk ahead along the service road about 100 yards to a big cement box-like structure on the right side of the road.

10 River Cleanup

If you look carefully into the water on your left (beware the steep drop-off,) you will notice a huge door. This is a “safety valve” for the Richmond Storm and Sanitary Sewer System. When it rains heavily in Southside Richmond, water from the streets is added to the sewer pipes. Heavy rain fills them to bursting. This Combined Storm and Sewer Water Overflow gate, (CSO for short,) relieves the pressure by dumping the mix into the river. It keeps the system from exploding, but it also pollutes the river.
and degrades recreation. Since federal laws have made it illegal now to pollute the river, the City has constructed an additional pipe. It is placed underground beside the railroad tracks. All four CSOs in the park are permanently closed.

*Continue on the service road for about 10 paces to a flat, wooden bridge. Cross halfway on the bridge and look to the left, upstream.*

### Water Powered Industry

The eastern tip of the island you are about to enter is a stone wall. Part of the island is obviously manmade. A wooden gate ran from the wall to the shore. It controlled water flow down the channel to a water wheel at the saw mill. The rest of the water was sent back to the river. Walk straight ahead to a set of steps along the river’s edge. These steps mark the site of a recent park ferry boat. Attached to a cable, it could be pulled by hand across to Goat Island #1. It was frequently damaged by floods. The only way to get to the island is by walking across the dam when it is dry. (If water level permits you may cross the dam and explore the three Goat Islands or go ahead to the footbridge that lies past the dam.)

### Helping Fish

Standing with your back to the footbridge stairs, you will be looking out at the usually dry rocks and can observe again the way that nature and humans shape rocks differently. The solid rock riverbed explains why there are river rapids. While a mud or sand bottom would create a smooth flow, rocks push water up and around. At high river flows in the spring, water often comes over the dam and covers these rocks, creating rapids and whitewater. Note that most rocks are rounded and natural. Migrating fish like shad and herring can make it upstream only as far as the dam. Since they cannot jump like salmon, Dominion Energy, who built the dam, also built a fish ladder. Look for a long, open-topped cement trough, which can be best viewed by crossing the dam. Water ran through it and cement baffles slowed it down. It did not work well because it was not in the main flow and the fish were unable to find it. Even if it were easier to find, they would not tend to navigate through the holes in the baffles. Nonetheless, it was a serious attempt by humans to get along with nature. A modern, effective fish ladder has since been built at Bosher’s Dam.

### The River Runs this Way

From the middle of the footbridge looking east, you can barely see where the rock wall once closed off the millrace. Note the stones jutting out at right angles from the wall on the left side. A notch in the bottom of the wall probably let water shoot out to turn an “undershot” water wheel. This powered a long, straight saw which cut planks from logs. Just beyond the bridge on shore there was a chair factory.

*You may end your tour here and loop back to the Visitor Center heading west along the service road...or you may wish to continue east towards the spiral pedestrian tower.*

### Nearing the End of your Journey

Continuing downstream to the foot of the 22nd Street pedestrian tower, you will notice a stone wall. This was the “headgate” for a water-powered cotton mill. If you walk further along a very narrow, rocky path for about 50 paces you will come to a cement walkway that forms the top of the sewer line. Along this walkway you will find the remains of an old granite quarry full of drill holes and pieces of cut curbstone.