

Script – A View Apart: The Hamilton – Trenton - Bordentown Marsh

This educational program is provided by *Friends for the Hamilton – Trenton – Bordentown Marsh*. Photographs, except as indicated, are copyright by MA Leck. (For permission to use contact: leck@rider.edu). The program was prepared by Mary Allesio Leck, Emeritus Professor of Biology, Rider University, with help from Jennifer Rogers, Naturalist, Mercer County Parks Commission, jrogers@mercercounty.org.

* Indicates a new slide.

*This natural area is inspirational to many and can elicit strong feelings of place. An example is part of a long poem, *I Fell into a Marsh Once* by Patricia Orban Quinby:

*“Yes, I fell into a marsh once
Head over heels over heart.
It caught me,
captured me,
and fell back into me.
We’ve been together ever since.
The marsh and me.
Through this knowing of marsh,
I have come to know
and love myself,
to love others,
and to love these wild lands.”*

What is this Place called "THE Marsh" marshes are wet places that are home to many kinds of plants and animals.... they help control flooding, they help purify the water, and they are places where people can obtain food (fish) and play. But marshes are much more.....

The Hamilton – Trenton - Bordentown Marsh is a very special place for many people including people who played there when they were kids; for scientists who have studied its plants and animals who include ecologists, who study wetlands, botanists who study plants, and ornithologists who study birds; and for archaeologists who examine the soils for evidence of those who lived here centuries and millennia ago, both colonists and Indians.

This talk will briefly consider why the marsh is important and its diverse habitats, where organisms live, and the kinds of plants and animals you might find if you're there at the right time....whether during the day or during the year.

***Background and importance of the Hamilton – Trenton – Bordentown Marsh**

*The map shows (in green) roughly the area that is referred to as the marsh. There are six places where there are trails from which you can explore the marsh. Four are marked with hiker icons:

1. Hamilton - Mercer County's Roebing Park - Spring Lake
2. Hamilton - Mercer County's Roebing Park - Watson Woods
3. Bordentown Township - Northern Community Park

4. Bordentown Bluffs – D&R Canal State Park

The two other areas having trails are on Duck Island and are not marked on this map. These are (5) the D&R Canal State Park Tow Path trail and (6) the trails along the north and east edges of the constructed wetland.

The map shows the boundaries of the Abbott Farm National Historic Landmark, designated by the USA Department of Interior in 1976. The area in green, broadly considered ‘the marsh,’ contains about 1250 acres of wetlands and additional adjacent public open space brings the acreage to a little more than 3000 acres.

The low-lying wetland area occupies an ancient meander of the Delaware River.

Importance:

Diverse habitats.* Many kinds of habitats occur in the marsh. These include **tidal freshwater wetlands including marshes and swamps, and creeks and rivers. Some tidal features: water is fresh (salt line occurs south of Philadelphia); tides ebb and flow twice a day and because of a lag, high and low tide is an hour later with each passing day; tide schedules can be found on ww.marsh-friends.org or in local Trenton newspapers; and tidal range is more than 9 feet. Other habitats include **ponds, floodplains, and upland forests and thickets**. The marsh is tidal because the Delaware River is tidal to Trenton.

**Biodiversity.* Because of the diverse kinds of habitats, many kinds of organisms have found suitable living conditions. More than 245 species of birds, 900 species of plants, and many insect, reptiles, amphibians, fish, and mammals have been observed there. Freshwater fish diversity (~62) is the highest on the state. The organisms shown on the slide are (top) – Jewelweed and honeybee and (bottom) swamp rose.

**Historical significance.* There are a number of historically significant features found within the marsh boundaries. These include 13,000 years of use by Woodland (or Lenape) Indians; the Watson House, 1708, the oldest house in Mercer county; boats sunk in Crosswicks Creek during the Revolutionary War to keep them from being used by the British; Point Breeze, the residence of Joseph Bonaparte, brother of Napoleon and former King of Spain, who lived there for 22 years (~1817- 1837); while Joseph Bonaparte lived at Point Breeze, he saw the construction of the D&R Canal and the Camden and Amboy Railroad, completed in 1833. White City Amusement Park, built about 1870 and in operation until automobiles permitted people to drive to the Jersey shore.

(The upper photograph: two broken arrowheads –left; two scrapers -upper right; two pottery fragments; and in the center a stone that is thought to be a small grinding stone where paint, for example, might have ground up. Lower: remains of a sunken D&R Canal barge near the mouth of Crosswicks Creek).

**Among the archaeologists who brought recognition to the marsh is Charles Conrad Abbott, 1843-1919. At the lower left is a photograph of a sedge swamp from one of his books taken circa 1892; at the right is current day sedge swamp, a habitat type that is not very common today.*

**Benefits and Values.* The marsh is valuable for the things it can do. Wetlands: help control flooding (the large area can fill up with several feet of water when the Delaware River floods); it helps with groundwater recharge (water seeps into the ground and becomes available for towns / cities that have wells for drinking water; wetlands can remove pollutants; provide habitat for

wildlife; provide place for recreation (fishing, canoeing, kayaking); it is an educational resource and provides open space for people.

(Top photo – educational trip for NJ DEP; bottom – students from Trenton Central HS and Princeton HS examining a mud sample during a Rider University workshop.

*Marsh Views

*Aerial view of tidal marsh showing a tidal channel. This marsh area has been used by ecologists to study the tidal freshwater marsh ecosystem. Lower right – scientist stands in the bottom of the tidal channel at low tide; at high tide he would have to swim. At high tide the high marsh is covered with about a foot of water.

*The amount of plant growth during a growing season is astounding. In March the marsh is covered with dead plant material from last year; in May seeds have germinated and plants have begun to grow; by late August, plants are more than 3 feet tall and some are more than 6 feet tall.

*Because wetlands are so valuable, by law, wetlands that are destroyed, as by highway construction, need to be replaced. The created wetland on Duck Island is such a wetland. The photograph was taken in early 1994; by November 1994, the 94 acres site had 8 islands and two miles of tidal channels. There are 4 inlets to the Delaware River through which water flows. (The highway was completed in 1995).

* Colonization by plants (and animals) was rapid (see May – June 1995). The primary way seeds reached the bare soil of the created wetland was by water although some, were certainly transported by air currents. (In all views, the navigation beacon at the edge of the Delaware River can be seen).

*Through the Seasons

So what's so special? Let's take a walk and see.

* Let's begin on the first day of the new millennium. January 1, 2000.

It was a foggy day. Winter was trying to make an appearance, but the air was warmer than the ground and water, causing fog that lasted until noon.

* By mid January **winter** had really come to the marsh.

* The **ice** was thick. Bubbles from the bottom mud collected as the water froze.

* We could find **tracks** (right photo) in the snow, like those of a **muskrat**. A muskrat weighs about 2 lbs, and has a flattened tail it swings back and forth for swimming.

The ice permitted us to walk up to a **muskrat lodge** (left photo). We wondered how many were inside, whether they could hear us talking, or if they were away somewhere eating, plants. Muskrats have flaps of skin over their teeth that allow them to eat under water.

Notice the flat, light brown leaves of **cattail** that were used to make this lodge. This winter home of muskrats, made of mud and plants, has an underwater entrance and a room above the water level.

The cattail, incidentally, is one of the muskrat's favorite foods. Conveniently, this lodge was in a cattail patch ... similar, perhaps, to living in a McDonalds.

* The **cattail**, food for muskrats, was also food for Indians. All parts of the plant were useful.

The **seed fuzz** could be used for insulation; the young flower stalks in the spring could be eaten as a vegetable (like asparagus), the pollen used for soup and medicine, and rhizomes (stems buried in the mud) eaten like potatoes.

Leaves could be used to make floor mats.

- * Here the cattail provides food for a chickadee that is eating insects found among the seeds.
- * The cattail fuzz (which allows seeds to float in air) is excellent nest material for a white footed mouse in winter. (This nest, under tree bark. was about 30 cm (1.5') above the ground).
- * and for a yellow warbler nest in the springtime
- * Winter is a time to look at the barks of trees. This is river birch; its bark can be used to start fires even when it is damp.
- * Birch and other trees are food for another aquatic rodent, the beaver. The beaver, like the muskrat, also has flaps of skin over its teeth so that it can eat under water.

However, the beaver has sharp teeth with which it can cut down trees. These may be used for food or construction of lodges and dams.

Beavers, like muskrats, were used by Native Americans and others for fur and food. The musk gland, used by the animal to outline its territory, is used by humans in the manufacture of perfume.

- * Beavers make dams, in the process creating ponds that protect their lodges from predators. Because of the resulting change in water level, trees around the edge die, providing habitat for woodpeckers, wood ducks, and other animals.
- * As the dams are built taller, there is flooding. Therefore, what was once a road to Annabelle Avenue now is passable only by canoe.

From winter to spring there are wonderful changes.

- * Trees and other plants, such as birch, produce flowers. This birch catkin contains many tiny flowers.
- * The cottonwood catkin is larger, and looks like a great caterpillar.
- * and sometimes when looking at flowers of tall trees, you may find surprises such as this baby great-horned owl that was unable to fly... although it was nearly big enough. It was just outside its nest, located in the hollow of a red maple tree. (There's a second one; can you see its eye?)
- * Many other birds nest in the marsh, such as Canada geese.
- * The goose nest is a large pile of reeds.
A closer look shows large eggs lying on a bed of down.
- * Later in the season, the parents, which mate for life, stand guard over their goslings.

* In spring and early summer it is possible to find male red-winged blackbirds defending their territories. He has a brightly colored red and yellow patch on his wings.

If he is successful in enticing a female to his patch of marsh, they will build a nest of grasses and other plant material about 30 cm (1 ft) above the water. Notice how the nest is secured by woven pieces of grass. The baby red-wings in this nest are probably only a day or two old. (We were canoeing by this nest, and almost dumped it into the water because we didn't know it was there).

* Mute swan and signet. Swans are the heaviest flying birds in the world; males may weigh 42 lbs.

* Spring is the time to find frogs such as this bullfrog, which is the largest of our frogs and sounds just like a bull bellowing.

* Sometimes, if especially lucky on a warm March day, you might see garter snakes that have just come out of hibernation.

* In Spring, you can find a variety of flowers like this Jack-in-a-pulpit, or Wild Oats.

* When the spring wildflowers are mostly done blooming on a warm day in June, you might find female turtles laying eggs in holes they scoop out of the soil. This female snapping turtle just emerged from the water and is covered with a tiny plant called duckweed.

* The hole into which the female drops her eggs is a few inches deep. She covers them with soil, and there they incubate until fall (at higher temperatures babies develop into females, at lower temperatures into males).

* Destroyed turtle nest (left). Turtle eggs are food for foxes or raccoons that dig up the eggs.

But some make it, and if you're lucky you might find a baby turtle (right). This one is brown probably because it just emerged from being buried in mud during the winter.

* During much of the year, you may be able to observe turtles, which are cold blooded animals, sunning themselves, as this one, on a log where is warming up after emerging from the cold water.

* This is a box turtle, one of several kinds of turtles that can be found in the marsh. We have used the turtle as the logo for the marsh. The turtle was important in Lenape Indian legends and was a metaphor for earth and life. Turtles were used for food and their shells for bowls and sometimes ceremonial rattles.

* Other animals you might see are damselflies (similar to dragonflies). This female is laying, eggs on a submerged plant called Wild Celery

* There are also butterflies, like this Baltimore butterfly (left photo)

Baltimore butterflies are found near marshes because caterpillars eat a specific plant called Turtlehead (right photo).

* A Tiger swallowtail, sipping nectar at Purple Loosestrife. Sometimes butterflies land on people. What do you suppose they might be doing? (Getting- salts from sweat).

* Sometimes caterpillars are more interesting than adults. In this case the saddleback caterpillar, is much more colorful than the brown moth into which it eventually metamorphoses.

* The marsh has many very colorful flowers. Some include:

* Blue Flag Iris

* Yellow Iris

*. Swamp Milkweed, this is a food plant for the Monarch Butterfly. A toxic chemical produced by the plant (a cardiac glycoside), doesn't hurt the caterpillar, but accumulates in its body so that when the adult butterfly emerges, it is distasteful to birds and is left alone. Some movies show Blue Jays vomiting after eating a Monarch...they do not eat another one!

*. The Marsh Mallow has much mucilage: this mucilage has medicinal value (e.g., for dysentery and lung ailments).

*. This is Jewelweed, a very common plant: its juice is used as a cure for Poison Ivy.

*. Turk's Cap Lily can grow more than 2 meters (6 feet) tall.

*. Canada Lily. The spots on the Canada Lily and the Turk's Cap are positioned to attract pollinators.

*. Wild Rice. The kernels of this tall grass were harvested by Native Americans. To prevent birds from eating them before they were ripe, the Indians tied a number of the tops together. This species is an annual; during, its single growing season, an individual can grow more than 3 meters (9 feet) tall. In the autumn; flocks of black birds can be observed eating the seeds of this plant.

A number of rare plants can be found at the Hamilton - Trenton Marsh.

*. These include Swamp Beggars Tick (*Bidens bidentoides*) (left photo) and Arrowhead (right) that forms a turf-like mat. (*Sagittaria subulata*).

Both are considered rare because they are not found in many places, perhaps because they are very fussy about where they live, and / or because their habitats, due habitat destruction, are not available.

*. The marsh has thickets of Mountain Laurel at the Bordentown Bluffs

*. or lush growth of ferns in a glen near Spring Lake.

*. Along the tidal channels at low tide, wildlife such as the Snowy Egret and American Egret, may be found stalking their fish prey. More than 230 species of birds have been observed at the marsh. (and so far (2009) more than 900 kinds of plants).

*. And sometimes it is possible to see Osprey

*. or even our national emblem, the Bald Eagle. During 2008, a pair of eagles successfully nested at the marsh where two young were fledged. The nest, which is used for many years, can be seen from the Light Rail train.

The marsh holds secrets.

*. At the bottom of Crosswicks Creek are the remains of Revolutionary War boats, sunk so that the British could not have them. (boats are not visible in this view).

*. Secrets also relate to the Native Americans who made the marsh home. Many artifacts (some on display at the New Jersey State Museum) provide evidence for a long habitation and clues to how they lived there.

It is special---

*. A place where students can learn about wetland ecology, such at this Rider University ecology class (at the Duck Is. constructed wetland)

*. or Karin Lisco, a Rider University, marine science major, who did a field experiment with Purple Loosestrife (She studied whether purple loosestrife reduced the number of other species; it didn't in this situation)

* or students from Holland Middle School.

* And it's been special to members of the Trenton Central High School marching band and twirlers...who tramped through mud in hip boots.

* It is a special place to canoe and find marsh critters.

* to canoe

*. to see beautiful sunsets

*. and fall foliage (with a muskrat lodge).

*We hope it becomes a special place for you too.

Photographs of the Red-winged Blackbird, Osprey, and Bald Eagle were obtained from Vireo, Philadelphia Academy of Natural Sciences: other photographs are by M.A. Leek. All organisms shown occur at the Hamilton – Trenton - Bordentown Marsh. (Reproduction only with permission).

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