

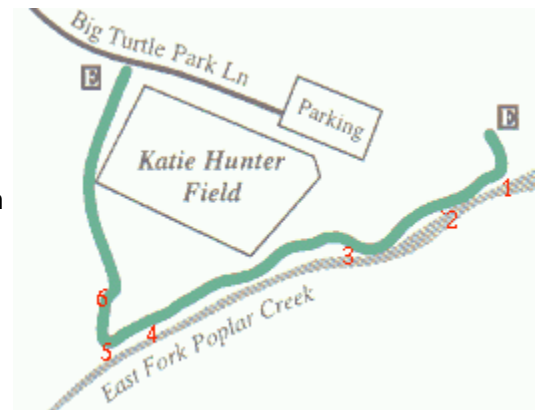
## Big Turtle Park exhibits

Bryce Galen of Oak Ridge constructed the Big Turtle Park Greenway for an Eagle Scout project in 1998. Bryce provided the following trail stop ecological descriptions.

### 1 Creek Cleanup

East Fork Poplar Creek runs approximately 15 miles from the Oak Ridge Y-12 Plant, through the City of Oak Ridge, then west, where it is parallel to a section of the Big Turtle Nature Trail before it empties into Poplar Creek just north of East Tennessee Technology Park. Unfortunately, the creek was contaminated as a result of past discharges from the Y-12 Plant.

Today, however, East Fork Poplar Creek is on its way to environmental recovery after decades of contaminant releases into the creek. In the summer of 1997, 47,000 cubic yards of soil containing mercuric sulfide and other contaminants were excavated and disposed of from upstream portions of the creek. Clean soil was then brought in, and some sections of the creek bank were reseeded. This area of the creek contains rocks that cause turbulence in the water. The riffles that result help to bring Oxygen back into the water so fish, insects, and other organisms can live in this river environment.



### 2 River Cane Bamboo

The scientific name of this cane is *Arundinaria gigantea*. It is the only bamboo species native to the U.S. It once grew in vast thickets from Georgia and Texas to Maryland and Ohio. It is particularly hardy since it can resist temperatures as low as -10° F. It has also been known to grow up to 20 feet tall in some locations! This river cane is sometimes used as fodder for domestic animals such as cows and goats. It also has a few other agricultural and utilitarian uses.

### 3 Wastewater Treatment (NPDES) Outfall

Across the creek, the release or "outfall" of treated wastewater from an Oak Ridge facility can be seen. You may wonder why we treat wastewater.

Water, when used, becomes contaminated. Before it can be returned to the environment or reused, most of the contamination must be removed. Wastewater treatment, also called "water recycling", separates and removes contaminants from water. The end product of water recycling is a clean water product, ready to be reused or returned to the environment. The by-products of water recycling are called biosolids. Biosolids contain high-quality organic nutrients and can be used to condition soil for growing non-food crops or made into compost for application on lawns and trees.

The treatment of this water from the city helps our community in many ways. We are protected from waterborne diseases, and water downstream is also safe for other uses like recreation and water supply. Treatment also helps wildlife by preserving the natural environment they depend on. It removes toxic and hazardous materials that might accumulate in the environment, making our community a better place for everyone!

#### **4 Sedimentary Structures**

Large sedimentary rocks like this one are common on the Earth's surface. They are important because they provide valuable information about the Earth's past. For example, fossils are common in sedimentary rocks and geologists can use sedimentary rocks to interpret the Earth's past.

You may wonder how such a large rock got here along the edge of the trail. There appears to be trees and brush growing all around it. How did it get here? Did glaciers move it? An earthquake? Actually, it was pushed here by earth moving equipment that was used to build the soccer field. Trees and vines grow very quickly, so the forest around here is rather young. It just appears that some natural earth forces placed this large rock here. Changes in nature take place all the time though. Think about how this forest will look in 20 years. Then think about how this area will change if the nature trail is not cared for and kept clean for others to enjoy.

#### **5 The Hydrologic Cycle**

Though you may know it as the "Water Cycle," scientists refer to the continuous circulation of water between the earth and atmosphere as the Hydrologic Cycle. The confluence of these two creeks is a perfect example of the Hydrologic Cycle in action. Rainwater flows down the small creek from the wetland basin into the East Fork of Poplar Creek. From here, the water is carried through an incredible system of rivers of increasing size where it eventually makes its way to the Gulf of Mexico! Some water won't quite make it all the way though. Water along the riverbank filters into the soil where plant roots can take it up. Some percolates deeper and joins the groundwater aquifer.

Once water has found its place in oceans, rivers, soil, or vegetation, it evaporates into the air. As the air rises, it cools, condensing into clouds. As water droplets grow in size, rain clouds form. The water in clouds then falls back to earth as rain, or precipitation. Precipitation runs off the mountains and hills into low-lying areas like the nearby wetland basin. From there it is carried towards the lakes and seas again by streams like these right here. The cycle begins again. The water you see here is, of course, an important part of that complex cycle.

#### **6 The Beaver Dam Benefits**

The many branches, logs, and various natural construction materials you can see below were not just carried there by the current, but arranged in a very particular pattern. Nature's best engineers, beavers, have built a home here, which serves as a dam to create this large wetland environment. Since the beavers moved into this area in the spring of 1994, different people have expressed various opinions about the dam and resulting wetland. The City of Oak Ridge was concerned that the excess water would pose a problem to the community, and others were concerned that the beavers needed the dam and wetland area to exist in this habitat. Luckily, to the satisfaction of both groups, an engineering solution was soon found that would prevent flooding, and at the same time allow the beavers to exist happily in their natural habitat. In the summer of 1995, a device called the Clemson Pond Leveler was installed beneath the dam to allow excess water to escape and prevent flooding.

Today, the beaver dam has created a new and unique wetland ecosystem that attracts many new species of animals and plants to the park. Visitors here are offered a chance to experience a special part of the environmental diversity of our community. The beaver dam showcases the wetland area -- home to hundreds of different species that could not be seen here if the area was dry and forested. Stay very quiet and watch carefully. Maybe you will even see a beaver!

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