the Tidal Schuylkill



What is a Tidal River?
The Lower Schuylkill is tidal, which means that its direction of flow and water levels are influenced by the tides of the ocean. Twice a day, when the tide comes in, water flows upriver from the Delaware toward Fairmount Dam. When the tide goes out, the direction of flow reverses. The total depth of the river ranges between 15 and 35 feet, and the water level fluctuates by about 6 feet between high and low tide. Some tidal rivers are brackish – a bit salty – because seawater mixes with fresh river water when the tide comes in. Not so for the Lower Schuylkill, which is beyond the reach of salt from the ocean. In fact, water is released from five reservoirs in the Delaware River Watershed to keep salty water as far downriver as possible on the Delaware, because salt increases the costs of corrosion control and drinking water treatment.

Gray's Ferry: In the 1790s, the Gray family operated a ferry to shuttle passengers to their inn and pleasure garden. Gray's Garden was designed in a romantic style intended to mimic nature, leading visitors through a procession of shady pathways that opened into grand clearings and river vistas. The gardens were open to the public and admission was free, with the exception of Tuesdays and Saturdays when concerts were held there and a 25¢ admission fee was charged.

Combined Sewer Outfalls, or CSOs, are pipes that discharge sewage into the river. Normally, sewage is filtered by treatment plants, but during storms, rainwater runs off city streets into the sewers and overwhelms the city's capacity to treat its wastewater. As a result, runoff and raw sewage are released into the rivers. The city advises that no one swim in Philadelphia waterways for 24 hours after it rains.

Veolia Cogeneration Plant provides heat and electricity to about 300 customers in Center City and University City, including large institutions such as UPenn and the Barnes Museum. It burns natural gas and some fuel oil, which comes via barge on the Schuylkill River and is stored on site in seven tanks.

Swing bridge: The Philadelphia, Wilmington, and Baltimore Railroad Bridge No. 1 was built in 1902 and used until 1984. A new swing bridge will soon replace it to connect the Bartram's Mile and Grays Ferry Crescent Trails.

Bartram's Garden: colonial botanist John Bartram's homestead. Each year over 50,000 people visit the site, which includes historic buildings, gardens, a unique stone cider press, and the Community Boathouse.

Freshwater mussels
Over a dozen species of freshwater mussels were once found throughout the Delaware Estuary, but populations have declined dramatically and many species are near extinction. Freshwater mussels help strengthen streambeds against erosion and filter the water they live in of particles and pollutants, allowing more sunlight to reach the plant and animal habitat at the river bottom. A freshwater mussel hatchery will be constructed at Bartram's Garden in the next few years. Mussels born here will be reintroduced to waterways in the Delaware and Susquehanna River Basins in Pennsylvania to help remediate habitat and water quality.

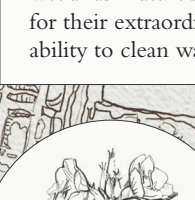
PES North Rail Yard brings crude oil by train to its refineries, which are also supplied by local pipeline and barges.

Spatterdock: If you paddle into the tidal wetland at high tide, you might see Sagittaria latifolia, or broad-leaf arrowhead, growing in the water. Another plant that grows in the muddy flats in the water near Bartram's is spatterdock (pictured).



Wetlands, such as the marshy area visible from the river on the south end of Bartram's Garden, are home to a variety of plants and organisms which filter storm water before slowly discharging the filtered water. Some people call wetlands "nature's kidneys" for their extraordinary ability to clean water.

Philadelphia Energy Solutions Refinery
The Point Breeze and Girard Point oil refineries were combined by Sunoco in 1994 to make up this complex. It can process up to 335,000 barrels of crude oil per day and is the largest refinery on the eastern seaboard. PES mainly produces gasoline. PES also imports, stores, and processes benzene, which it turns into cumene, a chemical feedstock. Much of PES is in a 10-year Keystone Opportunity Zone, which exempts it from many local and state taxes until 2023.



Look for plants colonizing old pilings. These old industrial remnants seem to support a surprising diversity of life. What plants and animals do you see there?

Diverse vegetation
Along the west bank is a remarkably diverse plant community. Paddling along this stretch of the river, you'll notice many different species of trees and shrubs growing side by side. No single species has become dominant along this manmade embankment in the 30-40 years since the plant life in the area was destroyed by industry.

Oil processing and transport has happened on this site since 1866, making it one of the oldest continuously operating refineries in the world.

The PES refinery is the largest industrial source of toxic air pollution in Philadelphia.

The Ganges: In 1800, two US schooners illegally engaging in the slave trade were intercepted by the US naval vessel Ganges off the coast of Cuba and re-routed to Philadelphia. After receiving care at the quarantine hospital known as the Province Island Lazaretto, 128 West Africans who had been held aboard the ships were all given the surname "Ganges" and indentured to families and employers in the area. To this day, the surname Ganges survives among their descendants in Philadelphia and elsewhere in the US.



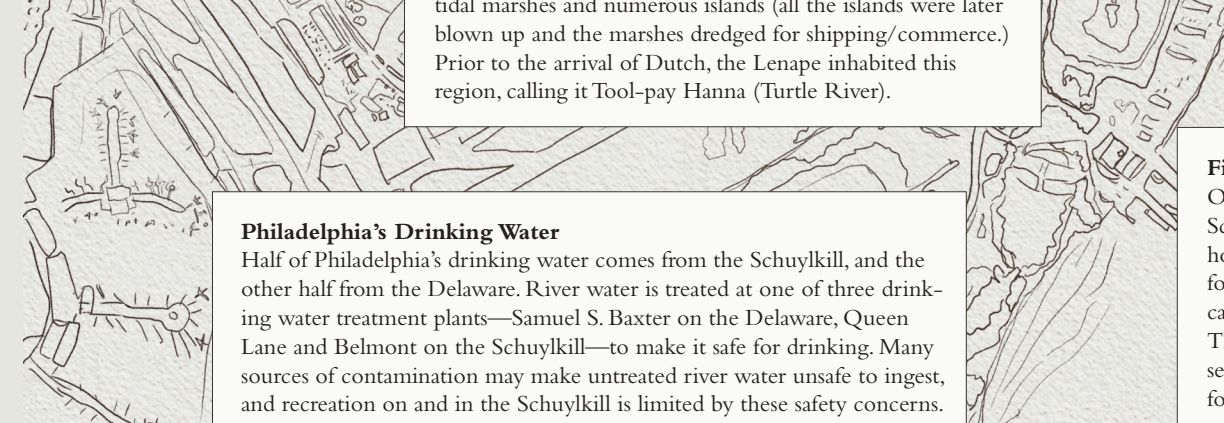
Amorpha fruticosa, or shrub indigo, is very abundant on the concrete and rocky banks of the river and also on the old piers in the river. It has a beautiful indigo flower that butterflies love. It was listed in the Bartrams' first plant catalog in 1783. Shrub indigo was native to South Carolina but really thrives here in Philly now!

Wildlife: Great blue herons, bald eagles, double-crested cormorants, and belted kingfishers feed on the fish in the tidal Schuylkill and are regularly sighted along its banks. Migrating osprey have been seen here as well. Keep an eye out for turtles basking on rocks and logs and the elusive river otter, or even a swimming beaver…

"Skookill:" The name Schuylkill is Dutch for "hidden creek;" at the time Dutch settlers arrived, the mouth of the river at its confluence with the Delaware was obscured by tidal marshes and numerous islands (all the islands were later blown up and the marshes dredged for shipping/commerce.) Prior to the arrival of Dutch, the Lenape inhabited this region, calling it Tool-pay Hanna (Turtle River).

Fish
Over 40 species of fish live in the tidal Schuylkill, which serves as a year-round home for some and a migratory passage for others. Common catches include catfish, perch, sunfish, carp, bass, and eels. The annual springtime migration of several species of shad is a popular time for fishing here.

Philadelphia's Drinking Water
Half of Philadelphia's drinking water comes from the Schuylkill, and the other half from the Delaware. River water is treated at one of three drinking water treatment plants—Samuel S. Baxter on the Delaware, Queen Lane and Belmont on the Schuylkill—to make it safe for drinking. Many sources of contamination may make untreated river water unsafe to ingest, and recreation on and in the Schuylkill is limited by these safety concerns. The Philadelphia Water Department offers Philly RiverCast, a daily estimate of water quality between Flat Rock Dam and Fairmount Dam, that forecasts whether this section of the Schuylkill is suitable for recreation. Swimming in the Lower Schuylkill is generally not advised.



The Delaware River Watershed
The Schuylkill River is a tributary of the Delaware River, flowing 128 miles from its headwaters in Pottsville, PA to where it joins the Delaware. It is part of the Delaware River Watershed – the 13,539-square-mile area, covering parts of Pennsylvania, New Jersey, New York, and Delaware, that drains into the Delaware River. From the mouth of the Schuylkill, it is about 7 miles up the Delaware to Penn's Landing and 44 miles down to Delaware Bay.