

## Successes & Challenges

### Successes

- In October 2014, HRWC launched a project with a state grant to work with the city of Ann Arbor, the Water Resources Commissioner, and residents to install Green Infrastructure in a neighborhood to treat stormwater. The project began in October 2014 and runs for 3 years.
- Despite being a very urban creek, Swift Run does benefit from Pittsfield Township's foresight in creating the Pittsfield Preserve at its headwaters, as well as the township's zoning of the area for agricultural preservation. These protected forest and farm fields will allow the creek to maintain its natural hydrology, especially if environmentally friendly farm practices are followed.

### Challenges

- Swift Run is an urban creek. Stormwater runoff from lawns, parking lots, and roads have created unstable water flow, E. Coli, phosphorus, conductivity, and habitat problems. As a result, the biological community of the creek has suffered.
- In order to maintain overall Huron watershed health, it is important to have urban areas like the City of Ann Arbor. This will enable natural areas and rural lands across the Huron watershed to remain as open land, and therefore the overall Huron River will remain healthy. However, this does mean that urban creeks, like Swift Run, have the burden of assimilating all the runoff and pollution associated with highly urban areas. Green Infrastructure like rain gardens, permeable pavement, green roofs, and other elements are necessary to help the creek function.



Upstream of US-23, Swift Run is ephemeral— the water only flows after a storm. Credit: HRWC

## What you can do!

### At home

- If you have pets, clean up after them and dispose of their waste properly. Pet waste left on the ground can contribute bacteria to the stream.
- Don't use phosphorus fertilizer. The City of Ann Arbor law and Michigan State law prohibit application of phosphorus fertilizer without a soil test to prove that the phosphorus is needed.
- If you live adjacent to Swift Run, leave a vegetated buffer strip adjacent to the waterway—ideally a suite of native plants, 50 feet wide.
- Minimize your turf lawn. Instead, install a raingarden and plant deep rooted native plants, in order to reduce runoff from your property.
- Money may be available to help residents in the Swift Run Creekshed install green infrastructure. For more details, contact Ric at HRWC (rlawson@hrwc.org)



Many areas on Swift Run are well shaded by overhanging vegetation. Credit: HRWC



# Swift Run Creekshed Report

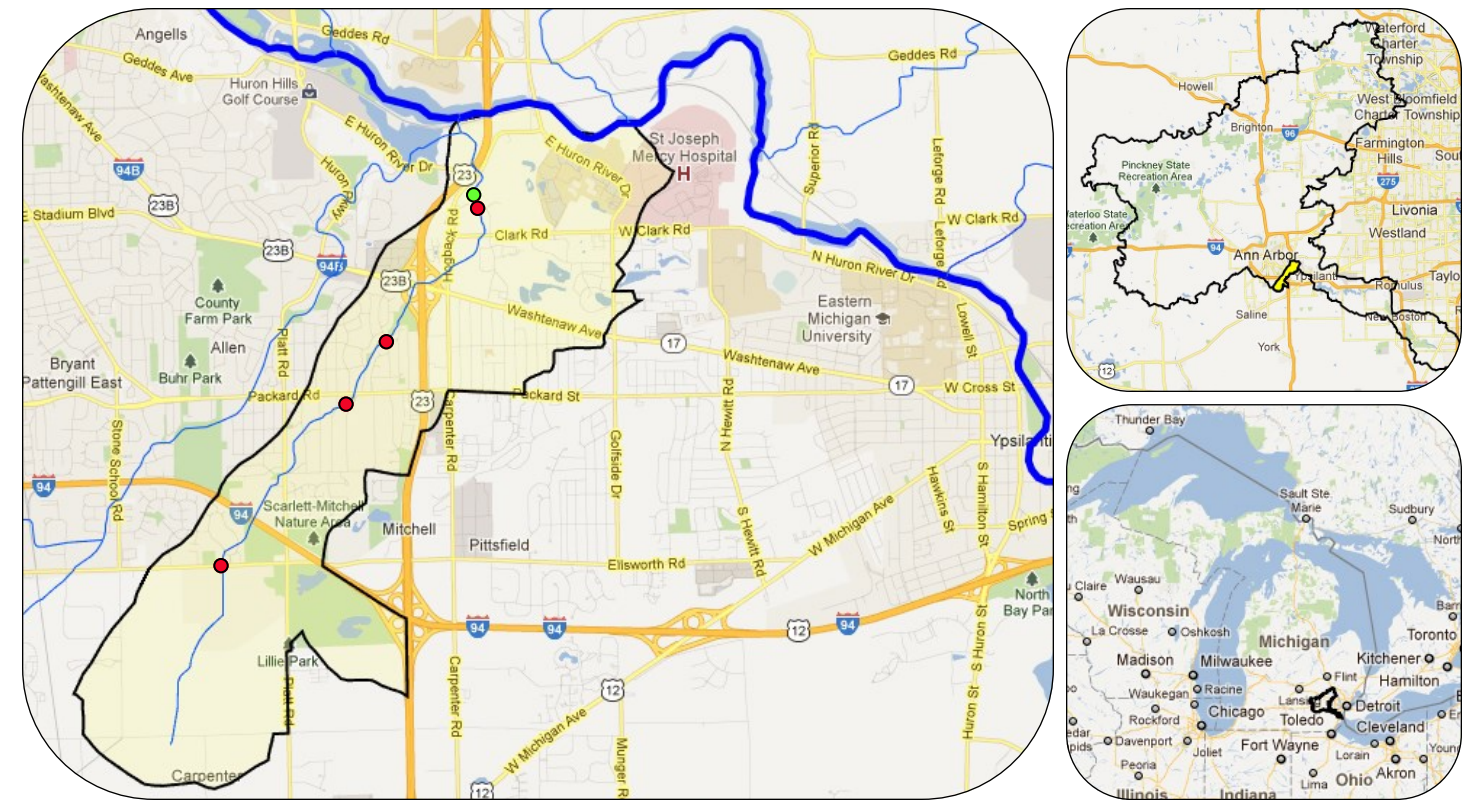
[www.hrwc.org/swiftrun](http://www.hrwc.org/swiftrun)

## Creekshed Profile

Swift Run runs along the Defiance Moraine, which marks the beginning of the ancient Lake Erie lake plain to the east. Before European settlement, the creek originated from a forested hardwood swamp, then flowed through oak hickory forest and oak barren landscapes before meeting the Huron River. As Ann Arbor was founded, the Swift Run creekshed became an important residential and commercial area. It now holds many well know locations, such as Arborland Mall, Washtenaw Community College, and Lillie Park.

Swift Run is relatively small creekshed in the Huron. It begins in farm fields in Pittsfield Township, flows through the City of Ann Arbor's landfill, under the US 23 and Washtenaw Avenue interchange, and into South Pond before entering the Huron River at Gallup Pond. The creek falls primarily in the city of Ann Arbor, but several parts of the creekshed are in Pittsfield and Ann Arbor townships, and the very eastern edge of the creekshed is in Superior and Ypsilanti Townships.

Swift Run is primarily a single channel, about 4.8 miles in length. Some of the channel does not have flowing water during dry weather. The creek's average slope is 17 feet per mile, which is average compared to the other tributaries to the Huron River (16 feet per mile is average). Haven Lake, a reclaimed gravel mine in Lillie Park, is the only lake in the creekshed (open water greater than 5 acres). There are 8 ponds (open water less than 5 acres), two of which are in line with Swift Run, close to where it passes under I-94 (they are too small to be seen on the map below). Several more of the ponds are located along Washtenaw Avenue in Ypsilanti, where they assist with stormwater retention.



- Monitoring sites for Aquatic Insects, Stream Habitat, and Stream Temperature
  - Monitoring site for Stream Flow, Phosphorus, Total Suspended Solids, and E. coli
- For more details on these parameters, please see inside.

# Creekshed Status and Trends



Swift Run flows through a narrow riparian zone through southeast Ann Arbor. Credit: David Rivers

## Creekshed Land Use

*Swift Run Creekshed is an urban environment*

Total creekshed Size: 5 square miles  
 Agriculture: 16%, 1 square miles  
 Residential & urban: 60%, 3.5 square miles  
 Forest: 7%, 0.4 square miles  
 Open: 8%, 0.4 square mile  
 Wetland: 6%, 0.3 square miles

Total impervious surface: 22% , 1.1 square miles

Numerous studies have shown that fish and insect communities are less diverse when the amount of impervious surface exceeds 10-12% of the total watershed area. Since 22% of the Swift Run creekshed is currently impervious, the biological and hydrological systems in the creek are highly impacted.

## Creekshed Natural Areas

*Natural lands rare*

Forests, wetlands, and grasslands soak up rainwater and runoff, filter pollutants from the creek, and provide wildlife habitat and beautiful places for us all to enjoy. About 16% of the creekshed still consists of intact natural areas. About half of these areas are protected from development (including Southeast Area, Pittsfield Preserve and Lillie parks). Protecting these remaining natural lands as well as maintaining natural features such as trees, pocket parks, plantings, and riparian buffers throughout the community is important.

## Stream Habitat

*Eroding banks and fine sediment*

The habitat on Swift Run is quite poor. Much of the creek in the upper portions has stagnant water or no water, depending on the weather conditions. In the lower part of the creek, flashy flows have eroded banks and washed away woody habitat. The streambed lacks diversity in substrate sizes, with too much silt and too little gravel and larger rocks.

## Dams and Impoundments

*One dam on the creek*

While dams provide recreational benefits, they greatly alter a stream's hydrology and degrade fish and insect habitat. There is one known dam on Swift Run. This dam is located close to the headwaters of the creek and creates a small pond used for agricultural irrigation.

## Fish Community

*Not studied; it is likely poor to non-existent*

There are no known surveys of fish in Swift Run. However, given the flashiness of the stream, the poor habitat conditions, and the numerous culverts restricting fish passage, it is likely that very few fish live in the creek. Haven Lake and the ponds in the creekshed likely hold small resident populations of cool and warm-water fish (panfish and small minnows).

## Aquatic Insect Community

*Poor*

Since Swift Run is an urban creek with flashy flows and unstable habitat, the insect community is also very poor. Total diversity is very low when compared to more natural streams. HRWC only finds stream creatures here that can survive in all streams; such as net-spinning caddisflies, scuds, isopods, and midges.

## Stream Water Temperature

*Cool to warm water*

Swift Run receives a mix of warm surface runoff and little cold groundwater. Vegetation shades much of the stream. Temperature measurements show that the water temperature of Swift Run can range between 60°F and 80°F during July and August. The maximum temperature is slightly warm for a small shaded creek. It seems likely that Swift Run does not receive as much groundwater as other small tributaries that flow to the Huron.

## E. coli

*High*

*E. coli* bacteria is a useful water quality indicator for the presence of fecal contamination. In Swift Run, *E. coli* is often present in high concentrations that do not permit for full body contact. After heavy rain events, *E. coli* can reach levels that are above State standards for partial body contact. These sources may be due to the large amount of impervious surfaces in the creekshed, which don't allow for urban runoff infiltration before entering the creek. It can take 48 hours for the *E. coli* to return to safe levels.

## Phosphorus

*High*

Phosphorus is the limiting nutrient in most freshwater systems; too much phosphorus can cause algal blooms and water quality problems. While the target for area streams is < 50 ug/l, Swift Run's mean total phosphorus (TP) is 103 ug/l. Even more elevated levels occur after heavy storms (see below). This is likely due to residential runoff.

## Color Coded Ranking

Excellent Fair Poor Unknown

## Total Suspended Solids

*High after storms*

Total suspended solids (TSS) is a measurement of the amount of sediment and organic material held by the stream. A high TSS indicates high turbidity and erosion problems. Good TSS values are below 80 mg/l. While Swift Run's mean TSS is 20 mg/l, levels can reach up to 384 mg/l during periods of high flow.

## Conductivity

*High*

Conductivity is a measurement of the amount of ions (also known as salts) dissolved in water. Conductivity is a quick and easy measurement to make and is useful as an indicator of potential problems, since conductivity is highly correlated with total dissolved solids (TDS). Conductivity levels in Swift Run are high, particularly on the lower portion, often reaching two times the levels upstream.

## Stream Flow

*Extremely flashy*

Stream flow is an important underlying factor for determining likely erosion rates, stream habitat quality, and aquatic community diversity. An important measure is "flashiness" or the rate a stream rises and falls through a storm event (see below). Swift Run has a flashiness rating that is high for comparable Michigan streams, but average for the Midwest.

## 2010 Storm Event Graph 0.53 inches of rain fell on July 28,

