## Successes & Challenges

### *Successes*

- Green roofs were installed at several schools in the Silver and Smith Creek watersheds. These roofs provide many benefits including a cleaner runoff.

- The Sibley Prairie Land Protection Project is working to secure protection of the 400-acre prairie.

- The Alliance of Downriver Watersheds (ADW) formed in 2006 to address stormwater issues, track watershed health, and plan and implement projects. Monitoring data reported here was funded by ADW. Many educational initiatives are underway with ADW support. ADW sponsored Green Schools and Grow Zones in the area, and the ADW ran the first regional Green Infrastructure Conference.

### *Challenges*

- Smith and Silver are urban creeks. Stormwater runoff from lawns, parking lots, and roads have created unstable stream flows, *E. coli*, phosphorus, conductivity, and habitat problems.

- In order to maintain overall Huron watershed health, it is important to have urban areas like the Silver and Smith creeksheds. 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 have the burden of assimilating all the runoff and pollution associated with urban areas. Green Infrastructure like rain gardens, permeable pavement, green roofs, and other elements are necessary to help the creek function.

HRWC volunteers monitor Smith Creek after a storm. Credit: HRWC

This section of Smith Creek shows signs of habitat degradation; it has been straightened, banks are eroding, and there is no woody debris or flow diversity. Credit: HRWC

## What you can do!

### *At home*

- Minimize your turf lawn. Instead, install a raingarden and plant deep rooted native plants, in order to reduce runoff from your property.

- 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. Michigan State law prohibits application of phosphorus fertilizer without a soil test to prove that the phosphorus is needed.

- Have your septic system checked regularly. Leaking septic systems can be a large source of phosphorus and *E. coli*.

### *In your community*

- Get involved in your local government, where all land use decisions impact the creek and creekshed. See HRWC's *Citizen's Guide to Land Use Planning*: http://www.hrwc.org/publications/smart-growth-publications/

Huron River Watershed Council

*Protecting the river since 1965*

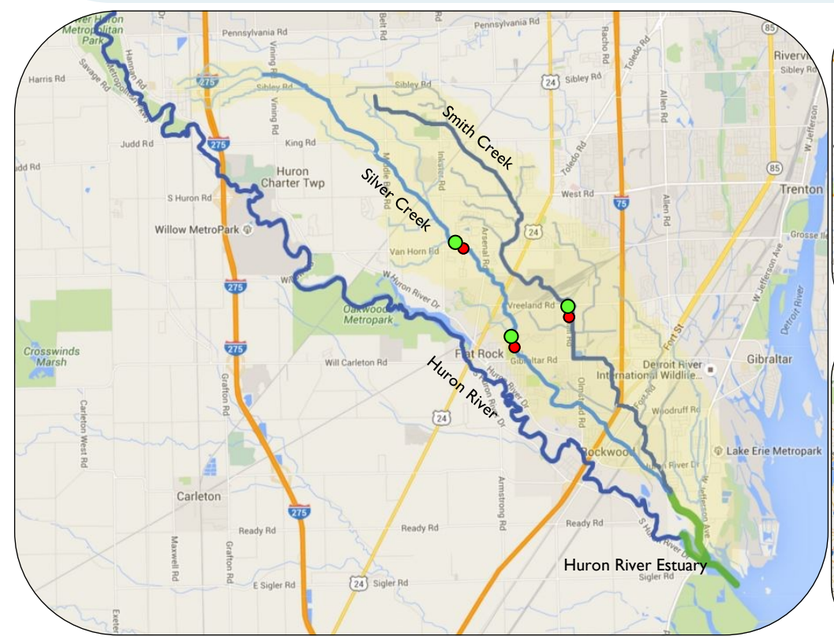
# Silver and Smith Creekshed Report

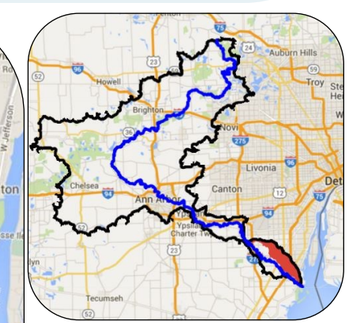
## Creekshed Profile

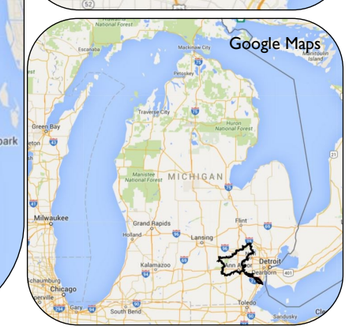
Silver and Smith creeksheds are located in the lower Huron River watershed. This region was among the first areas in Michigan to be farmed by European settlers who had a monopoly on the land once the Native American were consolidated into reservations and ultimately removed from the area by the early 1840s. As a result of the farming activities, many pieces of Silver and Smith creeksheds were ditched and tiled. Today, humans use the land in a variety of ways, primarily for residential, commercial, industrial, and agricultural purposes. There are very few areas of natural land remaining.

Silver and Smith are unique creeksheds in the Huron River watershed. They do not drain to the Huron River itself, but rather drain into the Huron River Estuary that connects directly to Lake Erie. Silver, Smith, and the estuary all meet at a point slightly to the west of the intersection of Streicher and West Jefferson Road. The townships of Huron, Berlin, and Brownstown, and the cities of Flat Rock, Rockwood, and Woodhaven all make decisions that affect these creeks.

Silver and Smith creeks flow through land that was covered by Lake Erie during the last Ice Age. During this time, fine particles of clay and silt covered the land, leaving a thick coat of fine sediment and also quite flat. The resulting landscape left unique ecosystems like flatwood swamps, beech forests, and lake plain prairie. The Sibley prairie in Brownstown Township is Michigan's largest prairie remnant. The slope of these two creeks is the flattest in the watershed, averaging 4.4 feet per mile over Silver Creek's 13.2 mile run and 5.0 feet per mile over Smith Creek's 10.6 mile run. There are many tributaries to the two creeks, and the total stream length is 65.9 miles. There is one lake (open water > 5 acres) and 2 ponds (open water < 5 acres) in their combined creekshed.




- 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.

**Huron River Watershed Council,** 1100 North Main Street, Ann Arbor, MI 48104, (734) 769-5123, **Updated 2016**

# Creekshed Status and Trends

HRWC volunteers take flow measurements on Silver Creek. Credit: HRWC

## Creekshed Land Use

*Extensive impervious surface*

*Total creekshed Size: 26 square miles*
Land use based on the year 2000:
Agriculture: 15%, *4 square miles*
Residential & urban: 44%, *11 square miles*
Forest: .7%, 0.2 *square miles*
Open: 17%, 4 *square mile*
Wetland: 22%, *6 square miles*

Total impervious surface: 23%, *5.8 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 23% of this creekshed is currently impervious, the biological and hydrological systems in the creek are highly impacted.

## Creekshed Natural Areas

*Few natural lands remaining*

The creekshed's forests, wetlands, and grasslands soak up rainwater and runoff, filter pollutants from runoff, and provide wildlife habitat and beautiful places for us all to enjoy. Only about 20% of the creekshed remains as intact natural areas, and almost none of these areas are protected from development. Without designated protection, the natural areas of the creekshed face an uncertain future. It will be important to keep these lands natural, so they can continue to help keep the creek healthy.

## Fish Community

*Wide diversity of sunfish species*

Fish data on these creeks is sparse. Based off of one Michigan DNR sample from 1994, we know that Silver Creek near Lake Erie has held a large variety of sunfish species like longear sunfish, bluegill, green sunfish, orangespotted sunfish, redear sunfish, pumpkinseed, and warmouth. Other fish included burbot, suckers, and yellow bullhead. However, quantity and size information is not available, so this category can not be ranked. The fish population in the creek is likely to be highly influenced by its proximity to Lake Erie.

## Aquatic Insect Community

*Poor to Fair*

Sample sites on Smith Creek and lower Silver Creek have low to moderately diverse insect populations, including dragonflies and damselflies, non-sensitive mayflies, and some caddisflies. The sample site on upper Silver Creek is healthier and more diverse, with more varieties of mayflies, caddis, true flies, and true bugs.

## Stream Habitat

*Poor*

Many sections of Smith and Silver creeks have been channelized; straightened for the purpose of moving the water quickly off the land. This causes bank erosion and uniform water flow, which reduces the instream habitat. The stream substrate is primarily fine sediments, which is somewhat natural given the underlying geology of clay and silt, but land use practices have increased the overall amount of these fine grained particles in the creeks.

## Dams and Impoundments

*Not present*

While dams provide recreational benefits, they greatly alter a stream's hydrology and degrade fish and insect habitat. There are no known dams in the Silver and Smith creeksheds.

## Total Suspended Solids

*Low*

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 during rain storms are below 80 mg/l; Silver Creek's mean TSS value is 14 mg/l, and Smith Creek's mean TSS value is 19 mg/l.

## E. coli

*Consistently high*

E. coli bacteria is a useful water quality indicator for the presence of fecal contamination. In the Silver creekshed and the Smith creekshed, E. coli is present in high concentrations that make drinking or recreational activities unsafe. After heavy rain events, E. coli can reaches levels that are well above State standards. Predominant sources are pets and wildlife. 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, and too much phosphorus can cause algal blooms and water quality problems. The target for area streams is < 50 μg/l. Silver Creek's mean total phosphorus (TP) is 100 μg/l, and Smith Creek's mean total phosphorus (TP) is 90 μg/l, which is very high. Stormwater runoff and erosion are the likely sources.

## Color Coded Ranking

Excellent | Fair | Poor | Unknown

## Stream Water Temperature

*Cool water*

Smith and Silver Creek are both in the expected water temperature range for creeks in southeast Michigan. During the summer months, the average water temperature is 68 °F and rarely goes above 80 °F.

## Conductivity

*Slightly elevated*

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. Conductivity levels in Silver Creek and Smith Creek are slightly above natural background levels, indicating the presence of some amount of unknown pollutants.

## Stream Flow

*Highly 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. Silver Creek and Smith Creek have a flashiness rating that is high or less natural than comparable Michigan and midwestern streams.

Volunteers measure stream flow at Silver Creek. Credit: HRWC