Huron River Watershed Council

Protecting the river since 1965

# Millers Creekshed Report

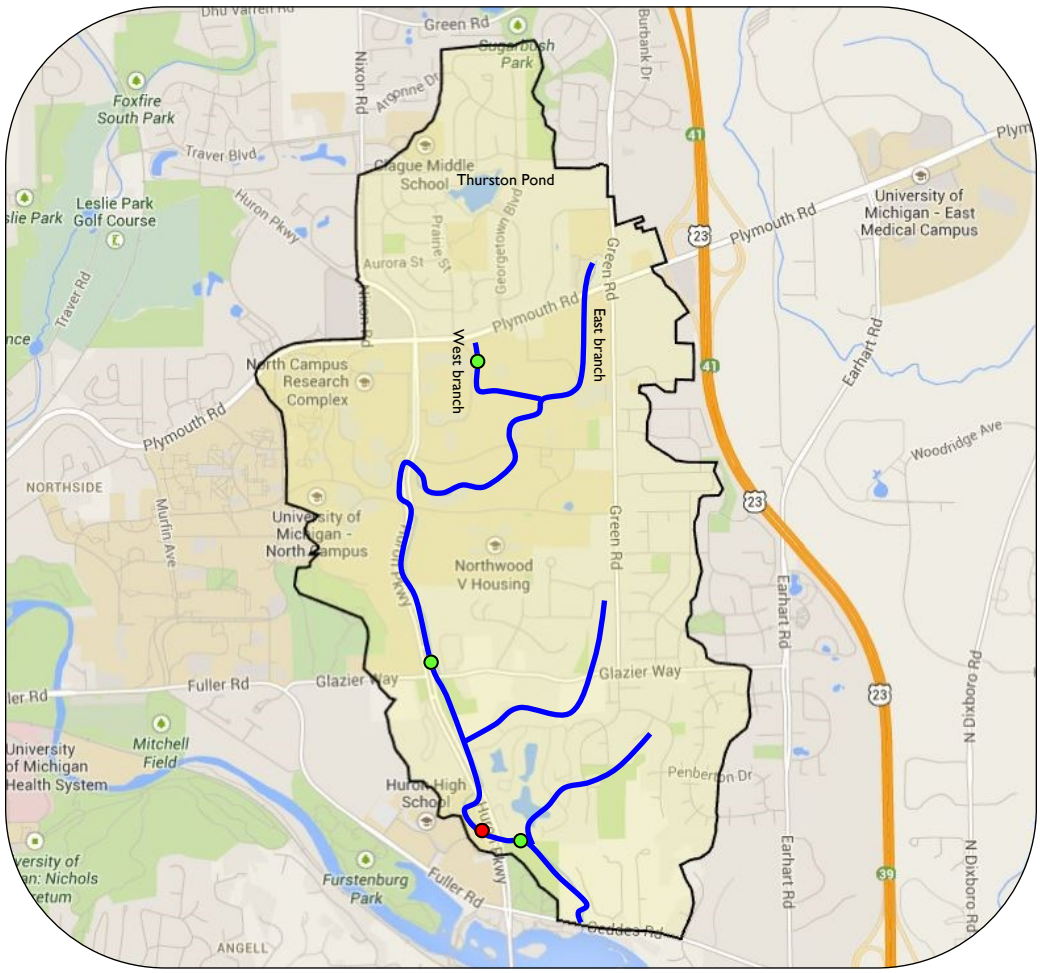
www.hrwc.org/millers

## Creekshed Profile

Until the 1950's, Millers Creekshed was largely a forested and agricultural area to the northeast of Ann Arbor. After that time, the University of Michigan bought 800 acres to establish the North Campus, and by the 1960's, large companies like Parke Davis moved into the area and several residential neighborhoods were built. In 1964, the City of Ann Arbor straightened part of Millers Creek and placed portions of the creek underground when it constructed Huron Parkway. Hotels, commercial centers, office buildings, and more residential areas were added in the 1990's when this area was the fastest growing part of Ann Arbor. The U-M now owns about 1/3 of the creekshed. All of it falls within the City of Ann Arbor.

The creekshed is one of the smallest in the Huron River system, draining only 2.4 square miles. However, it is the steepest tributary by far, with a gradient of 52 feet per mile compared to other tributaries which usually range between 10-15 feet per mile. In the half-mile from Hubbard Road to Glazier Way, the creek is extremely steep– dropping more than 70 feet!

Thurston Pond, the creekshed's most prominent water feature, was once a marsh. It was converted to a 7 acre lake in the early 1960's during the development of the Bromley and Orchard Hills subdivisions. The three small ponds further down the creek were created during the construction of the Geddes Lake Apartment complex.






Google Maps

- 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.

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# Creekshed Status and Trends

While the worst erosion area has been fixed on the main branch of Millers Creek, 15 foot tall eroding cliffs such as this one are still found on the smaller tributaries and are contributing massive amounts of sediment to the creek. Credit: HRWC

## Creekshed Land Use

*Impervious cover heavily impacts habitat*

Total creekshed size: *2.4 square miles*
Residential & urban: 80%, *2 square miles*
Forest: 11%, *0.3 square miles*
Open: 8%, *0.2 square mile*
Wetland: 0%

Total impervious surface: 30% , *0.7 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 30% of the Millers creekshed is currently impervious, this means that the system is has lost much of its

## Creekshed Natural Areas

*High urbanized creekshed*

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. Millers is within the City of Ann Arbor and therefore mostly consists of neighborhoods, businesses, and institutional uses. In fact, only 10% of the creekshed (about 148 acres) still consists of intact natural areas. 9 of those acres are protected from development (Ruthven Park). In this urban creekshed, it will be important to maintain natural features like trees, pocket parks, plantings, riparian buffers throughout the community to help

## Stream Habitat

*Highly degraded*

The stream habitat is a reflection of the pulsing nature of the water flow in Millers Creek. The high water flows are cutting down the stream bed through the movement of rocks and sand, with the result that over time the stream is incised creating tall, vertical, and eroding stream banks. This brings down neighboring trees and further exasperates the erosion. The creek does not have stable habitat since the force of the creek is powerful enough to tumble downed trees and large rocks.

## Dams and Impoundments

*Not present on main branch*

While dams provide recreational benefits, they greatly alter a stream's hydrology, and degrade fish and insect habitat. No dams block the main branch of Millers Creek. There are several small dams that create impoundments near the Geddes Lake Apartments. These impoundments can serve as sinks for phosphorus and can develop algae problems. However, they also serve a useful function as stormwater detention ponds.

## Fish Community

*Few fish present*

The fish community in Millers Creek is mostly non-existent. The high stormwater flows exceed a velocity that fish can endure, so any fish that enter the system are flushed back into the Huron River. The lack of habitat and low flow conditions when there is no stormwater flow

## Aquatic Insect Community

*Poor throughout*

The insect community in Millers Creek reflects the overall poor water quality, lack of habitat, and unstable stream flows that characterize the stream. The only creatures found in Millers are those that have the tenacity to endure harsh conditions, and therefore the overall diversity and

## Stream Water Temperature

*Cold to cool water*

Millers Creek receives a constant trickle of cold ground-water, and vegetation shades much of the stream. When the stream is flowing low, the water temperature can get as cold as 55°F during July and August. After rain events, warmer surface water enters the creek and can raise the temperature up to 75°F, which is obviously quite a bit higher, but is still a healthy summer temperature.

## Color Coded Ranking

Excellent | Fair | Poor

## 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 are below 80 mg/l. Millers Creek's mean TSS is 16 mg/l, although during high flow TSS levels can reach up to 154 mg/l.

## Conductivity

*Elevated to extremely 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, since conductivity is highly correlated with total dissolved solids (TDS). Conductivity levels in Millers Creek are high and have been high since monitoring began in 1993. The east branch of Millers is particularly high in conductivity, often exceeding the already high levels of the main branch by 3 times.

## E. coli

*Consistently high*

*E. coli* bacteria is a useful water quality indicator for the presence of fecal contamination. In the Millers creekshed, *E. coli* is normally present in high concentrations that make partial body contact unsafe (no drinking or recreational activities). 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

## Phosphorus

*Elevated*

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 µg/l, Millers Creek's mean total phosphorus (TP) is 84 µg/l. With more elevated levels particularly after heavy storms (see below). This is likely due to residential and urban runoff.

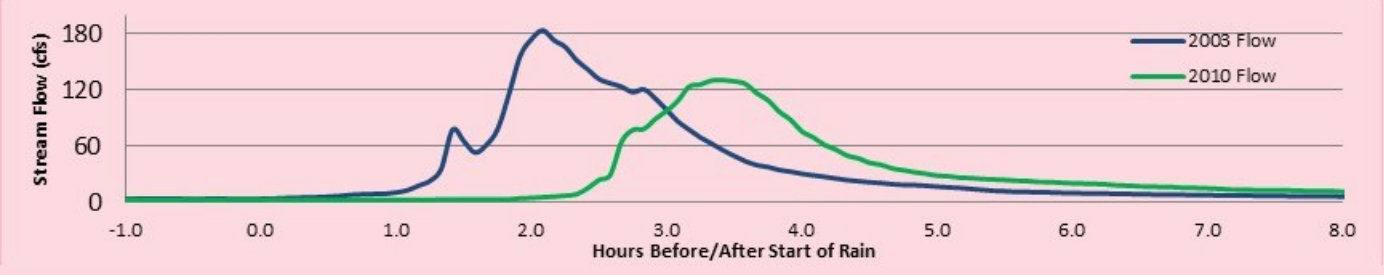
## Stream Flow

*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. Millers Creek is extremely flashy. Recent projects have reduced the flashiness considerably, though a serious problem still exists (see below).

## Stream flow at Glazier Way after two similar storms (pre and post stormwater control project)

For both storms, approximately 0.6 inches fell over a two hour time period.



## Successes & Challenges

### *Successes*

• The Millers Creek Action Team (MCAT) is a diverse public and private sector partnership of people who live and work in the watershed. The group has been meeting regularly since 2001. Its mission is to work together to establish and implement socially, environmentally, and economically sustainable watershed management standards and practices that will improve Millers Creek.

• The HRWC measured distinct improvements in the creek's stormwater flow after the 2009 Millers Creek Rainwater Project in which HRWC and partners improved a detention basin, constructed several raingardens, and installed rainbarrels throughout the creekshed.

• The City of Ann Arbor regraded and restored the steep stream banks along Huron Parkway in an effort to reduce erosion and erosive flows.

• The City of Ann Arbor conducted an erosion study in 2013 with recommendations for strategies to reduce erosion. The City is implementing the plan through it's capital improvement plan.

• The City of Ann Arbor purchased a high quality park, Narrow Gauge Way, for permanent protection and parkland.

### *Challenges*

• There is an unknown pollution source on the east branch of the creek. The conductivity levels in the water on this branch are three times higher than in other places on the creek.

• High stream flows after storms still cause massive erosion and destroy habitat. While there has been improvements in recent years due to many of the successes listed above, the problem is not yet solved. In particular some of the smaller tributaries are downcutting and eroding at very high rates.

• Having urban areas like the City of Ann Arbor allow natural areas and rural lands across the Huron watershed to remain as open land, and therefore the overall Huron River can remain healthy. However, this does mean that urban creeks, like Millers, have the burden of the runoff and pollution associated with highly urban areas. Green Infrastructure like rain gardens, permeable pavement, green roofs, and other elements is necessary to help the creek function.

HRWC and the residents of the neighborhood built this raingarden in 2009 to reduce stormwater to Millers Creek. It is located on the corner of Briarcliff and Prairie Streets. Credit: HRWC

## What you can do!

### *At home*

• Minimize your turf lawn. Instead, put in deep rooted native plants and trees that do not need to be fertilized or watered.

• Create a raingarden: www.ewashtenaw.org/raingardens. Direct downspouts and runoff to natural areas or garden to soak up and clean the water.

• 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. City of Ann Arbor and State of Michigan laws prohibit application of phosphorus fertilizers without a soil test to prove that the phosphorus is needed.

### *In your community*

• Talk to HRWC about joining the MCAT.