Huron River Watershed Council

Protecting the river since 1965

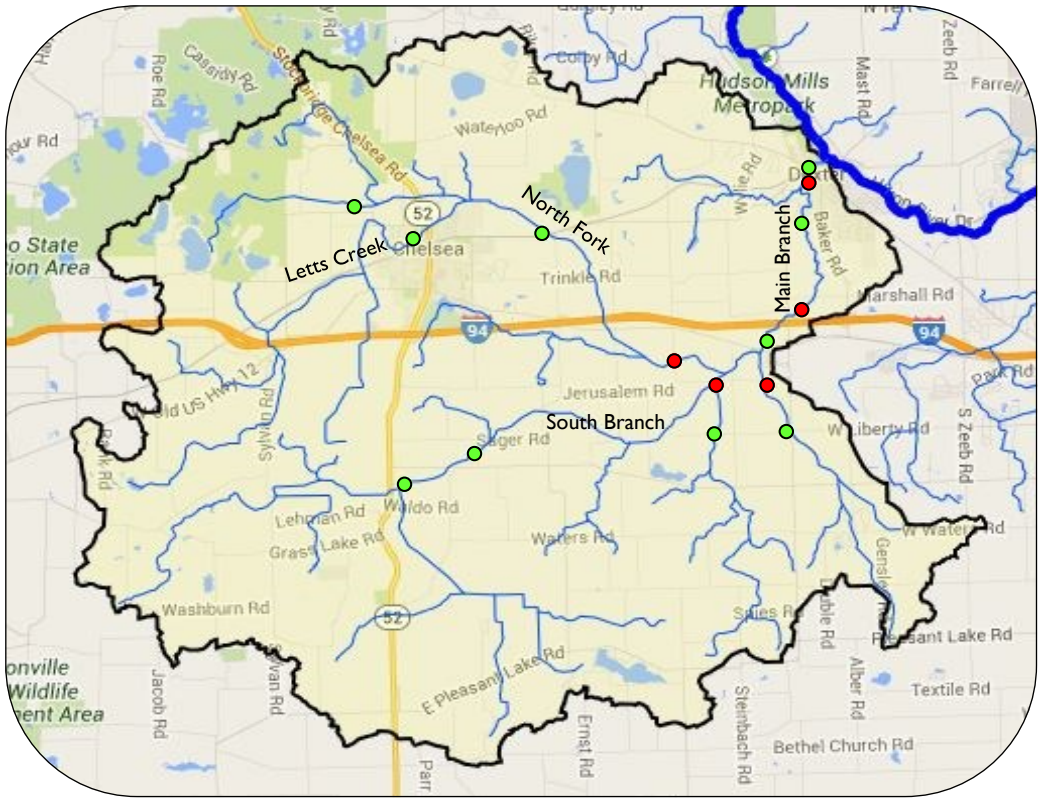
Mill Creekshed Report

www.hrwc.org/mill

Creekshed Profile

Mill Creek's two branches begin in the glacial Sharon Short Hills in Sharon Township (South Branch), and in the sandy hills of the Waterloo Recreation area (North Fork). The streams then flow through a large glacial till plain, where they once meandered through swaths of oak savannah, oak forest, and tamarack swamps. The rich soils attracted farmers, who eventually channelized most of the streams and drained most of the swamps. Today, the creekshed remains the most agricultural in the Huron watershed, but suburban homes are encroaching on the farm fields. While there are many beautiful places on Mill Creek, some portions fail to meet minimum water quality standards. The Michigan DEQ has listed the creek as "impaired" due to excess phosphorus and poor fish and aquatic insect populations.

The Mill creekshed is the largest in the Huron watershed, covering 143 square miles. The entire stream network runs 226 miles and empties into the Huron River just north of the Village of Dexter. The average gradient for the stream system is about 8 feet per mile, which is one of the flattest in the watershed. There are 40 lakes (open water >5 acres) and 18 ponds (open water < 5 acres). The 3 biggest lakes are Four Mile Lake (256 acres), Cavanaugh Lake (197 acres), and Pleasant Lake (195 acres). The creekshed comprises all or portions of the villages of Chelsea and Dexter, and the townships of Dexter, Freedom, Lima, Lodi, Lyndon, Scio, Sharon, Sylvan, and Webster; which are all in Washtenaw County. A tiny sliver of the creekshed's headwaters arise from Jackson County.



- 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 2014**

Creekshed Status and Trends

Kayaker and HRWC volunteer Lee Green rides the Mill Creek rapids. The whitewater feature was created in 2008 after the removal of the Mill Pond dam.

Creekshed Land Use

Little impervious surface; much channelization

Total creekshed Size: 143 square miles
Agriculture: 47%, *68 square miles*
Residential & urban: 18%, *25 square miles*
Forest: 10%, *14 square miles*
Open: 8%, *12 square mile*
Water and Wetland: 16%, *20 square miles*

Total impervious surface: 4%, *6 square miles*

While the low impervious surface in the creekshed allows runoff water to soak into the soil and groundwater, which is protective of water quality, most of Mill's streams have been straightened and its wetlands drained for agriculture, resulting in water quality measures below those expected for this level of impervious surface.

Creekshed Natural Areas

Many natural lands yet to be protected

The creekshed's 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 31% of the creekshed still consists of intact natural areas. However, only a small fraction of these areas is protected from development (about 6% of the watershed, most of it in the Waterloo-Pinckney Recreation Area). Most of the creekshed's remaining natural areas (81%) face an uncertain future. It will be important to keep these lands natural, so they can continue to help keep the creek healthy.

Stream Habitat

Fair

Mill Creek's habitat is typical of agricultural areas. Narrow riparian buffers provide good woody debris habitat, but much of the creek has been straightened in the past, reducing the diversity of riffles and pool habitat. However, with a fairly stable hydrologic regime, this agricultural creekshed has more varied habitat than would be found in an urban creek.

Dams and Impoundments

Present, but do not dominate the system

While dams provide recreational benefits, they greatly alter a stream's hydrology and degrade fish and insect habitat. A dam at the mouth of Mill Creek was removed in 2008, connecting the entire stream system to the Huron River. Other smaller dams are present but are not on the main branch of Mill Creek and only have minor impacts.

Fish Community

A warm and cool-water fish community

Northern Pike were once large and plentiful in Mill Creek, when the stream was still connected to plentiful wetland nursery areas. Pike can still be found, but other fish make up the majority of the fish community: sunfish, johnny darters, mottled sculpin, suckers, and creek chubs are plentiful. In the last three years, Trout Unlimited has stocked brown trout into the colder portions of Mill Creek with the assistance of the Michigan DNR.

Aquatic Insect Community

Fair

Overall, Mill Creek has an adequate insect community. None of the monitored sites are severely impacted, but are not indicative of pristine or healthy conditions, either. There is a lot of sand in Mill Creek filling in hiding spaces

Stream Water Temperature

Cool to Cold water

Mill Creek receives a mix of cold groundwater and warmer surface runoff. Most areas of Mill Creek are similar to other tributaries of the Huron River; reaching a maximum of 75 degrees F on summer days. However, some of the creeks have heavy groundwater inputs that keep the creek under 65 degrees F in the summer, making them some of the coldest creeks in Southeast Michigan.

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. Mill Creek's mean TSS is 14 mg/l.

E. coli

Exceeds Health Standards

E. coli bacteria is a useful water quality indicator for the presence of fecal contamination. In the Mill creekshed, *E. coli* is present in high concentrations that do not permit for partial body contact (no drinking or recreational activities) upstream of Dexter. After heavy rain events, *E. coli* can reach even higher levels due to animal and agricultural waste running off the land into the creek. A 2013 HRWC geographic and animal source study found extensive contamination from numerous sources.

Conductivity

Normal

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 Mill Creek are normal and have been normal

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, Mill Creek's (flow-weighted) mean total phosphorus (TP) is 97 µg/l, with more elevated levels particularly after heavy storms (see graph below). This is likely due to residential and agricultural runoff.

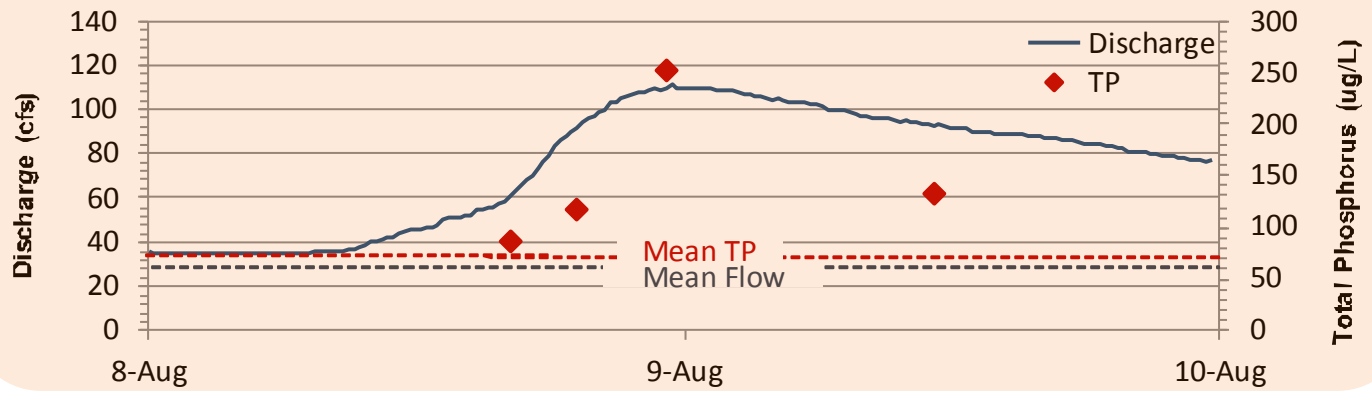
Stream Flow

Moderately 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). Mill Creek has a flashiness rating that is above average compared to other Michigan streams, but more natural than average for the Midwest.

2009 Storm Event Graph

1 inch of rain fell on August 8, over 10 hours.



Successes & Challenges

Successes

•The removal of the Mill Pond Dam in 2008 and subsequent restoration of Mill Creek catalyzed the historic and quaint village to expand its economic, recreation, and community development opportunities based on the waterway flowing through town. The dam removal has restored habitat and added water quality features for a cleaner and healthier creek.

•In partnership, HRWC and Legacy Land Conservancy educated landowners on land protection and management options with a goal of reducing polluted runoff to Mill Creek. So far, we have protected 710 acres in the watershed.

• In 2010 HRWC completed two stream stabilization projects that stabilized severely eroding streambanks using innovative techniques.

• From 2004 through 2007, HRWC carried out a "Mill Blitz" in which HRWC volunteers performed intensive water quality and flow monitoring on numerous Mill Creek locations.

Challenges

• Mill creekshed's communities and residents must promote compact development and preserve natural areas and open spaces. It is extremely important to limit increases of impervious surface in order to maintain the creek's integrity.

•Elevated levels of bacteria mean the creek is unsafe for human exposure. Bacteria sources need to be better identified, but, in general, animal waste (including agricultural and pets) needs to be contained and disposed of properly.

• Residential development, agriculture, and historical channelization of many stretches on the have taken their toll on the creek. Restoring natural stream banks and returning the creek to more natural flows will increase habitat diversity and make the creek more inviting to a wider variety of aquatic wildlife.

• Phosphorus runoff to Mill Creek continues to be a problem. Likely sources of phosphorus are excessive fertilizers in residential areas and agricultural application.

• While erosion is not a major systematic problem throughout the creekshed, after storms visible erosion of stream banks and channel beds is evident in some areas. These areas need to be stabilized.

The entirety of Mill Creek (including the headwaters shown here) flow through rural and suburban areas, and are subject to the impacts that come from such environments. Credit: Dave Brooks

What you can do!

At home

• Maintain a 25 foot vegetated buffer, ideally made of native plants, from all ditches, creeks, and water bodies.

• Have your septic system checked regularly. Leaking septics systems can be a source of phosphorus and bacteria.

• If you own significant property work with a land conservancy to establish an easement to protect it from future development.

• Test your soil to know if you need to apply fertilizer.

In your community

• Advocate for ordinances related to stormwater, natural lands, and land preservation.

• Volunteer with HRWC and come learn about the river and land that drains to the Huron River.

• Join a local board or commission.