



Protecting the river since 1965

Pettibone Creekshed Report

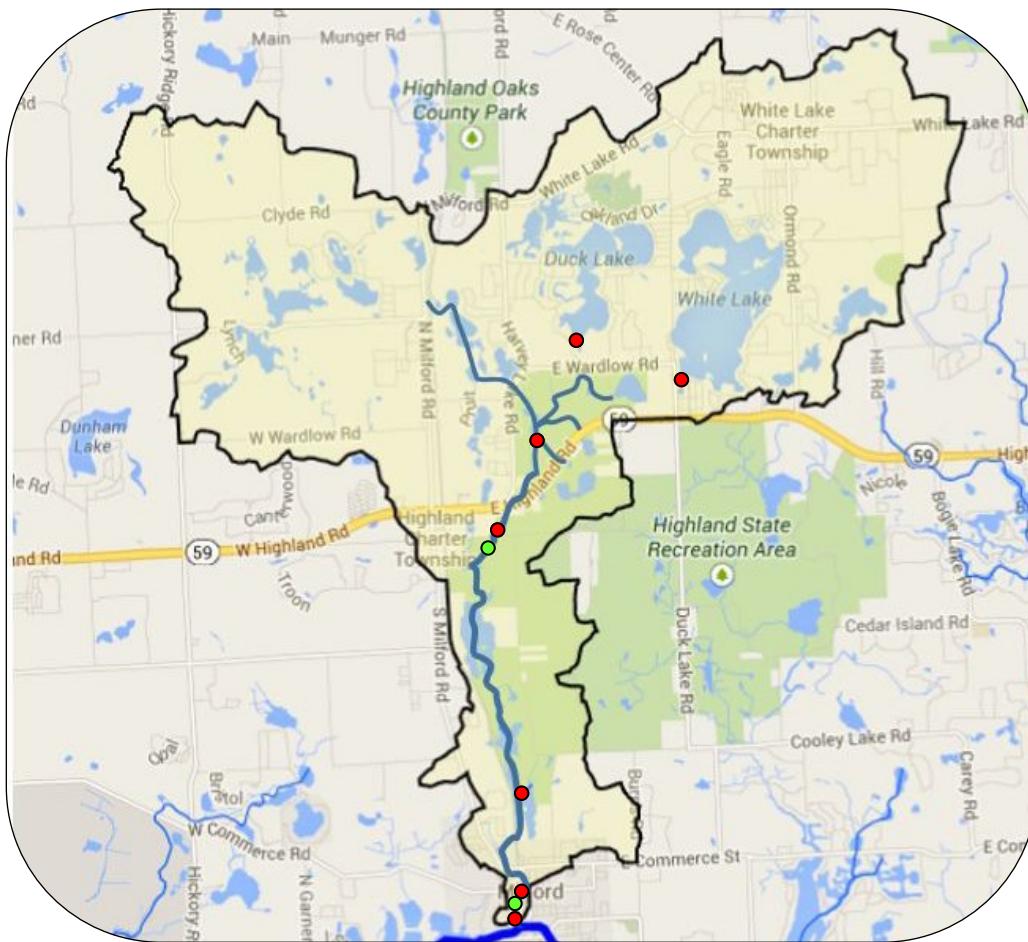
www.hrwc.org/pettibone

Creekshed Profile

Originating in Highland and White Lake townships, Pettibone Creek flows through Milford Township and meets the Huron River at the Mill Pond park in the Village of Milford, Oakland County. The creekshed lies in a glacial landscape of coarse sand and gravel deposits, and was once nearly entirely “oak barrens.” Oak barrens are now considered a critically imperiled ecosystem by the Michigan Natural Features Inventory due to their massive clearing for agriculture during European settlement and continued development. Tamarack swamps and marshes lined its valleys. The area is now home to many sand and gravel operations and residential areas.

Pettibone creekshed is a land of lakes. There are 30 lakes (open water > 5 acres) and 44 ponds (open water < 5 acres) in the creekshed. The two largest lakes, White Lake (540 acres) and Duck Lake (340 acres), as well as many of the smaller lakes, are surrounded by residential housing. However, there are several smaller lakes that still have natural shorelines.

Due to the geology of the area, much of the water flow in the creekshed is through groundwater, and the actual visible creek is quite small. Only 19 miles of branching stream channels make up the creek’s ecosystem, but it drains 22 square miles of land. In contrast, Fleming creekshed is about the same size but contains 48 miles of streams. Pettibone Creek’s average slope is 14 feet per mile, which is on par for the Huron River Watershed as a whole.



● Monitoring sites for Aquatic Insects, Stream Habitat, and Stream Temperature

For more details on these parameters, please see inside.

● Dams

Creekshed Status and Trends



Much of Pettibone Creek flows through beautiful, nearly pristine wetland habitat. Credit: Scott Girardi

Creekshed Land Use

Encroaching impervious surface

Total creekshed size: 25 square miles

Agriculture: 11%, 3 square miles

Residential & urban: 45%, 11 square miles

Forest: 10%, 3 square miles

Open: 15%, 4 square miles

Wetland: 8%, 2 square miles

Total impervious surface: 11%, 3 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 11% of the Pettibone creekshed is currently impervious, this means that the system is at the tipping point of losing much of its biological diversity.

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 18% of the creekshed still consists of intact natural areas. However, only a small fraction of these areas is protected from development (about 10% of the watershed, all in the Highland State Recreation Area). Nearly half of the creekshed's natural areas faces an uncertain future. It will be important to keep these lands natural, so they can continue to help keep the creek

Stream Habitat

Excellent upstream; Poor downstream

Most of the creek has wide riparian zones, meanders through wetlands, and has plenty of gravel and firm sand composing the stream substrate. The habitat is quite poor where the stream flows through the Village of Milford, but this is only a small part of the creek's length.

Dams and Impoundments

Dominate the system

While dams provide recreational benefits, they greatly alter a stream's hydrology, and degrade fish and insect habitat. Seven known dams are in Pettibone Creekshed. Three of these create ponds in the Village of Milford. One creates a small pond slightly to the east of Highland. The other three control the lakes levels of Alderman, Duck, and White Lakes. These dams drastically change the character of Pettibone Creek.

Aquatic Insect Community

Fair upstream; Poor downstream

The aquatic insect community is a reflection of the stream habitat and water temperature in Pettibone Creek. The sample site in Milford is downstream of a dam and alongside a strip mall. The insect population is not diverse or abundant here. At the upstream sample site, the insect population is much healthier, but is still degraded, possibly due to warm water temperatures.

Stream Flow

Stream flow is an important underlying factor for determining likely erosion rates, stream habitat quality, and aquatic community diversity. Stream flow measurements have not been made in Pettibone Creek by HRWC or any other known organization or individual.

Conductivity

Occasionally 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 Pettibone Creek are typically at natural levels, but it is not unusual to detect slightly elevated levels in the winter (most likely due to salt runoff from roads).

Stream Water Temperature

Cool to Warm water

While Pettibone Creek receives cold groundwater inputs, the many impoundments on the system serve to warm the water. Temperature measurements show that the water temperature of Pettibone Creek can get above 80°F and rarely drops below 68°F during July and August. This is a higher water temperature than would be expected for a creek flowing through highly permeable sand and gravel deposits.

Water Quality

Unknown

Beyond conductivity, water quality measurements (such as phosphorus, bacteria, nitrogen, and total suspended solids) have not been made in Pettibone Creek by HRWC or any other known organization or individual.

Fish Community

Likely is a coolwater fish community

The fish community in Pettibone is likely limited due to the number of dams that block fish passage through the system. However, no known fish surveys have been conducted on Pettibone Creek. It is probable that the creek has a coolwater fish community, consisting of smallmouth bass, northern pike (especially in the lakes), various kinds of sunfish, and a wide array of suckers, minnows, and darters.

Color Coded Ranking

Excellent

Fair

Poor

Unknown



Looking downstream along a parking lot as Pettibone Creek runs through Milford. Credit: Tim Appleton



Looking upstream toward a dam on Pettibone Creek as it runs through Milford. Credit: Tim Appleton

Successes & Challenges

Successes

- The Village of Milford has a Wellhead Protection Program, which includes policies to prevent groundwater contamination to their public wells, as well as an active education program.
- The Village of Milford is an active, attractive and interesting place with accessible and comfortable spaces. As one of the five Trail Towns in the Huron River's RiverUp! program, Milford is beginning to redefine their community to maximize Huron River based tourism, economic revitalization and future economic development opportunities.

Challenges

- There is a scarcity of data on Pettibone Creek. HRWC has two sample sites on Pettibone Creek for the monitoring the insect community, water temperature and habitat, and also has information that can be pulled from GIS and aerial imagery. DEQ and DNR have not done any monitoring of the creek. Given this lack of state involvement, the local government (Village, Township, and County) needs to invest more in water quality monitoring on Pettibone Creek.
- The dams on Pettibone Creek create ponds that are only used for recreational purposes such as duck hunting. Removing the unneeded dams on the system (or at least the ones in the Village of Milford where no hunting takes place) would increase the overall water quality, water temperature, and biological community of the stream system.
- Pettibone 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.
- Oak-barrens were the dominant pre-settlement ecosystem in Pettibone creekshed, and these areas are now very rare. Bringing back the oak-barrens would make for an exciting restoration project.



Volunteers visit Pettibone Creek in January during the annual Stonefly Search
Credit: Max Bromley

What you can do!

At home

- Have your septic system checked regularly and maintained properly. Leaking septic systems can be a large source of phosphorus and *E. coli*.
- If you own property with a natural area, work with a land conservancy to establish an easement to protect it from future development.
- If you own a property adjacent to a water body, establish and maintain a riparian buffer to minimize erosion and nutrient runoff.

In your community

- Talk to your local government about taking a proactive role in water monitoring and dam removal on Pettibone Creek.
- Volunteer with HRWC and come learn about the river and land that drains to the Huron River.