

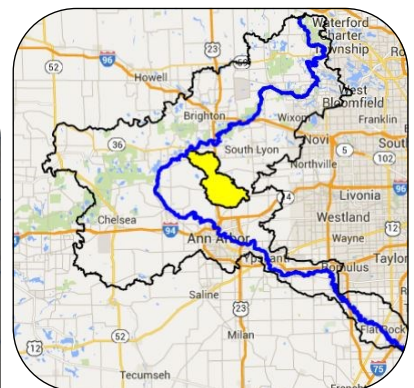
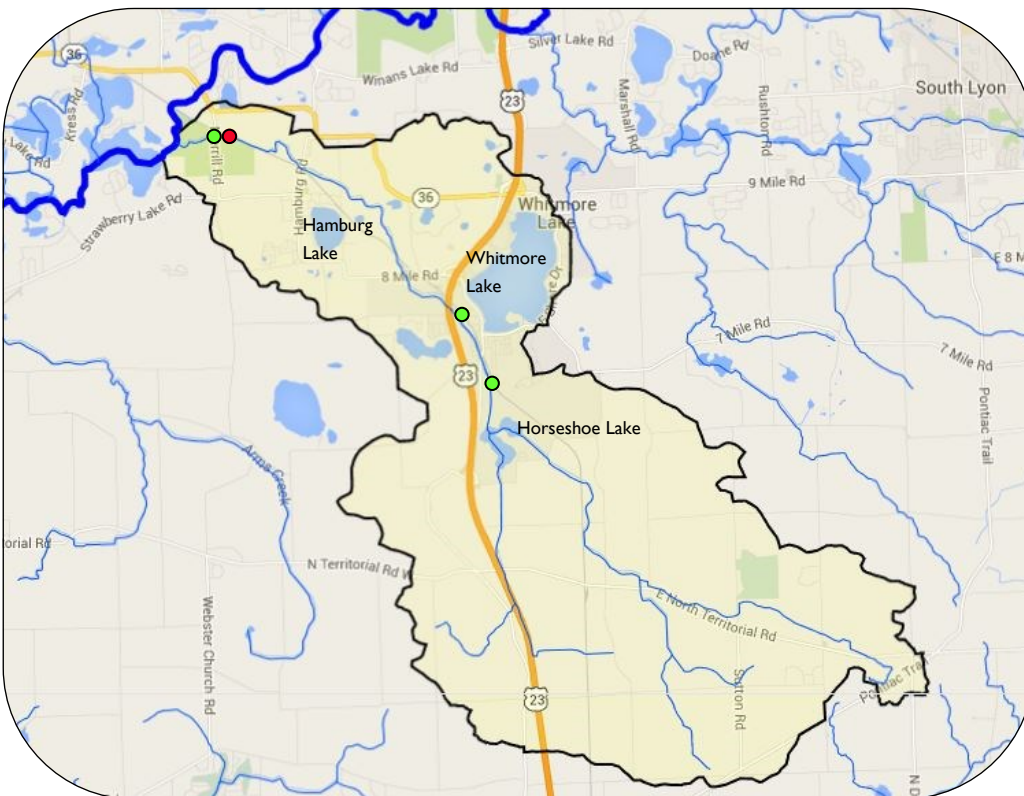
Horseshoe Creekshed Report

Creekshed Profile

Horseshoe Creek flows off the northern slope of the Fort Wayne Moraine, through a gentle rolling landscape and into the Huron River in Hamburg Township in Livingston County. Before European settlement, the watershed was mostly oak-hickory forest with wet prairie wetlands along drainages and the creek. Closer to the Huron, tamarack and black spruce swamps (very rare in the watershed) grew in depressions. Through the 19th and 20th century, much of the area was drained and converted to agriculture, and the creekshed is still primarily used for agriculture today. In the early to mid-20th century, Horseshoe Creekshed was a popular vacation destination thanks to the 575-acre Whitmore Lake, and a town based on the tourism and named after the lake sprouted up along its shores.

Horseshoe creekshed falls primarily in Northfield Township, Washtenaw County. However, the northern 20% of the creekshed, near the mouth of the creek, is in Hamburg and Green Oak townships in Livingston County. Tiny slivers of the creek are found in Salem, Ann Arbor, and Webster townships in Washtenaw County.

Horseshoe Creek is made of two channels that empty into Horseshoe Lake that then form the main branch of the creek that flows out of the lake. The two tributaries are a total of 15 miles, and the main branch is 6.5 miles. The creeks upstream of Horseshoe Lake often do not have flowing water during dry weather. The creek's average slope is 10 feet per mile, which is less steep than other tributaries to the Huron River (16 feet per mile is average). There are 8 lakes in the creekshed (open water greater than 5 acres), including Whitmore Lake, Horseshoe Lake, and Hamburg Lake, all of which are surrounded by houses and are popular places for fishing and boating. There are 10 ponds in the creekshed (open water less than 5 acres.)



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

For more details on these parameters, please see inside.

● Monitoring site for Phosphorus and Total Suspended Solids

Creekshed Status and Trends



Horseshoe Creek, as it nears the Huron, flows through a mix of a forest, agriculture fields, and wetlands. Credit: Lee Burton

Creekshed Land Use

Habitat for a healthy ecosystem

Total creekshed Size: 30.4 square miles

Agriculture: 34%, 10.4 square miles

Residential & urban: 18%, 7.4 square miles

Forest: 8%, 2.5 square miles

Open: 11%, 3.4 square miles

Wetland: 17%, 5.3 square miles

Total impervious surface: 7% , 1 square mile

Numerous studies have shown that fish and insect communities are less diverse when the amount of impervious surface exceeds 10% of the total watershed area. However, while only 7% of the creekshed is currently impervious, drainage and channelization for agriculture have kept the creek from enjoying the benefits of the natural water cycle.

Creekshed Natural Areas

Natural lands need protection

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 28% of the creekshed consists of intact natural areas. However, only a small fraction (9%) of these areas are protected from development. The vast majority of the creekshed's natural areas face an uncertain future. It will be important to keep these lands natural, so they can continue to ease runoff and pollution threatening the creek.

Stream Habitat

Poor upstream; Good downstream

The upstream portions of Horseshoe Creek are heavily affected by agriculture. The creek has been straightened in this section, causing fast stream velocities and eroding banks. The middle section of Horseshoe Creek, through the town of Whitmore Lake, has also been straightened. The banks are eroded, the riparian zone is narrow, and there is significant construction rubble and trash in the stream. However, downstream of Whitmore Lake, Horseshoe Creek flows through a wide forested and wetland riparian zone. Instream aquatic plants and woody debris provide good cover and food for the living creatures there.

Fish Community

The creek has not been studied; lakes lack large fish

There are no known surveys of fish in Horseshoe Creek, but it has unimpeded passage to the main branch of the Huron River and therefore is likely holding small bass, sunfish, and a variety of minnow and darter species. The Michigan DNR has conducted fish surveys of Whitmore Lake. Sunfish were by far the most plentiful, with larger gamefish like bass and pike smaller and fewer than expected. Despite this, many locals fish and ice fish in Whitmore Lake.

Aquatic Insect Community

Poor upstream; Good downstream

The insects in Horseshoe Creek are a reflection of the stream habitat. The insect community is quite poor through the suburban neighborhood of Whitmore Lake. Near the mouth of the creek the insect community is abundant and diverse. However, long term trends indicate that the downstream insect community has declined in recent years, perhaps being affected by poor upstream conditions.

Stream Water Temperature

Cool to warm water

Horseshoe Creek receives a mix of warm surface runoff combined with some amount of cold groundwater. Temperature measurements show that the water temperature of Horseshoe Creek can range between 62°F and 79°F during July and August. The maximum temperature is slightly warm for a small shaded creek. It seems likely that Horseshoe Creek does not receive as much groundwater as other small tributaries that flow to the Huron. Measurements made in 2013 show that about 70% of the water in the creek at the creek's mouth comes from Horseshoe Lake (warm surface water) and about 30% comes from groundwater flow.

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, since conductivity is highly correlated with total dissolved solids (TDS). Conductivity levels in Horseshoe Creek are slightly elevated, indicating the presence of a low amount of unknown pollutants.

Dams and Impoundments

One small dam

The creek has one small lake-level control structure at the mouth of Horseshoe Lake. This structure is used to make slight changes to the water level of Horseshoe Creek to meet lake management needs. An augmentation well to maintain the lake level for Whitmore Lake also draws water from Horseshoe Creek.

Stream Flow

Unknown

Stream flow is an important underlying factor for determining likely erosion rates, stream habitat quality, and aquatic community diversity. There has been no data collected on stream flow in Horseshoe Creek.

Color Coded Ranking

Excellent

Fair

Poor

Unknown

Water Quality

Good results, but little data

Little water quality sampling has been conducted in Horseshoe Creek. The results suggest that the creek has acceptably low levels of phosphorus (mean of 30 µg/l matches the target level), which is the limiting nutrient that can cause algal blooms. Suspended solids, a measure of sediments and organic material in the stream, are also very low at a mean of 3 mg/l against a target of < 80. No samples have been assessed for bacteria levels. More data is needed for a complete assessment.



Horseshoe Creek has many beautiful locales, but unfortunately this degraded location next to Barker Road in Whitmore Lake is probably the most recognizable place on the creek. The bank is unstable and slumping into the creek. Planting native plants and eliminating lawn mowing would improve the quality of the creek in this section. Credit: HRWC

Successes & Challenges

Successes

- Northfield Township's master plan calls for encouraging higher density housing and businesses within the community of Whitmore Lake, where sewer and water and other "gray" infrastructure exists, and designates surrounding rural and agricultural areas for lower density land uses, where the township's (and creekshed's) "green" infrastructure predominates.

Challenges

- Horseshoe Creek is a natural feature that is largely unseen and unknown by the local residents. The area is known more for the lakes that are enjoyed by boaters and anglers. It is important to help the residents increase their knowledge of the creek in order to inspire stewardship and care for it.
- The Whitmore Lake augmentation well, operated by the Washtenaw County Water Resources Commission, pumps water from Horseshoe Creek in the summer. The well has been observed to draw the creek down to almost no flow during dry periods. Such a condition threatens all life in the creek.
- Horseshoe Creek runs north from Washtenaw County into Livingston County, leaving it straddling political jurisdictions. Therefore planning has been incomplete and there is no watershed management plan that covers the entire creekshed.

What you can do!

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/>
- Volunteer with HRWC and come learn about the river and watershed.
- Explore Horseshoe Creek for yourself! Join the HRWC creekwalking program this summer with your friends or family and get to know the features of Horseshoe Creek.



A rustic stairway connects the Lakelands Trail to Horseshoe Creek. Credit: HRWC

What you can do!

At home

- If you have property adjacent to Horseshoe Creek or a lake, leave a vegetated buffer strip adjacent to the waterway—ideally a suite of native plants, 50 feet wide. Better yet, complete as many waterfront wisdom activities as possible: www.hrwc.org/waterfront.
- 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.
- If you manage horses or livestock, install fencing or other exclusions to keep them out of the streams. A vegetated buffer will also reduce erosion and keep their waste from washing into streams.