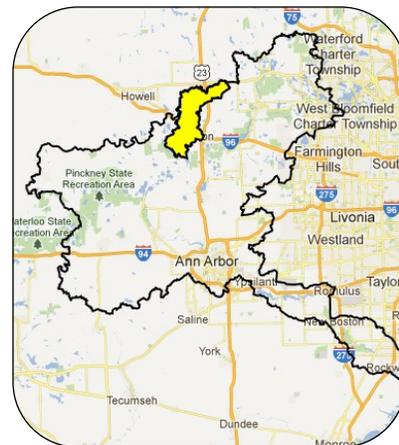
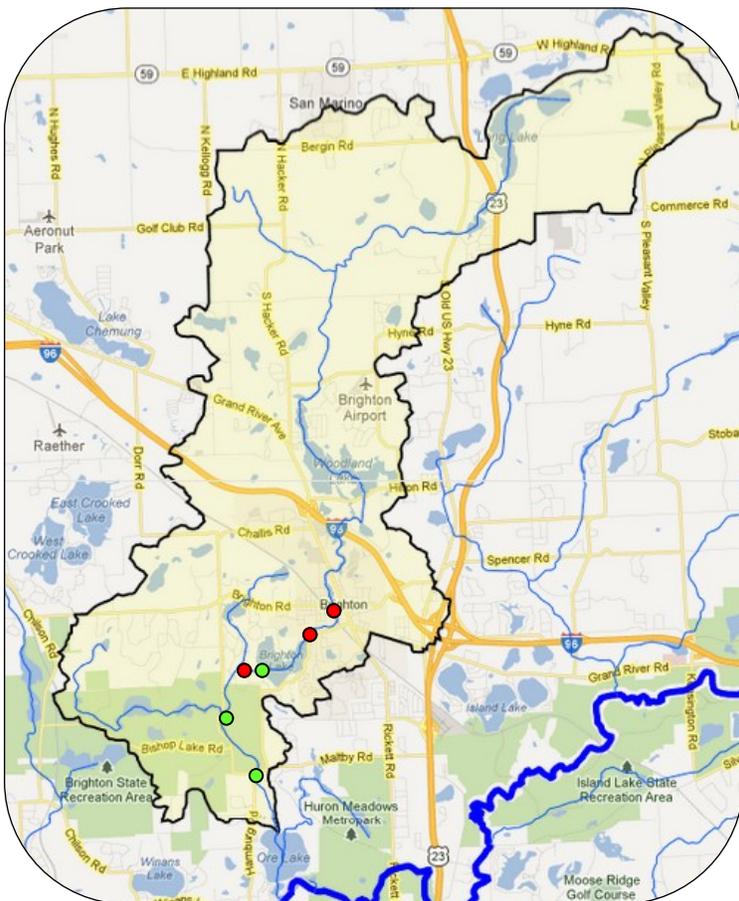


## Creekshed Profile

Once covered by oak barrens, oak and hickory forests, and marshes and swamps, this creekshed was home to Chippewa and Potawatomi Native American tribes. Initial European settlement centered on the transformation of the open barrens for agricultural production and the forested areas for timber. Over the past few decades agriculture has been quickly diminishing as land has transferred to suburban uses.

This 34 square mile creekshed lies within Livingston County and comprises all or portions of Hartland, Oceola, Genoa, Brighton, and Hamburg townships and the City of Brighton. There are 34 lakes (open water >5 acres) and 34 ponds (open water < 5 acres) in the South Ore creekshed. The three biggest lakes are Woodland Lake (258 acres), Long Lake (178 acres), and Brighton Lake (163 acres).

South Ore Creek's main stem and its tributaries total 36 miles of waterways. The main branch starts at the outflow of Maxfield and Long Lakes. From there, it flows southwest until it reaches Woodland Lake, then flows south through the City of Brighton, and downstream to the Brighton Lake impoundment within the southwestern portion of the City of Brighton. Downstream of Brighton Lake, the creek flows through Brighton State Lake Recreation Area, which greatly helps South Ore Creek's water quality toward the mouth of the creek. After exiting Brighton State Rec Area, the creek empties into Ore Lake, which then drains into the main branch of the Huron River. Throughout its run, the main branch of the creek drops 108 feet and has an average gradient of about 6 feet per mile, which is flat when compared to other creeks in the Huron River Watershed (Fleming and Norton Creek are 13 feet per mile, for example).



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

For more details on these parameters, please see inside.

● Monitoring site for Stream Flow, Phosphorus, Total Suspended Solids, and *E. coli*

# Creekshed Status and Trends



Looks can be deceiving! This beautiful stretch below Brighton Dam has a very poor macroinvertebrate community. Credit: Jim Kralik

## Creekshed Land Use

### *Past the tipping point*

Total creekshed Size: 34 square miles

Agriculture: 8%, 3 square miles

Residential & urban: 47%, 16 square miles

Forest: 8%, 3 square miles

Open: 16%, 6 square mile

Wetland: 15%, 5 square miles

Total impervious surface: 15% , 5 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 15% of the South Ore creekshed is currently impervious, this means that the biological and hydrological systems in the creek are suffering negative impacts.

## Creekshed Natural Areas

### *Many natural lands yet unprotected*

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 22% of the creekshed still consists of intact natural areas. However, only a small fraction of these areas is protected from development (about 7% of the watershed, including parts of Brighton State Recreation Area). The rest of those natural areas face an uncertain future. It will be important to keep these lands natural, so they can continue to help keep the creek healthy.

## Dams and Impoundments

### *Greatly change the quality of the creekshed*

Dams greatly alter a stream's hydrology and degrade fish and insect habitat. Three known dams block South Ore Creek. Two of these dams regulate lake water level, Woodland Lake and Brighton Lake. The Brighton Mill Dam creates an impoundment through the City of Brighton, and the impoundment causes excessive water warming and algae growth.

## Stream Habitat

### *Moderately diverse habitat*

The stream bed of South Ore Creek is an even mix of rocks, gravel, and sand. At the 2 downstream sample sites, stream bends, undercut banks, pools, and riffles all provide different places for different types of organisms to live. However, the sample site below Brighton Lake is a uniform shallow riffle and lacks a diversity of habitat types.

## Fish Community

### *Warm and cool-water fish community*

South Ore Creek is home to smallmouth and largemouth bass, but the stream gets warmer in the summer than other creeks in the Huron River watershed. Many areas are home to warm water, pollution tolerant fish species. Other species in South Ore Creek include carp, bullhead, suckers, channel catfish, bluegill, green sunfish, creek chubs, and various kinds of shiners and darters.

## Aquatic Insect Community

### *Ranges from poor to healthy*

South Ore Creek has a range of aquatic insect communities. The sample site below Brighton Lake has a very poor insect community with only a few types of bugs; it is one of the worst places HRWC measures in the whole Huron River watershed. As the creek flows downstream and further away from the effects of the creekshed's dams, the insect community improves and is quite diverse at the furthest downstream sample site. HRWC has been monitoring the creek since 1994.

## Stream Water Temperature

*Cool to warm water*

South Ore Creek receives a mix of cold groundwater and warmer surface runoff. Much of the stream is affected by warm water because of dams, which create impoundments that are more exposed to the sun than shaded creeks. Temperature measurements show that the water temperature of South Ore Creek can exceed 80 °F during July and August. This is not excessively hot but is warmer than other creeks in the Huron River Watershed.

## E. coli

*Uncertain*

*E. coli* bacteria is a useful water quality indicator for the presence of fecal contamination. In the South Ore creekshed, *E. coli* concentrations are unknown, but waters in the region do not show high bacteria levels. *E. coli* is normally present in low concentrations in all streams that permit for partial body contact (no drinking, but recreational activities are fine). After heavy rain events, *E. coli* could reach levels that are above State standards. It can take 48 hours for the *E. coli* to return to safe levels.

## Phosphorus

*Occasionally high*

Phosphorus is the limiting nutrient in most freshwater systems, and too much phosphorus can cause algal blooms and water quality problems. South Ore Creek's mean total phosphorus (TP) is 29 µg/l, which is just below the target for area streams of under 30 µg/l. However, it is sometimes higher after heavy storms (see below). This is likely due to residential runoff. Brighton Lake also periodically suffers algae blooms.

## 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.. South Ore Creek's mean TSS is 5 mg/l.

## Conductivity

*Normal to slightly elevated*

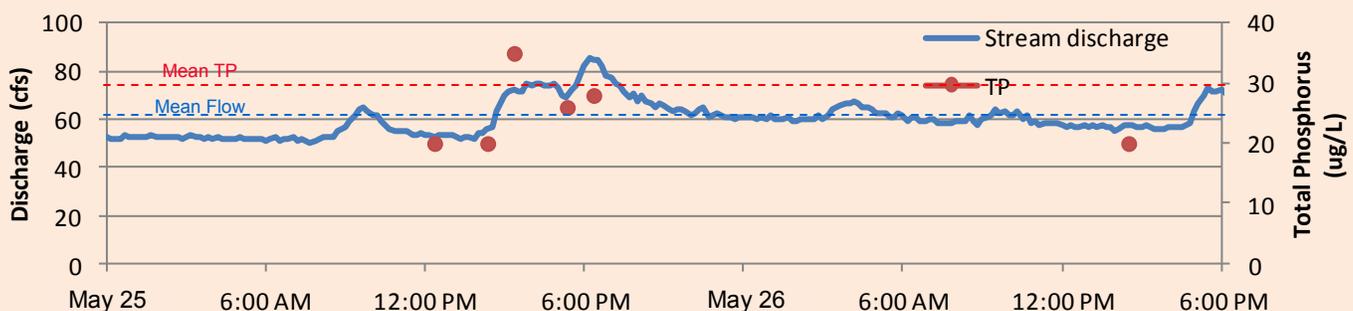
Conductivity is a measurement of the amount of ions (also known as salts) dissolved in water. Conductivity is a quick and easy measurement to make, and is useful as an indicator of potential problems, since conductivity is highly correlated with total dissolved solids (TDS). Conductivity levels in South Ore Creek average 677 µS, which is normal. About once a year a measurement is taken in the 900-

## Stream Flow

*Natural flows*

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). South Ore Creek has a flashiness rating that is very low (more natural) for comparable Michigan streams.

## 2010 Storm Event Graph 1.7 inches of rain fell on May 25, 7 AM through 8 PM.



## Successes & Challenges

### Successes

- The Livingston Watershed Advisory Group (WAG) developed watershed management plans for the Brighton Lake and Strawberry Lake watersheds. The WAG meets quarterly to discuss implementation.
- The Livingston WAG, Michigan DNR, and volunteers restored a section of the Bishop Lake shore as a bioengineering demonstration project.
- Hamburg and Genoa townships have adopted standards to control stormwater pollution and set developments back from natural features like wetlands, while Brighton Township has a strong wetlands protection ordinance.
- Brighton township has established a natural features protection overlay to ensure incoming developments are protective of natural areas (as shown by HRWC's bioserve map), wetlands, and streams.
- Genoa and Hartland have created in their master plans town (or village) centers to encourage redevelopment and walkable, livable neighborhoods that do not consume natural areas.
- The City of Brighton upgraded the waste water treatment plant and moved its discharge outfall below Brighton Lake in 1988.

### Challenges

- Future development as projected by most of South Ore communities' master plans will continue to follow a low density pattern of development. This will result in more stormwater runoff pollution due to the increased pavement, rooftops and other impervious surfaces.
- Nearly all of the existing natural areas in the creekshed are under private ownership and designated for some kind of development. If the creekshed loses these wetlands and forests, it will lose the ecosystem services they currently provide.
- The dams on the lower half of South Ore Creek are a likely cause of many of the creek's problems. The local governments in charge of these dams need to look carefully at these structures and determine if their presence is worth the environmental cost and if the dam management could be conducted to mimic more natural stream flows.



The dam outlet at Brighton Lake. Credit: Jim Kralik

## What you can do!

### At home

- Minimize your turf lawn; put in deep-rooted native plants and trees that don't need fertilizer or watering.
- Waterfront homeowners: keep a 15 foot buffer of native plants and trees between your lawn and the water front to provide habitat and promote pollutant filtering.
- Have your septic system checked regularly. Leaking 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.

### In your community

- Learn to identify environmental impairments like algal growth in waterways and erosion on land—and follow up with HRWC when you see something wrong.
- Volunteer with HRWC and come learn about the river and land that drains to the Huron River.
- Find out if your local government is part of the Livingston WAG. If not, encourage their participation.