

# Shingle Creek and West Mississippi 2016 Monitoring Program

## *Shingle Creek Monitoring*

Water quality and quantity monitoring on Shingle Creek and select lakes is performed by Wenck staff and the USGS and macroinvertebrate monitoring in Shingle Creek is performed by volunteers through the Hennepin County Environmental Services' (HCES) RiverWatch program. Additional lake monitoring is performed by volunteers through the Met Council's Citizen Assisted Lake Monitoring Program (CAMP). Wetland monitoring is conducted through HCES's Wetland Health Program (WHEP).

The monitoring program includes both routine monitoring as well as obtaining data to be used to evaluate progress toward the lake and stream TMDLs every five years. In 2016 the Commission will complete 5-year reviews of progress toward the Bass and Eagle Lake chains TMDLs and will perform monitoring on Meadow and Success Lakes.

### **Stream Monitoring**

Routine Stream Flow and Water Quality Monitoring. The Shingle Creek Commission has routinely monitored stream flow and water quality in Shingle Creek since 1996. Two locations, one downstream of Humboldt Avenue in Minneapolis ("SC-0," see attached Figure 1 for all monitoring locations) and one upstream of Zane Avenue in Brooklyn Park ("SC-2") have been monitored for water quantity and various water quality chemical parameters. In 2007, the monitoring location upstream of Zane Avenue was moved upstream to just downstream of Brooklyn Boulevard in order to obtain a better stage-discharge relationship. This site is identified as SC-3 and SC-2 is no longer monitored. In 2015 Bass Creek ("BC-1" on Figure 1) was added as a third site to be routinely monitored for water quality and flow.

A fourth site at Queen Avenue in Minneapolis ("SC-1") is monitored for flow by the US Geological Survey (USGS) as a part of its ongoing National Assessment of Water Quality (NAWQA). Chemical parameters are no longer routinely measured at the USGS site, except for continuous conductivity and temperature. The Queen Avenue data are available on-line real-time at <http://waterdata.usgs.gov/mn/nwis/uv?05288705>. The Commission also partners financially with the USGS in the operation of the Queen Avenue monitoring station.

Volunteer Stream Monitoring. Student volunteers provide stream macroinvertebrate monitoring through Hennepin County's RiverWatch at three locations on Shingle Creek shown on Figure 1. Site 10 is monitored by students from Park Center High School. The other sites and volunteer groups have varied year to year. The Commission contracts with Hennepin County for this service. The Three Rivers Park Board occasionally monitors an additional site on Shingle Creek in the North Mississippi Regional Park (shown as Site A on Figure 1). For 2016 the Commission will monitor three sites yet to be determined.

### **Lake Monitoring**

Intensive Lake TMDL Monitoring. To track the effectiveness of BMP implementation in improving lake water quality, the Commission periodically performs intensive lake monitoring to supplement the volunteer surface monitoring. Because the Commission's goals include achieving delisting of lakes that meet their TMDLs and water quality, the monitoring plan includes more rigorous lake monitoring sufficient to demonstrate to the MPCA and EPA that conditions have improved.

# Shingle Creek and West Mississippi 2016 Monitoring Program

For 2016, Meadow and Success Lakes will be monitored twice monthly, including surface water samples and water column temperature and DO profiles. Note that Magda and Pomerleau are scheduled for 2017, at which point we will have been through the cycle of all lakes and will start up again in 2018 with Ryan and Crystal and then the Twins.

Aquatic Vegetation Surveys. A component of the intensive monitoring is to obtain or update surveys of lake aquatic vegetation. Aquatic vegetation plays an important role in water quality and biotic integrity, and that vegetation community can change as water quality changes. For 2016 surveys for Meadow and Success Lakes will be updated in tandem with the intensive monitoring.

Sediment Coring. Monitoring on Eagle Lake in 2015 identified internal loading as a potentially important source of phosphorus in the overall nutrient budget. The 2010 TMDL for Eagle Lake used model residual to estimate internal loading. However, recent lake and watershed monitoring suggest that internal loading may be a larger part of the overall phosphorus budget than previously thought. Sediment core results will be used to verify the internal phosphorus loading that was observed during the 2015 intensive sampling effort.

Volunteer Lake Monitoring. The Shingle Creek Commission has participated in the Met Council's "Citizen Assisted Lake Monitoring Program" (CAMP) since 1993. This program trains volunteers to take surface water samples and make water quality observations from late spring to early fall, using standardized reporting techniques and forms. The CAMP program has been the Commission's primary means of obtaining ongoing lake water quality data. This program is also an NPDES Education and Outreach BMP.

CAMP was initiated by the Met Council to supplement the water quality monitoring performed by Met Council staff and to increase our knowledge of water quality of area lakes. Volunteers in the program monitor the lakes every other week from mid April to mid October. They measure surface water temperature and Secchi depth, and collect surface water samples that are analyzed by the Met Council for total phosphorous, total Kjeldahl nitrogen, and chlorophyll-a. The volunteers also judged the appearance of the lake, its odor, and its suitability for recreation.

Lakes are monitored on a rotating schedule. The larger lakes are monitored every other year while the smaller lakes are monitored every three years. It is assumed that when a lake undergoes the intensive sampling program, no CAMP monitoring will be performed that year. 2016 volunteer lake monitoring will be conducted on Crystal, Ryan, and the Twin Lake Chain.

## **Wetland Monitoring**

Wetland 639W monitoring. In 2016 we will continue to monitor water level in the wetland at both the outlet weir and the overflow weir and collect approximately 5 water quality samples to estimate phosphorus loading from the wetland to Upper Twin Lake.

Volunteer Wetland Monitoring. In 2007 the Commission began participating in Hennepin County's Wetland Health Evaluation Program (WHEP), a volunteer monitoring program. Through this program, adult volunteers monitor vegetative diversity and macroinvertebrate communities. The Commission discontinued participation in this program between 2011-2013 for budget reasons. The program started up again in 2014 and is budgeted to continue in 2016 at two yet to be determined sites.

# Shingle Creek and West Mississippi 2016 Monitoring Program

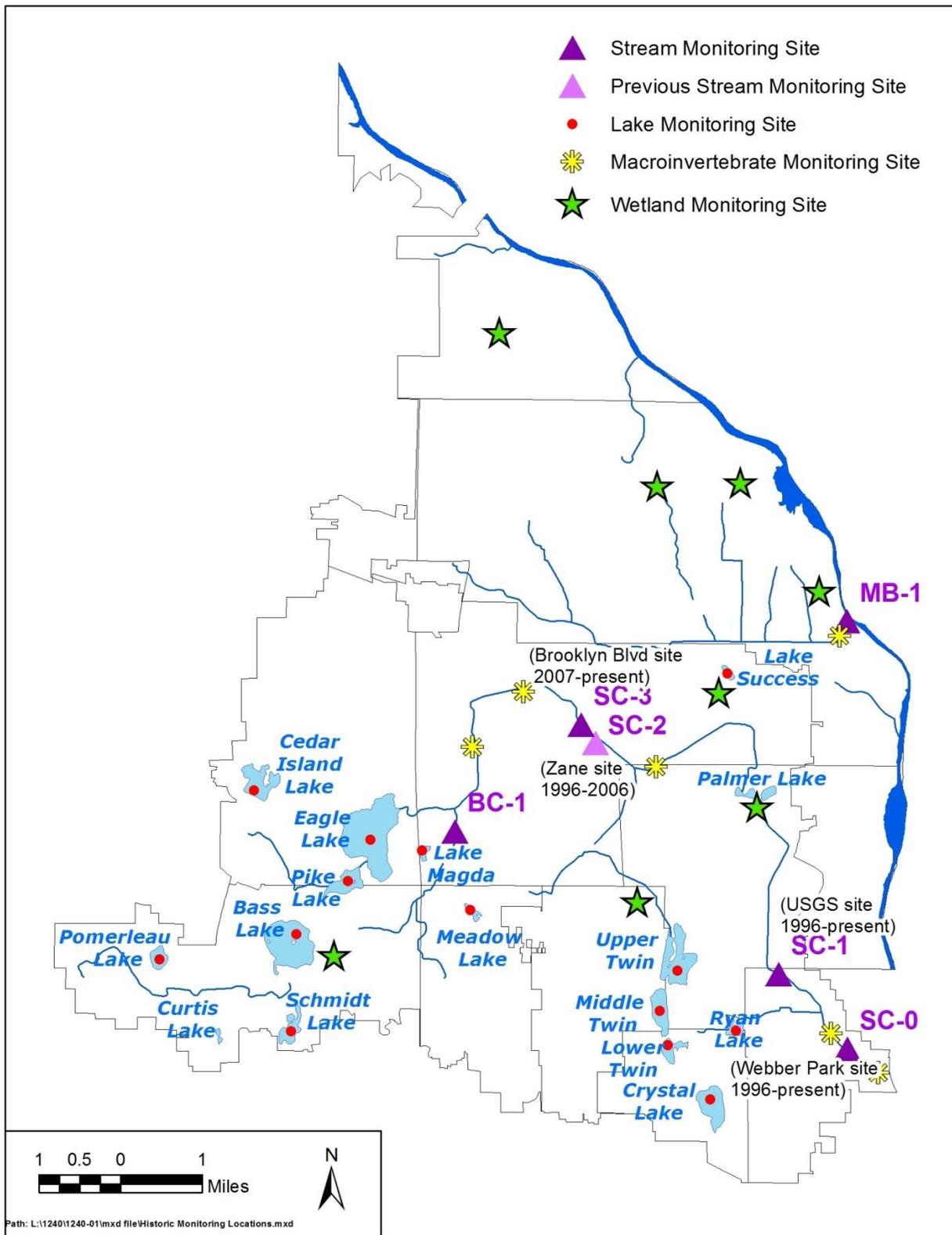


Figure 1. Shingle Creek watershed monitoring locations.

# Shingle Creek and West Mississippi 2016 Monitoring Program

## *West Mississippi Monitoring*

The West Mississippi Commission for many years did not routinely monitor water quality in the few streams that are present in the watershed. The Commission undertook stream and outfall monitoring in 1990-1992 and found that the water quality of runoff from the watershed was generally within ecoregion norms. Since much of the watershed was poised to develop under Commission rules regulating the quality and rate of runoff, the Commission elected to discontinue further monitoring. In 2010 and 2011 the Commission authorized a repeat of the 1990-1992 monitoring, to determine current conditions and evaluate whether the development rules were protective of downstream water quality.

The Third Generation Plan incorporated ongoing, routine monitoring for West Mississippi that includes monitoring flow and water quality at two sites per year on a rotating basis.

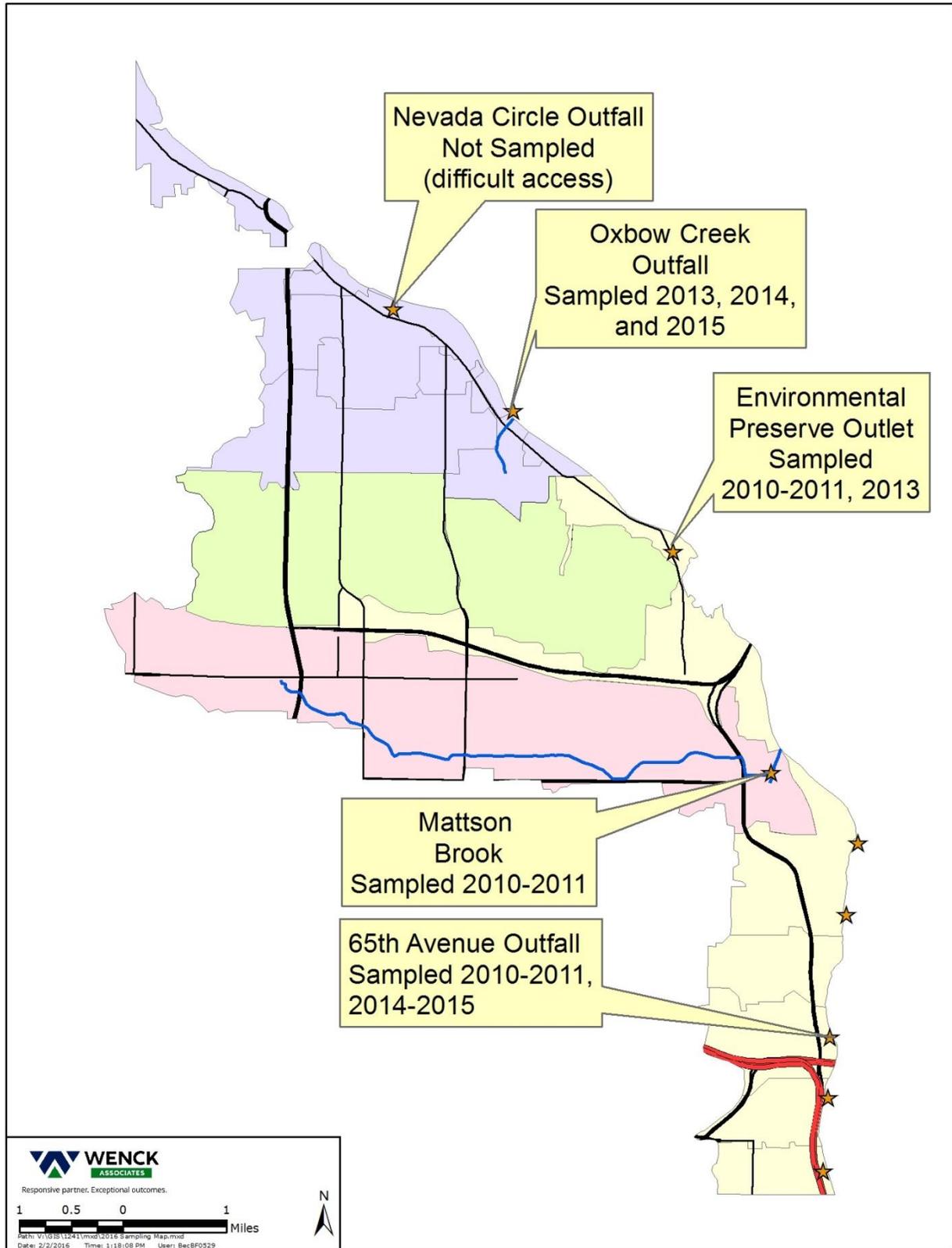
Routine Monitoring. Figure 2 shows the West Mississippi outfall sites sampled in 2010, 2011, 2013, 2014, and 2015 (no monitoring was conducted in 2012). The Environmental Preserve and Mattson Brook sites will be monitored again in 2016 for flow and water quality using automatic samplers. Continuous flow will be monitored using pressure transducers, and water quality will be analyzed through field parameter measurements, periodic grab samples and storm composite sampling using ISCO automated samplers purchased by the Commission in 2010.

Volunteer Stream Monitoring. Student volunteers from Minneapolis South High School provide stream macroinvertebrate monitoring through Hennepin County Environmental Services' RiverWatch at one location in West Mississippi – Mattson Brook. The Commission contracts with Hennepin County for this service (see Figure 1 for location).

For 2016 the Commission will continue participating in the Hennepin County Environmental Services' RiverWatch program at one site at Mattson Brook. The funds are contracted to Hennepin County, which runs the program and manages the volunteers.

Volunteer Wetland Monitoring. In 2007 both the West Mississippi and Shingle Creek Commissions began participating in Hennepin County Environmental Services' Wetland Health Evaluation Program (WHEP), a volunteer monitoring program. Through this program, adult volunteers monitor vegetative diversity and macroinvertebrate communities. In 2016 two wetlands will be monitored at sites to be determined.

# Shingle Creek and West Mississippi 2016 Monitoring Program



# Shingle Creek and West Mississippi 2016 Monitoring Program

**Figure 2. West Mississippi watershed monitoring locations.**