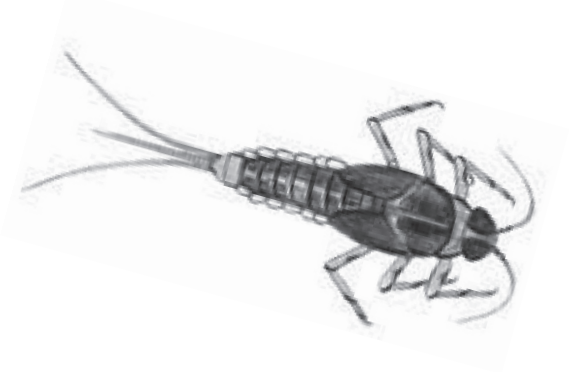
# Stream Quality Monitoring 2009 Annual Report



# Sandusky River
# State Scenic River

Ohio
Department of Natural Resources
Division of Watercraft

Ohio Department of Natural Resources Division of Watercraft Scenic Rivers Program

# Stream Quality Monitoring 2009 Annual Report
# Sandusky State Scenic River

## Contents


Introduction ..... 1

Overview ..... 2

Sandusky Scenic River Stream Quality Monitoring Station Map ..... 3

Stream Quality Monitoring Participants ..... 4

Stream Quality Monitoring Station Descriptions ..... 5-7

Sampling Results & General Trends ..... 8

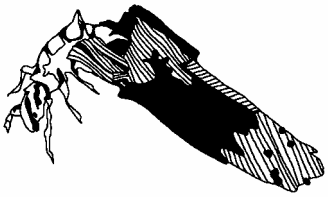
Total Suspended Solids (TSS) ..... 9

Comparison of Collected Stream Quality Monitoring Data ..... 10

- Table 1 - Macroinvertebrate Pollution Tolerance ..... 10
- Table 2 - 2009 Mean CIVs by Reference Station ..... 11
- Figure 1 - 2009 Mean CIV by Reference Station ..... 11
- Figure 2 - 1999-2009 Mean CIVs by Reference Station ..... 12

**Appendix-** 2009 Stream Quality Monitoring Data by Station ..... 13-14

# Introduction



### Ohio Scenic Rivers Program

With more than 60,000 miles of streams, Ohio is a water-rich state. Many of Ohio's streams support thriving plant and animal communities, including Ohio's state designated scenic rivers. Administered by the Ohio Division of Watercraft, the Ohio Scenic Rivers Program oversees 14 state designated scenic river systems, totaling 21 individual stream segments. These streams represent some of the best of Ohio's waterways.

### Stream Quality Monitoring Project

Developed in 1983, the Ohio Stream Quality Monitoring (SQM) Project uses volunteers in aquatic macroinvertebrate monitoring to compile biological and water quality data on the state's scenic rivers. The Ohio SQM project is an excellent, simple and cost-effective method of assessing a stream's health.

Aquatic macroinvertebrates are organisms, which lack a backbone (invertebrate), are large enough in size to view with the naked eye (macro), and spend at least a portion of their lives in the water (aquatic). Macroinvertebrates, such as various aquatic insects (e.g. mayfly, stonefly), are good indicators of stream health. When negative impacts to a stream occur, the result may show a decline or absence of certain macroinvertebrate species. Through consistent monitoring, changes observed in the macroinvertebrate community help the Ohio Scenic Rivers Program detect and address potential impacts to a stream.

The Ohio Scenic Rivers Program compiles volunteer field assessment information into a statewide database. The database serves as a tool to track short- and long-term changes and trends over time.

### SQM Project Relies on Volunteers

Coordinated by the Ohio Division of Watercraft, the Ohio SQM Project provides opportunities for public participation in scenic river protection efforts. Many local, youth and conservation organizations, individuals and families are committed to monitoring more than 150 stations along Ohio's scenic rivers.

SQM volunteers collect macroinvertebrate data from selected monitoring stations, also referred to as monitoring sites or reference stations, at least three times during the monitoring season. Volunteers complete field assessment forms which document taxonomy, tolerance and abundance of collected organisms.

### SQM Annual Report

The information collected by volunteers has become a critical tool for the documenting of the health of Ohio's state scenic, wild and recreational rivers. This report is a compilation of field data collected during 2009 by volunteers and staff. It also represents a year of dedication and commitment shown to Ohio's special waterways by thousands of SQM volunteers.

# Overview

In January 1970, the Director of the Ohio Department of Natural Resources designated approximately 70 miles of the Sandusky River as Ohio's second scenic river from U.S. Route 30 in Upper Sandusky to the Roger Young Memorial Park in Fremont. The southern two-thirds of the designated portion of the river flow through the farmlands of Wyandot and Seneca counties, carving its valley through 10 to 50-foot-high dolomite and limestone outcroppings. The northern portion of the Sandusky River flows through bedrock scoured by receding glaciers more than 13,000 years ago. North of Fremont, the Sandusky River flows approximately 15 miles before emptying into Sandusky Bay and Lake Erie.

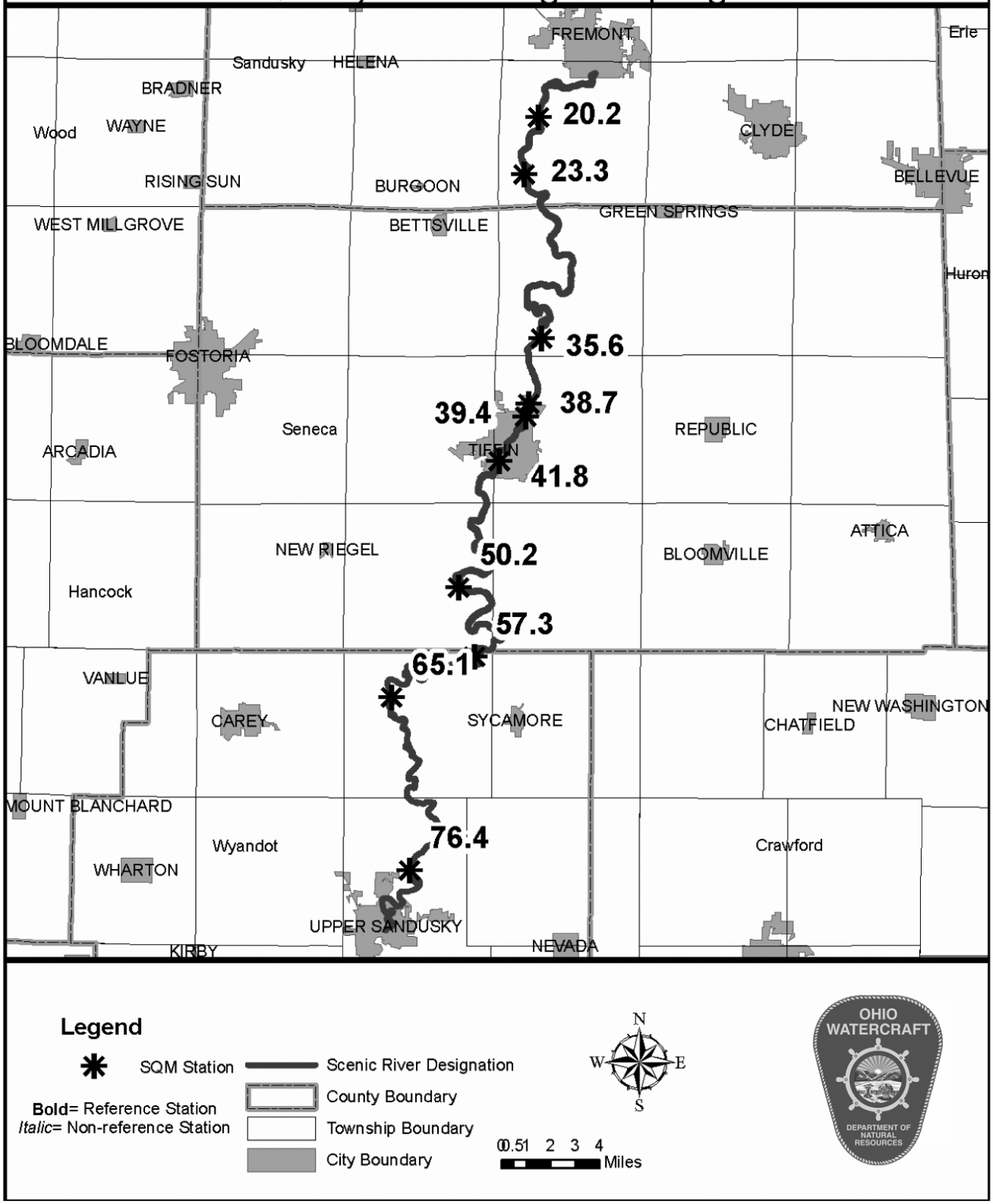
Deriving its name from the native *"sa-un-dustee"* or *"water within pools",* the Sandusky River is remote and scenic. As a result, the Sandusky is home to Ohio's largest inland nesting bald eagle population. While canoeing during the summer and fall months, it is not uncommon to observe a number of eagles fishing and resting along the heavily forested river corridor. To protect the eagles during critical nesting periods, canoe traffic is restricted during the late winter and early spring.

The Sandusky River valley also played an important role in Ohio's history. Several forts were constructed in the valley, including Fort Stephenson, site of an important victory in the War of 1812. The Sandusky was also home to the Seneca and Wyandot Indians. In gratitude for the Wyandot's support during the war, the Federal Government constructed Indian Mills in 1820 in what was then, the last native reservation in Ohio. One of the two mills is restored and maintained for public visitation by the Ohio Historical Society.

Aquatic life within the Sandusky is rich and diverse. In addition to numerous macroinvertebrates, such as dobsonfly larva, mayfly nymphs and many others, the Sandusky River is home to 68 species of fish, including large spring spawning runs of white bass and walleye. The Sandusky River also possesses healthy populations of pollution-sensitive fish, such as rainbow and fantail darters. Additionally, the Sandusky is the only river in Ohio that supports all six species of redhorse suckers. Redhorse suckers are further indicators of exceptional water quality.

Public access to the Sandusky River is available at several scenic river access areas administered by the Division of Watercraft and the Sandusky County Park District. Information about public access facilities on the Sandusky State Scenic River is available by contacting the Northwest Ohio Stream Quality Monitoring Coordinator at 419-621-1302 or visit www.ohiodnr.com/watercraft online.

# Sandusky River
## Stream Quality Monitoring Sampling Stations



# 2009 Stream Quality Monitoring Participants

Whether their contribution was a one-time event or a recurring stream exploration, the individuals and organizations listed below played a significant role in protecting the Sandusky River. Their time and dedication to this river and the Ohio SQM Project are greatly appreciated.

**River Mile 20.2 Tindall Bridge**
Volunteers are needed to monitor this site.

**River Mile 23.3 Wolf Creek Park Picnic Area/Canoe Launch (Sandusky County Park District)**
Fremont School 6-8 Summer School
Debbie Haubert for Sandusky County Park District

**River Mile 35.6 Izaak Walton League River Access**
Mario Livojevic
Bill Riley

**River Mile 39.4 Pioneer Mill**
Volunteers are needed to monitor this site.

**River Mile 41.8 Ella Street Bridge**
Volunteers are needed to monitor this site.

**River Mile 50.2 St. John's Bridge**
Casey and Shelby Monroe
Linda Rose

**River Mile 57.3 Mexico Bridge**
Volunteers are needed to monitor this site.

**River Mile 76.4 Indian Mill Scenic River Access**
Carey Schools
Jen Kalb
John Kiene
Mohawk Schools
Our Lady of Consolation School
Upper Sandusky Schools
Wyandot Soil and Water Conservation District

**River Mile N/A Forrest Preserve on Honey Creek (Seneca County Park District)**
Bloomville School 4-6 Grades
Casey and Shelby Monroe
Linda Rose

The continued success of the Ohio SQM Project is dependent upon the dedication of these (and other) monitors. We would like to acknowledge Linda Rose for Seneca County Park District and Debbie Haubert for Sandusky County Park District for monitoring their sites at least three times during the season. To become a volunteer, please contact the Northwest Ohio Stream Quality Monitoring Coordinator at 419-621-1302.

# Stream Quality Monitoring Station Descriptions

Stream Quality Monitoring sites along the Sandusky River have been selected based upon their ease of access, macroinvertebrate habitat and adequate sampling areas. Many riffle areas on the upper segment of the Sandusky, are widely dispersed, with many sites on private property or inaccessible. The lower Sandusky (from Tiffin south) is much more accessible, lending itself more readily to SQM activities. Brief summaries of the SQM stations on the Sandusky Scenic River follow:

**River Mile 20.2 - Tindall Bridge**
This site replaced Fremont's Hayes Avenue Bridge as the northern-most reference station on the Sandusky River, as Hayes Avenue Bridge was outside the Scenic River designation. Previously a non-reference site as access was treacherous to school groups due to refuse left by weekend and nocturnal recreators, Tindall Bridge and the surrounding area were reclaimed by officials when the bridge was restored in 2000.

Although years of flooding have scoured cobblestones and gravel from the area, shallow rapids on stepped bedrock make for provide habitat for aquatic macroinvertebrates. Historically, the site teamed with such pollution-intolerant species as dobsonfly larvae.

**River Mile 23.3 - Wolf Creek Park, Sandusky County Park District**
Wolf Creek Park is a scenic river area managed by the Sandusky County Park District. In addition to providing ideal habitat, this area is well maintained and a safe access point for enjoying the river. The extensive riffle can be located by entering the boat launch entrance, walking a short distance down the footpath and traversing the thick riparian shrubbery to the river's edge.

The river bottom is a mixture of sand, gravel, cobblestones and occasional boulders. In low to moderate flow, there are at least 20 suitable riffle areas. Cumulative Index Values (CIVs) consistently rate in the excellent category with nearly all taxa of pollution-intolerant organisms represented.

**River Mile 35.6 - Izaak Walton League River Access**
Located on grounds preserved by the Izaak Walton League, this site is monitored by its members and may be accessed by permission only.

**River Mile 38.7 - City of Tiffin Wastewater Treatment Plant *(non-reference site)***
Although monitoring at this site helps to evaluate the effect of Tiffin's treated wastewater discharge into the Sandusky Scenic River, the lack of suitable habitat has contributed to ever lowering scores. As regular sampling is done upstream in more ideal macroinvertebrate habitat at RM 35.6 and RM 39.5, this site is now considered non-reference and will not be regularly sampled in future.

**River Mile 39.2 - Huss Street Bridge, City of Tiffin *(non-reference site)***
The river bottom is similar to RM 38.7, although more cobbles are present here than at the treatment plant site. The substrate composition has been depleted to the degree that sampling at this site has been discontinued in favor of monitoring at Pioneer Mill (RM 39.5) where habitat is more conducive to macroinvertebrate populations.

**River Mile 39.4 – Pioneer Mill, City of Tiffin**
Although Pioneer Mill stopped grinding flour and meal in 1950, human activity has combined with the natural cycle of the Sandusky River to set the stage for good and safe stream quality monitoring. A major flood in 1913 created a "stone island", a two acre mound of bricks and

paving stones that were deposited in the Sandusky River downstream from the mill's stone dam (c. 1921) and an existing island. Although these bricks and stones were crushed with grinders powered by the mill and used to repave the streets of Tiffin, remnants still mix with cobbles and gravel to house a diverse population of pollution tolerant and intolerant macroinvertebrates.

Pioneer Mill itself became a restaurant in 1974 and was placed on the national register of historic places in recognition of its background. This site has been sampled in recent years for public education events.

**River Mile 41.8 - Ella Street, City of Tiffin**
The Ella Street sampling site is the last of three sampling stations within the City of Tiffin. Access to this particular site is difficult due to steep banks and riprap erosion control installed by the City of Tiffin. Caution is required when sampling in this area. To find adequate riffle areas, it is advantageous to search just upstream from the bridge from the western bank.

The stream bottom is a good mixture of sand, gravel, cobblestones and boulders, providing excellent habitat for mayfly nymphs, stoneflies, caddisflies and numerous other insect larvae. CIVs for this site are consistently in the excellent range.

**River Mile 50.2 - St. John's Bridge (former site of St. John's Dam)**
This site is located on Seneca County Road 6 between State Routes 231 and 53 immediately downstream from the former St. John's Dam which was removed in Fall 2003. This area has excellent smallmouth bass fishing, aided no doubt, by the diverse and abundant macroinvertebrate population found here. A small parking lot provides easy access, although the area is undeveloped and poorly maintained.

This sampling site is a well-proportioned mixture of sand, gravel and cobblestones. During periods of low to moderate flow, this site has at least five riffle areas housing a thriving and diverse macroinvertebrate population. The CIVs for this site typically score in the good to lower excellent range.

**River Mile 57.3 - Mexico Bridge**
The removal of St. John's Dam in 2003 restored river areas upstream of the site to more natural levels and exposed new riffle areas which were previously inaccessible due to deep water. A series of riffles directly downstream from Mexico Bridge offers good habitat shaded on both banks by hardwood trees. The best access to the sand, cobble and boulder riffles is found below the steep bank on the west side of the river.

**River Mile 65.1 - County Highway 16 Bridge *(non-reference site)***
Monitoring at this privately-owned site has been discontinued as steep banks and deep pools prevent safe access to samplers. Frequent flooding has washed away adequate habitat to support macroinvertebrate populations.

**River Mile 76.4 - Indian Mill**
Indian Mill is a restored gristmill owned by the Ohio Historical Society. Constructed by the Federal Government for the Wyandot Indians in 1820, Indian Mill and the adjacent timber dam are popular fishing, picnicking and tourist attractions. Canoe and fishing access is readily available in the scenic river access area across from Indian Mill.

The river bottom is quite diverse, with sand, gravel and cobblestones covering the riffle area just below the bridge. Samples from this site are consistently excellent with a wide variety of macroinvertebrates.

**Honey Creek Tributary - Forrest Nature Preserve *(non-reference site)***

This jewel of the Seneca County Park District is located on County Road 6 just a few miles east of the St. John's Bridge Sandusky River Access. A spacious gravel parking lot is available for public access but Honey Creek itself is buffered by hardwood riparian corridor. Maintained trails lead to easy-flowing riffles teaming with pollution-intolerant macroinvertebrates, such as stonefly and dobsonfly larvae.

# Sampling Results and General Trends

Stream Quality Monitors and Ohio Scenic Rivers staff reported some flooding on the Sandusky River during the early spring months. However, high water levels were not dangerous and only prevented late spring monitoring at RM 35.6 (Izaak Walton League River Access). Early spring results at that site were fair, but all spring macroinvertebrate samples at the other Sandusky reference sites were good to excellent.

The decision was made to abandon RM 65.1 (County Highway 16 Bridge) as a reference site as spring flooding washed out the last vestiges of habitat for assessed macroinvertebrate populations.

Spring assessment form observations also noted impaired sediment readings but little odor, although heavy foam accumulations were present at Wolf Creek. The higher-than-normal water levels were confirmed by the Division of Water's *Monthly Water Inventory Report for Ohio*, precipitation during April and May was above normal throughout most of the state. Precipitation for North Central Ohio was above normal in April at +.02 inches and +.44 inches in May. At this point in the season, precipitation for the 2009 water year was above normal in the northern one-third of the state and below normal elsewhere.

June through September water levels dropped considerably. Monitors recorded diverse macroinvertebrate sightings but in low quantities, low water levels and some stagnant water conditions. The Division of Water confirms the trend with below normal precipitation levels. A departure from normal of -1.20 inches in September qualified as mild drought according to the Palmer Drought Severity Index. October rains brought the Sandusky and its tributaries back up with precipitation of +1.62 in North Central Ohio.

In its ninth year of inclusion in the Scenic River water quality assessment, the sediment stick continues to dramatically exhibit the greatest pollution problem facing Northwest Ohio's waterways. The purpose of sediment monitoring is to estimate the amount of soil sediment impacting a stream by estimating the turbidity of total suspended solids (TSS) in the water. As noted in 2008, all reference sites exhibited higher turbidity readings than in past years, some to the point of being severely impaired and not only after heavy precipitation. Interviews with local citizens and agencies are mixed in opinion as to the cause of high turbidity in Northwest Ohio, but lower CIVs (see Table 2) on almost all Sandusky River reference sites coincide with higher turbidity. Group 1 macroinvertebrates such as dobsonfly larva, which are especially sensitive to heavy sediment loads, are found less frequently.

Volunteer and staff data are used for the Ohio SQM Project as a water quality-screening method. The data helps in detecting significant changes in stream quality based on CIV data from sites that have been monitored for many years over time by staff and trained volunteers. In the event that significant CIV declines are noticed for a particular site, potential problems that may be causing stream degradation can be further investigated and addressed.

The staff of the Ohio Scenic Rivers Program appreciates the assistance we received from our dedicated volunteer monitors. Working together has produced significant results **but additional volunteers are needed to monitor at all reference sites** to ensure accurate and thorough data. For more information, please contact Northwest Ohio Stream Quality Monitoring Coordinator at 419-621-1302.

# Total Suspended Solids (TSS)

In 1999, the Scenic River Program added Total Suspended Solids (TSS) monitoring to the Ohio SQM Project. The purpose of this addition is to estimate the amount of soil sediments impacting a stream by estimating the turbidity of the water. These sediments are attributed to problems originating upstream of the sampling site. The equipment is calibrated to predict TSS at 90% accuracy. The measurements are accurate enough to determine the changes in sediment rates in a stream at a given location and time.

Variables such as amount of precipitation, slope and gradient of the river system, soil type, time of year data is collected, amount of development, amount of riparian corridor, velocity of the river flow and the amount of waste water effluent have an effect on the TSS value.

Precipitation amount is important because of the increased potential for sediments to be carried into the river during a rain event. The TSS value may appear higher than normal if precipitation amounts are not taken into account. Since large rain events usually happen in the spring and early summer, the time of year the samples are taken could affect the TSS score. The gradient of the stream is important as well. Sediments do not settle out as easily in high gradient streams because the velocity of the water washes it downstream. In low gradient streams, sediment has a chance to settle out, resulting in a lower TSS value. Soil types impact TSS values because some soil types erode faster than others. A better understanding of the types of soils within the watershed may give way to a better understanding of the baseline TSS values for a stream.

Development in an area can cause changes in the TSS score. Areas cleared for new buildings are often not covered, causing an acute rise in the amount of suspended solids in nearby streams. Impermeable surfaces can also cause chronic elevation of TSS values because there is no buffer to absorb or trap runoff. Wastewater treatment plant effluent would only affect TSS scores in low flow situations, and only if the plant employs only primary or secondary treatment.

The actual process of taking a sample is simple. Using a clear Lucite sediment stick developed by the Lake Soil and Water Conservation District, a water sample is collected from the stream. Keeping the sample materials suspended, water is then poured out of the tube until the 0.4-inch target dot is visible on the tube bottom. A reading of the water column height is taken from the markings on the stick to the nearest ¼ inch. A conversion table is then used to convert the sediment stick reading to a total suspended solids measurement in the form of an estimate of the weight of solids suspended in the water column (mg/l).

The TSS measurement can further be used to estimate water quality through the use of the following scale:

TSS <10 mg/l = excellent water quality
TSS 10-28 mg/l = normal water quality
TSS 29-133 mg/l = impaired water quality
TSS >133 mg/l = severely impacted water quality

**2009 Results:** A total of 31 TSS readings were taken on the Sandusky River. The Sandusky River had a median reading of 54mg/l of TSS, which corresponds to the impaired water quality range. The data set ranged from 22 mg/l to as high as 214 mg/l of total suspended solids.

# Comparison of Collected Stream Quality Monitoring Data

Frequent monitoring of the same reference station is performed a minimum of three times per year, consistently year after year. An assessment of the diversity and tolerance levels of taxonomy collected generates the Cumulative Index Value (CIV) for the site on a given date. Field assessment results are used as basic indicators of long-term changes in a stream's macroinvertebrate community and help Scenic Rivers staff identify pronounced stream quality problems.

Table 1 identifies the 20 macroinvertebrates assessed and their general tolerance to pollutants. Pollution-intolerant organisms, such as those listed in Group I, require unpolluted, high quality water in order to survive. Pollution-tolerant organisms, such as those listed in Group III, are extremely tolerant of deteriorated water conditions.

**Table 1. Macroinvertebrate Pollution Tolerance**

| Group I Taxa<br>Pollution Intolerant | Group II Taxa<br>Moderately Tolerant | Group III Taxa<br>Pollution Tolerant |
|---|---|---|
| Water Penny Beetle Larvae (WP)<br>Mayfly Nymphs (MF)<br>Stonefly Nymphs (ST)<br>Dobsonfly Larvae (DO)<br>Caddisfly Larvae (CD)<br>Riffle Beetle Adult (RI)<br>Other Snails (OS) | Damselfly Nymphs (DA)<br>Dragonfly Nymphs (DR)<br>Crane Fly Larvae (CR)<br>Beetle Larvae (BL)<br>Crayfish (CF)<br>Scuds (SC)<br>Clams (CL)<br>Aquatic Sowbugs (SW) | Black Fly Larvae (BF)<br>Aquatic Worms (AW)<br>Midge Larvae (MI)<br>Pouch Snails (PS)<br>Leeches (LE) |

Table 2 on following page represents the mean CIV for each Stream Quality Monitoring reference station sampled on the river during 2009. In addition, the table uses symbols (◆) to indicate those macroinvertebrates found to be present at least once during the year at the respective reference station. Each macroinvertebrate is identified by a 2-letter code given in Table 1. CIVs of 23 or greater indicate *Excellent* stream quality; CIVs of 17-22 indicate *Good* stream quality; CIVs ranging from 11-16 suggest *Fair* stream quality; and CIVs of 10 or less reflect *Poor* stream quality. Situated beside the CIV are the symbols + (improved), = (equal), or – (declined) indicating the relationship to the previous years CIV.

For the full range of CIV attained at all sites monitored during the year, including non-reference stations, please see the *Appendix*.

**Table 2. Sandusky River 2009 Mean CIVs by Reference Station**

| STATION | WP | MF | ST | DO | CD | RI | OS | DA | DR | CR | BL | CF | SC | CL | SW | BF | AW | MI | PS | LE | CIV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.2 | ◆ | ◆ | | ◆ | ◆ | ◆ | ◆ | ◆ | | | ◆ | ◆ | | ◆ | | | ◆ | ◆ | ◆ | ◆ | 28+ |
| 23.3 | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | ◆ | | ◆ | ◆ | ◆ | | ◆ | 37+ |
| 35.6 | | ◆ | | | ◆ | ◆ | ◆ | ◆ | | | ◆ | ◆ | | ◆ | | | | ◆ | | | 21- |
| 39.4 | ◆ | ◆ | ◆ | | ◆ | ◆ | ◆ | | | | ◆ | ◆ | | ◆ | | | ◆ | ◆ | | ◆ | 27+ |
| 41.8 | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | | ◆ | ◆ | | ◆ | | | ◆ | ◆ | | | 31+ |
| 50.2 | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | | | ◆ | ◆ | | ◆ | | | ◆ | ◆ | | | 29+ |
| 57.3 | ◆ | ◆ | ◆ | | ◆ | ◆ | ◆ | | | ◆ | ◆ | ◆ | | ◆ | | | ◆ | ◆ | | | 28+ |
| 65.1 | | ◆ | | | ◆ | ◆ | | | | | ◆ | ◆ | | | | | ◆ | ◆ | | | 15= |
| 76.4 | ◆ | ◆ | ◆ | | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | ◆ | | ◆ | ◆ | ◆ | ◆ | ◆ | 35+ |

Figure 1 represents the maximum and minimum range of CIVs recorded during the year for each reference station. Figure 2 represents mean CIVs at each reference station over many years.

For the full range of CIVs attained at all sites monitored during the year, including non-reference stations, please see the Appendix.

**Figure 1. Sandusky River 2009 CIV Maximum & Minimum Ranges**

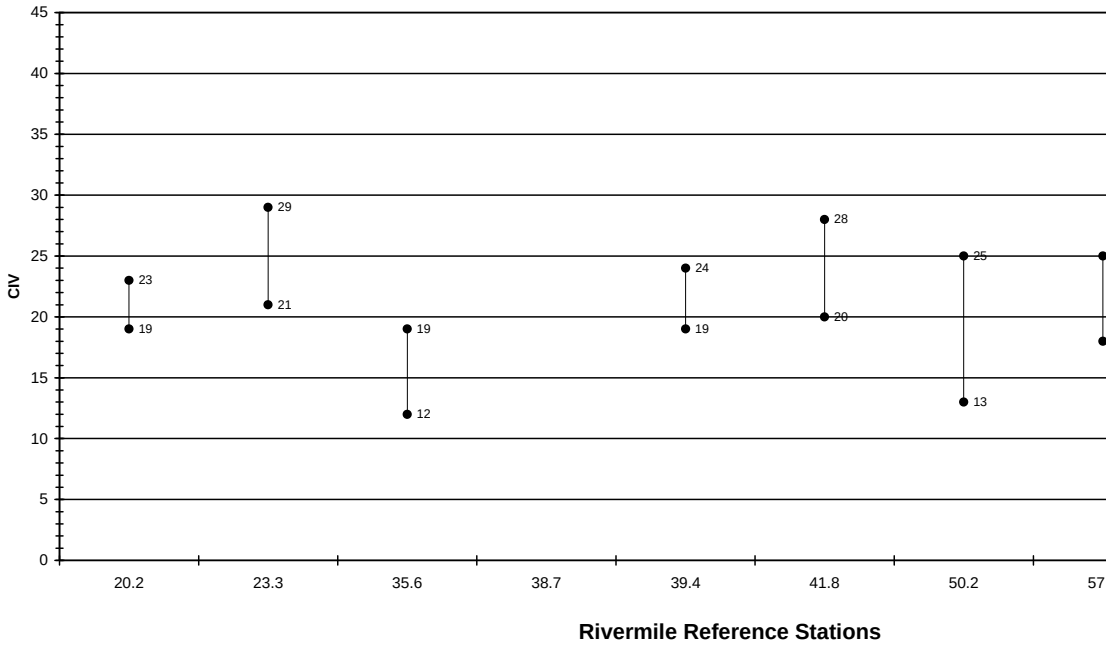
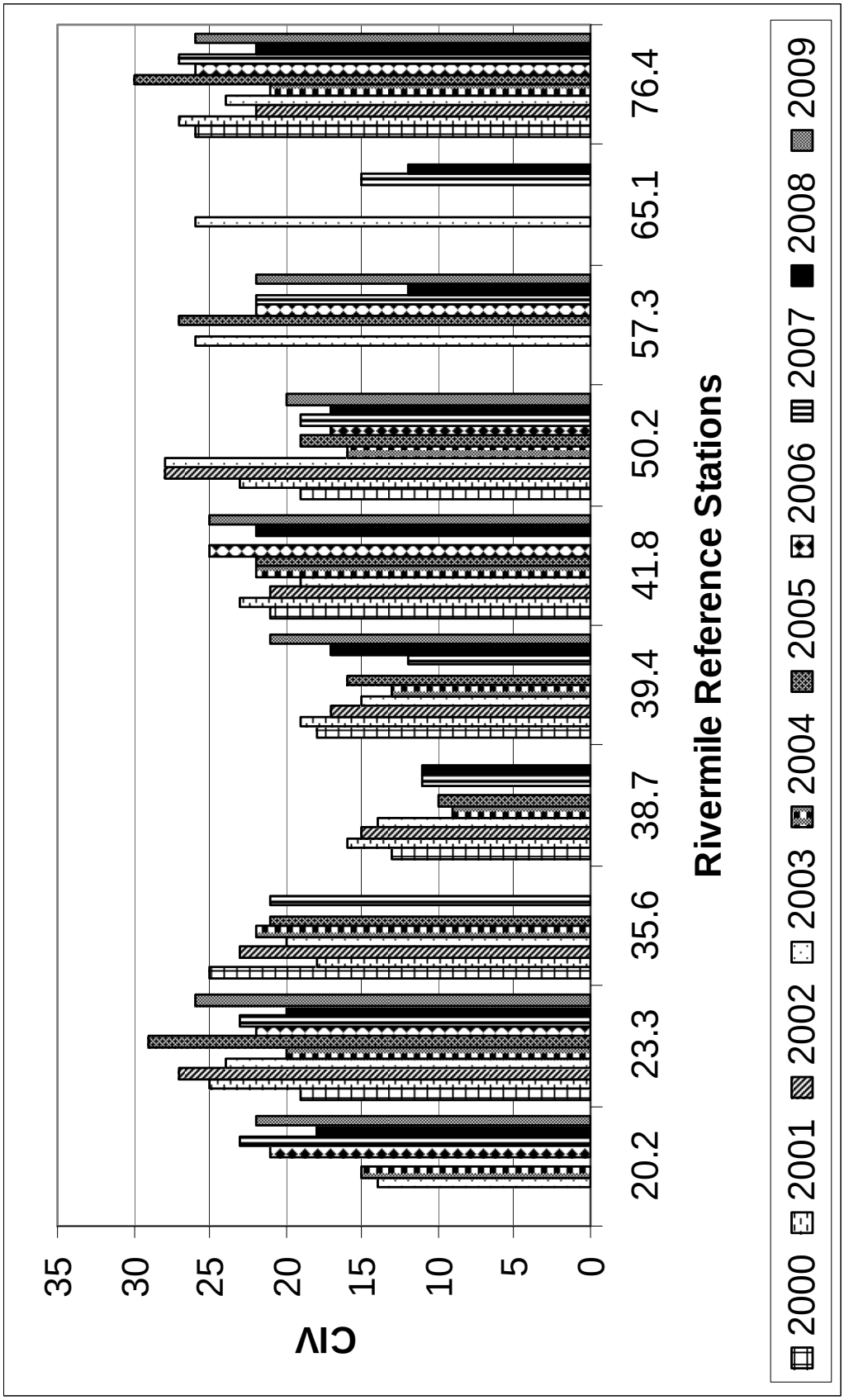


**Figure 2. Sandusky River 1999 – 2009 Mean CIVs**



# Appendix

## 2009 Stream Quality Monitoring Data by Monitoring Station

| 2009 CIVs by Monitoring Station SANDUSKY RIVER | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM | DATE | WP | MF | ST | DO | CD | RI | OS | DA | DR | CR | BL | CF | SC | CL | SW | BF | AW | MI | PS | LE | CIV |
| 20.20 | 5/21/2009 | | B | A | | B | A | C | | | | A | | | | | | A | A | | | 19.00 |
| 20.20 | 8/3/2009 | A | B | | | C | A | C | | | | B | A | | A | | | B | | A | | 23.00 |
| 20.20 | 9/19/2009 | | B | | | B | A | C | A | | | A | A | | A | | | A | | A | B | 23.00 |
| 23.30 | 6/13/2009 | A | B | A | | B | A | A | A | A | | A | B | | A | | | A | | | | 29.00 |
| 23.30 | 6/25/2009 | A | A | | A | A | | A | A | A | | | A | | A | | | | | | | 23.00 |
| 23.30 | 8/1/2009 | A | B | | | C | B | A | A | | A | A | A | | A | | | B | | | | 26.00 |
| 23.30 | 8/3/2009 | | B | | | C | B | A | | | | B | A | | B | | | A | A | | A | 21.00 |
| 23.30 | 9/5/2009 | A | A | A | | C | A | A | A | | | A | A | | A | | B | B | | | A | 29.00 |
| 35.60 | 5/25/2009 | | B | | | B | | B | A | | | | | | | | | | B | | | 12.00 |
| 35.60 | 9/25/2009 | | C | | | B | A | B | | | | A | A | | B | | | | A | | | 19.00 |
| 39.40 | 5/21/2009 | | A | A | | A | B | | | | | A | A | | A | | | | A | | | 19.00 |
| 39.40 | 8/3/2009 | A | B | | | C | A | | | | | B | A | | B | | | B | A | | | 20.00 |
| 39.40 | 9/19/2009 | A | B | | | C | A | A | | | | A | A | | A | | | B | A | | A | 24.00 |
| 41.80 | 5/21/2009 | A | A | A | A | | B | B | A | | | A | A | | A | | | A | A | | | 28.00 |
| 41.80 | 8/3/2009 | A | B | | A | C | A | B | | | | B | B | | B | | | A | A | | | 26.00 |
| 41.80 | 9/19/2009 | | A | | | C | A | B | | | | B | A | | B | | | A | B | | | 20.00 |
| 50.20 | 6/16/2009 | A | A | | A | A | A | | | | | A | A | | A | | | | | | | 21.00 |
| 50.20 | 7/21/2009 | | A | | | A | | A | | | | | A | | A | | | | | | | 13.00 |
| 50.20 | 8/3/2009 | A | B | | A | C | B | B | | | | B | A | | B | | | | A | | | 25.00 |
| 50.20 | 8/18/2009 | A | A | A | | A | | A | | | | | A | | A | | | A | | | | 20.00 |
| 50.20 | 9/19/2009 | | B | | B | C | A | B | | | | B | A | | B | | | B | | | | 22.00 |
| 50.20 | 10/17/2009 | | A | B | B | B | | A | | | | | A | | A | | | A | | | | 20.00 |
| 57.30 | 5/21/2009 | A | A | A | | A | A | A | | | A | A | A | | A | | | | A | | | 25.00 |
| 57.30 | 8/3/2009 | B | B | | | C | A | A | | | | A | A | | A | | | A | A | | | 23.00 |
| 57.30 | 9/19/2009 | A | A | | | C | B | | | | | B | A | | A | | | | | | | 18.00 |
| 65.10 | 5/21/2009 | | A | | | A | A | | | | | A | A | | | | | A | A | | | 15.00 |
| 76.40 | 4/25/2009 | A | A | A | | C | A | A | A | A | | A | A | | A | | | A | A | | | 30.00 |
| 76.40 | 8/3/2009 | A | B | | | C | A | B | | | | A | B | | B | | A | A | A | | | 24.00 |
| 76.40 | 9/19/2009 | B | B | | | C | A | C | | | | | A | | A | | A | | A | | A | 22.00 |
| 76.40 | 10/5/2009 | A | A | A | | C | | B | A | | | A | A | | B | | | A | | A | B | 26.00 |
| 76.40 | 10/6/2009 | A | B | A | | C | A | B | A | | A | A | A | | B | | | A | | A | B | 31.00 |
| 76.40 | 10/12/2009 | A | A | | | B | | A | | | | A | A | | A | | A | A | A | | | 21.00 |

| 2009 CIVs by Monitoring Station<br>HONEY CREEK | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RM | DATE | WP | MF | ST | DO | CD | RI | OS | DA | DR | CR | BL | CF | SC | CL | SW | BL | AW | MI | PS | LE | CIV |
| 0.00 | 6/2/2009 | A | A | A | A | A | | A | | | | | A | | A | | | | | | A | 23.00 |
| 0.00 | 7/1/2009 | A | A | A | A | A | A | A | | | | A | A | | A | | | | | | | 27.00 |
| 0.00 | 7/21/2009 | A | A | | | A | | A | | | | | A | | A | | | | | | | 16.00 |
| 0.00 | 8/18/2009 | A | A | A | A | A | | A | | | | | A | | A | | | | | | | 22.00 |
| 0.00 | 9/21/2009 | A | | A | A | A | | A | | | | A | A | | | | | | | | | 19.00 |
| 0.00 | 10/12/2009 | A | | A | B | A | A | A | | | | | A | | A | | | | | | | 22.00 |