Stream Quality Monitoring 2014 Annual Report
Maumee State Scenic & Recreational River

Contents

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, comprising 800 river miles along 26 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 in detecting and addressing 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 Division of Watercraft's Scenic Rivers Program, 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 2014 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

On July 18, 1974, the Maumee River was designated a scenic and recreational river by the director of the Ohio Department of Natural Resources. Flowing through the rich agricultural counties of Northwest Ohio, the designated portions of the Maumee River meander from the Ohio-Indiana border for 96 miles to the cities of Maumee and Perrysburg. From Perrysburg, the river flows northeast through Toledo before joining Lake Erie.

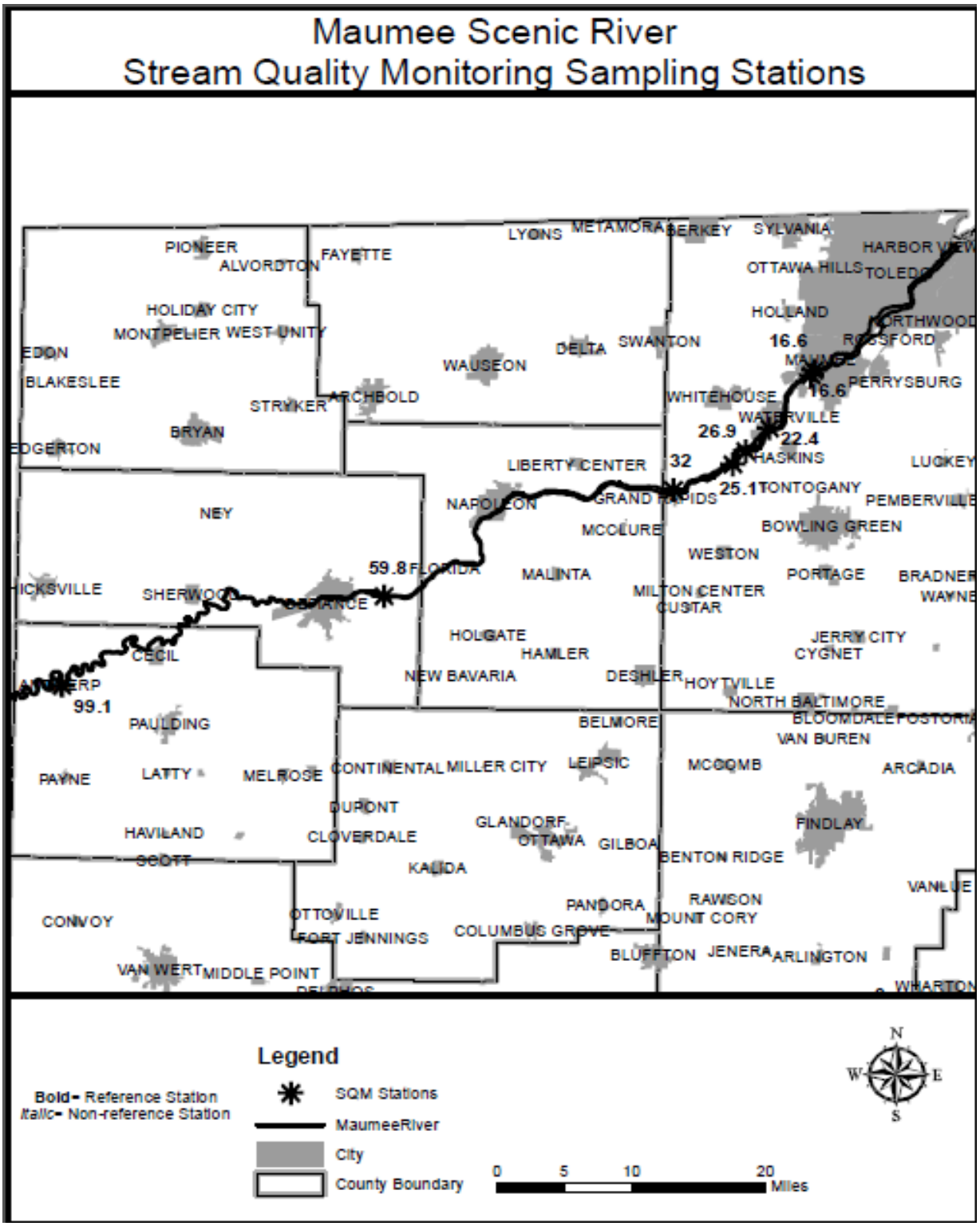
In the western end of the watershed, the Maumee flows along a broad floodplain and sharply meandering channel. Valley walls rise to the surrounding terrain and the riverbanks support a healthy, forested corridor. Approaching Defiance, the Maumee undergoes dramatic changes. The floodplain widens and the river channel nearly doubles in size, having added the Auglaize and Tiffin rivers to its flow. The surrounding topography flattens and forest cover on the riverbanks becomes relatively sparse.

Like many of Ohio's rivers, the Maumee is home to many chapters of our state's colorful history. During the 17th and 18th centuries, there was a great southward and westward movement of the Native Americans of the Maumee Valley brought on by tribal warfare and increasing early American settlers. In 1794, tensions between the natives and early Americans resulted in George Washington's ordering of General "Mad" Anthony Wayne to win control of the Ohio country for the United States. Wayne's victory at the Battle of Fallen Timbers along the banks of the Maumee led to the Treaty of Greenville, which opened the Northwest Territory to increased settlement. Several other important battles occurred along Maumee at Fort Meigs and the British Fort Miamis. Sites of several other forts are also found throughout the valley.

Following the end of these conflicts, the Maumee River Valley transformed into a center of transportation (and increased commerce) with the completion of the Miami-Erie canal from Toledo to Defiance in 1842. This part of Ohio's canal system provided travelers with links to Cincinnati and the Ohio River to the south, and Cleveland and other cities to the east. Restored canal villages, like Grand Rapids, and mills, like the Ludwig Mill, provide visitors a glimpse of Ohio's past.

Although noted for its history, the Maumee River possesses a thriving aquatic community. More than 60 species of fish reside in the river including impressive spring spawning runs of game fish, such as walleye and white bass. Many large water species, such as the northern pike, are also found in the Maumee. The Maumee riverbanks support many species of birds, including large populations of great blue herons and bald eagles.

Numerous public facilities along the Maumee provide easy and safe ways to enjoy this magnificent river. For more information, please contact the Northwest Ohio Scenic Rivers Manager at 419-429-8306 or visit *watercraft.ohiodnr.gov* online.


Maumee Scenic River
Stream Quality Monitoring Sampling Stations
PIONEER
ALVORDTON
FAYETTE
LYONS
METAMORA
BERKEY
SYLVANIA
OTTAWA HILLS
TOLEDO
HARBOR VIEW
HOLIDAY CITY
MONTPELIER
WEST UNITY
EDON
BLAKESLEE
WAUSEON
DELTA
SWANTON
HOLLAND
16.6
NORTHWOOD
ROSSFORD
PERRYSBURG
STRYKER
ARCHBOLD
WHITEHOUSE
WATERVILLE
26.9
22.4
BRYAN
EDGERTON
LIBERTY CENTER
32
HASKINS
LUCKEY
25.1
TONTOGANY
PEMBERVILLE
NEY
NAPOLEON
GRAND RAPIDS
MCCLURE
BOWLING GREEN
59.8
FLORIDA
MALINTA
WESTON
PORTAGE
BRADNER
WAYNE
MILTON CENTER
CUSTAR
SHERWOOD
DEFIANCE
HOLGATE
JERRY CITY
CYGNET
CECIL
HAMLER
NEW BAVARIA
DESHLER
HOYTVILLE
NORTH BALTIMORE
99.1
PAULDING
BELMORE
BLOOMDALE
VAN BUREN
PAYNE
LATTY
MELROSE
CONTINENTAL
MILLER CITY
LEIPSIC
MCCOMB
ARCADIA
DUPONT
GLANDORF
FINDLAY
HAVILAND
CLOVERDALE
OTTAWA
GILBOA
SCOTT
KALIDA
BENTON RIDGE
VANLUE
PANDORA
RAWSON
CONVOY
OTTOVILLE
MOUNT CORY
FORT JENNINGS
COLUMBUS GROVE
BLUFFTON
JENERA
ARLINGTON
VAN WERT
MIDDLE POINT
WHARTON
Legend
Bold= Reference Station
Italic= Non-reference Station
SQM Stations
MaumeeRiver
City
County Boundary
0
5
10
20
Miles
N
W
E
S

2014 Stream Quality Monitoring Participants

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

River Mile 16.6 - Side Cut Metropark / Buttonwood Park
Eric Scott and the Wood County Park District
Randal Huber and Harold Brown

River Mile 17.0 – Interstate 475 Bridge (*non-reference station*)
Volunteers Needed

River Mile 22.4 - Farnsworth Metropark, Roche de Bout Rapids
Nicole Sarver
Tom and Peggy Sheehan

River Mile 25.1 - Weirs Rapids State Fishing Access
Larry Lindsay and the Naturalist Scouts

River Mile 26.9 - Otsego Park
Eric Scott and the Wood County Park District
Megan Shortridge

River Mile 32.0 - Downstream of Providence Dam
Nicole Sarver

River Mile 54.9 – Florida Bridge (*non-reference station*)
Volunteers Needed

River Mile 59.8 - Independence Dam State Park
James Ross
Robert Brady

River Mile 99.10 - Antwerp Village Park
Stephanie Putnam

The continued success of the Ohio SQM Project is dependent upon the dedication of these (and past) volunteers. If you are interested in becoming a volunteer, please contact the Northwest SQM Coordinator at 614-570-4372.

Stream Quality Monitoring Station Descriptions

Stream Quality Monitoring stations along the Maumee River have been selected based upon their ease of access, macroinvertebrate habitat and adequate sampling areas. Where possible, sampling stations are located on public property or where public access to the riffle area is convenient and safe. The following are brief descriptions of selected SQM stations located on the Maumee River.

River Mile 16.6 - Buttonwood Park / Side Cut Metropark
Located adjacent to State Route 65 in Wood County, this site is the eastern-most reference station on the Maumee River. Access through the park area, owned and administered by the Wood County Park District, is convenient and safe. The riffle area is very wide and sampling sites are numerous. Sampling occurs on both sides of the river, with suitable riffle areas found at Buttonwood and Side Cut Metroparks. However, caution must be exercised when sampling in this area due to its popularity as a fishing site during the spring walleye spawning run. Snagged fishing lures and hooks are common. During periods of high flow, currents in the river may be too strong to allow safe sampling.

The riverbed is comprised of limestone cobblestones and boulders, providing exceptional habitat for mayfly nymphs, riffle beetles and other pollution intolerant macroinvertebrates.

River Mile 17.0 – Interstate 475 Bridge *(non-reference site)*
Located beneath one of Northwest Ohio's most traveled interstates, this site provides SQM participants an opportunity to observe the effects of commuter traffic and urban sprawl on a river ecosystem.

The Village of Waterville Sewage Treatment Plant outflow empties upstream and debris from the bridge overpass collects in the river and on the banks. The riverbed is primarily silt deposit on bedrock with scarce riffles comprised of gravel and boulders. Caution must be exercised, as fishing hooks and broken glass are common.

Although this is not a site for young children or introductory groups, seasoned SQM participants are encouraged to compare findings at this site to those found upstream at Farnsworth Metropark and downstream at Side Cut Metropark, two of the finest macroinvertebrate habitats at the east end of the scenic river designation.

River Mile 22.4 - Farnsworth Metropark
One of the most notable features of Farnsworth Metropark is "Roche de Bout," a very large limestone outcropping in the Maumee River. Long before the arrival of European settlers into the Maumee Valley, Roche de Bout was an important meeting place for early Native Americans from throughout the Maumee Valley and Great Lakes region. Unknown to most people, the Bowling Green Fault runs right through Roche de Bout.

Excellent macroinvertebrate samples may be taken just upstream of Roche de Bout where shallow to knee-deep riffles stretch from Farnsworth Metropark on the north bank to nearly the south bank in Wood County. SQM sampling frequently yields excellent ratings as many pollution intolerant species reside in the cobblestones and boulder rapids. Numerous dragonfly nymphs may also be found in the water willow along the Farnsworth river wall.

Algae growth on the stepped bedrock can make wading treacherous in fast-moving currents during high water periods, so additional caution should be observed under these conditions.

River Mile 25.10 - Weirs Rapids
Weirs Rapids is located adjacent to a public fishing access owned and administered by the Ohio Division of Wildlife. This is a beautiful site along the Maumee, formed as the river cascades over a series of limestone “steps.” However, development along the southern bank has resulted in erosion and increased soil sediments which threaten this site. Weir Rapids provides frequent opportunities for observing great blue herons and egrets congregating in the shallows. Bald eagles feed in this area as well.

Macroinvertebrate populations at Weirs Rapids are variable, depending upon the composition of the river bottom. Scoured areas in the rapids have bottoms comprised of bedrock, thereby providing little or no suitable habitat. However, where cobblestones and boulders are present, they teem with mayfly nymphs, freshwater clams, caddisfly larvae and crayfish.

River Mile 26.9 - Otsego Park
Otsego Park reflects Wood County Park District's concern for the preservation of the Maumee River habitat above and below its banks. Spring SQM participants may spot doe with fawn in the newly green floodplain, as well as a number of migratory birds that find shelter provided by the steep bank below adjacent State Route 65.

The riverbed consists of cobblestones, gravel and occasional boulders, providing a good habitat for aquatic macroinvertebrates. Although the water flow here is fairly slow moving for this powerful river, SQM participants must exercise caution, as the current can be swift between the island and the bank. Otsego Park is a beautiful spot for family or school group outings; Wood County Park District maintains a nature center in the WPA-built shelter house on the high south bank.

River Mile 32.0 - Downstream of Providence Dam
The Providence Dam was built in 1838 to form a water supply reservoir for the Miami-Erie Canal’s final stretch to Maumee Bay. In 1997, the dam was renovated with public canoe access constructed downstream. Although this site can be treacherous with the strong current flowing from the spill over the dam, riffles comprised of cobble, boulder and gravel provide excellent macroinvertebrate habitat downstream of the dam.

Providence Metropark not only provides beautiful access to this frequently monitored site, but is home to a fully restored water-powered saw and grist mill and offers historical interpretations and mule-powered canal boat rides through a working, original lock from the Miami-Erie Canal days.

River Mile 54.9 - Florida Bridge *(non-reference site)*
The Village of Florida was founded in 1834 and, like many small villages along the Maumee, enjoyed flourishing trade during the canal era before fading with the demise of the canal. The village is notable due to its construction on what was once a great Native American village called “Snaketown.”

Public parking is available on the north river bank upstream of the bridge. Although a clear riffle is not indicated in the one to two feet of water that normally flows beneath Florida Bridge, this site has been monitored in the recent past by Defiance College classes and adult special interest groups. Approximately one mile east of the village, a spillway to the Miami-Erie canal provides hiking trails and yet another interesting perspective on the Maumee’s diverse history.

River Mile 59.8 - Independence Dam State Park
Independence Dam State Park provides interesting and safe access to this reference station. Located on the north shore of the river immediately adjacent to U.S. Route 424, this site is another very high-quality sampling area on the Maumee River. Located downstream from the dam, numerous riffle areas provide a large number of areas to sample. During periods of high water, this area is treacherous to wade.

The riverbed consists of cobblestones, gravel and boulders, providing exceptional habitat for aquatic macroinvertebrates. Although mayfly nymphs and caddisfly larvae are abundant at this site as well as other pollution-intolerant species such as the occasional dobsonfly larva.

River Mile 99.1 - Antwerp Village Park
The Village of Antwerp provides a fine setting for a day of environmental education in its park on the high bank above the upper-most reference site on the Maumee River. Tall trees provide shade for mid-summer SQM participants as they descend a steep series of steps to follow a sloping physical fitness trail to the riverbank.

The river bottom is largely comprised of limestone cobblestones under about one to two feet of swiftly flowing water. The effects of agricultural runoff may be clearly detected by SQM participants. Although not ideal habitat, mayfly nymphs, clams and crayfish are among some of the organisms that may be found at this site.

Sampling Results and General Trends

The 2014 field-monitoring season for the Maumee State Scenic and Recreational River was normal. For the duration of the field season, from May to October, precipitation was 19.84 inches, or 0.67 inches above average. This allowed for great monitoring conditions throughout the season. Air temperatures were normal as well. From May to October the average air temperature was 64.9 degrees Fahrenheit or only 0.1 degrees F below average. (Data from the National Oceanic and Atmospheric Administration.)

Volunteers and ODNR staff on the Maumee River conducted a total of 28 assessments at seven official monitoring sites in 2014. The Maumee River recorded an average CIV of 19.10, corresponding to the good range for stream quality. The average taxonomic diversity per assessment was 9 macroinvertebrate orders (e.g. stonefly, damselfly, mayfly, etc.).

The 2014 average CIV of 19.10 for the Maumee River decreased from the 2013 average of 21.28. Four reference stations scored in the excellent range at least once during the field season. Two other sites scored in the good range, on average, throughout the season. One site scored in the fair range, on average, throughout the season. The slight degrees in average CIV values from 2013 to 2014 may be a result of natural variations. As monitoring continues it is important to consider that urban development and agriculture continue to put pressure on the Maumee River and its Watershed. The Natural Resources Conservation Service states that, in recent years there has been a documented increase in soluble phosphorus (DRP or dissolved reactive phosphorus) exported from Ohio watersheds. Such concentrations of nutrients can cause algae growth and low oxygen levels in the waterways.

Data collected by SQM Project volunteers and ODNR staff is used as a water quality screening method. The data helps to detect significant changes in stream quality based on CIV data from sites monitored for many years. If there is a significant decline in the average CIV, 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. It is only through their efforts that it was possible to complete SQM sampling in the Maumee River watershed during 2014. 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 the Northwest SQM Coordinator at 614-570-4372.

Total Suspended Solids (TSS)

In 1999, the Scenic River Program added Total Suspended Solids (TSS) monitoring to the Stream Quality Monitoring (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 and 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

2014 TSS Results: A total of 28 TSS readings were taken in the Maumee River. The Maumee River had a median reading of 54 mg/L of TSS, which corresponds to the impaired range. The data set ranged from 8 mg/l to as high as 113 mg/L of total suspended solids.

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

Table 2 on the following page represents the mean CIV for each Stream Quality Monitoring reference station sampled on the river during 2014. 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 of 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 CIVs attained at all sites monitored during the year, including non-reference stations, please see the *Appendix.*

Table 2. Maumee River 2014 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
16.6		◆	◆		◆	◆	◆	◆			◆	◆		◆	◆	◆	◆	◆		◆	16-
22.4		◆			◆	◆	◆				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	18-
25.1		◆	◆		◆	◆	◆			◆	◆	◆		◆		◆	◆	◆	◆	◆	19-
26.9	◆	◆	◆		◆	◆	◆	◆		◆	◆	◆	◆	◆			◆	◆	◆	◆	19-
32.0		◆			◆	◆	◆	◆			◆	◆	◆	◆	◆		◆	◆	◆	◆	23-
59.8		◆	◆	◆	◆	◆	◆				◆	◆	◆	◆			◆	◆	◆	◆	20=
99.1		◆	◆		◆	◆	◆	◆		◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	20-

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.

Figure 1. Maumee River 2014 Maximum and Minimum CIV Ranges

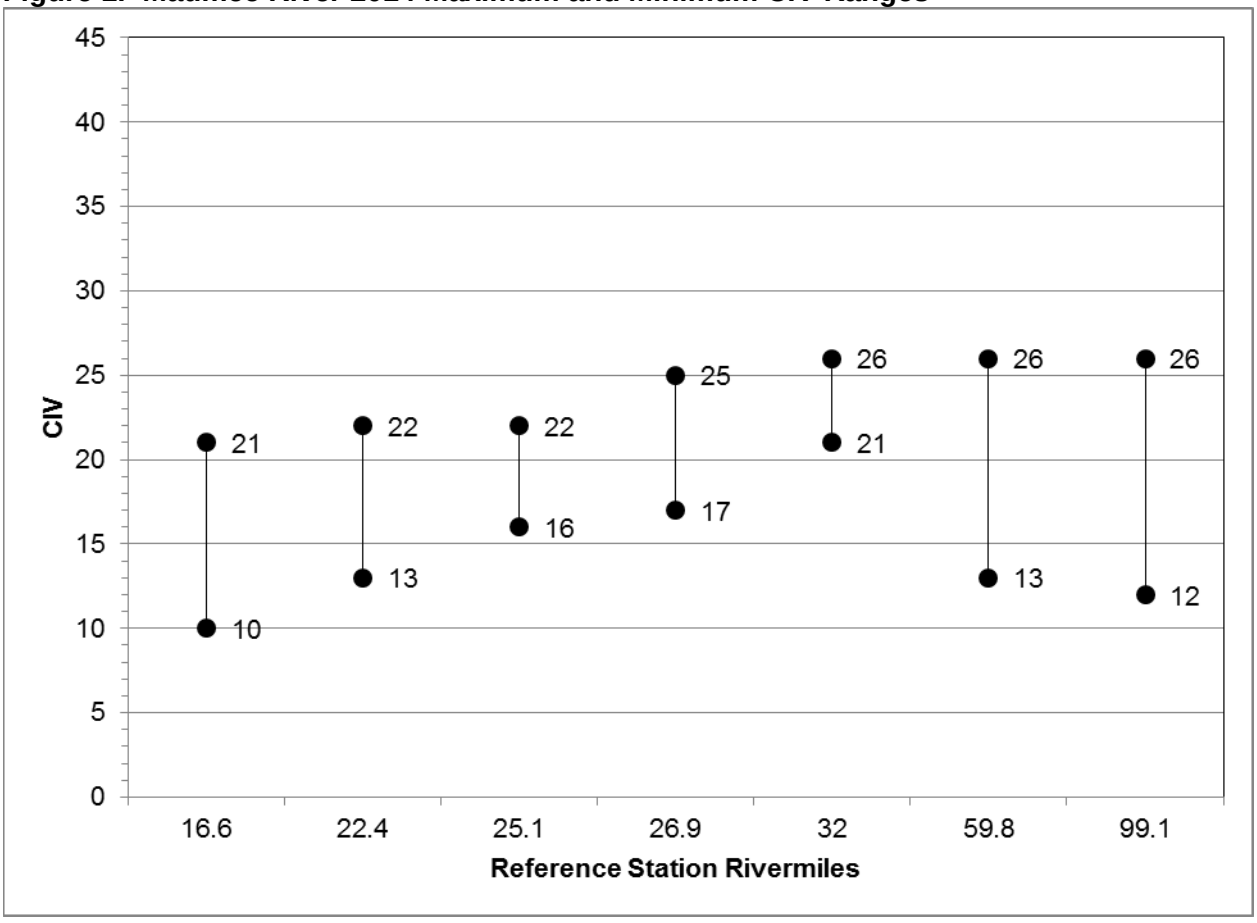
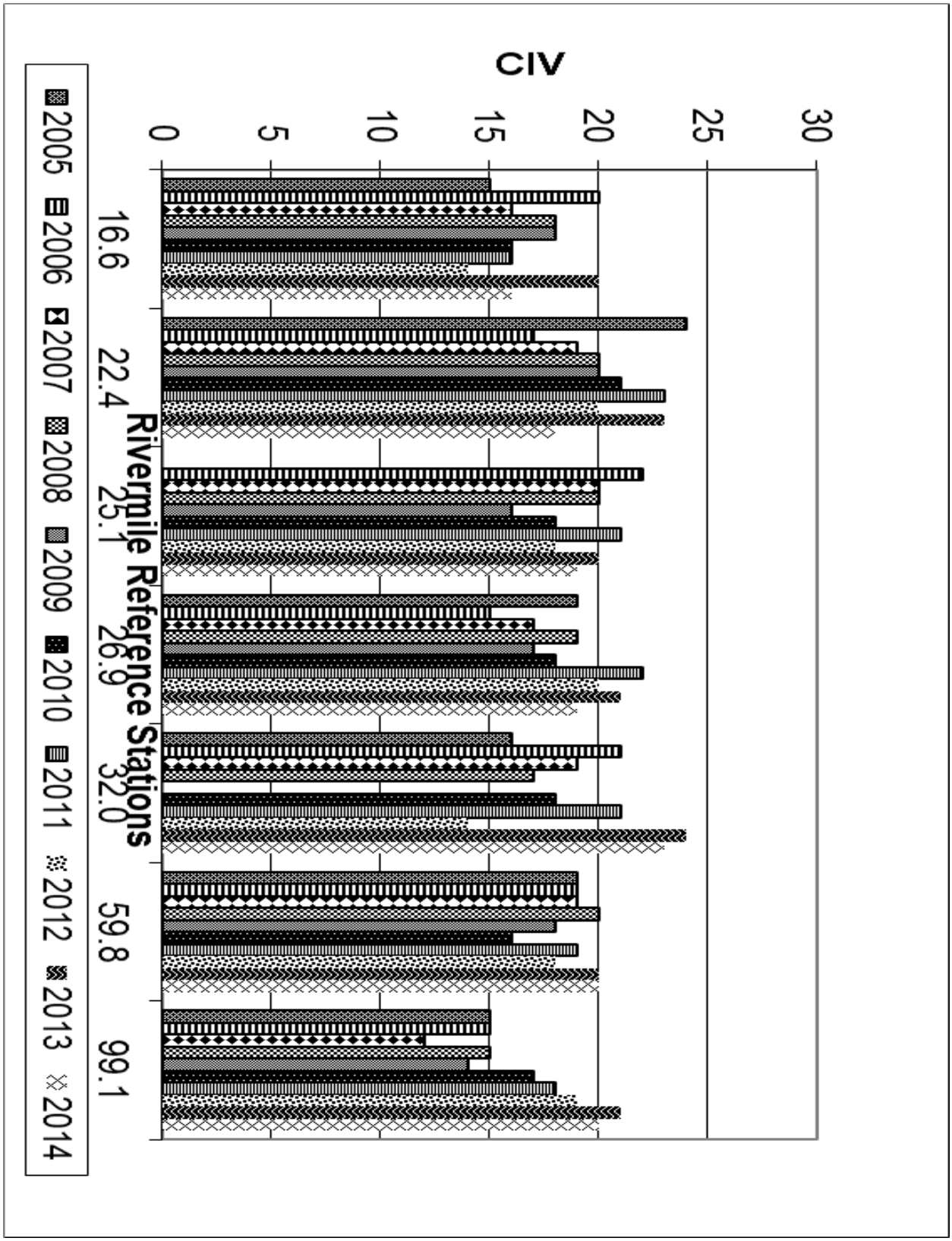


Figure 2. Maumee River 2005 – 2014 Mean CIVs



Qualitative Habitat Evaluation Index (QHEI)

The Qualitative Habitat Evaluation Index (QHEI) is a system developed and employed by the Ohio Enironmental Protection Agency (OEPA) to measure physical habitat conditions in and around rivers and streams in Ohio. During 1998, SQM staff tested a modified version of the QHEI, referred to as *Citizen's QHEI,* to gather baseline measurements at reference stations on several of Ohio's scenic rivers. It is anticipated that such measurements will become yet another annual tool that will be used to monitor habitat and water quality conditions on all Ohio scenic rivers.These habitat conditions will be re-evaluated every five years.

Results from 2012 QHEI are included below. When attempting to interpret this data, it is important to recognize that OEPA generally concludes that any site receiving a QHEI value greater than 60 meets current warmwater habitat (WWH) standards. Meeting WWH standards suggests that such locations should be adequate for supporting reproducing communities of fish and macroinvertebrate life. Sites attaining QHEI scores of greater than 80 are generally believed to contain exceptional habitat conditions for warmwater communities.

The following table has been prepared to assist with determining the relationship between habitat conditions (measured by the QHEI) and macroinvertebrate community performance (measured by the Cumulative Index Value), at each of the reference stations on selected rivers.

Table 3. Maumee River 2012 QHEI and SQM Assessment Data

Reference Station	QHEI	2012 Average CIV	SQM Assessment
RM 16.6	67	14	Fair
RM 22.4	68	20	Good
RM 25.1	58	18	Good
RM 26.9	62	19	Good
RM 32.0	49	17	Good
RM 59.8	47	17	Good
RM 99.1	51	19	Good

Appendix
2014 Data by Monitoring Station

MAUMEE RIVER																					
RM	DATE	WP	MF	ST	DO	CD	RI	OS	DA	DR	CR	BL	CF	SC	CL	SW	BF	AW	MI	PS	LE	CIV
16.60	5/26/2014		A			A	A	A				A						B			B	16
16.60	5/31/2014					C		C								A		C			A	10
16.60	7/19/2014		B			C		C							B			A	A		A	14
16.60	8/6/2014		B	A			A	A	A			B			B		A	B			B	21
16.60	9/19/2014					B	A	B	A			A	A		A			B			A	19
22.40	7/30/2014		B			C	B	B				B	A		B		B		C	A	B	22
22.40	7/30/2014		A			C	A	C							A			A	A			16
22.40	8/20/2014		A			A	A	A				A		A		B	A	B	C		A	22
22.40	9/20/2014					B	B	B							A				A		A	13
25.10	6/21/2014		A			B		A					A		A			B		B	B	16
25.10	7/3/2014		A			C	A	C			A	B	A		A		A		A			22
25.10	9/6/2014		B	A		C		C					C		A			B			A	18
26.90	6/16/2014		A			B	A	B					A		A				A			17
26.90	6/21/2014	A	B			B	A	A			A		B	A	A			A			A	25
26.90	9/20/2014		B			B	A	B	A			B							B			17
26.90	10/30/2014			B		B	A	A				A	B							A		17
32.00	7/30/2014		A			B	B	A				B	A	A	A	A		A	B	A	A	26
32.00	9/5/2014					B	B	B	B			B	A	A	B			A	B	A	A	23
32.00	10/29/2014		A			B		B	A			B	A	B	B			A			A	21
59.80	6/15/2014		B	B	A	B	A	B					B	A	A				A		A	26
59.80	7/30/2014		B			C	B	B				B	A		B			A	A	A	A	22
59.80	9/3/2014					A	B	B					A	A					A	A		15
59.80	9/28/2014					C	A	A					A		B							13
59.80	10/29/2014		A			C	A	B				B	B	A	B				A	A	A	23
99.10	7/17/2014		B	B			A						A				A					12
99.10	8/18/2014		C	A		A	A	A	A		A	A			C			A	A	A		26
99.10	9/4/2014		A			B	A	A	A			B	A		A			A	A	A	A	24
99.10	9/20/2014		A	A			A	B	A				A			A			A			19