

2011 Study Plan for the Ashtabula River Watershed FINAL

HUCs 041100030101, 041100030102, 041100030103, 041100030104, and
041100030105
(Ashtabula County, Ohio)



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INTRODUCTION

As part of the water quality monitoring approach for the Total Maximum Daily Load (TMDL) development and the NPDES permitting process, an intensive ambient assessment will be conducted during the 2011 field sampling season within Hydrologic Unit Codes (HUCs) 041100030101, 041100030102, 041100030103, 041100030104, and 041100030105; corresponding to the Ashtabula River watershed (Figure 1, Table 1). The Ashtabula River watershed was previously assessed in 1995 (Ohio EPA, 1997a). Additional water quality assessments were conducted for portions of the watershed in 2007, 2005, 2003, and 2000 (Ohio EPA, 2007, 2006a, and 2001a, respectively).

The primary focus of the present study is to characterize the watershed with respect to attainment with designated beneficial uses in the State Water Quality Standards. This assessment will be used to determine if TMDL's are necessary to address water quality impairments. The objectives of the TMDL process are to estimate pollutant loads from the various sources within the basin, define or characterize allowable loads to support beneficial uses, and to allocate pollutant loads among different pollutant sources through appropriate controls (e.g., NPDES permitting, storm water management, 319 proposals, NPS controls or other abatement strategies). The components of the TMDL process supported by this survey are primarily the identification of impaired waters, verification (and re-designation if necessary) of beneficial use designations, and identification of sources of use impairment. These data are necessary precursors to the development of effective control or abatement strategies. A list of sampling stations to be used in the study can be found in Tables 3 and 4.

Sampling Objectives:

- Monitor and assess the chemical, physical, and biological integrity of the principal drainage network of the Ashtabula River watershed (HUCs 041100030101, 041100030102, 041100030103, 041100030104, and 041100030105) in support of the TMDL process;
- Assess water quality trends and attainment of biological water quality criteria in Fields Brook, a highly industrialized urban watershed that was the focus of a U.S.EPA Superfund remediation in the 1990's;
- Assess physical habitat influences on stream biotic integrity;
- Assess water quality for the support of recreational uses and assign appropriate recreational use designations for water bodies in the watershed;
- Evaluate the appropriateness of existing use designations and assign uses to undesignated streams;
- Characterize the amount of resource degradation attributable to various land uses, including agricultural practices and urbanization;
- Determine any aquatic impacts from known potential sources, including point source dischargers and unsewered communities;
- Collect fish samples for the Ohio Sport Fish Tissue Monitoring Program; and
- Document any changes in the biological, chemical, and physical conditions of the study areas where historical information exists.

ISSUES TO BE EVALUATED

Nonpoint Sources

The lower HUC of the watershed (041100030105) is highly urban with dense concentrations of industrial activity. Several industrial stormwater discharge permits exist within this assessment unit, primarily discharging to Fields Brook. In the upper HUCs within the watershed, sewage treatment is reliant almost exclusively upon on-site sewage treatment systems which may affect attainment of recreational uses in the watershed. The soils characteristics in most of the watershed contains a high clay content that, when combined with low land relief, can exacerbate the rate of septic system failures due to poor absorption. Bacteriological sampling will be conducted in these areas of either potential or known septic system failures.

The upper portion of the watershed is predominantly rural with mixed agricultural and forested land uses. Agricultural impacts to streams via sediment runoff, manure management, and habitat and flow alternations have the potential to contribute to degradation of water quality. Assessments related to these issues will be important for the management of the designated State Scenic Rivers within the Ashtabula River watershed.

Point Sources

There are no NPDES permitted wastewater discharges located in any of the assessment units in the upper Ashtabula River watershed (HUCs 041100030101, 041100030102, 041100030103, 041100030104). Permitted discharges in the lower Ashtabula River assessment unit consist primarily of industrial stormwater discharges (Table 2). Therefore, there will be no targeted assessment of point source dischargers included in this survey.

Small Stream Evaluation

Numerous small streams in the Ashtabula River watershed, generally with drainage areas less than 10 mi², have not been previously monitored by Ohio EPA. The 2011 survey will assess five of these streams with respect to use attainability for the designation of beneficial uses. Due to resource constraints of the Ecological Assessment staff, additional tributary streams will not be evaluated biologically as part of the 2011 TMDL survey. However, as staff resources allow, Northeast District Office (NEDO) staff will work with ODNR Scenic River Program staff to visit additional streams to conduct either QHEI or Primary Headwater Habitat assessments to assist in characterizing the overall conditions within the watershed. The information from these visits will be used to assign priority to future sampling efforts of these streams, if warranted.

RAP Beneficial Use Impairments

The lower Ashtabula River and Harbor are designated as an Area of Concern (AOC) by the International Joint Commission. A RAP is currently in progress to address BUI's identified for the AOC (for information see U.S.EPA's web site: <http://www.epa.gov/glnpo/aoc/ashtabula.html>). Concurrent with this sampling plan, an additional sampling effort will be carried out in the lower Ashtabula River assessment unit (HUC 041100030105) to help determine the status of beneficial use impairments (BUI's) in the estuary portion of the Ashtabula River where remedial dredging activities have been conducted to remove legacy sediment contamination with PCB's and other industrial chemicals under the Great Lakes Legacy Act. Goals and procedures for this additional monitoring effort are addressed in a separate sampling plan (Ohio EPA, 2011). Ohio EPA will coordinate implementation of sampling efforts in the Ashtabula River watershed with the other agencies in order to assure data quality and to pool resources wherever possible. In addition, Ohio EPA will use data gathered during the other sampling efforts as appropriate to assess the condition of the lower Ashtabula River with respect to attainment of applicable Water Quality Standards.

Fish Tissue

In 2006, the State of Ohio issued a fish advisory urging anglers not to consume fish caught from U.S. Route 20 to the mouth of the Ashtabula main stem. This advisory was issued as a precautionary measure based on evidence that dredging can temporarily increase levels of contaminants in fish from affected waters. Ohio EPA plans to collect fish tissue from the main stem of the Ashtabula in 2011 and potentially again in 2013 in order to determine whether this advisory should remain in place, or can be reduced or rescinded based on current, post-remediation fish tissue contaminant levels.

Conservation

Three stream segments in the Ashtabula River watershed, comprising 46.29 miles, are designated as State Scenic Rivers [<http://ohiodnr.com/tabid/21442/Default.aspx>]. They include the Ashtabula River mainstem from the confluence of the East and West Branches (RM 27.54) to the E. 24th Street Bridge (RM 2.30); the East Branch Ashtabula River from Pennline Fen (RM 12.0) to the mouth, and the West Branch Ashtabula River for the North Richmond Rd. crossing (RM 9.05) to the mouth. The Ashtabula River is therefore designated as a Superior High Quality Water in OAC 3745-1-05 from RM 27.54 to RM 2.00. In addition, the Ashtabula River mainstem is designated as a Seasonal Salmonid Habitat (SSH) from State Route 11 (RM 5.8) to the mouth. Data gathered during the 2011 water quality survey will assist resource managers in the protection of these resources.

In addition, the U.S. Fish and Wildlife Service routinely monitors the Ashtabula River as part of the long-term control plan for sea lamprey in the Great Lakes. Although the Ashtabula River has never been treated to control sea lamprey up to this point, the data gathered during the present survey will provide valuable background data for ambient water chemistry, flows, and fish community composition should plans be made to conduct sea lamprey treatments in the Ashtabula River watershed.

SAMPLING METHODS/QUALITY ASSURANCE

Ohio EPA Manuals

All biological, chemical, EPA laboratory, data processing, and data analysis methods and procedures adhere to those specified in the following documents:

- Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA, 2009a)
- Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA, 1987a, 1989a, and 1989b)
- The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Rankin, 1989)
- Methods for Assessing Habitat in Flowing Waters: Using Qualitative Habitat Evaluation Index (QHEI) (Ohio EPA, 2006b)
- Ohio EPA Sediment Sampling Guide and Methodologies (Ohio EPA, 2001b)
- State of Ohio Cooperative Fish Tissue Monitoring Program, Fish Collection Guidance Manual (Ohio EPA, 2009b)

Field Measurements

Multi-probe field measurements will be collected in conjunction with all water samples for the following parameters:

- Temperature (°C)
- Conductivity/Specific conductance (µmhos/cm)
- Dissolved oxygen (mg/l) + percent oxygen saturation
- pH (S.U.)

Field measurements will be recorded on the laboratory sample submission form. For field instruments with data logging capabilities, the field readings may be logged to the system using a unique site identification number. Logged field meter data will then be uploaded to the Ohio EPA EA3 data management system using meter-specific software obtained from the manufacturer(s) and the Division of Surface Water Field Data Uploading Application software developed for this purpose (Ohio EPA, 2009c).

Water Sampling

Chemical sampling locations within the study area are listed in Tables 3 and 4, and are depicted in Figure 2. Conventional chemical/physical water quality samples will be collected ten times during the period of January 1, 2011 through October 31, 2011 at the sentinel sites under a range of flow conditions. Conventional water chemistry samples will be collected at least four times at all other designated locations during the period of June 15 through October 15 (summer index period). Non-sentinel site sampling will be targeted for low and base flow conditions. Four rounds of sampling will be conducted for water column organics analysis at sites located in Strong Brook and Fields Brook (Tables 3 and 4) during the summer index period.

All Surface water grab samples will be collected from the upper 12 inches of river water and sampled into appropriate containers. Collected water will be preserved using appropriate methods, as outlined in Parts II and III of the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA 2009a) and delivered to the Ohio EPA lab for analysis. The analyte list and analytical methods to be used for surface water samples is provided in Table 5.

Sediment Sampling

Sediment samples will be collected at locations indicated in Table 3 using the procedures outlined in the Ohio EPA sediment sampling manual (Ohio EPA, 2001b). Chemical parameters to be tested for sediment samples and analytical methods are listed in Table 5. Fine grained multi-incremental sediment samples will be collected in the upper 4 inches of bottom material using either decontaminated stainless steel scoops or Ekman dredges. Collected sediment will be placed into glass jars with Teflon-lined lids, placed on ice (to maintain 4°C) and delivered to the Ohio EPA DES laboratory. Analysis of sediment samples will include semi-volatile organic constituents, pesticides, PCB's, and heavy metals.

Bacteriological Sampling

Water samples will be collected at all of the sentinel and conventional chemistry sampling sites for bacteriological analyses to determine the attainment status for recreational uses. Testing will include *Escherichia coli* (*E. coli*) bacteria. Water samples will be collected into sterilized polyethylene containers, cooled to 4°C, and transported to Adams Water Laboratory, 912 E. Tallmadge Ave., Akron, OH 44310 within 6 hours of sample collection. All samples will be analyzed for *E. coli* bacteria using U.S.EPA approved methods (STORET Parameter Code

31633). Sentinel sites will be sampled at least 10 times under varying flow conditions during the recreational season (May 1 - October 31). Other sites will be sampled at least five times during the recreation season under normal flow regimes in order to assess ambient bacteria levels when recreation is most likely to occur. Ohio EPA staff will assess each sampling site to determine the appropriate recreational criteria to apply using the definitions provided in OAC 3745-1-07(B)(4). Nearby USGS gaging stations may be consulted in order to determine appropriate flow regimes in which to schedule sampling events.

Macroinvertebrate Community Assessment

Macroinvertebrates will be collected from artificial substrates and from the natural habitats. Quantitative sampling using artificial substrates will be conducted at reference sites, at sites with drainage areas in excess of 20 mi², and at lacustrine sites. Qualitative sampling methods will be utilized at headwater sites with drainages smaller than 20 mi² for the macroinvertebrate community assessment. The artificial substrate collection provides quantitative data and consists of a composite sample of 5 modified Hester-Dendy (HD) multiple-plate samplers colonized for six weeks. At the time of the artificial substrate collection, a qualitative multihabitat composite sample is also collected. This sampling effort consists of an inventory of all observed macroinvertebrate taxa from the natural habitats at each site with no attempt to quantify populations other than notations on the predominance of specific taxa or taxa groups within major macrohabitat types (e.g., riffle, run, pool, margin). Macroinvertebrate sampling methods that will be used at each individual site are listed in Table 3.

Fish Assemblages and Habitat

Fish will be sampled at each sampling location with pulsed DC current. Two passes will be conducted at sites larger than 20 mi² and at ecoregional reference sites, and a single pass will be used at all headwater sites (drainage area <20 mi²) [Table 3]. Detailed biological sampling protocols are documented in the Ohio EPA manual Biological Criteria for the Protection of Aquatic Life, Volume III (Ohio EPA, 1989b). QHEI scores will be calculated for the habitat at all fish sampling locations.

Fish Tissue

Fish tissue samples will be collected from six¹ locations as part of the Ohio Fish Tissue Consumption Monitoring Program (Table 3). Fillet samples of edible size sport fish will be tested for organochlorinated pesticides, PCBs, mercury, lead, cadmium, arsenic, and selenium. Results will be used in the Ohio Sport Fish Consumption Advisory Program. Collection procedures, target fish species, sizes and Sampling and decontamination protocols will follow those listed in the State of Ohio Cooperative Fish Tissue Monitoring Program guidance documents (State of Ohio Cooperative Fish Tissue Monitoring Program, 2005 and 2009b).

Flow Monitoring

Flow measurements will be collected periodically at the sentinel site locations under varying flow conditions in order to develop a rating curve for water depth and/or bridge tape readings vs. stream flow. Stream stage will be measured continuously at four locations as indicated in Table 3 using either a pressure sensor device mounted within a protective PVC casing or using a bridge mounted acoustic Doppler water level sensor. In addition, at each sentinel site, fixed bridge marks will be established to facilitate the determination of the height of the water surface using a weighted gage tape (bridge tape). Bridge tape readings will be collected at each

¹ Note: fish tissue samples will be collected from an additional three sites in the Ashtabula River lacustrine. The locations of these samples is described in the 2011 Lake Erie Nearshore Monitoring Plan (Ohio EPA, 2011).

sentinel site every time a water sample or flow measurement is collected. Stream flow measurements will be taken using either wading or floating acoustic Doppler flow velocity meters. Stream velocity measurements will be integrated with stream depth measurements to calculate the total stream flow using established USGS methods.

Quality Control

An acid blank will be run on new lots of acids used for preservation of samples. Matrix spike duplicates will be collected for organic water samples at a minimum of 5 percent. Field meters will be calibrated daily, using manufacturer guidelines and requirements noted in the Manual of Ohio EPA Surveillance Methods and Quality Assurance Practices (Ohio EPA 2009a).

Sampling Summary

A summary of the number of samples to be collected during the 2011 survey is provided in Table 6.

CONTACTS

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Table 1. Assessment units to be studied during the 2011 Ashtabula River watershed biological and water quality survey.

Assessment Unit (12-Digit HUC Code)	Narrative	Drainage Area (mi ²)
041100030101	East Branch Ashtabula River	35.23 ²
041100030102	West Branch Ashtabula River	27.63
041100030103	Upper Ashtabula River	15.46 ²
041100030104	Middle Ashtabula River	30.27
041100030105	Lower Ashtabula River	18.23

Table 2. Facilities regulated by the National Pollution Discharge Elimination System in Ashtabula River watershed.

Facility	Permit #	Receiving Stream	Design Flow	Note
ASHTA Chemicals Inc	3IE00016	Fields Brook		Storm Water
Ashtabula River Landfill	3IN00350	Ashtabula R.		Inactive
Clean Harbors PPM LLC	3II00202	Strong Brook		Storm Water
Detrex Corporation	3IF00017	Fields Brook	0.548	
Gabriel Performance Products LLC	3IF00002	Fields Brook	0.22	
Millennium Inorganic Chemicals Inc Plant 2	3IE00017	Fields Brook		Storm Water
Mobile Acres Park & Sales	3PV00083	Fields Brook	0.02	
Ridge View Estates	3PW00034	RM 7.55 Trib. Ashtabula R.	0.01	
Ryber Development LLC	3IE00011	West Brook (Fields Brook)		Storm Water
State Road Industrial Dev LLC	3IE00012	Fields Brook	0.001	

² Portions in Pennsylvania

Table 3. Sampling locations with associated sampling protocols and issues, by HUC-12 assessment units, for the Ashtabula River watershed survey, 2011.

Stream	Location	River Mile	Drain Area	Station Code	Issue	Sample Type
HUC 041100030101						
Trib to E. Br. Ashtabula R. RM 1.35	Scribner Rd.	1.10	4.9	301385	Use attainability	F _D ,M _Q ,C,E
RM 0.80 Trib. To Trib to E. Br. Ashtabula R. RM 1.35	Hilldom Rd.	0.30	8.9	301386	Use attainability	F _D ,M _Q ,C,E
East Branch of E. Br. Ashtabula River	State Rte 7	0.39	2.5	301387	Use attainability	F _D ,M _Q ,C,E
East Branch Ashtabula R.	Adams Rd. (upper crossing)	2.40	21.0	301388	TMDL assessment, Sentinel Site	F ₂ ,M _{HD} ,Q,L
East Branch Ashtabula R.	Caine Rd.	5.47	13.0	301389	TMDL assessment	F,M _Q ,C,E
East Branch Ashtabula R.	Turner Rd.	7.97	9.3	301390	TMDL assessment	F,M _Q ,C,E
HUC 041100030102						
Trib to W. Br. Ashtabula R. RM 3.50	Caine Rd.	0.92	6.8	301391	Use attainability	F _D ,M _Q ,C,E
West Branch Ashtabula R.	Graham Rd.	2.70	31.0	A01K12	Ecoregional Reference Site, Sentinel Site	F ₂ ,M _{HD} ,Q,L
West Branch Ashtabula R.	Schrambling Rd.	6.30	15.1	301392	TMDL assessment	F,M _Q ,C,E
West Branch Ashtabula R.	N. Richmond Rd.	9.04	12.9	301393	TMDL assessment	F,M _Q ,C,E
West Branch Ashtabula R.	Hall Rd.	11.28	7.6	301394	Use Attainability	F _D ,M _Q ,C,E
HUC 041100030103						
Ashtabula River	Hilldom Rd.	27.00	65.2	A01S02	Ecoregional Reference Site	F ₂ ,T,M _{HD} ,C,E
Ashtabula Creek	Reger Rd.	0.28	17.3	301395	TMDL assessment, Sentinel Site	F ₂ ,M _{HD} ,Q
Ashtabula Creek	Middle Rd.	5.24	10.0	A01S16	TMDL assessment	F,M _Q ,C,E

Table 3. Sampling locations with associated sampling protocols and issues, by HUC-12 assessment units, for the Ashtabula River watershed survey, 2011.

Stream	Location	River Mile	Drain Area	Station Code	Issue	Sample Type
HUC 041100030104						
Ashtabula River	Green Hill Rd.	13.90	113.0	A01K09	TMDL assessment	F ₂ ,T,M _{HD} ,C,E
Ashtabula River	Benetka Rd.	19.03	94.0	A01W20	TMDL assessment, Sentinel Site	F ₂ ,T,M _{HD} ,Q
Ashtabula River	Kelloggsville Rd.	23.80	88.4	502810	TMDL assessment	F ₂ ,T,M _{HD} ,C,E
Trib to Ashtabula R. RM 16.98	Gageville Rd.	0.43	17.3	301397	Use attainability	F,M _Q ,C,E
HUC 041100030105						
Ashtabula River	Tannery Hill Rd.	3.42	127.0	301398	TMDL assessment, Sentinel Site , Upstream of AOC, upstream limit of fish advisory	F ₂ ,T,M _{HD} ,Q,L
Ashtabula River	Upst. U.S. 20	3.70	127.0	A01K05	Upstream of fish consumption advisory	T
Ashtabula River	State Rd.	6.24	121.0	502760	TMDL assessment	F ₂ ,M _{HD} ,C,E
Ashtabula River	Hadlock Rd.	10.00	118.0	A01K07	TMDL assessment	F ₂ ,T,M _{HD} ,C,E
Strong Brook	Lake Ave.	0.46	1.0	502800	TMDL assessment, Sentinel Site	F _D ,M _Q ,C _o ,S,Q,L
Hubbard Run	Plymouth Ridge Rd.	0.21	2.7	301399	Use attainability	F _D ,M _Q ,C,E
Trib to Hubbard Run RM 0.20	ust Plymouth Ridge Rd.	0.10	2.1	301400	Use attainability	F _D ,M _Q ,C,E
Fields Brook	15th St.	0.33	5.8	502780	Sentinel Site, CERCLA remediation	C _o ,Q,L
Fields Brook	Columbus Ave.	0.89	5.6	A01W14	CERCLA remediation	F _D ,M _Q ,C _o ,S,E
Fields Brook	State Rd.	1.84	3.6	A01W09	CERCLA remediation	F _D ,M _Q ,C _o ,S,E

Key for Table 3 **Sample Type** column:

C	Chemistry site (4 rounds, base flow)
C _o	Water organics collected with chemistry samples
E	<i>E. coli</i> bacteria assessment site (5 rounds)
F	One-pass fish Site (EAS)
F _D	One-pass fish Site (NEDO)
F ₂	Two-pass fish site (for reference sites and/or drainage area 20 sq. miles or greater)
M _Q	Qualitative macroinvertebrate site – qualitative sample
M _{HD}	Hester-Dendy quantitative macroinvertebrate site
T	Fish tissue site
Q	Sentinel Site: flow monitoring, chemistry (10 rounds), <i>E. coli</i> bacteria (10 rounds), Datasonde [®]
L	Continuous water level logger
S	Sediment sampling location

Table 4. Sampling locations with geographical coordinates, by stream, for the Ashtabula River watershed survey, 2011.

Stream	Location	River Code	River Mile	Drainage Area	Latitude	Longitude	USGS Quad
HUC 041100030101							
Trib to E. Br. Ashtabula R. RM 1.35	Scribner Rd.	07-005-002	1.10	4.9	41.81175	-80.58082	Pierpont
RM 0.80 Trib. To Trib to E. Br. Ashtabula R. RM 1.35	Hilldom Rd.	07-005-003	0.30	8.9	41.81880	-80.58342	Pierpont
East Branch of East Branch Ashtabula R.	State Rte 7	07-005-001	0.39	2.5	41.76902	-80.57191	Pierpont
East Branch Ashtabula R.	Adams Rd. (upper crossing)	07-005-000	2.40	21.0	41.79845	-80.59433	Pierpont
East Branch Ashtabula R.	Caine Rd.	07-005-000	5.47	13.0	41.76487	-80.57803	Pierpont
East Branch Ashtabula R.	Turner Rd. (Twp. 337)	07-005-000	7.97	9.3	41.73970	-80.55936	Leon
HUC 041100030102							
Trib to W. Br. Ashtabula R. RM 3.50	Caine Rd.	07-004-001	0.92	6.8	41.76483	-80.60802	Leon
West Branch Ashtabula R.	Graham Rd.	07-004-000	2.70	31.0	41.78170	-80.61780	Pierpont
West Branch Ashtabula R.	Schrambling Rd.	07-004-000	6.30	15.1	41.73924	-80.61969	Leon
West Branch Ashtabula R.	N. Richmond Rd.	07-004-000	9.04	12.9	41.71414	-80.61453	Leon
West Branch Ashtabula R.	Hall Rd.	07-004-000	11.28	7.6	41.69695	-80.58568	Leon
HUC 041100030103							
Ashtabula River	Root Rd.	07-001-000	25.90	66.5	41.83330	-80.62860	Pierpont
Ashtabula River	Hilldom Rd.	07-001-000	27.00	65.2	41.81860	-80.62390	Pierpont
Ashtabula Creek	Reger Rd.	07-003-000	0.28	17.3	41.84400	-80.61120	Pierpont
Ashtabula Creek	State Rte 84	07-003-000	3.22	12.1	41.86287	-80.56930	Pierpont
Ashtabula Creek	Middle Rd.	07-003-000	5.24	9.51	41.87771	-80.54400	Conneaut
HUC 041100030104							
Ashtabula River	Green Hill Rd.	07-001-000	13.90	113.0	41.85160	-80.72720	Gageville
Ashtabula River	Benetka Rd.	07-001-000	19.03	94.0	41.84890	-80.68890	Gageville
Ashtabula River	Kelloggsville Rd.	07-001-000	23.80	88.4	41.85220	-80.61727	Gageville
Trib to Ashtabula R. RM 16.98	Gageville Rd.	07-001-002	0.43	17.3	41.83640	-80.70668	Gageville

Table 4. Sampling locations with geographical coordinates, by stream, for the Ashtabula River watershed survey, 2011.

Stream	Location	River Code	River Mile	Drainage Area	Latitude	Longitude	USGS Quad
HUC 041100030105							
Ashtabula River	Tannery Hill Rd.	07-001-000	3.42	127.0	41.87311	-80.78185	Ashtabula South
Ashtabula River	@ U.S. 20	07-001-000	3.67	127.0	41.87230	-80.77886	Ashtabula South
Ashtabula River	State Rd.	07-001-000	6.24	121.0	41.85560	-80.76220	Ashtabula South
Ashtabula River	Hadlock Rd.	07-001-000	10.00	118.0	41.87420	-80.71580	Gageville
Strong Brook	Lake Ave.	07-001-001	0.46	1.0	41.88610	-80.80420	Ashtabula North
Hubbard Run	Plymouth Ridge Rd.	07-002-000	0.18	5.4	41.85330	-80.77890	Ashtabula South
Trib to Hubbard Run RM 0.20	ust Plymouth Ridge Rd.	07-002-001	0.10	2.1	41.85312	-80.77566	Ashtabula South
Fields Brook	15th St.	07-010-000	0.33	5.8	41.89330	-80.79280	Ashtabula North
Fields Brook	Columbus Ave.	07-010-000	0.89	5.6	41.88900	-80.78680	Ashtabula North
Fields Brook	State Rd.	07-010-000	1.84	3.6	41.89310	-80.77260	Ashtabula North

Table 5. List of chemical/physical water quality parameters to be analyzed/measured in surface water, sediment, and fish tissue from the Ashtabula River watershed survey, 2011.

Parameters	Test Method	Water	Sediment ¹	Fish Tissue
Acidity	USEPA 305.1	X		
Alkalinity (carbonate/bicarbonate)	USEPA 310.1	X		
Solids, Dissolved (TDS)	USEPA 160.1	X		
Solids, Suspended (TSS)	USEPA 160.2	X		
Ammonia	USEPA 350.1	X		
TKN	USEPA 351.2	X		
Nitrate-Nitrite	USEPA 353.1	X		
Nitrite	USEPA 354.1	X		
Chloride	USEPA 325.1	X		
COD	USEPA 410.4	X		
Sulfate	USEPA 375.4	X		
Total Phosphorus	USEPA 365.4	X		
ICP 1 (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Hardness)	USEPA 200.7	X		
ICP 3 (Al, Ba, Ca, Cr, Cu, Fe, Mg, Mn, Na, Ni, K, Sr, Zn, Pb)	USEPA 200.7		X	
SIMA 1 (As, Cd, Pb, Se)	USEPA 200.9, SM 3113B	X		X
SIMA 2 (As, Cd, Se)	USEPA 200.9, SM 3113B		X	
Mercury, Total	USEPA 245.1/ USEPA 7471A		X	X (245.1)
pH - grab	YSI 600XL meter / USEPA 150.1	X - field / lab		
Conductivity - grab	YSI 600XL meter / USEPA 120.1	X - field / lab		
Dissolved Oxygen - grab	YSI 600XL meter	X - field		
Temperature - grab	YSI 600XL meter	X - field		
VOCs	USEPA 8260		X	
SVOCs	USEPA 625/ USEPA 8270C	X	X	
Pesticides/PCBs/ Chlordane	USEPA 590.1, 608/ USEPA 8081A, 8082	X	X	X (OEPA 590.1)
<i>E. coli</i>	USEPA 1103.1/ 640.1	X		
Chlorophyll a	USEPA 445.1	X ¹		
Percent Solids	SM 2540G		X	X
Total Organic Carbon (TOC)	OEPA 335.2		X	

Sampling Summary

Table 6. Sampling Summary: Ashtabula 2011 Survey⁴

Chemistry:				
Water:	Sentinel – 7 Sites (10 rounds)	Assessment (4 rounds)	Total Samples	
Water Chemistry	70	74	144	
Water Organics	0	16	16	
Bacteria:	Sentinel (7 Sites/ 10 rounds)	Assessment (20 sites/ 5 rounds)	Total	
<i>E. coli</i> Bacteria	70	100	170	
Sediment:	Sentinel	Assessment (1 round)	Total	
	0	3	3	
Fish:				
	Sites (26 Total)		Passes (36 Total)	
	EAS⁵	NEDO	EAS	NEDO
1 Pass Sites	6	10	6	10
2 Pass Sites	10	0	20	0
Total	16	10	26	10
Macroinvertebrates:			Fish Tissue:	
	Sites		Sites	Samples
Qualitative	16		6	24
Hester Dendy - ICI	10			
Total Sites	26			

⁴ Note: Additional sampling within the Ashtabula lacustrary is described in the Lake Erie nearshore monitoring plan for 2011.

⁵ NEDO will conduct the fish assessments for all sites with drainage areas < 10 mi²

Figure 1. 12 Digit HUC assessment units for the 2011 Ashtabula River watershed survey.

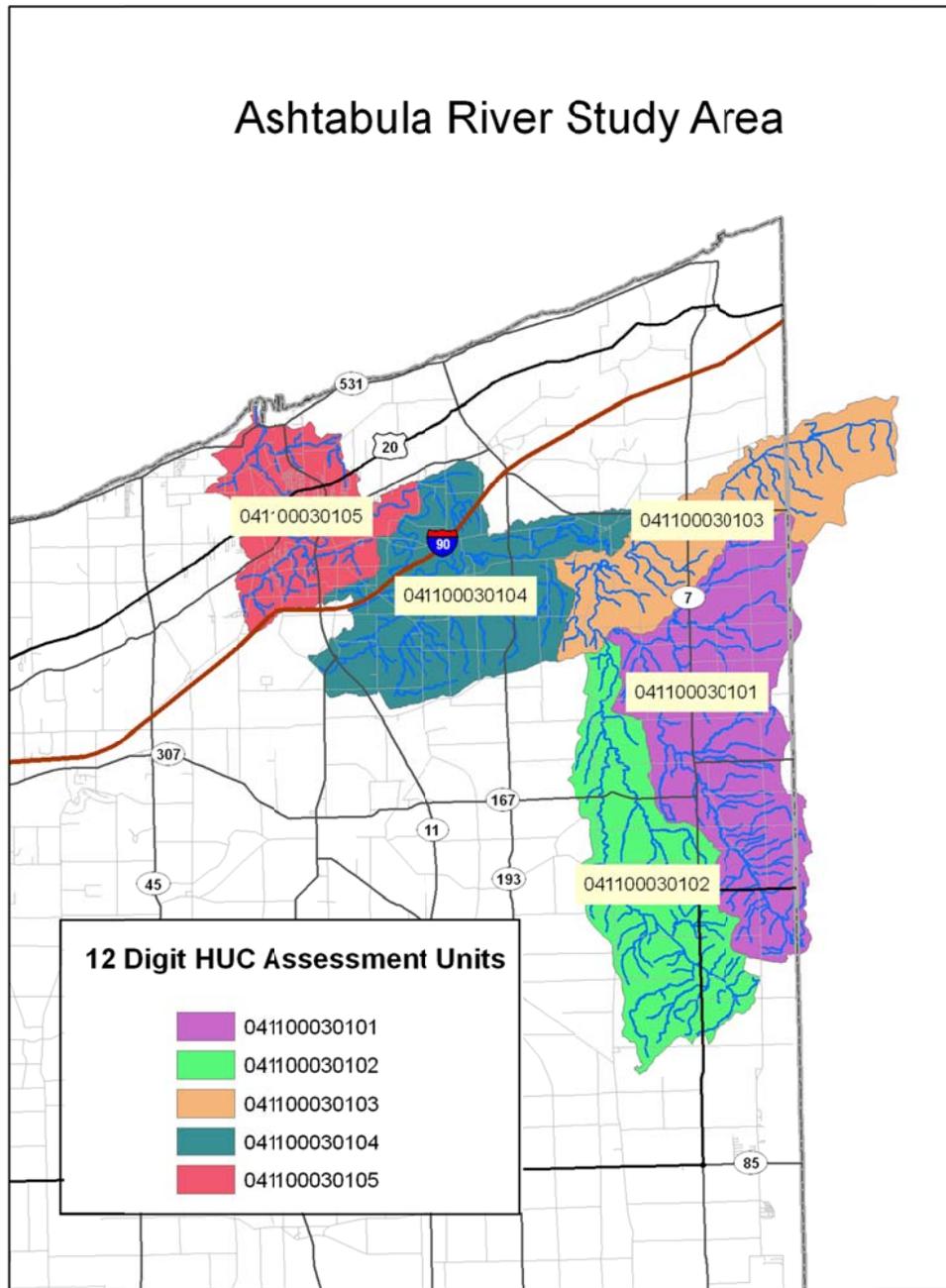
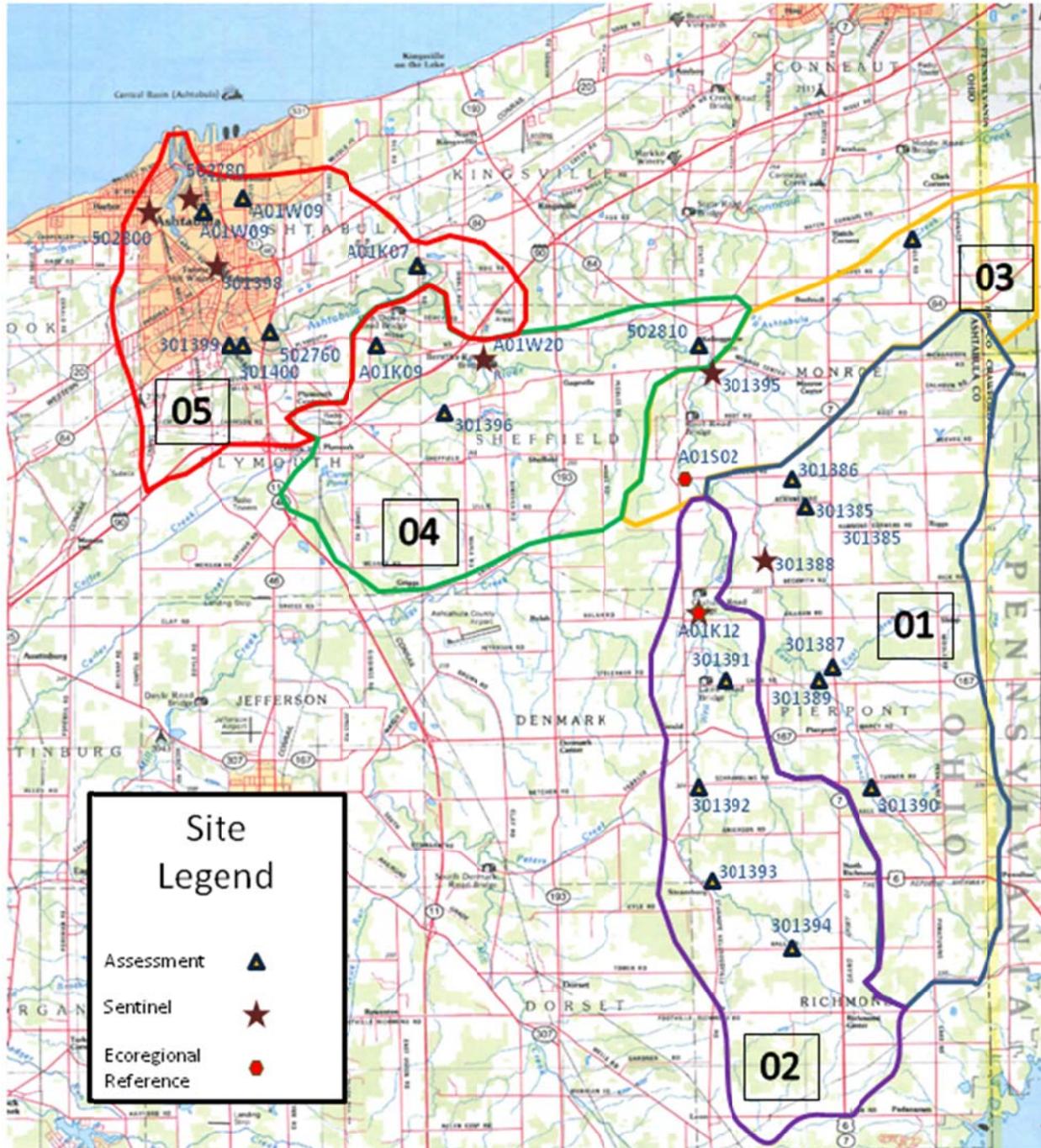


Figure 2. Sampling locations for the 2011 Ashtabula River watershed survey.



**Ashtabula River TMDL Survey Area
HUC 0411000301**

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