

2012 Study Plan for the Black River Watershed FINAL

HUCs 0411000103, 0411000104, 0411000105, and 0411000106
(Ashland, Cuyahoga, Huron, Lorain, and Medina Counties, Ohio)



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INTRODUCTION

As part of Ohio EPA's approach for biological and chemical water quality monitoring, an intensive ambient assessment will be conducted during the 2012 field sampling season within the Black River watershed (Figure 1). The Black River watershed is located in north-central Ohio and drains approximately 470 square miles of both agricultural and highly urbanized land uses (Figure 2). Four 10-digit Hydrologic Unit Codes (HUC) sub-watersheds (0411000103, 0411000104, 0411000105, and 0411000106) divide the study area. Each 10 digit HUC is subdivided into 12 digit HUCs sub-watersheds (Figure 1, Table 1) which serve as the base assessment units (AUs) for Ohio EPA use attainment evaluations and integrated reporting (Ohio EPA, 2012a). The entire Black River watershed is designated as an Area of Concern (AOC) by the International Joint Commission. A Remedial Action Plan (RAP) is currently in progress to address beneficial use impairments identified for the AOC. The Black River watershed was previously assessed by Ohio EPA in 1992 (Ohio EPA, 1993) and 1997 (Ohio EPA, 1998). Additional water quality assessments were conducted for portions of the watershed on various occasions, but the results of these studies have not been comprehensively compiled.

The present study is designed to characterize the watershed with respect to the current attainment status for the designated beneficial uses in the State Water Quality Standards and to provide a timely, cohesive suite of data to evaluate the condition of the Area of Concern and measure progress toward the identified Beneficial Use Impairments. Ohio EPA developed a Total Maximum Daily Load (TMDL) study for the Black River watershed (Ohio EPA, 2008) which was approved by U.S.EPA on August 20, 2008. The 2012 assessment will be used to determine if the water quality impairments listed in the TMDL continue to exist, if TMDL implementation activities have resulted in water quality improvements, and whether additional water quality impairments exist which were not addressed in the approved TMDL report.

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 Table 2.

Sampling Objectives:

- Monitor and assess the chemical, physical, and biological integrity of the principal drainage network of the Black River watershed (HUCs 041100010303, 041100010304, 041100010305, and 041100010306) in support of the TMDL process;
- 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;
- Provide data to evaluate progress in addressing the identified Beneficial Use Impairments in the Area of Concern;
- Provide updated data to determine the effectiveness of long term measures to control combined sewer outfall (CSO) discharges in the city of Elyria and the Village of Avon Lake as well as bypasses from permitted NPDES dischargers;

- Evaluate the appropriateness of existing use designations and assign uses to undesignated streams;
- Evaluate the effectiveness of stream restoration and preservation efforts in the watershed;
- 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

Issues of concern at each of the monitoring locations are summarized in Table 3 and are described below.

Nonpoint Sources

The lower portion of the watershed (HUC 0411000106) includes the highly urbanized areas of the cities of Elyria and Lorain with dense concentrations of industrial activity. Several industrial stormwater discharge permits exist within the assessment units within this sub-watershed. In the upper AUs within the watershed, sewage treatment is heavily reliant upon on-site sewage treatment systems which may affect attainment of recreational uses in the watershed. Bacteriological sampling will be conducted to determine the level of attainment with the recreational use criteria based upon the *Escherichia coli* (*E. coli*) bacteria indicator.

Much of the upper watershed 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. Land use patterns within the Black River watershed is summarized in Figure 2.

Point Sources

There are 59 NPDES permitted wastewater discharges located in the Black River watershed (Figure 3, Table 4). Specific discharges which will be bracketed for sampling as part of this study are as follows: the Lodi WWTP, the Grafton WWTP, the Wellington WWTP, the Oberlin WWTP, the North Ridgeville WWTP, the Elyria WWTP, the Brentwood WWTP, the Eaton Estates WWTP, Lorain Tubular, and Republic Steel. In addition, downstream sampling locations will be used to assess potential impacts from the LaGrange WWTP.

The City of Elyria and the City of Avon Lake are both CSO communities. The long term control plan for the City of Elyria is currently under review by the Ohio EPA. CSO locations in the City of Elyria affect the lower portions of both the East Branch and the West Branch of the Black River as well as the Black River mainstem. The City of Avon Lake has an approved long term control plan, and Ohio EPA is the lead agency for monitoring compliance with the plan. The majority of the CSO locations in the City of Avon Lake discharge directly to Lake Erie. However, some impacts to tributary streams in AU 041100010603 from CSO's are possible within the CSO area.

Small Stream Evaluation

Numerous small streams in the Black River watershed, generally with drainage areas less than 10 mi², have not been assigned designated aquatic life uses in the Water Quality Standards. This includes all of the named direct Lake Erie tributaries included in AU 041100010603. The 2012 survey will assess eleven of these streams with respect to use attainability for the designation of beneficial uses.

RAP Beneficial Use Impairments

The entire Black River watershed is designated as an Area of Concern (AOC) by the International Joint Commission. A RAP is currently in progress to address beneficial use impairments (BUI's) identified for the AOC (for information see U.S.EPA's web site: <http://www.epa.gov/glnpo/aoc/blackriver.html>). Concurrent with this sampling plan, several additional monitoring efforts are underway in the lower Black River assessment unit (HUC 041100010602) in conjunction with various environmental restoration efforts and the Great Lakes Restoration Initiative (GLRI). Sampling outlined in this study plan is designed to provide current water quality assessment data to help determine the status of BUI's in the Black River watershed. Goals and procedures for Ohio EPA's monitoring efforts in the Black River estuary related to a nearshore Lake Erie monitoring grant under the GLRI are addressed in a separate monitoring plan (Ohio EPA, 2011). Where appropriate, Ohio EPA will coordinate implementation of sampling efforts in the Black River estuary with the other entities and 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 Black River with respect to attainment of applicable Water Quality Standards.

Fish Tissue

The State of Ohio has issued a fish advisory for the lower Black River from Interstate Highway 80 (RM 14.2) to the mouth. The advisory recommends that meals of Common Carp be limited to one meal per month or one meal per two months (depending upon the size class of the fish) based upon PCB levels. In addition, it is recommended that the consumption of Freshwater Drum be limited to one meal per month based upon levels of PCB's and mercury in the fish tissue. Ohio EPA plans to collect fish tissue from selected sites (Figure 4, Table 2) in 2012 in order to determine whether these advisories should remain in place, or can be reduced or rescinded based on current fish tissue contaminant levels.

Conservation

Several sections of the Black River and tributary streams flow through properties owned and managed by the Lorain County Metroparks or other local park systems. In addition, a Water Trail has been established on the Black River mainstem as a cooperative effort between ODNR and the Lorain County Metroparks <http://www.dnr.state.oh.us/tabid/2897/default.aspx>. Assessment of the water quality conditions within this segment of the river will assist managers of these park areas to make informed decisions with respect to recreational uses.

Two areas in the watershed will be monitored to determine the effectiveness of stream restoration and stream protection resulting from the Water Resources Restoration Sponsorship Program (WRRSP) and stream mitigation projects under the 404/401 permitting process. Stream reaches along the East Fork and West Fork of the East Branch of the Black River near Lodi were restored using funding from the WRRSP program and as mitigation associated with the 404/401 regulatory program. Monitoring in these areas will provide data regarding the effectiveness of these restoration efforts. In addition, a conservation area purchased as stream mitigation under the 404/401 program along the lower reach of Elk Creek (West Branch

tributary) now managed by the Lorain County Metroparks will also be sampled to determine the condition of the resource.

CERCLA Remediation Projects

There are two sites in Elyria adjacent to the Black River under active investigation and remedial activities under CERCLA: the Ford Road Landfill (<http://www.epa.gov/region5/cleanup/fordroad/>) and the former Chemical Recovery Systems (<http://www.epa.gov/region5/cleanup/crs/>). The Ford Road Landfill site is located adjacent to the mainstem of the Black River at approximately RM 10.9. The 2012 water quality survey will bracket this site for biological attainment, fish tissue, water chemistry (including organic compounds), and sediment chemistry.

The Chemical Recovery Systems site is located adjacent to the East Branch Black River at approximately RM 0.9. Sampling associated with this site will include similar bracketing for biological attainment, fish tissue, and water chemistry (including organic compounds). However, sampling within this reach is confounded by the close proximity to the confluence with the West Branch, low head dams both upstream and downstream of the site, and a large waterfall. Therefore, the site on the mainstem of the Black River in Cascade Park (501520) will be used to bracket the potential downstream impacts on in-stream biology and fish tissue contamination in sport fish. This site may also be used to assess potential impacts on stream sediment chemistry if the downstream site on the East Branch at Washington St. (B01P07) is not accessible.

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, 2012b)
- 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, 2006)
- Ohio EPA Sediment Sampling Guide and Methodologies (Ohio EPA, 2012c)
- State of Ohio Cooperative Fish Tissue Monitoring Program, Fish Collection Guidance Manual (Ohio EPA, 2012d)

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, 2009).

Water Sampling

Chemical sampling locations within the study area are listed in Table 2, and are depicted in Figure 5. Conventional chemical/physical water quality samples will be collected ten times under a range of flow conditions during 2012 and 2013 at the sentinel sites. For the two designated Public Water Supply stream reaches identified in Table 2, water chemistry samples for determination of attainment of the PWS use will be collected ten times during two seasons in 2012 and 2013. The 2012 sampling (5 rounds) will coincide with the biological sampling index period of June 15 to October 15 under base flow conditions. The 2013 sampling (5 rounds) will be conducted in the spring during periods when the water treatment plants are actively pumping water to replenish the upground reservoirs used as their water supplies.

Conventional water chemistry samples will be collected at least five times under base flow conditions at all other designated locations during the period of June 15 through October 15, 2012 (summer index period).

Sampling will be conducted for water column organics analysis, including herbicides, according to the following schedule:

- Two rounds of sampling at the sentinel sites as indicated in Table 2 during the summer index period.
- Ten rounds of sampling at Public Water Supply intakes as indicated in Table 2, including five rounds of sampling during the 2012 summer index period and five rounds of sampling during the spring of 2013 when water is being pumped from the streams to replenish the water supply reservoirs.
- Five rounds of sampling (excluding the herbicide analytes) under base flow conditions at sites selected to bracket the Chemical Recovery and Ford Rd. Landfill sites in Elyria.

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, 2012b) 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 Figure 6 and Table 2 using the procedures outlined in the Ohio EPA sediment sampling manual (Ohio EPA, 2012c). 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 including mercury.

Bacteriological Sampling

Water samples will be collected at all of the sentinel sites and at selected assessment unit chemistry sampling sites as indicated in Figure 7 and Table 2 for bacteriological analyses to

determine the attainment status for recreational uses. Testing will be for counts of *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 Black River estuary 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 depicted in Figure 8 and listed in Table 2.

Fish Assemblages and Habitat

Fish will be sampled at each selected 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) (Figure 8, Table 2). 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. For sites located in the Black River estuary (sites downstream of RM 6.0), habitat quality will be assessed using the Lake Erie QHEI methodology (Ohio EPA, 2010).

Fish Tissue

Fish tissue samples will be collected from twenty two locations as part of the Ohio Fish Tissue Consumption Monitoring Program (Figure 4, Table 2). 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 Fish Tissue Collection Manual, 2012d).

Flow Monitoring

Flow measurements will be collected periodically at the sentinel site locations listed in Table 2 and depicted in Figure 5 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 seven locations as indicated in Figure 9 and Table 2 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 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.

Continuous Monitoring with Datasode® Data Recorders

Datasode® continuous water quality monitoring instruments will be deployed at 28 sites during two 48 hour periods to record the diel patterns for changes in water temperature, pH, and conductivity. The locations for the placement of these monitors are indicated in Figure 9 and in Table 2. Placement locations are designed to bracket permitted wastewater treatment plants and other sources of pollutants that may cause changes for these parameters either near to a pollutant discharge or farther downstream where impacts to water quality may occur as pollutants are assimilated by the in-stream biota and sediments.

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 five percent or once per month when organic samples are being collected, whichever is greater. 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 2012b). Field duplicates and field blanks will be collected at a rate of five percent of the samples collected.

Sampling Summary

Summaries of the number of samples to be collected during the 2012 survey are provided in Table 6.

CONTACTS

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Medina County – Eric Moore (330) 245-3043

County Sheriff Offices:

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Hospitals:

Medina County:	
Lodi Community Hospital 225 Elyria St. Lodi, OH 44254 (330) 948-1222	Medina Hospital 1000 E. Washington St. Medina, OH 44256 (330) 725-1000
Lorain County:	
Mercy Allen Hospital 200 West Lorain St. Oberlin, OH 44074 (440) 775-1211	Mercy Regional Medical Center 3700 Kolbe Rd. Lorain, OH 44053
EMH Elyria Medical Center 630 East River St. Elyria, OH 44035 (440) 329-7500	

Watershed Contacts:

Contact Person	Affiliation	Sites
Keith Brown (440) 371-9857 kbrown@metroparks.cc	Lorain County Metroparks	Black River mainstem sites downstream of Elyria WWTP 501510 B01K53 B01S07
Terry Korzan (440) 366-2211 tkorzan@cityofelyria.org	Elyria WWTP	Black River in vicinity of the Elyria WWTP outfall B01W07
Matt Kaliszewski (Groundskeeper) (440) 225-9752	Spring Valley CC	Black River upstream of the Ford Road Landfill B01S09
Daniel Brotherton (440) 774-4060 ext. 3252 dbrotherton@republicservices.com or Richard Kostelnick (440) 774-4060 ext. 3249 rkostelnick@republicservices.com	Lorain County Landfill (Republic Services)	Plum Creek upstream of Oberlin-Elyria Rd. B01P02
Steve Hoffert (440) 775-7280 shoffert@cityofoberlin.com	Oberlin WWTP	Plum Creek downstream of Oberlin WWTP B01S10 B01W03
Rich Ternes (440) 458-4332 rternes@metroparks.cc	Lorain County Metroparks	West Branch Black R. ust of Plum Creek 201619 East Branch Black R. @ Indian Hollow Park B01S30
Greg Frenk (440) 647-4726 (440) 213-1623 (cell)	Wellington WWTP	Charlemont Creek trib. Wellington WWTP sites: 301940,301941,301943
Jim Spetz (330) 722-9364 jspetz@medinaco.org	Medina County Parks	East Fork E. Br. and West Fork E. Br. Sites: B01P30, 201606

Table 1. Assessment units to be studied during the 2012 Black River watershed biological and water quality survey.

HUC 10 Watershed	HUC 12 Assessment Unit	HUC 12 Narrative	Drainage Area (mi²)
0411000103	041100010301	East Fork of East Branch Black River	14.2
	041100010302	Headwaters West Fork East Branch Black River	43.4
	041100010303	Coon Creek-East Branch Black River	38.3
0411000104	041100010401	Town of Litchfield-East Branch Black River	36.0
	041100010402	Salt Creek-East Branch Black River	33.9
	041100010403	Willow Creek	22.5
	041100010404	Jackson Ditch-East Branch Black River	33.6
0411000105	041100010501	Charlemont Creek	26.0
	041100010502	East Creek-West Branch Black River	40.1
	041100010503	Wellington Creek	29.6
	041100010504	Middle West Branch Black River	25.6
	041100010505	Plum Creek	13.8
	041100010506	Elk Creek-West Branch Black River	39.1
0411000106	041100010601	French Creek	38.4
	041100010602	Black River	35.3
	041100010603	Heider Ditch-Frontal Lake Erie	26.3

Table 2. Monitoring locations and sampling allocations for the Black River watershed survey, 2012.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Latitude	Longitude	USGS Quad	Sampling
041100010301								
E. Fk. E. Br. Black R. @ Chippewa Rd.	20-014-000	5.84	7.60	B01W12	41.07709	-82.02211	Lodi	F,M _Q ,C
E. Fk. E. Br. Black R. @ Lodi City Park	20-014-000	2.67	12.90	B01S36	41.03654	-82.01210	Lodi	F,M _Q ,C,B
E. Fk. E. Br. Black R. Ust. Lodi WWTP	20-014-000	1.76	13.90	B01W11	41.03658	-82.020006	Lodi	F,M _Q ,C,D
E. Fk. E. Br. Black R. Dst. Lodi WWTP	20-014-000	1.60	14.00	B01S35	41.03827	-82.02038	Lodi	F,M _Q ,C,D
E. Fk. E. Br. Black R. Dst. Lodi @ SR 224/U.S. 42	20-014-000	1.03	14.10	B01P30	41.04533	-82.02400	Lodi	F,M _Q
E. Fk. E. Br. Black R. at Mouth @ Richmond Rd.	20-014-000	0.06	15.20	B01W10	41.05004	-82.03440	Lodi	C,B,D
041100010302								
W. Fk. E. Br. Black R. @ T391	20-015-000	13.97	14.10	301931	41.05104	-82.20172	Sullivan	F,M _Q ,C
W. Fk. E. Br. Black R. @ SR 301	20-015-000	8.90	25.00	201609	41.03861	-82.12602	Sullivan	F ₂ ,M _{HD} ,C
W. Fk. E. Br. Black R. @ SR 421	20-015-000	2.30	41.10	201607	41.02750	-82.04120	Lodi	F _D ,M _{HD} ,C
W. Fk. E. Br. Black R. @ Hidden Hollow Park	20-015-000	1.20	41.50	201606	41.03902	-82.03970	Lodi	F _D ,M _{HD} ,C
W. Fk. E. Br. Black R. @ Sanford Rd.	20-015-000	0.34	42.20	B01W13	41.04573	-82.03566	Lodi	F _D ,M _{HD} ,C,B
Clear Creek @ Pawnee Rd.	20-016-000	1.80	6.20	201615	41.01438	-82.07790	Lodi	F,M _Q ,C,B
041100010303								
E. Br. Black R. @ Shaw Rd. (Twp 99)	20-010-000	41.45	68.00	B01S34	41.07537	-82.06168	Lodi	F ₂ ,M _{HD} ,C,B,T,D
E. Br. Black R. @ Old Mill Rd (Twp 68)	20-010-000	40.47	72.00	B01K07	41.08641	-82.06907	Lodi	F ₂ ,M _{HD} ,C,D
RM 39.06 Trib. EB Black R @ Spencer Lake Rd.	20-010-010	2.16	4.66	Q01K04	41.11316	-82.05757	Lodi	F,M _Q ,C
Coon Creek @ River Corners Rd	20-013-000	0.88	10.20	301933	41.09605	-82.09456	Lodi	F,M _Q ,C,B
RM 41.41 Trib. EB Black R. @ Shaw Rd. (Lower)	20-010-011	0.35	1.83	302006	41.07533	-82.05637	Lodi	F,M _Q ,C

Table 2. Monitoring locations and sampling allocations for the Black River watershed survey, 2012.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Latitude	Longitude	USGS Quad	Sampling
041100010401								
E. Br. Black R. @ River Corners Rd.	20-010-000	36.80	96.00	201591	41.10856	-82.09430	Lodi	F ₂ ,M _{HD} ,C
E. Br. Black R. @ Smith Rd. (Lorain/Medina County Line)	20-010-000	32.42	104.00	B01S33	41.13665	-82.11660	LaGrange	F ₂ ,M _{HD} ,Q _L ,T
Rm 28.65 Trib. E. Br. Black R. @ Foster Rd.	20-010-008	1.50	5.30	201599	41.15706	-82.08950	LaGrange	F,M _Q ,C,B
041100010402								
E. Br. Black R. @ Short Rd.	20-010-000	24.60	136.00	201589	41.18958	-82.09793	LaGrange	F ₂ ,M _{HD} ,C,T
E. Br. Black R. @ Vermont Ave.	20-010-000	18.94	158.00	B01S32	41.23435	-82.08160	LaGrange	F ₂ ,M _{HD} ,C,B,T
RM 22.65 Trib. E. Br. Black R. @ Vermont Rd.	20-010-006	0.60	6.40	B01K09	41.20376	-82.07730	LaGrange	F,M _Q ,C,B
Salt Creek @ Chamberlain Rd.	20-011-000	0.53	6.73	301934	41.23024	-82.06224	LaGrange	F,M _Q ,C,B
Crow Creek @ Vermont Rd.	20-012-000	0.80	3.70	201602	41.18640	-82.08180	LaGrange	F,M _Q ,C,B
041100010403								
Willow Creek Ust. Eaton Estates @ Island Rd	20-010-001	6.49	2.99	301935	41.31461	-82.00140	Grafton	F,M _Q ,C,B
Willow Creek @ Durkee Rd.	20-010-001	2.85	13.30	B01S38	41.32649	-82.05070	Grafton	F,M _Q ,C,B,D
041100010404								
E. Br. Black R. @ Parsons Rd.*	20-010-000	11.34	179.00	B01S31	41.27458	-82.06676	Grafton	F ₂ ,M _{HD} ,C,T,D
E. Br. Black R. Dst. Grafton WWTP @ Indian Hollow Park	20-010-000	10.50	180.00	B01S30	41.27855	-82.07540	Grafton	F ₂ ,M _{HD} ,Q
E. Br. Black R. Ust. Brentwood Trib. (Adj. Robson Rd.)	20-010-000	6.00	185.00	B01S29	41.32537	-82.07629	Grafton	F ₂ ,M _{HD} ,C,B
E. Br. Black R. @ Fuller Rd.	20-010-000	3.07	217.00	B01S11	41.34711	-82.09480	Grafton	F ₂ ,M _{HD} ,Q _L ,T
E. Br. Black R. at Elyria @ E. Bridge St.	20-010-000	1.140	222.000	B01P10	41.36924	-82.09812	Grafton	C _O ,S
E. Br. Black R. at Elyria @ Washington St.	20-010-000	0.360	222.000	B01P07	41.36875	-82.10640	Grafton	F ₂ ,M _{HD} ,C _O ,B,T,S, D
RM 5.89 Trib. E. Br. Black R. (Brentwood Trib.) @ Waterfall Dr.	20-010-012	1.00	4.45	301936	41.31855	-82.07265	Grafton	F,M _Q ,C
RM 5.89 Trib. E. Br. Black R. (Brentwood Trib.) @ Robson Rd.	20-010-012	0.10	7.19	301937	41.32533	-82.07559	Grafton	F,M _Q ,C,B

Table 2. Monitoring locations and sampling allocations for the Black River watershed survey, 2012.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Latitude	Longitude	USGS Quad	Sampling
041100010501								
Charlemont Creek @ Baker Rd	20-024-000	8.55	10.80	301938	41.11935	-82.25751	Nova	F,M _Q ,C
Charlemont Creek @ Wellington WTP Intake	20-024-000	3.00	22.00	301939	41.16493	-82.24760	Wellington	PWS
Charlemont Creek @ Pitts Rd.	20-024-000	2.20	22.60	201634	41.17492	-82.24260	Wellington	F ₂ ,M _{HD} ,C,B,D
Charlemont Creek @ Peck- Wadsworth Rd.	20-024-000	0.39	25.80	B01P05	41.18975	-82.22740	Wellington	F ₂ ,M _{HD} ,Q _L
RM 0.51 Trib. To Charlemont Creek Ust Wellington WWTP	20-024-001	1.00	1.75	301940	41.17570	-82.22850	Wellington	F,M _Q ,C
Wellington WWTP 001 Outfall	20-024-001	0.92		301941	41.17610	-82.22695	Wellington	C
RM 0.51 Trib. To Charlemont Creek Dst Wellington Wwtp	20-024-001	0.76	1.75	301943	41.17923	-82.22689	Wellington	F,M _Q ,C
041100010502								
W. Br. Black R. S Of Rochester @ Stewart Rd.	20-020-000	48.10	4.30	201627	41.08612	-82.31990	Nova	F,M _Q ,C
W. Br. Black R. at Rochester @ St. Rt. 511	20-020-000	41.67	16.00	B01S41	41.13342	-82.30670	Brighton	F,M _Q ,C,T
W. Br. Black R. S of Brighton @ St. Rt. 511	20-020-000	37.30	28.00	201624	41.15451	-82.31020	Brighton	F ₂ ,M _{HD} ,C
W. Br. Black R. NW of Wellington @ Pitts Rd.	20-020-000	28.50	37.00	B01K21	41.18572	-82.24240	Wellington	F ₂ ,M _{HD} ,Q _L ,T
East Creek @ Stocking Rd	20-020-003	0.56	5.40	B01W23	41.13792	-82.33210	Brighton	F,M _Q ,C,B
Buck Creek SE of Rochester @ Bursley Rd.	20-025-000	0.95	4.80	B01S46	41.11547	-82.28320	Nova	F,M _Q ,C,B
041100010503								
Wellington Creek @ Bursley Rd.	20-023-000	17.10	5.20	201633	41.11618	-82.20950	Sullivan	F,M _Q ,Q
Wellington Creek @ Cemetery Rd.	20-023-000	13.09	10.50	B01S43	41.15799	-82.20950	Wellington	F,M _Q ,C,B
Wellington Creek @ Webster Rd.	20-023-000	8.40	19.70	201632	41.19984	-82.17680	Oberlin	F ₂ ,M _{HD} ,C
Wellington Creek Near Mouth @ Nickel Plate Rd.	20-023-000	0.60	29.60	201630	41.26524	-82.16830	Oberlin	F ₂ ,M _{HD} ,Q
041100010504								
W. Br. Black R. N of Wellington @ St. Rt. 58	20-020-000	25.30	67.00	B01S40	41.20572	-82.21712	Wellington	F ₂ ,M _{HD} ,C,T
W. Br. Black R. @ St. Rt. 303	20-020-000	19.60	80.00	201620	41.23720	-82.19850	Wellington	F ₂ ,M _{HD} ,C
W. Br. Black R. @ West Rd (Nickel Plate Rd.)	20-020-000	16.56	83.00	B01W19	41.26517	-82.17970	Oberlin	F ₂ ,M _{HD} ,Q _L ,T

Table 2. Monitoring locations and sampling allocations for the Black River watershed survey, 2012.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Latitude	Longitude	USGS Quad	Sampling
041100010505								
Plum Creek at @ Morgan St.	20-021-000	5.57	4.77	301944	41.28699	-82.22050	Oberlin	F,M _Q ,C,B
Plum Creek Ust. Oberlin WWTP @ St. Rt. 511	20-021-000	3.19	7.60	B01P03	41.29987	-82.18640	Oberlin	F,M _Q ,C,D
Oberlin WWTP Outfall to Plum Creek	20-021-000	2.85	7.90	B01W03	41.29568	-82.18396	Oberlin	C
Plum Creek Just Dst. Oberlin WWTP	20-021-000	2.80	7.90	B01S10	41.29580	-82.18250	Oberlin	F,M _Q ,C
Plum Creek @ Oberlin-Elyria Rd.	20-021-000	0.71	9.28	B01P02	41.30077	-82.15970	Oberlin	F,M _Q ,Q _L
041100010506								
W. Br. Black R. E. of Oberlin @ Parsons Rd.	20-020-000	14.39	130.00	B01S39	41.27940	-82.16230	Oberlin	PWS
W. Br. Black R. @ Metroparks Equestrian Area	20-020-000	10.60	132.00	201619	41.29502	-82.14860	Oberlin	F ₂ ,M _{HD} ,C,T,D
W. Br. Black R. Near Oberlin @ Butternut Ridge Rd.	20-020-000	7.68	161.00	B01P01	41.31386	-82.13144	Oberlin	F ₂ ,M _{HD} ,C,T,D
W. Br. Black R. Ust. Elyria @ Oberlin-Elyria Rd.	20-020-000	4.18	169.00	B01S13	41.33680	-82.12090	Grafton	F ₂ ,M _{HD} ,Q
W. Br. Black R. at Elyria, Ust. Third St.	20-020-000	1.20	172.00	B01K18	41.36520	-82.11220	Grafton	F ₂ ,M _{HD} ,C,B,T
Kelner Ditch @ Parsons Rd.	20-020-001	3.00	4.40	201629	41.27468	-82.13218	Oberlin	F,M _Q ,C,D
Kelner Ditch @ Nickel Plate Diagonal Rd.	20-020-001	1.00	9.40	B01W15	41.29237	-82.13978	Oberlin	F,M _Q ,C,B
Elk Creek @ Metropark Property off Parsons Rd.	20-022-000	0.15	7.55	301945	41.27456	-82.16343	Oberlin	F,M _Q ,C
041100010601								
French Creek @ Mills Rd.	20-002-000	10.41	11.80	B01P19	41.41879	-82.01340	Avon	F,M _Q ,C
French Creek @ Riegelsberger Rd.	20-002-000	9.02	17.20	B01P18	41.43496	-82.00290	Elyria	F,M _Q ,C,B
French Creek @ Bridge Point Tr.	20-002-000	5.50	25.40	301953	41.45708	-82.04079	Elyria	F ₂ ,M _{HD} ,C
French Creek @ Camp Wahoo Dr.*	20-002-000	3.75	31.20	B01P32	41.46655	-82.06910	Elyria	C,B
French Creek @ Abbe Rd (SR 301)*	20-002-000	3.20	32.30	B01P32	41.46407	-82.07618	Avon	F ₂ ,M _{HD} ,D
French Creek @ Gulf Rd.	20-002-000	0.54	38.60	B01S14	41.45829	-82.10570	Elyria	F ₂ ,M _{HD} ,Q _L ,T

Table 2. Monitoring locations and sampling allocations for the Black River watershed survey, 2012.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Latitude	Longitude	USGS Quad	Sampling
041100010602								
Black R. at Elyria @ Cascade Park	20-001-000	14.95	396.00	501520	41.37932	-82.10772	Avon	F ₂ ,M _{HD} ,Q _O ,T,S
Black R. Dst. Elyria, Spring Valley Golf Club	20-001-000	11.50	398.00	B01S09	41.39690	-82.09780	Avon	F ₂ ,M _{HD} ,C _O ,T
Black R. 250 Ft. Ust. Elyria WWTP	20-001-000	10.700	401.000	B01W07	41.40807	-82.09339	Avon	F ₂ ,M _{HD} ,C _O ,S,D
Elyria WWTP Outfall To Black R.	20-001-000	10.650	401.000	B01E01	41.40825	-82.09243	Avon	C _O
Black River @ Ford Rd.	20-001-000	9.80	412.00	501510	41.41148	-82.09520	Elyria	F ₂ ,M _{HD} ,T,Q _O ,L,S
Black River 0.25 mi. Dst. I-90	20-001-000	9.300	413.000	B01K53	41.41196	-82.10387	Avon	501510 Alternate ¹
Black River @ North Ridge Rd.	20-001-000	8.35	418.00	B01S07	41.42561	-82.09983	Elyria	F ₂ ,M _{HD} ,T,D
Black R. at Lorain @ E. 31st St.	20-001-000	6.20	424.00	B01S06	41.44319	-82.10711	Elyria	C,B
Black R. at Lorain, Ust. French Creek	20-001-000	5.400	425.000	B01S15	41.45500	-82.11330	Avon	Estuary,C,T
Black R. at Lorain, Dst. French Creek	20-001-000	4.800	464.000	B01K50	41.46030	-82.12170	Avon	Estuary,C
Black R. Ust. US Steel 002, Dst. Island	20-001-000	3.700	466.000	B01S22	41.45420	-82.13500	Lorain	Estuary,C,T
Black R. at Lorain, Dst. E. 21st St.	20-001-000	1.65	469.000	B01K32	41.45690	-82.16500	Lorain	Estuary,C
Black R. at Lorain, 0.18 Mi. Ust. Erie St.	20-001-000	0.600	470.000	B01K27	41.46830	-82.17250	Lorain	Estuary,C,T
Black R. at Lorain @ Mouth	20-001-000	0.30	470.000	B01K26	41.47038	-82.17803	Lorain	Estuary,C
RM 10.18 Trib. Black R. @ Gulf Rd.	20-001-yyy	0.68	10.20	301954	41.40547	-82.08607	Avon	F,M _Q ,C,B
041100010603								
Heider Ditch @ Electric Blvd	13-006-000	0.25	7.84	301955	41.50995	-82.01940	Avon	F,M _Q ,C _E ,B
Gable Ditch @ Electric Ave.	13-006-xxx	0.30	1.39	301956	41.51065	-82.00636	Avon	F,M _Q ,C _E ,B
Powdermaker Ditch @ Electric Ave	13-006-xxx	0.15	4.25	301956	41.50301	-82.05202	Avon	F,M _Q ,C _E ,B

¹ Should construction make the Ford Rd. bridge inaccessible, the alternate location is in the Bur Oak area of the Lorain County Metroparks.

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

C	Chemistry site (5 rounds, base flow), "Stream_Survey" template
C _o	Water chemistry as listed above plus 2 rounds water column organics ¹
C _E	Water chemistry as listed above plus chlorophyll <i>a</i> and dissolved ortho P
PWS	Public water supply, 10 rounds "Stream_Survey" template and water column organics ¹ : 5 rounds summer 2012, 5 rounds spring 2013
B	<i>E. coli</i> bacteria assessment site (5 rounds)
F	One-pass fish Site (EAS)
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 [®] continuous data recorder (NOTE: NO Datasonde [®] at station 201633)
Q _O	Sentinel Site: same parameters and frequency as listed above, plus 2 rounds water column organics ¹
Q _L	Sentinel Site: same parameters and frequency as listed above, plus continuous water level logger
D	Datasonde [®] continuous data recorder
S	Sediment sampling location
Estuary	Biological sampling by Lake Erie monitoring staff. Include 2 passes for fish, and Hester-Dendy quantitative macroinvertebrate evaluation.

NOTES TO FIELD CREWS: CONSULT THE WATERSHED CONTACTS LIST ON PAGE 10 OF THIS PLAN FOR INFORMATION REGARDING ACCESS FOR SPECIFIC MONITORING LOCATIONS

¹ Water column organics sampling includes BNA (525), pesticides (608), PCB's (608), Cyanazine (525.2), Herbicides (525.2), Carbamates (531.1), and Glyphosate (547)

Table 3. Summary of the issues to be addressed at the monitoring locations for the Black River 2012 survey.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Issues
041100010301					
E. Fk. E. Br. Black R. @ Chippewa Rd.	20-014-000	5.84	7.60	B01W12	Use attainment
E. Fk. E. Br. Black R. @ Lodi City Park	20-014-000	2.67	12.90	B01S36	Trends
E. Fk. E. Br. Black R. Ust. Lodi WWTP	20-014-000	1.73	13.90	B01W11	Lodi WWTP, WRRSP Project
E. Fk. E. Br. Black R. Dst. Lodi WWTP	20-014-000	1.60	14.00	B01S35	Lodi WWTP, WRRSP Project
E. Fk. E. Br. Black R. Dst. Lodi @ SR 224/U.S. 42	20-014-000	1.03	14.10	B01P30	Lodi WWTP, WRRSP Project
E. Fk. E. Br. Black R. at Mouth @ Richmond Rd.	20-014-000	0.06	15.20	B01W10	Far field water chemistry dst. Lodi WWTP
041100010302					
W. Fk. E. Br. Black R. @ T391	20-015-000	13.97	14.10	301931	HUC Assessment
W. Fk. E. Br. Black R. @ SR 301	20-015-000	8.90	25.00	201609	HUC Assessment
W. Fk. E. Br. Black R. @ SR 421	20-015-000	2.30	41.10	201607	Cleveland Airport mitigation evaluation (upstream)
W. Fk. E. Br. Black R. @ Hidden Hollow Park	20-015-000	1.20	41.50	201606	Cleveland Airport mitigation evaluation (within)
W. Fk. E. Br. Black R. @ Sanford Rd.	20-015-000	0.34	42.20	B01W13	Cleveland Airport mitigation evaluation (downstream)
Clear Creek @ Pawnee Rd.	20-016-000	1.80	6.20	201615	Use attainability
041100010303					
E. Br. Black R. @ Shaw Rd. (Twp 99)	20-010-000	41.45	68.00	B01S34	Trends. HUC assessment. Upstream dam.
E. Br. Black R. @ Old Mill Rd (Twp 68)	20-010-000	40.47	72.00	B01K07	Trends. HUC assessment. Downstream dam.
RM 39.06 Trib. EB Black R @ Spencer Lake Rd.	20-010-010	2.16	4.66	Q01K04	Use attainability
Coon Creek @ River Corners Rd	20-013-000	0.88	10.20	301933	Use attainability. Trends
RM 41.41 Trib. EB Black R. @ Shaw Rd. (Lower)	20-010-011	0.35	1.83	302006	Use attainability, HUC assessment

Table 3. Summary of the issues to be addressed at the monitoring locations for the Black River 2012 survey.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Issues
041100010401					
E. Br. Black R. @ River Corners Rd.	20-010-000	36.80	96.00	201591	HUC Assessment
E. Br. Black R. @ Smith Rd. (Lorain/Medina County Line)	20-010-000	32.42	104.00	B01S33	Sentinel
Rm 28.65 Trib. E. Br. Black R. @ Foster Rd.	20-010-008	1.50	5.30	201599	Use attainability
041100010402					
E. Br. Black R. @ Short Rd.	20-010-000	24.60	136.00	201589	Trends
E. Br. Black R. @ Vermont Ave.	20-010-000	18.94	158.00	B01S32	Trends
RM 22.65 Trib. E. Br. Black R. @ Vermont Rd.	20-010-006	0.60	6.40	B01K09	Use attainability
Salt Creek @ Chamberlain Rd.	20-011-000	0.53	6.73	301934	Use attainability
Crow Creek @ Vermont Rd.	20-012-000	0.80	3.70	201602	Trends
041100010403					
Willow Creek Ust. Eaton Estates @ Island Rd	20-010-001	6.49	2.99	301935	Eaton Estates WWTP
Willow Creek @ Durkee Rd.	20-010-001	2.85	13.30	B01S38	Eaton Estates WWTP, HUC assessment, trends
041100010404					
E. Br. Black R. @ Parsons Rd.*	20-010-000	11.34	179.00	B01S31	Ecoregional reference site. Upstream Grafton WWTP
E. Br. Black R. Dst. Grafton WWTP @ Indian Hollow Park	20-010-000	10.50	180.00	B01S30	Grafton WWTP
E. Br. Black R. Ust. Brentwood Trib. (Adj. Robson Rd.)	20-010-000	6.00	185.00	B01S29	Trends
E. Br. Black R. @ Fuller Rd.	20-010-000	3.07	217.00	B01S11	Sentinel, upstream CSO's.
E. Br. Black R. at Elyria @ E. Bridge St.	20-010-000	1.140	222.000	B01P10	Low head dam downstream, Chemical Recovery DERR site, CSO impacts.
E. Br. Black R. at Elyria @ Washington St.	20-010-000	0.360	222.000	B01P07	Low head dam downstream, Chemical Recovery DERR site, CSO impacts.
RM 5.89 Trib. E. Br. Black R. (Brentwood Trib.) @ Waterfall Dr.	20-010-012	1.00	4.45	301936	Recovery following dam removal, upstream Brentwood WWTP
RM 5.89 Trib. E. Br. Black R. (Brentwood Trib.) @ Robson Rd.	20-010-012	0.10	7.19	301937	Recovery following dam removal, Brentwood WWTP, HUC Assessment

Table 3. Summary of the issues to be addressed at the monitoring locations for the Black River 2012 survey.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Issues
041100010501					
Charlemont Creek @ Baker Rd	20-024-000	8.55	10.80	301938	HUC assessment
Charlemont Creek @ Wellington WTP Intake	20-024-000	3.00	22.00	301939	PWS Source Water
Charlemont Creek @ Pitts Rd.	20-024-000	2.20	22.60	201634	Wellington WWTP
Charlemont Creek @ Peck- Wadsworth Rd.	20-024-000	0.39	25.80	B01P05	Wellington WWTP
RM 0.51 Trib. To Charlemont Creek Ust Wellington WWTP	20-024-001	1.00	1.75	301940	Wellington WWTP
Wellington WWTP 001 Outfall	20-024-001	0.92		301941	Wellington WWTP
RM 0.51 Trib. To Charlemont Creek Dst Wellington Wwtp	20-024-001	0.76	1.75	301943	Wellington WWTP
041100010502					
W. Br. Black R. S Of Rochester @ Stewart Rd.	20-020-000	48.10	4.30	201627	HUC Assessment.
W. Br. Black R. at Rochester @ St. Rt. 511	20-020-000	41.67	16.00	B01S41	Unsewered areas.
W. Br. Black R. S of Brighton @ St. Rt. 511	20-020-000	37.30	28.00	201624	HUC Assessment.
W. Br. Black R. NW of Wellington @ Pitts Rd.	20-020-000	28.50	37.00	B01K21	Sentinel
East Creek @ Stocking Rd	20-020-003	0.56	5.40	B01W23	HUC Assessment. Use attainability
Buck Creek SE of Rochester @ Bursley Rd.	20-025-000	0.95	4.80	B01S46	Unsewered areas
041100010503					
Wellington Creek @ Bursley Rd.	20-023-000	17.10	5.20	201633	Findley Lake loadings
Wellington Creek @ Cemetery Rd.	20-023-000	13.09	10.50	B01S43	Trends
Wellington Creek @ Webster Rd.	20-023-000	8.40	19.70	201632	HUC assessment
Wellington Creek Near Mouth @ Nickel Plate Rd.	20-023-000	0.60	29.60	201630	Sentinel
041100010504					
W. Br. Black R. N of Wellington @ St. Rt. 58	20-020-000	25.30	67.00	B01S40	Trends
W. Br. Black R. @ St. Rt. 303	20-020-000	19.60	80.00	201620	Trends, RAP priority
W. Br. Black R. @ West Rd (Nickel Plate Rd.)	20-020-000	16.56	83.00	B01W19	HUC Assessment. Sentinel

Table 3. Summary of the issues to be addressed at the monitoring locations for the Black River 2012 survey.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Issues
041100010505					
Plum Creek at @ Morgan St.	20-021-000	5.57	4.77	301944	Urban impacts
Plum Creek Ust. Oberlin WWTP @ St. Rt. 511	20-021-000	3.19	7.60	B01P03	Oberlin WWTP
Oberlin WWTP Outfall to Plum Creek	20-021-000	2.85	7.90	B01W03	Oberlin WWTP
Plum Creek Just Dst. Oberlin WWTP	20-021-000	2.80	7.90	B01S10	Oberlin WWTP
Plum Creek @ Oberlin-Elyria Rd.	20-021-000	0.71	9.28	B01P02	Oberlin WWTP, Landfill
041100010506					
W. Br. Black R. E. of Oberlin @ Parsons Rd.	20-020-000	14.39	130.00	B01S39	Public Water Supply intake for Oberlin WTP
W. Br. Black R. @ Metroparks Equestrian Area	20-020-000	10.60	132.00	201619	Oberlin WWTP, Landfill
W. Br. Black R. Near Oberlin @ Butternut Ridge Rd.	20-020-000	7.68	161.00	B01P01	Oberlin WWTP, Landfill, LaGrange WWTP
W. Br. Black R. Ust. Elyria @ Oberlin-Elyria Rd.	20-020-000	4.18	169.00	B01S13	Trends
W. Br. Black R. at Elyria, Ust. Third St.	20-020-000	1.20	172.00	B01K18	Trends
Elk Creek @ Metropark Property off Parsons Rd.	20-022-000	0.15	7.55	301945	Lagrange WWTP
Kelner Ditch @ Parsons Rd.	20-020-001	3.00	4.40	201629	Lagrange WWTP
Kelner Ditch @ Nickel Plate Diagonal Rd.	20-020-001	1.00	9.40	B01W15	Cleveland Airport mitigation site.
041100010601					
French Creek @ Mills Rd.	20-002-000	10.41	11.80	B01P19	HUC assessment
French Creek @ Riegelsberger Rd.	20-002-000	9.02	17.20	B01P18	HUC assessment
French Creek @ Bridge Point Tr.	20-002-000	5.50	25.40	301953	HUC Assessment, trends Upstream historical flyash disposal
French Creek @ Camp Wahoo Dr.*	20-002-000	3.75	31.20	B01P32	Chemistry monitoring location for Ecoregional Reference site, HUC Assessment, trends, downstream historical flyash disposal, upstream North Ridgeville WWTP
French Creek @ Abbe Rd (SR 301)*	20-002-000	3.20	32.30	B01P32	Ecoregional Reference site, HUC Assessment, trends, downstream historical flyash disposal, upstream North Ridgeville WWTP

Table 3. Summary of the issues to be addressed at the monitoring locations for the Black River 2012 survey.

Assessment Unit/ Site Name	River Code	River Mile	Drainage Area	EA3 Station	Issues
French Creek @ Gulf Rd.	20-002-000	0.54	38.60	B01S14	N. Ridgeville WWTP, sentinel site.
041100010602					
Black R. at Elyria @ Cascade Park	20-001-000	14.95	396.00	501520	Sentinel site, USGS gage location, trends, CSO impacts.
Black R. Dst. Elyria, Spring Valley Golf Club	20-001-000	11.50	398.00	B01S09	Upstream Ford Rd landfill, CSO impacts.
Black R. 250 Ft. Ust. Elyria WWTP	20-001-000	10.700	401.000	B01W07	Downstream Ford Rd landfill, upstream Elyria WWTP
Elyria WWTP Outfall To Black R.	20-001-000	10.650	401.000	B01E01	Elyria WWTP
Black River @ Ford Rd.	20-001-000	9.80	412.00	501510	Elyria WWTP, sentinel site.
Black River 0.25 mi. Dst. I-90	20-001-000	9.300	413.000	B01K53	Alternate biological site for Ford Rd (construction may impact access).
Black River @ North Ridge Rd.	20-001-000	8.35	418.00	B01S07	Trends, HUC assessment, far field Elyria WWTP.
Black R. at Lorain @ E. 31st St.	20-001-000	6.20	424.00	B01S06	Trends, HUC assessment.
Black R. at Lorain, Ust. French Creek	20-001-000	5.400	425.000	B01S15	Upstream French Creek and steel mills.
Black R. at Lorain, Dst. French Creek	20-001-000	4.800	464.000	B01K50	French Creek, habitat improvement projects, steel mill discharges
Black R. Ust. US Steel 002, Dst. Island	20-001-000	3.700	466.000	B01S22	Steel mill impacts, habitat improvement projects, potential Lorain WWTP relocation
Black R. at Lorain, Dst. E. 21st St.	20-001-000	1.65	469.000	B01K32	Steel mill impacts, habitat improvement projects, potential Lorain WWTP relocation
Black R. at Lorain, 0.18 Mi. Ust. Erie St.	20-001-000	0.600	470.000	B01K27	Fish shelf habitat restoration project
Black R. at Lorain @ Mouth	20-001-000	0.30	470.000	B01K26	Upstream Lorain WWTP
RM 0.18 Trib. Black R. @ Gulf Rd.	20-001-yyy	0.68	10.20	301954	Use attainability
041100010603					
Heider Ditch @ Electric Blvd	13-006-000	0.25	7.84	301955	Use attainability.
Gable Ditch @ Electric Ave.	13-006-xxx	0.30	1.39	301956	Use attainability.
Powdermaker Ditch @ Electric Ave	13-006-xxx	0.15	4.25	301956	Use attainability.

Table 4. Facilities regulated by the National Pollution Discharge Elimination System in Black River watershed.

HUC 12 Assessment Unit/ Facility Name	Ohio EPA Permit No.	USEPA Permit No.	Stream	Tributary	Latitude	Longitude
041100010301						
Chatham Elementary School	3PT00092	OH0129909	East Fork E Branch		41.10186	-82.02067
Lodi WWTP	3PB00027	OH0020991	East Fork E Branch		41.03753	-82.01966
041100010302						
Black River Local Schools	2PT00015	OH0122173	West Fork E Branch	Unnamed Trib	41.05445	-82.17505
041100010401						
Litchfield Elem Sch	3PT00099	OH0131300	Center Creek		41.17136	-82.02515
Spencer Forge and Manufacturing	3IS00087	OH0052329	East Branch	Unnamed Trib	41.10257	-82.12741
Spencer WWTP	3PA00018	OH0022071	East Branch	Unnamed Trib	41.11120	-82.11363
041100010402						
Medina Meats	3IH00110	OH0139335	Crow Creek		41.18486	-82.03828
Penfield Elem Sch	3PT00103	OH0131636	East Branch	Unnamed Trib	41.16776	-82.11899
041100010403						
Buckeye Terminals LLC - Lorain	3IN00059	OH0000795	Willow Creek	Unnamed Trib	41.30597	-82.01997
Circle K 5317	3PR00494	OH0140899	Willow Creek		41.31454	-82.00104
Cleveland Illum Co Westwood Facility	3IN00224	OH0112313	Willow Creek	Bannister Ditch	41.30027	-82.01695
Eaton Homes WWTP	3PH00023	OH0026140	Willow Creek		41.31213	-82.01020
The Activity Center	3PR00487	OH0140732	Carpenter Ditch	Unnamed Trib	41.33597	-81.96802
041100010404						
Brentwood Lake WWTP	3PH00024	OH0026158	East Branch	RM 5.89 Trib.	41.31972	-82.07214
Browning Ferris Ind	3PR00185	OH0123871	East Branch	Unnamed Trib	41.31979	-82.10147
Butternut Terrace Apts	3PW00038	OH0140538	East Branch	Unnamed Trib	41.32674	-82.07471
Crane Lear Romec Corp	3IS00118	OH0102792	East Branch	Unnamed Trib	41.37229	-82.08294
Grafton WWTP	3PB00024	OH0025372	East Branch		41.27614	-82.06568
JED Investments	3PW00033	OH0134376	East Branch	Unnamed Trib	41.32558	-82.07796
041100010501						
Wellington WTP	3IV00200	OH0030325	Charlemont Creek	Unnamed Trib	41.15278	-82.24306
Wellington WWTP	3PC00014	OH0028037	Charlemont Creek	Unnamed Trib	41.17630	-82.22710

Table 4. Facilities regulated by the National Pollution Discharge Elimination System in Black River watershed.

HUC 12 Assessment Unit/ Facility Name	Ohio EPA Permit No.	USEPA Permit No.	Stream	Tributary	Latitude	Longitude
041100010502						
Country Stage Campground	2PR00121	OH0125369	West Branch		41.05936	-82.33150
Graphite Sales Inc	2PR00231	OH0138380	Buck Creek	Unnamed Trib	41.03208	-82.28105
Troy Twp WWTP	2PH00019	OH0135585	Buck Creek	Unnamed Trib	41.03444	-82.31028
041100010503						
Findley State Park WWTP	3PP00004	OH0037044	Wellington Creek	Findley Lake	41.12755	-82.21011
Pheasant Run Association	3PW00001	OH0043621	Wellington Creek	Unnamed Trib	41.20453	-82.15734
041100010504						
A-1 Construction Apts	3PW00027	OH0128881	West Branch	Unnamed Trib	41.26678	-82.20738
Sterling Foundry Inc	3ID00052	OH0051934	West Branch	Unnamed Trib	41.16199	-82.22408
041100010505						
BFI Lorain County Resource Recovery Complex	3PR00394	OH0136808	Plum Creek		41.29777	-82.17024
Lorain County Landfill LLC	3IN00335	OH0133035	Plum Creek		41.30139	-82.17309
Oberlin Water Environment Protection Facility	3PD00025	OH0020427	Plum Creek		41.29623	-82.18450
041100010506						
Alco Mfg Corp	3IS00123	OH0131466	West Branch	Unnamed Trib	41.33503	-82.10912
D'Tanglez Studio Beauty Shop	3PR00326	OH0133051	West Branch	Unnamed Trib	41.30533	-82.15078
Elyria Foundry Co	3ID00070	OH0101036	West Branch		41.36954	-82.12005
Elyria Motel	3PR00191	OH0125806	West Branch	Unnamed Trib	41.33818	-82.11857
Forest Hills Country Club	3PZ00055	OH0043699	West Branch	Unnamed Trib	41.32152	-82.13584
LaGrange WPCP	3PB00061	OH0046221	West Branch	Kelner Ditch	41.24269	-82.12819
Mac's Convenience Stores LLC DBA Circle K No 5312	3PR00434	OH0139211	West Branch	Unnamed Trib	41.33737	-82.11800
Oberlin WTP	3IW00061	OH0045195	West Branch	Unnamed Trib	41.28068	-82.17797
Remediation and Liability Mgmt Co Inc (REALM)	3II00200	OH0140694	West Branch	Unnamed Trib	41.37191	-82.13894
Town and Country Co-Op Inc	3IG00085	OH0121959	West Branch	Unnamed Trib	41.37205	-82.12253
United Initiators Inc	3IN00340	OH0133540	West Branch	Unnamed Trib	41.36244	-82.12532
West Carlisle Elem School	3PT00104	OH0131644	West Branch	Unnamed Trib	41.31100	-82.11598

Table 4. Facilities regulated by the National Pollution Discharge Elimination System in Black River watershed.

HUC 12 Assessment Unit/ Facility Name	Ohio EPA Permit No.	USEPA Permit No.	Stream	Tributary	Latitude	Longitude
041100010601						
French Creek WWTP	3PD00043	OH0044512	French Creek		41.46117	-82.07993
Parker Marine	3PR00476	OH0140520	French Creek		41.46251	-82.12519
Sheffield Middle School	3PT00088	OH0129216	French Creek		41.46500	-82.09361
041100010602						
Barr Elem School	3PT00015	OH0142841	Black River	Unnamed Trib	41.46234	-82.11425
Elyria WWTP	3PD00034	OH0025003	Black River		41.40498	-82.08945
Kalt Manufacturing Co	3IS00079	OH0051802	Black River	Unnamed Trib	41.37526	-82.02857
Lorain Black River WWTP	3PE00005	OH0026093	Black River	(Considered Lake Erie)	41.47170	-82.17932
National Bronze and Metals of Ohio Inc	3IN00316	OH0128970	Black River		41.42325	-82.10211
Republic Technologies International LLC	3ID00076	OH0134287	Black River		41.44841	-82.13602
SBS Garage	3PR00213	OH0126292	Black River	Unnamed Trib	41.46209	-82.12287
United States Steel Corp - D2 Landfill	3ID00028	OH0001562	Black River		41.44668	-82.13623
US Steel Lorain Tubular Operations	3ID00074	OH0129003	Black River	Unnamed Trib	41.44660	-82.11985
Westfield Allotment WWTP	3PA00024	OH0083801	Black River	Unnamed Trib	41.37055	-82.02999
041100010603						
Oldcastle APG Sheffield	3II00195	OH0139203	Lake Erie	Unnamed Trib	41.48139	-82.07846
Avon Lake WPCF	3PD00003	OH0023981	Lake Erie	Direct Lake Erie	41.50028	-82.05723
Avon Lake Power Plant	3IB00002	OH0001112	Lake Erie	Direct Lake Erie	41.50378	-82.05316

Table 5. List of chemical/physical water quality parameters to be analyzed/measured in surface water, sediment, and fish tissue from the Black River watershed survey, 2012.

Parameters	Test Method	Water	Sediment	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/ USEPA7471A		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)
Herbicides/Cyanazine	USEPA 525.2	X		
Carbamates	USEPA 531.1	X		
Glyphosate	USEPA 547	X		
<i>E. coli</i>	USEPA 1103.1/ 640.1	X		
Chlorophyll a	USEPA 445.1	X ¹		
Percent Solids	SM 2540G		X	
Percent Lipids				X
Total Organic Carbon (TOC)	OEPA 335.2		X	

Sampling Summary

Table 6. Sampling summary for the 2012 Black River watershed survey.

Sample Type	Total Sites	Total Samples
Fish		
1 Pass Sites	45	45
2 Pass Sites	37 ^a	74
Total Sites	82	
Total Passes		119
Macroinvertebrates		
Qualitative Sample	41	41
Hester Dendy Sample	41 ^a	41
Water Chemistry		
Inorganic water chemistry (Stream Survey template)	87 (13 Sentinel Sites)	536 ^b
Recreational Use Sites (<i>E. coli</i>)	52 (13 Sentinel Sites)	325
Organic Water Chemistry Sites		
BNA (625)	18	70
Pesticides/PCB's (608)	18	70
Herbicides/Cyanazine (525.2)	4	24
Carbamates (531.1)	4	24
Glyphosates (547)	4	24
Sediment Chemistry (metals + Hg + pest + BNA + PCB)	4	4
Fish Tissue	22	88

^a Includes six estuary sites.

^b Include QA/QC samples

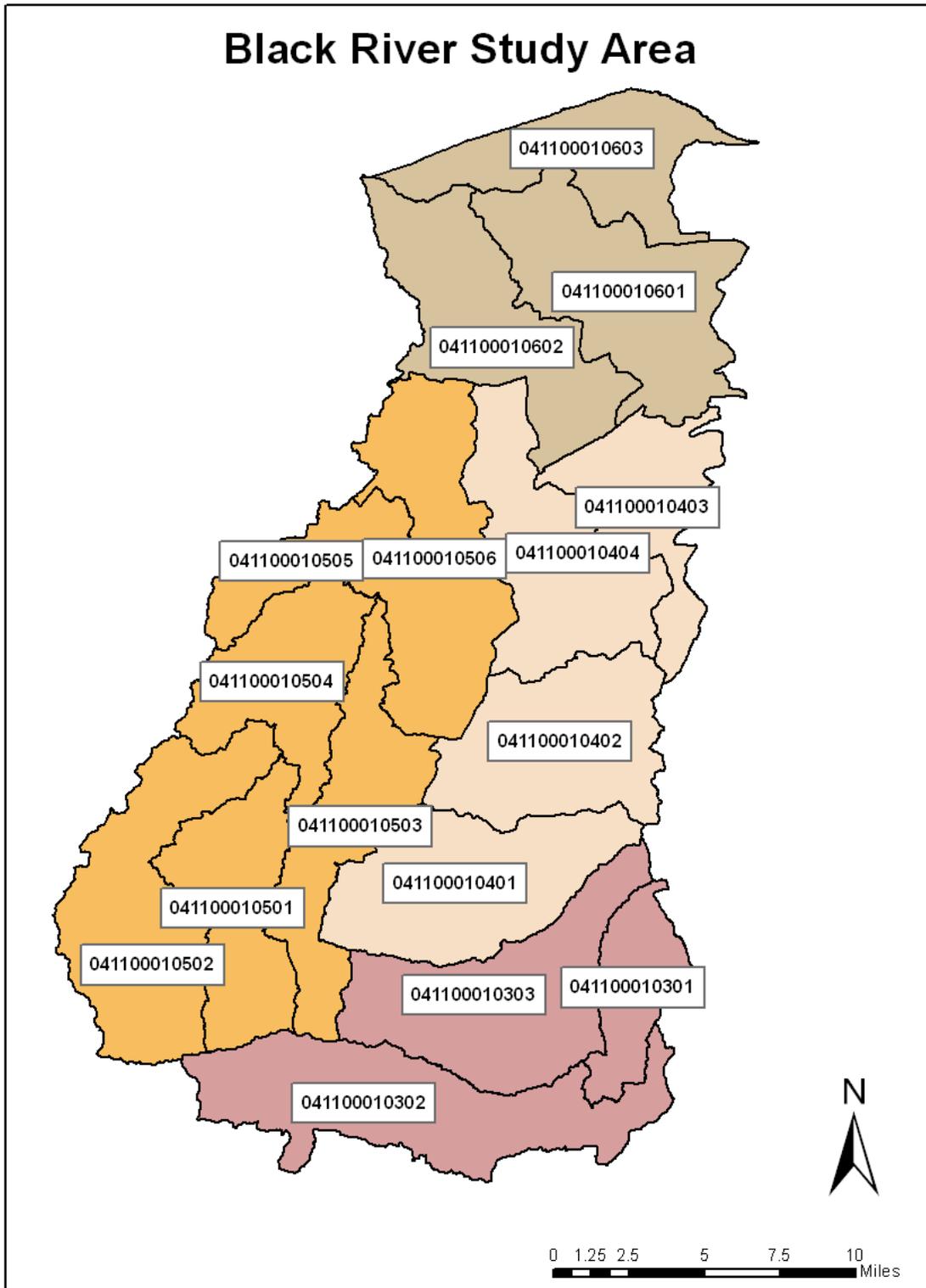


Figure 1. 12 Digit HUC assessment units for the 2012 Black River watershed survey.

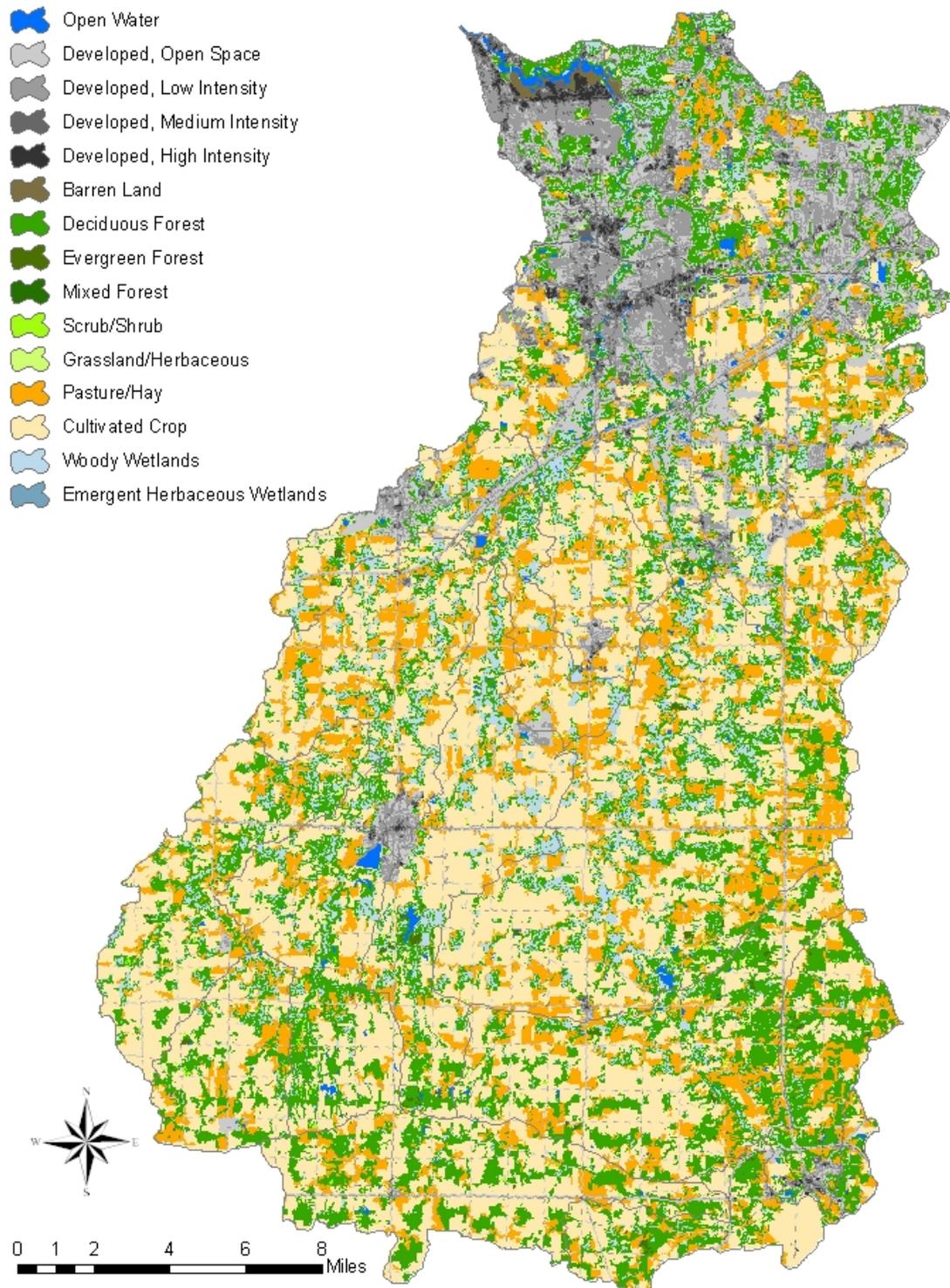


Figure 2. Land use in the Black River watershed (excludes AU 041100010603).

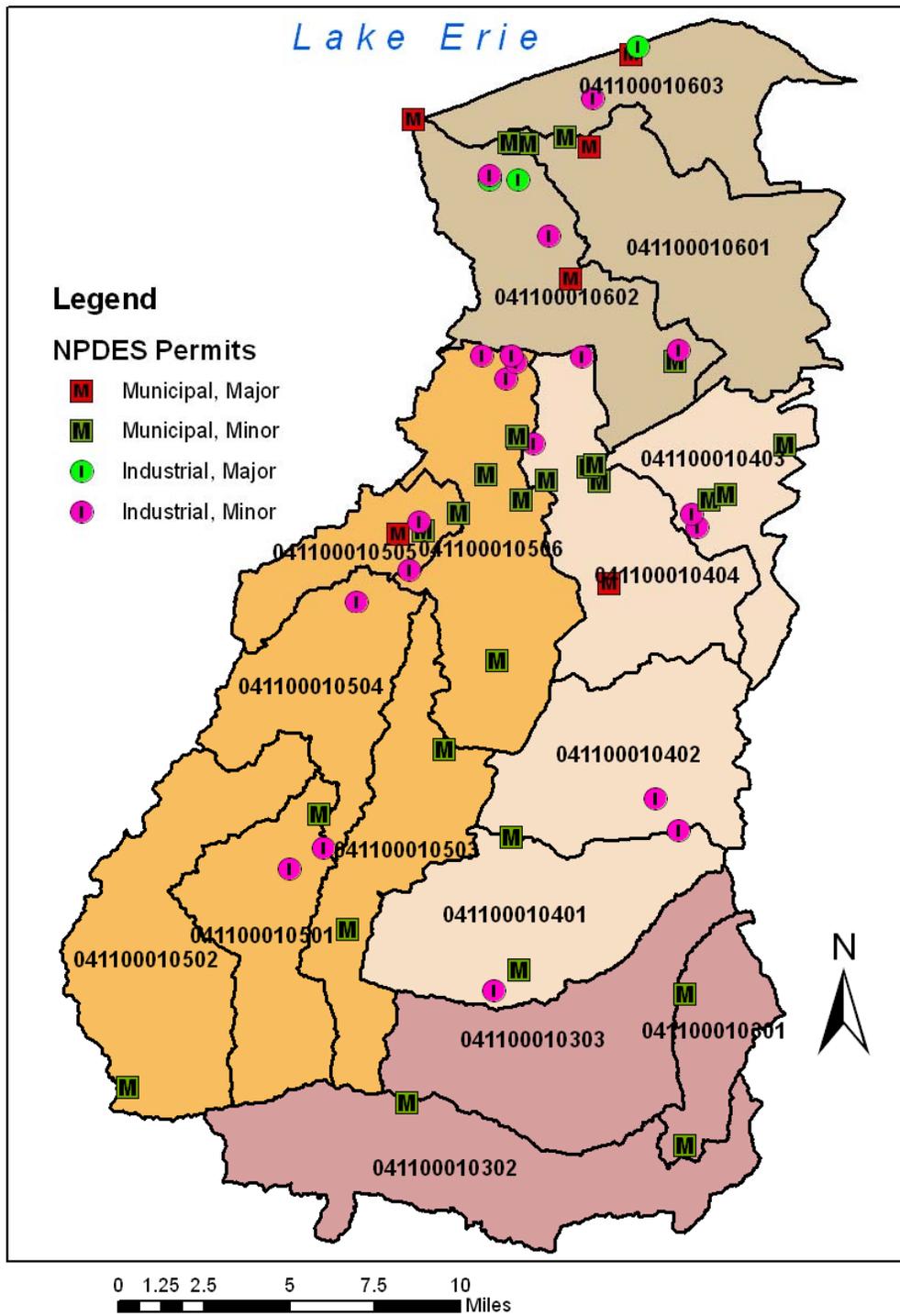


Figure 3. Location of NPDES permitted dischargers in the Black River watershed.

Black River 2012

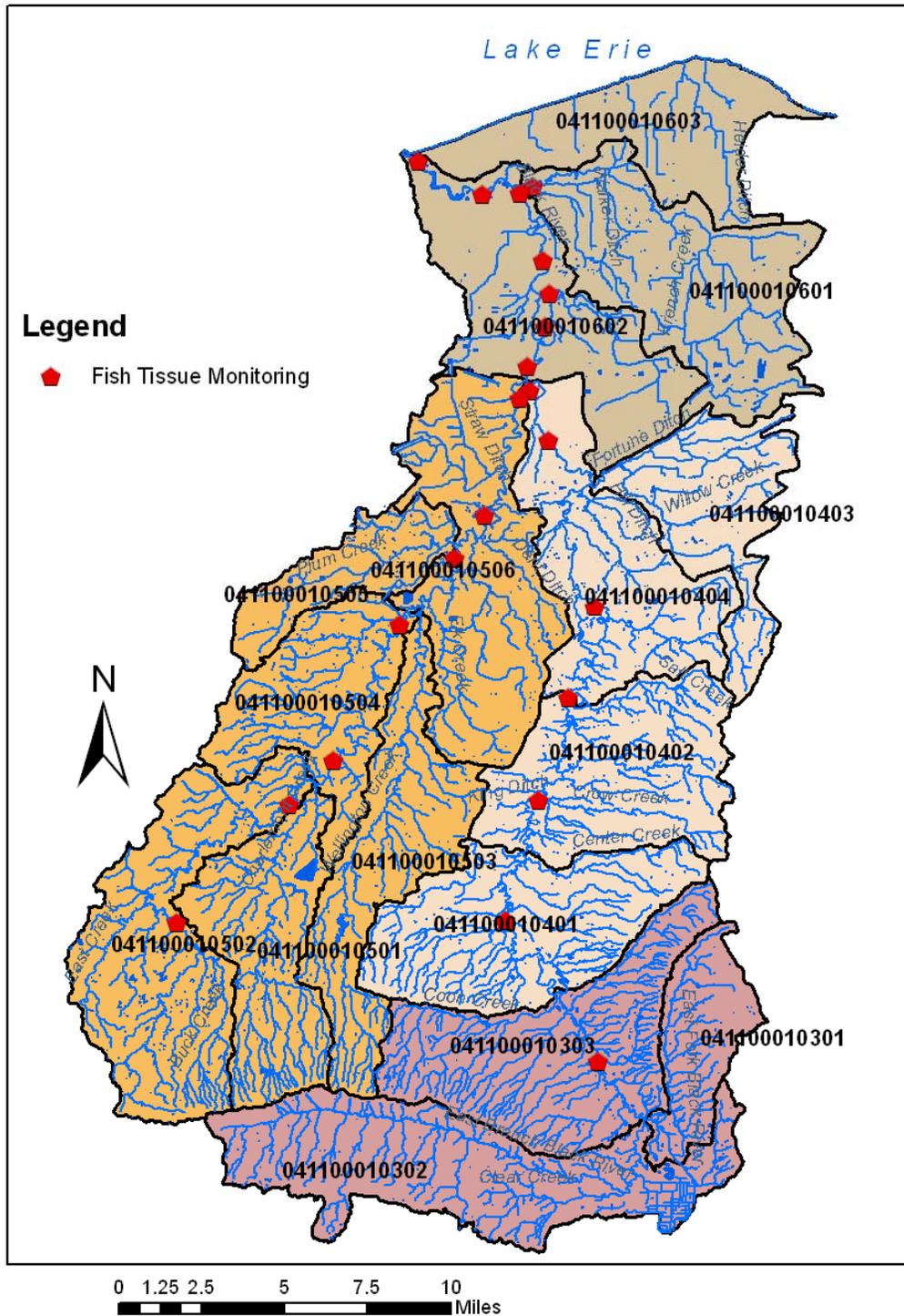


Figure 4. Fish tissue monitoring locations for the 2012 Black River watershed survey.

Black River 2012

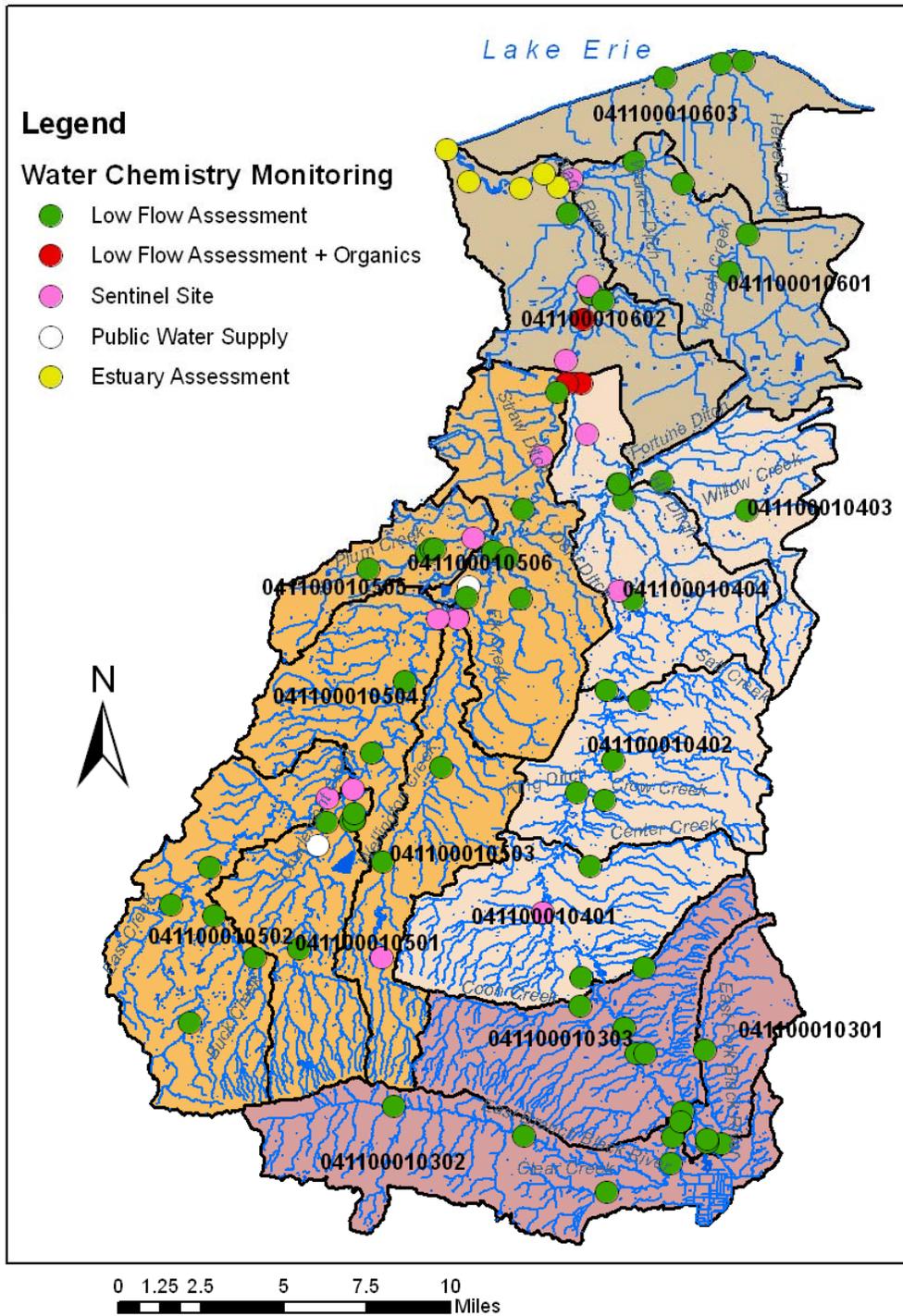


Figure 5. Water chemistry sampling locations for the 2012 Black River watershed survey.

Black River 2012

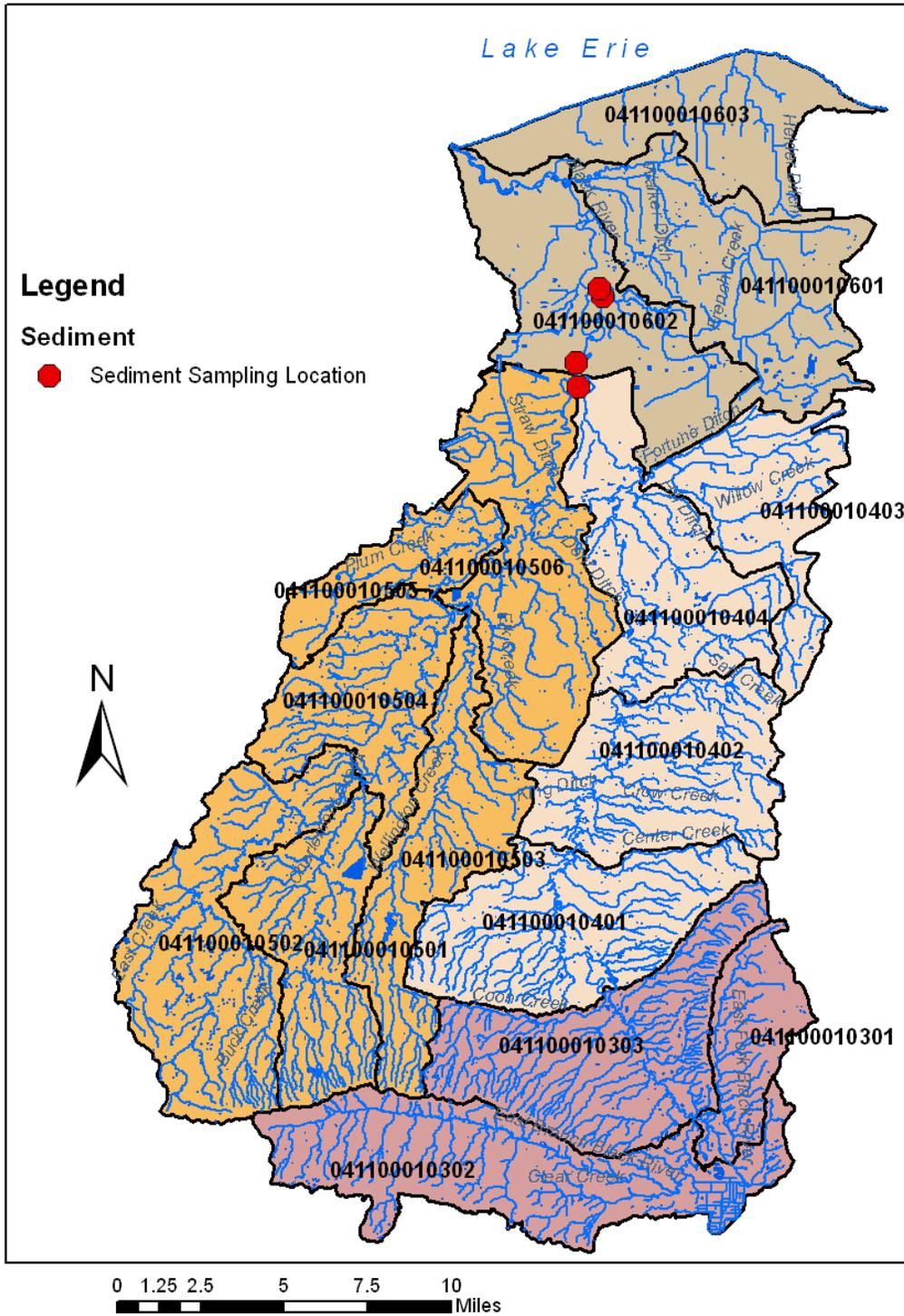


Figure 6. Sediment chemistry sampling locations for the 2012 Black River watershed survey.

Black River 2012

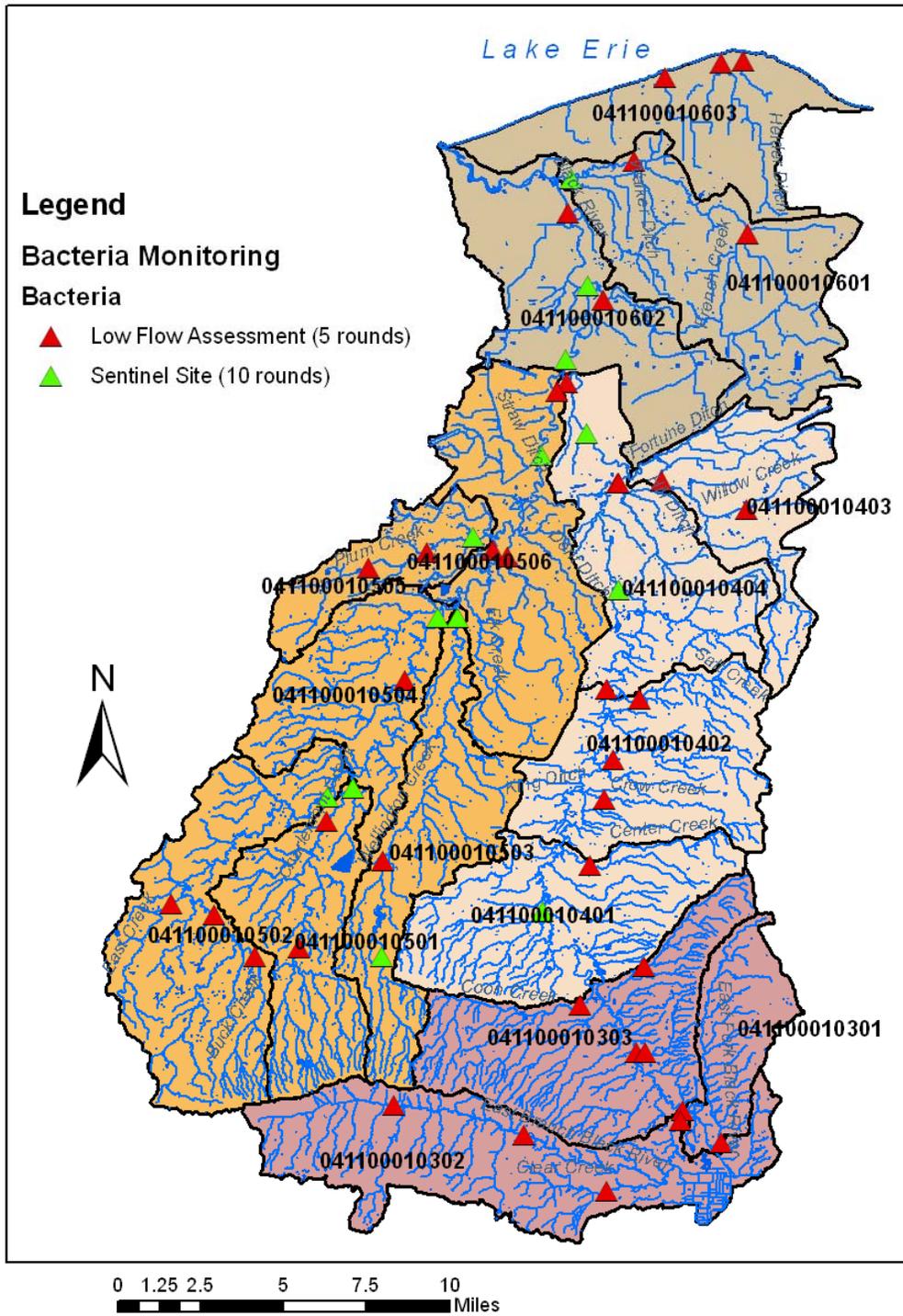


Figure 7. Recreational use (*E. coli* bacteria) monitoring locations for the 2012 Black River watershed survey.

Black River 2012

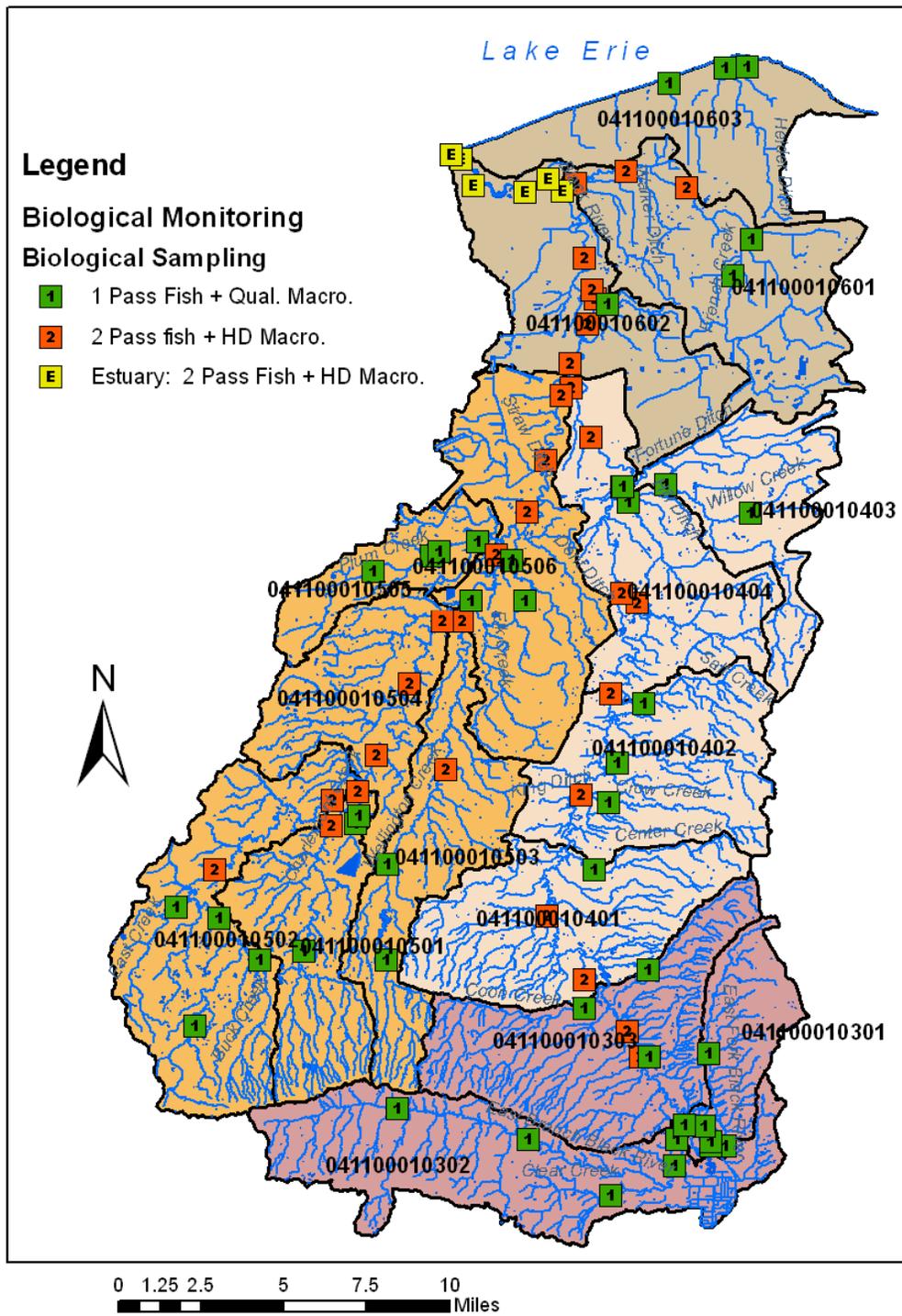


Figure 8. Biological community monitoring locations for the 2012 Black River watershed survey.

Black River 2012

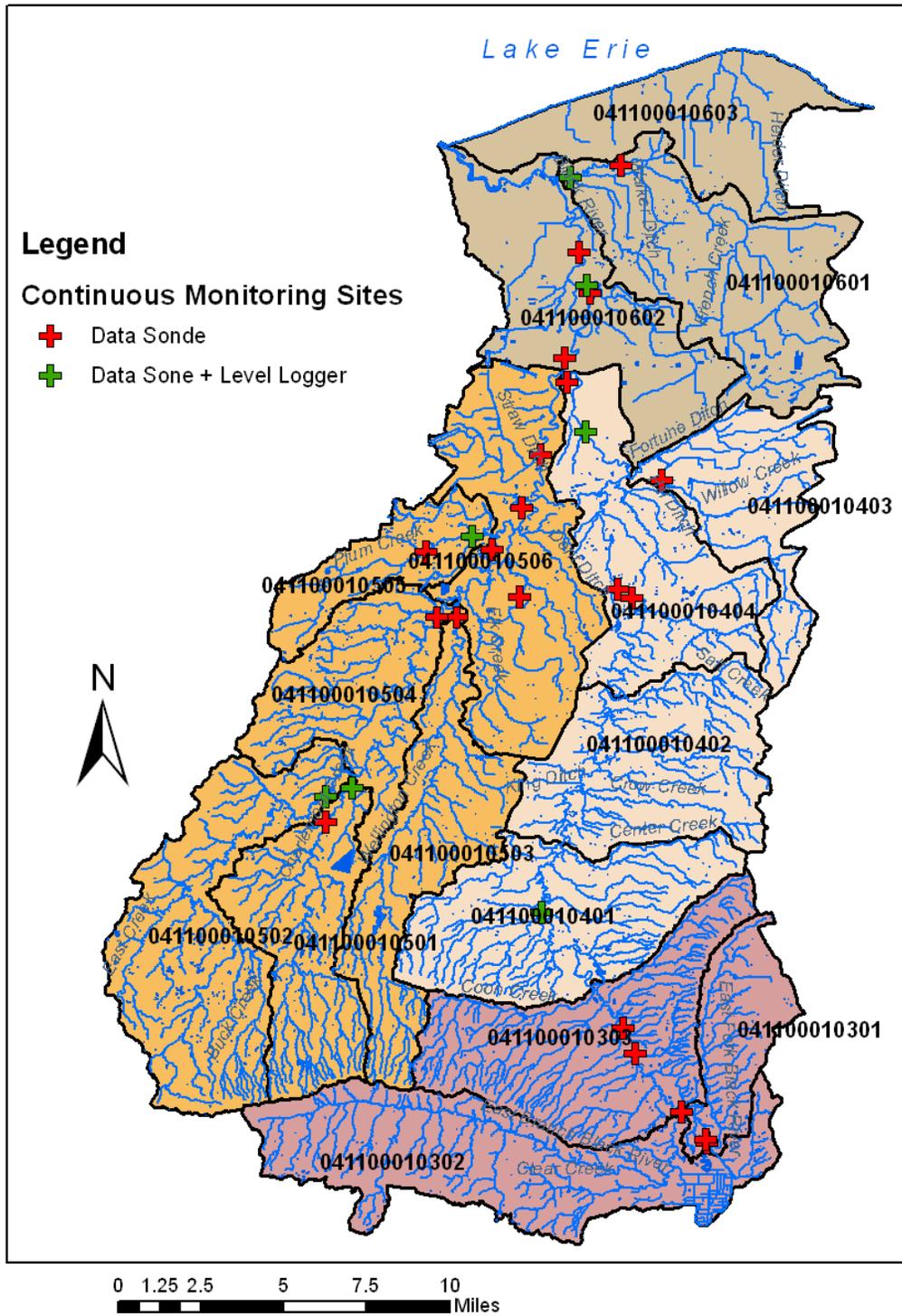


Figure 9. Continuous water quality monitoring locations for the 2012 Black River watershed survey.

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