



Study Plan for CWA Section 319(h), Ohio SWIF, and GLRI Projects

**Pre-Implementation Monitoring for Fiscal Year 2015 Projects
and
Post-Implementation Monitoring for Selected Previous Years Projects**



Division of Surface Water
Ecological Assessment Section
April 27, 2015

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Objectives

1. Establish baseline biological and physical habitat quality in new 319 and GLRI project water bodies by evaluating fish and macroinvertebrate communities, along with assessing physical habitat conditions. This will include evaluation of the attainment status of designated or recommended aquatic life uses of the water bodies expected to be restored by each project.
2. Biological monitoring will also occur at previously implemented 319 and three SWIF project sites where restoration work has been completed for at least one year.
3. Complete a report summarizing the aquatic biological results by project area.

Sampling Activities

Biological Community Assessment

The fish communities will be assessed at each sampling site using wading or boat electrofishing methods. Artificial substrate quantitative samplers will be set at applicable macroinvertebrate sampling stations. At all sites or where small stream size, low stream flow conditions, or other contingencies will not support placement of artificial substrate samplers, qualitative macroinvertebrate sampling will be conducted. Sampling locations are listed in Table 1 and Figures 1-7.

Stream Habitat Assessment

Stream habitat will be evaluated at each biological sampling site and will be used in the overall environmental assessment of the waterbodies.

Results

The results of the data collected will provide pre-implementation water resource conditions at each of the FY15 319 project areas. The biological community assessment and physical habitat data will be used to assign/confirm the appropriate aquatic life use, determine aquatic life use attainment/impairment status, and assess physical habitat condition at each water body project area. At seven previously implemented 319 project sites, and three SWIF project areas, post-construction biological community and physical habitat conditions will be assessed to compare with baseline monitoring results collected prior to project implementation.

Quality Assurance/Sampling Methods

Ohio EPA Manuals

All biological, data processing, and data analysis methods and procedures adhere to those specified in Biological Criteria for the Protection of Aquatic Life, Volumes II - III (Ohio EPA 1987, 1989a, 1989b, 2014b, 2014c) for biological community assessments, and The Qualitative Habitat Evaluation Index (QHEI); Rationale, Methods, and Application (Ohio EPA 1989c, 2006) for stream habitat assessment.

Use Attainment

Attainment/non-attainment of aquatic life uses will be determined by using biological criteria codified in Ohio Administrative Code (OAC) 3745-1-07, Table 7-17. Numerical biological criteria are based on multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), indices measuring the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community.

Performance expectations for the tiered aquatic life uses (Warmwater Habitat [WWH], Exceptional Warmwater Habitat [EWH], and Modified Warmwater Habitat [MWH]) were developed using the regional reference site approach (Hughes et al. 1986; Omernik 1987). This fits the practical definition of biological integrity as the biological performance of the natural habitats within a region (Karr and Dudley 1981). Attainment of an aquatic life use is FULL if all three indices (or those available) meet the applicable criteria, PARTIAL if at least one of the indices did not attain and performance did not fall below the fair category, and NON if all indices either fail to attain or any index indicates poor or very poor performance.

Stream Habitat Assessment

Stream habitat is evaluated using the Qualitative Habitat Evaluation Index (QHEI) developed by the Ohio EPA for streams and rivers in Ohio (Ohio EPA 1989c, 2006). Various attributes of the available habitat are scored based on their overall importance to the establishment of viable, diverse aquatic faunas. Evaluations of type and quality of substrate, amount of instream cover, channel morphology, extent of riparian canopy, pool and riffle development and quality, and stream gradient are among the metrics used to evaluate the characteristics of a stream segment, not just the characteristics of a single sampling site. As such, individual sites may have much poorer physical habitat due to a localized disturbance yet still support aquatic communities closely resembling those sampled at adjacent sites with better habitat, provided water quality conditions are similar. QHEI scores from hundreds of segments around the state have indicated that values higher than 60 were generally conducive to the establishment of warmwater faunas while those which scored in excess of 75-80 often typify habitat conditions which have the ability to support exceptional faunas.

Biological Community Assessment

Artificial substrate collections of macroinvertebrates will be collected at all sites with greater than 20 mi² drainage areas or at reference site locations. This sample provides quantitative data and consists of a composite sample of five modified Hester-Dendy multiple-plate artificial substrate samplers colonized for six weeks. Qualitative macroinvertebrate sampling will be conducted at all sampling locations. This sampling effort consists of an inventory of all observed

macroinvertebrate taxa from the natural stream 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). Detailed macroinvertebrate assemblage sampling protocols are documented in Biological Criteria for the Protection of Aquatic Life, Volume III (1989b, 2014b).

Fish will be sampled at each sampling location using pulsed DC headwater, wading, or boat electrofishing methods depending on watershed size at each sampling zone. Sites with drainage areas greater than 20 mi² or at reference site locations will be sampled twice during the sampling index period. Fish are processed in the field which includes identifying each individual to species, counting individuals at all sites, weighing individuals at wading and boat sites, and recording any external abnormalities. Detailed fish assemblage sampling protocols are documented in Biological Criteria for the Protection of Aquatic Life, Volume III (1989b, 2014b).

319(h) Project Descriptions

The following summaries describe projects that are recommended for FY15 Section 319(h) subgrant funding. These projects have been identified during the course of the review as having met Section 319(h) eligibility requirements and having the highest potential for water quality improvements within the watershed where they will be implemented. Each of these projects was reviewed by Region 5 Nonpoint Source (NPS) Program staff. **Ohio EPA anticipates having all Subgrant funds obligated (contracted) for these projects within approximately 12 months following award of Ohio EPA's Section 319(h) program grant from USEPA Region 5.** All pre-implementation projects are assigned to the following EA³ project: Grant Year 2015 319 Projects (Pre-Project Monitoring).

15(h)EPA-16

Clermont Soil & Water Conservation District

1000 Locust Street

Owensville, Ohio 45160

Clermont County

Project Contact: John McManus, 513-732-7075; jmcmanus@clermontcountyohio.gov

Restoration of Tributary to O'Bannon Creek

FY 2015 Section 319(h) NPS grant funding is requested to restore 620 linear feet of a tributary to O'Bannon Creek and stabilize 500 feet of stream bank 0.7 miles upstream of the main stem of O'Bannon Creek. The project will implement a combination of natural channel design and bioengineering techniques. Channel pattern will be improved by increasing radii of curvature of the three bends within the project reach and channel dimension will be returned to appropriate width and depth during the channel re-grading. A new floodplain will be graded along approximately 2/3 of the right descending bank. Bankfull benches will be excavated from the floodplain limits to the up-and downstream ends of the project reach to tie into existing ground. Channel profile will be maintained by construction of riffles using cobble and gravel harvested on-site from existing point bars and alluvial fans. Aquatic habitat will be improved by installation of bioengineered bank stabilization structures on the outside bank of the two left bends in the project reach. Native plantings will be utilized throughout the project, establishing a diverse and structurally complex riparian zone for the

streams re-graded banks and new floodplain. This project is being implemented consistent with recommendations within the O'Bannon Creek TMDL and/or state-endorsed Watershed Action Plan.

15(h)EPA-32

City of Mason

6000 Mason-Montgomery Road

Mason, Ohio 45040

Warren County

Project Contact: Kathleen Wade-Dorman, 513-229-8500; kdorman@masonoh.org

Marival/Broadview Stream & Riparian Restoration and Protection

FY 2015 Section 319(h) NPS grant funding is requested to restore approximately 3,200 linear feet of a headwater tributary to the Muddy Creek. Restoration of the Lower Reach will consist of installation of cross vanes and j-hooks to direct flow away from steep eroded banks, construction of a floodplain bench on the inside of a meander bend in an effort to reduce mid-channel shear stresses, and establishment of desirable natives in the riparian zone. The stream is located approximately 300 feet from a community club house, providing an excellent location and opportunity for educational and outreach via workshops and site tours. A conservation easement approximately 1.05 acres in size will protect, in perpetuity, tributary and riparian zone. The Upper Reach project will restore some sinuosity through natural channel design. The project will then include the establishment of desirable natives in the riparian zone. This project is being implemented consistent with recommendations within the Muddy Creek TMDL and/or state-endorsed Watershed Action Plan.

15(h)EPA-15

Springfield Township

2459 Canfield Road

Akron, Ohio 44312

Summit County

Project Contact: Dean Young, 330-794-1739; dy@youngyeargin.com

Upper Tuscarawas River Stabilization Project

FY 2015 Section 319(h) NPS grant funding is requested to begin addressing TMDL impairment concerns in a relatively high profile and visible area that will also be conducive to extensive public outreach and education opportunities. This project will help minimize erosion along the Upper Tuscarawas River riparian zone; it will improve in-stream and riparian habitat; and it will permanently protect the riparian corridor through the donation of a conservation easement to a

qualified conservation organization. This project will reduce NPS pollutant loadings to Upper Tuscarawas. This project is being implemented consistent with recommendations within the Upper Tuscarawas TMDL and/or state-endorsed Watershed Action Plan.

15(h)EPA-28

Wood Soil & Water Conservation District

1616 East Wooster Street #32

Bowling Green, Ohio 43402

Wood County

Project Contact: Beth Landers, 419-354-5517; bethlanders@woodswcd.com

Reducing Nutrients and Sediment in Bull Creek

FY 2015 Section 319(h) NPS grant funding is requested to concentrate on the agricultural best management practices that producers are interested in, and to provide a way they can adopt practices when EQIP funding isn't available to them, including adding cover crops to rotation, utilizing variable rate technology (VRT) to create nutrient application plans based on sampling and tri-state recommendations (into cover crops or residue), controlled drainage structures, blind inlets, reduced tillage, and adding a perennial hay crop to the rotation. These practices were chosen based on both producer interest, and effectiveness for reducing phosphorus and sediment runoff. This project will reduce nonpoint source pollutant loadings to Bull Creek. This project is being implemented consistent with recommendations within the Portage River basin TMDL and/or state-endorsed Watershed Action Plan.

GLRI Project Descriptions

The Nature Conservancy in Ohio

20937 Parklane Drive

Fairview Park, OH 44126

Cuyahoga County

Project Contact: Amy Brennan, 440-665-1021; abrennan@tnc.org

Cessna Stream Restoration – Tributary to the Blanchard River

Nature Conservancy – Hardin County, Ohio

This project has been delayed until 2016.

This component of the Maumee River Sediment and Nutrient Reduction Initiative includes the restoration using natural channel design methodology of more than 3000 linear feet of Cessna Creek, a tributary to the Blanchard River which ultimately flows into the Maumee River. An additional 1000 linear feet of severely eroding streambank will also be stabilized using bioengineering practices. Stream restoration will take place between RM 3.9 and RM 4.3 on property

that is currently privately owned and used for row crop agriculture. Although the stream has maintained some of its natural meander patterns it is extremely entrenched with bank heights up to 10 feet and little or no riparian corridor. Dr. Andy Ward of Ohio State University indicated that this stream is perhaps that most seriously unstable of any he has seen previously. This project will restore naturalized channel and flow conditions within the project site and serve as a valuable demonstration of how to manage compatible uses of farming and natural stream channels.

The Nature Conservancy will contract with a design/build contractor through a competitively bid process to design the stream restoration using natural channel design methodology. Design specifications will require that the restored stream meet bankfull channel dimensions for a stream draining 13.5 square miles (size of Cessna Creek drainage area). A native riparian corridor will be encouraged through active planting of native tree and shrub species as well as an aggressive program to manage invasive species.

Following completion of the proposed restoration activities, this project site will be protected in perpetuity by the permanent retirement (and placing under conservation easement) of 6 acres of currently farmed cropland.

Successful completion of this project will result in Sediment reductions totaling more than 244 tons per year, Nitrogen loadings by 489 pounds per year and Phosphorus loadings by more than 244 pounds per year. Effectiveness monitoring of this project site will be completed pre and post construction by Ohio EPA's Ecological Assessment Unit.

Metroparks of the Toledo Area

5100 W. Central Avenue

Toledo, OH 43615

Lucas County

Project Contact: Tim Schetter, 419-407-9847; tim.schetter@metroparkstoledo.com

Oak Openings Riparian and Stream Restoration Project – Tributaries to Ai Creek, Van Fleet and Neis Ditch

Toledo Metroparks – Lucas County, Ohio

Metroparks recently acquired 80 acres of agricultural lands within the Oak Openings Region and will acquire an additional 120 acres of agricultural lands within the Oak Openings Region by early 2015. These croplands are drained by approximately 2 linear miles of existing ditches and degraded streams serving as tributaries to Swan Creek within the Maumee Watershed. These agricultural lands occur within historic floodplains and wetland areas dominated by native Oak Openings sandy soils which are designated as extremely to very highly erodible.

Under this project, Metroparks will remove 200 acres of marginal croplands from production and restore them to native Oak Openings forests. This will immediately eliminate a major source of sedimentation via wind erosion and runoff into three separate Swan Creek tributaries. To further eliminate sediments flowing into Swan Creek, Metroparks will restore natural floodplains and native vegetation along 2 linear miles of these tributaries flowing through, and adjacent to the restored croplands.

Table 1. FY15 Section 319(h) and GLRI projects - baseline and follow-up monitoring locations, 2015. Provided links are to the pre-project monitoring reports which include the initial assessments of the relevant project areas. * The 2015 post project monitoring data for West Creek will be collected by Northeast Ohio Regional Sewer District.

RM	Stream Name	Station ID	Lat.	Long.	Eco-Region	Current Aquatic Life Use	River Code	Mi2	Pre-Project Monitoring
http://epa.ohio.gov/portals/35/documents/319MonitoringReport2009.pdf									
0.75	TOWN RUN AT MARYSVILLE @ WALNUT ST. (LOWER CROSSING)	V03K10	40.2308	-83.3648	ECBP	WWH	02-109-015	1.3	2009
0.21	TOWN RUN AT MARYSVILLE @ 5TH STREET, DST. CULVERT	V03G02	40.2363	-83.3650	ECBP	WWH	02-109-015	1.7	2009
http://epa.ohio.gov/portals/35/documents/319_SWIF_TSD_2011.pdf									
*1.85	WEST CREEK NEAR BROOKLYN HEIGHTS @ LANCASTER RD.	301214	41.4148	-81.6652	EOLP	WWH	019-001-004	9.2	2010
*0.19	WEST CREEK NEAR BROOKLYN HEIGHTS @ ST. RT. 17 (GRANGER RD.)	F01P10	41.4147	-81.6478	EOLP	WWH	019-001-004	13.2	2010
4.08	SOLOMON RUN UPST. ST. MARTIN @ BROWN COUNTY INN RD.	M04S20	39.2136	-83.8792	IP	WWH	11-147-000	3.7	2011
3.30	SOLOMON RUN AT OLD ST. MARTIN RESERVOIR (FREE-FLOWING)	303011	39.2100	-83.8900	IP	EWH	11-147-000	4.1	2011
2.90	SOLOMON RUN S OF ST. MARTIN @ ST. RT. 251	M04S19	39.2061	-83.8944	IP	WWH	11-147-000	5.0	2011
23.32	CHIPPEWA CREEK UPST. CHIPPEWA LAKE @ ST. RT. 162	R06G17	41.0990	-81.9200	EOLP	WWH	17-550-000	9.3	2011
21.70	CHIPPEWA CREEK JUST UPST. CHIPPEWA LAKE @ CHIPPEWA RD.	301699	41.0766	-81.9124	EOLP	WWH	17-550-000	14.6	2011
3.93	OLENTANGY R. AT COLUMBUS @ DODRIDGE ST.	V04S19	40.0161	-83.0162	ECBP	WWH	02-400-000	535.0	2011
2.20	OLENTANGY R. AT COLUMBUS @ KING AVE. (free-flowing)	303012	39.9915	-83.0243	ECBP	MWH-I	02-400-000	540.0	2011
0.65	OLENTANGY R. AT COLUMBUS @ RR DST GOODALE ST.	V04S25	39.9720	-83.0207	ECBP	WWH	02-400-000	543.0	2011
http://epa.ohio.gov/Portals/35/documents/319MonitoringReport2012.pdf									
4.80	BLACKLICK CREEK JUST DST. BLACKLICK ESTATES WWTP	V05S14	39.8944	-82.8594	ECBP	WWH	02-130-000	57.0	2012

RM	Stream Name	Station ID	Lat.	Long.	Eco-Region	Current Aquatic Life Use	River Code	Mi2	Pre-Project Monitoring
4.35	BLACKLICK CREEK S OF WHITEHALL @ WINCHESTER PIKE	V05P19	39.8906	-82.8637	ECBP	WWH	02-130-000	57.0	2012
2.40	BLACKLICK CREEK AT GROVEPORT, BEHIND OHIO EPA BUILDING	V05G97	39.8732	-82.8782	ECBP	WWH	02-130-000	58.7	2012
14.95	BLACK R. AT ELYRIA @ CASCADE PARK	501520	41.3793	-82.1077	EOLP	WWH	20-001-000	396.0	2012
7.05	SYCAMORE CREEK UPST. PICKERINGTON @ DRIVEWAY OFF ST. RT. 256	302116	39.8788	-82.7258	ECBP	WWH	02-085-000	10.6	2012
6.64	SYCAMORE CREEK @ ST. RT. 256	V08W62	39.8792	-82.7331	ECBP	WWH	02-085-000	11.7	2012
5.90	SYCAMORE CREEK AT PICKERINGTON, DST. RR, DST ST. RT. 256	200209	39.8796	-82.7428	ECBP	WWH	02-085-000	14.8	2012
1.87	ROSE RUN AT NEW ALBANY, 0.2 MI. DST. U.S. RT. 62	V05S26	40.0825	-82.8139	ECBP	WWH	02-123-003	1.7	2012
1.60	ROSE RUN AT NEW ALBANY @ FODOR RD.	V05G84	40.0814	-82.8216	ECBP	WWH	02-123-003	1.9	2012
0.47	ROSE RUN DST. NEW ALBANY @ HARLEM RD.	V05S25	40.0727	-82.8317	ECBP	WWH	02-123-003	2.9	2012
12.15	E. BR. CHAGRIN R. @ KIRTLAND RD.	302104	41.5961	-81.2949	EOLP	CWH	15-002-000	22.4	2012
11.75	E. BR. CHAGRIN R. ADJ. WISNER RD. @ RIVERWOOD FARM	302105	41.6009	-81.2909	EOLP	CWH	15-002-000	23.5	2012
11.38	E. BR. CHAGRIN R. @ WISNER RD,	302106	41.6055	-81.2918	EOLP	CWH	15-002-000	24.2	2012
Current Year Pre-project Baseline Monitoring									
123.10	Tuscarawas R. Near Uniontown @Pressler Rd	R06P27	40.9942	1933.5544	EOLP	WWH	17-500-000	25.5	2015
122.05	Tuscarawas R. Upst Massillon Rd Free flowing	303016	40.9946	-81.4591	EOLP	WWH	17-500-000	27.3	2015
120.10	Tuscarawas R. S of Akron, Upst Summit co. WWTP	R06G01	41.0090	-81.4790	EOLP	WWH	17-500-000	32.3	2015
0.90	Trib to O'Bannon Creek (RM 2.15) upst 319 project	303017	39.2549	-84.2241	IP	Undesignated	11-010-001	7.9	2015
0.60	Trib to O'Bannon Creek (RM 2.15) @ 319 project	303018	39.2563	-84.2224	IP	Undesignated	11-010-001	7.9	2015
0.30	Trib to O'Bannon Creek (RM 2.15) Dst. 319 Project @ Neale Lane	303019	39.2576	-84.2261	IP	Undesignated	11-010-001	7.9	2015

RM	Stream Name	Station ID	Lat.	Long.	Eco-Region	Current Aquatic Life Use	River Code	Mi2	Pre-Project Monitoring
0.01	Trib to Muddy Creek (RM 4.06) Dst Stone Ridge Drive (DST. LOWER REACH RESTORATION)	303022	39.3669	-84.2954	IP	Undesignated	11-020-003	0.2	2015
0.64	Bull Creek	S01S45	41.3111	-83.5858	HELP	WWH	16-102-000	29.8	2015
3.90	Bull Creek	S99Q05	41.2542	-83.6119	HELP	WWH	16-102-000	19.0	2015
8.45	Bull Creek	S01K10	41.1898	-83.5934	HELP	WWH	16-102-000	8.3	2015
0.65	Trib (Eckert Ditch) to Bull Creek (@1.17) @ Mermill Rd	303021	41.2965	-83.5826	HELP	Undesignated	16-102-001	8.8	2015
5.05	Trib (Eckert Ditch) to Bull Creek (@1.17) @ Cygnet Rd	303020	41.2395	-83.5806	HELP	Undesignated	16-102-001	4.1	2015
0.20	Neis Ditch Dst. Waterville Swanton Rd, SR 64 (dst project area)	303051	41.571489	83.872883	HELP	Undesignated	04-010-001	5.0	2015 GLRI
0.30	Neis Ditch Upst. Waterville Swanton Rd SR 64 (lower project area)	303052	41.572576	83.873579	HELP	Undesignated	04-010-001	5.0	2015 GLRI
1.65	Neis Ditch Off of SW corner of Cemetary, S of Maddie Street (upper project area)	303053	41.576728	83.892474	HELP	Undesignated	04-010-001	4.4	2015 GLRI
2.20	Neis Ditch Co Rd 2 (upst project area)	303054	41.57726	83.900935	HELP	Undesignated	04-010-001	3.8	2015 GLRI
2.45	Van Fleet Ditch Dst bike path (dst project area)	303055	41.556838	83.771216	HELP	Undesignated	04-003-007	1.5	2015 GLRI
2.60	Van Fleet Ditch Upst bike path (lower project area)	303056	41.556436	83.773682	HELP	Undesignated	04-003-007	1.4	2015 GLRI
3.50	Van Fleet Ditch Upst Eber Rd (upper project area)	303057	41.554363	83.785831	HELP	Undesignated	04-003-007	0.8	2015 GLRI
4.10	Van Fleet Ditch Upst bike path (upst project area)	303058	41.556517	83.790575	HELP	Undesignated	04-003-007	0.6	2015 GLRI

RM	Stream Name	Station ID	Lat.	Long.	Eco-Region	Current Aquatic Life Use	River Code	Mi2	Pre-Project Monitoring
4.15	Cessna Creek Private farm field off CR 90 (at Ford)	303059	40.706578	83.631749	ECBP	WWH	04-199-000	12.4	2015 GLRI
4.30	Cessna Creek Private farm field off CR 91	303060	40.709007	83.633183	ECBP	WWH	04-199-000	12.3	2015 GLRI

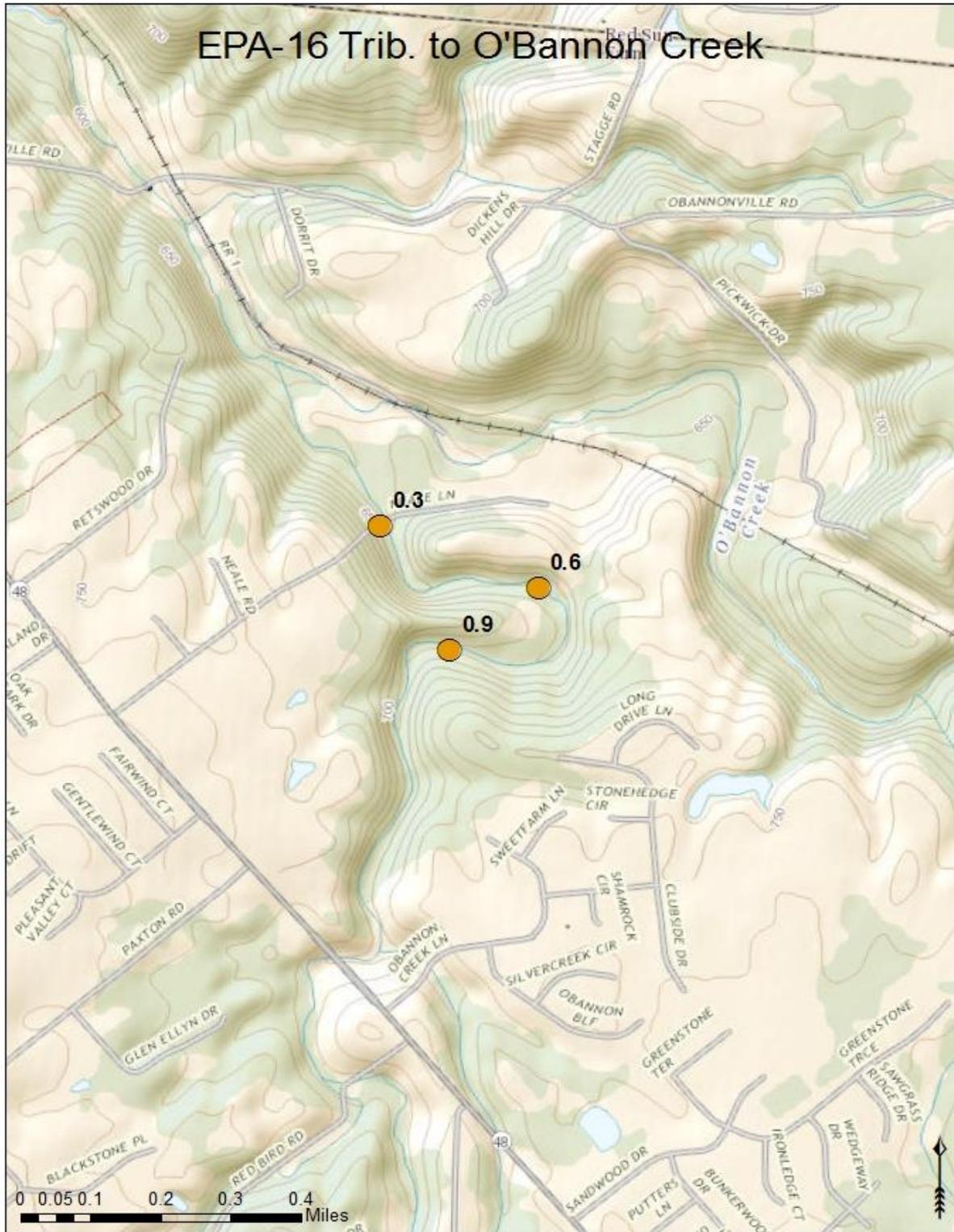


Figure 1. Tributary to O'Bannon Creek sampling locations with river miles indicated, 2015 [15(h)EPA-16].

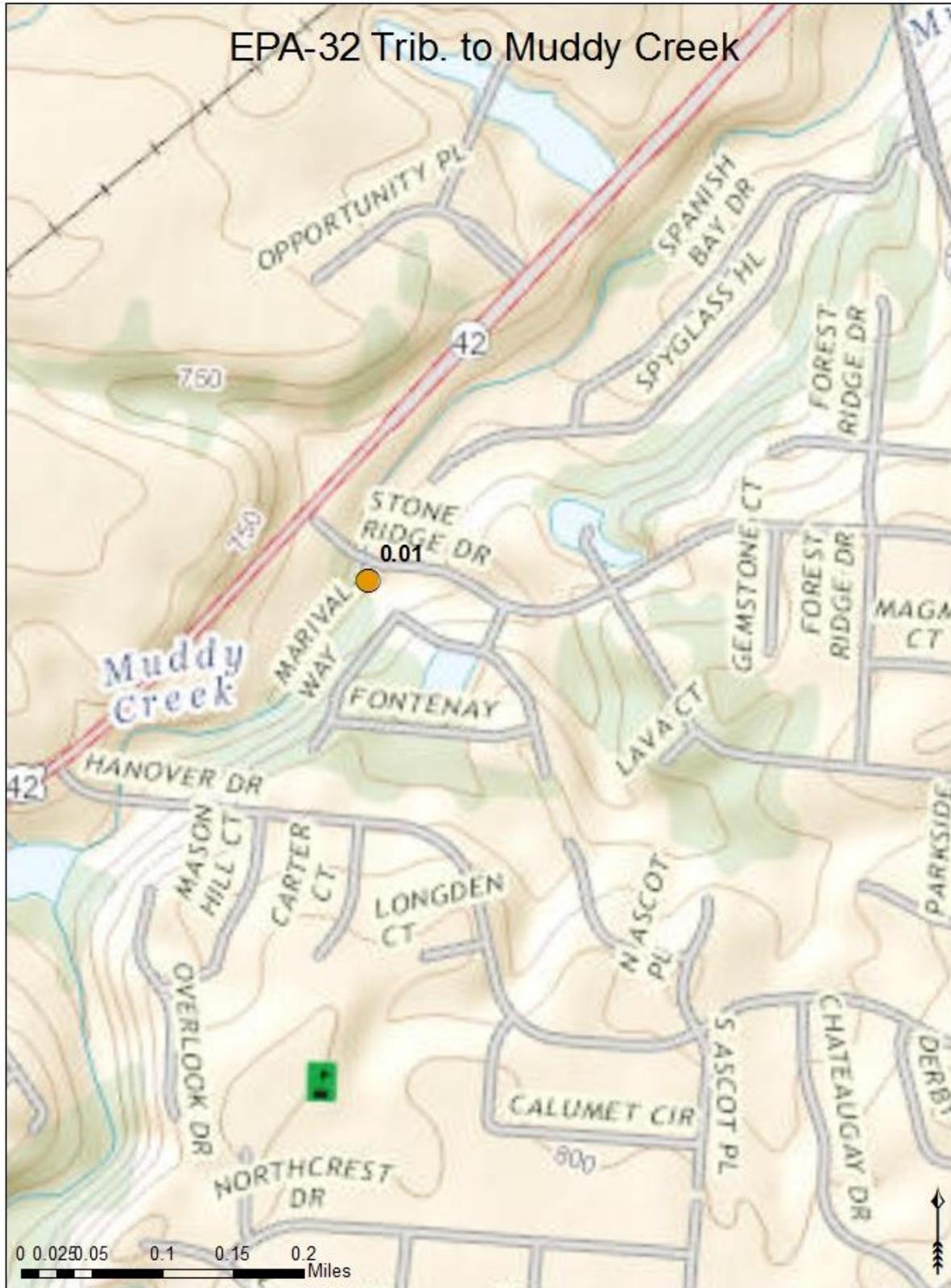


Figure 2. Trib. to Muddy Creek sampling location with river mile indicated, 2015 [15(h)EPA-32].

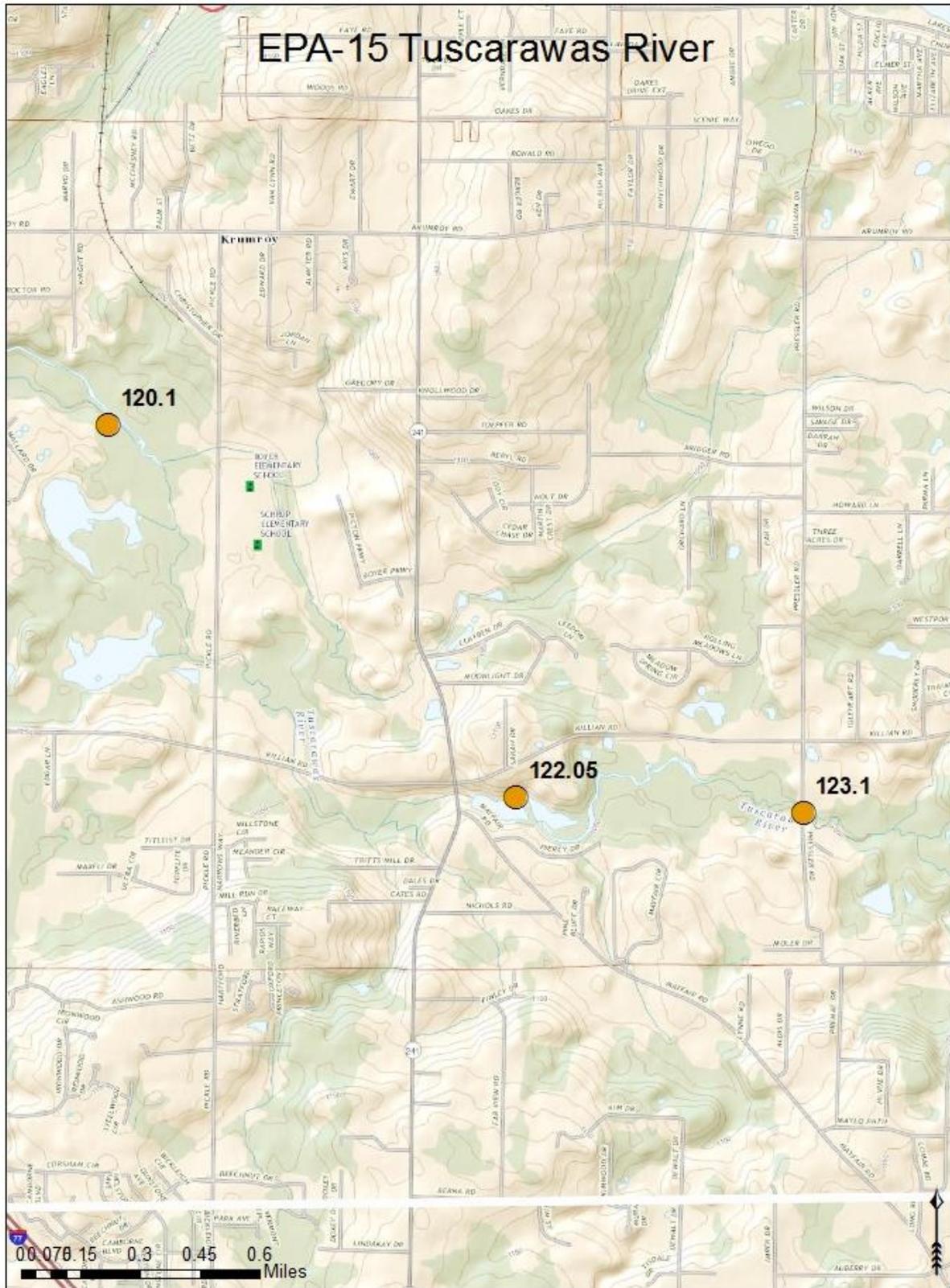


Figure 3. Tuscarawas River sampling locations with river miles indicated, 2015 [15(h)EPA-15].

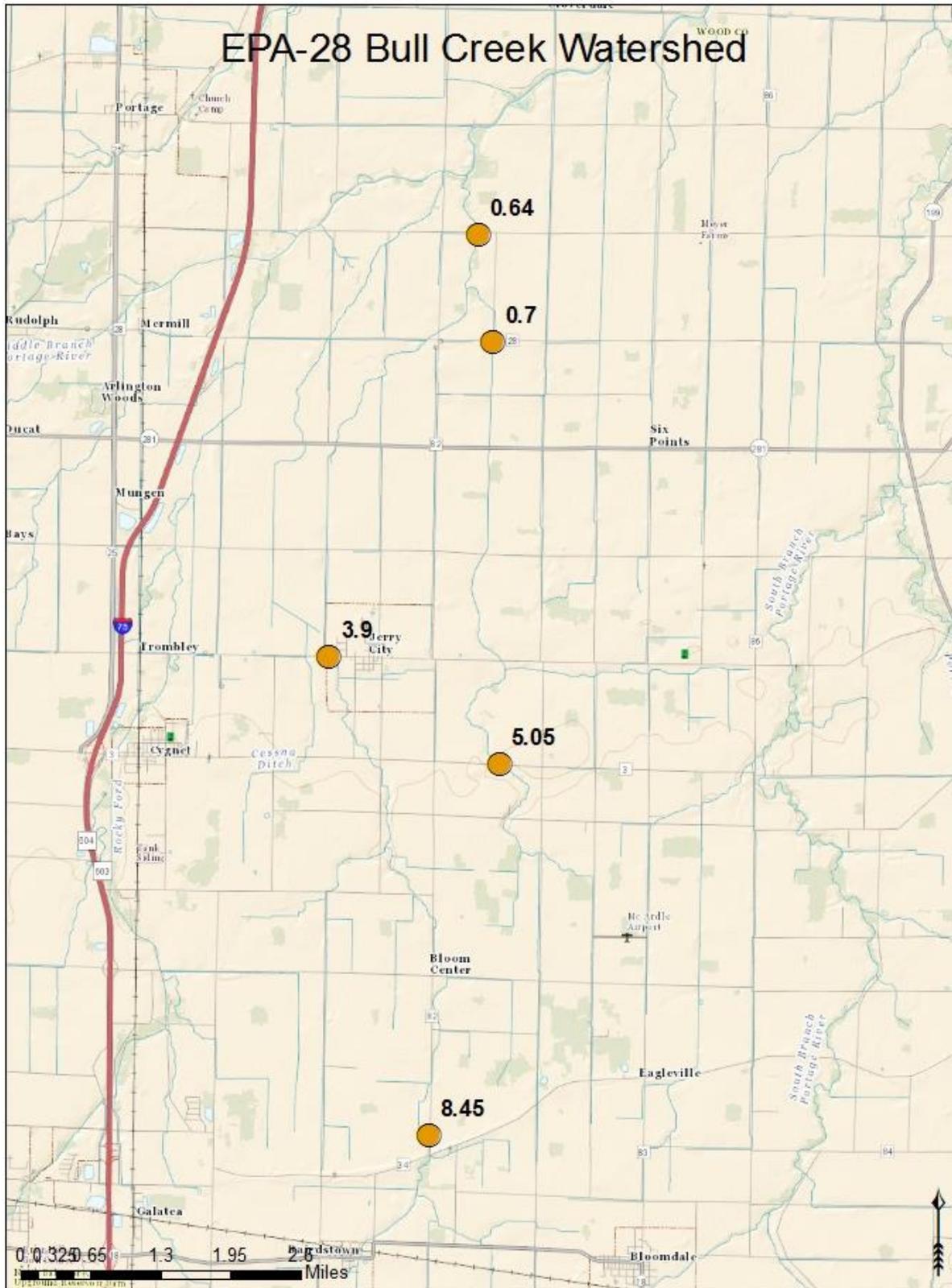


Figure 4. Bull Creek watershed sampling locations with river miles indicated, 2015 [15(h)EPA-28].

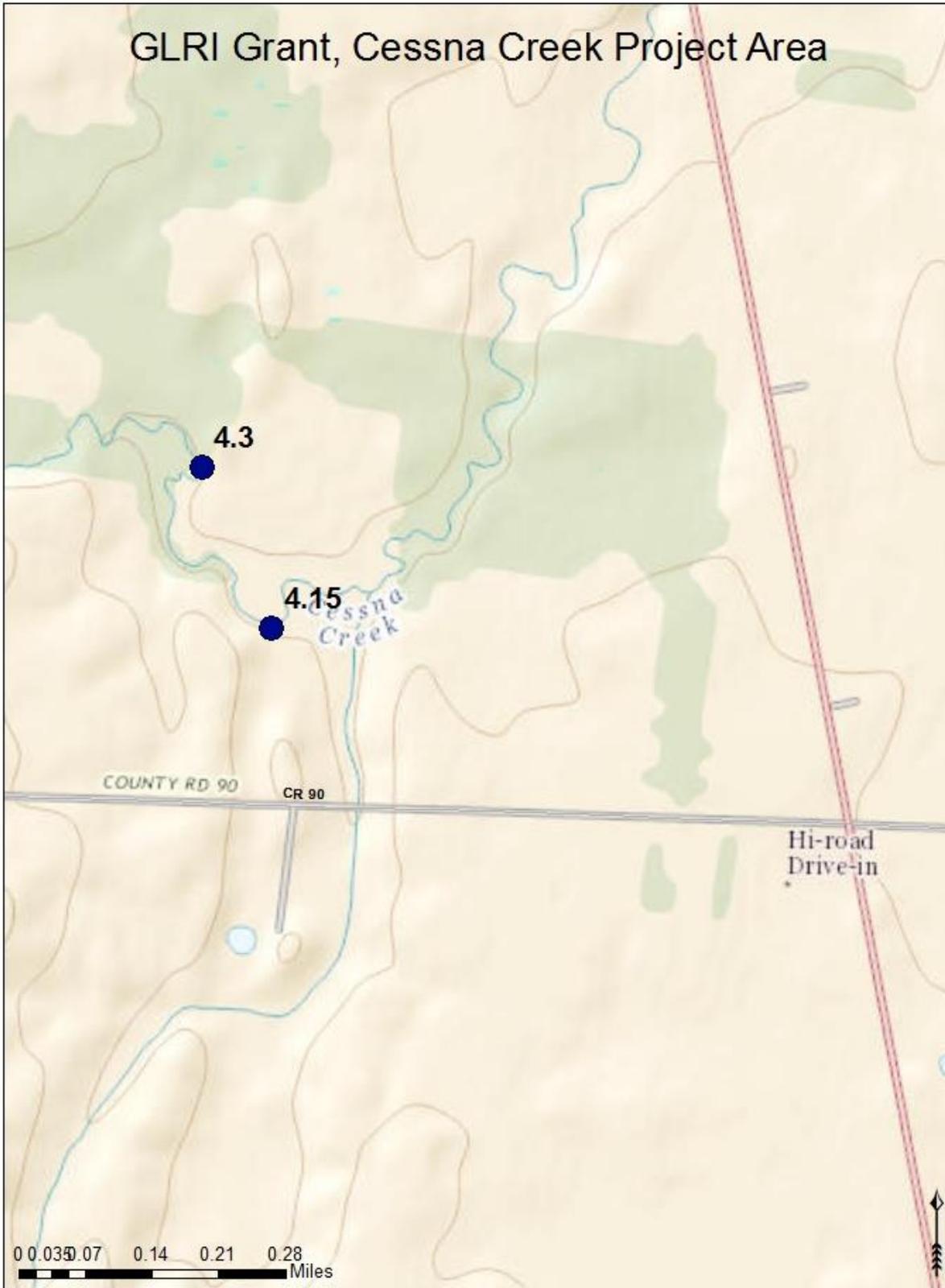


Figure 5. Cessna Creek watershed sampling locations with river miles indicated, 2015 [GLRI grant].

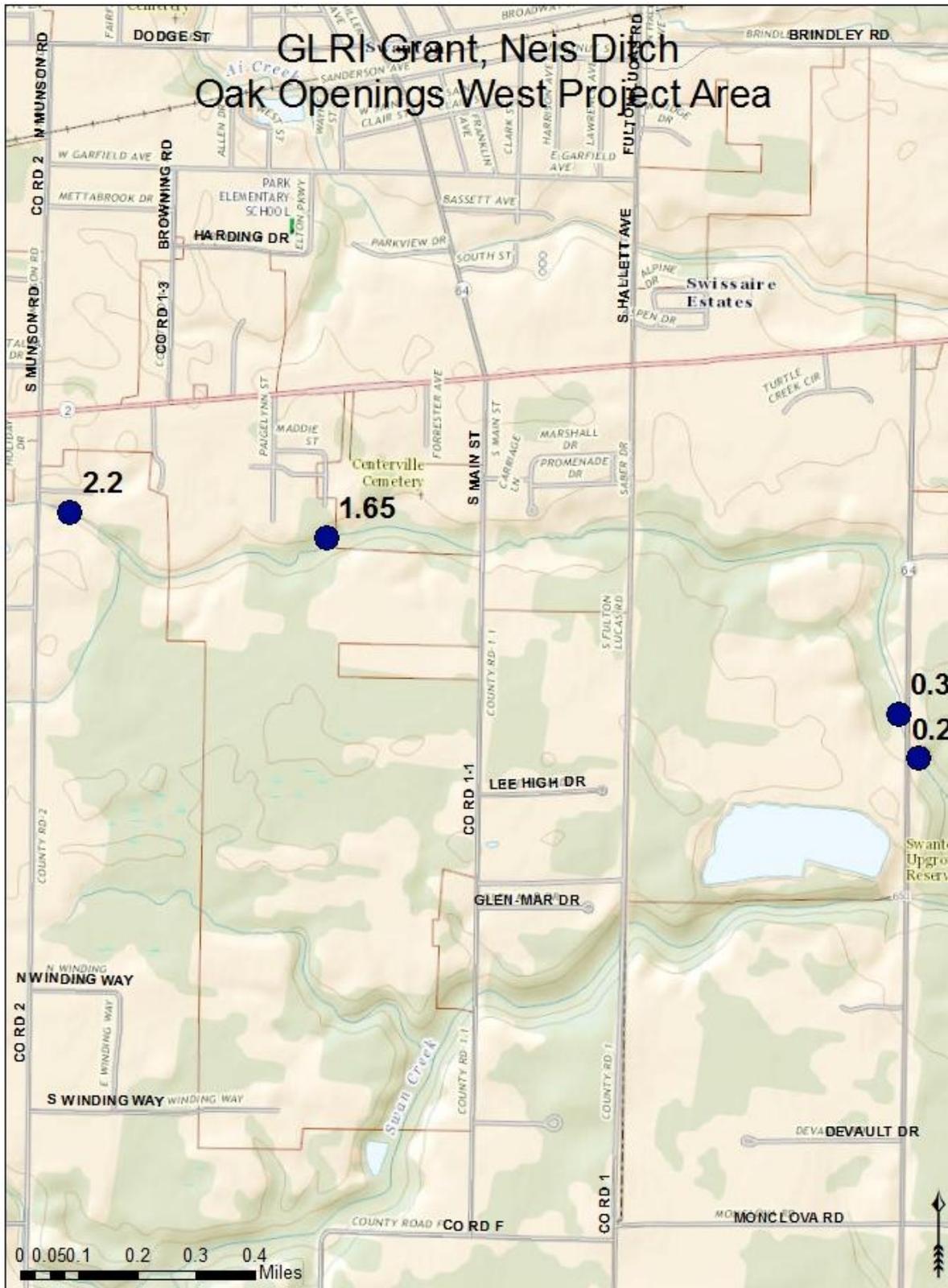


Figure 6. Neis Ditch watershed sampling locations with river miles indicated, 2015 [GLRI grant].

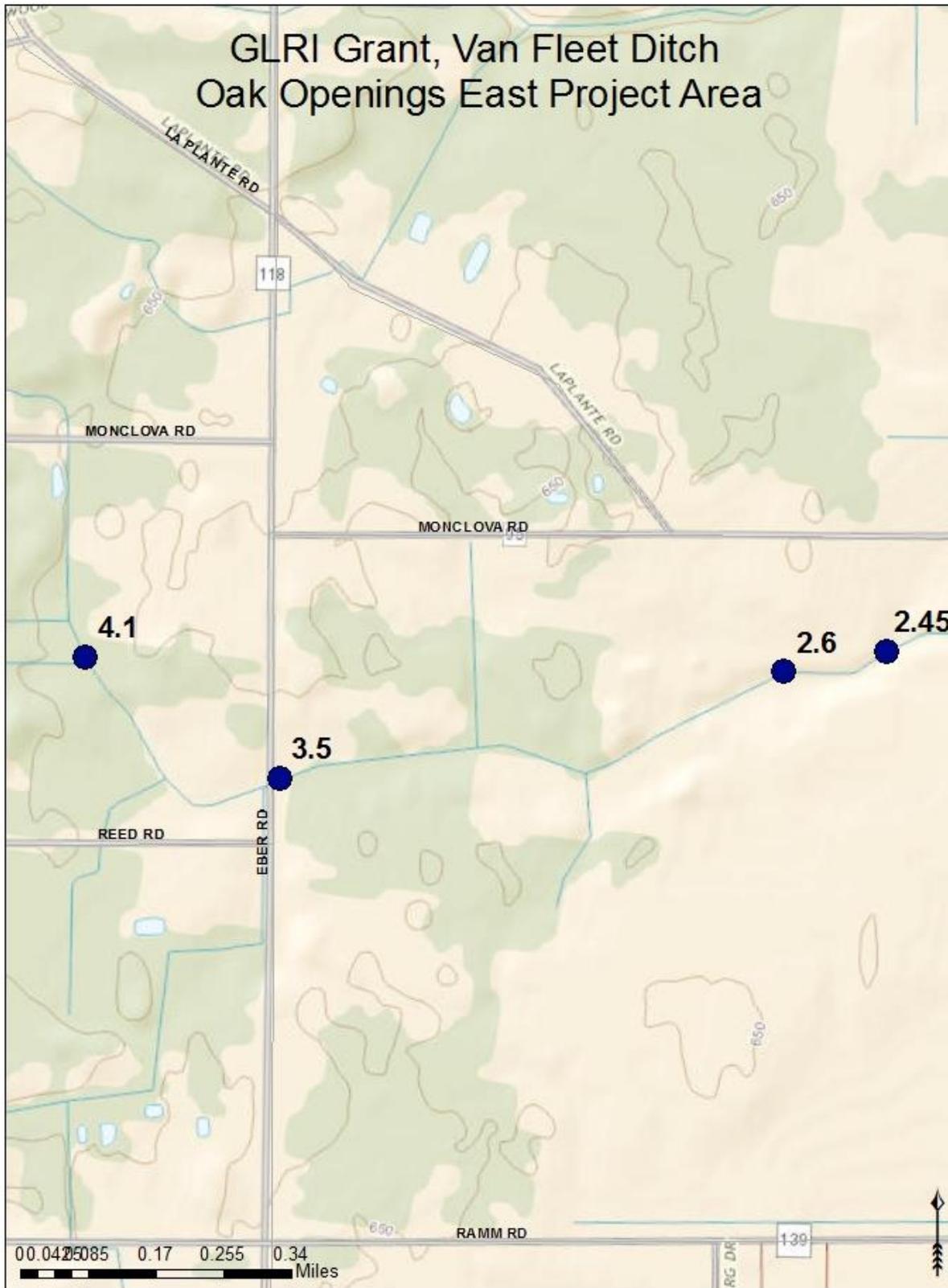


Figure 7. Van Fleet Ditch watershed sampling locations with river miles indicated, 2015 [GLRI grant].

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