Ohio Environmental Protection Agency

Quality Assurance Project Plan (QAPP) for 2025 Clean Water Act Section 319(h) Stream Improvement Project Sampling: Pre- and Post-Project Implementation Monitoring



Ohio EPA Technical Report AMS/2025-319H-1
Division of Surface Water
Ecological Assessment Unit
June 2025

TMDL DEVELOPMENT | ●○○○○

Group A: Project Management and Information/Data Quality Objectives

A1. Title Page

Quality Assurance Project Plan (QAPP)
for the Clean Water Act Section 319(h) Project Sampling for Pre- and Post-Project Implementation Monitoring

Statewide

June 2025

Version 1.0 - Effective 2025

Prepared by:
Ohio Environmental Protection Agency
Division of Surface Water
Lazarus Government Center
50 W. Town Street, Suite 700
Columbus, Ohio 43215

Ohio Environmental Protection Agency
Ecological Assessment Section
4675 Homer Ohio Lane
Groveport, Ohio 43125

Mail to:
P.O. Box 1049
Columbus, Ohio 43216-1049

R. Mike DeWine
Governor, State of Ohio

John Logue
Director, Ohio Environmental Protection Agency

A2. Approval Page

Quality Assurance Project Plan for the CWA Section 319(h) Project Sampling: Pre- and Post-Project Implementation Monitoring

E-SIGNED by Erin Sherer
on 2025-07-23 18:51:55 GMT

Date: _____

Erin Sherer, Division Assistant Chief

E-SIGNED by Katherine Harris
on 2025-07-23 17:23:02 GMT

Date: _____

Katherine Harris, DSW Quality Assurance Coordinator

E-SIGNED by Benjamin Rich
on 2025-07-23 17:23:37 GMT

Date: _____

Ben Rich, Assessment and Modeling Unit Supervisor

E-SIGNED by Andrew Phillips
on 2025-07-24 18:44:01 GMT

Date: _____

Andrew Phillips, Ecological Assessment/Study Coordinator

E-SIGNED by Joshua Griffin
on 2025-07-23 20:24:48 GMT

Date: _____

Joshua Griffin, NPS, TMDL and CAFO Section Manager

List of Acronyms - (Glossary of Terms can be found ***here***)

AFO	Animal Feeding Operation
ALU	aquatic life use
AWS	agricultural water supply
CAFO	concentrated animal feeding operation
CFR	Code of Federal Regulations
cfs	cubic feet per second
cfu	colony forming units
CSO	combined sewer overflow
CWA	Clean Water Act
CWH	Coldwater Habitat
DA	drainage area
DC	direct current
DELT	deformities, erosions, lesions, tumors
DIN	dissolved inorganic nitrogen
DMR	Discharge Monitoring Report
DO	dissolved oxygen
ECBP	Eastern Corn Belt Plains
EAU	Ecological Assessment Unit
EPA	Environmental Protection Agency
EPT	Ephemeroptera, Plecoptera, Trichoptera
ESL	ecological screening level
EWH	Exceptional Warmwater Habitat
FFY	Federal fiscal year
GIS	geographic information system
GLRI	Great Lakes Restoration Initiative
GPS	global positioning system
HELP	Huron/Erie Lake Plain
HHEI	headwater habitat evaluation index
HSTS	home sewage treatment system
HUC	hydrologic unit code
IBI	index of biotic integrity
ICI	invertebrate community index
IP	Interior Plateau
IPS	integrated prioritization system
IWS	industrial water supply
LRAU	large river assessment unit
LRW	limited resource water
MGD	million gallons per day
MI	moderately intolerant

MIwb	Modified Index of well-being
MS4	Municipal Separate Storm Systems
MWH	Modified Warmwater Habitat
NPDES	National Pollutant Discharge Elimination System
NPS	Non-point source
NPS-IS Plan	Non-point source – implementation strategic plan
NWQI	National Water Quality Initiative
OAC	Ohio Administrative Code
ODA	Ohio Department of Agriculture
ODH	Ohio Department of Health
ODNR	Ohio Department of Natural Resources
OMZA	outside mixing zone average
OMZM	outside mixing zone minimum
ORAM	Ohio Rapid Assessment Method
ORC	Ohio Revised Code
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCR	Primary Contact Recreation
PEC	probable effects concentration
POTW	publicly owned treatment works
PTI	permit to install
PTO	permit to operate
PWS	public water supply
QHEI	Qualitative Habitat Evaluation Index
RM	river mile
SCR	Secondary Contact Recreation
SRV	sediment reference value
SSH	seasonal salmonid habitat
SSO	sanitary sewer overflow
STV	statistical threshold value
SWIF	Surface Water Improvement Fund
SWMP	storm water management plan
TALU	tiered aquatic life use
TDS	total dissolved solids
TEC	threshold effects concentration
TKN	total Kjeldahl nitrogen
TMDL	total maximum daily load
TOC	total organic carbon
TP	total phosphorus
TSS	total suspended solids

UAs	urban areas
UAA	use attainability analysis
USGS	United States Geological Survey
VIBI	Vegetation Index of Biotic Integrity
VOC	volatile organic compound
WAU	watershed assessment unit
WQS	water quality standards
WWH	Warmwater Habitat
WWTP	wastewater treatment plant

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Document Format

This Quality Assurance Project Plan follows the Quality Assurance Project Plan Standard, Directive Number ***CIO 2105-S-02.0***, effective July 18, 2023.

A4. Project Purpose, Problem Definition, and Background

Water quality monitoring will be completed for 21 Section 319(h) projects that are being locally implemented under subgrants from Ohio EPA.

1. Where appropriate, and as staffing resources allow, establish baseline biological and physical habitat quality in Section 319(h) project water bodies by evaluating fish and macroinvertebrate assemblages, wetland plant communities, and/or by assessing physical habitat conditions. Where applicable, this may include evaluation of the attainment status of designated or recommended aquatic life uses, or wetland antidegradation categories of the water bodies expected to be restored by each project.
2. Where appropriate, and as staffing resources allow, post-project biological monitoring is proposed to occur again at Section 319(h) project sites where restoration work has been completed for at least one year.
3. Where appropriate, and as staffing resources allow, a report summarizing the biological and physical habitat results by project will be provided.

A5. Project Task Description

The collected data would, ideally, provide insight into water resource conditions at each of the list project areas before and after implementation of stream improvement projects. The biological assessment and physical habitat data can also be used to assess physical habitat condition at each water body project area, assign/confirm an appropriate aquatic life use, and determine aquatic life use (ALU) attainment status. In some instances, causes and sources of aquatic life attainment can be ascertained. Biological community and physical habitat results collected *at least* one to two years after project completion are used to compare with baseline monitoring results collected prior to project implementation.

This QAPP was specifically developed to encompass Ohio EPA's §319/NPS Program pre- and post-monitoring for many recently executed grants, and some recently closed §319 and GLRI grant awards (mostly pass-through sub-awards for projects implemented by sub-awardees implementing entities). Ohio EPA is the only entity collecting data relative to these awards, and for select projects where surface water monitoring is applicable, that data is collected before project implementation and after project implementation (by several years).

Depending on the sampling type, field season will run from May 1 to October 31, 2025. The index period for fish and nutrient sampling is during the summer low flow period of June 15 – October 15. The macroinvertebrate sampling index period is slightly shorter, from June 15 – September 30. The draft report is usually completed within 2-3 years following the conclusion of field work.

The following table includes reference to applicable §319 program grant awards covered by this QAPP (and potentially other annual 319 program monitoring QAPPs).

Table 3 – List of projects that will receive pre- and post-project monitoring in 2025.

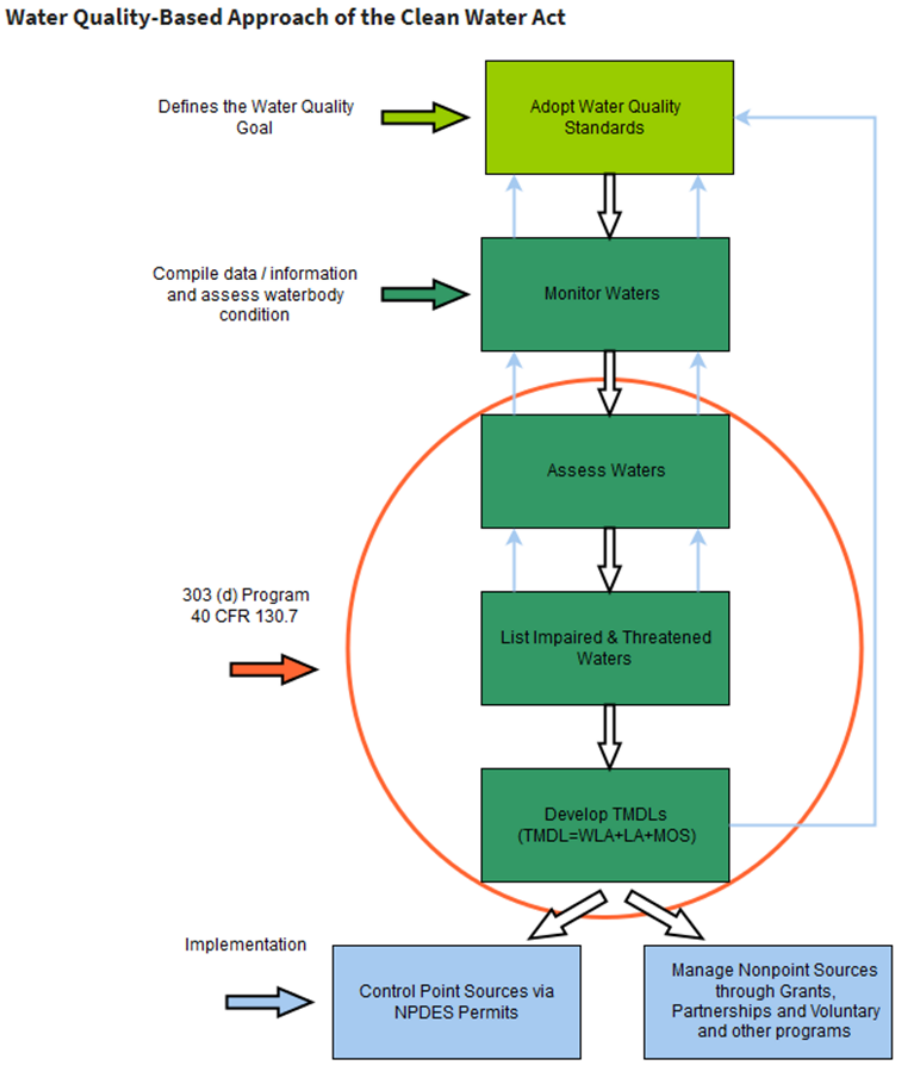
Ohio EPA Grant Number	Award-Project Name	Project Sponsor	Federal Funding Requested
Pre-project monitoring			
25(h)319-12	Furnace Run at Wheatley Road Stream Restoration Project	Richfield Township	$362,800.00
25(h)319-16	West Liberty Lions Park Stream Restoration	Village of West Liberty	$266,054
25(h)319-21	Spruce Stormwater Wetland Basin	City of North Olmstead	$375,000
25(h)319-22	Grand River Casement Floodplain Restoration	West Creek Conservancy	$123,920
25(h)319-25	Broughton Preserve Floodplain and Stream Restoration Project	Rural Action	$264,510
25(h)319-27	Fayetteville Dam Removal & Stream Restoration	Brown Soil & Water Conservation District	$385,790
Post-project monitoring			
18(h)EPA-21	Stream Restoration/Streambank & Riparian Restoration	West Creek Conservancy	$262,878
18(h)EPA-26	Stream Restoration, Streambank Stabilization, Wetland Restoration & Riparian Restoration	Clermont Soil & Water Conservation District	$90,056

A6. Information/Data Quality Objectives and Performance/Acceptance Criteria

The projects that are recommended for FY25 Section 319(h) subgrant funding, followed by completed projects that will be evaluated for post-project water resource improvements. These new projects have been identified through the internal review process 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 USEPA 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 319(h) projects are assigned to the following EA3 project: Grant Year 2025 319 Projects (Pre-Project Monitoring). The implementation projects are listed and displayed in Appendix 2.

The data collected during this watershed survey fulfills multiple objectives:

- Assess and report on the status of Water Assessment Units (WAUs) as required by the Clean Water Act (CWA) 305(b) and 303(d)
- Assess causes and sources of impairment
- Total Maximum Daily Load (TMDL) development and implementation
- Determine and evaluate water quality trends at watershed, stream, and site level scales
- Evaluate the effectiveness of projects on water quality.



Source: ***https://www.epa.gov/tmdl/overview-identifying-and-restoring-impaired-waters-under-section-303d-cwa***

Figure 3- Water Quality-Based Approach of the Clean Water Act

Monitor and Assess Ohio's Waters

Under Section 305(b) of the Clean Water Act (CWA), Ohio EPA is required to assess and report on the quality of Ohio's waters. Ohio EPA determines attainment/non-attainment status of water quality standards in three main ways:

- Three aquatic community indices serve as the principal arbiters of Aquatic Life Use (ALU) attainment or condition status of Ohio's lotic waters: Index of Biotic integrity (IBI), Modified Index of well-being (MIwb) and the Invertebrate Community Index (ICI). Where quantitative macrobenthos data are unavailable, corresponding narrative equivalents derived from qualitative sampling are used in lieu of ICI scores (need a reference). Further explanations of Ohio EPA's biocriteria can be found in Ohio Administrative Code (OAC) Chapter 3745-1-07 and additionally at ***epa.ohio.gov/static/Portals/35/rules/01-all.pdf***

Under Section 303(d) of the CWA Ohio EPA is federally obligated to list impaired and threatened waters by determining attainment/non-attainment status of water quality standards. To support this objective, the following data is planned to be collected: fish and macroinvertebrate community assemblages, physical stream habitat evaluation (Qualitative Habitat Evaluation Index, or QHEI), and either Vegetation Index of Biotic Integrity (VIBI), Ohio Rapid Assessment Method for Wetlands (ORAM), or wetland delineation data for assessing wetland projects.

Assess Causes and Sources of Impairment

Chemical and physical monitoring is a direct measure of the CWA goal and can be used to determine the factors that limit biologic attainment. Specific objectives for each planned measurement are included below:

- **Physical Habitat Assessments:** The Qualitative Habitat Evaluation Index (QHEI) (Rankin 1989, 1995, and Ohio EPA 2006) is a method that evaluates microhabitat necessary to support biological assemblages consistent with Ohio's tiered ALU designations. Channel morphology, lithography, gradient, and riparian conditions are fundamental components of riverine habitat, affecting the diversity, structure, organization, and viability of aquatic communities. Because the QHEI explicitly measures the presence, absence, or relative function of these key attributes, it serves as an important and cost-efficient monitoring tool to describe and rank macrohabitat quality, evaluate habitat effects in surface water assessments, and aid in establishing ALU potential for underperforming waters.
- **Use Designations**: All data collected as part of this survey will form the basis of UAAs for unassessed waters, verify or reaffirm existing beneficial uses, or readjust the current aquatic life use designations as appropriate for updates to the WQS.

TMDL Implementation

The Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the Clean Water Act, focuses on identifying and restoring polluted rivers, streams, lakes, and other surface water bodies. TMDLs are prepared for waters identified as impaired on the 303(d) list in the Integrated

Report. A TMDL is a written, quantitative assessment of water quality problems in a water body and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet Water Quality Standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a water body. 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 the various 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, gathering ambient information that will factor into the wasteload allocation, and ascribing causes and sources of use impairment. These data are necessary precursors to the development of effective control or abatement strategies.

A7. Distribution List

This QAPP will be distributed to the following division management and staff, saved on the DSW collaboration site and posted on the DSW Biological and Water Quality Monitoring and Assessment webpage.

Table 1 — Distribution List

Name/Title	Contact Email/Phone	
DSW Central Office		
Ashley Ward, Acting Environmental Administrator	***mark.johnson@epa.ohio.gov***	(614) 644-2274
Erin Sherer, Asst. Environmental Administrator	***erin.sherer@epa.ohio.gov***	(614) 644-2018
Joby Jackson, Asst. Environmental Administrator	***joby.jackson@epa.ohio.gov***	(937) 285-6029
VACANT, Environmental Manager	VACANT	(614) 644-2876
Melinda Harris, Environmental Manager	***melinda.harris@epa.ohio.gov***	(614) 728-1357
Mariah Hood, Environmental Specialist 3	***mariah.hood@epa.ohio.gov***	(614) 644-2865
Katherine Harris (QA/QC Officer)	***katherine.harris@epa.ohio.gov***	(614) 644-2014
Ruth Briland, Environmental Specialist 3	***ruth.briland@epa.ohio.gov***	(614) 644-2046
Ben Rich, Environmental Supervisor	***benjamin.rich@epa.ohio.gov***	(614) 836-8772
Leah Kaldy, Environmental Specialist 2	***leah.kaldy@epa.ohio.gov***	(614) 836-8784
Andrew Phillips, Environmental Specialist 2	***andrew.phillips@epa.ohio.gov***	(614) 836-8773
Josh Griffin, Environmental Manager	***joshua.griffin@epa.ohio.gov***	(614) 265-6685
Rick Wilson, Environmental Specialist 3	***rick.wilson@epa.ohio.gov***	(614) 644-2032
Anna Kamnyev. Environmental Manager	***anna.kamnyev@epa.ohio.gov***	(614) 644-2020
Jeff Boyles, Environmental Supervisor	***jeffrey.boyles@epa.ohio.gov***	(614) 644-2494
Matthew Lamoreaux, Environmental Specialist 3	***matthew.lamoreaux@epa.ohio.gov***	(614) 644-2327

A8. Project Organization

Table 2 — Roles and Responsibilities.

Individual(s) Assigned:	Responsible for:	Authorized to:
Division of Surface Water		
Ashley Ward Acting DSW Chief	Overall administration of division.	Confirm project existence; approve staff and capital resources; approve plans; edit reports.
Erin Sherer Assistant Chief	Overall administration of division.	Confirm project existence; approve staff and capital resources; approve plans; edit reports.
Vacant Assessment & Modeling Section Manager	Overall management of monitoring section.	Assign staff; approve plans; edit reports.
Joshua Griffin NPS, TMDL and CAFO Section Manager	Overall management of monitoring section.	Assign staff; approve plans; edit reports.
James Fath TMDL and IR Unit Supervisor	Coordination of biennial Integrated Report update; TMDL program development.	Assign and support staff; edit reports.
Melinda Harris Standards and Tech Support Section Manager	Quality management (QAPPs, SOPs); staff training; water quality standard rules.	Approve plans and edit reports.
Katherine Harris Standards and Tech Support Staff	DSWs quality management program.	Develop and implement field QA/QC guidelines. Track field QA/QC and staff training.
Mariah Hood Standards and Tech Support Lead Worker	Water quality standard criteria development and rule updates.	Help plan study. Make recommended beneficial use changes.
Ben Rich Ecological Assessment Unit Supervisor	Supporting biological field crews with supplies, equipment and training.	Obtain approvals and signatures; develop budgets; conduct field audits; edit reports.
Ruth Briland Assessment and Modeling Section Lead Worker	Assist with property access, track project progress, managing data and compiling information for Integrated Report.	Provide landowner information for access consent. Upload fish, bug and chemistry data into EA3. Review and comment on reports. Write assigned Integrated Report sections.
Leah Kaldy Study Coordinator/Ecological Assessment Unit Bug Crew Leader	Macroinvertebrate population assessments and overall study coordination.	Plan and coordinate study. Schedule and complete assigned field activities. Tabulate data and write discussion for technical report.
Andrew Phillips Ecological Assessment Unit Fish Crew Lead	Fish population assessments. Habitat assessments.	Schedule and complete assigned field activities. Tabulate data and write discussion for technical report.

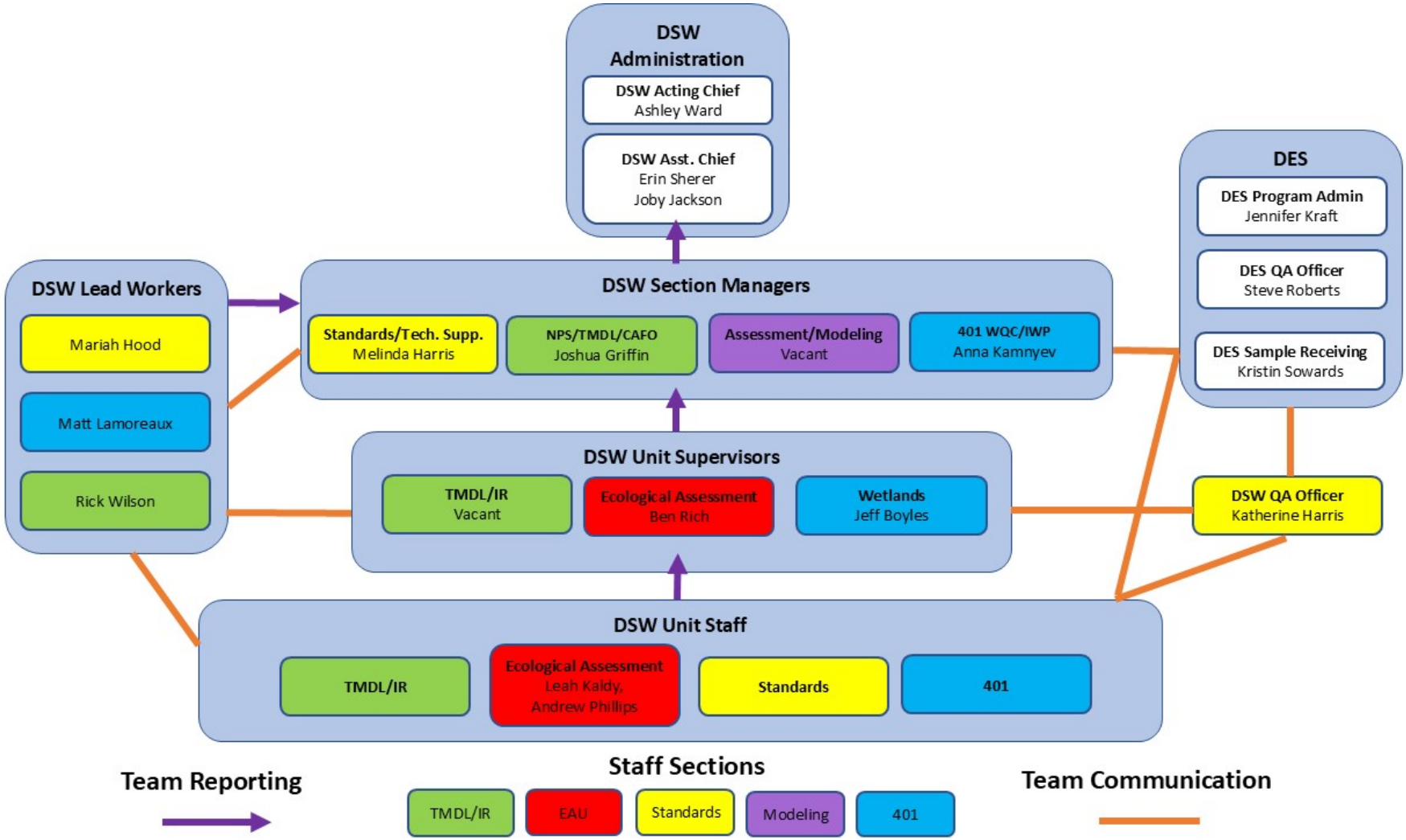
Individual(s) Assigned:	Responsible for:	Authorized to:
Anna Kamnyev 401/Isolated Wetland Program Section Manager	Overall management of monitoring section.	Assign staff; approve plans; edit reports.
Jeff Boyles Mitigation/Wetland Ecology/ODOT Unit Supervisor	Supporting wetlands field crews with supplies, equipment and training.	Obtain approvals and signatures; develop budgets; conduct field audits; edit reports.
Matthew Lamoreaux Wetlands Ecology Lead Worker	Wetland assessments.	Schedule and complete assigned field activities. Tabulate data and write discussion for technical report.

A9. Project Quality Assurance Manager Independence

The Project QAM shall be independent of environmental information operations. The Project QAM's independence is ensured through separation of sections and reporting chains within Ohio EPA's Division of Surface Water. The Project QAM has oversight authority and responsibilities for planning, documenting, coordinating, and assessing effectiveness of the QAPP. The QAM has authority to access and discuss quality-related issues with senior management outside of the direct supervisory chain as necessary.

A10. Project Organization Chart and Communications

Figure 1 — Organization Chart.



A11. Personnel Training/Certification

All staff who conduct surface water sampling, whether from streams or lakes, receive initial training by someone experienced in the proper techniques required, usually a supervisor or veteran employee. Mandatory refresher training is done on an annual basis for all Agency surface water samplers. Annual boating safety refresher training is required by internal safety policy SP 10-12. Employees who operate watercraft must also demonstrate proficiency in boat operation to their supervisor on an annual basis. Supervisors should also conduct an annual field audit to verify standard operating procedures are followed.

A12. Documents and Records

Microsoft® SharePoint is used as a document library. Access is through ***Ohio EPA's SharePoint collaboration site***.

Examples of documents posted to this location include;

Pre-sampling documents:

- Preliminary information sheets
- Property access forms
- Draft and final QAPP versions

Project documents:

- All data files
- Draft report sections
- Changes to sites, staff, parameters, etc. should be filed in the project folder by the study team leader
- Project photos will be moved to and stored in the Lynx Photo System. All files and original data sheets will be initially retained by Ohio EPA at the Groveport Field Office while the survey report is being finalized in accordance with established retention schedules.
- Long term survey information and data storage will take place at the State's Storage Facility in accordance with established retention schedules.

Changes in project leadership or major actions which might affect the DQOs require an updated QAPP and signoff sheet. The study team leader shall retain copies of all management reports, memoranda, and all correspondence between team members.

For analytical samples the original chain of custody form is delivered to DES along with the samples and retained by the Laboratory. A copy of the form may be kept in a binder by the sample collector as well. After water samples are analyzed and the results are approved by the DES QA Officer the data will be released to Sample Master® and subsequently uploaded to DSW's Ecological Assessment and Analysis Application (EA3). The sample collector reviews laboratory sheets for completeness and accuracy, validates field QC, adds comments and completes edits if necessary and approves the sheet. All data approved in EA3 is sent to U.S. EPA's Water Quality Exchange.

Datalogger temperature data files will be created for each stream location. The district study team will download the data files from the dataloggers and transmit them to the Assessment and Modeling Section staff for data reduction and analysis.

Original fish and QHEI data sheets will be retained at the Groveport Field Office. Data from the field sheet is manually entered into the EA3 database using the appropriate data entry screen. The sheets are double entered to minimize mistakes.

Group B: Implementing Environmental Information Operations

B1. Identification of Project Environmental Information Operations

The site selection process for §319 sampling is determined the grant awards for the program. The projects had pre-implementation monitoring done before the project is started, and post-implementation sampling for the projects completed. The sampling is then used to determine the project's impact on water quality.

A summary of the planned sampling effort is shown in Appendix 1. A detailed list of sampling sites and the type of sampling at each is shown in Appendix 2. A list of facilities regulated by individual NPDES permit is shown in Appendix 3.

B2. Methods for Environmental Information Acquisition

Biological Community Assessment

Fish and macroinvertebrate sampling protocols are detailed in ***Ohio EPA Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities*** (Ohio EPA 2015b).

A combination of quantitative and qualitative methods will be employed to monitor benthic macroinvertebrate communities. Quantitative collections are made using modified Hester-Dendy multiple plate artificial substrate samplers, deployed at all biomonitoring sites draining more than 20 mi^2, or at reference sites regardless of size. Once deployed, artificial substrates are left to colonize, in-stream, for a six-week period. Qualitative sampling will be conducted at all biomonitoring stations. This sampling method consists of a basic inventory of macroinvertebrate taxa from natural substrates, noting dominant taxa among major habitat types.

Fish will be sampled at each designated location using pulsed DC headwater, wading, backpack, or boat electrofishing methods depending on stream size at each sampling zone. Sites may be sampled once, twice, or more through the summer sampling season. Reasons why sites may be sampled twice (or even more) during the sampling index period could include: sites downstream from permitted dischargers, reference site locations, sites that did not meet goals during the first sampling pass, or areas that are prone to greater fluctuations or system instability. Typically, at least 4 weeks should elapse between sampling at a particular site. The number of passes may be adjusted as necessary based on best professional judgment of the Ohio EPA field staff. Reasons for a single pass monitoring at sites may include extremely difficult or time-consuming access, work delays related to weather, or the emergence of alterations (natural or otherwise) at points of access or sampling reach, rendering replication of the initial effort hazardous or costly. At least 10 percent of fish sampling locations will receive a second electrofishing sampling event. Fish are processed in the field, which includes identifying each specimen to species level, counting individuals at all sites, weighing individuals at wading and boat sites, and recording external abnormalities. Some specimens are preserved for further identification in the laboratory (if necessary) or to document new or noteworthy species records.

Wetlands Assessment

A wetland delineation assesses if an area meets the definition of a wetland that would be regulated under the Clean Water Act. The wetland delineation manual and its supplements can be found at ***www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/reg_supp/.*** The ORAM and VIBI determine the quality of wetland. The ORAM manual and VIBI field manual can be found ***here***. Ohio EPA will determine which wetland assessment method to use based on the type of work proposed at a specific site and whether the site needs pre-monitoring, post-monitoring, or both.

Ohio EPA will take a wetland delineation sample point for sites that re-establish wetland areas during post-monitoring. A wetland delineation sample point requires the rater to observe soil, hydrology, and vegetation using a combination of desktop and field analysis. Based on hydric soil, hydrologic and hydrophilic vegetation indicators listed within the wetland delineation manual and its supplements, the rater determines if an area meets wetland criteria. A wetland delineation can be performed any time of year.

The ORAM is a level 2 wetland assessment tool, developed by Ohio EPA, with a primary purpose of assigning a Category to naturally occurring wetlands. ORAM largely looks at the level of disturbance to the wetland and can be interpreted as a measure of intactness to natural condition. The method predicts that wetlands with less disturbance will be higher quality. This method requires the rater to perform a desktop analysis and a site visit. Information from both the desktop analysis and the site assessment are used to fill out the ten-page scoring form to determine a final score. The site assessment can be performed any time of year. Ohio EPA will assess wetlands using the ORAM for sites that require pre-monitoring and post-monitoring sites where the proposed work was enhancement or preservation.

The VIBI is used to standardize vegetation sampling techniques for the development of a functional assessment using vascular plants as indicator species. It is a level 3 assessment. There are four different versions of VIBI depending on which vegetative community the rater is sampling. The VIBI requires an in-depth field evaluation and has sampling period during the growing season between June 15 and September 15. The typical sample area for VIBI is a 20-meter by 50-meter ($1000m^2$). The rater locates the sample plot within the same plant community and hydrogeomorphic class to properly calculate the VIBI score. Each plant is identified to the species level and assigned a cover class on the field data sheet. The rater then enters this information into a spreadsheet that automatically calculates a final VIBI score. Ohio EPA will conduct a post-monitoring VIBI on sites that propose to re-establish, enhance, or preserve wetlands with either rare habitat types or are projected to be of the highest quality.

B3. Integrity of Environmental Information

Sample Master® software is used by DES to manage laboratory information. The sample collector logs into the system and places an order by selecting the appropriate project, stations to be sampled, and test group(s) to be analyzed. The program creates a chain of custody form and container labels for each site.

The analytical methods to be used in this study are provided in Appendix 4 along with the preservatives, holding times, and reporting limits. SOPs for the analytical methods are available upon request.

B4. Quality Control

Stream Habitat Evaluation

To ensure technical proficiency and promote standardized observations between and among all Ohio EPA field staff tasked with macrohabitat assessment, participation in annual QHEI refresher training is required. The training pre-dates the onset of sampling activities by several weeks, is field-based, and typically organized and lead by a senior Fish Evaluation Group (FEG) biologist. Participants are asked to independently generate a QHEI from one or several target stream segments; this followed by a group discussion, on-site, where each component of each of the five metrics that comprise the QHEI are reviewed in detail. In this way, all investigators are obliged to revisit guidance material and reaffirm the various definitions, categories, and related classifications that underpin this key assessment tool. The annual refresher has proved an efficient method to discipline observations made by front-line field staff and as such has served as a practical check on investigator drift.

Wetlands Evaluation

The wetland assessment at each site will be performed by the Ohio EPA wetland ecologist with assistance from other Ohio EPA staff. The Ohio EPA staff performing the wetland assessments are trained in ORAM, VIBI, and wetland delineation methods. They routinely practice ORAM and VIBI as part of their job duties. Ohio EPA staff also participate regular refresher courses and training events in these methods.

B5. Instruments/Equipment Calibration, Testing, Inspection, and Maintenance

This section is not applicable to this project.

B6. Inspection/Acceptance of Supplies and Services

This section is not applicable to this project.

B7. Environmental Information Management

Data collected for this project and other data previously collected by Ohio EPA will be used to develop data summaries for each waterbody.

The data management process is shared by the Division of Surface Water (DSW) and Division of Environmental Services (DES). DES uses Sample Master® software to manage laboratory information and DSW uses the Ecological Assessment and Analysis Application (EA3) to manage data. These programs are linked together to allow the transfer of information between the two systems. EA3 software is used to assign a permanent six-digit station ID number to each sampling location and to create a project name to associate locations so data can subsequently be exported and assessed in groups.

Field measurements are collected instantaneously using a multi-parameter meter and saved in an internal file storage system. These files are downloaded to the manufacturer's software, exported to Microsoft Excel® and then uploaded to Sample Master® so field data can be associated with chemistry data in the database.

Field and chemistry data tabulated in Sample Master® are eventually uploaded into EA3. Then, in EA3, the sample collector will review each data sheet for accuracy, validate field QC, add comments and complete edits, if necessary, before approving the sheet. This data is then available for use in IR reports. Once data sheets are approved in EA3, they are batch queried and imported into WQX (Water Quality Exchange) by the Assessment and Modeling Lead Worker. Imported data is exported to the Water Quality Portal (WQP) by WQX and made available to the public. All agency files are ultimately backed up and housed in the State of Ohio Computer Center (SOCC).

The project leader will maintain the project file in a dedicated folder on SharePoint. The goal or objective is to have a complete record of all decisions about modifications of data collection, validation, or interpretation between the QAPP signoff and project report completion. To achieve this, the project leader will need to be included on emails or otherwise receive summaries of all actions that meet the above description. Project photos should all be filed in the Lynx photo management system.

Group C: Assessment, Response Actions and Oversight

C1. Assessment and Response Actions

Assessments

Periodic assessment of field sites, field equipment, and laboratory equipment is necessary to ensure that data obtained meets project needs. This is an ongoing process that continues every day during project implementation, as well as on larger scale assessments that take place less frequently (*e.g.*, annually). The assessments generally focus on readiness and consistency of implementation but also are looking for continual improvement opportunities.

Daily assessments (for each day of project activities, as applicable) include assessment of field equipment and supplies, laboratory equipment and supplies, completeness of the day's samples and associated field notes, future needs, etc.

Response Actions

Despite best preparations, assessments may find situations requiring corrective actions. Small day-to-day level assessment findings are often addressed by the individual doing the assessment in the field and are common enough to the process to not necessitate a formal response.

- Inquiries concerning data quality are received

Corrective action implementation will be determined by the likelihood that the situation may affect the quality of the data. Field corrective actions will be brought to the attention of the study team for consideration as to their impact on the data, their potential interest to other sampling teams/subcontractors, any future considerations for process improvement, and for their potential inclusion to the quarterly reports.

Reporting and Resolution of Issues

Any audits or other assessments that reveal findings of practice or procedure that do not conform to the written QAPP will be corrected as soon as possible. The study team and QA coordinator will be notified regarding deviations.

Data Completeness

Success of the project will be judged by the resulting data fulfilling the needs outlined in the data objectives. Potential data gaps will be monitored as the project progresses and the project schedule will be revised to fill these gaps where they are determined to be significant or to potentially impact the fulfillment of project objectives.

C2. Oversight and Reports to Management

The project leader or district supervisor will receive regular updates from field staff throughout the sampling season and will report to division management during Senior Management Team meetings. Any problems that jeopardize completion of the project will lead to memorandum and consultation with program management and quality assurance staff.

The final summary will report all study results and findings. Aquatic life use attainment will be determined by biological criteria. Causes and sources of aquatic life use impairment will be identified and supported by stream habitat evaluations. Wetland delineation data will show if areas are meeting wetland criteria. For wetlands schedule for both pre-monitoring and post-monitoring, ORAM (or VIBI) scores will show if the proposed work was an improvement in wetland quality.

Group D: Environmental Information Review and Usability Determination

D1. Environmental Information Review

Data verification will be conducted by the study team with assistance from other DSW staff. This process will confirm that sample results received are congruent with samples submitted and parameters requested from the laboratory. The process will also result in summaries of any differences between initial sampling and methods planned in the QAPP and results reported and available. Differences may result from samples not being collected (due to weather, scheduling, etc.), samples not being submitted (due to accidents like broken containers, or delays resulting in being past holding times, etc.), problems at the laboratory (methods changing, containers or equipment

breaking), or other reasons. It is also possible that additional sampling would take place because of field observations/conditions. Documenting deviations from the QAPP is the responsibility of the project leader.

All fish, macroinvertebrate, and habitat data are hand-entered into the EA3 database using a double data entry method. This helps to minimize data entry errors. Final approval of data involves a reconciliation between the paper forms and the electronic data which is completed by the data collector or a database administrator in the Ecological Assessment Unit. Wetland delineation data forms, ORAM forms, and VIBI forms will be filled out in the field, then finalized and digitized in the office. The finalized forms will be reviewed by 401 management. Digital records of the forms will be kept within the wetland ecology folder on the Ohio EPA data servers.

Upon approval in EA3, field and laboratory data cannot be revised without intervention from database administrators in the Agency's Office of Information Technology Services (ITS).

D2. Useability Determination

Biological and habitat field sampling results will be verified and validated based on field staff experience and qualifications and adherence to training and QA/QC procedures for current and new field staff available in Subsection 1, Part A (macroinvertebrates) and Subsection 2, Part A (Fish and Habitat) in *Biological Criteria for the Protection of Aquatic Life: Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities*.

The study team will make final decisions regarding validity and usability and will evaluate the sample collection, analysis, and data reporting processes to determine if the data is of sufficient quality to meet the project objectives. Data validation involves all procedures used to accept or reject data after collection and prior to use. These include screening, editing, verifying, and reviewing. Data validation procedures ensure that objectives for data precision and bias will be met, that data will be generated in accordance with the QAPP and SOPs, and that data are traceable and defensible. The process is both qualitative and quantitative and is used to evaluate the project.

Issues related to biological and habitat data uncertainty, including any patterns of analytical or field QC uncertainties, will be assessed by field staff and their management. For most situations, issues can be addressed with acknowledgement of factors captured in the sample metadata which can confirm, explain, and document the data quality concern. Significant, persistent, or unresolved issues will be brought to the attention of the project study team, division QC personnel, and Ecological Assessment Unit and/or DSW management for further evaluation. This combination of personnel will assess how to best label affected data for storage in the EA3 database and how to eliminate or limit any similar problems going forward. Consideration will also be given on how best to memorialize data limitations or anomalies as the data is transferred to other databases, including the WQ Portal, so that future users of the sampling data are aware of any data quality issues or limitations.

Appendix 1. Summary of Sampling Effort

Type of Sample	# of sites
Biology	
Fish	5
Macroinvertebrate (qualitative)	5
Habitat Only	3
Wetlands	
ORAM, VIBI, Invasive Species Survey, wetland delineation data	0

Appendix 2. Streams, Sampling Locations, and Sampling Type.

Pre-Project Monitoring

Station	Stream or receiving waterbody(s)	Station Name	Aquatic Life Use	River Code	River Mile	Drain-age Area	Latitude	Longitude	Project	Sampling
304638	Trib. to Furnace Run (3.18)	TRIB. TO FURNACE RUN (3.18) @ GLENCAIRN FOREST DR.	Undes.	19-020-005	1.00	0.9	41.221784	-81.619776	Furnace Run at Wheatley Road Stream Restoration Project	BIO
203033	Hefflefinger Ditch	HEFFLEFINGER DITCH AT WEST LIBERTY @ MOUTH	CWH	14-100-009	0.10	0.2	40.255015	-83.746382	West Liberty Lions Park Stream Restoration	BIO
G02S13	Grand River	GRAND R. AT PAINESVILLE @ N. END OF PARK, ADJ. GOLF COURSE	EWH	03-001-000	6.1	687.0	41.735058	-81.234820	Grand River Casement Floodplain Restoration	QHEI only
302377	Second Creek	SECOND CREEK NEAR DEVOLA, ADJ. ST. RT. 821	WWH	17-001-018	0.40	2.3	39.455532	-81.453753	Broughton Preserve Floodplain and Stream Restoration	BIO
304639	Trib. to East Fork Little Miami River (56.17)	TRIB. TO E. FK. L. MIAMI R. (56.17) UPST. DAM	Undes.	11-100-011	0.55	0.2	39.183370	-83.928262	Fayetteville Dam Removal & Stream Restoration	QHEI only
304640	Trib. to W. Br. Rocky River (0.76/1.85)	TRIB. TO W. BR. ROCKY RIVER (0.76/1.85) DST. SHERWOOD DR.	Undes.	13-200-014	0.70	0.7	41.399607	-81.937735	Spruce Stormwater Wetland Basin	QHEI Only

BIO – Biological (fish, macroinvertebrate, and salamanders if present) & habitat sampling
H – Habitat sampling only
W – Wetland sampling
DA – Drainage Area (mi^2)
RM – River Mile.

Post-Project Monitoring

Station	Stream or receiving waterbody	Station Name	River Code	River Mile	Drainage Area	Latitude	Longitude	Project	Sampling
304239	Trib. To West Ck. (5.25)	TRIB. TO WEST CK. (5.25) UPST. W. RIDGEWOOD DR.	19-001-051	0.30	0.2	41.386463	-81.702257	West Creek-Padua Stream and Floodplain Restoration	BIO
304016	Trib. to Salt Run (1.04/0.68/1.6)	TRIB. TO SALT RUN (1.04/0.68/1.6) @ SHOR PARK	11-103-003	0.20	0.1	39.109219	-84.240359	Stream Restoration, Streambank Stabilization, Wetland Restoration & Riparian Restoration	BIO

BIO – Biological (fish, macroinvertebrate, salamander) & habitat sampling
H – Habitat sampling only
W – Wetland sampling
DA – Drainage Area (mi2)
RM – River Mile.

Appendix 3. Project Descriptions

Pre-Project Monitoring

Furnace Run at Wheatley Road Stream Restoration	Pre-Project Baseline Monitoring (2025) **Project number:** 25(h)319-12 **Stream sampled:** Furnace Run

Summary:
This stream restoration project is located on one of the headwater branches of Furnace Run, a tributary to the Cuyahoga River. The project is located on property owned by the Glencairn Homeowners Association (HOA), situated on the north side of Wheatley Road in Richfield Township at the entrance to Cuyahoga National Park. The Glencairn HOA is working collaboratively with Richfield Township, which will remove an impounded section of Furnace Run and restore it as a free-flowing stream. In conjunction with this project the Glencairn HOA has already agreed to record either a conservation easement or environmental covenant on the restored area to maintain the water quality and conservation benefits of this project in perpetuity. This project is identified as a priority within the Cuyahoga River: Furnace Run NPS-IS Plan, which received full approval in January 2025.

Currently, this headwater branch of Furnace Run is impounded as a shallow pond without any riparian habitat and becomes laden with algae every summer. The riparian area around the pond is currently landscaped with manicured grass, which will be restored to a native floodplain and riparian ecology as part of this project, improving stormwater filtration and floodplain function to benefit Furnace Run water quality.

Project Deliverables:

- Return a natural flow and sediment transport regime to this section of the Furnace Run headwaters by removing an approximately 0.5-acre impoundment.
- Restore an estimated 262 linear feet of the Furnace Run headwaters.
- Remove landscaped grass areas and re-naturalize the riparian corridor of Furnace Run with native vegetation to connect approximately 0.5-acres of floodplain.
- Record a conservation or environmental covenant to protect the restored area in perpetuity.

Environmental Benefits:
Successful completion of this project will restore in-stream flow and habitat metrics, allowing opportunities for fish passage and fauna development. Estimated load reductions using STEPL Model include: nitrogen (923 lbs./year), phosphorus (265 lbs./year), and sediment (165 tons/year).

Pre-project Monitoring:
One site will be located just downstream from the proposed project area on the unnamed tributary to Furnace Run. Subsequent post-project monitoring will occur after the dam removal within the project area.



Figure 3- 1 – Project area overview for Furnace Run Restoration at Wheatley Rd. The proposed project area is within the blue circle.

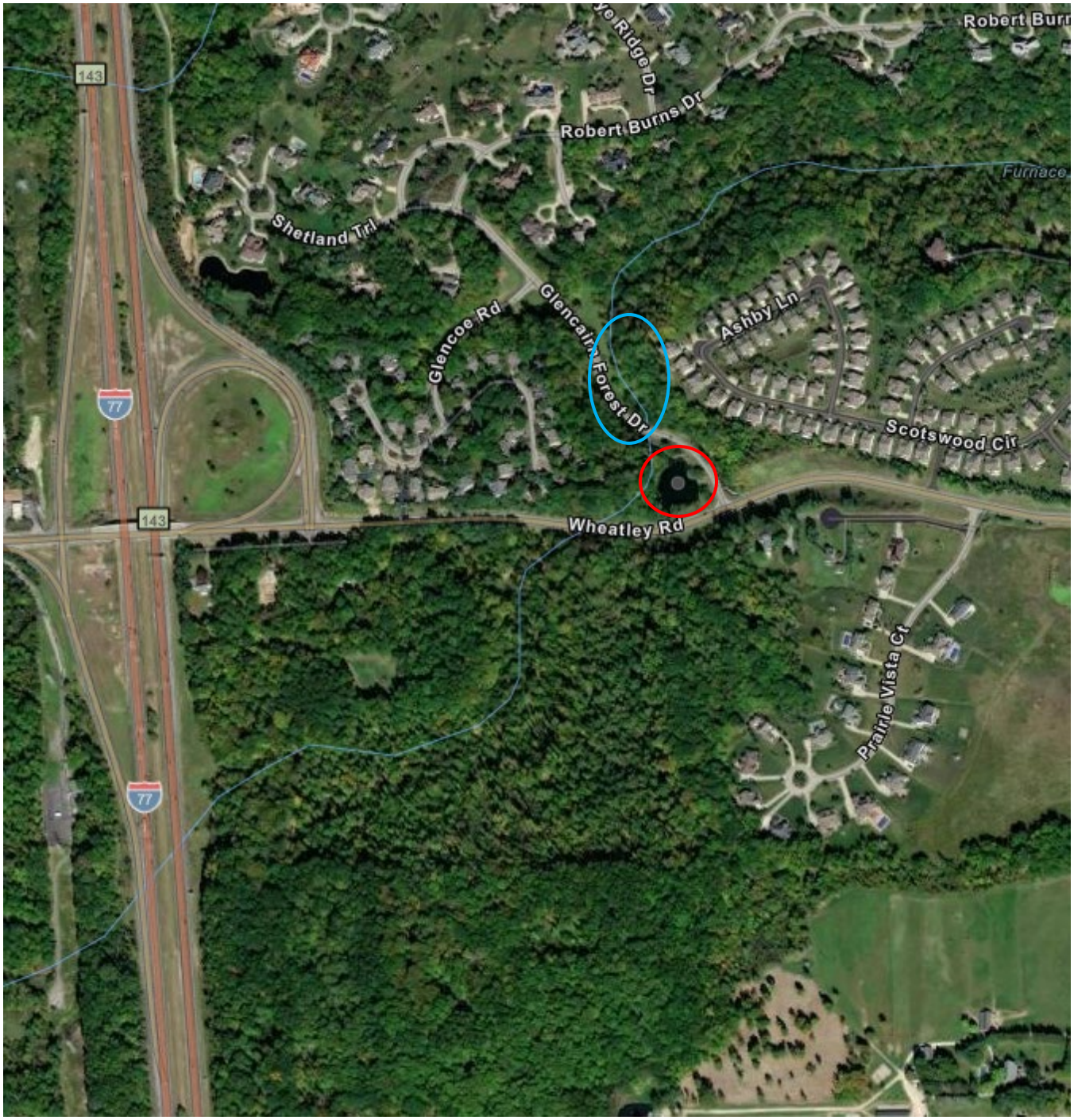


Figure 3-2 – Project area overview for Furnace Run headwaters restoration. Pre-project biological monitoring proposed to occur downstream (blue circle) from the project area (red circle).

West Liberty Lions Park Stream Restoration

Pre-Project Baseline Monitoring (2025)

Project number: 25(h)319-16

Stream sampled: Hefflefinger Ditch

Summary:

This stream restoration project is to occur within the West Liberty Lions Park, located between Baird Street and Township Road 174 in West Liberty, Logan County, Ohio. The unnamed tributary that flows through the park converges with the Mad River headwaters at river mile 52.2 and drains an estimated 200-acres of agricultural land upstream of the park, in addition to draining a portion of the maintained lawn within the park. The entirety of the unnamed tributary has been channelized with no riparian habitat and this, coupled with an upstream drainage tile, has led to bank erosion and in-stream sedimentation. The unnamed tributary lacks any sinuosity, in-stream cover, or natural stream sequences. There is also no riparian habitat along the tributary and only a very narrow riparian buffer area along the Mad River within Lions Park.

This project will increase the sinuosity of the unnamed tributary within Lions Park for 500 linear feet before it flows into the Mad River. Approximately 1.2-acres of riparian buffer habitat will be established around the tributary and will be planted with native riparian seed, shrubs, and trees to provide shade. A 0.5-acre native riparian buffer along the Mad River within Lions Park will also be planted. An estimated 20,000 people visit Lions Park annually, and an accessory benefit of this project is the opportunity for public outreach and the educational benefit for the community to interact with a stream restoration project.

Project Deliverables:

- Increase the sinuosity of the tributary within Lions Park for 500 linear feet before it flows into the Mad River.
- Establish 1.2-acres of riparian buffer habitat around the tributary with native riparian seed, shrubs, and trees for shade.
- Install five bank stabilization structures and construct riffle pool sequences within the tributary.
- Expand the riparian buffer along the portion of the Mad River within Lions Park with native plantings to create a 20-40 ft wide, 0.5-acre riparian zone.

Environmental Benefits:

Successful completion of this project will improve or increase aquatic habitat metrics. Estimated load reductions using STEPL Model include: nitrogen (58.6 lbs./year), phosphorus (29.3 lbs./year), and sediment (29.3 tons/year).

Pre-project Monitoring:

Pre-project biological and habitat monitoring will be conducted at one location in Hefflefinger Ditch.



Figure 3- 3 – Project area overview for West Liberty Lions Park Stream Restoration. The red boundary is Lions Park, and the blue circle indicates the tributary reach to be evaluated for pre-project monitoring.

Grand River Casement Floodplain Restoration	Pre-Project Baseline Monitoring (2025) **Project number:** 25(h)319-22 **Stream sampled:** Grand River

Summary:

The proposed Grand River Casement Restoration Project entails acquisition and restoration of a 67-acre property that includes the former Casement Club golf course, situated along 0.75 miles of Grand River frontage in the City of Painesville and Painesville Township in Lake County. The Casement property is situated almost entirely in the Grand River floodplain and is located along an impaired stretch of the Grand River. The Red Creek-Grand River NPS-IS identifies the Grand River downstream of SR 84 (encompassing the project area) as Critical Area 1 due to substantially worse water quality metrics compared to upstream in the watershed where the Grand River is in attainment of either Exceptional Warmwater Habitat or Warmwater Habitat standards. Causes of impairments to in-stream habitat quality in Critical Area 1 identified in the Red Creek-Grand River NPS-IS include habitat alteration from urban/suburban runoff and hydromodification; siltation and sedimentation from riparian deforestation, streambank erosion, channel scour and bank failure; flow alteration and imperviousness; and organic enrichment, dissolved oxygen and temperature change caused by urban/suburban stormwater runoff.

West Creek Conservancy's restoration of the Casement property seeks to address several of these sources of impairment by restoring natural hydrology and floodplain function throughout the Property to permit natural infiltration and sediment/nutrient settling and reduce velocity of high energy flows. Restoring native habitat including riparian forest throughout the Casement property will help prevent erosion and cool water temperatures, while providing habitat for a variety of species. Activities include restoring, enhancing and expanding wetlands and vernal pools with shallow grading, seepage berms and addition of woody debris/habitat structures; restoring hummock & hollow microtopography and removing tile drains to rehydrate the floodplain; revegetation and reforestation utilizing dense planting clusters; installing in-stream woody debris jams in an ephemeral drainage capturing stormwater from east of the Casement property to promote floodplain activation; and invasive species management.

Project Deliverables:

- Restore and stabilize 950 ft oxbow wetland channel to reestablish connectivity with the Grand River mainstem.
- Install four log jams and three live wattle fences for in-stream habitat and erosion/sediment control in the 950 ft oxbow channel.
- Reforest with native species by means of cluster/pod planting across approximately 30-acres of floodplain forest, forested wetlands, and vernal pools.

Environmental Benefits:
Successful completion of this project will improve or increase aquatic habitat metrics. Estimated load reductions using STEPL Model include: nitrogen (76 lbs./year), phosphorus (9 lbs./year), and sediment (2 tons/year).

Pre-project monitoring:
Sampling results from the 2020-2021 statewide large rivers survey will be used as pre-project monitoring information for this effort.

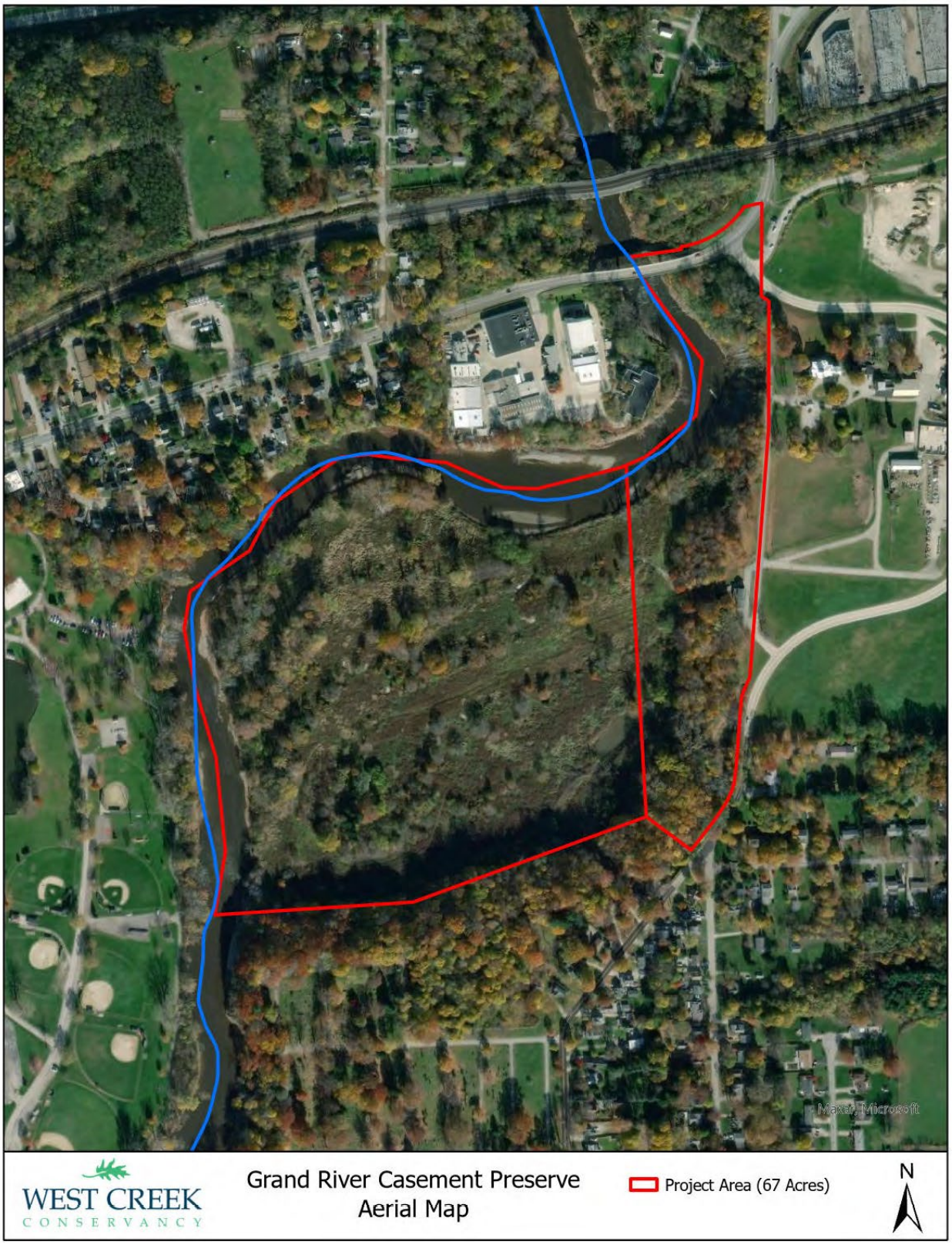


Figure 3-4 – Project area overview for Grand River Casement Floodplain Restoration. The proposed acquisition area is displayed by the red polygons and the blue circle trace indicates the flow path of the Chagrin River through the proposed project area.

Broughton Preserve Floodplain and Stream Restoration

Pre-Project Baseline Monitoring (2025)

Project number: 25(h)319-25

Stream sampled: Second Creek

Summary:
The Broughton Preserve Floodplain and Stream Restoration project site will occur adjacent to and within Second Creek, which discharges into the Muskingum River at river mile 3.58. The 4.5-acre project site is located within the Broughton Nature and Wildlife Education Area, which encompasses over 800-acres of publicly accessible natural land near Marietta, Ohio. This preserve experiences over 100,000 visits annually and is the major nature and recreational area for the city of Marietta. Current site conditions in the project area include an insufficient riparian corridor, severe stream bank erosion, and disconnected floodplain which are all contributing to habitat loss along Second Creek.

This project aims to improve the riparian corridor along approximately 2,500 linear feet of Second Creek, addressing 2.3% of the approximately 106,569 linear feet of the riparian corridor issues within the watershed. Floodplain connectivity will be increased, and stream bank erosion will be reduced via natural channel design techniques along 600 linear feet of Second Creek. The primary benefit of this project will be reductions in nutrient and sediment loadings into the Muskingum River culminating from natural floodplain restoration, increased riparian buffer areas, and stream bank stabilization.

Project Deliverables:

- Restore 2,500 linear feet of riparian corridor along Second Creek.
- Restore 600 linear feet of Second Creek.
- Remove 4-acres of invasive plant species and replace them with native herbaceous seed.
- Plant 4.5-acres with a total of 1,853 trees, shrubs, and live stakes, 109 of which will be larger trees.

Environmental Benefits:
Successful completion of this project will reduce nutrient and sediment loading into the Muskingum River by restoring natural floodplain connection, increasing riparian buffer areas, and reducing bank erosion along Second Creek. Estimated load reductions include: nitrogen (228.75 lbs./year), phosphorus (25.73 lbs./year), and sediment (8.2 tons/year).

Pre-project Monitoring:
Pre-project biological and habitat monitoring will be conducted at one location in Second Creek through the proposed project area.

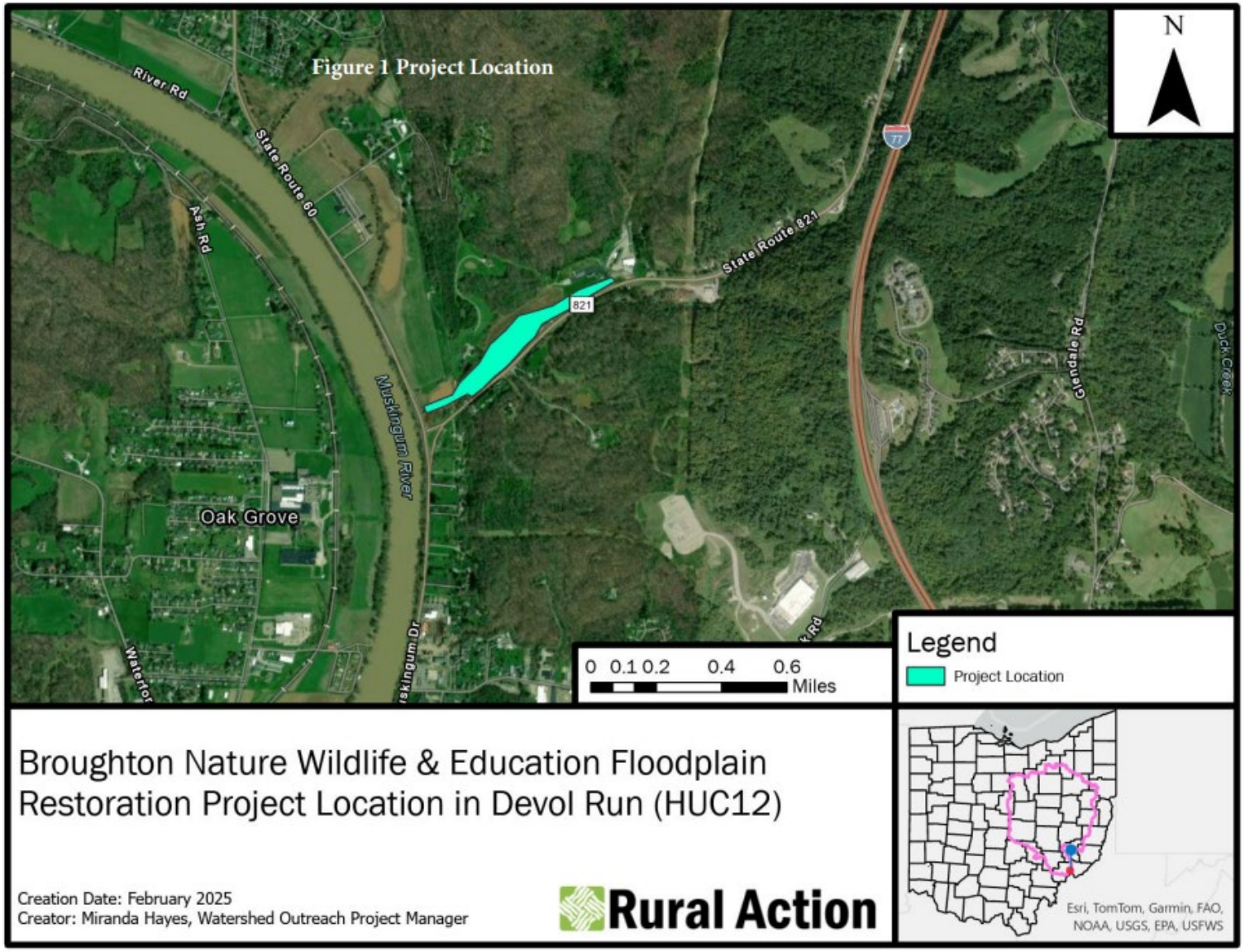


Figure 3-5 – Project overview for Broughton Preserve Floodplain and Stream Restoration Project. The figure was obtained from the project application.

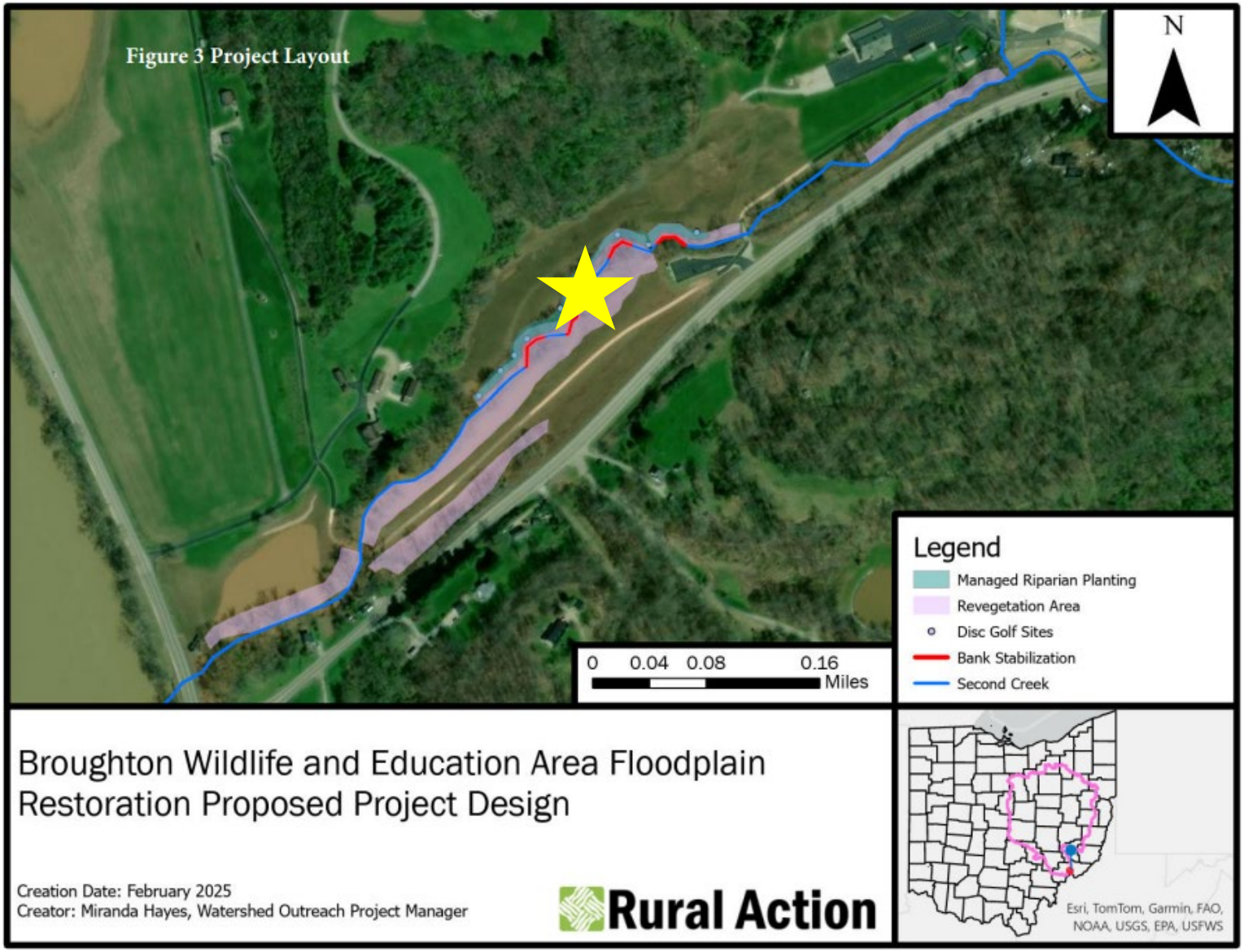


Figure 3-6 – Project area and sampling location for the Broughton Preserve Floodplain and Stream Restoration. Pre-project biological and habitat monitoring will occur around the yellow star. The figure was obtained from the project application.

Fayetteville Dam Removal & Stream Restoration	Pre-Project Baseline Monitoring (2025) **Project number:** 25(h)319-27 **Stream sampled:** Trib. to East Fork Little Miami River (56.17)

Summary:
Brown County Soil and Water Conservation District (SWCD) is working in partnership with the Fayetteville-Perry School District to remove a Class I low-head dam, originally constructed in the 1950s for agricultural use, on a 0.48mi^2 tributary to the East Fork Little Miami River. The dam is in the Solomon Run sub-watershed on the Fayetteville-Perry school campus, and the dam and lake area are currently fenced for student safety and the area is not utilized. The dam is located approximately 0.5 miles upstream of the confluence with the East Fork Little Miami River, and spans 219-ft long, 14.5-ft high, and has a pool area of 4-acres. The dam currently impounds approximately 800 linear feet of the tributary, and the pool experiences substantial fluctuations in water level and algae growth. Removal of the dam would restore natural stream flow and function.

Project Deliverables:

- Decommission and full removal of a Class I dam.
- Installation of three grade control structures.
- Placement of four beaver dam analogs.
- Construction of four pocket wetlands totaling approximately 0.46-acres.

Environmental Benefits:
Anticipated results and estimated annual load reductions: nitrogen (1,605 lbs./year), phosphorus (136 lbs./year) and sediment (93.1 tons/year).

Pre-project Monitoring:
Only pre-project QHEI scores will be collected from this stream. The sampling site will be located upstream from the earthen dam within the ponded areas.

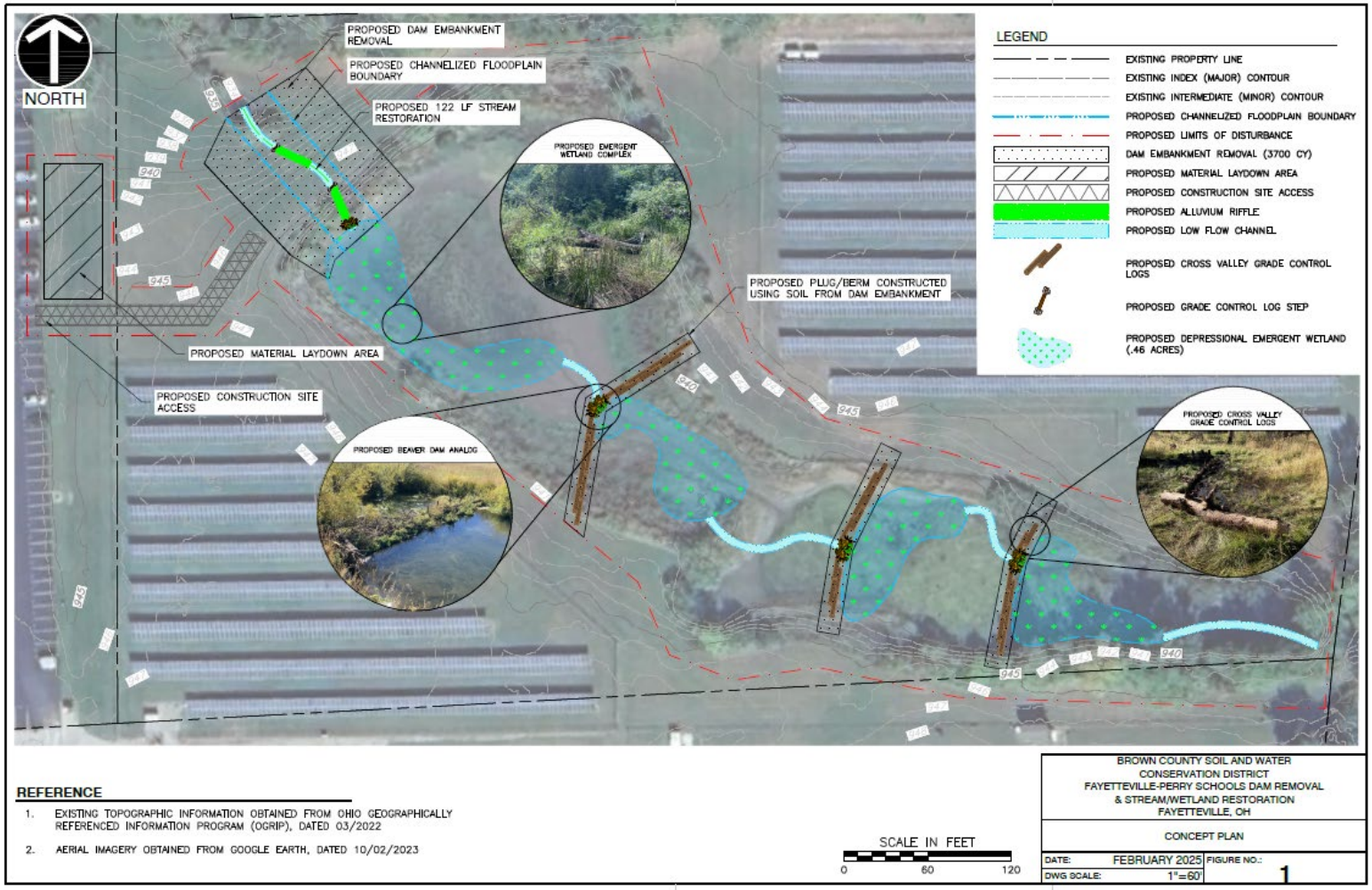


Figure 3-7 – Project area workplan for the Fayetteville Dam Removal and Stream Restoration Project.



Figure 3-8: Aerial overview of the proposed project area. Pre-project habitat monitoring will occur at the yellow pin.

Spruce Stormwater Wetland Basin	Pre-Project Baseline Monitoring (2025) **Project number:** 25(h)319-21P **Stream sampled:** Trib. to W. Br. Rocky River (0.76/1.85)

Summary:
The Spruce Property Stormwater Wetland Project will reduce nonpoint source pollutants, relieve neighborhood flooding, reduce downstream flooding and erosion, and improve the water quality of stormwater runoff from an urbanized residential neighborhood in North Olmsted, Ohio. The project site is located near the heavily channelized Root Ditch, a tributary to the West Branch of the Rocky River.

The project will design and construct a stormwater wetland basin on a 12-acre property owned by the City of North Olmsted. This site, previously home to Spruce Elementary School, is called the "Spruce Property." The basin will manage the discharge from Root Ditch, which collects runoff from residential areas to the north and south of I-480 and the east and west of Stearns Road, covering a total drainage area of approximately 454 acres.

Project Deliverables:
The project will install a diversion structure to divert flows into the basin west of the existing site entrance at Sherwood Drive. The basin will cover approximately 2.5 acres of the already cleared area, avoiding the need to clear additional trees or impact wetlands. The diversion structure will discharge into a stormwater treatment wetland basin approximately 2.5 acres in size and approximately 6 to 7 feet in depth. The basin will have a low-flow channel within the wetland to maximize nutrient uptake and pollutant breakdown by the wetland vegetation. Providing a hydraulic connection with the proposed wetland basin will enhance the existing wooded wetlands to the south and west. A control structure will be designed to reduce peak discharges to Root Ditch. Approximately 2.5 acres of stormwater treatment wetlands will be created as part of this project.

Given the residential setting, the project will consider the safety of the residents both during construction and for future use. The basin side slopes will be 1:3 to provide safe egress from the basin. There will be a buffer around the basin for future maintenance. Trail access will be provided from the neighborhood to the north and the already established walk/bike path along the north side of I-480. Upon completion of the wetland basin, the project site will transform into a residential park with trails, picnic areas, and educational features, including informational displays and public events.

Environmental Benefits:
Annual load reduction was calculated using the U.S. EPA’s Stormwater Calculator, identifying significant reductions due to the proposed project interventions. The estimated annual reduction of nonpoint source

pollutants for the Spruce Property project is as follows: nitrogen: 2,458 pounds/year; phosphorus: 266 pounds/year; sediment: 55 tons/year.

Pre-project Monitoring:
Pre-project biological and habitat monitoring is proposed for the unnamed tributary adjacent to the project area around the proposed outfall.



Figure 3-9: Project area overview for the Spruce Stormwater Wetland Basin. Biological and habitat monitoring will be attempted near the yellow star in the vicinity of the proposed flow control outlet, downstream from Sherwood Dr.

Post-Project Monitoring

West Creek-Padua Stream and Floodplain Restoration	Post-Project Implementation Monitoring (2025) **Project number:** 21(h) EPA-06 **Stream sampled:** Tributary to West Creek (5.25)

Summary:
The Padua Restoration site is located on an 18-acre property owned by the West Creek Conservancy, immediately adjacent to 500+ acres protected by the West Creek Conservancy. The previous owner modified the property, including a significant reach of the stream and artificially elevated the site and installed a drainage system. This project aims to regrade the land, establish a more naturalized ridge, and restore the stream channel to a more natural alignment, as well as create a functional floodplain and riparian area.

Project Deliverables:

- Restore the stream channel to a more natural state.
- Regrade land to establish a more naturalized upland ridge.
- Creation and re-vegetation/tree planting of a functional floodplain and riparian area.

Environmental Results:
These improvements are expected to restore the land and stream channel to a more natural state with annual load reductions: phosphorus (4.7 lbs./year), sediment (5.6 tons/year), and nitrogen (3 lbs./year).

Post-project Monitoring:
Post-project biological and habitat monitoring will occur in the newly constructed channel. Pre-project monitoring occurred in the old channel that was bypassed during project implementation (Figure 3-13).



Figure 3-10: Project aerial overview from after project implementation. The pre-project monitoring location was located in the old, bypassed channel noted by the yellow pin. Post-project monitoring will occur through the newly constructed channel within the project area indicated by the red circle.

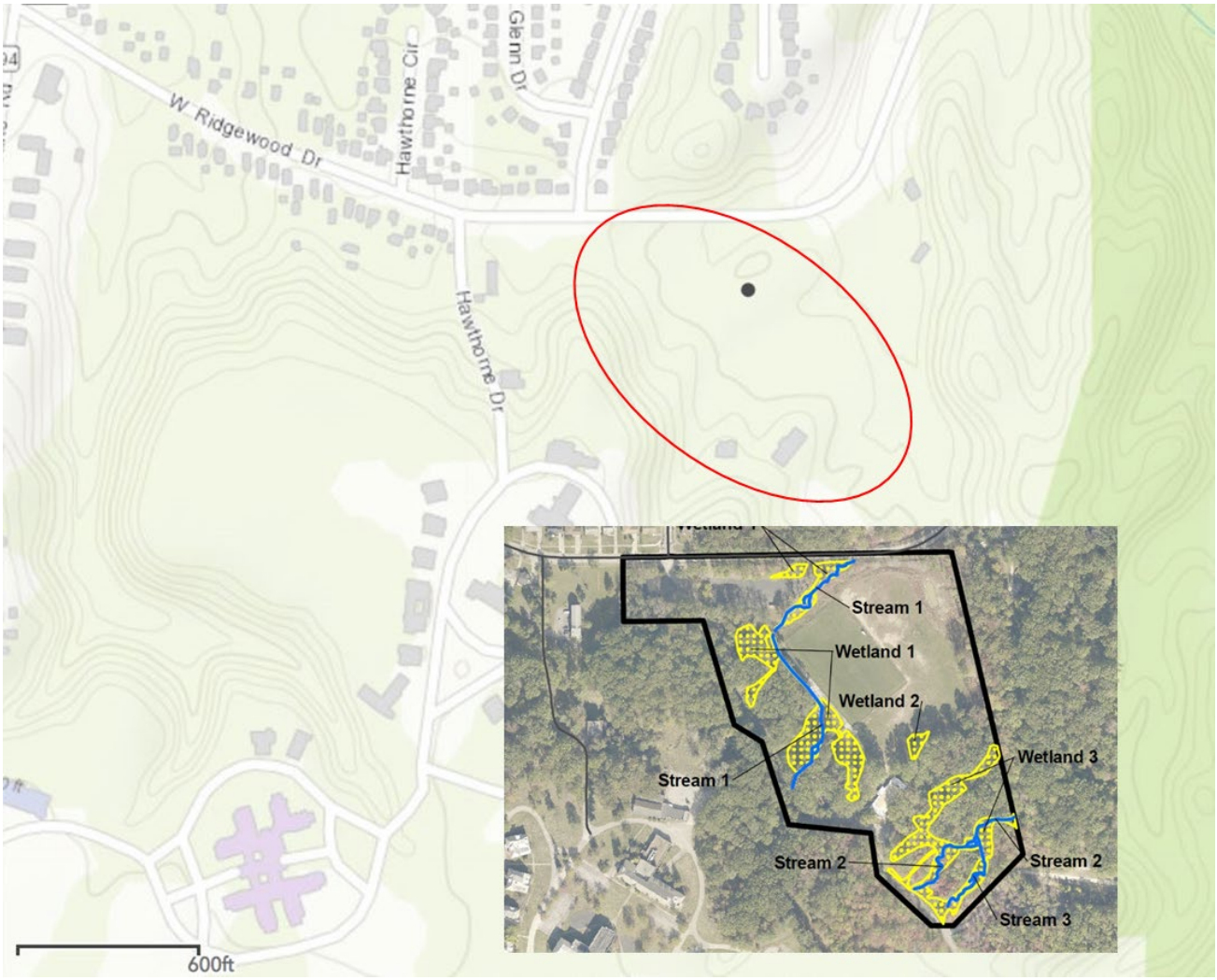


Figure 3-11: West Creek Padua Restoration sampling site, [21(h)EPA-06].

Salt Run—East Fork Little Miami River	Post-Project Implementation Monitoring (2025) **Project number:** 18(h)EPA-26 **Stream sampled:** Trib. to Salt Run (1.04/0.68/1.6)

Summary:
Clermont SWCD is partnering with the Clermont County Park District to implement a stream restoration and wetland enhancement project at Shor Park located in Clermont County, Union Township. The project area includes a headwater tributary of Avey's Run (designated by Ohio EPA as Warmwater Habitat) within the Salt Run watershed, a 42 square mile sub-watershed of the East Fork Little Miami River.

The Project Team will daylight approximately 550 feet of an existing 48-inch concrete pipe that enters the park from the southwest and is exhibiting signs of failure, including separation at the pipe joints and the formation of large sinkholes. The pipe will be removed, and a natural stream channel constructed in its place. The restored stream reach will be stabilized with up to two riffles, two buried rock grade control structures, and one energy dissipation pool.

Project Deliverables:

- Restore 550 linear feet of stream channel
- Install five in-stream habitat structures
- Install two grade structures
- Restore 550 linear feet of natural flow
- Plant 10 acres of native grasses in riparian areas
- Stabilize 200 linear feet of streambank using bio-engineering
- Remove/treat 11.5 acres of invasive species
- Plant five acres of trees, shrubs and/or live stakes in riparian areas
- Reconstruct and restore 0.3 acre of wetlands
- Plant 0.3 acre of wetland species
- Treat/remove 0.3 acre of invasive species

Environmental Results:
Successful completion of this project will reduce nonpoint source pollutant loadings to Salt Run-East Fork Little Miami River and restore 550 linear feet of stream channel/natural flow, stabilize 200 linear feet of streambank, and reconstruct/restore 0.3 acre of wetlands by treating/removing invasive species, planting wetland species and trees/shrubs/live stakes.

Post-project Monitoring:
Post-project monitoring biological and habitat monitoring will be conducted at one location through the project area, coinciding with the pre-project monitoring reach.



Figure 3-12: Aerial overview of the project area after implementation, April 2023. Post-project monitoring is proposed to occur within the red circle.

Appendix 4. List of Physical/Chemical Parameters and Reporting Limits

This section is not applicable to this project.

Appendix 5 – Safety Contacts and Hospital Locations

Safety:	
County Wildlife Officers:	**County Sheriff:**
Brown County – (513) 646-4014 Clermont County – (513) 673-1566 Cuyahoga County – (330) 245-3033 Lake County – (330) 245-3034 Logan County – (937) 441-5224 Summit County – (330) 245-3042 Washington County – (740) 412-9184	Brown County – (937) 378-4435 Clermont County – (513) 732-7500 Cuyahoga County – (216) 443-6000 Lake County – (440) 350-5517 Logan County – (937) 592-5731 Summit County – (330) 643-2154 Washington County – (740) 373-6623
OEMA:	**State Highway Patrol:**
Brown County – (937) 378-1658 Clermont County – (513) 732-7661 Cuyahoga County – (216) 443-5683 Lake County – (440) 350-5499 Logan County – (937) 593-5743 Summit County – (330) 643-2558 Washington County – (740) 373-5613	Brown County – (937-378-6191 Clermont County – (513) 732-1510 Cuyahoga County – (216) 265-1677 Lake County – (440) 286-6612 Logan County – (937) 644-8811 Summit County – (330) 535-2783 Washington County – (740) 374-6616
Hospitals:	
Mercy Health – Clermont Hospital 3000 Hospital Drive Batavia, Ohio 45103 (513) 732-8200	Mercy Health – Mount Orab Medical Center 154 Health Partners Circle Mt Orab, Ohio 45154 (937) 444-4000
MetroHealth Main Campus Medical Center 2500 Metro Health Drive Cleveland, Ohio 44109 (216) 778-7800	University Hospitals Lake West Medical Center 36000 Euclid Avenue Willoughby, Ohio 44094 (440) 953-9600

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