Quality Assurance Project Plan (QAPP) for Study Plan for CWA Section 319(h) Projects – Pre-Implementation Monitoring for Fiscal Year 2020 Projects

Division of Surface Water
Ecological Assessment Unit
Assessment and Modeling Section
Quality Assurance Project Plan for Study Plan for
CWA Section 319(h) Projects –
Pre-Implementation Monitoring for Fiscal Year 2020 Projects

August 3, 2020

Prepared by
State of Ohio Environmental Protection Agency

Ecological Assessment Unit
Assessment and Modeling Section

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State of Ohio

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Section A – Project Management

A1 – Quality Assurance Project Plan for CWA Section 319(h) Projects: Pre-Implementation Monitoring for Fiscal Year 2020 Projects Projects Sign-Off

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Date: 10/20/2020

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Date: 10/19/2020

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Date: 10/19/2020

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Date: 10/19/2020

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Date: 10/15/2020

Andrew Phillips, Fish Biologist and Study Team Leader

Date: 10/19/2020
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A3 – Distribution List

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</tr>
</tbody>
</table>

A4 – Project/Task Organization and Communication

A4.1 Roles and Responsibilities

<table>
<thead>
<tr>
<th>Individual(s) Assigned</th>
<th>Responsible For:</th>
<th>Authorized To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief or Asst. Chief</td>
<td>Allocate resources, project implementation, resolve disputes.</td>
<td>Resolve disputes, suggest changes and edits, approve needed resources, approve overall project and QAPP</td>
</tr>
<tr>
<td>EAU Supervisor (Vacant)</td>
<td>Staff assignment, signatures, payments, and reporting. Confirm intermediate and final milestones completed in a timely manner.</td>
<td>Review documents and reports; suggest changes and edits; obtain approvals and signatures.</td>
</tr>
<tr>
<td>Elizabeth Hagen</td>
<td>QA/QC input to document development. Prepare documents and reports. Follow-up on deliverable delays and their manager for ALU information.</td>
<td>Review documents and reports; suggest changes and edits.</td>
</tr>
<tr>
<td>John Mathews Manager</td>
<td>Oversight of planning and resource expenditures, participate in decision making as necessary</td>
<td>Resolve disputes, suggest changes and edits, approve needed</td>
</tr>
<tr>
<td>Rick Wilson</td>
<td>Will ensure QAPP revisions &amp; distribution</td>
<td>Review documents and reports; suggest changes and edits</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Individual(s) Assigned</th>
<th>Responsible For:</th>
<th>Authorized To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Phillips</td>
<td>Scheduling and coordination of field activities. Complete field activities and quality control; field sampling and analysis, data collection, review, analysis, verification, database population and transmission. Assist with project planning.</td>
<td>Prepare documents and reports. Arrange for external training. Schedule field activities.</td>
</tr>
<tr>
<td>Benjamin Foster</td>
<td>Fish Biologist</td>
<td></td>
</tr>
<tr>
<td>Benjamin Foster</td>
<td>Macroinvertebrate Biologist</td>
<td></td>
</tr>
<tr>
<td>Melanie Rudolf</td>
<td>Wetland Ecologist</td>
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</tbody>
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**A5 – Problem Definition/Background**

Water quality monitoring 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.

**A6 – Project Task/Description**

Any collected data would ideally provide insight into pre-implementation water resource conditions at each of the project areas. The biological assessment and physical habitat data are used to assign/confirm the appropriate aquatic life use, determine aquatic life use (ALU) attainment status, and assess physical habitat condition at each water body project area. Post-construction biological community and physical habitat conditions (at least one year after project completion) is used to compare with baseline monitoring results collected prior to project implementation.

**A6.1 – Project Descriptions**

The following summaries describe projects that are recommended for FY20 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 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 319(h) projects are assigned to the following EA3 project: Grant Year 2020 319 Projects (Pre-Project Monitoring).
Smith Creek Restoration at Centerville Mills Park

Bainbridge Township proposes to modify and/or remove approximately 750 linear feet of eroding embankment along Lake Paterek and restore at least 750 linear feet of Smith Creek, which is channelized and hydrologically disconnected to its floodplain along the lake embankment at Centerville Mills Park, a public park. In addition, this restoration by Bainbridge Township will also convert the impounded lake to a wetland with a remaining ponded area that combines public fishing area with newly planted wetland habitat. Smith Creek is designated Coldwater Habitat (CWH) and is a tributary to the State Scenic River, the Aurora Branch of the Chagrin River. Smith Creek is located in the Headwaters Aurora Branch 12-digit HUC watershed (12-digit HUC: 04110003-03-02).

Project Deliverables

- Restore 750 linear feet of stream channel and riparian floodplain
- Remove & treat 0.25 acres of invasive species
- Plant 1.0 acre of trees, shrubs and/or live stakes in riparian areas
- Removal of 1 dam
- Wetland reconstruction and restoration, and native plantings for 3 acres
- Conduct public education and outreach by developing 1 press release; creating/maintaining 2 websites; installing 1 project sign; Conducting 1 CRWP Board of Directors presentation; and preparing 1 CRWP Annual Report

Environmental Results: Restoration of Smith Creek and the restoration of adjacent wetland habitats will improve the hydrologic function and habitat quality of the stream at the project site and provide water quality benefits to downstream reaches of Smith Creek and the State Scenic Aurora Branch of the Chagrin River. Site-specific goals for this project are to achieve a post-construction QHEI score of 62 for this coldwater stream through improvements to riparian zone, substrate, and channel morphology in the stream restoration reach. Estimated load reductions using U.S. EPA Region 5 Model includes: nitrogen (363.4 lbs./year), phosphorus (181.7 lbs./year), and sediment (181.7 tons/year).

Sowinski Park Restoration

This project will restore a 600-foot reach of Doan Brook at Sowinski Park within the historic Cleveland Cultural Gardens along Martin Luther King Jr. Drive. The project will replace failing channel walls segments with natural streambank and floodplain. Successful completion will also increase acreage of wetland oxbow habitat planted with native plantings.

Project Deliverables

- Restore 600 linear feet of stream channel and riparian floodplain
- Plant 0.6 acres of trees, shrubs and/or live stakes in riparian areas
- Conduct public education and outreach by developing 1 project fact sheet, conducting 1 public meeting, developing 1 press release, creating/maintaining 2 websites, installation of 1 project signs, conducting 2 tours, conducting 2 field days, compile 2 DBWP annual reports, 2 presentations for DBWP Board of Trustees Meeting & CRWP Board of Directors Meeting, and 2 E-blasts for DBWP and CRWP.

Environmental Results: These improvements are expected to decrease bank erosion and sediment pollution and improve stream habitat metrics along with annual load reductions: phosphorus (104 lbs./year), sediment (104 tons/year), and nitrogen (207 lbs./year).
Two Stage Ditch Restoration in Van Fleet Ditch - Phase 2

In 2019, Lucas County was awarded funding through a Great Lakes Restoration Initiative (GLRI) grant to implement a two-stage ditch restoration project to restore floodplain functionality to an approximately 0.75 mile stretch of Van Fleet Ditch between Weckerly Road and Keener Road. This proposed project, Two-Stage Ditch Restoration in Van Fleet Ditch: Phase Two, seeks to extend the first phase of Van Fleet Ditch with an additional 0.42 miles of restoration. Phase 2 will align with Phase 1 activities to recognize efficiencies in the design and construction process.

**Project Deliverables**
- Construct 2,215 linear feet of two-stage ditch channel and restore riparian floodplain
- Plant 2 acres of native grasses in riparian area
- Install 2 instream habitat structures
- Draft 4 Standard Easement Legal Language documents and execute 4 landowner contracts
- Develop 1 project fact sheet, conduct 1 public meeting, develop 2 press releases, create/maintain 1 project website, install 2 project signs, conduct 1 tour, develop 2 newsletters.

**Environmental Results:** Successful completion of this project will increase floodplain connectivity and help restore ecological function within a highly constrained and channelized agricultural setting by creating a vegetated floodplain bench that will reduce sediment and nutrient loads, create instream habitat, and improve water quality in a waterway that contributes to the Maumee River. U.S. EPA StepL Load Reduction Model estimates annual load reductions of: phosphorus (47 lbs./year), sediment (25.4 tons/year), and nitrogen (120 lbs./year).

Wolf Creek Restoration

Cleveland Metroparks will restore and stabilize 1,200 linear feet of stream and riparian area along Wolf Creek in Garfield Park Reservation using stabilization using natural channel design and bioengineering. Floodplain connectivity along this stretch of creek will be restored. 2 acres of riparian area will be treated for invasive plant control and planted with native grasses and 1.25 acres of trees, shrubs, and/or live stakes.

**Project Deliverables**
- Restore +/- 1,200lf of streambank along Wolf Creek using natural channel design and bioengineering.
- Provide streambed grade control via 3-5 constructed grade control structures along +/- 1,200lf of stream.
- Install 2-4 erosion and sediment control structures
- Restore +/- 1,200lf of riparian area along Wolf Creek, including +/- 2 acres of invasive species control, +/-2 acres native grass plantings, and +/- 1.25 acres of tree, shrub, and/or live stake plantings in riparian areas.
- Reduce sediment and nutrient loads in Wolf Creek that are the result of eroding and unstable streambanks.
- Prepare for future phases of the large-scale restoration project in Garfield Park Reservation, including recreation of the +/- 2.25-acre recreational pond and +/- 3 acres of wetlands.
- Conduct 1 public meeting, conduct 1 press release, install 1 project sign, conduct 1 tour, conduct 2 volunteer events, produce 3 social media posts
Environmental Results: Successful completion of this project will improve habitat and riparian areas through this reach of Wolf Creek. It will reduce sediment and nutrient loads in Wolf Creek that are the result of eroding and unstable streambanks. This project is expected to yield estimated load reductions of phosphorus 29.9 (lbs./year), sediment (125.4 tons/year), and nitrogen (64.9 lbs./year). It will also improve resilience of Wolf Creek to better respond to climate change, including severe storms and long droughts.

20(h)EPA-17 (Figure 5)
Holmes County Engineer's Office
Project Contact: Christopher Young, (330)674-1856, cryoung@holmesengineer.org

Rush Run Stream Restoration and Stabilization

This project aims to restore 1378 linear feet of Rush and 2.5 riparian acres adjacent to the stream Run in the Tea Run-Killbuck Creek watershed. Rush Run is severely eroded at this location due to historic livestock grazing activities in and nearby the stream. This project location will be protected by a conservation easement.

Project Deliverables

- Restore 1378 linear feet of flood plain
- Restore 1378 linear feet of stream channel, including restoring more natural flow
- Install 5 instream habitat structures
- Install 2 grade control structures
- Restore 1378 linear feet of streambank by re-contouring or regrading
- Plant 2.5 acres of native grasses, trees, shrubs and/or live stakes in riparian areas
- Draft standard easement legal language, complete 1 appraisal report, execute 1 landowner contract, acquire 2.5 acres of conservation easement.

Environmental Results: Successful completion of this project is anticipated to yield: improved measured bank stability; increases in aquatic habitat metrics; and annual load reductions: nitrogen (137 lbs./year), phosphorus (52 lbs./year) and sediment (84 tons/year).

20(h)EPA-06 (Figure 6)
Geauga Park District
Project Contact: Paul Pira (Park Biologist), (440)279-0812, ppira@geaugaparkdistrict.org

Spring Brook Restoration

This project aims to restore 500 linear feet of Spring Brook (a coldwater habitat tributary) and adjacent 2.5 riparian acres in the Beaver Creek-Chagrin River watershed. Stream Daylighting and Restoration: 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 (2) riffles, two (2) buried rock grade control structures, and one (1) energy dissipation pool.

Project Deliverables

- Restore 500 linear feet of stream channel, including the daylighting of approximately 500 feet of existing 48-in. concrete pipe. Re-contour and stabilize streambanks.
- Restore 2 acres of riparian habitat floodplain, including invasive species treatment/removal and native plantings of trees, shrubs and/or live stakes.
• Conduct public education and outreach by developing 1 fact sheet and 1 press release, creating/maintaining 2 websites, installing 1 project signs, conducting 1 tours, developing 1 newsletter, compile 1 CRWP annual report, 1 presentation for CRWP Board of Directors Meeting.

**Environmental Results:** Successful completion of this project is anticipated to yield: improved measured stream bank stability; increases in fish community, and aquatic habitat metrics; and annual load reductions: nitrogen (78 lbs./year), phosphorus (39 lbs./year), and sediment (39 tons/year). Loading reductions should also benefit Bass Lake downstream. Bass lake has recurring challenges with nutrient loading and potentially harmful algal blooms.

### 20(h)EPA-14 (Figure 7)
Tinker’s Creek Watershed Partners  
Project Contact: Kate Chapel, (440)897-3905, KChapel@tinkerscreekwatershed.org

**Brandywine Creek Stream Restoration at Owen Brown**

This project will restore approximately 1,500 linear feet of an unnamed tributary to Brandywine Creek at River Mile 10.07, including 1200 linear feet of streambank restoration. The project tributary is channelized, entrenched, and disconnected from the active floodplain. 2.5 acres of riparian restoration (via tree, shrub and native grass plantings) is included. This project is designed to address total dissolved solids, direct habitat alterations, nutrients, flow alteration, and organic enrichment from sources that include urban runoff/storm sewers, land development/suburbanization, and road runoff (non-construction related).

**Project Deliverables**

- Restore 1,500 linear feet of stream channel
- Install 7 grade control structures
- Stabilize 1,200 linear feet of streambank using bioengineering
- Remove/treat 3 acres for invasive species
- Plant 2.5 acres of trees, shrubs, and/or live stakes in riparian areas
- Conduct public education and outreach by: developing 2 fact sheet and 1 press release, conduct 3 public meeting, create/maintain 1 website, install 1 project signs, conduct 1 tour, conduct 1 field day, conduct 1 workshop, develop 7 newsletters, develop 2 project rendering documents for print

**Environmental Results:** Successful completion of this project is anticipated to yield: improved aquatic habitat metrics and measured stream bank stability. Estimated load reductions will include - nitrogen (252 lbs./year), phosphorus (125.7 lbs./year), and sediment (125.7 tons/year).
Crabapple Creek Crossing Improvement

This relatively small project will stabilize the stream bank by installing articulated concrete block matting at the vehicle crossing to decrease erosion and sediment load. This project addresses a known sediment source and problem location. Crabapple Creek is a direct tributary to Captina Creek, an Outstanding State Water, Aquatic Resource of National Importance, and the only known watershed in Ohio that supports breeding populations of the Eastern Hellbender Salamander. One of the greatest threats to the Eastern Hellbender and water quality throughout Ohio is sedimentation.

**Project Deliverables**

- Install 1 erosion control structure
- Restore 20 linear feet of streambank by re-contouring or regrading
- Execute 1 landowner contract
- Develop 1 project fact sheet and 3 press releases, install 2 project signs, develop 1 display, conduct 1 tour, develop 1 newsletter

**Environmental Results:** Successful completion of this project is expected to reduce sediment loadings in Crabapple Creek by at least 1200 lbs./year (0.6 ton/year). Captina Creek downstream from Crabapple Creek will also benefit from reduced sediment loadings.

**20(h)EPA-05 (Figure 9)**

Grand Lake St. Marys Lake Facilities Authority Project Contact: Theresa Dirksen, (419)586-4209, Theresa.dirksen@mercercountyohio.org

Gilliland Nature Preserve Wetland/Natural Area Development

This project will restore approximately 9.4 acres of wetlands and upland habitat on land soon to be owned by the Grand Lake St. Marys Lake Facilities Authority (LFA). This project will help prevent future residential or commercial development around Grand Lake St. Marys.

**Project Deliverables**

- Reconstruct and restore 2.0 acres of wetlands
- Install one stop log structure
- Plant 5.4 acres of wetland species
- Plant 1.5 acres of trees
- Construct a 0.5 acres walking path
- Conduct 1 public meeting, create/maintain 1 website, install 1 project sign, develop 1 display, conduct 1 tour

**Environmental Results:** This project will help prevent future residential or commercial development around Grand Lake St. Marys. Based on the US EPA StepL load reduction calculator, this project will result in a nitrogen load reduction of 60 pounds per year; a phosphorus load reduction of 19 pounds per year; and a sediment load reduction of 13.5 tons per year.
20(h)EPA-29 (Figure 10)
City of Mentor
Project Contact: Kenn Kaminski, (440)974-5722, Kaminski@cityofmentor.com

Springbrook Garden Park Stream Restoration – Phase 2

This project, located in a public park in the Marsh Creek-Frontal Lake Erie watershed, is a second phase to a wetland and floodplain restoration that is currently underway just downstream of this project site. Phase 2 is designed to re-establish the ecological and natural function in a former agricultural ditch, stabilize both stream banks, remove invasive plants, and restore riparian habitat.

Project Deliverables

- Restore 650 linear feet of floodplain, stream channel, and natural streamflow
- Install 2 instream habitat structures
- Restore & stabilize 1300 linear feet of streambank using bioengineering
- Restore 650 linear feet of streambank using re-contouring or regrading
- Plant 1 acre of native grass in riparian area
- Plant 1 acre of trees, shrubs, and/or live stakes in riparian area
- Remove/treat 0.5 acres of invasive species
- Conduct public education and outreach by developing 1 fact sheet, 1 press release, create/maintain 2 websites, install 1 project sign, and develop 1 newsletter

Environmental Results: Successful completion of this project in expected to result in reductions in overall discharge volume and peak runoff by means increasing settling of suspended solids, filtration, and nutrient uptake by floodplain plants. Anticipated results: improvement to aquatic habitat metrics; and annual load reductions: nitrogen (166 lbs./year), phosphorus (83 lbs./year) and sediment (98 tons/year).

20(h)EPA-26 (Figure 11)
City of Sharonville
Project Contact: Bennett Kottler, (513)563-8800, bkottler@themillcreekalliance.org

Twin Creek Wetland Enhancement

The Project proposes adjusting the elevation of the invert pipes connecting the wetland to the Mill Creek mainstem and the base flow of the East Fork Mill Creek. Wetland inlets will be excavated, lowered, and replaced with new inlet piping. Three heavy iron flapper gates will be replaced with light and durable aluminum gates to increase water flow into the wetland. Approximately 120 cubic yards of existing swales will be reshaped to better distribute water throughout the wetlands. 5 acres of wetland will be reconnected to the stream system. Minor invasive plant removal will occur and be replaced with 0.2 acres of planted native wetland species.

Project Deliverables

- Construct 2 inlet channels and 1 outlet channel
- Install 2 stop-log structure/flapper gates
- Reconstruct, restore, and reconnect 5.0 acres of wetland to stream
- Remove 0.2 acres of invasives and replant with wetland species
- Install 1 water control device
- Develop 1 project fact sheet, conduct 1 public meeting, develop 1 press release, create/maintain 1 website, install 1 project sign, conduct 1 tour, conduct 1 field day, develop 1 newsletter

Environmental Results: Successful completion of this project will improve water flow into and through the Twin Creeks wetland area. Annual load reductions: nitrogen (25 lbs./year), phosphorus (33 lbs./year) and sediment (36 tons/year).
Marie DeLarme Wetland Restoration

The Project Area is 8 acres of an agricultural tract owned by the Black Swamp Conservancy (BWC). The tract has been in agricultural (hay) production since 2004. The 8-acre project area lies in the floodplain of Marie DeLarme Creek. About 5 of the 8 acres have wetland hydrology and soils. This project will restore 2 acres of vernal pool wetlands to promote longer water retention in the floodplain; and restore the remaining 6 acres to riparian woodland by seeding the site with native riparian species and planting native trees and shrubs.

Project Deliverables

- Reconstruct and restore 2.0 acres of wetlands
- Plant 2 acres of wetland species
- Treat/remove 2 acres of invasive species
- Develop 1 project fact sheet, develop 1 press release, create/maintain 1 website, install 1 project sign, conduct 1 tour, conduct 1 field day, develop 1 newsletter

Environmental Results: Successful completion of this project will convert existing agricultural fields into a functioning wetland habitat, reducing nutrients and sediment export into Marie DeLarme Creek and the Maumee River. Annual load reductions are consistent with loads expected from converting agricultural land to wooded riparian as follows: nitrogen (33 lbs./year), phosphorus (6 lbs./year), and sediment (1 ton/year).

20(h)EPA-28 (Figure 13)

The Nature Conservancy

Project Contact: Andrew Bishop, (216)310-2661, Andrew.Bishop@tnc.org

Restore Headcuts in Brecksville Reservation Headwater Streams

This project focuses on improving severely eroded headwater tributaries within the Brecksville Reservation (Willow Lake-Cuyahoga River watershed), with a high percentage of developed urban contributing land-use. Approximately 6000 linear feet of headwater tributaries will be restored through the installation of approximately 250 in-stream habitat structures (simulated log-jam habitat features). The log jams are designed to mimic natural accumulation of woody debris and organic material to capture eroded sediment and dissipation stream energy. Structures will be constructed using existing deadfall and branches in the immediate vicinity of the head cuts. This project is built as a proof-of-concept for applying this approach with paraprofessionals throughout the Cuyahoga Valley. Our outreach effort will build on CM's Watershed Volunteer Program (WVP) and Cuyahoga Valley National Park's strong volunteer program.

Project Deliverables

- Restore 6000 linear feet of stream channel by installing 250 simulated log-jam structures
- Conduct public education and outreach by developing 1 project fact sheet, installing 4 project signs, conducting 2 field days, developing 1 newsletter article, and 4 posts to social media.

Environmental Results: Successful completion of this project will reduce rates of erosion and entrenchment in headwater streams throughout the project area. Anticipated results: improved bank stability; and annual load reductions: nitrogen (325 lbs./year), phosphorus (160 lbs./year), and sediment (160 tons/year).
Mill Creek Alliance
Project Contact: Bennett Kottler, (513)563-8800, bkottler@themillcreekalliance.org

Mill Creek Low-Head Dam Mitigation, River Mile 12.2
This project builds on previous low-head dam mitigation projects along the Mill Creek, including two recent completions in the City of Cincinnati parallel to Spring Grove Avenue, and previous mitigation projects at Hartwell Golf Course, Center Hill Avenue, and Hopple Street. With the goal of eliminating all low-head dam barriers in the Mill Creek Watershed, this project proposes to modify one additional dam. As seen at our other project sites, constructing rock riffles downstream of a Mill Creek dam restores natural, free-flowing habitat, and improves water quality in a relatively short period of time.

Oxygenation increases microbial processing of stream water while also allowing fish passage. Physical removal of water quality pollutants increases by capture and storage in stream sediment in the induced pool between the riffle and the upstream dam. The process begins by filling the scour pool downstream of the low head dam, and may eventually take up about half of the volume of the induced pool behind the constructed riffle.

Project Deliverables
- Modify 1 dam structure
- Restore 1100 linear feet of natural flow
- Dispose of 1 cubic yard of debris
- Install 1 fish passage and/or habitat structures
- Draft 2 standard easement legal language, complete 2 appraisal reports, execute 2 landowner contracts
- Conduct public education and outreach by: developing 1 fact sheet and 1 press release, conduct 1 public meeting, install 1 project sign, create/maintain 1 website, hold 2 tours via canoe, conduct 1 stream clean up, and develop one newsletter

Environmental Results: Successful completion of this project will yield: restoration of 1100 linear feet natural flow; improved aquatic habitat and fish bio-metrics; and anticipated annual load reductions of nitrogen (52 lbs./year), phosphorus (22 lbs./year), and sediment (18 tons/year).
Ohio Division Natural Resources Sponsored Projects
Project Contact: Christina Kuchle (christina.kuchle@dnr.state.oh.us)

Maumee - St. Joseph River Confluence Wetland Expansion (Figure 15)
Ohio Department of Natural Resources - Division of Natural Areas and Preserves, Williams County
A combination of nutrient-reduction practices is planned for this project site, which currently has 20 acres in agricultural use. Efforts include decommissioning subsurface drainage tiles, expansion of existing wetlands, and creation of new ones. Native vegetation, including shrubs and sedges, will be planted to help hold nutrients on the land, preventing them from entering nearby waterways. A deciduous forest of native trees also will be restored, within which nutrient and sediment-trapping vernal pools will naturally occur. The project size is 140 Acres and will be completed in partnership with the Black Swamp Conservancy.

Environmental Results: ODNR Rated high for nutrient removal. Successful completion of this project is estimated to yield loading reductions of nitrogen (1650 lbs./year), phosphorus (140 lbs./year), and sediment (19 tons/year).

St. Joseph’s River Wetland Restoration & Sustainable Agriculture (Figure 16)
Ohio Department of Natural Resources Restoration - Division of Natural Areas and Preserves, Williams County
The project will protect and restore a considerable amount of natural forested wetland along the St. Joseph River, while retaining enough tillable acres to establish a small to mid-size sustainable farming operation. 54 acres of the property would be restored (27 acres of wetlands and 27 acres of non-hydric reforestation), 1,600 linear feet of channel restoration, 14 acres of agricultural land would be retained and 26 acres of existing habitat would be protected. It will provide significant nutrient reduction due to wetland restoration, stream restoration and reduce runoff from tree planting.

Environmental Results: ODNR Rated high for nutrient removal. Successful completion of this project is estimated to yield loading reductions of nitrogen (940 lbs./year), phosphorus (80 lbs./year), and sediment (11 tons/year).

Sandusky River Redhorse Bend Wetland Restoration (Figure 17)
Ohio Department of Natural Resources - Division of Natural Areas and Preserves, Sandusky County /Sandusky River Watershed
This project will reconnect 55 acres of floodplain habitat to the Sandusky River, including wetland and riparian restoration. Two ditches flowing through the site will be restored to headwater streams to enhance the natural filtration of surface water runoff. This project will be completed in partnership with the Black Swamp Conservancy.

Environmental Results: ODNR Rated high for nutrient removal. Successful completion of this project is estimated to yield loading reductions of nitrogen (320 lbs./year), phosphorus (81 lbs./year), and sediment (32 tons/year).

Forder Bridge Wetland Restoration & Treatment System (Figure 18)
Ohio Department of Natural Resources - Division of Natural Areas and Preserves, Paulding County, Ohio 041000050205
This project proposes to proposes to 1) install a series of wetlands where the stream enters the property; 2) recontour the banks of the stream to reconnect it to its floodplain in at least two areas between the proposed wetlands and the eroded reach; 3) install riffle grade control structures in at least the lower reach of the stream to stabilize the channel. Black Swamp Conservancy owns and manages the Preserve. 2,600 linear feet of an intermittent stream run through the middle of Forder Bridge and into the Maumee River. The stream has a wooded buffer along most of its length, except where it
first enters the property from a culvert on CR 424. The lower reach of the stream is severely eroding. The stream drains an area of about 0.1 square mile, including about 20 acres of actively farmed land and the 30 acres of recently reforested retired farmland at Forder Bridge. Doing wetland and stream restoration at this site would allow water from 100% of the drainage to interact with the restoration practices once installed. The pollution estimate below does not consider elimination of eroding stream area.

**Environmental Results:** ODNR Rated high for nutrient removal. Successful completion of this project is estimated to yield loading reductions of nitrogen (440 lbs./year), phosphorus (30 lbs./year), and sediment (6 tons/year).
Table 1. Sampling locations for SFY2020 Section 319(h) projects. All projects are pre-project monitoring.

<table>
<thead>
<tr>
<th>Station</th>
<th>Stream or receiving waterbody</th>
<th>Station Name</th>
<th>River Code</th>
<th>RM</th>
<th>DA</th>
<th>Lat</th>
<th>Long</th>
<th>Project</th>
<th>Sampling</th>
</tr>
</thead>
<tbody>
<tr>
<td>D01G20</td>
<td>Smith Creek</td>
<td>SMITH CREEK @ YMCA CAMP FOOTBRIDGE</td>
<td>15-005-001</td>
<td>0.50</td>
<td>10.50</td>
<td>41.34892</td>
<td>-81.336473</td>
<td>Smith Creek Restoration</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>200135</td>
<td>Doan Brook</td>
<td>DOAN BROOK AT CLEVELAND @ ROCKEFELLER PARK</td>
<td>19-039-000</td>
<td>1.40</td>
<td>8.50</td>
<td>41.525715</td>
<td>-81.626429</td>
<td>Sowinski Park Restoration</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>302025</td>
<td>Van Fleet Ditch</td>
<td>VAN FLEET DITCH W OF MONCLOVA @ KEENER RD.</td>
<td>04-003-007</td>
<td>1.00</td>
<td>2.20</td>
<td>41.5539278</td>
<td>-83.7523861</td>
<td>Two Stage Ditch Van Fleet Ditch-Ph. 2</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304200</td>
<td>Wolf Creek</td>
<td>WOLF CREEK NEAR MOUTH</td>
<td>19-006-003</td>
<td>0.15</td>
<td>2.18</td>
<td>41.4297</td>
<td>-81.6044333</td>
<td>Wolf Creek Restoration</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>203633</td>
<td>Rush Run</td>
<td>RUSH RUN NW OF HOLMESVILLE @ CO. RD. 1</td>
<td>17-178-000</td>
<td>0.90</td>
<td>5.25</td>
<td>40.659034</td>
<td>-81.971014</td>
<td>Rush Run Restoration &amp; Stabilization</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>D01W32</td>
<td>Spring Brook</td>
<td>SPRING BROOK (TRIB. TO CHAGRIN R, 47.65) @ INTER-URBAN</td>
<td>15-001-019</td>
<td>0.30</td>
<td>0.20</td>
<td>41.550376</td>
<td>-81.229839</td>
<td>Spring Brook Restoration</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304201</td>
<td>Trib. to Brandywine Creek (10.07)</td>
<td>TRIB. TO BRANDYWINE CREEK (10.07) @ W. PROSPECT ST.</td>
<td>19-010-002</td>
<td>0.40</td>
<td>2.20</td>
<td>41.24781</td>
<td>-81.445196</td>
<td>Brandywine Creek Stream Restoration</td>
<td>F,Mq,H</td>
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<tr>
<td>303953</td>
<td>Crabapple Creek</td>
<td>CRABAPPLE CREEK @ TWP. RD. 84</td>
<td>06-110-000</td>
<td>3.5</td>
<td>2.70</td>
<td>39.86446</td>
<td>-80.998498</td>
<td>Crabapple Ck Crossing Improvements</td>
<td>F,Mq,H</td>
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<tr>
<td>304209</td>
<td>Grand Lake St. Mary's</td>
<td>GILLIAND WETLAND NATURE PRESERVE</td>
<td>22-999-000</td>
<td>n/a</td>
<td>n/a</td>
<td>40.504722</td>
<td>-84.489444</td>
<td>Gilliland Nature Preserve Wetland/Natural Area Development</td>
<td>W</td>
</tr>
<tr>
<td>304202</td>
<td>Marsh Creek</td>
<td>MARSH CREEK @ SPRINGBROOK GARDENS PARK</td>
<td>03-026-000</td>
<td>3.90</td>
<td>0.95</td>
<td>41.6863269</td>
<td>-81.3052825</td>
<td>Springbrook Restoration, Phase 2</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304210</td>
<td>East Fork Mill Creek</td>
<td>TWIN CREEK WETLAND</td>
<td>23-006-000</td>
<td>n/a</td>
<td>n/a</td>
<td>39.291817</td>
<td>-84.433774</td>
<td>Twin Creek Wetland Enhancement</td>
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<td>304211</td>
<td>Marie DeLarme Creek</td>
<td>FOREST WOODS NATURE PRESERVE WETLAND</td>
<td>04-056-000</td>
<td>n/a</td>
<td>n/a</td>
<td>41.236016</td>
<td>-84.66643</td>
<td>Marie DeLarme Wetland Restoration</td>
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<tr>
<td>Station</td>
<td>Stream or receiving waterbody</td>
<td>Station Name</td>
<td>River Code</td>
<td>RM</td>
<td>DA</td>
<td>Lat</td>
<td>Long</td>
<td>Project</td>
<td>Sampling</td>
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<tr>
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</tr>
<tr>
<td>302646</td>
<td>Trib. to Cuyahoga River (21.7)</td>
<td>TRIB. TO CUYAHOGA R. (21.70) NEAR BRECKSVILLE, UPST. W. BR.</td>
<td>19-001-036</td>
<td>0.8</td>
<td>1.0</td>
<td>41.2968</td>
<td>-81.5839</td>
<td>Headcut Treatments in Brecksville Reservation</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304204</td>
<td>Trib. to Cuyahoga River (22.65)</td>
<td>TRIB. TO CUYAHOGA R. (22.65) UPST RIVERVIEW RD.</td>
<td>19-001-049</td>
<td>0.4</td>
<td>0.05</td>
<td>41.2957</td>
<td>-81.576142</td>
<td>F,Mq,H</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304205</td>
<td>Trib. to Cuyahoga River (23.4)</td>
<td>TRIB. TO CUYAHOGA RIVER (23.4) NEAR BUCKEYE TRAIL</td>
<td>19-001-050</td>
<td>0.9</td>
<td>0.5</td>
<td>41.286409</td>
<td>-81.578874</td>
<td>F,Mq,H</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304203</td>
<td>Mill Creek</td>
<td>MILL CREEK @ CLARK RD.</td>
<td>23-001-000</td>
<td>12.2</td>
<td>73.3</td>
<td>39.216153</td>
<td>-84.45002</td>
<td>Mill Creek Low-Head Dam Mitigation, River Mile 12.2</td>
<td>F,Mq,H</td>
</tr>
<tr>
<td>304212</td>
<td>St. Joseph River</td>
<td>ST. JOSEPH RIVER CONFLUENCE WETLAND</td>
<td>04-000-000</td>
<td>-</td>
<td>-</td>
<td>41.647908</td>
<td>-84.568193</td>
<td>Maumee - St. Joseph River Confluence Wetland Expansion</td>
<td>W</td>
</tr>
<tr>
<td>304206</td>
<td>Trib. to St. Joseph River (61.4)</td>
<td>TRIB. TO ST. JOSEPH R. (61.4) NEAR MOUTH</td>
<td>04-400-002</td>
<td>0.1</td>
<td>0.2</td>
<td>41.514654</td>
<td>-84.705114</td>
<td>St. Joseph’s River Wetland Restoration &amp; Sustainable Agriculture</td>
<td>F,Mq,H,W</td>
</tr>
<tr>
<td>201316</td>
<td>Sandusky River</td>
<td>SANDUSKY R. @ U.S. RT. 20</td>
<td>05-001-000</td>
<td>13.7</td>
<td>1264</td>
<td>41.366752</td>
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<td>Sandusky River Redhorse Bend Wetland Restoration</td>
<td>H,W</td>
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<tr>
<td>304207</td>
<td>Trib. to Maumee River (91.6)</td>
<td>TRIB. TO MAUMEE RIVER (91.6) DST. CO. RD. 424</td>
<td>04-001-017</td>
<td>0.1</td>
<td>1.2</td>
<td>41.221175</td>
<td>-84.672561</td>
<td>Forder Bridge Wetland Restoration &amp; Treatment System</td>
<td>F,Mq,H,W</td>
</tr>
</tbody>
</table>

F – Fish sampling
Mq – Macroinvertebrate qualitative sampling
H – Habitat sampling
W – Wetland sampling
DA – Drainage Area (mi²)
RM – River Mile.
Table 2. Ohio EPA field sampling load for the 319(h) study areas, 2020.

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>No. Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish Stations (total)</td>
<td>15</td>
</tr>
<tr>
<td>Macrobenthos (total)</td>
<td>15</td>
</tr>
<tr>
<td>Qualitative (Natural Substrates)</td>
<td>15</td>
</tr>
<tr>
<td>Habitat</td>
<td>16</td>
</tr>
<tr>
<td>Wetland</td>
<td>7</td>
</tr>
</tbody>
</table>
Figure 1 – Project area for Smith Creek Restoration
Figure 2 – Project area overview for Sowinski Park Restoration.
Figure 3 – Project area overview for Two Stage Ditch Van Fleet Ditch-Ph. 2
Figure 4 - Project area overview for Wolf Creek Restoration.
Figure 5 - Project area overview for Rush Run Restoration & Stabilization.
Figure 6 - Project area overview for Spring Brook Restoration. Figure obtained from grant application
Figure 7 - Project area overview for Brandywine Creek Stream Restoration.
Figure 8 - Project area overview for Crabapple Ck. Crossing Improvements.
Figure 9 - Project area overview for Gilliland Nature Preserve Wetland/Natural Area Development.
Figure 10 - Project area overview for Springbrook Restoration, Phase 2.
Figure 11 - Project area overview for Twin Creek Wetland Enhancement
Figure 12 - Project area overview for Marie DeLarme Wetland Restoration.
Figure 13 - Project area overview for Headcut Treatments in Brecksville Reservation. Figure is from derived from project application. Superimposed red circles represent pre-monitoring sampling locations. Smaller dots represent head-cutting areas in the watershed, with “hottest” colors representing the greatest amounts of erosion.
Figure 14 – Project area overview for Mill Creek Low-Head Dam Mitigation, River Mile 12.2
Area outlined in red indicates Black Swamp Conservancy Lands. Blue lines indicate stream/ditch systems in the surrounding area.

Figure 15 – Project area overview for Maumee – St. Joseph River Confluence: Agricultural Land to Wetland Conversion
Figure 16 – Project area overview for St. Joseph's River Wetland Restoration & Sustainable Agriculture. Part of the project involves restoring the waterway running through the property.
Figure 17 - Project area overview for Sandusky River Redhorse Bend Wetland Restoration.
Figure 18 - Project area overview for Forder Bridge Wetland Restoration & Treatment System.
A7 – Quality Objectives and Criteria

To gather ambient environmental information (biological, physical habitat) within 319 project areas to assess environmental benefits realized from implementation. Collection of vegetation data on riparian and wetland plant communities and assign wetland antidegradation categories when applicable.

A8 – Special Training/Certification

Ohio EPA’s Division of Surface Water (DSW) has developed an Access database called “TrainTrack” to document initial and refresher trainings. All staff involved in collecting any type of environmental sample must complete training associated with that sampling method. The first line supervisors shall ensure staff have the necessary safety and skill set training (initial and refresher training) prior to sampling. Biological trainings and quality assurance refresher activities are described in the Biological Criteria Manual Volume 3 (Ohio EPA 2015b). Initial training or refresher trainings are conducted annually for Ohio EPA staff (both full time and intermittent) that will be collecting biological and/or habitat sampling.

A9 – Documents and Records

The study team leader will provide a copy of the final QAPP to the appropriate project personnel by email as detailed in the distribution list. As the plan is updated, each person on the distribution list will be sent an email with the most current document. The most current date of revision will be included in the document name and in the header of the document.

The biological and habitat forms, chain of custody forms, sample submission forms, Vegetation Index of Biotic Integrity (VIBI) data forms, and field logs will be maintained in their original form and information from those forms will be included in Agency databases. The databases are backed up on secure servers.

The format for all data recording will be consistent with the requirements and procedures used for data validation and assessment described in this QAPP. Files generated according to applicable and attached standard operating procedures (such as raw data, results of QC checks, problems encountered, etc.) will be documented and reported to the study team.

All communications regarding study plan changes or refinements, such as changes to sites, staff, parameters, etc., will be filed in the Sharepoint project file by the study team leader. Other major actions which might affect the DQOs, project leader changes, etc., will require an updated QAPP with a new signoff sheet.

A9.1 Document/Record Control

The recording media for the project will be a combination of paper and electronic means to document site conditions. Data gathered using paper will be recorded using indelible ink, and changes to such data records will be made by drawing a single line through the error with an initial by the responsible person. Similar methods will be used for electronic data recording.

The study team leader will retain the most recent version of the QAPP and be responsible for distribution of the current version of the QAPP to the project team. Agency management and the Quality Assurance Crew (QAC) will approve updates to the QAPP as needed. The study leader will retain copies of all management reports, memoranda, and all correspondence between team members identified in Section A. Retention of records should emphasize any deviations from the signed QAPP, including the rationale for those changes.
A9.2 Document Storage

A SharePoint project file will act as a central repository for all documents collected or generated relevant to this project. All project documents will be scanned in and stored electronically on the project SharePoint file and hardcopies will be stored at an Ohio EPA office. Project photos will be moved to and stored in the Lynx Photo System. All files will be retained by Ohio EPA in accordance with its records retention policy.

All communications regarding study plan changes or refinements, such as changes to sites, staff, parameters, etc., will be filed in the SharePoint project file by the study team leader. Other major actions which might affect the DQOs, project leader changes, etc., will require an updated QAPP with a new signoff sheet.

Section B – Data Generation and Acquisition

B1 – Sampling Process Design
This small study includes sampling locations that encompass various water quality enhancement projects. Ohio EPA intends to measure biological and habitat quality before and after project implementation. Data collection will be performed using standards methods and frequencies as described in Ohio EPA 2105ab. As resources allow, all pre-project field assessments will be conducted during the 2020 field sampling season. Post-project sampling will occur after successful project implementation and after each project has had enough time to mature. In many instances, it may take several years after implementation to fully realize all environmental benefits from some projects.

B2 – Sampling Methods

Stream Habitat Assessment
Stream habitat is evaluated using either the Qualitative Habitat Evaluation Index (QHEI) or Headwater Habitat Evaluation Index (HHEI) developed by the Ohio EPA for streams, rivers, and other primary drainages in Ohio (Ohio EPA 1989b, 2006, 2009). 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.

Biological Community Assessment
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 (2015c).

Fish will be sampled once at each sampling location using pulsed DC headwater, wading, or backpack electrofishing methods, depending on watershed size at each sampling zone (Table 1). Fish are processed in the field which includes identifying each individual to species, counting individuals at all sites, weighing individuals at locations > 20mi², and recording any external abnormalities. Detailed fish assemblage
sampling protocols are documented in Biological Criteria for the Protection of Aquatic Life, Volume III (2015c).

Depending on site-specific characteristics encountered, biological sampling at locations draining less than <2.0 mi² may employ primary headwater techniques, as described in Ohio EPA 2009.

Vegetation will be sampled at each wetland sampling location once during the sampling index period by establishing a fixed 0.1-hectare sampling plot. Each species occurring within the plot will be identified to species and assigned a cover class. Detailed wetland vegetation sampling protocols are documented in Field Manual for the Vegetation Index for Biotic Integrity for Wetlands v. 1.5 (Mack and Gara, 2015) and the Vegetation Index of Biotic Integrity “Floristic Quality” (Gara, 2013).

**B3 – Sample Handling and Custody**

Fish collected with electrofishing procedures are initially sorted by species into appropriately sized containers. At the end of the electrofishing sampling event, the collected fish are identified, counted, and tallied on the fish data sheet. Bulk weights are also recorded at sampling locations with a drainage area greater than 20mi² (Ohio EPA 2015c). As the sample is processed in the field, most fish are returned live back to the waterbody. Select specimens may be vouchered in a 10% formalin solution and returned to the laboratory if further examination is needed. Vouchers of other notable fish specimens may also be retained. After processing of the electrofishing sample, the habitat evaluation is completed. The habitat evaluation will typically occur through the stream reach where electrofishing occurred.

Macroinvertebrate specimens collected using qualitative sampling procedures outlined in Ohio EPA 2015b are composited in a 4-ounce sampling jar, preserved with a 70% ethanol solution, and returned to the laboratory for subsequent analysis. At the time of collection of the artificial substrates and/or qualitative sample, the macroinvertebrate field sheet is completed to document site conditions, sample retrieval issues, and field observations of diversity and abundance of organisms collected. Macroinvertebrate samples are stored indefinitely at an Ohio EPA facility.

Vegetation that cannot be identified in the field during vegetation sampling procedures are vouchered, placed in a vasculum, and returned to the laboratory. Per VIBI protocol, plant vouchers are given a unique voucher number and placed in a plant press, or if unavailable, placed in a refrigerator. Plant vouchers are labeled and handled using procedures detailed in the Field Manual for the Vegetation Index of Biotic Integrity for Wetlands v 1.5. Pressed and mounted plant vouchers are stored indefinitely in the Ohio EPA herbarium.

**B4 – Analytical Methods**

The chemical analysis of environmental samples is not an objective of this project; no analytical methods or equipment will be utilized.

**B5 – Quality Control**

Quality control measures for fish and macroinvertebrate sampling are described in Biological Criteria for the Protection of Aquatic Life, Volume III (Ohio EPA 2015c) and Field Evaluation Manual for Ohio’s Primary Headwater Habitat Streams (Ohio EPA 2009). Quality control measures for vegetation evaluation and sampling procedures are described in Field Manual for the Vegetation Index for Biotic Integrity for Wetlands v. 1.5 (Mack and Gara 2015) and the Vegetation Index of Biotic Integrity “Floristic Quality” (Gara 2013).
B6 – Instrument/Equipment Testing, Inspection, and Maintenance

The team leaders have several years of experience operating and maintaining most of the equipment to be used during this project. The team leaders will inspect the equipment prior to and during the sampling. The team leaders will ensure that all equipment remains in functional working condition.

All instruments/equipment will be inspected and calibrated prior to use. Other equipment used will follow specifications provided in the biological and habitat methods cited.

B7 - Instrument/Equipment Calibration and Frequency

The team leaders have operated and maintained the equipment that will be used during this project for many years. The team leaders will inspect the equipment prior to and during the sampling. The team leaders will ensure that all equipment remains in functional working condition. The electrofishing gear undergoes preventive maintenance, and is repaired or replaced as needed. Use of all fish sampling equipment will follow specifications provided in the biological methods cited. Newly received equipment is inspected for quality and consistency with previous equipment.

B8 – Inspection/Acceptance of Supplies and Consumables

Supplies and consumables will be inspected upon receipt by the field sampling teams. Nearly all the supplies utilized for this project are maintained and used during the normal business operations of the Ohio EPA. The field team leaders will be responsible to ensure that all sample containers and all needed supplies and consumables are available in advance of all field work. It will be their responsibility to maintain and replenish stock. Consumable supplies include sample containers, ethanol and formalin preservatives, and miscellaneous field supplies such as distilled water, sampling gear disinfectant, disposable gloves, paper towels, and paper field forms. Field personnel will confirm that all reagents are within applicable shelf life.

B9 – Non-Direct Measurements

Not Applicable

B10 – Data Management

B10.1 – EA3

Knowledge of the Division of Surface Water (DSW) biological data sheets and Ecological Assessment and Analysis Application (EA3) program is needed to manage data. The station ID numbers that are assigned to each sampling location are created using EA3. Project names are also created in EA3 so stations can be grouped together to facilitate data assessment.

The sites listed in this study plan table are coded with EA3 Station IDs that link data across several tables. They must be included on all field, lab and sample sheets and reported with all data results. If for some reason a location other than the one listed in the study plan is sampled, and that location is close enough from the one listed in the table and is fully representative of the EA3 Station, use the river mile listed in the study plan, and simply record the location information separately. An exact river mile can be assigned later to an Absolute Location Point (ALP) if warranted. If the location is not representative of the site listed on the study plan due to distance or a confounding factor (e.g. large drainage area change), a new station may be warranted. All attempts are made to access the sampling location as close to the point of record as possible, but challenging stream access for biological or other sample may preclude this. It is also
imperative that, if a new station is sampled, the study plan coordinator be notified so that this information can be distributed to all the study team.

**B10.2 - YSI® Pro Series Units**

The YSI® Pro Series units have an internal file storage system. A site list based on Station ID # is first created using YSI® Pro Series Data Manager V1.1.8 software installed on a desktop PC. The field meter is then connected to the PC via a USB port so the site list can be uploaded to the meter. Data is saved in the field by selecting the correct Station from the menu. After sampling is completed the files are downloaded to the Data Manager software. They are then exported as an Excel file and, upon completion of the survey, are provided to the project manager who designates a network folder for retaining the data.

**B10.3- Fish, VIBI, and QHEI Data Sheets**

The original fish, macroinvertebrate, and QHEI field and data sheets will be digitally archived. Original VIBI field and data sheets will be archived at the Lazarus Building. Data from the field and data sheets are manually entered into EA3 using the appropriate data entry screen. The sheets are double entered and then approved by the original collector to reduce error rate.

**Section C – Assessment and Oversight**

**C1 – Assessments and Response Actions**

**C1.1 – 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 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.

**C1.2 - 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 or in the lab and are common enough to the process and do not necessitate a formal response.

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.
C1.3 - 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.

C1.4 - 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 – Reports to Management

Monthly oral progress reports are to be provided to management on the survey/study and what steps are being taken to resolve any issues or problems. This may include access problems early on that lead to changes of sites and weather or resource problems during sampling. After the samples have been evaluated, the team leader and project biologists will have a meeting to evaluate for any beneficial use recommendations. They will also generate a written report that will document the project conclusions and accompany any ensuing rulemaking efforts that may result from the generation of this data.

C2.1 – 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 (assessed with Volume II of the Biological Criteria for the Protection of Aquatic Life, http://epa.ohio.gov/dsw/bioassess/BioCriteriaProtAqLife.aspx). Numerical biological criteria are based on multi-metric 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. Macroinvertebrate data collected from sites where only qualitative protocols are used to collect samples will be assessed with various attributes of the macroinvertebrate community including, but not limited to, total, EPT, and sensitive taxa diversity. A narrative assessment of the data will be coupled with the fish assessment to confirm or recommend an appropriate aquatic life use.

Performance expectations for the basic 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.

C2.2 – Stream Habitat Evaluation

Complete and accurate stream habitat assessment data, along with the survey’s biological findings, are essential to achieving the data quality objectives identified in A7. All Ohio EPA field staff conduct annual habitat refresher training to ensure proper and consistent habitat scoring.
C2.3 – Wetland Use Attainment, Antidegradation Category and Floristic Quality

Wetland tiered aquatic life use and antidegradation categories will be determined using vegetation criteria codified in the Ohio Administrative Code (OAC) 3745-1-54. Complete quantitative assessment of wetland and/or riparian vegetation will be used to assign wetland antidegradation categories as identified in the quality objectives in A7. Non-wetland riparian vegetation will be assessed to evaluate vegetation floristic quality and vegetation disturbance.

SECTION D: DATA VALIDATION AND USABILITY

D1 – Data Review, Verification, and Validation

Data verification will be conducted by the study team with assistance from other DSW staff. The process will also result in summaries of any differences between initial sampling and methods planned in the QAPP and final results reported and available. Differences may result from samples not being collected (due to weather, scheduling, etc.) 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.

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.

D2 – Verification and Validation Methods

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 (June 2015).

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 as a whole.

D3 – Reconciliation with User Requirements

Issues related to biological and habitat data uncertainty, including any patterns of 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.

References


___ 1989a. Addendum to Biological criteria for the protection of aquatic life: Volume II. Users manual for biological field assessment of Ohio surface waters. Division of Water Quality Planning and Assessment, Surface Water Section, Columbus, Ohio.

___ 1989b. The qualitative habitat evaluation index (QHEI): rationale, methods, and application. Division of Water Quality Planning and Assessment, Columbus, Ohio.
