

PHILO- CROOKSVILLE AND PHILO- RUTLAND 138 KV STRUCTURE ADDITION PROJECT



An AEP Company

BOUNDLESS ENERGY™

PUCO Case No. 24-0688-EL-BNR

Submitted to:
The Ohio Power Siting Board
Pursuant to Ohio Administrative Code
Section 4906-6-05

Submitted by:
Ohio Power Company

July 26, 2024

CONSTRUCTION NOTICE

Ohio Power Company

Philo-Crooksville and Philo-Rutland 138 kV Structure Addition Project

4906-6-05

Ohio Power Company (“AEP” or the “Company”) provides the following information to the Ohio Power Siting Board (“OPSB”) in accordance with the accelerated application requirements of Ohio Administrative Code Section 4906-6-05.

4906-6-05(B) General Information

B(1) Project Description

The name of the project and applicant's reference number, names, and reference number(s) of resulting circuits, a brief description of the project, and why the project meets the requirements for a Letter of Notification.

The Company is proposing the Philo-Crooksville and Philo-Rutland 138 kilovolt (kV) Structure Addition Project (the “Project”) in the Village of Crooksville in Perry County, Ohio (OH). Approximately 1 mile south of the Crooksville Station, three transmission lines converge onto a single pole. As part of the Crooksville-Philo South 138 kV Transmission Line Rebuild Project (approved in Case No. 21-1112-EL-BLN), the Company identified the need to separate the three transmission line assets onto separate poles for operational flexibility and safety. One of the three poles required to separate the transmission lines was previously approved by the OPSB in the Crooksville-Philo South 138 kV Transmission Line Rebuild Project. The subject of this filing involves installing a single structure along both the Philo-Crooksville and Philo-Rutland 138 kV transmission lines. The Project will be constructed within an existing 100-foot-wide right-of-way (“ROW”) with additional supplemental easements as needed to accommodate blowout. The location of the Project is shown on Maps 1 and 2 in Appendix A.

The Project meets the requirements for a Construction Notice (“CN”) because it is within the types of projects defined by Item (2)(a) of *Appendix A* to O.A.C. 4906-1-01, *Application Requirement Matrix for Electric Power Transmission Lines*:

- (2) Adding new circuits on existing structures designed for multiple circuit use, replacing conductors on existing structures with larger or bundled conductors, adding structures to an existing transmission line, or replacing structures with a different type of structure, for a distance of:

- (a) Two miles or less.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

B(2) Statement of Need

If the proposed project is an electric power transmission line or natural gas transmission line, a statement explaining the need for the proposed facility.

The existing Philo-Rutland 138 kV Transmission Line is approximately 13.5 miles long and consists of a 6-wire, single circuit configuration. The Philo-Rutland 138 kV line was originally constructed in 1925 with 2-397.5 & 636 KCM ACSR conductors and steel lattice structures. Nearly all of the approximately 13.5 miles of line still utilizes the original conductor.

There are several asset renewal concerns on this transmission line, including burned insulators and damaged shield wire. Pre-1930's vintage lattice transmission towers were not designed for modern wind and ice loading requirements and lack adequate lightning protection. The nearly 100-year old towers have well exceeded the 70 year typical lifespan for this type of structure. In addition, these lines pose increased risk of failure due to the loss of strength identified with similar constructed lines.

The overall deterioration of the line is an indicator of the need to rebuild the asset rather than repair it. The circuit serves approximately 5.156 MW (1,794 customers) for Guernsey- Muskingum Co-Op at Cannelville Switch, who presently are at increased risk of outages. Failure to move forward with the Project will place these customers at increased risk of outages due to the condition and deterioration of the line. Over the past five years, these customers have been subject to 320,767 customer minutes of interruption.

This Project need was presented to PJM on 2/21/2020 and the solution was presented on 03/19/2020. Subsequently, a supplemental Project ID was assigned by PJM (#s2223). The Project was included in the AEP Transmission Company's 2024 Long Term Forecast Report Table FE-T9 pages 34-35 (see Appendix B).

B(3) Project Location

The applicant shall provide the location of the project in relation to existing or proposed lines and substations shown on an area system map of sufficient scale and size to show existing and proposed transmission facilities in the project area.

Map 1 in Appendix A shows the location of the Project in relation to existing transmission facilities on a United States Geological Survey 1:24,000 topographic quadrangle (Crooksville [1977], Deavertown [1977]). Map 2 in Appendix A identifies the Project components on 2020 aerial imagery (Ohio State Imagery Program).

B(4) Alternatives Considered

The applicant shall describe the alternatives considered and reasons why the proposed location or route is best suited for the proposed facility. The discussion

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

shall include, but not be limited to, impacts associated with socioeconomic, ecological, construction, or engineering aspects of the project.

The current configuration of the three transmission lines on a single structure does not align with the Company's operational or safety standards, therefore additional structures were necessary. The Project proposes to install 2 new structures, one along each transmission line, near the existing structure and within existing ROW and supplemental easements to accommodate blowout. Installing the new structures within existing ROW allows the Company to utilize existing access, minimizes tree clearing, impacts to private properties, and aquatic and cultural resources. The Project represents the most suitable location and is the most appropriate solution for meeting the Company's needs in the area.

B(5) Public Information Program

The applicant shall describe its public information program to inform affected property owners and tenants of the nature of the project and the proposed timeframe for project construction and restoration activities.

The Company maintains a website (<http://aeptransmission.com/ohio/>) on which an electronic copy of this CN is available. An electronic copy of the CN will be served to the public library in each political subdivision affected by this Project. The Company also retains land agents who will discuss Project timelines, construction and restoration activities with affected owners and tenants.

B(6) Construction Schedule

The applicant shall provide an anticipated construction schedule and proposed in-service date of the project.

The Company anticipates construction of the Project to begin in October 2024 and be in-service in December 2024.

B(7) Area Map

The applicant shall provide a map of at least 1:24,000 scale clearly depicting the facility with clearly marked streets, roads, and highways, and an aerial image.

Map 1 included in Appendix A identifies the location of the Project area on a United States Geological Survey 1:24,000 quadrangle maps (Crooksville [1977], Deavertown [1977]). Map 2 in Appendix A includes a 2020 aerial map of the Project area (Ohio State Imagery Program).

To visit the Project from Columbus, take I-70 E towards Wheeling, West Virginia. Continue on I-70 for approximately 30 miles. Taking exit 132 for OH-13 (Newark/Thornville). Turn right onto OH-13 S (Jacksonstown Road) and travel approximately 15 miles to OH-669 E and continue

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

approximately 4 miles to OH-93. Turn right onto OH-669 E/OH-93 S, travel 0.5 mile to West Main Street. Continue on West Main Street 0.5 mile to South State Street. Veer right onto South State Street and travel 0.75 mile to Brown Circle Drive. Turn left onto Brown Circle Drive and the Project will be to the north at 39.759240° N, -82.085998° W.

B(8) Property Agreements

The applicant shall provide a list of properties for which the applicant has obtained easements, options, and/or land use agreements necessary to construct and operate the facility and a list of the additional properties for which such agreements have not been obtained.

The table below identifies the property parcel numbers and an indication as to whether the easement/option necessary to construct and operate the facility has been obtained.

| Property Parcel Number | Easement Agreement/Option Obtained (Yes/No) |
|-------------------------------|--|
| 11009225000 | Yes |
| 110015150000 | Yes |
| 070000030000 | Yes |
| 070000030100 | Yes |

B(9) Technical Features

The applicant shall describe the following information regarding the technical features of the Project:

B(9)(a) Operating characteristics, estimated number and types of structures required, and right-of-way and/or land requirements.

The Philo-Crooksville 138 kV Transmission Line (Structure 64B) is planned to include:

Voltage: 138 kV
Conductors: 336.4 kmil 30/7 Strands ORIOLE ACSR; 397.5 kmil 30/7 Strands LARK
Static Wire: 159 kmil 12/7 GUINEA & 7#8 Alumoweld
Insulators: Polymer
ROW Width: 100 feet
Structure Types: One (1) Steel Monopole Dead End, Double Circuit

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

The Philo-Rutland 138 kV Transmission Line (Structure 64C) is planned to include:

Voltage: 138 kV
Conductors: 556.5 kcmil 26/7 Strands DOVE ASCR; 636 kcmil 26/7 Strands GROSEBEAK ASCR
Static Wire: 7#8 Alumoweld
Insulators: Polymer
ROW Width: 100 feet
Structure Types: One (1) Steel Monopole Dead End, Single Circuit

For electric power transmission lines that are within one hundred feet of an occupied residence or institution, the production of electric and magnetic fields during the operation of the proposed electric power transmission line. The discussion shall include:

B(9)(b) Electric and Magnetic Fields

i) Calculated Electric and Magnetic Field Levels

Three loading conditions were examined: (1) Normal Maximum Loading, (2) Emergency Loading, and (3) Winter Normal Conductor Rating, consistent with the OPSC requirements. Normal Maximum Loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter normal (WN) conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. It is not anticipated that this circuit of this line would operate at its WN rating in the foreseeable future.

EMF levels were computed one meter above ground under the line and at the ROW edges (50/50 feet, left/right, of centerline).

Results calculated using EPRI's EMF Workstation 2015 software are summarized below:

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 kV STRUCTURE ADDITION PROJECT

| Clouse-Zanesville 138 kV Line (64B-63: Double Circuit) | | | | | |
|---|--------------------------|-----------------------------|-------------------|-------------------------------|-----------------------------|
| Condition | Phase current (A) | Phasing Arrangements | Sag (feet) | Electric Field (kV/m)* | Magnetic Field (mG)* |
| (1) Normal Max. Loading[^] | 233.87 | A-B-C/ A-B-C | 53.62/ 52.83 | 0.246/1.075/0.248 | 12.16/20.16/12.07 |
| (2) Emergency Line Loading^{^^} | 398.71 | A-B-C/ A-B-C | 65.74/ 64.92 | 0.186/1.661/0.189 | 26.72/53.19/26.46 |
| (3) Winter Conductor Rating^{^^^} | 790.72 | A-B-C/ A-B-C | 53.62/ 52.83 | 0.246/1.075/0.248 | 41.12/68.15/40.79 |

- [^] - Peak line flow expected with all system facilities in service.
- ^{^^} - Maximum flow during a critical system contingency
- ^{^^^} - Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions.

*EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 50 feet (left) and 50 feet (right) of centerline, respectively.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

| Clouse-Zanesville 138 kV Line (1-64B) | | | | | |
|--|--------------------------|-----------------------------|-------------------|-------------------------------|-----------------------------|
| Condition | Phase current (A) | Phasing Arrangements | Sag (feet) | Electric Field (kV/m)* | Magnetic Field (mG)* |
| (1) Normal Max. Loading[^] | 233.87 | A-B-C | 34.92 | 0.183/0.356/0.109 | 5.01/6.41/3.77 |
| (2) Emergency Line Loading^{^^} | 398.71 | A-B-C | 46.14 | 0.194/0.480/0.097 | 10.84/15.09/7.63 |
| (3) Winter Conductor Rating^{^^^} | 790.72 | A-B-C | 34.92 | 0.183/0.356/0.109 | 16.94/21.66/12.74 |

- [^] - Peak line flow expected with all system facilities in service.
- ^{^^} - Maximum flow during a critical system contingency
- ^{^^^} - Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions.

*EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 50 feet (left) and 50 feet (right) of centerline, respectively.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

| Crooksville-Lemaster-Strouds Run 138 kV Line (65-64C) | | | | | |
|--|--------------------------|-----------------------------|--------------------------------|-------------------------------|-----------------------------|
| Condition | Phase current (A) | Phasing Arrangements | Ground Clearance (feet) | Electric Field (kV/m)* | Magnetic Field (mG)* |
| (1) Normal Max. Loading[^] | 265.04 | A-B-C | 22.32 | 0.083/0.731/0.083 | 6.37/14.07/6.37 |
| (2) Emergency Line Loading^{^^} | 502.46 | A-B-C | 30 | 0.039/1.019/0.039 | 13.96/38.50/13.96 |
| (3) Winter Conductor Rating^{^^^} | 1175.62 | A-B-C | 22.32 | 0.083/0.731/0.083 | 28.26/62.42/28.26 |

- [^] - Peak line flow expected with all system facilities in service.
- ^{^^} - Maximum flow during a critical system contingency
- ^{^^^} - Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions.

*EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 50 feet (left) and 50 feet (right) of centerline, respectively.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

| Crooksville-Lemaster-Strouds Run 138 kV Line (64C-65) | | | | | |
|--|--------------------------|-----------------------------|--------------------------------|-------------------------------|-----------------------------|
| Condition | Phase current (A) | Phasing Arrangements | Ground Clearance (feet) | Electric Field (kV/m)* | Magnetic Field (mG)* |
| (1) Normal Max. Loading[^] | 265.04 | A-B-C | 21.32 | 0.061/0.676/0.061 | 6.21/13.44/6.21 |
| (2) Emergency Line Loading^{^^} | 502.46 | A-B-C | 30.7 | 0.038/1.035/0.038 | 14.08/39.93/14.08 |
| (3) Winter Conductor Rating^{^^^} | 1175.62 | A-B-C | 21.32 | 0.061/0.676/0.061 | 27.56/59.60/27.56 |

- [^] - Peak line flow expected with all system facilities in service.
- ^{^^} - Maximum flow during a critical system contingency
- ^{^^^} - Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions.

*EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 50 feet (left) and 50 feet (right) of centerline, respectively.

For power-frequency EMF, IEEE Standard C95.6TM-2002 recommends the following limits:

| | General Public ----- | Controlled Environment ----- |
|-----------------------------|----------------------------|------------------------------------|
| Electric Field Limit (kV/m) | 5.0 | 20.0 |
| Magnetic Field Limit (mG) | 9040 | 27,100 |

The above EMF levels are well within the limits specified in IEEE Standard C95.6TM-2002. Those limits have been established to "prevent harmful effects in human beings exposed to electromagnetic fields in the frequency range of 0-3 kHz."

ii) Design Alternatives

A discussion of the applicant's consideration of design alternatives with respect to electric and magnetic fields and their strength levels, including alternate conductor configuration and phasing, tower height, corridor location, and right-of-way width.

Design alternatives were not considered due to EMF strength levels. Transmission lines, when energized, generate EMF. Laboratory studies have failed to establish a strong correlation between exposure to EMF and effects on

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

human health. However, some people are concerned that EMF have impacts on human health. Due to these concerns, EMF associated with the new circuits was calculated and set forth in the table above. The EMF was computed in a manner to maximize the estimate, assuming the highest reasonable input values based on conditions along the proposed transmission line rebuild. Normal daily EMF levels would be less than these, which were calculated at maximum load conditions. Based on studies from the National Institutes of Health, the magnetic field (measured in milliGauss, or mG) associated with emergency loading at the highest EMF value for this transmission line is lower than those associated with normal household appliances like microwave ovens, electric shavers and hair dryers. For additional information regarding EMF, the National Institutes of Health has posted information on their website: <http://www.niehs.nih.gov/health/topics/agents/emf/>. Additionally, information on electric and magnetic fields is available on the Company's website: <https://www.aepohio.com/community/education/emf>. The information found on the Company's website describes the basics of electromagnetic field theory, scientific research activities, and EMF exposures encountered in everyday life. Similar material will be made available for those affected by the construction activities for this Project.

B(9)(c) Project Costs

The estimated capital cost of the project.

The estimated cost of the Project, comprised of applicable tangible and capital costs, is approximately \$550,000 (Class 3). Pursuant to the PJM OATT, the costs for this Project will be recovered in the Ohio Power Company's FERC formula rate (Attachment H-20 to the PJM OATT) and allocated to the AEP Zone.

B(10) Social and Economic Impacts

The applicant shall describe the social and ecological impacts of the project.

B(10)(a) Provide a brief, general description of land use within the vicinity of the proposed project, including a list of municipalities, townships, and counties affected.

The Project is located in the Village of Crooksville in Perry County, Ohio. Land use in the Project area within the Village of Crooksville consists of medium-density residential and public housing communities. The Project crosses through the James Brown Terrace Heights public housing community, a Perry Metropolitan Housing Authority development, within the Village of Crooksville. The Project plans to rebuild the transmission line within the existing ROW, so no new easements will be required, and no additional impacts are anticipated.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

B(10)(b) Agricultural Land Information

Provide the acreage and a general description of all agricultural land, and separately all agricultural district land, existing at least sixty days prior to submission of the application within the potential disturbance area of the project.

According to the Perry County Auditor's Office as of June 5, 2024, the Project does not cross registered Agricultural District land. The Project does not cross active agricultural row crop land (Appendix A, Map 2), therefore, impacts to agricultural uses are not anticipated.

B(10)(c) Archaeological and Cultural Resources

Provide a description of the applicant's investigation concerning the presence or absence of significant archeological or cultural resources that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

A cultural resource survey and report were conducted by the Company's consultant for the Project. Correspondence from the State Historic Preservation Office ("SHPO") was received in July and December 2020, see Appendix D. The SHPO stated that the Project will have no adverse effect on historic properties and that no further archaeological work is necessary.

B(10)(d) Local, State, and Federal Agency Correspondence

Provide a list of the local, state, and federal governmental agencies known to have requirements that must be met in connection with the construction of the project, and a list of documents that have been or are being filed with those agencies in connection with siting and constructing the project.

A Notice of Intent ("NOI") was filed with the Ohio Environmental Protection Agency ("OEPA") for authorization of construction storm water discharge under General Permit OHC000006. Permit oGC03920*BG was renewed by the OEPA on August 8, 2023. The Company will implement and maintain best management practices as outlined in the Project-specific Storm Water Pollution Prevention Plan ("SWP3") to minimize erosion and sediment to Project surface water quality during storm events. If necessary, the SWP3 will be revised to include the construction areas for the Project. If the expanded construction area increases the Limits of Disturbance beyond the permitted acreage limit, the Company will submit a SWP3 amendment to the OEPA for approval prior to the start of construction.

The Company's consultant completed wetland delineation and stream identification field reviews for the Project in May 2020. Forty-seven streams and twelve wetlands were identified within the study area for the Crooksville-Philo South 138 kV Transmission line, however only one stream is

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

within the Project area. The stream will either be aerially spanned, crossed by an air bridge, or avoided all together.

The Project is not located in a Federal Emergency Management Agency (“FEMA”) 100-year floodplain area (FIRM Panel 39127C0164D [effective date 04/18/2011]). Therefore, no floodplain permitting is anticipated for the Project. These resources are shown on Figure 2 in Appendix D.

Coordination with the Federal Aviation Administration (“FAA”) will not be required, as there are no known airports or heliports within five miles of the Project.

In addition to easement acquisition, state and local road permits or bonds could be required. Coordination with these stakeholders is necessary to identify the authorization requirements and timeframes.

There are no other known local, state, or federal requirements that must be met prior to commencement of the Project.

B(10)(e) Threatened, Endangered, and Rare Species

Provide a description of the applicant's investigation concerning the presence or absence of federal and state designated species (including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

A coordination letter was submitted to the United States Fish and Wildlife Service (“USFWS”) Ohio Ecological Services Field Office on July 9, 2020, seeking technical assistance on the Project for potential impacts to threatened or endangered species. In a response email dated July 15, 2020, the USFWS noted the potential for the Indiana bat and northern long-eared bat to occur within the Project area. The USFWS recommended that if tree removal was required for the Project, it be limited to the time between October 1 and March 31 to avoid the potential for take of the Indiana bat and northern long-eared bat. The Company does not anticipate the need to clear trees as the Project is located in an open lawn area.

The USFWS stated that due to the Project type, size, and location, no other impacts to federally endangered, threatened, or proposed species or designated critical habitat are anticipated.

A coordination letter was submitted to the Ohio Department of Natural Resources (“ODNR”) Division of Wildlife (“DOW”) on July 9, 2020, seeking technical assistance for potential impacts to threatened or endangered species in the vicinity of the Project area. In a response received on September 17, 2020, ODNR-DOW noted the potential for the Indiana bat, northern long-eared bat, little brown bat and tri-colored bat to occur within the Project area. ODNR-DOW recommended that if tree removal was required for the Project, it be limited to the time between

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

October 1 and March 31 to avoid potential for take of these state-listed species. ODNR-DOW also recommended conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH \geq 20 if possible. The Company does not anticipate the need to clear trees as the Project is located in an open lawn area.

ODNR-DOW also noted the potential for the Black Tern, Northern Harrier, Sandhill Crane and Trumpeter Swan bird species to be present in the Project area. Suitable habitat for the Black Tern, Sandhill Crane, and Trumpeter Swan were not identified during field survey and therefore the Project is not likely to impact these species. Habitat for the Northern Harrier was identified in the broader Crooksville-Philo South 138 kV Transmission Line Project, however, there is no habitat situated within the Project area, therefore no impacts are anticipated to the Northern Harrier.

ODNR-DOW noted the potential for eleven mussel species, two amphibian species, and six fish species to be present in the Project area; however, impacts to these species are not anticipated as no in-water work is proposed for the Project.

Coordination letters from USFWS and ODNR-DOW are provided in Appendix C.

B(10)(f) Areas of Ecological Concern

Provide a description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains, wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

Coordination letters were submitted to the USFWS and ODNR requesting a review of the Project and identification of areas of ecological concern. The USFWS response dated July 15, 2020 (Appendix C), indicated there are no federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the Project. The ODNR response received on September 17, 2020 (Appendix C) indicated that according to the Ohio Natural Heritage Database (ODNR), no known unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state natural preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas are located within the Project area.

A review of the National Conservation Easement Database, Land and Water Conservation Fund Database, and the USACE Regulatory In-lieu Fee and Bank Information Tracking System did not identify mapped easements or mitigation sites in the Project area.

The Project does not cross a FEMA 100-year floodplain area. Therefore, no floodplain permitting is anticipated for the Project. These resources are shown on Figure 2 in Appendix D.

PHILO-CROOKSVILLE AND PHILO-RUTLAND 138 KV STRUCTURE ADDITION PROJECT

In May of 2020, the Company's consultant completed wetland delineation and stream identification field reviews within a 200-foot-wide corridor for the existing and proposed transmission line centerline, which included the existing ROW – this report was completed for the 21-1112-El-BLN filing. The May 2020 field review included the area subject to this filing. The results of the survey are presented in the Ecological Survey Report included in Appendix D. One intermittent stream, S047, was identified within the Project area. The Philo-Rutland and Philo-Crooksville 138 kV transmission lines currently span this stream aurally. The new alignments for the Philo-Crooksville and Philo-Rutland lines will also span this stream aurally upon the installations of Structures 64B and 64C respectively. For construction activities, if a stream crossing is necessary, the stream would be crossed by an airbridge; however, a crossing will most likely not be needed. No impact to this stream is anticipated.

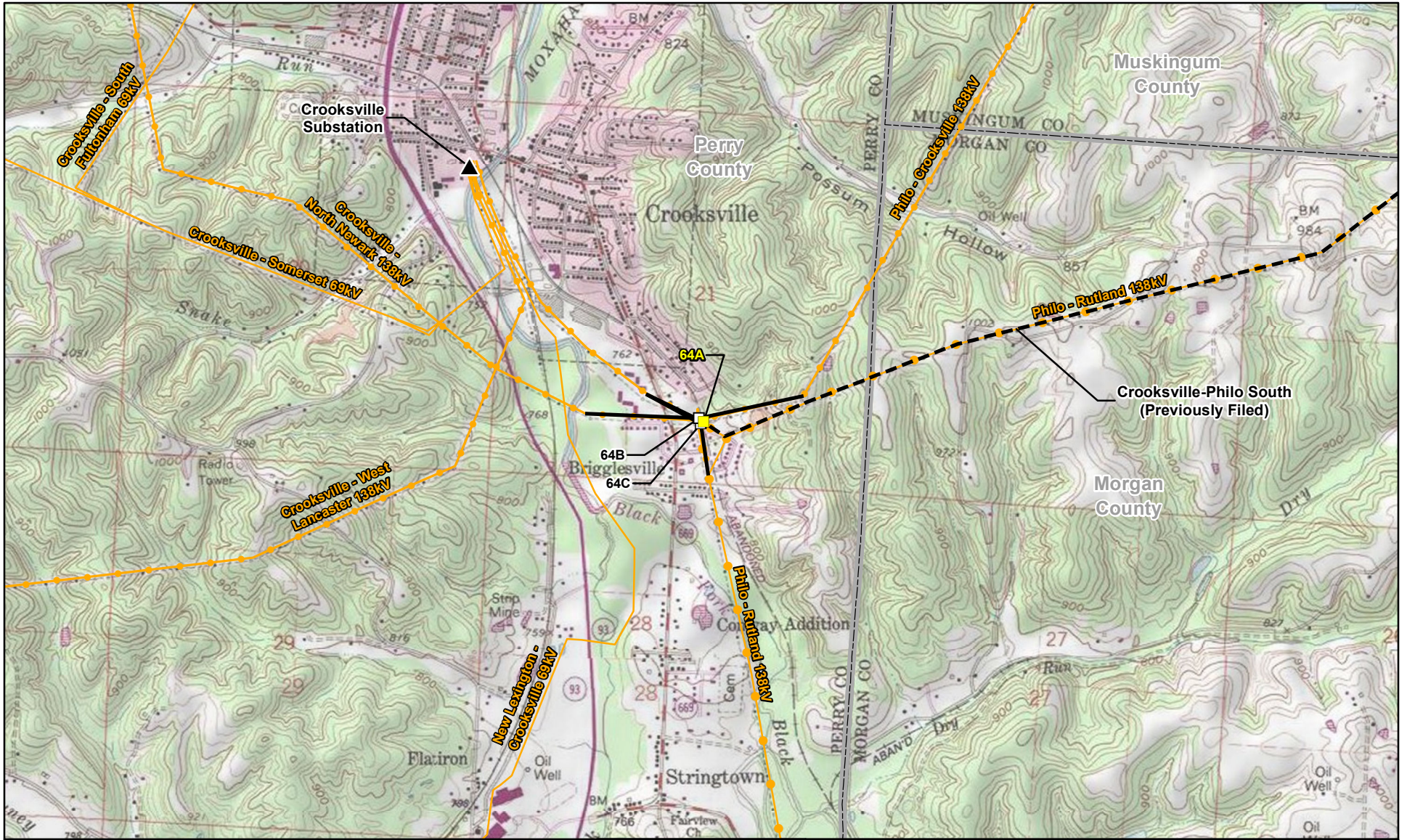
B(10)(g) Unusual Conditions

Provide any known additional information that will describe any unusual conditions resulting in significant environmental, social, health, or safety impacts.

To the best of the Company's knowledge, no unusual conditions exist that would result in substantial environmental, social, health, or safety impacts.

APPENDIX A

Project Maps



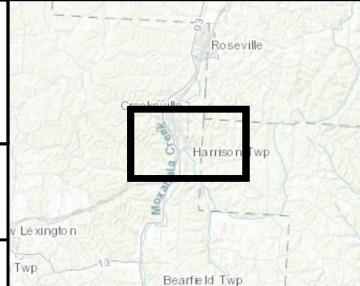
Legend

- ▲ Existing Station
- Proposed Structure
- Previously Approved Proposed Structure
- Proposed 138 kV Transmission Line
- Previously Filed Proposed 138 kV Transmission Line
- Existing 69 kV Transmission Line
- Existing 138 kV Transmission Line
- ▭ County Boundary

USGS Topographic (Crooksville (1977) and Deavertown (1977), Ohio), Esri ArcGIS Online, Accessed 07/2024.

NAD 1983 State Plane Ohio South Feet

July 05, 2024



**Figure 1
Project Location Map**

**Philo-Crooksville and Philo-Rutland
138kV Structure Addition Project**

0 2,000
Feet



Legend

- ▲ Existing Station
- Proposed Structure
- Previously Approved Proposed Structure
- Proposed 138 kV Transmission Line
- Previously Filed Proposed 138 kV Transmission Line
- Existing 69 kV Transmission Line
- Existing 138 kV Transmission Line
- Parcel Boundary

Aerial Imagery, Ohio State Imagery Program (OSIP), 2020. World Transportation, Esri ArcGIS Online, Accessed 07/2024.

NAD 1983 State Plane
Ohio South Feet



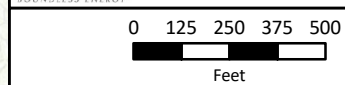
July 05, 2024



**Figure 2
Aerial Map**



**Philo-Crooksville and Philo-Rutland
138kV Structure Addition Project**



APPENDIX B

PJM Interconnection Submittal

PUCO Form FE-T9
AEP Ohio Transmission Company
Specifications of Planned Transmission Lines

| | | |
|----|---|---|
| 1 | LINE NAME AND NUMBER: | Crooksville - Philo (s2223), TP2019113 |
| 2 | POINTS OF ORIGIN AND TERMINATION | Crooksville, <u>Philo</u> INTERMEDIATE STATION - Cannelville SW |
| 3 | RIGHTS-OF-WAY: LENGTH / WIDTH / CIRCUITS | 13 mi / 100 ft / 1 circuit |
| 4 | VOLTAGE: DESIGN / OPERATE | 138 kV/ 138 kV |
| 5 | APPLICATION FOR CERTIFICATE: | 11/9/2022 |
| 6 | CONSTRUCTION: | 2023-2024 |
| 7 | CAPITAL INVESTMENT: | \$25M |
| 8 | PLANNED SUBSTATION: | N/A |
| 9 | SUPPORTING STRUCTURES: | Steel |
| 10 | PARTICIPATION WITH OTHER UTILITIES | N/A |
| 11 | PURPOSE OF THE PLANNED TRANSMISSION LINE | Rebuild of existing 138 kV line |
| 12 | CONSEQUENCES OF LINE CONSTRUCTION DEFERMENT OR TERMINATION | Increased risk of equipment failure. |
| 13 | MISCELLANEOUS: | |



AEP Transmission Zone M-3 Process Crooksville-Philo 138kV Circuit Rebuild

Need Number: AEP-2020-OH004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 05/11/2020

Previously Presented:

Needs Meeting 2/21/2020

Solutions Meeting 3/19/2020

Project Driver:

Equipment Material/Condition/Performance/Risk

Specific Assumption Reference:

AEP Guidelines for Transmission Owner Identified Needs (AEP Assumptions Slide 8), AEP Presentation on Pre-1930s Lines

Problem Statement:

Crooksville – Philo 138kV

- Length: 13 Miles
- Original Construction Type: Aluminum/Steel Lattice
- Original Conductor Type: 397.5 ACSR Lark / 636 ACSR Grosbeak (vintage 1926)
- Momentary/Permanent Outages: 1 total outages
 - CMI: 320,767
 - Number of open conditions: 5
 - Total structure count: 65
 - Open conditions include: Burnt insulators, damaged shield wire
- Please reference assumptions materials on pre-1930s era lattice lines





AEP Transmission Zone M-3 Process Crooksville-Philo 138kV Circuit Rebuild

Need Number: AEP-2020-OH004

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan 05/11/2020

Selected Solution:

- Rebuild ~12 miles of the Crooksville – Philo 138kV circuit. **(s2223.1) Estimated Cost: \$29.8M**
- Replace Cannelville Switch with a new phase-over-phase switch. Relocate the existing Cannelville – Guernsey-Muskingum Co-op 138kV line to new Cannelville Switch. The switch needs to be relocated to maintain service to the customer while the line is being rebuilt. **(s2223.2) Estimated Cost: \$1.1M**

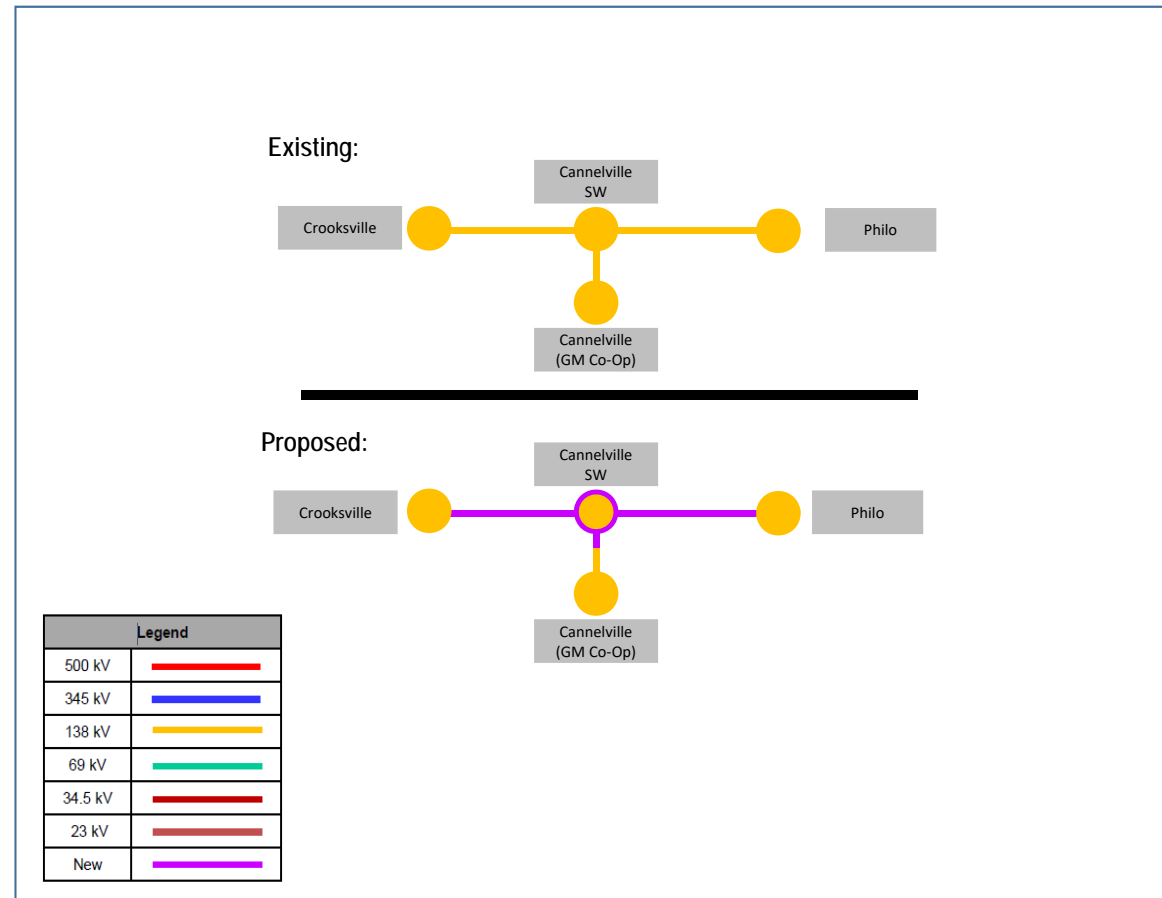
Estimated Cost: \$30.9M

Projected In-Service: 9/30/2022

Supplemental Project ID: s2223

Project Status: Engineering

Model: N/A



APPENDIX C

Agency Correspondence



In reply, refer to
2020-MLT-48961

July 17, 2020

Mr. Ryan J. Weller
Weller & Associates, Inc.
1395 West Fifth Avenue
Columbus, Ohio 43212

RE: Philo-Cannelsville 138kV Transmission Line Rebuild Project, Perry, Morgan, and Muskingum Counties, Ohio

Dear Mr. Weller:

This letter is in response to the correspondence received on June 29, 2020 regarding the proposed Philo-Cannelsville 138kV Transmission Line Rebuild Project, Perry, Morgan, and Muskingum Counties, Ohio. We appreciate the opportunity to comment on this project. The comments of the Ohio State Historic Preservation Office (SHPO) are made pursuant to Section 149.53 of the Ohio Revised Code and the Ohio Power Siting Board rules for siting this project (OAC 4906-5). The comments of the Ohio SHPO are also submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108 [36 CFR 800]).

The following comments pertain to the *Phase I Archaeological Investigations for the Approximately 20.9 km (13 mi) Philo-Cannelsville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio* by Weller & Associates, Inc. (2020).

A literature review, visual inspection, shovel probe and shovel test unit excavation was completed as part of the investigations. No previously identified archaeological sites are located within the project area. Two (2) new archaeological sites were identified during survey. Ohio Archaeological Inventory (OAI) #33MU1620 and 33MU1621 are small prehistoric lithic scatters. They sites recommended not eligible for listing in the National Register of Historic Places (NRHP). Our office agrees with this recommendation and no additional archaeological investigations are needed.

The following comments pertain to the *History/Architecture Investigations for the 13.0 km (20.9 mi) Philo-Cannelsville 138 kV Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio* by Weller & Associates, Inc. (2020).

A literature review and field survey were completed as part of the investigations. Two National Register-listed resources, four Ohio Historic Inventory resources, and 108 resources 50 years of age or older were identified within the Area of Potential Effects.

It is Weller's recommendation that one of the previously recorded Ohio Historic Inventory properties (PER0002606) is eligible for inclusion in the National Register of Historic Places under Criterion C. Our office agrees with Weller's recommendation regarding eligibility.

Based on the information provided, the project corridor will be relatively unobstructed and visible from a majority of the identified historic properties. The existing nature of the project and proposed rebuild should not impact the significance or integrity of these historic properties in a way that would alter their National Register status or eligibility. Therefore, we agree that the project as proposed will have no adverse effect on historic properties.

Based on the information provided, we agree that the project as proposed will have no adverse effect on historic properties.

No further coordination with this office is necessary, unless the project changes or unless new or additional historic properties are discovered during implementation of this project. In such a situation, this office should be contacted. If you have any questions, please contact me at (614) 298-2022, or by e-mail at khorricks@ohiohistory.org, or Joy Williams at jwilliams@ohiohistory.org. Thank you for your cooperation.

Sincerely,



Krista Horrocks, Project Reviews Manager
Resource Protection and Review

RPR Serial No: 1084713-1084714



Permit Reference
2020-ML-486

February 2020

Mr. [Name] [Address]
[City] [State]
[Zip] [Phone]
[Email]

RE: Philo-Crooksville 138kV Transmission Line Rebuild Project, Perry, Morgan, and Muskingum Counties, Ohio

Dear Mr. [Name]

With reference to the correspondence dated February 2020 for the February 2020 record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio, the Ohio Department of Transportation (ODOT) is pleased to inform you that the Ohio Department of Transportation (ODOT) has approved the record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio. The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address]. The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address].

For information, ODOT is pleased to announce that Phase I Archaeological Investigations for the Approximately 20.9 km (13 mi) Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio is currently in progress. The Phase I Archaeological Investigations for the Approximately 20.9 km (13 mi) Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio is currently in progress.

The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address]. The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address].

For information, ODOT is pleased to announce that History/Architecture Investigations for the 13.0 km (20.9 mi) Philo-Crooksville 138kV Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio is currently in progress. The History/Architecture Investigations for the 13.0 km (20.9 mi) Philo-Crooksville 138kV Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio is currently in progress.

The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address]. The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address].

The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address]. The record drawings for the Philo-Crooksville 138kV Transmission Line Rebuild Project in Perry, Morgan, and Muskingum Counties, Ohio are available for review at the following location: [Address].

RPR Reference No. 084-084-4-086

Based on the information provided, it is recommended that the proposed amendments be adopted as written. No further coordination or consultation is required with the appropriate state or federal agencies or additional information is required. The proposed amendments were reviewed on 6/4/2022 and the information is provided for your review at [Corroborate Ohio](#) or contact at [Corroborate Ohio](#) for more information.

Respectfully,



Christa Corroborate Project Manager
Corroborate Project Lead

RPR 17184008400840086

OHIO HISTORY CONNECTION

800 E. 17th Ave., Columbus, OH 43211-2474 • 614.297.2300 • ohiohistory.org

From: Ohio, FW3 <ohio@fws.gov>
Sent: Wednesday, July 15, 2020 8:31 AM
To: Kristen Vonderwish; Joshua Noble
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate
Subject: AEP Crooksvills - Philo 138 kV Line Rebuild, Perry, Morgan, and Muskingum Co

EXTERNAL E-MAIL MESSAGE



UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994



TAILS# 03E15000-2020-TA-1809

Dear Ms. Vonderwish,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥ 3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥ 3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are

present and trees ≥ 3 inches dbh cannot be avoided, we recommend removal of any trees ≥ 3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see <http://www.fws.gov/midwest/endangered/mammals/nleb/index.html>), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.

If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus it is important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew,

Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrice M. Ashfield". The signature is fluid and cursive, with a large initial "P" and "A".

Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW



Ohio Department of Natural Resources

MIKE DeWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6621
Fax: (614) 267-4764

September 17, 2020

Kristen Vonderwish
GAI Consultants
6000 Town Center Blvd., Suite 300
Canonsburg, PA 15317

Re: 20-707; Crooksville - Philo 138 kV Line Rebuild Project

Project: The proposed Project involves rebuilding approximately 6.7 miles of the existing Crooksville – Philo 138 kV transmission line and the installation of a new switch at the Cannelville station.

Location: The proposed project is located in Perry, Morgan, and Muskingum Counties, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has no records at or within a one-mile radius of the project area.

A review of the Ohio Natural Heritage Database indicates there are no other records of state endangered or threatened plants or animals within the project area. There are also no records of state potentially threatened plants, special interest or species of concern animals, or any federally listed species. In addition, we are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. If trees are present within the project area, and trees must be cut, the DOW recommends cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH ≥ 20 if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the “OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE CLEARING”. If state listed bats are documented, DOW recommends cutting only occur from October 1 through March 31, however, limited summer tree cutting may be acceptable after consultation with DOW (contact Sarah Stankavich, sarah.stankavich@dnr.state.oh.us).

The DOW also recommends that a desktop or field-based habitat assessment is conducted to determine if there are potential hibernaculum(a) present within the project area. Habitat assessments should be conducted in accordance with the current USFWS “Range-wide Indiana Bat Survey Guidelines” and submitted to Sarah Stankavich, sarah.stankavich@dnr.state.oh.us if potential hibernacula are present within .25 miles of the project area. If a potential hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the following listed mussel species:

Federally Endangered

fanshell (*Cyprogenia stegaria*)
sheepnose (*Plethobasus cyphus*)
snuffbox (*Epioblasma triquetra*)

Federally Threatened

rabbitsfoot (*Quadrula cylindrica cylindrica*)

State Endangered

long-solid (*Fusconaia maculata maculata*)
Ohio pigtoe (*Pleurobema cordatum*)
sharp-ridged pocketbook (*Lampsilis ovata*)
wartyback (*Quadrula nodulata*),

State Threatened

black sandshell (*Ligumia recta*)

fawnsfoot (*Truncilla donaciformis*)
threehorn wartyback (*Obliquaria reflexa*)

This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol (2020), all Group 2, 3, and 4 streams (Appendix A) require a mussel survey. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 5 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2020) can be found at: <http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/licenses%20&%20permits/OH%20Mussel%20Survey%20Protocol.pdf>

The project is within the range of the following listed fish species:

State Endangered

northern madtom (*Noturus stigmosus*)

State Threatened

American eel (*Anguilla rostrata*)

blue sucker (*Cycleptus elongatus*)

channel darter (*Percina copelandi*)

mountain madtom (*Noturus eleutherus*)

paddlefish (*Polyodon spathula*)

The DOW recommends no in-water work in perennial streams from April 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), a state endangered species and a federal species of concern. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size to provide suitable habitat, this project is not likely to impact this species.

The project is also within the range of the eastern spadefoot toad (*Scaphiopus holbrookii*), a state endangered species. This species is found in areas of sandy soils that are associated with river valleys. Breeding habitats may include flooded agricultural fields or other water holding depressions. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the black tern (*Chlidonias niger*), a state endangered bird. The black tern prefers large, undisturbed inland marshes with fairly dense vegetation and pockets of open water. They nest in various kinds of marsh vegetation but cattail marshes are generally favored. Nests are built on top of muskrat houses or on top of floating vegetation. If this type of

habitat will be impacted, construction should be avoided in this habitat from April 1 to June 30 to reduce impacts to this species. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 to September 1. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state threatened bird. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to June 15. If this habitat will not be impacted, this project is not likely to have an impact on this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or Sarah.Tebbe@dnr.state.oh.us if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

APPENDIX D

Ecological Survey Report



Ecological Survey Report

AEP Ohio Transmission Company
Crooksville – Cannelville 138 kV Transmission Line Rebuild Project
Perry, Morgan, and Muskingum Counties, Ohio

GAI Project Number: C170352.83, Task 001

November 2021

Prepared for:
American Electric Power Service Corporation
8600 Smiths Mill Road
New Albany, Ohio 43054

Prepared by:
GAI Consultants, Inc.
Canton Office
5299 Lauby Road, Suite 120
North Canton, Ohio 44720

Report Authors:

Kristen L. Vonderwish
Project Environmental Specialist

Joshua J. Noble, MS
Senior Environmental Manager



BOUNDLESS ENERGY™

Table of Contents

| | | |
|------------|--|---|
| 1.0 | Introduction..... | 1 |
| 2.0 | Methods..... | 1 |
| 2.1 | Wetlands | 1 |
| 2.1.2 | Onsite Inspection | 2 |
| 2.2 | Waterbodies..... | 3 |
| 2.2.1 | Preliminary Data Gathering..... | 3 |
| 2.2.2 | Onsite Inspection | 3 |
| 2.3 | Rare, Threatened, and Endangered Species | 3 |
| 2.3.1 | Preliminary Data Gathering..... | 3 |
| 2.3.2 | Onsite Inspection | 4 |
| 3.0 | Results..... | 4 |
| 3.1 | Wetlands | 4 |
| 3.1.1 | Preliminary Data Gathering..... | 4 |
| 3.1.2 | Onsite Inspection | 4 |
| 3.1.3 | Regulatory Discussion | 5 |
| 3.2 | Waterbodies..... | 5 |
| 3.2.1 | Preliminary Data Gathering..... | 5 |
| 3.2.2 | Onsite Inspection | 5 |
| 3.2.3 | Regulatory Discussion | 5 |
| 3.3 | Rare, Threatened, and Endangered Species | 6 |
| 3.3.1 | Preliminary Data Gathering..... | 6 |
| 3.3.2 | Onsite Inspection | 7 |
| 4.0 | Conclusions | 7 |
| 5.0 | References | 8 |
| Table 1 | Wetlands Identified Within the Project Study Area | |
| Table 2 | Waterbodies Identified Within the Project Study Area | |
| Table 3 | ODNR and USFWS RTE Species and Critical Habitat Review Results | |
| Figure 1 | Project Location Map | |
| Figure 2 | Resource Location Map | |
| Figure 3 | Stream Eligibility Map | |
| Appendix A | Photographs | |
| Appendix B | Wetland Determination Data Forms | |
| Appendix C | Ohio Rapid Assessment Method for Wetlands (ORAM) Data Forms | |
| Appendix D | Primary Headwater Habitat Evaluation (HHEI) Data Forms | |
| Appendix E | ODNR and USFWS Correspondence | |

1.0 Introduction

GAI Consultants, Inc. (GAI), on behalf of American Electric Power Ohio Transmission Company, Inc. (AEP), completed an ecological survey for the Crooksville – Cannelville 138 kilovolt (kV) Line Rebuild Project (Project) located in Perry, Morgan and Muskingum Counties, Ohio (OH). The proposed Project involves rebuilding approximately 6.7 miles of the existing Philo-Rutland 138 kV transmission line and the installation of a new switch at the Cannelville Station.

Ecological surveys were conducted on May 18 - 21, 2020 and September 16 – 17, 2021. The Project study area consisted of a 200-foot-wide corridor centered along the existing transmission line and a 50-foot-wide corridor for access roads, as shown in Figure 1.

The Project study area is located within the Brush Creek (USGS HUC #050400040801), Black Fork (USGS HUC # 050400040501), and Middle Moxahala Creek (USGS HUC # 050400040503) watersheds.

This report details the results of the ecological surveys regarding the existence of aquatic resources within the Project area (Figure 2). The United States Army Corps of Engineers (USACE) Wetland Determination Data Forms are provided in Appendix B and Ohio Rapid Assessment Method for Wetlands (ORAM) Data Forms are provided in Appendix C. Ohio Environmental Protection Agency (OEPA) Primary Headwater Habitat Evaluation (HHEI) Data Forms are provided in Appendix D.

2.0 Methods

2.1 Wetlands

The 1987 USACE *Corps of Engineers Wetlands Delineation Manual* (Wetlands Delineation Manual) (USACE, 1987) and the 2012 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region, Version 2.0* (Regional Supplement) (USACE, 2012) describe the methods used to identify and delineate wetlands that fall under the jurisdiction of the USACE. This approach recognizes the three parameters of wetland hydrology, hydrophytic vegetation, and hydric soils to identify and delineate wetland boundaries. In accordance with the Wetlands Delineation Manual and Regional Supplement, GAI completed preliminary data gathering and onsite inspections.

2.1.1 Preliminary Data Gathering

The preliminary data gathering is used to compile and review information that may be helpful in identifying wetlands and/or areas that warrant further inspection during the investigation. The preliminary data gathering includes a review of the following:

- ▶ USGS 7.5-minute topographic mapping for Crooksville (USGS, 1977), Deavertown (USGS, 1977), Philo (USGS, 1977), and Rokeby Lock (USGS, 1977) (Figure 1);
- ▶ United States Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI) mapping (USFWS, 2020) (Figure 2).
- ▶ Federal Emergency Management Agency (FEMA), National Flood Hazard Layer (FEMA, 2020) (Figure 2).
- ▶ United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS, 2019) soil mapping (Figure 2).

Topographic mapping is used to identify mapped streams and the overall shape of the landscape in the Project area to determine potential locations for wetlands, such as floodplains and depressions. NWI mapping is used to determine locations where probable wetlands are located based on infrared photography. Soil mapping is reviewed to determine the location and extent of mapped hydric soils that have a high probability of containing wetlands.

2.1.2 Onsite Inspection

The methodology described in the Regional Supplement identifies areas meeting the definition of a wetland by evaluating three parameters: hydrology, vegetation, and soil. During the on-site inspection, GAI staff traversed the Project study area on foot to determine if indicators of wetlands were present. When indicators of wetlands are observed, an observation point is established, and a Data Form is completed to determine if all wetland indicators are present.

The presence of wetland hydrology is determined by examining the observation point for primary and secondary indicators of wetland hydrology. The presence of any primary indicator signifies the presence of wetland hydrology, or the presence of two or more secondary indicators signifies the presence of wetland hydrology.

Vegetation is characterized by four strata. This includes trees (woody plants, excluding vines, three inches or more [≥ 3.0 "] in diameter at breast height [DBH]), saplings/shrubs (woody plants, excluding vines, less than three inches [< 3.0 "] DBH and greater than or equal to [\geq] 3.28 feet tall), herbs (non-woody plants, regardless of size, and all other plants less than [$<$] 3.28 feet tall), and woody vines (greater than 3.28 feet tall). In general, trees and woody vines are sampled within a 30-foot (30.0') radius, saplings and shrubs are sampled within a 15-foot (15.0') radius, and herbs are sampled within a five-foot (5.0') radius.

When evaluating an area for the presence of hydrophytes, classification of the indicator status of vegetation is based on *The National Wetland Plant List: 2016 Update of Wetland Ratings* (Lichvar et al., 2016). The list of possible indicator statuses for plants is as follows:

- ▶ Obligate Wetland (OBL) – OBL plants occur in standing water or in saturated soils.
- ▶ Facultative Wetland (FACW) – FACW plants occur in areas of prolonged flooding or require standing water or saturated soils but may on rare occasions, occur in non-wetlands.
- ▶ Facultative (FAC) – FAC plants occur in a variety of habitats, including wetland and mesic to xeric non-wetland habitats.
- ▶ Facultative Upland – Facultative Upland plants occur in xeric or mesic non-wetland habitats.
- ▶ Obligate Upland – Obligate Upland plants rarely occur in water or saturated soils.

The presence of hydrophytic vegetation is determined by a Rapid Test, Dominance Test or Prevalence Index. The Rapid Test finds a vegetation community to be hydrophytic if all dominant species are OBL or FACW. Hydrophytic vegetation is considered present based on the Dominance Test if more than 50 percent of dominant species are OBL, FACW, or FAC. The Prevalence Index weighs the total percent of vegetation cover based on the indicator status of each plant. Hydrophytic vegetation is considered present when the Prevalence Index is less than or equal to (\leq) 3.0 (USACE, 2012).

To determine the presence of hydric soils, soil data is collected by digging a minimum 16 inch (16.0") deep soil pit, unless a restrictive layer is present. The soil profile is studied and described, while possible hydric indicators are examined. Soil indicators described in the Wetlands Delineation Manual and Regional Supplement are used to determine the presence of hydric soils. The presence of these indicators signifies a hydric soil.

If all parameters including wetland hydrology, a dominance of hydrophytic vegetation, and hydric soils are identified at a single observation point, the area is determined to be a wetland. Once a wetland is identified, the boundary is delineated.

Wetland boundaries are determined by looking for locations in which one of the three wetland indicators would transition into an upland characteristic. When the transition is identified, a

Data Form is completed in the Upland Area. Wetland boundaries are marked in the field using pink flagging labeled “WETLAND DELINEATION.” The locations of the flags are recorded using a Global Positioning System (GPS) unit. Each wetland is codified with a unique identifier indicating the feature type and number (such as W001).

Wetlands are classified using the *Classification of Wetlands and Deepwater Habitats of the United States* as modified for NWI Mapping Convention. This system classifies wetlands based on topographic position and vegetation type. Palustrine system wetlands found within the study area are classified as Palustrine Emergent (PEM), Palustrine Scrub-Shrub, Palustrine Forested (PFO), or Palustrine Unconsolidated Bottom (PUB) based on aerial coverage of the vegetative community across the extent of the wetland boundary (Cowardin et al., 1979).

2.2 Waterbodies

As with wetlands, Sections 404 and Section 401 of the Clean Water Act (CWA) and state regulations protect waterbodies in OH. Generally, waterbodies are defined as environmental features that have defined beds and banks, ordinary high water mark (OHWM), and contain flowing or standing water for at least a portion of the year.

2.2.1 Preliminary Data Gathering

During the preliminary data gathering, the USGS 7.5-minute topographic mapping is examined for the presence of mapped waterbodies including perennial and intermittent streams. In addition, the topographic mapping identifies areas likely to contain unmapped waterbodies including ephemeral streams (USGS, 1977) (Figure 1).

The OEPA 401 Water Quality Certification for the 2017 Nationwide Permits Stream Eligibility Web Map (OPEA, 2017) determined eligibility for coverage under the 401 Water Quality Certification (WQC) for the 2017 Nationwide Permits (NWP). Furthermore, the map identifies ineligible areas that may require a CWA Section 401 individual permit from the OEPA should stream impacts occur within the Project area (OEPA, 2017) (Figure 3).

2.2.2 Onsite Inspection

During the onsite inspection, GAI staff traversed the study area, concurrently with the wetland inspection, whereby waterbodies are identified. Waterbodies are identified on the morphological and hydrologic characteristics of the channel and the presence of aquatic macroinvertebrates.

When a waterbody is identified, field measurements are collected. The measurements include top of bank width, top of bank depth, pool depth, water depth, OHWM width, and OHWM depth. A detailed description of substrate composition is recorded. Waterbodies are delineated using white flagging marked with the GAI stream code (such as S001). The tops-of-bank for streams wider than 10 feet (>10.0') are delineated, while the centerline of smaller streams is delineated. The locations of the flags are recorded using a sub-meter-capable hand-held GPS unit.

2.3 Rare, Threatened, and Endangered Species

GAI conducts a literature review of potential Rare, Threatened, and Endangered (RTE) species in the vicinity of the Project study area. Potential habitat for RTE species are noted during the ecological survey.

2.3.1 Preliminary Data Gathering

A request for review of the Ohio Natural Heritage Database is submitted to the Ohio Department of Natural Resources (ODNR) to determine if state-listed Threatened or Endangered species occur within a one-mile (1.0 mi) radius of the Project area. A request is submitted to the USFWS Ohio Ecological Services Field Office to determine if federally-listed Threatened or Endangered species occur within the vicinity of the Project area.

2.3.2 Onsite Inspection

During the onsite inspection, GAI staff traverse the study area in conjunction with the wetland and waterbody inspections to determine if suitable habitat for state- and/or federally-listed RTE species is present within the study area.

3.0 Results

3.1 Wetlands

3.1.1 Preliminary Data Gathering

Desktop review of available USFWS NWI digital data for the Project revealed four NWI mapped wetlands within the Project study Area. Three NWI wetlands are classified as a palustrine, unconsolidated bottom, intermittently exposed, excavated (PUBGx) which corresponds to W003, W007, and W008. Pond 001 is classified as a palustrine, unconsolidated bottom, intermittently exposed, diked/impounded (PUBG), (USFWS, 2017).

NWI Disposition Table

| NWI Code | NWI Description | Figure Number | Related Field Inventoried Resource (Wetland ID/Stream ID) | Comments |
|----------|---|---------------------|---|---|
| PUBGx | Palustrine; Unconsolidated bottom; Intermittently exposed; Excavated. | Fig. 2, Sheet 2 | W003-PSS-CATMOD2 | W003 appears to be an unmaintained farm pond within the review area and ROW. |
| PUBGx | Palustrine; Unconsolidated bottom; Intermittently exposed; Excavated. | Fig. 2, Sheet 3 | W007-PUB-CATMOD2, W007-PEM-CATMOD2 | W007 appears to be an unmaintained farm pond within the review area and ROW. |
| PUBGx | Palustrine; Unconsolidated bottom; Intermittently exposed; Excavated. | Fig. 2, Sheet 4 | W008-PUB-CATMOD2 | W008 appears to be an unmaintained farm pond within the review area and ROW. |
| PUBGh | Palustrine; Unconsolidated bottom; Intermittently exposed; Diked/Impounded | Fig. 2, Sheet 12 | POH-KLV-001 | POH appears to be an unmaintained farm pond primarily outside of the review area and ROW. |

According to the USDA-NRCS soil mapping, forty-one (41) soil map units are located within the Project study area (Figure 2). Two soil map units (Lk- Lindside silt loam and Lm- Lobdell loam, channery substratum) are classified as hydric or are known to contain hydric inclusions.

3.1.2 Onsite Inspection

Thirteen wetlands were identified and delineated within the Project study area including nine PEM wetlands, one PSS wetland, one PFO wetland, one PUB wetland, and one PEM/PUB wetland. To document site conditions, USACE Data Forms were completed for each wetland and upland reference. Information on the delineated wetlands can be found in Table 1 and photographs of the wetlands are included in Appendix A.

3.1.3 Regulatory Discussion

The USACE guidance classifies waters of the United States (WOTUS) into four categories: territorial seas and traditional navigable waters (TNWs), tributaries, lakes, ponds, and impoundments of jurisdictional waters, and adjacent wetlands. Territorial seas and TNWs include large rivers and lakes and tidally-influenced waterbodies used in interstate or foreign commerce. Tributaries include naturally occurring perennial and intermittent rivers and streams that contribute surface flow to TNWs in a typical year. Tributaries also include ditches if they satisfy the flow conditions of the perennial and intermittent tributary definition, were constructed in or relocate a tributary, or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a TNW in a typical year. Lakes and ponds, and impoundments of jurisdictional waters are standing bodies of open water that contribute surface water flow to a TNW or territorial sea in a typical year. Adjacent wetlands are wetlands that physically touch (abut) other jurisdictional waters or are inundated by jurisdictional waters in a typical year. Wetlands physically separated from other jurisdictional waters by an artificial berm, dike, or similar artificial feature must have a direct hydrologic surface connection to the jurisdictional water in a typical year to be considered adjacent (USACE 2019).

The status of wetlands is determined partly based on the classification of the waterbody that the wetland is associated with, and the degree of that association. Wetlands that abut or are adjacent to WOTUS are jurisdictional.

Wetlands that do not exhibit an association with any surface water are categorized as non-jurisdictional under present USACE guidance and policy (USACE 2019). These wetlands are regulated by the OEPA Division of Surface Water and may require an Isolated Wetland Permit.

As regulated by Ohio Administrative Code (OAC) rules 3745-1-50 through 3745-1-54, wetlands were also evaluated using the ORAM to determine the appropriate wetland category. Any wetland score that fell within a gray zone between categories was scored one of two ways. Either the wetland was assigned to the higher of the two categories or it was assessed using a non-rapid method to determine its quality (Mack, 2001). The category assigned to a particular wetland determines the requirement, if any, for additional levels of protection administered by the OEPA.

3.2 Waterbodies

3.2.1 Preliminary Data Gathering

A desktop review of the available USGS topographic mapping revealed seven mapped stream segments located within the Project study area (Figure 1). A desktop review of OEPA's Stream Eligibility Web Map revealed the Project is located within watersheds categorized as "Eligible Areas" which may require 401 WQC coverage (Figure 3).

3.2.2 Onsite Inspection

Forty-seven stream segments were identified and delineated within the Project study area. Fifteen stream segments were classified as having a perennial flow regime, 26 were classified as intermittent and six were classified as ephemeral. Information on the delineated waterbodies and its classification can be found in Table 2, and photographs of the identified stream are included in Appendix A.

3.2.3 Regulatory Discussion

As with wetlands, present USACE guidance and policy determines the jurisdictional status of waterbodies identified during the Project. TNWs and tributaries are considered jurisdictional.

Streams are generally defined as environmental features that have defined beds and banks, an OHWM, and contain flowing or standing waters for at least a portion of the year (USACE

2005). Streams were classified as perennial, intermittent, or ephemeral based upon presence of flow, estimated duration of flow, stream bed characteristics, and presence of aquatic biota. The USACE Jurisdictional Determination Form Instructional Guidebook (USACE, 2007) and the revised definition of “Waters of the United States” (USACE 2019) were used to determine stream classification and flow status.

As regulated by OAC Chapter 3745-1-24, streams were also assessed according to OEPA guidance using either the HHEI for watersheds less than one square mile (<1.0 mi²) in size, or the Qualitative Habitat Evaluation Index (QHEI) for watersheds between one and twenty square miles (1.0-20.0 mi²) in size.

Although ephemeral streams are no longer regulated by the USACE, the Ohio EPA considers ephemeral streams as “waters of the state,” and thus regulated according to the State’s 401 Water Quality Standards.

3.3 Rare, Threatened, and Endangered Species

3.3.1 Preliminary Data Gathering

A desktop review of ODNR, Division of Wildlife’s Ohio’s Listed Species revealed 337 Endangered, Threatened, Species of Concern, and Species of Interest located in OH (ODNR, 2020). Eighteen of the state-listed species are considered federally endangered, and five are federally threatened.

A review of the USFWS *County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species for Ohio*, as well as the USFWS Information for Planning and Consultation website revealed three federally Endangered or Threatened species that may occur within the Project study area (USFWS, 2018). The list of species includes the following:

- ▶ Indiana bat (*Myotis sodalis*) – Endangered;
- ▶ Northern long-eared bat (*Myotis septentrionalis*) – Threatened; and
- ▶ American Burying Beetle (*Nicrophorus americanus*) – Threatened.

Additionally, there are 2 migratory bird species that may occur within the Project study area.

The ODNR and USFWS consultation letters were submitted on July 9, 2020. A response from USFWS was received on July 15, 2020. A response from the ODNR was received on September 17, 2020. The USFWS and ODNR responses are included in Appendix E.

The USFWS identified that the Indiana bat and northern long-eared bat may be present in the vicinity of the Project. Potential impacts to these species will be determined by the schedule of Project construction and extent of tree clearing that is needed.

The ODNR identified eleven mussel species, six fish species, and four bird species within range of the project area. The ODNR also identified that the entire state of Ohio is within the range of the Indiana bat, the little brown bat (*Myotis lucifugus*), and the tricolored bat (*perimyotis subflavus*). Potential impacts to bat species will be determined by the schedule of Project construction and extent of tree clearing that is needed. The ODNR also recommended that no in-water work in perennial streams be conducted from April 15 to June 30 to reduce potential impacts to indigenous aquatic species and their habitat. If no in-water work in a perennial stream is anticipated, the Project is unlikely to impact aquatic species. The ODNR stated that, due to its location, the Project is not likely to impact the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*) and eastern spadefoot toad (*Scaphiopus holbrookii*). A list of RTE species identified by the ODNR and USFWS responses is included as Table 3.

3.3.2 Onsite Inspection

Potential habitat for RTE species was evaluated within the Project study area. In general, the habitat encountered within the study area consisted of maintained transmission line right-of-way bordered by mixed deciduous forest, open fields, residential and industrial properties and PEM/PUB/PSS/PFO wetlands. Fifteen perennial, 26 intermittent and six ephemeral streams were identified within the study area. Representative photographs of the identified habitat types are included in Appendix A.

4.0 Conclusions

Ecological surveys were conducted within the Project study area on May 18 - 21, 2020 and September 16 – 17, 2021. Forty-seven streams (15 perennial, 26 intermittent, and six ephemeral) were identified within the Project study area. Thirteen wetlands were identified within the Project study area. Summaries of the delineated aquatic features are provided in Tables 1 and 2, and a map of their locations is depicted on Figure 2. Photographs of the wetland and stream features are included in Appendix A. Wetland Determination Data Forms documenting the investigation are provided in Appendix B, with HHEI and ORAM Data Forms provided in Appendix C and D, respectively.

The jurisdictional status of these features are considered preliminary and should be confirmed with the USACE and state agencies through the Jurisdictional Determination (JD) process.

5.0 References

- Cowardin, D. M., V. Carter, F. C. Golet, and E. T. La Roe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States Department of the Interior, Fish and Wildlife Service. Publication No. FWS/OBS 79/31. Washington, D.C.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. United States Department of the Army, United States Army Engineer Waterways Experiment Station. Technical Report Y-87-1. Vicksburg, Mississippi.
- Federal Emergency Management Agency. 2015. National Flood Hazard Layer Web Map Service (WMS). Available from <https://hazards.fema.gov/femaportal/wps/portal/NFHLWMSkmzdownload>.
- Lichvar, R. W., D.L. Banks N. C. Melvin, and W. N. Kirchner. 2016. The National Wetland Plant List: 2016 Update of Wetland Ratings. Phytoneuron 2016-30: 1-17. United States Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, and BONAP, Chapel Hill, North Carolina. Available from <http://rsgisias.crrel.usace.army.mil/NWPL/>.
- Mack, John J. 2001. Ohio Rapid Assessment Methods for Wetlands Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.
- Ohio Administrative Code. 2011. State of Ohio: Water Quality Standards, Chapter 3745-1.
- Ohio Department of Natural Resources, Division of Wildlife. Ohio's Listed Species. <https://wildlife.ohiodnr.gov/portals/wildlife/pdfs/publications/information/pub356.pdf>.
- Ohio Department of Natural Resources, Division of Wildlife. State-Listed Species by County. <http://wildlife.ohiodnr.gov/species-and-habitats/state-listed-species/state-listed-species-by-county>.
- Ohio Environmental Protection Agency. 2006. Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Division of Surface Water, Columbus, Ohio.
- Ohio Environmental Protection Agency. 2018. Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams. Version 4.0. Ohio EPA Division of Surface Water, Columbus, Ohio. 117 pp.
- Ohio Environmental Protection Agency, Division of Surface Water. 2017. 401 Water Quality Certification for the Nationwide Permits Stream Eligibility Web Map (2017 Reissuance). <http://oepa.maps.arcgis.com/apps/webappviewer/index.html?id=e6b46d29a38f46229c1eb47deefe49b6>.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Morgan County, Ohio. Available online at <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Muskingum County, Ohio. Available online at <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Perry County, Ohio. Available online at <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.

- United States Army Corps of Engineers. 2005. Regulatory Guidance Letter No. 05-05. Ordinary High Water Mark Identification. Available from <http://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl05-05.pdf>.
- United States Army Corps of Engineers. 2007. *Jurisdictional Determination Form Instructional Guidebook*. Available from http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/cwa_guide/jd_guidebook_051207final.pdf.
- United States Army Corps of Engineers. 2019. Definition of “Waters of the United States”—Recodification of Pre-Existing Rules, Federal Register, Title 33 CFR 328.
- United States Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region Version 2.0*, ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-10-16. Vicksburg, Mississippi: United States Army Engineer Research and Development Center.
- United States Fish and Wildlife Service. 2018. County Distribution of Federally-Listed Endangered, Threatened, and Proposed Species. United States Fish and Wildlife Service, Endangered Species, Midwest Region. Available from <https://www.fws.gov/midwest/endangered/lists/ohio-cty.html>.
- United States Fish and Wildlife Service. 2017. National Wetlands Inventory for Ohio. Washington, D.C.: United States Fish and Wildlife Service, Division of Habitat and Resource Conservation. Available from <http://www.fws.gov/wetlands/Data/Mapper.html>.
- United States Fish and Wildlife Service, Environmental Conservation Online System. Information for Planning and Consultation. <https://ecos.fws.gov/ipac/>.
- United States Geological Survey. 1977. Crooksville, Ohio 7.5-Minute Topographic Quadrangle (1:24,000).
- United States Geological Survey. 1977. Deavertown, Ohio 7.5-Minute Topographic Quadrangle (1:24,000).
- United States Geological Survey. 1977. Rokeby Lock, Ohio 7.5-Minute Topographic Quadrangle (1:24,000).
- United States Geological Survey. 1977. Philo, Ohio 7.5-Minute Topographic Quadrangle (1:24,000).

TABLES

Table 1
Wetlands Identified Within the Project Study Area

| Wetland ID ¹ | Location | | Isolated? | Habitat Type ³ | Delineated | ORAM | | Nearest Structure # (Existing / Proposed) | Existing Structure # in Wetland | Proposed Structure # in Wetland | Structure Installation Method | Proposed Impacts | |
|-------------------------|-----------------------|------------------------|-----------|---------------------------|--------------------------|--------------------|-----------------------|---|---------------------------------|---------------------------------|-------------------------------|-------------------------------|------------------------------|
| | Latitude ² | Longitude ² | | | Area (acre) ⁴ | Score ⁵ | Category ⁶ | | | | | Temporary Matting Area (acre) | Permanent Impact Area (acre) |
| W001-PEM-CAT2 | 39.810518 | -81.986415 | No | PEM | 0.069 | 31 | 2 | 33 / 33 | N/A | N/A | N/A | 0.00 | 0.00 |
| W002-PEM-CATMOD2 | 39.809477 | -81.987859 | No | PEM | 0.042 | 40 | Modified 2 | 34 / 34 | N/A | N/A | N/A | 0.00 | 0.00 |
| W003-PSS-CATMOD2 | 39.806806 | -81.992889 | No | PSS | 0.296 | 43 | Modified 2 | 35 / 35 | N/A | N/A | N/A | 0.00 | 0.00 |
| W004-PEM-CAT2 | 39.806671 | -81.994349 | No | PEM | 0.120 | 33 | 2 | 35 / 35 | N/A | N/A | N/A | 0.00 | 0.00 |
| W005-PEM-CAT2 | 39.802158 | -82.001771 | No | PEM | 0.100 | 32 | 2 | 39 / 39 | N/A | N/A | N/A | 0.001 | 0.00 |
| W006-PEM-CAT2 | 39.801034 | -82.003686 | No | PEM | 0.014 | 37 | Modified 2 | 39 / 39 40 / 40 | N/A | N/A | N/A | 0.00 | 0.00 |
| W007-PUB-CATMOD2 | 39.800009 | -82.005344 | No | PUB | 0.110 | 41 | Modified 2 | 40 / 40 | N/A | N/A | N/A | 0.00 | 0.00 |
| W007-PEM-CATMOD2 | 39.799790 | -82.005090 | No | PEM | 0.037 | | | 40 / 40 | N/A | N/A | N/A | 0.00 | 0.00 |
| W008-PUB-CATMOD2 | 39.799224 | -82.006545 | No | PUB | 0.148 | 43 | Modified 2 | 41 / 41 | N/A | N/A | N/A | 0.00 | 0.00 |
| W009-PEM-CATMOD2 | 39.791537 | -82.016757 | No | PEM | 0.022 | 35 | Modified 2 | 44 / 44 | N/A | N/A | N/A | 0.00 | 0.00 |
| W010-PFO-CAT2 | 39.784546 | -82.026647 | No | PFO | 0.051 | 49 | 2 | 48 / 48 | N/A | N/A | N/A | 0.00 | 0.00 |
| W011-PEM-CATMOD2 | 39.778191 | -82.034676 | No | PEM | 0.098 | 37 | Modified 2 | 51 / 51 | N/A | N/A | N/A | 0.00 | 0.00 |
| W012-PEM-CATMOD2 | 39.776881 | -82.036943 | No | PEM | 0.023 | 38 | Modified 2 | 51 / 51 | N/A | N/A | N/A | 0.00 | 0.00 |
| W013-PEM-CATMOD2 | 39.775200 | -82.038996 | No | PEM | 0.191 | 38 | Modified 2 | 52 / 52 | N/A | N/A | N/A | 0.00 | 0.00 |
| Total: | | | | | 1.321 | | | | | | | 0.001 | 0.00 |

Notes:

- 1 GAI map designation.
- 2 North American Datum, 1983.
- 3 Jurisdictional status is the opinion of GAI and must be confirmed by USACE and state agencies through the JD process.
- 4 PEM – Palustrine Emergent, PFO – Palustrine Forested; PUB – Palustrine Unconsolidated Bottom.
- 5 Total acreage of wetland located within the Project study area.
- 6 Interim scoring breakpoints for wetland regulatory categories for ORAM v 5.0 Score: Category 1 score 0 - 29.9; Category 1 or 2 gray zone ORAM score 30 - 34.9; Category modified 2 ORAM score 35 - 44.9; Category 2 ORAM score 45 - 59.9; Category 2 or 3 ORAM score 60 - 64.9; Category 3 ORAM score 65 - 100. OEPA Ecology Unit Division of Surface Water. *ORAM v. 5.0 Qualitative Score Calibration*. Dated August 15, 2000. http://www.epa.ohio.gov/portals/35/401/oram50sc_s.pdf.
- 7 OAC Rule 3745-1-54(C)(2) defines Category 1 wetlands as wetlands which "...support minimal wildlife habitat, and minimal hydrological and recreation functions," and as wetlands which have "...hydrologic isolation, low species diversity, a predominance of non-native species, no significant habitat or wildlife use, and limited potential to achieve beneficial wetland functions." Category 2 wetlands are defined as wetlands which "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Degraded but Restorable Category 2 Wetlands are according to OAC Rule 3745-1-54(C) states that wetlands that are assigned to Category 2 constitute the broad middle category that "...support moderate wildlife habitat, or hydrological or recreational functions," but include "...wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." OAC Rule 3745-1-54(C)(2) defines Category 3 wetlands as wetlands which "...support superior habitat, or hydrological or recreational functions," and as wetlands which have "...high levels of diversity, a high proportion of native species, or high functional values."

Table 2
Waterbodies Identified Within the Project Study Area

| Stream ID ¹ | Location | | Stream Type | Stream Name | Delineated Length (feet) ³ | Bankfull Width (feet) ⁴ | OHWM Width (feet) | Field Evaluation | | | Ohio EPA 401 Eligibility ⁸ | Stream Crossing? | Proposed Impacts | |
|------------------------|-----------------------|------------------------|--------------|--------------------|---------------------------------------|------------------------------------|-------------------|-------------------|-----------------------|--|---------------------------------------|------------------|------------------|-------------|
| | Latitude ² | Longitude ² | | | | | | Method | Score ^{5, 6} | Category / Rating / OAC Designation ⁷ | | | Fill Type | Length (LF) |
| S001 | 39.811194 | -81.983993 | Perennial | UNT to Brush Creek | 363.686 | 8 | 7 | HHEI | 62 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S002 | 39.810527 | -81.986409 | Perennial | UNT to Brush Creek | 334.200 | 4 | 3.5 | HHEI | 43 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S003 | 39.808665 | -81.989878 | Intermittent | UNT to Brush Creek | 215.255 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S004 | 39.806559 | -81.993800 | Intermittent | UNT to Brush Creek | 324.660 | 3 | 2 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S005 | 39.805913 | -81.994958 | Perennial | Brush Creek | 310.335 | 15 | 13 | Chapter 3745-1-24 | N/A | WWH | Eligible | No | N/A | 0.00 |
| S006 | 39.804966 | -81.996772 | Intermittent | UNT to Goose Creek | 271.178 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | Matted Bridge | N/A | 0.00 |
| S007 | 39.802600 | -82.001184 | Perennial | UNT to Goose Creek | 214.063 | 5 | 4 | HHEI | 51 | Small Drainage Warmwater Stream | Eligible | Matted Bridge | N/A | 0.00 |
| S008 | 39.801050 | -82.003565 | Intermittent | UNT to Goose Creek | 151.091 | 3 | 2 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | Matted Bridge | N/A | 0.00 |
| S009 | 39.799310 | -82.005958 | Perennial | UNT to Goose Creek | 218.430 | 4 | 3.5 | HHEI | 50 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S010 | 39.797790 | -82.007977 | Perennial | UNT to Goose Creek | 346.640 | 4 | 3.5 | HHEI | 54 | Small Drainage Warmwater Stream | Eligible | Matted Bridge | N/A | 0.00 |
| S011 | 39.797666 | -82.008567 | Intermittent | UNT to Goose Creek | 161.343 | 3 | 2.5 | HHEI | 37 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S012 | 39.796641 | -82.009718 | Ephemeral | UNT to Goose Creek | 65.316 | 3 | 2 | HHEI | 26 | Ephemeral Stream | Eligible | No | N/A | 0.00 |
| S013 | 39.795996 | -82.010603 | Ephemeral | UNT to Goose Creek | 73.603 | 3 | 2 | HHEI | 24 | Ephemeral Stream | Eligible | No | N/A | 0.00 |
| S014 | 39.795977 | -82.010709 | Ephemeral | UNT to Goose Creek | 76.847 | 3 | 2 | HHEI | 24 | Ephemeral Stream | Eligible | No | N/A | 0.00 |
| S015 | 39.794648 | -82.011964 | Ephemeral | UNT to Goose Creek | 190.090 | 3 | 2.5 | HHEI | 24 | Ephemeral Stream | Eligible | No | N/A | 0.00 |
| S016 | 39.794594 | -82.012384 | Perennial | UNT to Goose Creek | 241.855 | 8 | 7 | HHEI | 65 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S017 | 39.791948 | -82.016031 | Perennial | UNT to Goose Creek | 230.232 | 6 | 5.5 | HHEI | 55 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |

| | | | | | | | | | | | | | | |
|------|-----------|------------|--------------|--------------------|----------|---|-----|------|----|---------------------------------|----------|----|-----|------|
| S018 | 39.791861 | -82.016358 | Intermittent | UNT to Goose Creek | 187.701 | 4 | 3.5 | HHEI | 47 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S019 | 39.791743 | -82.016302 | Intermittent | UNT to Goose Creek | 101.690 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S020 | 39.791739 | -82.016627 | Intermittent | UNT to Goose Creek | 123.932 | 3 | 2 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S021 | 39.787316 | -82.022412 | Intermittent | UNT to Goose Creek | 1021.373 | 3 | 2 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S022 | 39.786544 | -82.023718 | Ephemeral | UNT to Goose Creek | 106.373 | 2 | 1.5 | HHEI | 30 | Ephemeral Stream | Eligible | No | N/A | 0.00 |
| S023 | 39.785981 | -82.024255 | Perennial | UNT to Goose Creek | 278.149 | 5 | 4 | HHEI | 66 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S024 | 39.785898 | -82.024402 | Intermittent | UNT to Goose Creek | 130.426 | 4 | 3.5 | HHEI | 51 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S025 | 39.782017 | -82.029670 | Perennial | UNT to Brush Creek | 229.786 | 6 | 5.5 | HHEI | 62 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S026 | 39.781052 | -82.031386 | Intermittent | UNT to Brush Creek | 73.973 | 3 | 2.5 | HHEI | 37 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S027 | 39.779960 | -82.032809 | Intermittent | UNT to Brush Creek | 123.711 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S028 | 39.779485 | -82.033486 | Perennial | UNT to Brush Creek | 387.112 | 9 | 8.5 | HHEI | 59 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S029 | 39.779041 | -82.033589 | Intermittent | UNT to Brush Creek | 272.990 | 3 | 2 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S030 | 39.775686 | -82.038631 | Intermittent | UNT to Brush Creek | 88.654 | 3 | 2.5 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S031 | 39.775578 | -82.038826 | Intermittent | UNT to Brush Creek | 102.752 | 3 | 2.5 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S032 | 39.775480 | -82.038851 | Intermittent | UNT to Brush Creek | 97.257 | 3 | 2.5 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S033 | 39.773401 | -82.041984 | Intermittent | UNT to Elk Run | 144.908 | 3 | 2.5 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S034 | 39.767922 | -82.050563 | Intermittent | UNT to Elk Run | 70.363 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S035 | 39.767946 | -82.051026 | Intermittent | UNT to Elk Run | 64.447 | 3 | 2.5 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S036 | 39.767746 | -82.050776 | Perennial | UNT to Elk Run | 497.880 | 5 | 4.5 | HHEI | 49 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |
| S037 | 39.767301 | -82.051862 | Perennial | UNT to Elk Run | 237.856 | 5 | 4.5 | HHEI | 52 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 |

| | | | | | | | | | | | | | | | |
|---------------|-----------|------------|--------------|-----------------------|-------------------|---|-----|------|----|---------------------------------|----------|----|-----|------|-------------|
| S038 | 39.767134 | -82.052259 | Intermittent | UNT to Elk Run | 334.516 | 4 | 3.5 | HHEI | 34 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S039 | 39.765318 | -82.057817 | Intermittent | UNT to Dry Run | 125.656 | 3 | 2.5 | HHEI | 24 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S040 | 39.765191 | -82.057884 | Perennial | UNT to Dry Run | 255.281 | 5 | 4.5 | HHEI | 49 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S041 | 39.764320 | -82.062092 | Intermittent | UNT to Dry Run | 182.112 | 3 | 2.5 | HHEI | 30 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S042 | 39.761403 | -82.075968 | Intermittent | UNT to Dry Run | 183.055 | 3 | 2.5 | HHEI | 34 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S043 | 39.760464 | -82.079061 | Intermittent | UNT to Dry Run | 276.632 | 4 | 3.5 | HHEI | 37 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S044 | 39.760727 | -82.079439 | Intermittent | UNT to Dry Run | 46.116 | 3 | 2 | HHEI | 27 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S045 | 39.760367 | -82.079559 | Perennial | UNT to Dry Run | 247.914 | 5 | 4.5 | HHEI | 52 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| S046 | 39.759725 | -82.082558 | Ephemeral | UNT to Maxahala Creek | 113.414 | 3 | 2 | HHEI | 22 | Ephemeral Stream | Eligible | No | N/A | 0.00 | |
| S047 | 39.759426 | -82.085182 | Intermittent | UNT to Maxahala Creek | 991.108 | 5 | 4.5 | HHEI | 52 | Small Drainage Warmwater Stream | Eligible | No | N/A | 0.00 | |
| Total: | | | | | 10,885.961 | | | | | | | | | | 0.00 |

Notes:

- ¹ GAI map designation.
- ² North American Datum, 1983.
- ³ Total stream length (in feet) located within the Project study area.
- ⁴ Width in feet from tops of stream bank
- ⁵ Scoring for OEPA Headwater Habitat Evaluation Index (HHEI) Primary Headwater Habitats (PHWH). Rheocrene; Ephemeral Aquatic Stream (natural channel); Ephemeral Aquatic Stream (modified channel); Small Drainage Warm Water Stream (natural channel); Small Drainage Warm Water Stream (modified channel); Spring Water Stream.
- ⁶ Narrative rating for headwater streams using the OEPA Qualitative Habitat Evaluation Index (QHEI). Excellent = ≥70; Good = 55 - 60; Fair = 43 - 54; Poor = 30 - 42; Very Poor = <30.
- ⁷ As defined by OAC Chapter 3745-1 Water Quality Standards, Water use designations and statewide criteria (OAC 3745-1-07). http://www.epa.ohio.gov/dsw/rules/3745_1.aspx.
- ⁸ As defined by the 401 WQC conditions for stream eligibility coverage under the 2017 NWP program. Streams located in Possibly Eligible areas are eligible for coverage if the pH is <6.5 or stream flow is ephemeral. Streams located in Possibly Eligible areas are also eligible for coverage if the HHEI score is <50, or if the HHEI score is between 50-69 and substrate composition is ≤10% coarse types (includes cumulative percentage of bedrock, boulders, boulder slabs, and cobble).

Table 3
ODNR and USFWS RTE Species and Critical Habitat Review Results¹

| Common Name | Scientific Name | Habitat Type | Listing Status ² | Habitat Type Present Within the Project Area? | Impacts to Habitat/Species Anticipated? | Restricted Construction Dates |
|--|---|---|-----------------------------|---|---|-------------------------------|
| Amphibians | | | | | | |
| Eastern hellbender ² | <i>Cryptobranchus alleganiensis alleganiensis</i> | Found in unglaciated (south and east) Ohio in large, swift flowing streams under large rocks | E, FSC | No | No; Per ODNR response, the project is not likely to impact this species | April 15 to June 30 |
| Eastern Spadefoot Toad ² | <i>Scaphiopus holbrookii</i> | Sandy soils that are associated with river valleys and flooded agricultural fields or other water holding depressions | E | No | No; Per ODNR response, the project is not likely to impact this species | - |
| Bats | | | | | | |
| Indiana bat ^{2,3} | <i>Myotis sodalis</i> | Trees >3" dbh | E, FE | Yes | No; Per ODNR response, the project is not likely to impact this species | April 1 to September 30 |
| Northern long-eared bat ^{2,3} | <i>Myotis septentrionalis</i> | Roost sites can be trees, caves, and mines | E, FT | Yes | No; Per ODNR response, the project is not likely to impact this species | April 1 to September 30 |
| Little brown bat ² | <i>Myotis lucifugus</i> | Roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves | E | Yes | No; Per ODNR response, the project is not likely to impact this species | April 1 to September 30 |
| Tricolored bat ² | <i>Perimyotis subflavus</i> | Roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves | E | Yes | No; Per ODNR response, the project is not likely to impact this species | April 1 to September 30 |
| Birds | | | | | | |
| Black tern ² | <i>Chlidonias niger</i> | Large, undisturbed inland marshes with fairly dense vegetation and pockets of open water | E | No | No; Per ODNR response, the project is not likely to impact this species | April 1 to June 30 |
| Northern Harrier ² | <i>Circus hudsonis</i> | Large marshes and grasslands | E | No | No; Per ODNR response, the project is not likely to impact this species | May 15 to August 1 |
| Sandhill Crane ² | <i>Grus canadensis</i> | Large wet meadow, shallow marsh, or bog | T | No | No; Per ODNR response, the project is not likely to impact this species | April 1 to September 1 |
| Trumpeter Swan ² | <i>Cygnus buccinator</i> | Large marshes and lakes ranging in size from 40 to 150 acres | T | No | No; Per ODNR response, the project is not likely to impact this species | April 15 to June 15 |

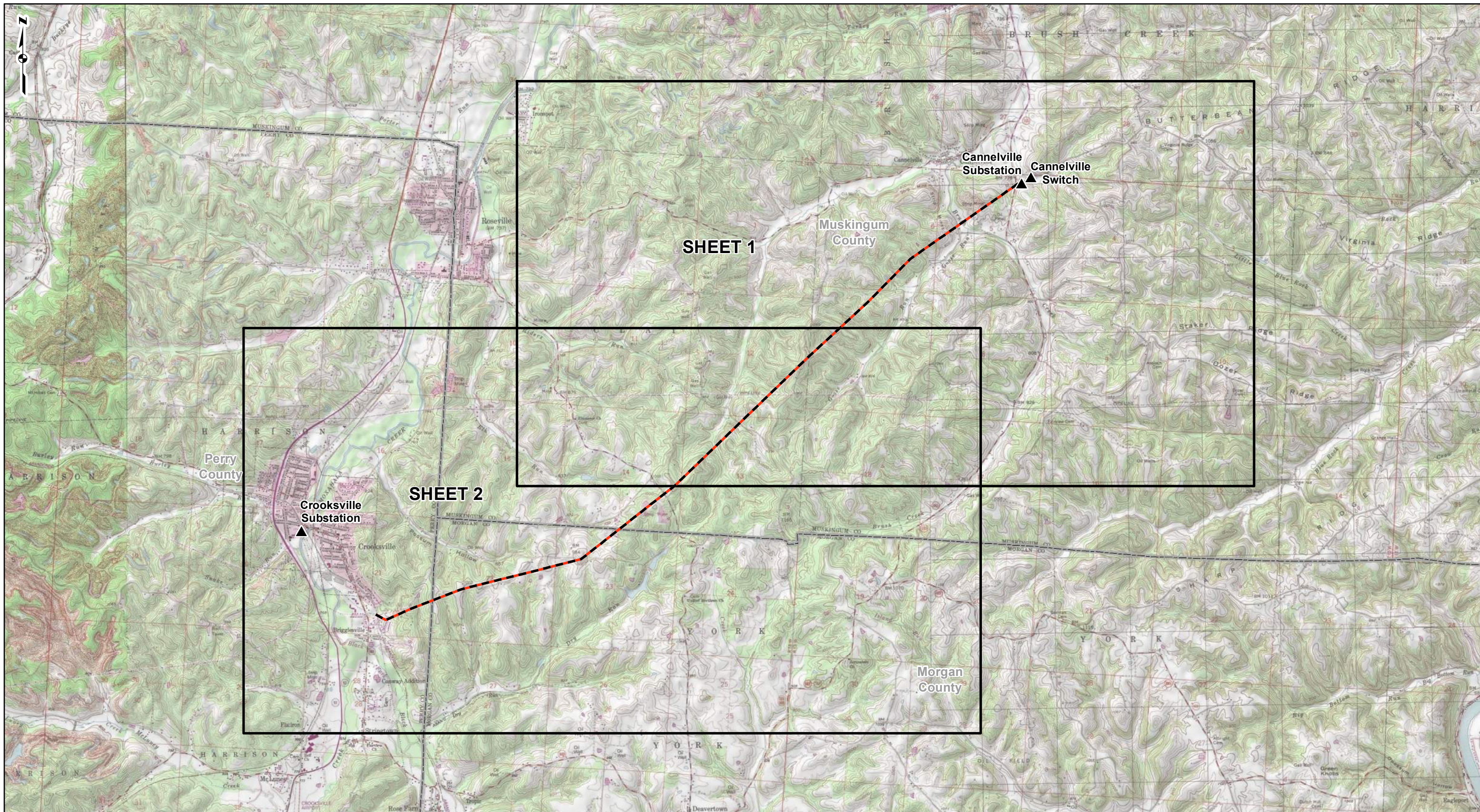
| Common Name | Scientific Name | Habitat Type | Listing Status ² | Habitat Type Present Within the Project Area? | Impacts to Habitat/Species Anticipated? | Restricted Construction Dates |
|------------------------------|---------------------------------------|--|-----------------------------|---|--|-------------------------------|
| Fish | | | | | | |
| Northern madtom ² | <i>Noturus stigmosus</i> | Deep swift riffles of large rivers | E | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| American eel ² | <i>Anguilla rostrata</i> | Freshwater lakes, streams, and rivers | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Blue sucker ² | <i>Cycleptus elongatus</i> | Main stems of major rivers and lower sections of main tributaries | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Channel darter ² | <i>Percina copelandi</i> | Rivers and large creeks in areas of moderate current over sand and gravel substrates | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Mountain madtom ² | <i>Noturus eleutherus</i> | Deep swift riffles of large rivers | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Paddlefish ² | <i>Polyodon spathula</i> | Large, deep, slow-moving rivers, lakes, and reservoirs | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Mussels | | | | | | |
| Black Sandshell ² | <i>Ligumia recta</i> | Found in varying sizes of creeks, rivers, and lakes with sand and gravel bottoms and a moderate current | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Fanshell ² | <i>Cyprogenia stegaria</i> | Found in medium to large rivers with sand or gravel substrates and a moderate current | FE | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Sheepnose ² | <i>Plethobasus cyphus</i> | Found in shallow areas of larger rivers and streams with moderate to swift currents flowing over coarse sand and gravel | FE | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Snuffbox ² | <i>Epioblasma triquetra</i> | Found in small to medium-sized creeks in areas with swift current; Can also be found in Lake Erie and some larger rivers | FE | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Rabbitsfoot ² | <i>Quadrula cylindrica cylindrica</i> | Shallow areas with sand and gravel along the bank and next to shoals | FT | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Long-solid ² | <i>Fusconaia maculata maculata</i> | Large or small rivers with gravel substrate | E | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |

| Common Name | Scientific Name | Habitat Type | Listing Status ² | Habitat Type Present Within the Project Area? | Impacts to Habitat/Species Anticipated? | Restricted Construction Dates |
|--------------------------------------|-------------------------------|--|-----------------------------|---|--|-------------------------------|
| <i>Mussels (continued)</i> | | | | | | |
| Ohio pigtoe ² | <i>Pleurobema cordatum</i> | Medium-sized rivers with mud, sand, gravel or cobble | E | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Sharp-ridged pocketbook ² | <i>Lampsilis ovata</i> | Large rivers in coarse sand or gravel | E | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Wartyback ² | <i>Quadrula nodulata</i> | Medium to large rivers with a mud, and or gravel bottom | E | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Fawnsfoot ² | <i>Truncilla donaciformis</i> | Large to medium large rivers with mud, soft sand or gravel substrates | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |
| Threehorn wartyback ² | <i>Obliquaria reflexa</i> | Large rivers with moderate currents and firm bottoms of gravel, sand and mud | T | No | No; No in-stream work is anticipated during construction | April 15 to June 30 |

Notes:

- ¹ E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; FE = federal endangered; FT = federal threatened; FSC = federal species of concern; FC = federal candidate.
- ² ODNR, Division of Wildlife (DOW) comments included in the ODNR response, dated September 17, 2020.
- ³ USFWS comments included in the USFWS response, dated July 15, 2020.

FIGURES



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: FULTONHAM (1985), PHILO (1977), CROOKSVILLE (1977), NEW LEXINGTON (1985), DEAVERTOWN (1977) AND ROKEY LOCK (1977), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 01/2021.

LEGEND

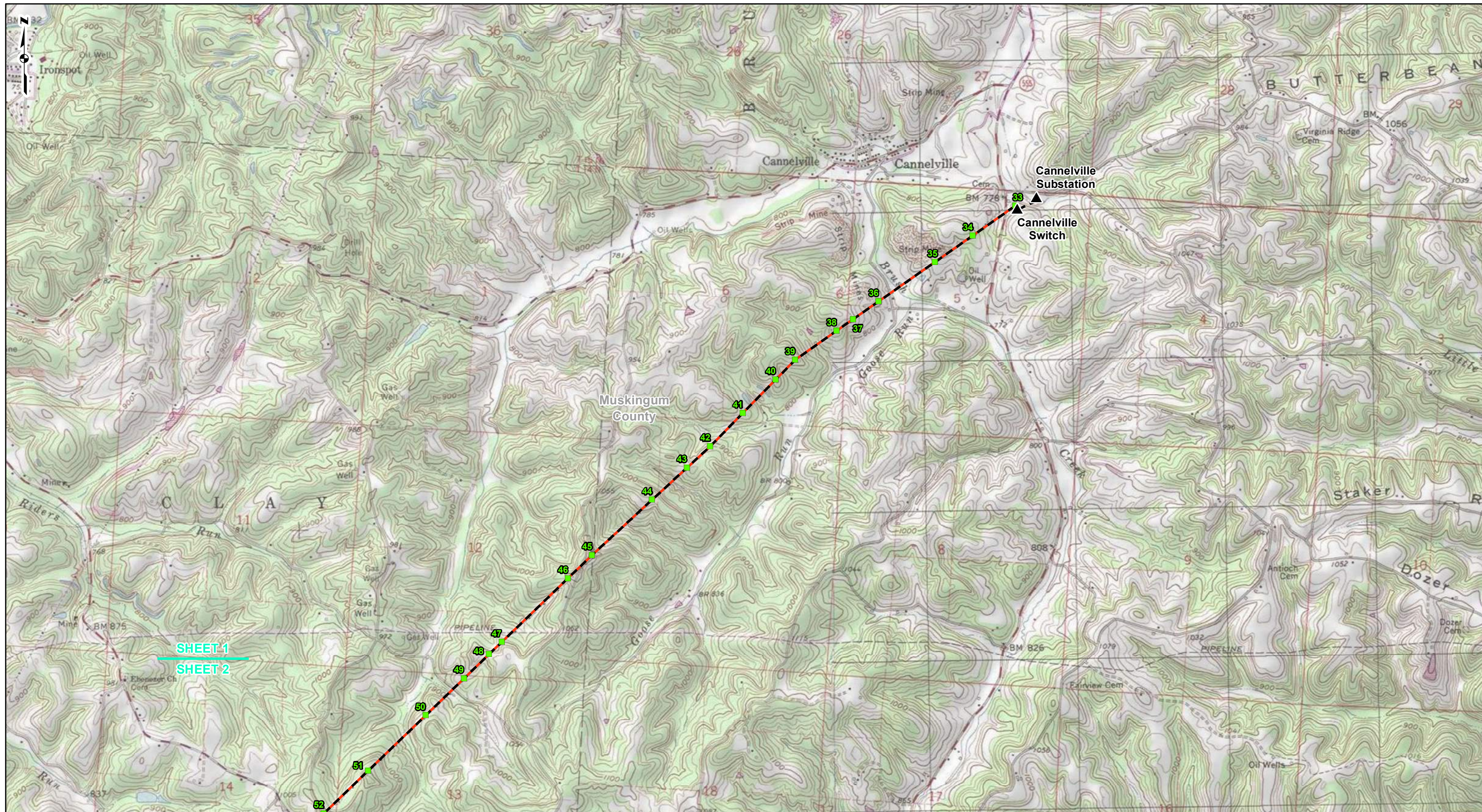
- Existing Substation/Switch
- Existing Transmission
- Proposed Transmission
- County Boundary
- Sheet Index

0 2,000 4,000 8,000 Feet

**FIGURE 1
PROJECT LOCATION MAP
SHEET INDEX**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



SHEET 1
SHEET 2

PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PHILO (1977), CROOKSVILLE (1977), DEAVERTOWN (1977) AND ROKEY LOCK (1977), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 01/2021.

LEGEND

- ▲ Existing Substation/Switch
- Proposed Structure
- Existing Transmission
- Proposed Transmission
- County Boundary

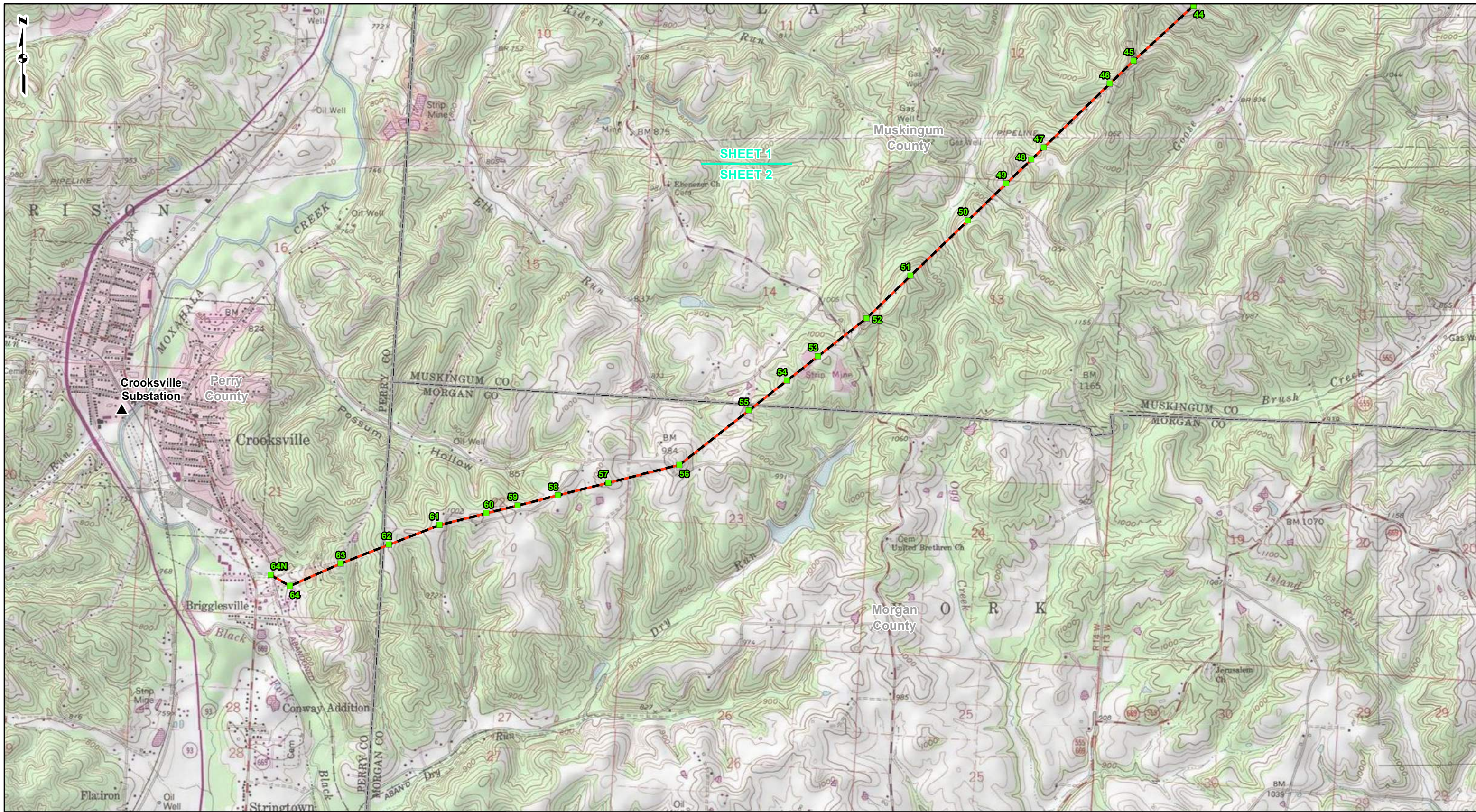
0 1,000 2,000 4,000 Feet

**FIGURE 1
PROJECT LOCATION MAP
SHEET 1 OF 2**

CROOKVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



SHEET 1
SHEET 2

PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PHILO (1977), CROOKSVILLE (1977), DEAVERTOWN (1977) AND ROKEY LOCK (1977), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 01/2021.

LEGEND

- ▲ Existing Substation/Switch
- Proposed Structure
- Existing Transmission
- Proposed Transmission
- ▭ County Boundary

0 1,000 2,000 4,000 Feet

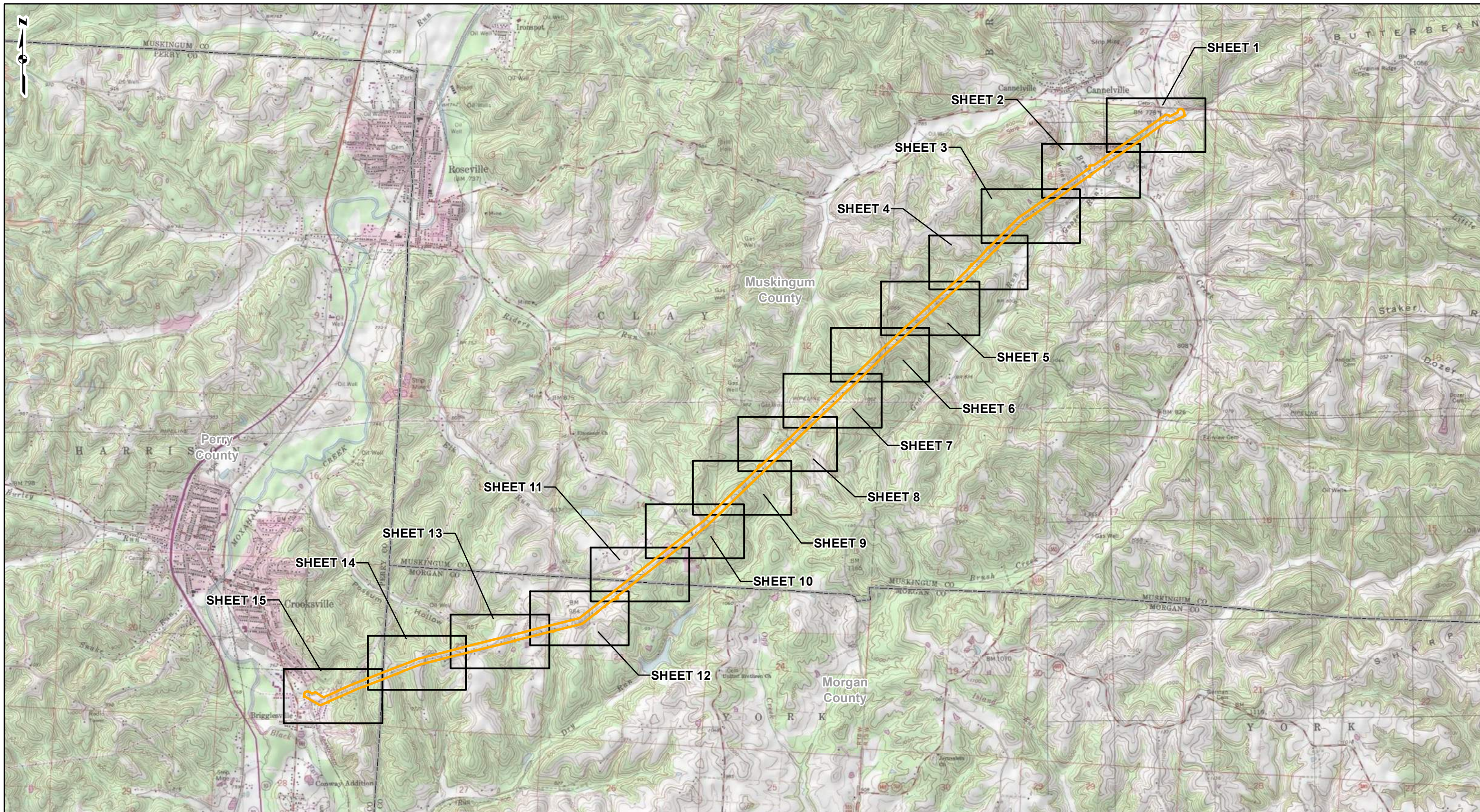
**FIGURE 1
PROJECT LOCATION MAP
SHEET 2 OF 2**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PHILO (1977), CROOKSVILLE (1977), DEAVERTOWN (1977) AND ROKEY LOCK (1977), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 01/2021.

LEGEND

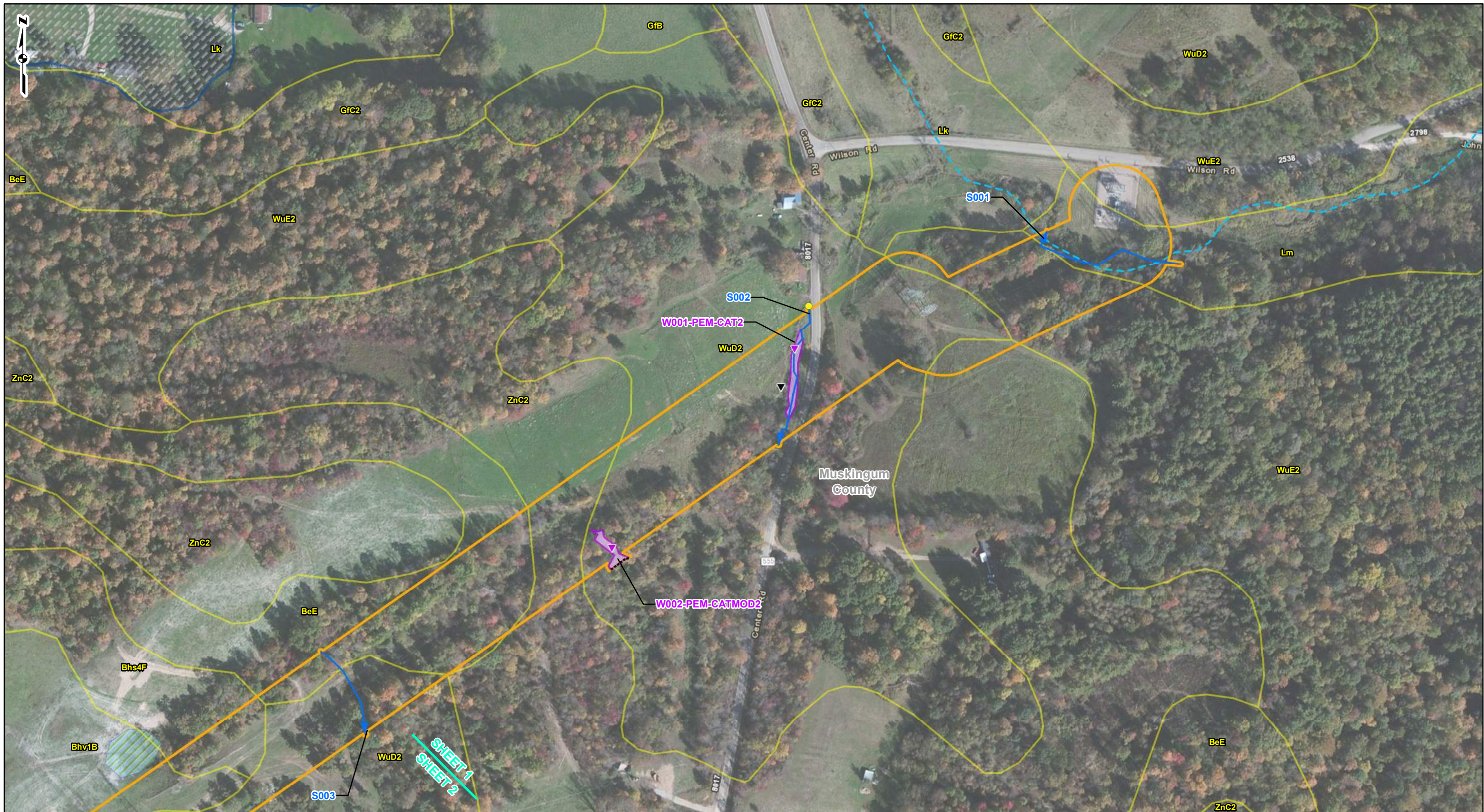
- Study Area
- Sheet Index
- County Boundary

0 1,500 3,000 6,000 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET INDEX**

CROOKSVILLE - PHILO 138KV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | --- NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

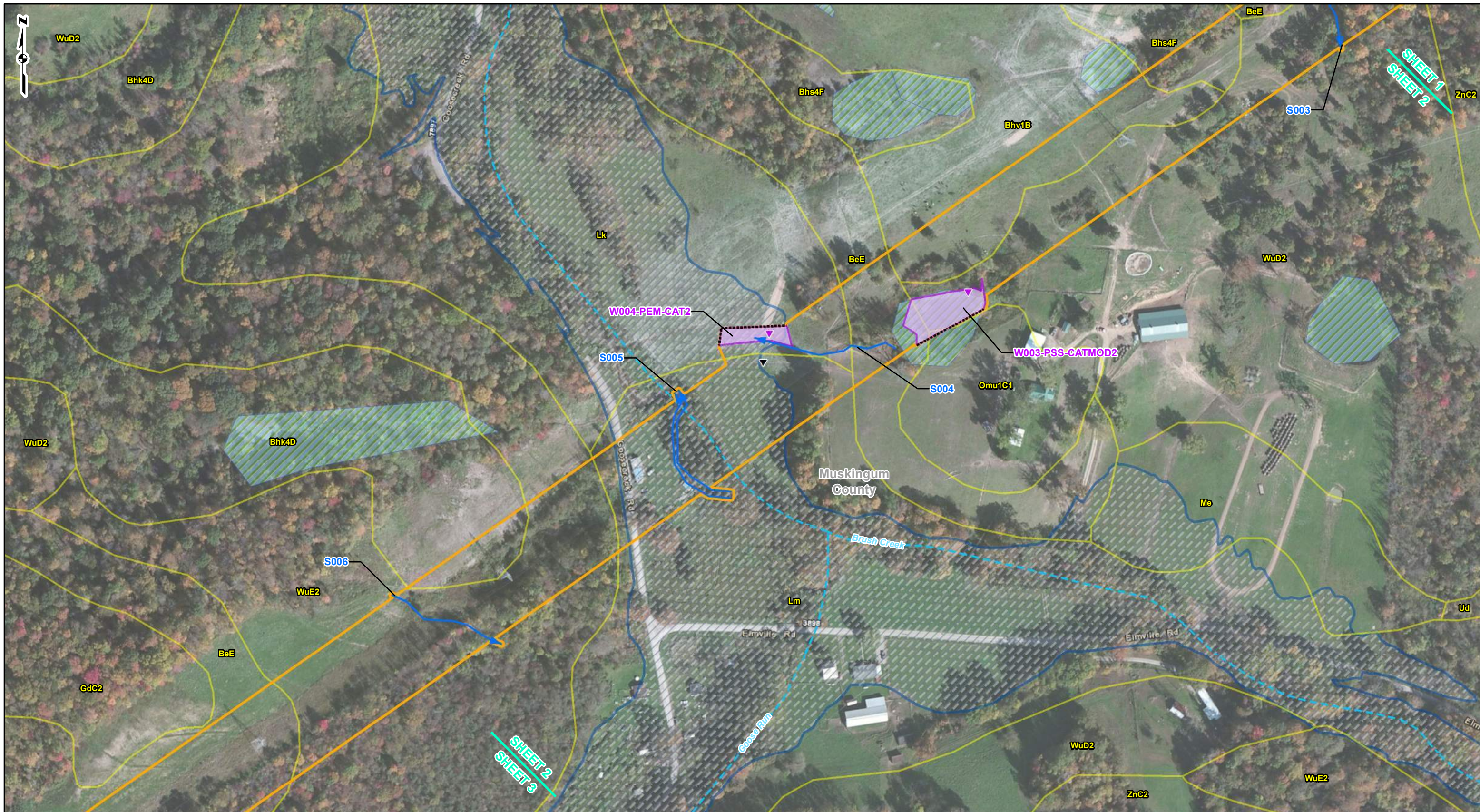
0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 1 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ⋯ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 2 OF 15**

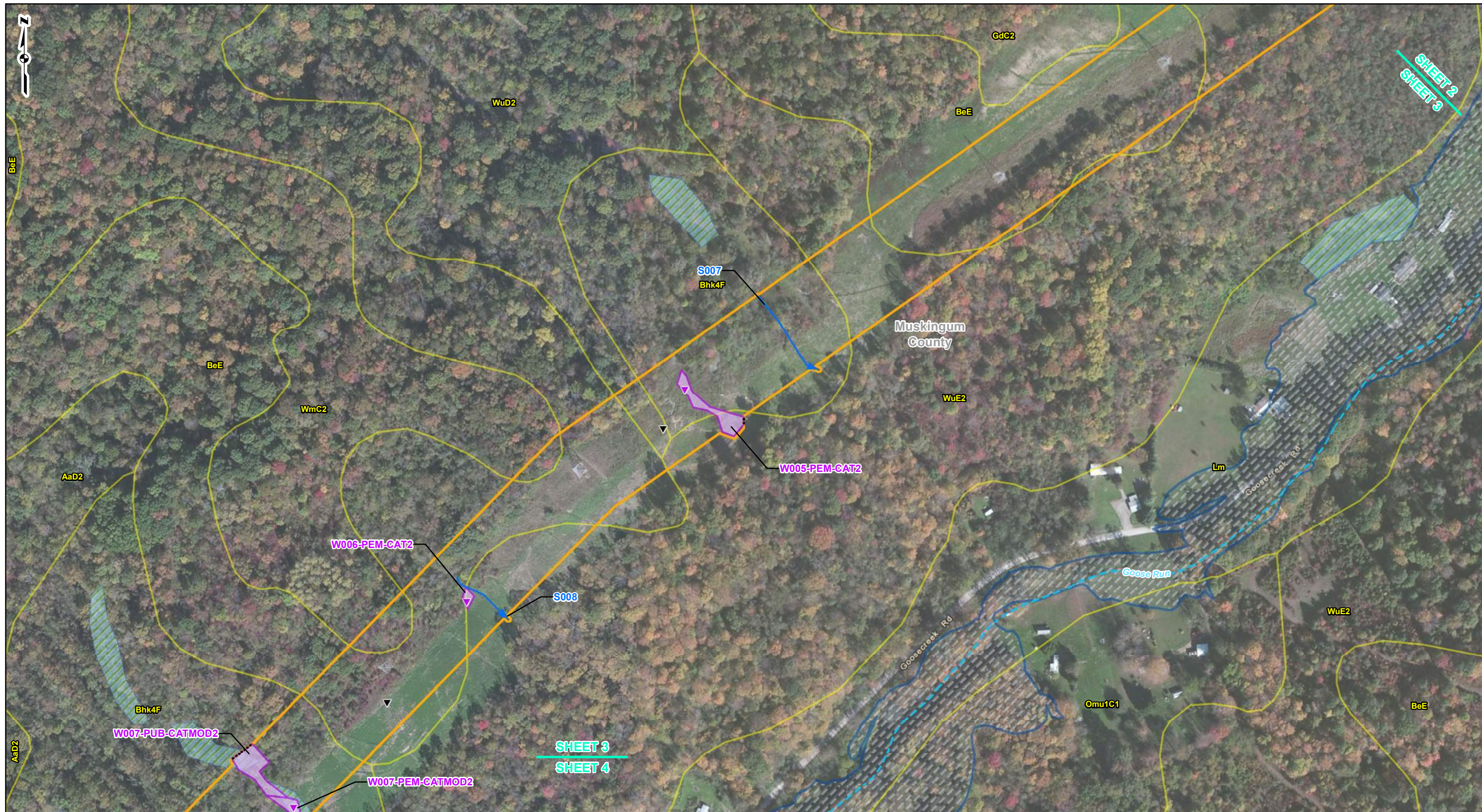
CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gci consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▭ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

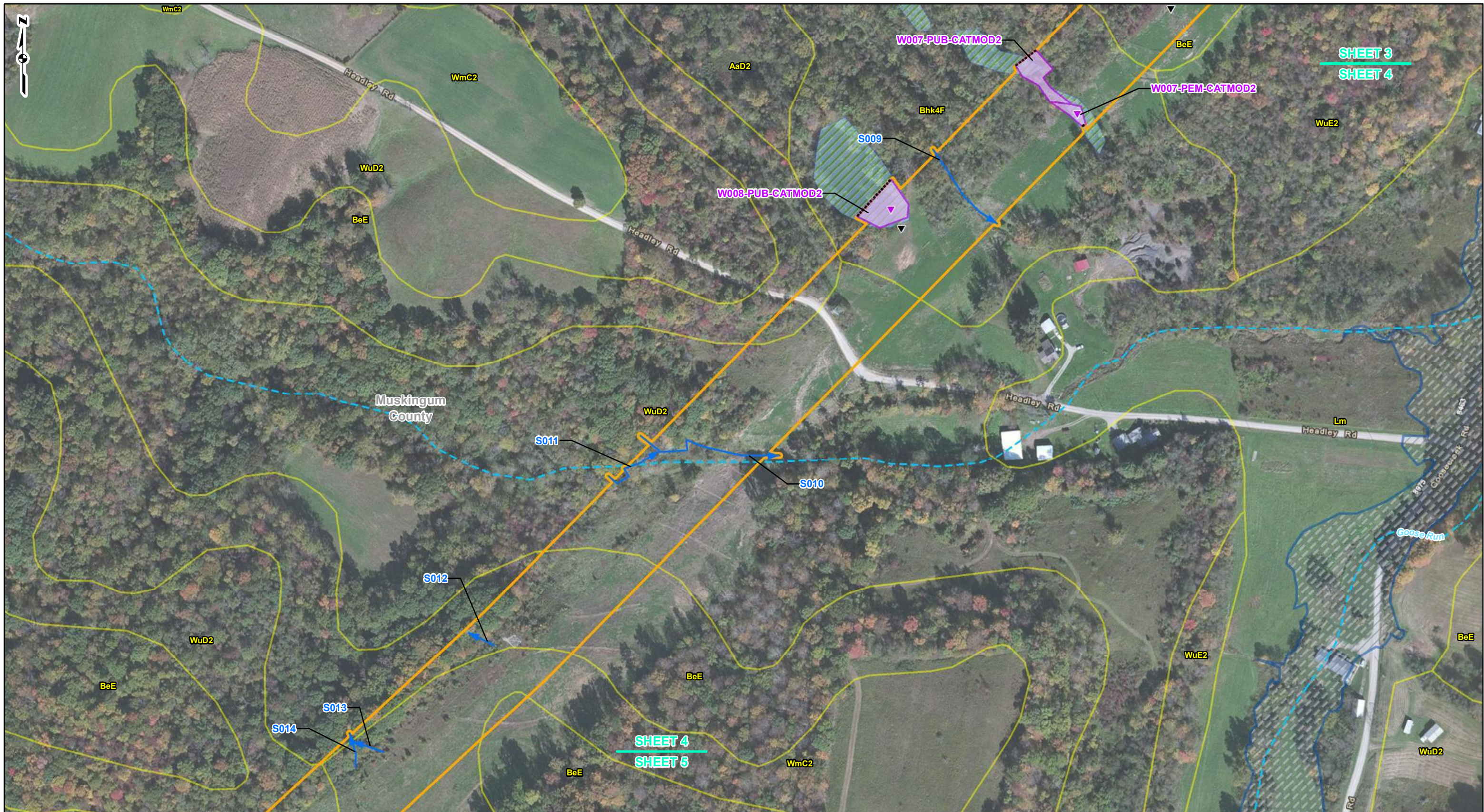
0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 3 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

gai consultants BOUNDLESS ENERGY

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



SHEET 3
SHEET 4

SHEET 4
SHEET 5

PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | - - - NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 4 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|---------------------------|--------------------|-----------------|
| ▲ Soil Test Pit | → Stream | Study Area | NWI Wetland |
| ▼ Upland Data Point | Open-Ended Boundary | NHD Stream | FEMA Floodplain |
| ▼ Wetland Data Point | Wetland | Soil Type Boundary | County Boundary |
| ● Culvert | Pond | | |

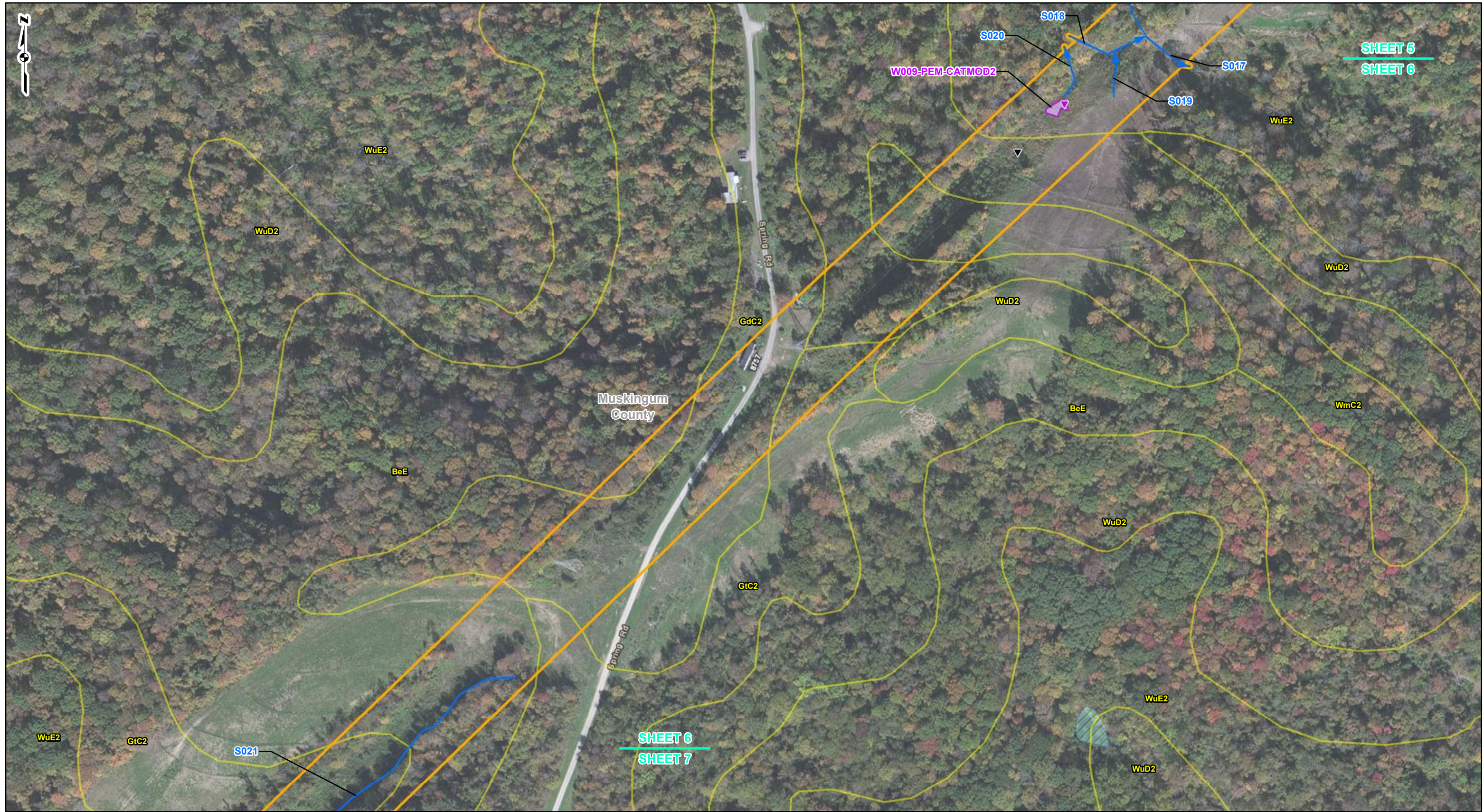
0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 5 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|--------------------|---------------------|--------------------|-----------------|
| Soil Test Pit | Stream | Study Area | NWI Wetland |
| Upland Data Point | Open-Ended Boundary | NHD Stream | FEMA Floodplain |
| Wetland Data Point | Wetland | Soil Type Boundary | County Boundary |
| Culvert | Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 6 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▨ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 7 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gci consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▭ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

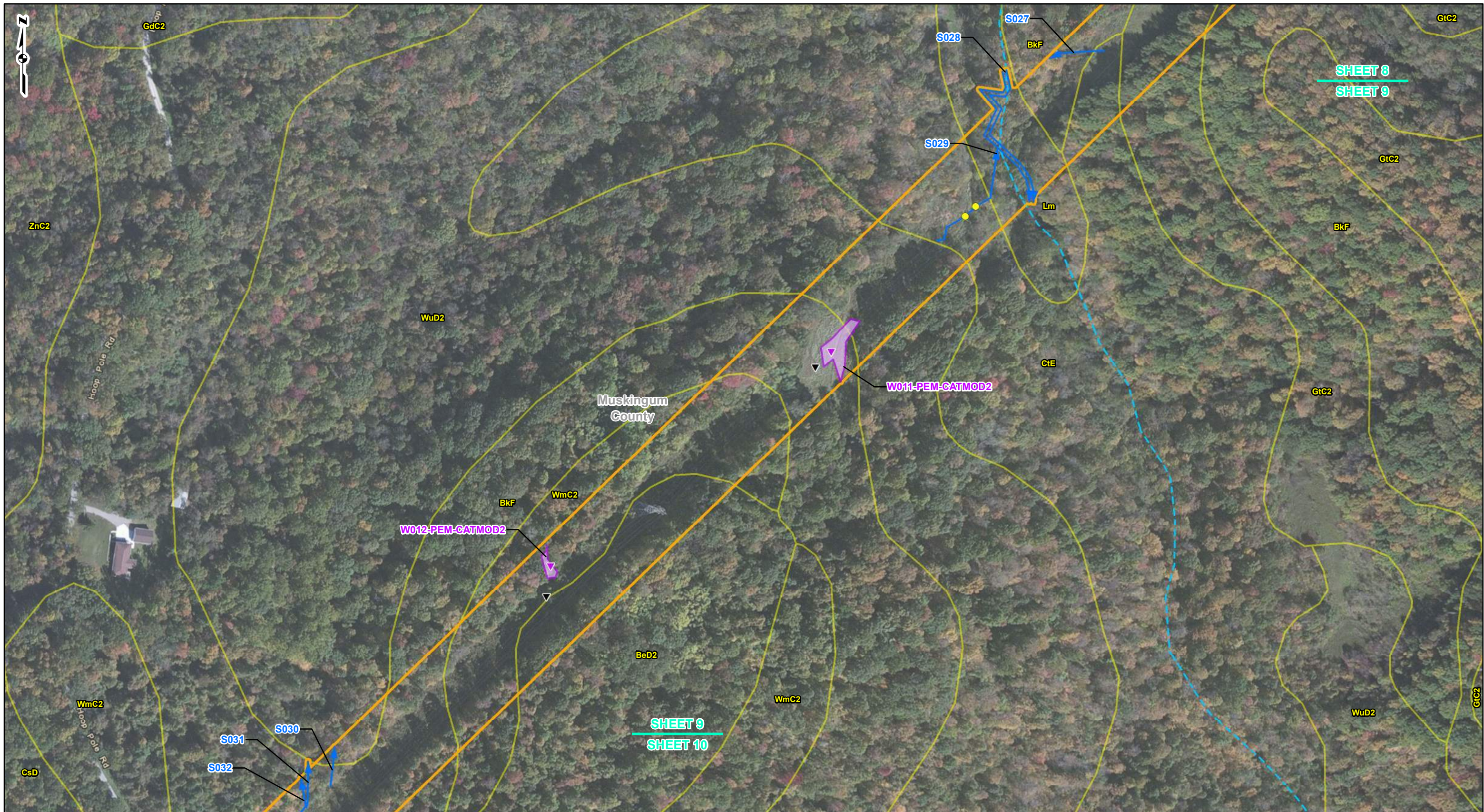
0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 8 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | - - - NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 9 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

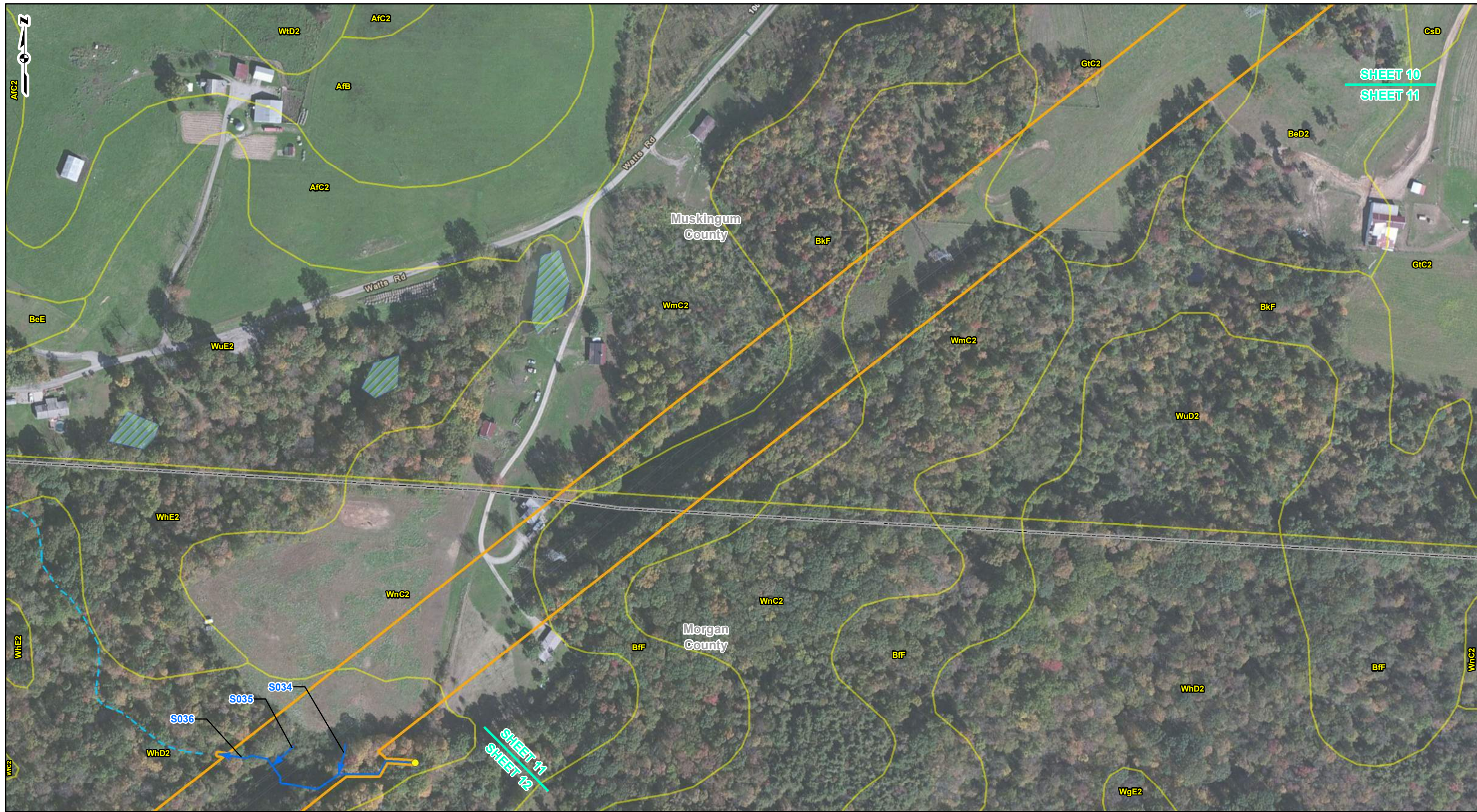
| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▭ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 10 OF 15**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▭ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 11 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|---------------------------|--------------------|-----------------|
| ▲ Soil Test Pit | → Stream | Study Area | NWI Wetland |
| ▼ Upland Data Point | Open-Ended Boundary | --- NHD Stream | FEMA Floodplain |
| ▼ Wetland Data Point | Wetland | Soil Type Boundary | County Boundary |
| ● Culvert | Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 12 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

g | gal consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | ▭ NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 13 OF 15**

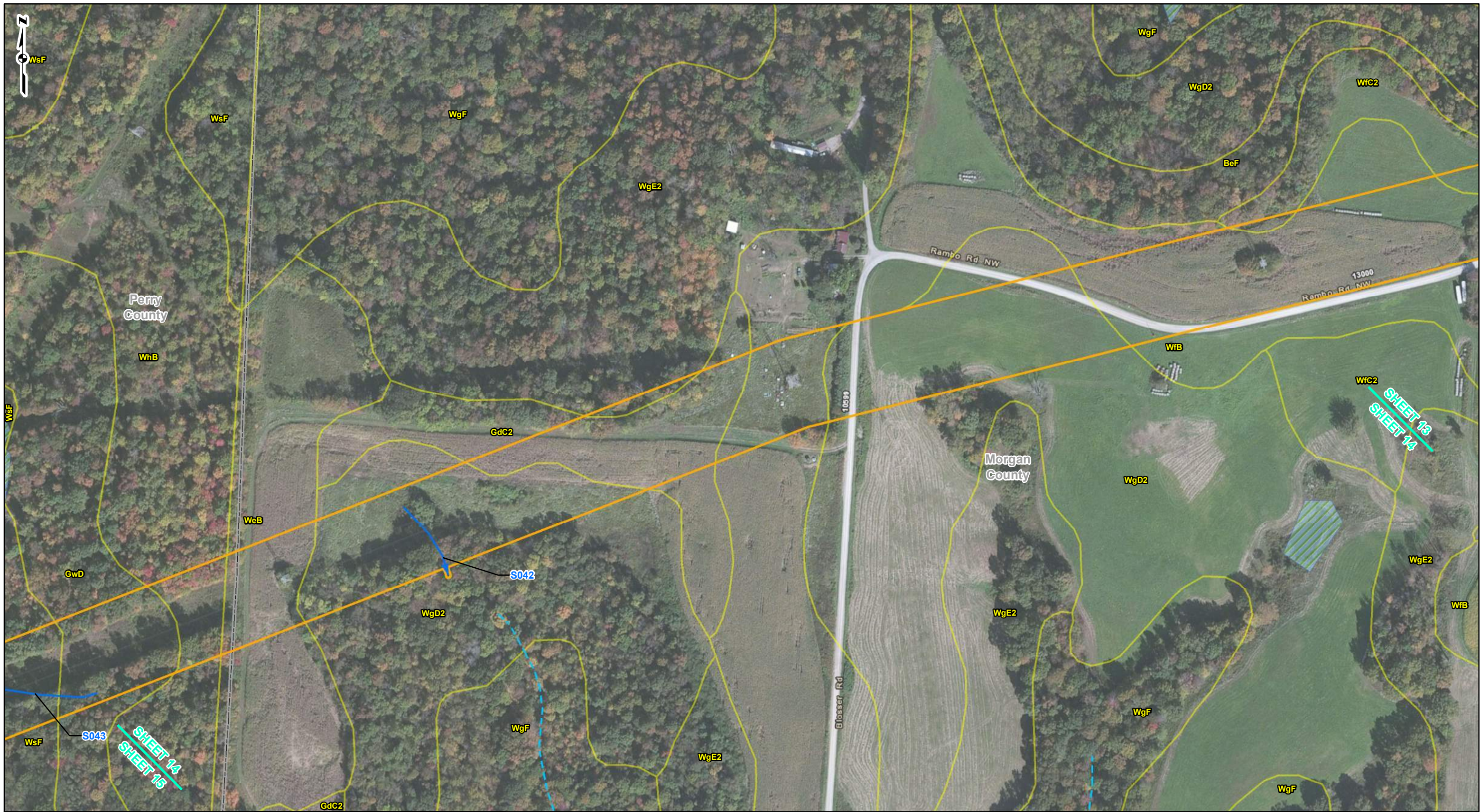
CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gci consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|---------------------------|--------------------|-----------------|
| ▲ Soil Test Pit | → Stream | Study Area | NWI Wetland |
| ▼ Upland Data Point | Open-Ended Boundary | - - - - NHD Stream | FEMA Floodplain |
| ▼ Wetland Data Point | Wetland | Soil Type Boundary | County Boundary |
| ● Culvert | Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 14 OF 15**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gci consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. NATIONAL WETLAND INVENTORY (NWI) WETLANDS, USFWS, 2020. SOIL SURVEY GEOGRAPHIC (SSURGO) DATABASE, USDA/NRCS, 2020. FEMA FLOODPLAINS, 2020.

LEGEND

| | | | |
|----------------------|-----------------------|----------------------|-------------------|
| ▲ Soil Test Pit | → Stream | ▭ Study Area | ▨ NWI Wetland |
| ▼ Upland Data Point | ⋯ Open-Ended Boundary | --- NHD Stream | ▨ FEMA Floodplain |
| ▼ Wetland Data Point | ▭ Wetland | ▭ Soil Type Boundary | ▭ County Boundary |
| ● Culvert | ▭ Pond | | |

0 100 200 400 Feet

**FIGURE 2
RESOURCE LOCATION MAP
SHEET 15 OF 15**

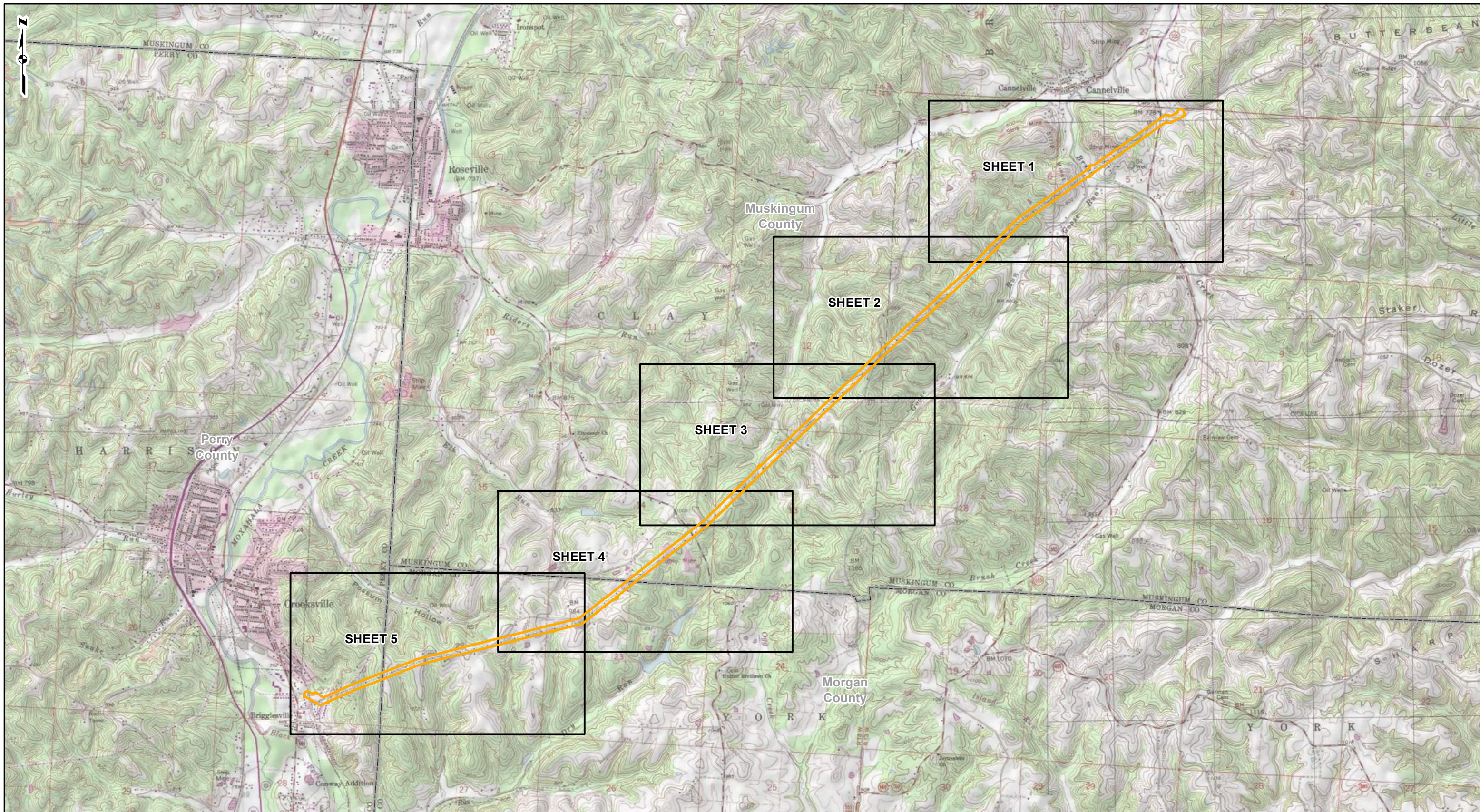
CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

gci consultants

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY

DRAWN BY: KJT
CHECKED: EFJ

DATE: 1/12/2021
APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PHILO (1977), CROOKSVILLE (1977), DEAVERTOWN (1977) AND ROKEY LOCK (1977), OHIO, OBTAINED THROUGH ESRI USA TOPO MAPS, NATIONAL GEOGRAPHIC TOPO AND USGS, ACCESSED 01/2021.

LEGEND

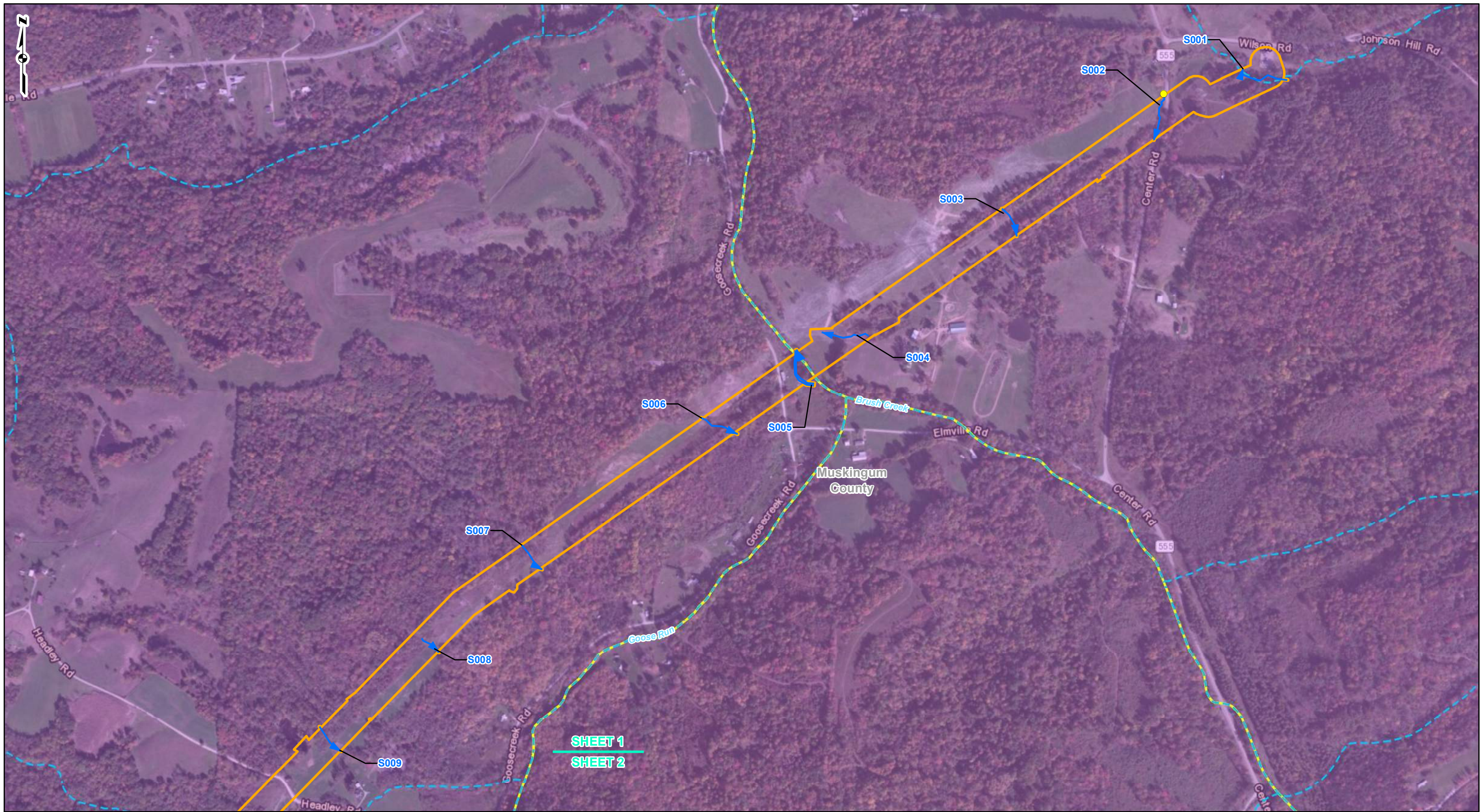
- Study Area
- Sheet Index
- County Boundary

0 1,500 3,000 6,000 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET INDEX**

CROOKSVILLE - PHILO 138KV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. STREAM ELIGIBILITY, OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), 2017. WQS STREAMS, OHIO WATER QUALITY STANDARDS, 2010.

LEGEND

| | | |
|------------|-----------------|----------------------------------|
| Culvert | NHD Stream | OH EPA Stream Eligibility |
| Stream | OH WQS Stream | Eligible |
| Study Area | County Boundary | Ineligible |
| | | Possibly Eligible |

0 300 600 1,200 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET 1 OF 5**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. STREAM ELIGIBILITY, OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), 2017. WQS STREAMS, OHIO WATER QUALITY STANDARDS, 2010.

LEGEND

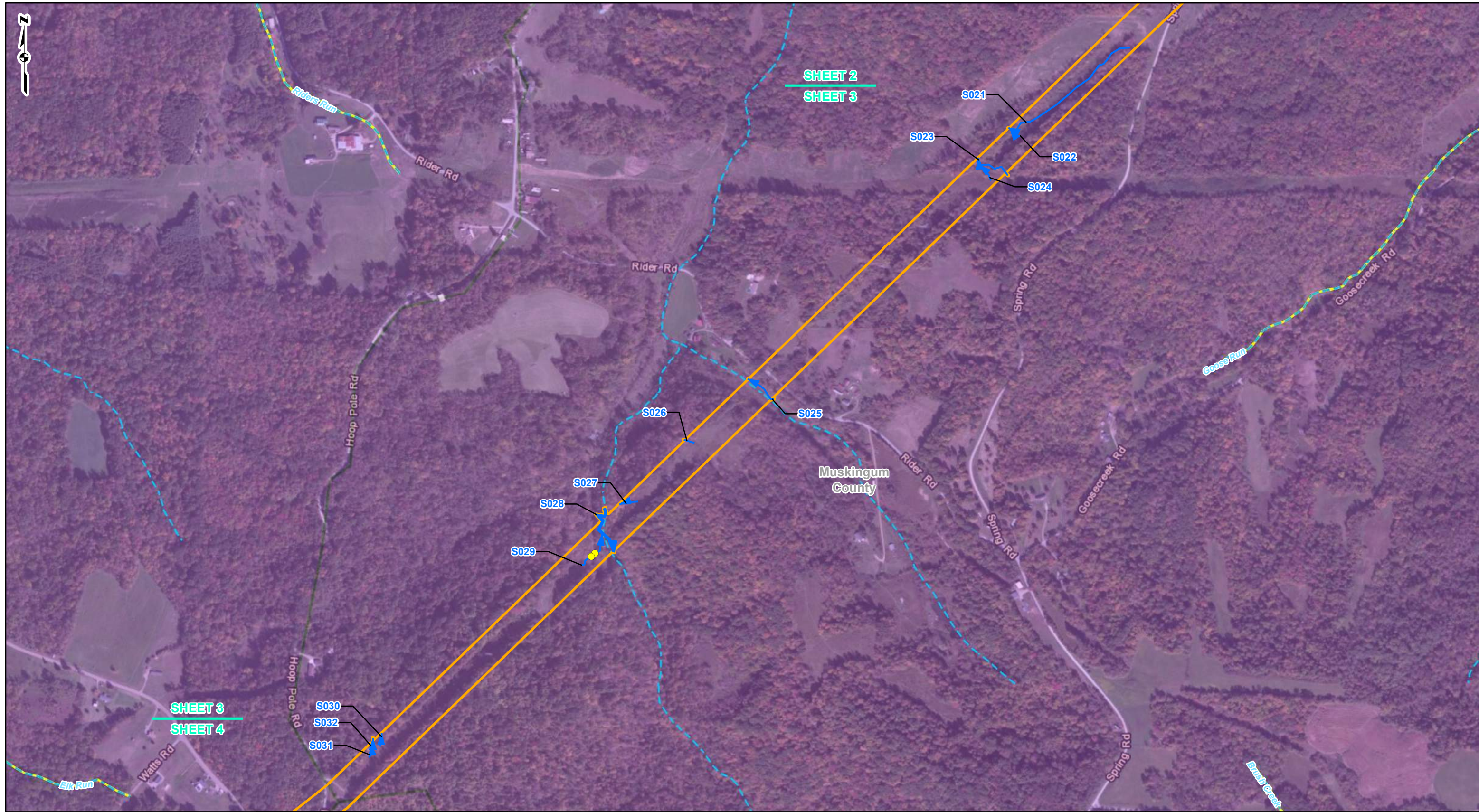
| | | |
|------------|-----------------|----------------------------------|
| Culvert | NHD Stream | OH EPA Stream Eligibility |
| Stream | OH WQS Stream | Eligible |
| Study Area | County Boundary | Ineligible |
| | | Possibly Eligible |

0 300 600 1,200 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET 2 OF 5**

CROOKVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. STREAM ELIGIBILITY, OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), 2017. WQS STREAMS, OHIO WATER QUALITY STANDARDS, 2010.

LEGEND

| | | |
|------------|-----------------|----------------------------------|
| Culvert | NHD Stream | OH EPA Stream Eligibility |
| Stream | OH WQS Stream | Eligible |
| Study Area | County Boundary | Ineligible |
| | | Possibly Eligible |

0 300 600 1,200 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET 3 OF 5**

CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. STREAM ELIGIBILITY, OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), 2017. WQS STREAMS, OHIO WATER QUALITY STANDARDS, 2010.

LEGEND

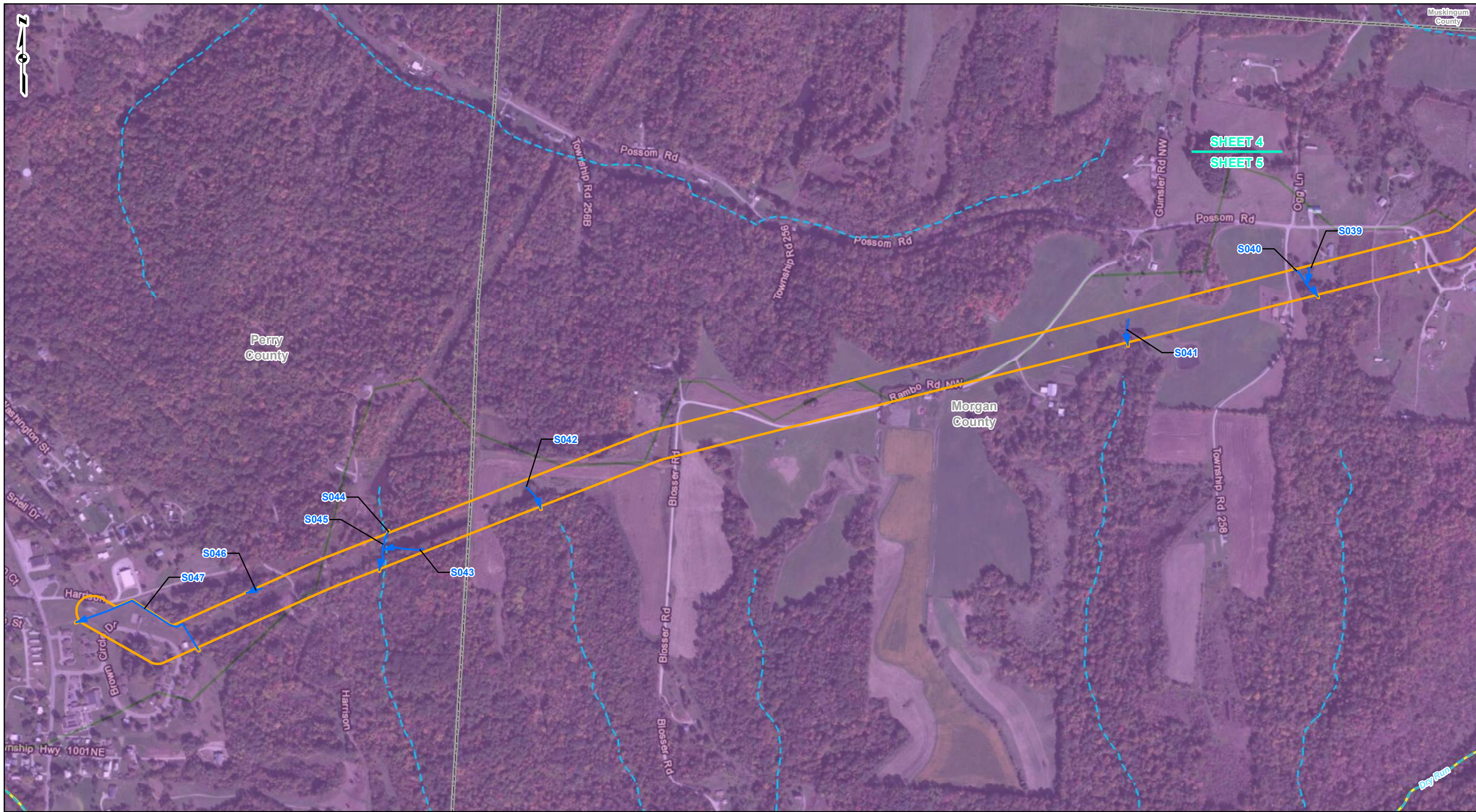
| | | |
|------------|-----------------|----------------------------------|
| Culvert | NHD Stream | OH EPA Stream Eligibility |
| Stream | OH WQS Stream | Eligible |
| Study Area | County Boundary | Ineligible |
| | | Possibly Eligible |

0 300 600 1,200 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET 4 OF 5**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:



PROJECT LOCATION

MUSKINGUM, PERRY, AND MORGAN COUNTIES, OHIO

REFERENCE: ESRI WORLD IMAGERY (CLARITY), ARCGIS ONLINE, ACCESSED 01/2021. TRANSPORTATION, ESRI, ARCGIS ONLINE, ACCESSED 01/2021. NATIONAL HYDROGRAPHY DATASET (NHD) STREAMS, USGS, 2018. STREAM ELIGIBILITY, OHIO ENVIRONMENTAL PROTECTION AGENCY (OEPA), 2017. WQS STREAMS, OHIO WATER QUALITY STANDARDS, 2010.

LEGEND

| | | |
|------------|-----------------|----------------------------------|
| Culvert | NHD Stream | OH EPA Stream Eligibility |
| Stream | OH WQS Stream | Eligible |
| Study Area | County Boundary | Ineligible |
| | | Possibly Eligible |

0 300 600 1,200 Feet

**FIGURE 3
STREAM ELIGIBILITY MAP
SHEET 5 OF 5**

**CROOKSVILLE - PHILO 138kV
LINE REBUILD PROJECT
AMERICAN ELECTRIC POWER**

DRAWN BY: KJT DATE: 1/12/2021
CHECKED: EFJ APPROVED:

**This foregoing document was electronically filed with the Public Utilities
Commission of Ohio Docketing Information System on**

7/26/2024 3:19:26 PM

in

Case No(s). 24-0688-EL-BNR

Summary: Application Construction Notice Philo-Crooksville and Philo-Rutland,
Part 1 of 2 electronically filed by Hector Garcia-Santana on behalf of Ohio Power
Company.

24-0688-EL-BNR
Part 2 of 2

APPENDIX A

Photographs



Photograph 1. Wetland W001-PEM-CAT2, Facing North



Photograph 2. Wetland W001-PEM-CAT2, Facing South



Photograph 3. Wetland W001-PEM-CAT2, Facing West



Photograph 4. Wetland W001-PEM-CAT2, Facing East



Photograph 5. Wetland W002-PEM-CATMOD2, Facing South



Photograph 6. Wetland W002-PEM-CATMOD2, Facing North



Photograph 7. Wetland W002-PEM-CATMOD2, Facing West



Photograph 8. Wetland W002-PEM-CATMOD2, Facing East



Photograph 9. Wetland W003-PSS-CATMOD2, Facing South



Photograph 10. Wetland W003-PSS-CATMOD2, Facing East



Photograph 11. Wetland W003-PSS-CATMOD2, Facing West



Photograph 12. Wetland W003-PSS-CATMOD2, Facing North



Photograph 13. Wetland W004-PEM-CAT2, Facing North



Photograph 14. Wetland W004-PEM-CAT2, Facing South



Photograph 15. Wetland W004-PEM-CAT2, Facing West



Photograph 16. Wetland W004-PEM-CAT2, Facing East



Photograph 17. Wetland W005-PEM-CAT2, Facing South



Photograph 18. Wetland W005-PEM-CAT2, Facing West



Photograph 19. Wetland W005-PEM-CAT2, Facing East



Photograph 20. Wetland W005-PEM-CAT2, Facing North



Photograph 21. Wetland W006-PEM-CAT2, Facing South



Photograph 22. Wetland W006-PEM-CAT2, Facing North



Photograph 23. Wetland W006-PEM-CAT2, Facing East



Photograph 24. Wetland W006-PEM-CAT2, Facing West



Photograph 25. Wetland W007-PUB-CATMOD2, Facing East



Photograph 26. Wetland W007-PUB-CATMOD2, Facing West



Photograph 27. Wetland W007-PUB-CATMOD2, Facing South



Photograph 28. Wetland W007-PUB-CATMOD2, Facing North



Photograph 29. Wetland W007-PEM-CATMOD2, Facing East



Photograph 30. Wetland W007-PEM-CATMOD2, Facing West



Photograph 31. Wetland W007-PEM-CATMOD2, Facing South



Photograph 32. Wetland W007-PEM-CATMOD2, Facing North



Photograph 33. Wetland W008-PUB-CATMOD2, Facing East



Photograph 34. Wetland W008-PUB-CATMOD2, Facing West



Photograph 35. Wetland W008-PUB-CATMOD2, Facing South



Photograph 36. Wetland W008-PUB-CATMOD2, Facing North



Photograph 37. Wetland W009-PEM-CATMOD2, Facing East



Photograph 38. Wetland W009-PEM-CATMOD2, Facing West



Photograph 39. Wetland W009-PEM-CATMOD2, Facing North



Photograph 40. Wetland W009-PEM-CATMOD2, Facing South



Photograph 41. Wetland W010-PFO-CAT2, Facing East



Photograph 42. Wetland W010-PFO-CAT2, Facing West



Photograph 43. Wetland W010-PFO-CAT2, Facing South



Photograph 44. Wetland W010-PFO-CAT2, Facing North



Photograph 45. Wetland W011-PEM-CATMOD2, Facing East



Photograph 46. Wetland W011-PEM-CATMOD2, Facing West



Photograph 47. Wetland W011-PEM-CATMOD2, Facing South



Photograph 48. Wetland W011-PEM-CATMOD2, Facing North



Photograph 49. Wetland W012-PEM-CATMOD2, Facing East



Photograph 50. Wetland W012-PEM-CATMOD2, Facing West



Photograph 51. Wetland W012-PEM-CATMOD2, Facing South



Photograph 52. Wetland W012-PEM-CATMOD2, Facing North



Photograph 53. Wetland W013-PEM-CATMOD2, Facing East



Photograph 54. Wetland W013-PEM-CATMOD2, Facing West



Photograph 55. Wetland W013-PEM-CATMOD2, Facing South



Photograph 56. Wetland W013-PEM-CATMOD2, Facing North



Photograph 57. Stream S001 Upstream, Facing East



Photograph 58. Stream S001 Downstream, Facing West



Photograph 59. Stream S002 Upstream, Facing South



Photograph 60. Stream S002 Downstream, Facing North



Photograph 61. Stream S003 Upstream, Facing Northwest



Photograph 62. Stream S003 Downstream, Facing Southeast



Photograph 63. Stream S004 Upstream, Facing East



Photograph 64. Stream S004 Downstream, Facing West



Photograph 65. Stream S005 (Brush Creek) Upstream, Facing Southeast



Photograph 66. Stream S005 (Brush Creek) Downstream, Facing Northwest



Photograph 67. Stream S006 Upstream, Facing Northwest



Photograph 68. Stream S006 Downstream, Facing Southeast



Photograph 69. Stream S007 Upstream, Facing Northwest



Photograph 70. Stream S007 Downstream, Facing Southeast



Photograph 71. Stream S008 Upstream, Facing Northwest



Photograph 72. Stream S008 Downstream, Facing Southeast



Photograph 73. Stream S009 Upstream, Facing Northwest



Photograph 74. Stream S009 Downstream, Facing Southeast



Photograph 75. Stream S010 Upstream, Facing West



Photograph 76. Stream S010 Downstream, Facing East



Photograph 77. Stream S011 Upstream, Facing West



Photograph 78. Stream S011 Downstream, Facing East



Photograph 79. Stream S012 Upstream, Facing East



Photograph 80. Stream S012 Downstream, Facing West



Photograph 81. Stream S013 Upstream, Facing East



Photograph 82. Stream S013 Downstream, Facing West



Photograph 83. Stream S014 Upstream, Facing South



Photograph 84. Stream S014 Downstream, Facing North



Photograph 85. Stream S015 Upstream, Facing Northeast



Photograph 86. Stream S015 Downstream, Facing Southwest



Photograph 87. Stream S016 Upstream, Facing Northwest



Photograph 88. Stream S016 Downstream, Facing Southeast



Photograph 89. Stream S017 Upstream, Facing Northwest



Photograph 90. Stream S017 Downstream, Facing Southeast



Photograph 91. Stream S018 Upstream, Facing Northwest



Photograph 92. Stream S018 Downstream, Facing East



Photograph 93. Stream S019 Upstream, Facing South



Photograph 94. Stream S019 Downstream, Facing North



Photograph 95. Stream S020 Upstream, Facing Southwest



Photograph 96. Stream S020 Downstream, Facing North



Photograph 97. Stream S021 Upstream, Facing Northeast



Photograph 98. Stream S021 Downstream, Facing Southwest



Photograph 99. Stream S022 Upstream, Facing East



Photograph 100. Stream S022 Downstream, Facing Northwest



Photograph 101. Stream S023 Upstream, Facing East



Photograph 102. Stream S023 Downstream, Facing West



Photograph 103. Stream S024 Upstream, Facing Southeast



Photograph 104. Stream S024 Downstream, Facing Northwest



Photograph 105. Stream S025 Upstream, Facing West



Photograph 106. Stream S025 Downstream, Facing East



Photograph 107. Stream S026 Upstream, Facing East



Photograph 108. Stream S026 Downstream, Facing West



Photograph 109. Stream S027 Upstream, Facing West



Photograph 110. Stream S027 Downstream, Facing East



Photograph 111. Stream S028 Upstream, Facing South



Photograph 112. Stream S028 Downstream, Facing North



Photograph 113. Stream S029 Upstream, Facing West



Photograph 114. Stream S029 Downstream, Facing East



Photograph 115. Stream S030 Upstream, Facing South



Photograph 116. Stream S030 Downstream, Facing North



Photograph 117. Stream S031 Upstream, Facing South



Photograph 118. Stream S031 Downstream, Facing North



Photograph 119. Stream S032 Upstream, Facing South



Photograph 120. Stream S032 Downstream, Facing North



Photograph 121. Stream S033 Upstream, Facing Southeast



Photograph 122. Stream S033 Downstream, Facing Northwest



Photograph 123. Stream S034 Upstream, Facing North



Photograph 124. Stream S034 Downstream, Facing South



Photograph 125. Stream S035 Upstream, Facing Northeast



Photograph 126. Stream S035 Downstream, Facing Southwest



Photograph 127. Stream S036 Upstream, Facing East



Photograph 128. Stream S036 Downstream, Facing West



Photograph 129. Stream S037 Upstream, Facing Southeast



Photograph 130. Stream S037 Downstream, Facing Northwest



Photograph 131. Stream S038 Upstream, Facing Southwest



Photograph 132. Stream S038 Downstream, Facing East



Photograph 133. Stream S039 Upstream, Facing Northeast



Photograph 134. Stream S039 Downstream, Facing Southwest



Photograph 135. Stream S040 Upstream, Facing Northwest



Photograph 136. Stream S040 Downstream, Facing Southeast



Photograph 137. Stream S041 Upstream, Facing North



Photograph 138. Stream S041 Downstream, Facing South



Photograph 139. Stream S042 Upstream, Facing Northwest



Photograph 140. Stream S042 Downstream, Facing Southeast



Photograph 141. Stream S043 Upstream, Facing East



Photograph 142. Stream S043 Downstream, Facing West



Photograph 143. Stream S044 Upstream, Facing Northeast



Photograph 144. Stream S044 Downstream, Facing Southwest



Photograph 145. Stream S045 Upstream, Facing North



Photograph 146. Stream S045 Downstream, Facing South



Photograph 147. Stream S046 Upstream, Facing Northeast



Photograph 148. Stream S046 Downstream, Facing Southwest



Photograph 149. Stream S047 Upstream, Facing Southeast



Photograph 150. Stream S047 Downstream, Facing West



Photograph 119. Representative Upland Habitat, Facing Southwest



Photograph 120. Representative Upland Habitat, Facing Northeast

APPENDIX B

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ATP State: OH Sampling Point: wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0%
 Subregion (LRR or MLRA): LBRN Lat: 39.810675 Long: -81.98041 Datum: NAD83
 Soil Map Unit Name: WuDZ - Westmoreland Guernsey Silt loam 15-25% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks: Wetland data for W001-PEM-CAT2
Data taken within transmission line ROW / open field.

HYDROLOGY

| Wetland Hydrology Indicators: | Secondary Indicators (minimum of two required) |
|--|---|
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Moss Trim Lines (B16) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Iron Deposits (B5) | <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Microtopographic Relief (D4) |
| <input type="checkbox"/> True Aquatic Plants (B14) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | |
| <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | |
| <input type="checkbox"/> Presence of Reduced Iron (C4) | |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | |
| <input type="checkbox"/> Thin Muck Surface (C7) | |
| <input type="checkbox"/> Other (Explain in Remarks) | |

Field Observations:
 Surface Water Present? Yes _____ No Depth (inches): —
 Water Table Present? Yes No _____ Depth (inches): 0
 Saturation Present? (includes capillary fringe) Yes No _____ Depth (inches): 0
 Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 50% of total cover: _____ | | 0 = Total Cover | |
| 20% of total cover: _____ | | | |
| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 50% of total cover: _____ | | 0 = Total Cover | |
| 20% of total cover: _____ | | | |
| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Phalaris arundinacea</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Impatiens capensis</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 3. <u>Carex vulpinoidea</u> | <u>20</u> | <u>Y</u> | <u>Obl</u> |
| 4. <u>Juncus effusus</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 5. <u>Cyperus esculentus</u> | <u>15</u> | <u>N</u> | <u>FACW</u> |
| 6. <u>Mimulus alatus</u> | <u>5</u> | <u>N</u> | <u>Obl</u> |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% of total cover: _____ | | 100 = Total Cover | |
| 20% of total cover: _____ | | | |
| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% of total cover: _____ | | 0 = Total Cover | |
| 20% of total cover: _____ | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR4/2 | 80 | 2.5YR3/6 | 20 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| | | | |
|--|--|---|--|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: | |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> (MLRA 147, 148) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> (MLRA 136, 147) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ATP State: OH Sampling Point: wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 01
 Subregion (LRR or MLRA): LRRN Lat: 39.809482 Long: -81.987845 Datum: NAD83

Soil Map Unit Name: Nu02-Westmoreland Guernsey Silt loam 15-25% Slope NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W002-PEM-CATMOD2</u> <u>Data taken along transmission line ROW edge/forest.</u> | |

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | Secondary Indicators (minimum of two required) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|--|---|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>—</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8"</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Herb Stratum (Plot size: <u>5r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>Impatiens capensis</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Carex lurida</u> | <u>20</u> | <u>Y</u> | <u>obl</u> |
| 3. <u>Carex vulpinoidea</u> | <u>20</u> | <u>Y</u> | <u>obl</u> |
| 4. <u>Juncus effusus</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 5. <u>Rumex crispus</u> | <u>10</u> | <u>N</u> | <u>FAC</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR 5/2 | 85 | 2.5YR 3/6 | 15 | C | PL | loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| | | | |
|--|--|--|--|
| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils³: | |
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: APP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): convex Slope (%): 10%
 Subregion (LRR or MLRA): LRRN Lat: 39.810446 Long: -81.986519 Datum: NAD83
 Soil Map Unit Name: MuDL - Westmoreland Cherry Silty loam 15-25% Slope NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|--|--|

Remarks: Upland data for W001 & W002
Data taken within transmission line ROW/open field.

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|---|--|

| | |
|---|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|---|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

Tree Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Sapling/Shrub Stratum (Plot size: 15'r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Herb Stratum (Plot size: 5'r)

| | | | |
|---------------------------------|-----------|----------|-------------|
| 1. <u>Solidago canadensis</u> | <u>25</u> | <u>Y</u> | <u>FACU</u> |
| 2. <u>Claytonia virginica</u> | <u>5</u> | <u>N</u> | <u>FAC</u> |
| 3. <u>Dactylis glomerata</u> | <u>20</u> | <u>Y</u> | <u>FACU</u> |
| 4. <u>Andropogon virginicus</u> | <u>5</u> | <u>N</u> | <u>FACU</u> |
| 5. <u>Anthoxanthum odoratum</u> | <u>20</u> | <u>Y</u> | <u>FACU</u> |
| 6. <u>Lonicera japonica</u> | <u>15</u> | <u>N</u> | <u>FACU</u> |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

Woody Vine Stratum (Plot size: 30'r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

| | | |
|---|----------|-------|
| Number of Dominant Species That Are OBL, FACW, or FAC: | <u>0</u> | (A) |
| Total Number of Dominant Species Across All Strata: | <u>3</u> | (B) |
| Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0</u> | (A/B) |

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |
| Prevalence Index = B/A = _____ | |

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Fac Upland veg is dominant

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/13/20
 Applicant/Owner: AFP State: OH Sampling Point: wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0%
 Subregion (LRR or MLRA): LRR N Lat: 39.806919 Long: -81.992686 Datum: NAD83
 Soil Map Unit Name: Wu02-Westmoreland/Guernsey silt loam 15-25% Slopes NWI classification: PUBGX

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | | | |
|---------------------------------|--|---------------------------------------|--|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? | Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> No _____ | | |

Remarks:
Wetland data for W003-PSS-CATMOD2
Data taken along transmission line ROW / fenced pasture.

HYDROLOGY

| Wetland Hydrology Indicators: | | Secondary Indicators (minimum of two required) |
|---|--|---|
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | | ___ Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> Surface Water (A1) | ___ True Aquatic Plants (B14) | ___ Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> High Water Table (A2) | ___ Hydrogen Sulfide Odor (C1) | ___ Drainage Patterns (B10) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | ___ Moss Trim Lines (B16) |
| ___ Water Marks (B1) | ___ Presence of Reduced Iron (C4) | ___ Dry-Season Water Table (C2) |
| ___ Sediment Deposits (B2) | ___ Recent Iron Reduction in Tilled Soils (C6) | ___ Crayfish Burrows (C8) |
| ___ Drift Deposits (B3) | ___ Thin Muck Surface (C7) | <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| ___ Algal Mat or Crust (B4) | ___ Other (Explain in Remarks) | ___ Stunted or Stressed Plants (D1) |
| ___ Iron Deposits (B5) | | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | ___ Shallow Aquitard (D3) |
| ___ Water-Stained Leaves (B9) | | ___ Microtopographic Relief (D4) |
| ___ Aquatic Fauna (B13) | | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:
 Surface Water Present? Yes No _____ Depth (inches): 12"
 Water Table Present? Yes No _____ Depth (inches): 0
 Saturation Present? (includes capillary fringe) Yes No _____ Depth (inches): 0
 Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology Indicators are A1, A2, A3, B7, C3, C9, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>Acer saccharinum</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Salix nigra</u> | <u>20</u> | <u>Y</u> | <u>Obl</u> |
| 3. <u>Cornus amomum</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
60 = Total Cover

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: AEP State: OH Sampling Point: wetland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0.1
 Subregion (LRR or MLRA): LBBN Lat: 39.806675 Long: -81.994239 Datum: NAD83
 Soil Map Unit Name: LK-Landside Siltloam 0-3% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks: Wetland data for W004-PEM-CAT2
Data taken within fenced pasture.

HYDROLOGY

| Wetland Hydrology Indicators: | Secondary Indicators (minimum of two required) |
|---|--|
| Primary Indicators (minimum of one is required; check all that apply) | _____ Surface Soil Cracks (B6) |
| _____ Surface Water (A1) | _____ Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> High Water Table (A2) | _____ Drainage Patterns (B10) |
| <input checked="" type="checkbox"/> Saturation (A3) | _____ Moss Trim Lines (B16) |
| _____ Water Marks (B1) | _____ Dry-Season Water Table (C2) |
| _____ Sediment Deposits (B2) | _____ Crayfish Burrows (C8) |
| _____ Drift Deposits (B3) | _____ Saturation Visible on Aerial Imagery (C9) |
| _____ Algal Mat or Crust (B4) | _____ Stunted or Stressed Plants (D1) |
| _____ Iron Deposits (B5) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| _____ Inundation Visible on Aerial Imagery (B7) | _____ Shallow Aquitard (D3) |
| _____ Water-Stained Leaves (B9) | _____ Microtopographic Relief (D4) |
| _____ Aquatic Fauna (B13) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:
 Surface Water Present? Yes _____ No Depth (inches): —
 Water Table Present? Yes No _____ Depth (inches): 12"
 Saturation Present? (includes capillary fringe) Yes No _____ Depth (inches): 0
 Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>Phalaris arundinacea</u> | <u>30</u> | <u>Y</u> | <u>Fach</u> |
| 2. <u>Juncus effusus</u> | <u>30</u> | <u>Y</u> | <u>Fach</u> |
| 3. <u>Impatiens capensis</u> | <u>30</u> | <u>Y</u> | <u>Fach</u> |
| 4. <u>Mimulus alatus</u> | <u>10</u> | <u>N</u> | <u>Obl</u> |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
 _____ = Total Cover

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ACP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): _____ Slope (%): 0%
 Subregion (LRR or MLRA): LBRM Lat: 39.806503 Long: -81.994287 Datum: NAD83
 Soil Map Unit Name: Lm-Cobdell loam NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Remarks: <u>Upland data for W003 & W004</u> <u>Data taken within fenced pasture.</u> | |

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: <u>Hydrology is not present.</u> | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>Doctylis dimerata</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 2. <u>Taraxacum officinale</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 3. <u>Trifolium pratense</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 4. <u>Plantago lanceolata</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 5. <u>Anthoxanthum odoratum</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ACP State: OH Sampling Point: wetland
 Investigator(s): KW Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0.1
 Subregion (LRR or MLRA): LRR N Lat: 39.802273 Long: -82.001986 Datum: NAD83
 Soil Map Unit Name: Bhk4F-Bethesda Channery Silt loam 25-70% Slopes NWI classification: NA
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
|--|--|

Remarks: Wetland data for W005-PEM-CAT2
Data taken within transmission line ROW/open field.

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) | Secondary Indicators (minimum of two required) |
| <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>—</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12"</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|---------------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 0 = Total Cover | | | |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 0 = Total Cover | | | |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Phalaris arundinacea</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Juncus effusus</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 3. <u>Carex vulpimoides</u> | <u>20</u> | <u>Y</u> | <u>OBL</u> |
| 4. <u>Onoclea sensibilis</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 100 = Total Cover | | | |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 0 = Total Cover | | | |
| 50% of total cover: _____ | | 20% of total cover: _____ | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crossville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ATP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): convex Slope (%): 0%
 Subregion (LRR or MLRA): LRR N Lat: 39.802039 Long: -82.002156 Datum: NAD83

Soil Map Unit Name: Wu02-Westmoreland (Guernsey Silt loam 15-25% Slope) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | |

Remarks: Upland data for W005-PEM-CAT2
Data taken within transmission line ROW/open field.

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: | <u>Secondary Indicators (minimum of two required)</u> |
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | _____ Surface Soil Cracks (B6) |
| _____ Surface Water (A1) | _____ Sparsely Vegetated Concave Surface (B8) |
| _____ High Water Table (A2) | _____ Drainage Patterns (B10) |
| _____ Saturation (A3) | _____ Moss Trim Lines (B16) |
| _____ Water Marks (B1) | _____ Dry-Season Water Table (C2) |
| _____ Sediment Deposits (B2) | _____ Crayfish Burrows (C8) |
| _____ Drift Deposits (B3) | _____ Saturation Visible on Aerial Imagery (C9) |
| _____ Algal Mat or Crust (B4) | _____ Stunted or Stressed Plants (D1) |
| _____ Iron Deposits (B5) | _____ Geomorphic Position (D2) |
| _____ Inundation Visible on Aerial Imagery (B7) | _____ Shallow Aquitard (D3) |
| _____ Water-Stained Leaves (B9) | _____ Microtopographic Relief (D4) |
| _____ Aquatic Fauna (B13) | _____ FAC-Neutral Test (D5) |
| _____ True Aquatic Plants (B14) | |
| _____ Hydrogen Sulfide Odor (C1) | |
| _____ Oxidized Rhizospheres on Living Roots (C3) | |
| _____ Presence of Reduced Iron (C4) | |
| _____ Recent Iron Reduction in Tilled Soils (C6) | |
| _____ Thin Muck Surface (C7) | |
| _____ Other (Explain in Remarks) | |

Field Observations:
 Surface Water Present? Yes _____ No Depth (inches): _____
 Water Table Present? Yes _____ No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes _____ No Depth (inches): _____
 Wetland Hydrology Present? Yes _____ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>Anthoxanthum odoratum</u> | <u>30</u> | <u>V</u> | <u>FACU</u> |
| 2. <u>Trifolium pratense</u> | <u>25</u> | <u>V</u> | <u>FACU</u> |
| 3. <u>Plantago major</u> | <u>5</u> | <u>N</u> | <u>FACU</u> |
| 4. <u>Andropogon virginicus</u> | <u>15</u> | <u>N</u> | <u>FACU</u> |
| 5. <u>Achillea millefolium</u> | <u>10</u> | <u>N</u> | <u>FACU</u> |
| 6. <u>Daucus carota</u> | <u>5</u> | <u>N</u> | <u>UPL</u> |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: AFP State: OH Sampling Point: Wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0.1
 Subregion (LRR or MLRA): LRRN Lat: 39.801003 Long: -82.003694 Datum: NAD83
 Soil Map Unit Name: NUFZ-Westmoeland/Guemsy Silt loam 25-40' Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W006-PEM-CAT2</u> <u>Data taken within transmission line ROW/open field.</u> | |

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | Secondary Indicators (minimum of two required) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|--|---|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
|---|------------------|-------------------|------------------|--|
| 1. <u>none</u> | | | | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
| 1. <u>none</u> | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
| 1. <u>Juncus effusus</u> | <u>40</u> | <u>Y</u> | <u>FacW</u> | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) |
| 2. <u>Scirpus cyperinus</u> | <u>40</u> | <u>Y</u> | <u>FacW</u> | |
| 3. <u>Eupatorium perfoliatum</u> | <u>20</u> | <u>Y</u> | <u>FacW</u> | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status | |
| 1. <u>none</u> | | | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ |

Remarks: (Include photo numbers here or on a separate sheet.)
Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|----|-------------------|------------------|-----------|-----------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR 4/2 | 50 | 2.5YR 3/6 | 15 | C | PL | Clay loam | |
| | 10YR 4/1 | 20 | | | | | | matrix color |
| | 10YR 4/6 | 15 | | | | | | co-matrix color |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | Indicators for Problematic Hydric Soils ³ : |
|--|--|
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Dark Surface (S7) | |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | |
| <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input checked="" type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: AFP State: OH Sampling Point: wetland
 Investigator(s): KLW Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0%
 Subregion (LRR or MLRA): LRRN Lat: 39.799713 Long: -82.005052 Datum: NA83
 Soil Map Unit Name: Bk4F-BethesdaChannery Silt loam 25-70% Slopes NWI classification: PUBGX

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W007-PEM/PUB-CATMOD2</u> <u>Data taken within transmission line ROW/open field.</u> | |

HYDROLOGY

| | |
|---|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | Secondary Indicators (minimum of two required) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|---|---|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A1, A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>Phalaris arundinacea</u> | <u>35</u> | <u>Y</u> | <u>Facw</u> |
| 2. <u>Impatiens capensis</u> | <u>20</u> | <u>Y</u> | <u>Facw</u> |
| 3. <u>Carex ¹ vulpinoidea</u> | <u>20</u> | <u>Y</u> | <u>Obl</u> |
| 4. <u>Typha x glauca</u> | <u>10</u> | <u>N</u> | <u>Obl</u> |
| 5. <u>Dichanthelium clandestinum</u> | <u>15</u> | <u>N</u> | <u>Fac</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 - Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

50% of total cover: _____ 20% of total cover: _____

100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR 4/2 | 85 | 2.5YR 3/6 | 15 | C | R | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16) (MLRA 147, 148)
- Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: APP State: OH Sampling Point upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): convex Slope (%): 12.1
 Subregion (LRR or MLRA): LRR N Lat: 39.800402 Long: -82.004319 Datum: NAD83
 Soil Map Unit Name: Bet Berks Chamery Silt loam 25 to 35% slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|--|--|

Remarks: Upland data for W006 & W007
Data taken within transmission line ROW/open field.

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|---|--|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology is not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

Tree Stratum (Plot size: 30r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>Anthoxanthum odoratum</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 2. <u>Plantago lanceolata</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 3. <u>Tritolium pratense</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 4. <u>Daucus carota</u> | <u>10</u> | <u>N</u> | <u>Upl</u> |
| 5. <u>Achillea mille-folium</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- ___ 1 - Rapid Test for Hydrophytic Vegetation
 - ___ 2 - Dominance Test is >50%
 - ___ 3 - Prevalence Index is ≤3.0¹
 - ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - ___ Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

SOIL

Sampling Point: upland

001

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|---|-------------------|------------------|---------|-----------------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR 4/2 | 60 | | | | | sl | |
| | 10YR 4/3 | 40 | | | | | | co-matrix color |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | Indicators for Problematic Hydric Soils ³ : |
|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Dark Surface (S7) | |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | |
| <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks: Hydric Soils not present.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/18/20
 Applicant/Owner: AFP State: OH Sampling Point: Wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 01
 Subregion (LRR or MLRA): LRRN1 Lat: 39.799207 Long: -82.006507 Datum: NAD 83

Soil Map Unit Name: BhK4F-BethesdaChannerySiltloam25-70% Slopes NWI classification: PUBGx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks: Wetland data for W008-PUB-CATMOD2
Data taken within PUBGx wetland.

HYDROLOGY

| Wetland Hydrology Indicators: | Secondary Indicators (minimum of two required) |
|--|---|
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | |
| <input checked="" type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Moss Trim Lines (B16) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Microtopographic Relief (D4) |
| <input type="checkbox"/> True Aquatic Plants (B14) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | |
| <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | |
| <input type="checkbox"/> Presence of Reduced Iron (C4) | |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | |
| <input type="checkbox"/> Thin Muck Surface (C7) | |
| <input type="checkbox"/> Other (Explain in Remarks) | |

Field Observations:
 Surface Water Present? Yes No _____ Depth (inches): 12"+
 Water Table Present? Yes No _____ Depth (inches): 0
 Saturation Present? (includes capillary fringe) Yes No _____ Depth (inches): 0
 Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A1, A2, A3, B7, C3, C9, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

Tree Stratum (Plot size: 30r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>Carex vulpinoidea</u> | <u>30</u> | <u>Y</u> | <u>Obl</u> |
| 2. <u>Sparganium americanum</u> | <u>20</u> | <u>Y</u> | <u>Obl</u> |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR4/1 | 85 | 2.5YR3/6 | 15 | C | PL | Clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils ³ : |
|--|--|--|
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Mustkingum Co. Sampling Date: 5/18/20
 Applicant/Owner: ACP State: OH Sampling Point upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 01.
 Subregion (LRR or MLRA): LBBN Lat: 39.799093 Long: -82.006427 Datum: NAD83
 Soil Map Unit Name: BhK4F-Bethesda Channery Silt loam 25-70% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|--|--|

Remarks: Upland data for W008-PUB-CATMOD2
Data taken within transmission line ROW open field.

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) | Secondary Indicators (minimum of two required) |
| <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |

| | |
|--|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

| Tree Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

| Herb Stratum (Plot size: <u>5r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>Dactylis glomerata</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 2. <u>Trifolium pratense</u> | <u>30</u> | <u>N</u> | <u>FacU</u> |
| 3. <u>Taraxacum officinale</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 4. <u>Anthoxanthum odoratum</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant

SOIL

Sampling Point: upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR4/3 | 100 | | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16) (MLRA 147, 148)
- Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Hydric Soils not present.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/19/20
 Applicant/Owner: AFP State: OH Sampling Point: Wetland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0.1
 Subregion (LRR or MLRA): LRRN Lat: 39.791555 Long: -82.016696 Datum: NAD83
 Soil Map Unit Name: WuDZ Westmoreland Queensy Silt loam 25-40% Slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W009-PEM-CATMOD2</u> <u>Data taken within transmission line ROW/open field.</u> | |

HYDROLOGY

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|---|---|---|--|---|--|---|---|--|---|--|---|---|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|---|---|
| <p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> Surface Water (A1)</td> <td><input type="checkbox"/> True Aquatic Plants (B14)</td> </tr> <tr> <td><input checked="" type="checkbox"/> High Water Table (A2)</td> <td><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturation (A3)</td> <td><input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</td> </tr> <tr> <td><input type="checkbox"/> Water Marks (B1)</td> <td><input type="checkbox"/> Presence of Reduced Iron (C4)</td> </tr> <tr> <td><input type="checkbox"/> Sediment Deposits (B2)</td> <td><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</td> </tr> <tr> <td><input type="checkbox"/> Drift Deposits (B3)</td> <td><input type="checkbox"/> Thin Muck Surface (C7)</td> </tr> <tr> <td><input type="checkbox"/> Algal Mat or Crust (B4)</td> <td><input type="checkbox"/> Other (Explain in Remarks)</td> </tr> <tr> <td><input type="checkbox"/> Iron Deposits (B5)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Water-Stained Leaves (B9)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Aquatic Fauna (B13)</td> <td></td> </tr> </table> | <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> True Aquatic Plants (B14) | <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Presence of Reduced Iron (C4) | <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Thin Muck Surface (C7) | <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Other (Explain in Remarks) | <input type="checkbox"/> Iron Deposits (B5) | | <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | <input type="checkbox"/> Water-Stained Leaves (B9) | | <input type="checkbox"/> Aquatic Fauna (B13) | | <p>Secondary Indicators (minimum of two required)</p> <table style="width:100%;"> <tr><td><input type="checkbox"/> Surface Soil Cracks (B6)</td></tr> <tr><td><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</td></tr> <tr><td><input type="checkbox"/> Drainage Patterns (B10)</td></tr> <tr><td><input type="checkbox"/> Moss Trim Lines (B16)</td></tr> <tr><td><input type="checkbox"/> Dry-Season Water Table (C2)</td></tr> <tr><td><input type="checkbox"/> Crayfish Burrows (C8)</td></tr> <tr><td><input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)</td></tr> <tr><td><input type="checkbox"/> Stunted or Stressed Plants (D1)</td></tr> <tr><td><input checked="" type="checkbox"/> Geomorphic Position (D2)</td></tr> <tr><td><input type="checkbox"/> Shallow Aquitard (D3)</td></tr> <tr><td><input type="checkbox"/> Microtopographic Relief (D4)</td></tr> <tr><td><input checked="" type="checkbox"/> FAC-Neutral Test (D5)</td></tr> </table> | <input type="checkbox"/> Surface Soil Cracks (B6) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Drainage Patterns (B10) | <input type="checkbox"/> Moss Trim Lines (B16) | <input type="checkbox"/> Dry-Season Water Table (C2) | <input type="checkbox"/> Crayfish Burrows (C8) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | <input type="checkbox"/> Stunted or Stressed Plants (D1) | <input checked="" type="checkbox"/> Geomorphic Position (D2) | <input type="checkbox"/> Shallow Aquitard (D3) | <input type="checkbox"/> Microtopographic Relief (D4) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> True Aquatic Plants (B14) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Saturation (A3) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Presence of Reduced Iron (C4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Thin Muck Surface (C7) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Other (Explain in Remarks) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Iron Deposits (B5) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Aquatic Fauna (B13) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Drainage Patterns (B10) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Moss Trim Lines (B16) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Dry-Season Water Table (C2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Crayfish Burrows (C8) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Shallow Aquitard (D3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Microtopographic Relief (D4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>—</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>12"</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: <u>Hydrology Indicators are A2, A3, C3, D2, D5.</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| | Absolute % Cover | Dominant Species? | Indicator Status | |
|--|------------------|-------------------|------------------|--|
| Tree Stratum (Plot size: <u>30'r</u>) | | | | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 1. <u>none</u> | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____ |
| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | | | | |
| 1. <u>none</u> | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Herb Stratum (Plot size: <u>5'r</u>) | | | | Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) |
| 1. <u>Phalaris arundinacea</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> | |
| 2. <u>Impatiens capensis</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> | |
| 3. <u>Onoclea sensibilis</u> | <u>10</u> | <u>N</u> | <u>FACW</u> | |
| 4. <u>Juncus effusus</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> | |
| 5. <u>Agrimonia parviflora</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> | |
| 6. <u>Packerd aurea</u> | <u>10</u> | <u>N</u> | <u>FACW</u> | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| 11. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Woody Vine Stratum (Plot size: <u>30'r</u>) | | | | Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height. |
| 1. <u>none</u> | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 50% of total cover: _____ 20% of total cover: _____ | | | | |
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | | | | |
| Remarks: (Include photo numbers here or on a separate sheet.) <u>Wetland veg is dominant.</u> | | | | |

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-10 | 10YR4/1 | 85 | 2.5YR3/6 | 15 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | Indicators for Problematic Hydric Soils ³ : |
|--|---|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Coast Prairie Redox (A16) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> (MLRA 147, 148) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> (MLRA 136, 147) |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Thick Dark Surface (A12) | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | |
| <input type="checkbox"/> Sandy Redox (S5) | |
| <input type="checkbox"/> Stripped Matrix (S6) | |
| <input type="checkbox"/> Dark Surface (S7) | |
| <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | |
| <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | |
| <input type="checkbox"/> Loamy Gleyed Matrix (F2) | |
| <input checked="" type="checkbox"/> Depleted Matrix (F3) | |
| <input type="checkbox"/> Redox Dark Surface (F6) | |
| <input type="checkbox"/> Depleted Dark Surface (F7) | |
| <input type="checkbox"/> Redox Depressions (F8) | |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | |
| <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | |
| <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | |
| <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Meds F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/19/20
 Applicant/Owner: ATP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): concave Slope (%): 10%
 Subregion (LRR or MLRA): LRR N Lat: 39.791269 Long: -82.017064 Datum: NAD83
 Soil Map Unit Name: BcF-Berks Channey Silt loam 25-35% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
|--|--|

Remarks: Upland data for W009-PEM-CATMOD2
Data taken within transmission line ROW.

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) _____ <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
|---|--|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology is not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

Tree Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Sapling/Shrub Stratum (Plot size: 15'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Herb Stratum (Plot size: 5'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>Anthoxanthum odoratum</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 2. <u>Dipsacus fullonum</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 3. <u>Setaria faberj</u> | <u>25</u> | <u>Y</u> | <u>Upl</u> |
| 4. <u>Lamium purpureum</u> | <u>15</u> | <u>N</u> | <u>FacU</u> |
| 5. <u>Polystichum acrostichoides</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 6. <u>Barbarea vulgaris</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

Woody Vine Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

| | | |
|---|----------|-------|
| Number of Dominant Species That Are OBL, FACW, or FAC: | <u>0</u> | (A) |
| Total Number of Dominant Species Across All Strata: | <u>3</u> | (B) |
| Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0</u> | (A/B) |

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|--------------------------------|---------------------|
| OBL species | x 1 = _____ |
| FACW species | x 2 = _____ |
| FAC species | x 3 = _____ |
| FACU species | x 4 = _____ |
| UPL species | x 5 = _____ |
| Column Totals: | (A) _____ (B) _____ |
| Prevalence Index = B/A = _____ | |

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

SOIL

Sampling Point: upland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR 4/2 | 100 | | | | | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils ³ : | |
|--|--|---|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> (MLRA 147, 148) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> (MLRA 136, 147) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

Hydric Soils not present.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AEP State: OH Sampling Point: wetland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 01
 Subregion (LRR or MLRA): LRRN Lat: 39.784484 Long: -82.026663 Datum: NAD83
 Soil Map Unit Name: BKF - Berks-Westmoreland complex 40-70' slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W010-PFO-CAT2</u> <u>Data taken within forested area.</u> | |

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks) | Secondary Indicators (minimum of two required) <ul style="list-style-type: none"> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
|---|--|

| | |
|--|---|
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>10"</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
|--|---|

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A1, A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|---------------------------|------------------|
| 1. <u>Ulm americana</u> | <u>40</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Fraxinus pennsylvanica</u> | <u>40</u> | <u>Y</u> | <u>FACW</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| <u>80</u> = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: <u>15r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Ulm americana</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Fraxinus pennsylvanica</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| <u>60</u> = Total Cover | | | |
| Herb Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Impatiens capensis</u> | <u>20</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Carex vulpinoidea</u> | <u>20</u> | <u>Y</u> | <u>Obl</u> |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| 11. _____ | _____ | _____ | _____ |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| <u>40</u> = Total Cover | | | |
| Woody Vine Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>none</u> | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| 50% of total cover: _____ | | 20% of total cover: _____ | |
| <u>0</u> = Total Cover | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AEP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): convex Slope (%): 10%
 Subregion (LRR or MLRA): LRRN Lat: 39.784143 Long: -82.026652 Datum: NAD83
 Soil Map Unit Name: GtCZ-Guernsey-Upshur Silty Clay lo-SS Slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Remarks: <u>Upland data for W010-PFO-CAT2</u> <u>Data taken within transmission line ROW.</u> | |

HYDROLOGY

| | |
|---|--|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: <u>Hydrology Indicators not present.</u> | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

Tree Stratum (Plot size: 30r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>Andropogon virginicus</u> | <u>30</u> | <u>Y</u> | <u>FacV</u> |
| 2. <u>Trifolium pratense</u> | <u>30</u> | <u>Y</u> | <u>FacV</u> |
| 3. <u>Achillea millefolium</u> | <u>20</u> | <u>Y</u> | <u>FacV</u> |
| 4. <u>Leucanthemum vulgare</u> | <u>20</u> | <u>Y</u> | <u>Upl</u> |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

100 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AFP State: OH Sampling Point: Wetland
 Investigator(s): KLV Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 0.1
 Subregion (LRR or MLRA): LRR N Lat: 39.778163 Long: -82.034733 Datum: NAD83

Soil Map Unit Name: BKF-Berks Westmorland complex 40-70% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W011-PEM-CATMOD2</u> <u>Data taken within transmission line ROW.</u> | |

HYDROLOGY

| | |
|---|--|
| <p>Wetland Hydrology Indicators:</p> <p><u>Primary Indicators (minimum of one is required; check all that apply)</u></p> ___ Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) ___ Water Marks (B1) ___ Sediment Deposits (B2) ___ Drift Deposits (B3) ___ Algal Mat or Crust (B4) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) | <p><u>Secondary Indicators (minimum of two required)</u></p> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? (includes capillary fringe) Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>None</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

| Sapling/Shrub Stratum (Plot size: <u>15r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>None</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

| Herb Stratum (Plot size: <u>5r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------|------------------|-------------------|------------------|
| 1. <u>Phalaris arundinacea</u> | <u>30</u> | <u>Y</u> | <u>FACW</u> |
| 2. <u>Impatiens capensis</u> | <u>25</u> | <u>Y</u> | <u>FACW</u> |
| 3. <u>Oxyclea sensibilis</u> | <u>15</u> | <u>N</u> | <u>FACW</u> |
| 4. <u>Typha x glauca</u> | <u>20</u> | <u>Y</u> | <u>OBL</u> |
| 5. <u>Eupatorium perfoliatum</u> | <u>10</u> | <u>N</u> | <u>FACW</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

50% of total cover: _____ 20% of total cover: _____

100 = Total Cover

| Woody Vine Stratum (Plot size: <u>30r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>None</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____

0 = Total Cover

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Mustkingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AEP State: OH Sampling Point: upland
 Investigator(s): KLV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0.1
 Subregion (LRR or MLRA): LBBN Lat: 39.778068 Long: -82.034858 Datum: NAD83
 Soil Map Unit Name: BK4-BerksWestmoreland complex 40-70' Slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> | |
| Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | |

Remarks: Upland data for W011-PEM-CATMOD2
Data taken within transmission line ROW.

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: | <u>Secondary Indicators (minimum of two required)</u> |
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | _____ Surface Soil Cracks (B6) |
| _____ Surface Water (A1) | _____ Sparsely Vegetated Concave Surface (B8) |
| _____ High Water Table (A2) | _____ Drainage Patterns (B10) |
| _____ Saturation (A3) | _____ Moss Trim Lines (B16) |
| _____ Water Marks (B1) | _____ Dry-Season Water Table (C2) |
| _____ Sediment Deposits (B2) | _____ Crayfish Burrows (C8) |
| _____ Drift Deposits (B3) | _____ Saturation Visible on Aerial Imagery (C9) |
| _____ Algal Mat or Crust (B4) | _____ Stunted or Stressed Plants (D1) |
| _____ Iron Deposits (B5) | _____ Geomorphic Position (D2) |
| _____ Inundation Visible on Aerial Imagery (B7) | _____ Shallow Aquitard (D3) |
| _____ Water-Stained Leaves (B9) | _____ Microtopographic Relief (D4) |
| _____ Aquatic Fauna (B13) | _____ FAC-Neutral Test (D5) |
| _____ True Aquatic Plants (B14) | |
| _____ Hydrogen Sulfide Odor (C1) | |
| _____ Oxidized Rhizospheres on Living Roots (C3) | |
| _____ Presence of Reduced Iron (C4) | |
| _____ Recent Iron Reduction in Tilled Soils (C6) | |
| _____ Thin Muck Surface (C7) | |
| _____ Other (Explain in Remarks) | |

| | |
|---|---|
| Field Observations: | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
| Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | |
| Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | |
| Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe) | |

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology not present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

Tree Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Sapling/Shrub Stratum (Plot size: 15'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Herb Stratum (Plot size: 5'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------|------------------|-------------------|------------------|
| 1. <u>Andropogon virginicus</u> | <u>10</u> | <u>N</u> | <u>FacU</u> |
| 2. <u>Dactylis glomerata</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 3. <u>Trifolium pratense</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 4. <u>Panicum carolinense</u> | <u>10</u> | <u>N</u> | <u>Upl</u> |
| 5. <u>Plantago lanceolata</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

50% of total cover: _____ 20% of total cover: _____
100 = Total Cover

Woody Vine Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

50% of total cover: _____ 20% of total cover: _____
0 = Total Cover

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AEP State: OH Sampling Point: Wetland
 Investigator(s): KCV Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 01
 Subregion (LRR or MLRA): LRR N Lat: 39.776882 Long: -82.036928 Datum: NAD83
 Soil Map Unit Name: WmC2-Westgate Siltloam 6-15% Slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Remarks: <u>Wetland data for W012-PEM-CATMOD2</u> <u>Data taken within transmission Line ROW.</u> | |

HYDROLOGY

| | |
|--|---|
| Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) | Secondary Indicators (minimum of two required) |
| <input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>~</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe) | Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: <u>Hydrology Indicators are A2, A3, C3, D2, D5.</u> | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

Tree Stratum (Plot size: 30'r)

| | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15'r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5'r)

| | | | |
|--------------------------------------|-----------|----------|-------------|
| 1. <u>Juncus effusus</u> | <u>30</u> | <u>Y</u> | <u>FacW</u> |
| 2. <u>Carex vulpinoidea</u> | <u>30</u> | <u>Y</u> | <u>Obl</u> |
| 3. <u>Impatiens capensis</u> | <u>30</u> | <u>Y</u> | <u>Facu</u> |
| 4. <u>Onoclea sensibilis</u> | <u>10</u> | <u>N</u> | <u>Facu</u> |
| 5. <u>Dichanthelium clandestinum</u> | <u>10</u> | <u>N</u> | <u>Fac</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

100 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30'r)

| | | | |
|----------------|--|--|--|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

0 = Total Cover
 50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

| Total % Cover of: | Multiply by: |
|----------------------|---------------------|
| OBL species _____ | x 1 = _____ |
| FACW species _____ | x 2 = _____ |
| FAC species _____ | x 3 = _____ |
| FACU species _____ | x 4 = _____ |
| UPL species _____ | x 5 = _____ |
| Column Totals: _____ | (A) _____ (B) _____ |

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|----------------|---------------|-----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-16 | 10YR4/2 | .85 | 2.5YR3/6 | 15 | C | PL | SL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators: | | Indicators for Problematic Hydric Soils ³ : | |
|--|--|--|--|
| <input type="checkbox"/> Histosol (A1) | <input type="checkbox"/> Dark Surface (S7) | <input type="checkbox"/> 2 cm Muck (A10) (MLRA 147) | |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148) | <input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148) | |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147) | |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Very Shallow Dark Surface (TF12) | |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Other (Explain in Remarks) | |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N) | <input type="checkbox"/> Redox Dark Surface (F6) | | |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Depleted Dark Surface (F7) | | |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Redox Depressions (F8) | | |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) | | |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122) | | |
| <input type="checkbox"/> Sandy Redox (S5) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148) | | |
| <input type="checkbox"/> Stripped Matrix (S6) | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147) | | |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Meets F3.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: AEP State: OH Sampling Point: Wetland
 Investigator(s): KLW Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): 01.
 Subregion (LRR or MLRA): LRR N1 Lat: 39.775234 Long: -82.038189 Datum: NAD 83

Soil Map Unit Name: BKF-Berks Westmoreland Complex 40-70% Slopes NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation NO, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |

Remarks: Wetland data for W013-PEM-CATMOD2
Data taken within transmission line ROW.

HYDROLOGY

| Wetland Hydrology Indicators: | Secondary Indicators (minimum of two required) |
|--|--|
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Moss Trim Lines (B16) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | <input type="checkbox"/> Shallow Aquitard (D3) |
| <input type="checkbox"/> Aquatic Fauna (B13) | <input type="checkbox"/> Microtopographic Relief (D4) |
| <input type="checkbox"/> True Aquatic Plants (B14) | <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) | |
| <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | |
| <input type="checkbox"/> Presence of Reduced Iron (C4) | |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | |
| <input type="checkbox"/> Thin Muck Surface (C7) | |
| <input type="checkbox"/> Other (Explain in Remarks) | |

Field Observations:
 Surface Water Present? Yes _____ No Depth (inches): —
 Water Table Present? Yes No _____ Depth (inches): 10"
 Saturation Present? Yes No _____ Depth (inches): 0
 (includes capillary fringe)
 Wetland Hydrology Present? Yes No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology Indicators are A2, A3, C3, D2, D5.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: wetland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

0 = Total Cover
 50% of total cover: _____
 20% of total cover: _____

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

0 = Total Cover
 50% of total cover: _____
 20% of total cover: _____

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>Phalaris arundinacea</u> | <u>20</u> | <u>y</u> | <u>Facu</u> |
| 2. <u>Juncus effusus</u> | <u>20</u> | <u>y</u> | <u>Facu</u> |
| 3. <u>Impatiens capensis</u> | <u>10</u> | <u>y</u> | <u>Facu</u> |
| 4. <u>Eupatorium perfoliatum</u> | <u>10</u> | <u>y</u> | <u>Facu</u> |
| 5. <u>Onoclea sensibilis</u> | <u>15</u> | <u>y</u> | <u>Facu</u> |
| 6. <u>Persicaria sagittatum</u> | <u>15</u> | <u>y</u> | <u>Obl</u> |
| 7. <u>Agrimonia parviflora</u> | <u>10</u> | <u>y</u> | <u>Facu</u> |
| 8. <u>Barbarea vulgaris</u> | <u>10</u> | <u>y</u> | <u>Facu</u> |
| 9. | | | |
| 10. | | | |
| 11. | | | |

150 = Total Cover
 50% of total cover: _____
 20% of total cover: _____

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

0 = Total Cover
 50% of total cover: _____
 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Wetland veg. is dominant.

SOIL

Sampling Point: wetland

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth (inches) | Matrix | | Redox Features | | | | Texture | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|---------|---------|
| | Color (moist) | % | Color (moist) | % | Type ¹ | Loc ² | | |
| 0-8 | 10YR 4/2 | 100 | | | | | SL | |
| 8-16 | 3/N | 90 | 2.5YR 3/6 | 10 | C | M | loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16) (MLRA 147, 148)
- Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No _____

Remarks:

Meets F2.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Crooksville Philo City/County: Muskingum Co. Sampling Date: 5/20/20
 Applicant/Owner: ATP State: OH Sampling Point: upland
 Investigator(s): KLW Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%): 0%
 Subregion (LRR or MLRA): LRRN Lat: 39.716695 Long: -82.039661 Datum: NAD83
 Soil Map Unit Name: WmC2 - Westgate Siltloam 6-15% Slopes NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

| | |
|--|--|
| Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> | Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> |
| Remarks: <u>Upland data for W012 & W013</u> <u>Data taken within transmission line ROW.</u> | |

HYDROLOGY

| | |
|---|--|
| <p>Wetland Hydrology Indicators:</p> <p>Primary Indicators (minimum of one is required; check all that apply)</p> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) | <p><u>Secondary Indicators (minimum of two required)</u></p> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5) |
| <p>Field Observations:</p> Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ | Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: <u>Hydrology not present.</u> | |

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: upland

| Tree Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |

0 = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Sapling/Shrub Stratum (Plot size: <u>15'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |

0 = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Herb Stratum (Plot size: <u>5'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------|------------------|-------------------|------------------|
| 1. <u>Dactylis glomerata</u> | <u>30</u> | <u>Y</u> | <u>FacU</u> |
| 2. <u>Achillea millefolium</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 3. <u>Cirsium arvense</u> | <u>20</u> | <u>Y</u> | <u>FacU</u> |
| 4. <u>Barbarea vulgaris</u> | <u>15</u> | <u>Y</u> | <u>FacU</u> |
| 5. <u>Verbascum thapsus</u> | <u>15</u> | <u>Y</u> | <u>FacU</u> |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |

100 = Total Cover

50% of total cover: _____ 20% of total cover: _____

| Woody Vine Stratum (Plot size: <u>30'r</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|--|------------------|-------------------|------------------|
| 1. <u>none</u> | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

0 = Total Cover

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No

Remarks: (Include photo numbers here or on a separate sheet.)

Upland veg is dominant.

APPENDIX C

Primary Headwater Habitat Evaluation (HHEI/QHEI) Data Forms



Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3) 62

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 0504004020 RIVER CODE _____ DRAINAGE AREA (mi²) .57
 LENGTH OF STREAM REACH (ft) _____ LAT 39.811345 LONG -81.984457 RIVER MILE _____
 DATE 5/15/20 SCORER KLV COMMENTS S001

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| | | | | |
|--|---|--|---|---|
| 1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B | | | | HHEI Metric Points Substrate Max = 40 <div style="border: 1px solid black; width: 40px; height: 40px; margin: 5px auto; text-align: center; line-height: 40px;">17</div> A + B |
| TYPE | PERCENT | TYPE | PERCENT | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | 30 | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | 10 | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | 20 | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | 30 | <input type="checkbox"/> MUCK [0 pts] | _____ | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | 10 | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | |
| Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>20</u> | | (A) <div style="border: 1px solid black; padding: 2px;">12</div> | (B) <div style="border: 1px solid black; padding: 2px;">5</div> | |
| SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>12</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u> | | | | |
| 2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box). | | | | Pool Depth Max = 30 <div style="border: 1px solid black; width: 40px; height: 40px; margin: 5px auto; text-align: center; line-height: 40px;">25</div> |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | |
| <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | |
| COMMENTS _____ | | MAXIMUM POOL DEPTH (centimeters): <u>20</u> | | |
| 3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box): | | | | Bankfull Width Max=30 <div style="border: 1px solid black; width: 40px; height: 40px; margin: 5px auto; text-align: center; line-height: 40px;">20</div> |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | |
| COMMENTS _____ | | AVERAGE BANKFULL WIDTH (meters) <u>8'</u> | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|------------------------------|---|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input checked="" type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> ≥3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/14/20 Quantity: 1.25"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

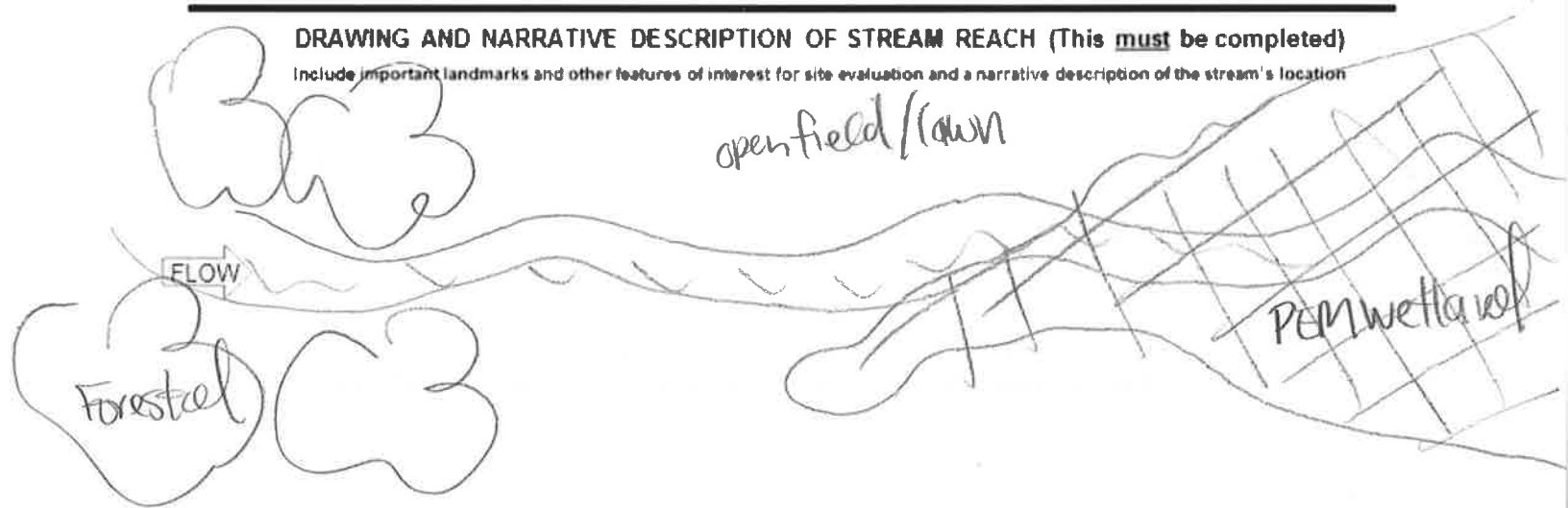
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

43

SITE NAME/LOCATION CROOKSVILLE PHHO
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 4.5qmi
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.810527 LONG. 81.9816409 RIVER CODE _____ RIVER MILE _____
 DATE 5/13/20 SCORER KLV COMMENTS S002

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>45</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | _____ | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|---|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|---|--|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4'

HHEI Metric Points

Substrate Max = 40

13

A + B

Pool Depth Max = 30

15

Bankfull Width Max=30

15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|-------------------------------------|---|-------------------------------------|--|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input checked="" type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | |
|-------------------------------|---|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 |
| | | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Mustkingum Co. Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: 50

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 100%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

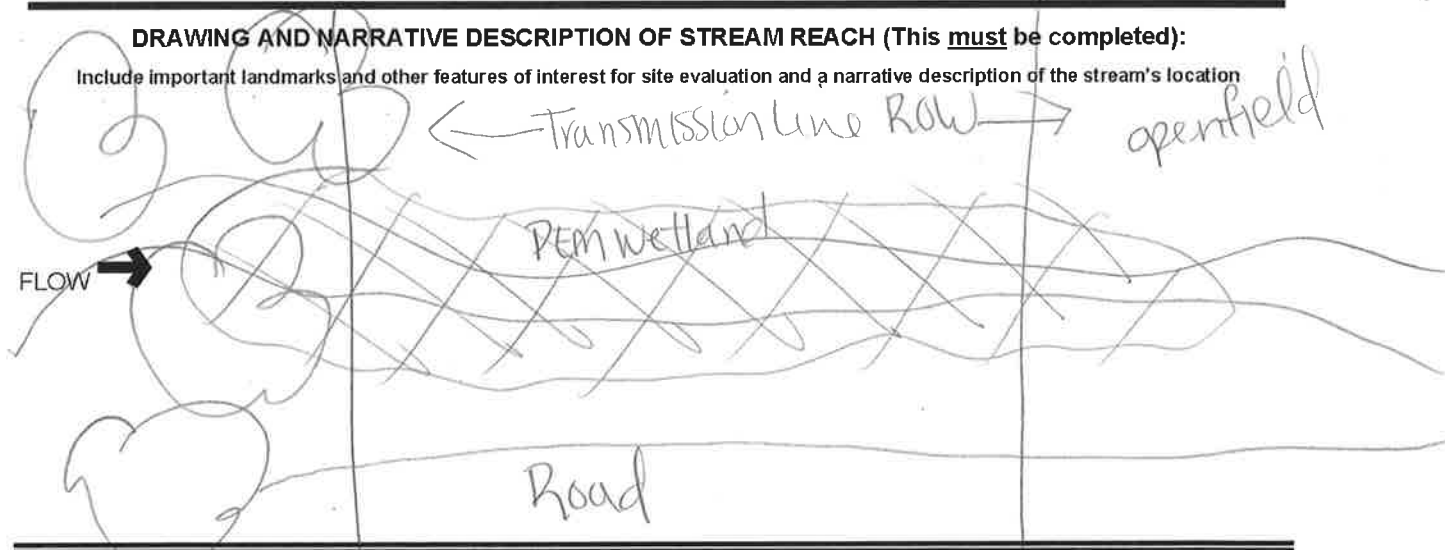
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

27

SITE NAME/LOCATION Crossville Philo SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 154mi
 LENGTH OF STREAM REACH (ft) _____ LAT 39.88665 LONG 81.98878 RIVER CODE _____ RIVER MILE _____
 DATE 5/13/20 SCORER KLV COMMENTS S003

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>25</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>15</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>25</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>20</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 12 (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

| | |
|--|---|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check *ONLY* one box):

| | |
|---|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'

HHEI Metric Points

Substrate Max = 40

17

A + B

Pool Depth Max = 30

5

Bankfull Width Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|---|----------------|---|-------------------------------------|
| L R | (Per Bank) | L R | (Most Predominant per Bank) |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | Wide >10m | <input type="checkbox"/> <input type="checkbox"/> | Mature Forest, Wetland |
| <input type="checkbox"/> <input type="checkbox"/> | Moderate 5-10m | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> <input type="checkbox"/> | Narrow <5m | <input type="checkbox"/> <input type="checkbox"/> | Residential, Park, New Field |
| <input type="checkbox"/> <input type="checkbox"/> | None | <input type="checkbox"/> <input type="checkbox"/> | Fenced Pasture |
| | | <input type="checkbox"/> <input type="checkbox"/> | Conservation Tillage |
| | | <input type="checkbox"/> <input type="checkbox"/> | Urban or Industrial |
| | | <input type="checkbox"/> <input type="checkbox"/> | Open Pasture, Row Crop |
| | | <input type="checkbox"/> <input type="checkbox"/> | Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Mustang Co. Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: 50"
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

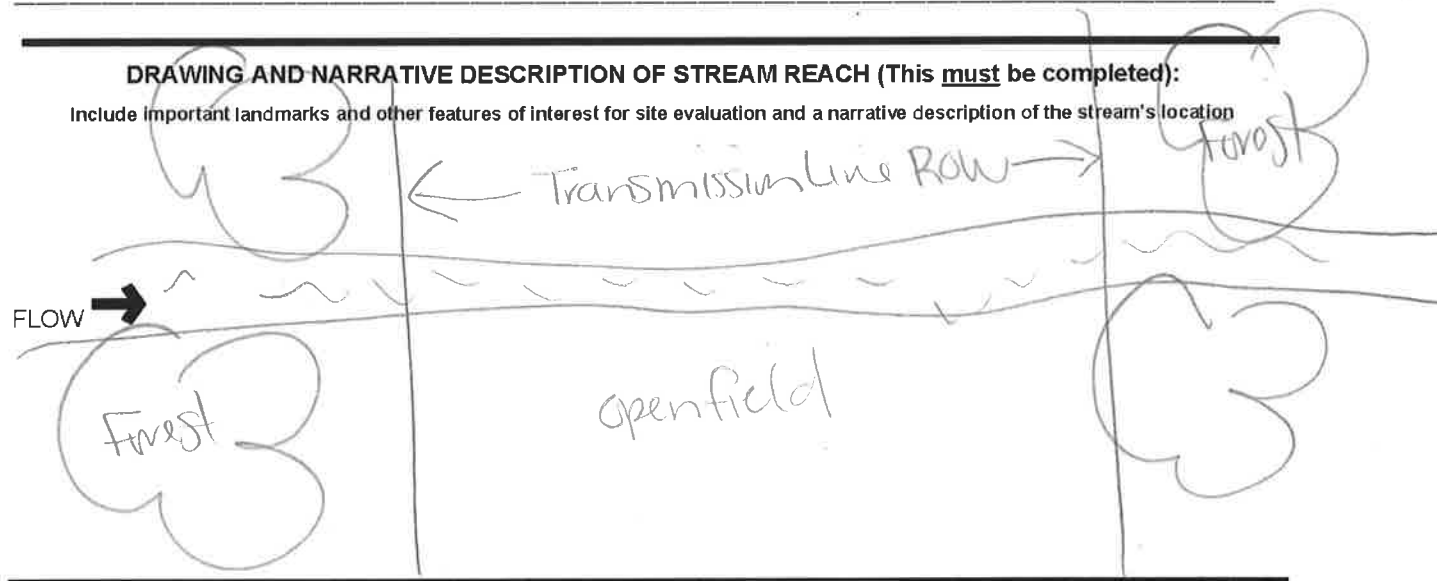
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

27

SITE NAME/LOCATION Crooksville photo
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 4.99
 LENGTH OF STREAM REACH (ft) _____ LAT 39.806559 LONG -81.9938 RIVER CODE _____ RIVER MILE _____
 DATE 5/13/20 SCORER KW COMMENTS S004

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLDG SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>90</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 12 (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|--|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'

HHEI Metric Points

Substrate Max = 40
17

A + B

Pool Depth Max = 30
5

Bankfull Width Max=30
5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|-------------------------------------|---|-------------------------------------|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Muskogum Co Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: 50"

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N): Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

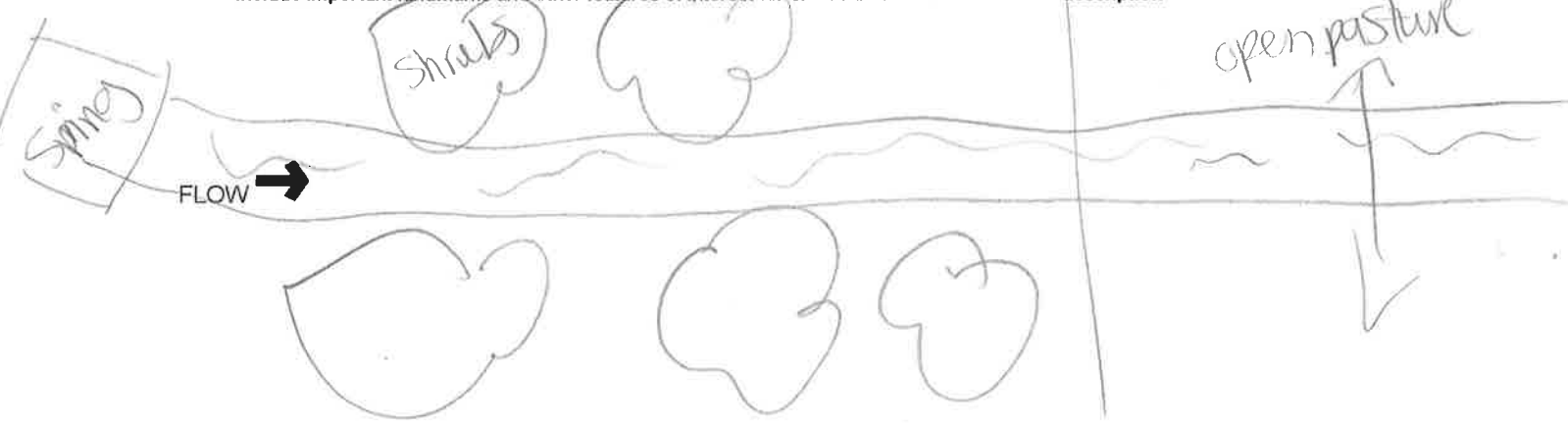
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

27

SITE NAME/LOCATION Crooksville Phio
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 459mi
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.8049166 LONG. 81.9967112 RIVER CODE _____ RIVER MILE _____
 DATE 5/18/20 SCORER KLV COMMENTS S006

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate **TYPE** boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>40</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 12 (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40

17

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|--|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5

Pool Depth Max = 30

5

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'

Bankfull Width Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|---|----------------|---|-------------------------------------|
| L R | (Per Bank) | L R | (Most Predominant per Bank) |
| <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | Wide >10m | <input type="checkbox"/> <input type="checkbox"/> | Mature Forest, Wetland |
| <input type="checkbox"/> <input type="checkbox"/> | Moderate 5-10m | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> <input type="checkbox"/> | Narrow <5m | <input type="checkbox"/> <input type="checkbox"/> | Residential, Park, New Field |
| <input type="checkbox"/> <input type="checkbox"/> | None | <input type="checkbox"/> <input type="checkbox"/> | Fenced Pasture |
| | | L R | |
| | | <input type="checkbox"/> <input type="checkbox"/> | Conservation Tillage |
| | | <input type="checkbox"/> <input type="checkbox"/> | Urban or Industrial |
| | | <input type="checkbox"/> <input type="checkbox"/> | Open Pasture, Row Crop |
| | | <input type="checkbox"/> <input type="checkbox"/> | Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Muskingum Co. Township / City: _____

MISCELLANEOUS

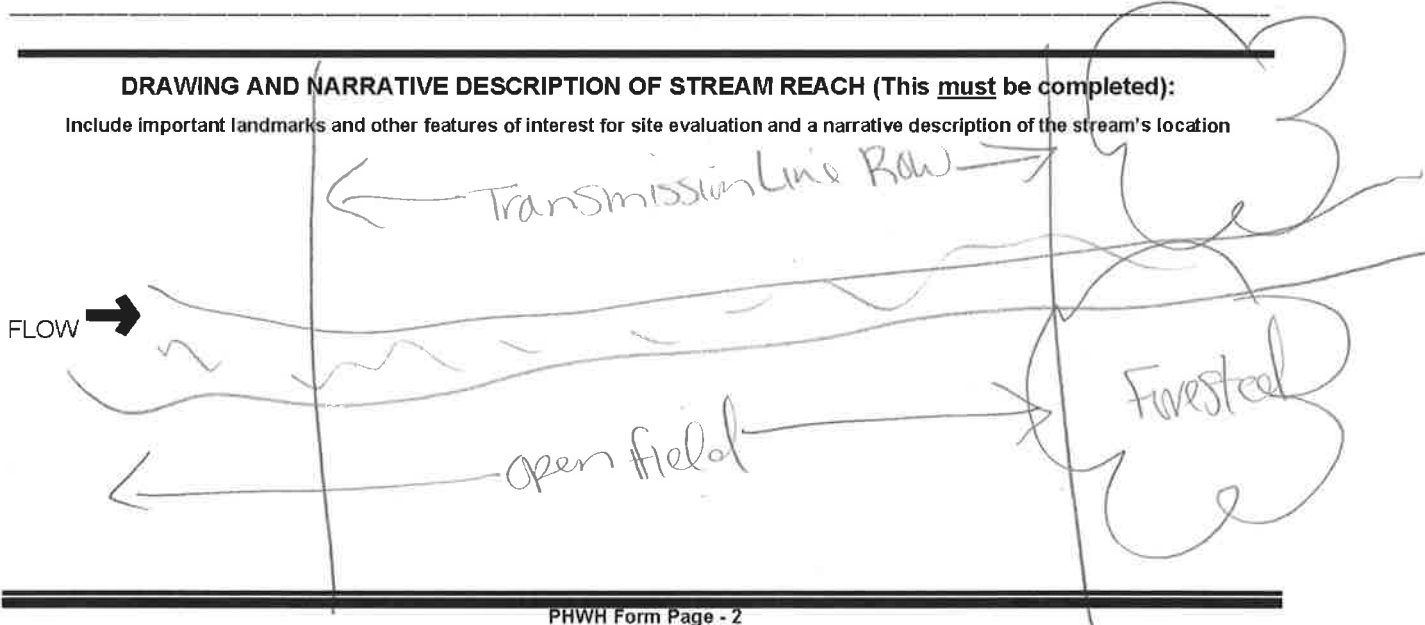
Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: .50"
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

51

SITE NAME/LOCATION CROOKSVILLE PHHO
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 6.59mi²
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.8026 LONG. 82.001184 RIVER CODE _____ RIVER MILE _____
 DATE 5/18/20 SCORER KLV COMMENTS S007

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>50</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>15</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | _____ | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 12 (B) 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 4

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|---|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|--|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 5

HHEI Metric Points

Substrate Max = 40

16

A + B

Pool Depth Max = 30

15

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|-------------------------------------|---|-------------------------------------|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Muskingum Co. Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: 50"
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 50%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N): Y If not, please explain: _____

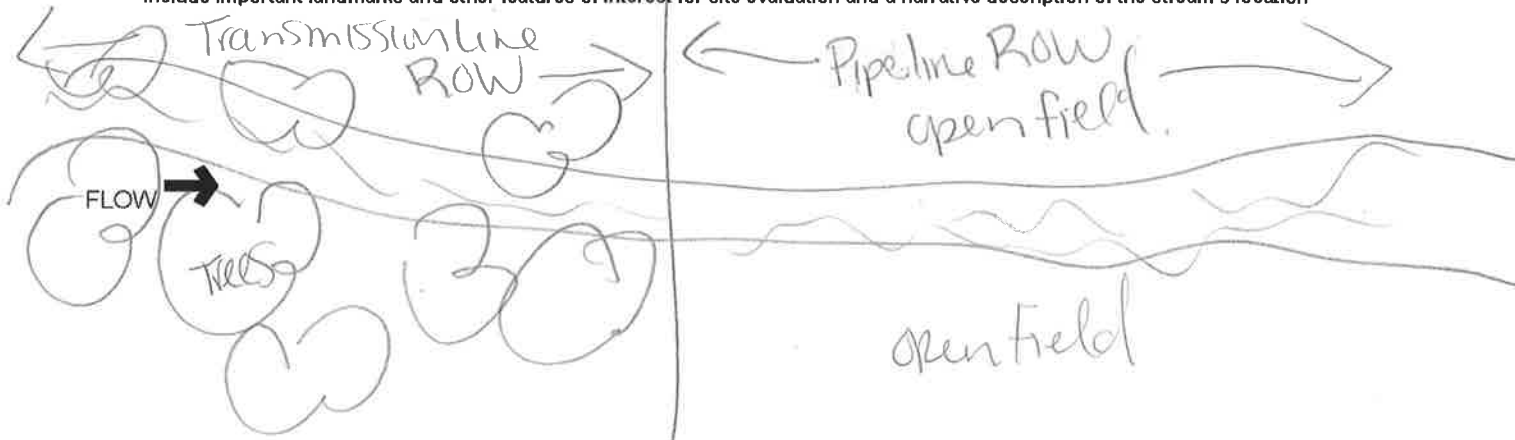
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

27

SITE NAME/LOCATION CROOKSVILLE Philo
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) 189mi
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.80105 LONG. 82.003505 RIVER CODE _____ RIVER MILE _____
 DATE 5/18/20 SCORER KLW COMMENTS S008

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLD R SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>10</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 15 (A) 12 (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|--|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> < 1.0 m (< 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3

HHEI Metric Points

Substrate Max = 40

17

A + B

Pool Depth Max = 30

5

Bankfull Width Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (Per Bank) | | (Most Predominant per Bank) | |
| Wide >10m | | Mature Forest, Wetland | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field | <input type="checkbox"/> |
| Moderate 5-10m | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field | <input type="checkbox"/> |
| Narrow <5m | | Fenced Pasture | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> |
| None | | | <input type="checkbox"/> |
| | | | <input type="checkbox"/> |
| | | | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Muskingum Co. Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/13/20 Quantity: .50"
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

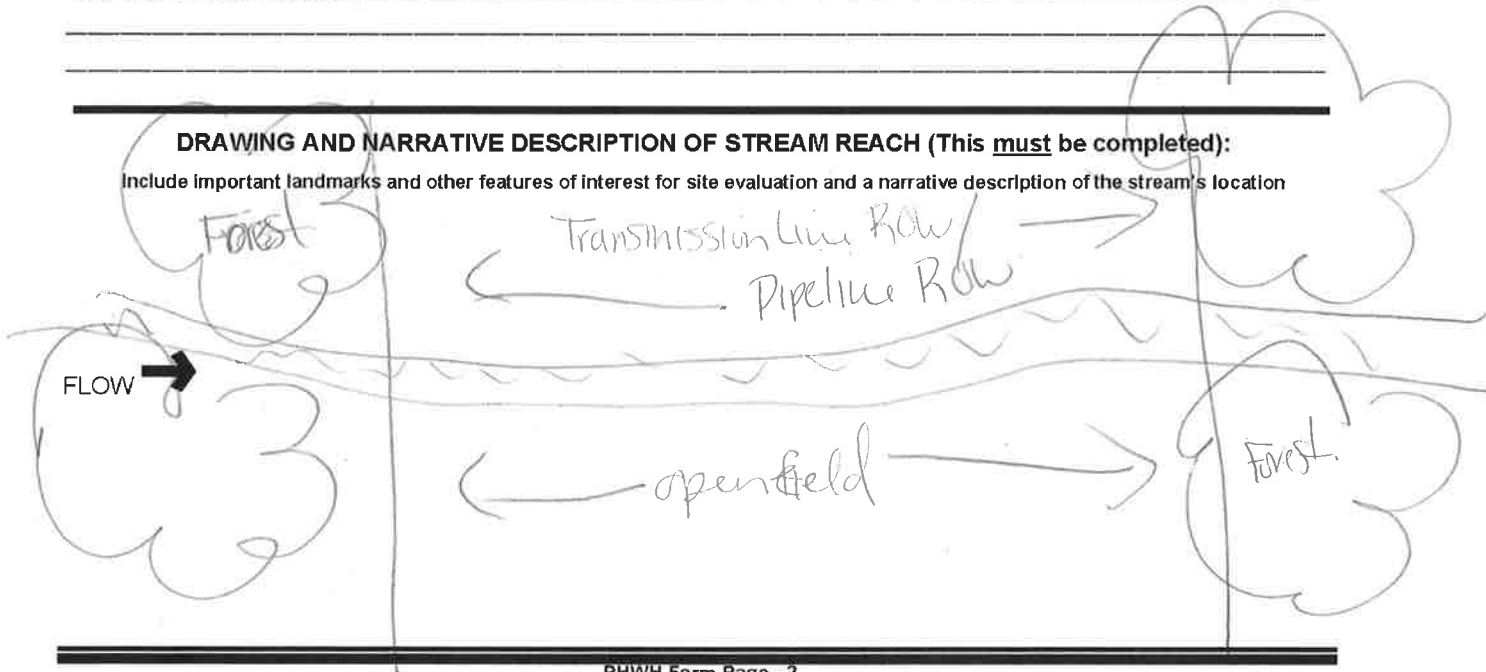
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

50

SITE NAME/LOCATION CRACKSVILLE Philo
 SITE NUMBER _____ RIVER BASIN 050400040801 DRAINAGE AREA (mi²) < 15 mi²
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.79931 LONG. 82.005958 RIVER CODE _____ RIVER MILE _____
 DATE 5/18/20 SCORER KLW COMMENTS S009

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE | PERCENT | TYPE | PERCENT |
|--|-----------|---|-----------|
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input type="checkbox"/> SILT [3 pt] | <u>20</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> |
| <input type="checkbox"/> BEDROCK [16 pt] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>10</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10 (A) 15 (B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: _____ TOTAL NUMBER OF SUBSTRATE TYPES: 5

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

| | |
|--|---|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts] |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

| | |
|---|--|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | |

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4'

HHEI Metric Points

Substrate Max = 40

20

A + B

Pool Depth Max = 30

15

Bankfull Width Max=30

15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN WIDTH | | FLOODPLAIN QUALITY | |
|---|-------------------------------------|---|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| (Per Bank) | | (Most Predominant per Bank) | |
| Wide >10m | | Mature Forest, Wetland | <input type="checkbox"/> Conservation Tillage |
| <input type="checkbox"/> Moderate 5-10m | | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field | <input type="checkbox"/> Urban or Industrial |
| <input type="checkbox"/> Narrow <5m | | <input checked="" type="checkbox"/> Residential, Park, New Field | <input type="checkbox"/> Open Pasture, Row Crop |
| <input type="checkbox"/> None | | <input type="checkbox"/> Fenced Pasture | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
County: Muskingum Co. Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/18/20 Quantity: 0.50"
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 40%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

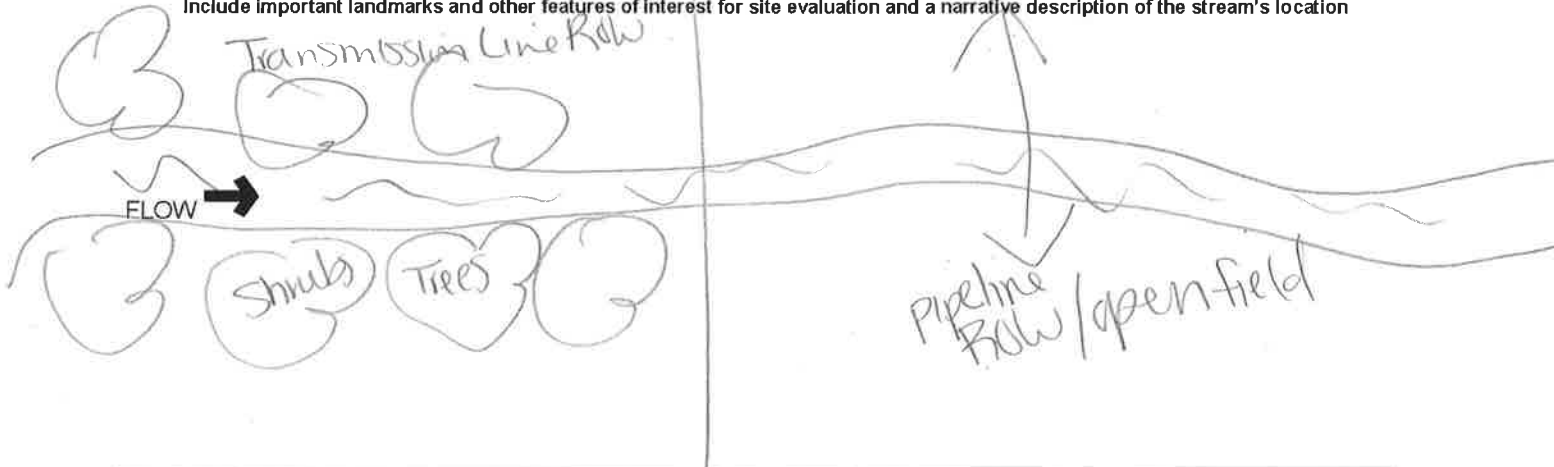
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Ohio Primary Headwater Habitat Field Evaluation Form
HHEI Score (sum of metrics 1+2+3) **54**

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN BrushCreek RIVER CODE 05040040201 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.7979 LONG -82.02977 RIVER MILE _____
 DATE 5/19/20 SCORER KCW COMMENTS S010

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <p>14</p> <p>A + B</p> |
|---|--|---|--|---|--|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|--|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>25</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (< 5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/19/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N) Canopy (% open): 80%

Were samples collected for water chemistry? (Y/N) Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) Species observed (if known): _____

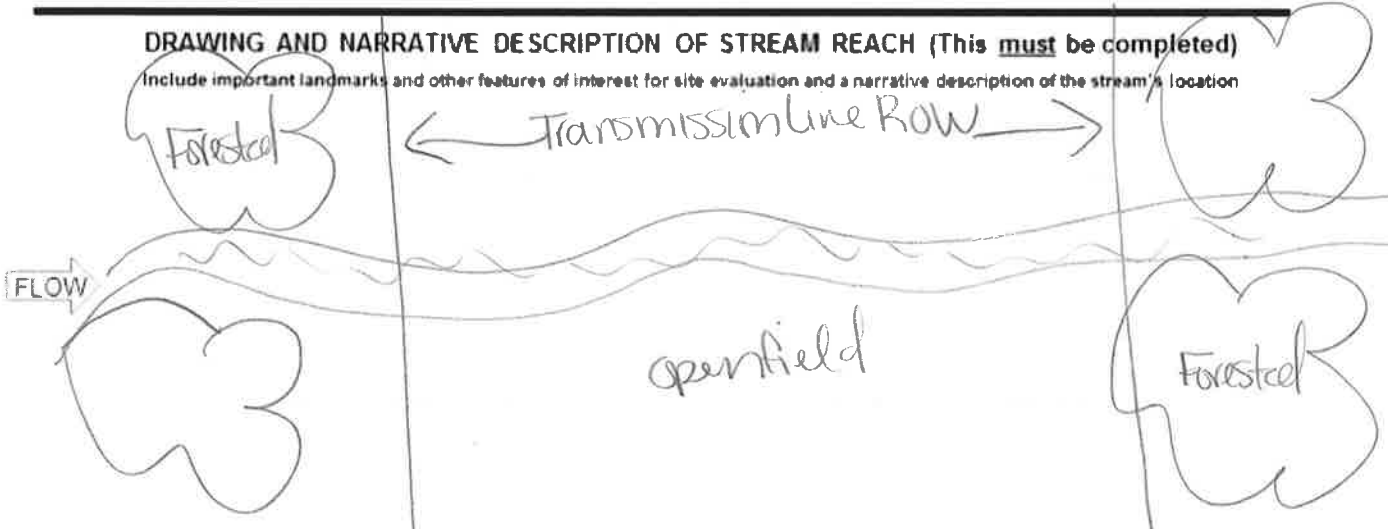
Salamanders Observed? (Y/N) Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

37

SITE NAME/LOCATION Crossville Ohio
 SITE NUMBER _____ RIVER BASIN Brush Creek RIVER CODE 0504004089 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.771666 LONG -82.003567 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S011

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>12</u> TOTAL NUMBER OF SUBSTRATE TYPES: (B) <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> |
|---|---|--|---|---|---|---|---|--|-----------|---|-------|--|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/19/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 35%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

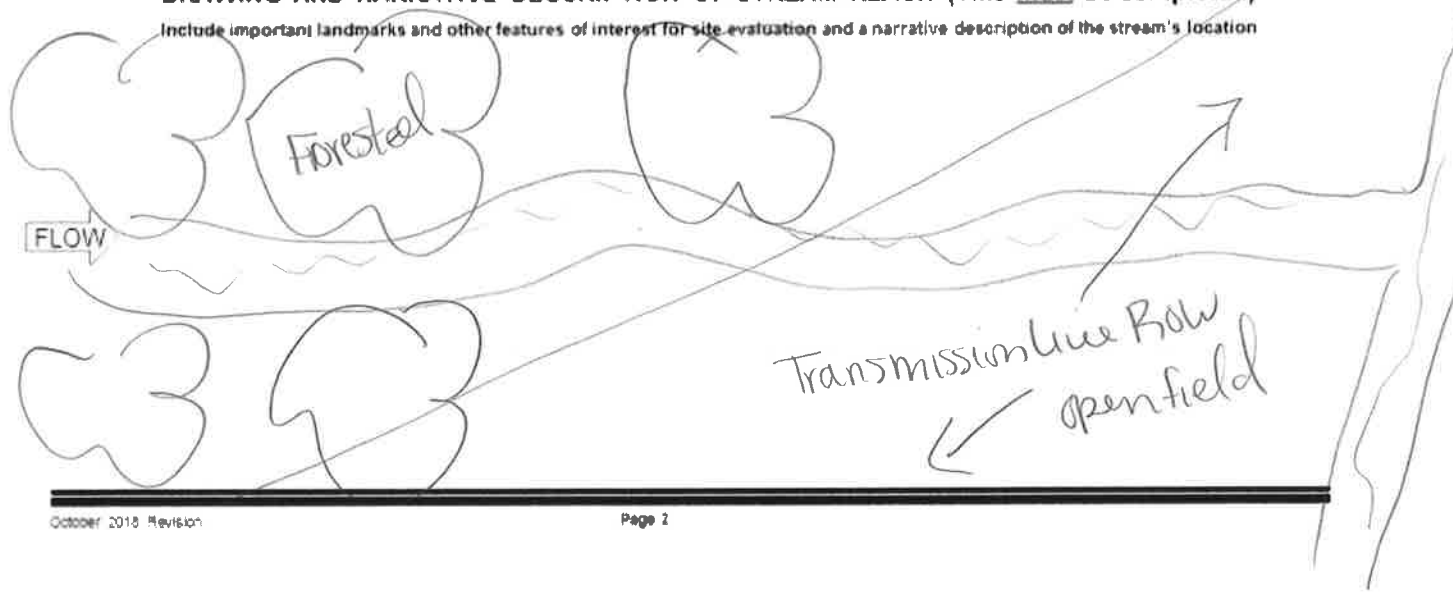
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

26

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brush Creek RIVER CODE 050400240201 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.796641 LONG -82.009718 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S012

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>40</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>15</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td>_____</td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>12</u> TOTAL NUMBER OF SUBSTRATE TYPES: (B) <u>4</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>12</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>4</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>40</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>15</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | _____ | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 <u>16</u> A + B</p> |
|---|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>40</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>15</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | _____ | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>5</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 <u>5</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 <u>5</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|--|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|---|--|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input type="checkbox"/> Moderate (2 ft/100 ft) | <input checked="" type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|---|--|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/19/20 Quantity: .50"
Photo-documentation Notes _____
Elevated Turbidity? (Y/N): N Canopy (% open): 90%
Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

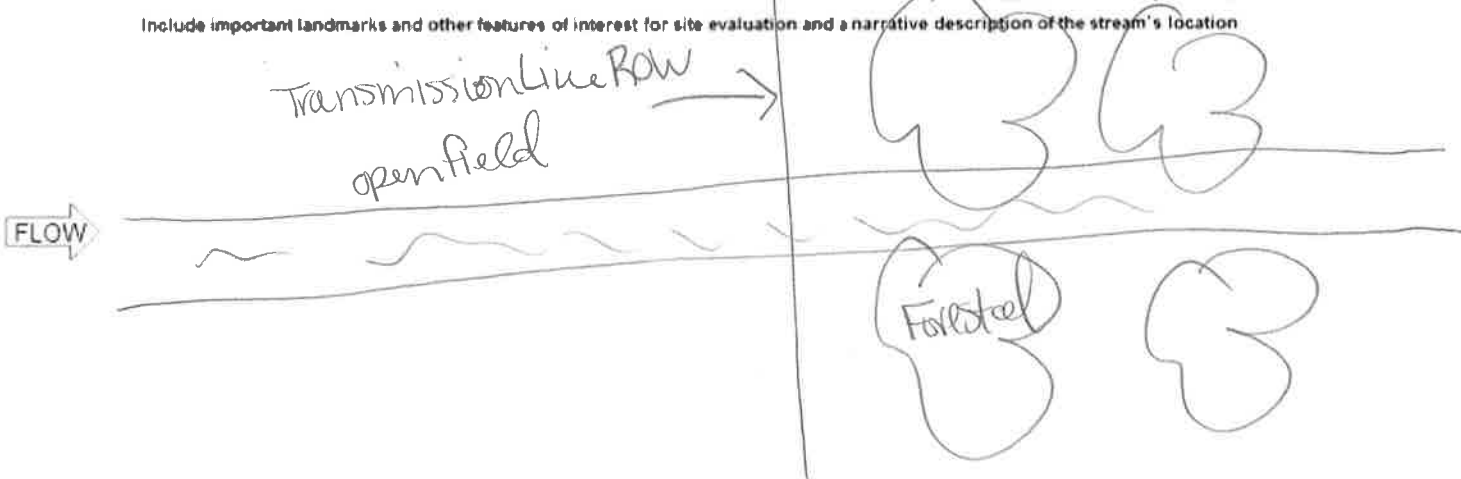
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN BrushCreek RIVER CODE 050400040801 DRAINAGE AREA (mF) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.75990 LONG -82.01063 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S013

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>10</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>20</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>10</u> (A) 9 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>10</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <p>14</p> <p>A + B</p> |
|--|---|--|---|---|---|---|---|---|-----------|---|-------|--|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|--|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>10</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>20</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>45</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|--|---|---|---|---|
| <input type="checkbox"/> Flat (< 5% slope) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2-5% slope) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (> 10% slope) |
|--|---|---|---|---|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/19/20 Quantity: .50"
Photo-documentation Notes _____
Elevated Turbidity? (Y/N) N Canopy (% open): 35%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts _____

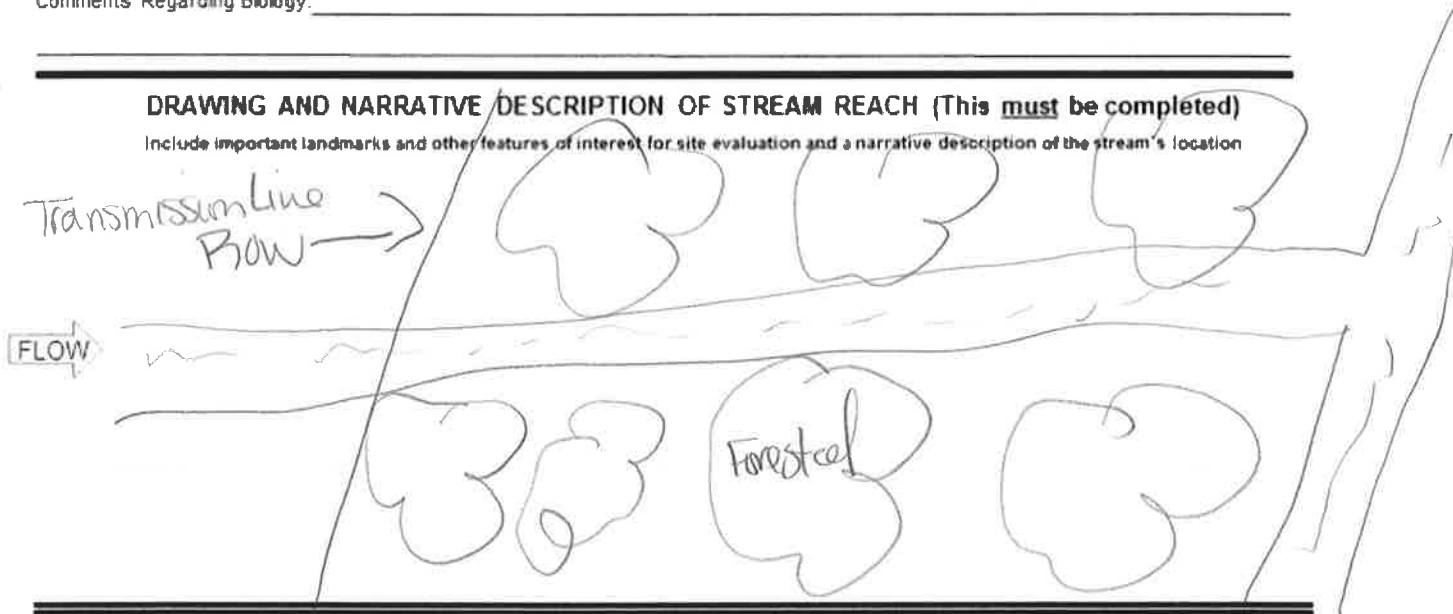
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Bush Creek RIVER CODE 0504004080 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.79977 LONG -82.01709 RIVER MILE _____
 DATE 5/19/20 SCORER KCW COMMENTS S014

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDG SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>9</u> (B) <u>5</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: (B) <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDG SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 14 A + B</p> |
|--|---|--|---|---|---|---|--|--|-----------|---|-------|--|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDG SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>4.5</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | <p>Pool Depth Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (>5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/19/20 Quantity: 1.50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open): 30%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

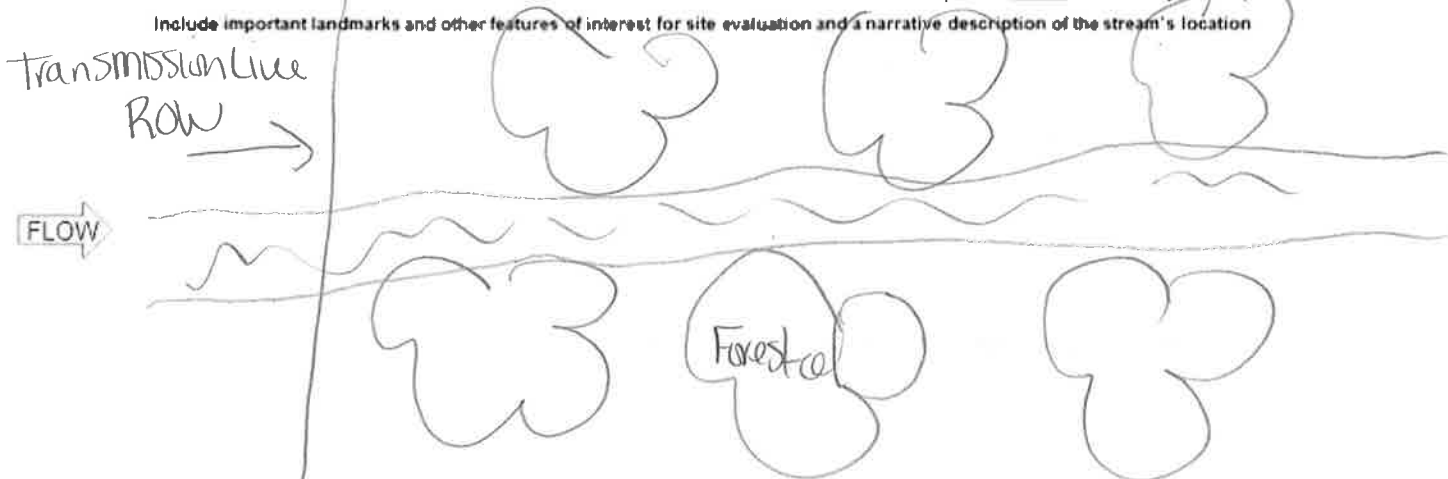
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville Phila
 SITE NUMBER _____ RIVER BASIN Bush Creek RIVER CODE 050400040821 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.794648 LONG -82.011964 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S015

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 14 A + B</p> |
|--|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|--|---|---|---|---|
| <input type="checkbox"/> Flat (0.5 to 100 ‰) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 to 100 ‰) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 to 100 ‰) |
|--|---|---|---|---|

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/19/20 Quantity: 50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open): 85%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

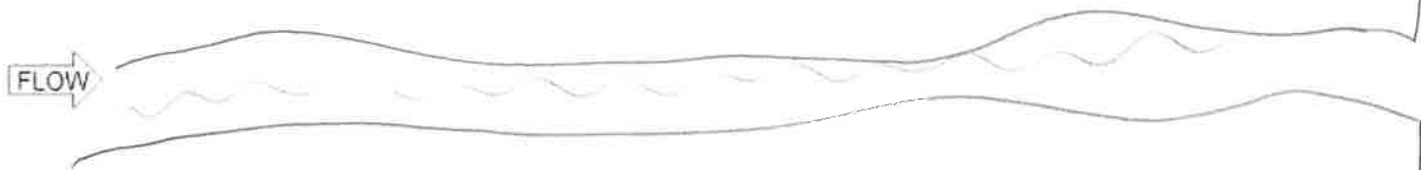
(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Transmission Line Row / open field





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

65

SITE NAME/LOCATION Crossville, Ohio
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 0504004021 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.794594 LONG -82.017384 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S016

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> SLT [3 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]</td> <td><u>15</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 15 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input type="checkbox"/> SLT [3 pt] | _____ | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>15</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | <u>10</u> | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 20 A + B</p> |
|---|---|--|---|---|--|--|---|---|-------|---|-------|--|-----------|---|-------|--|-----------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input type="checkbox"/> SLT [3 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] | <u>15</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 25</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 8'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 20</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ± 100 %) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ± 100 %) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ± 100 %) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (if Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/19/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 100%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

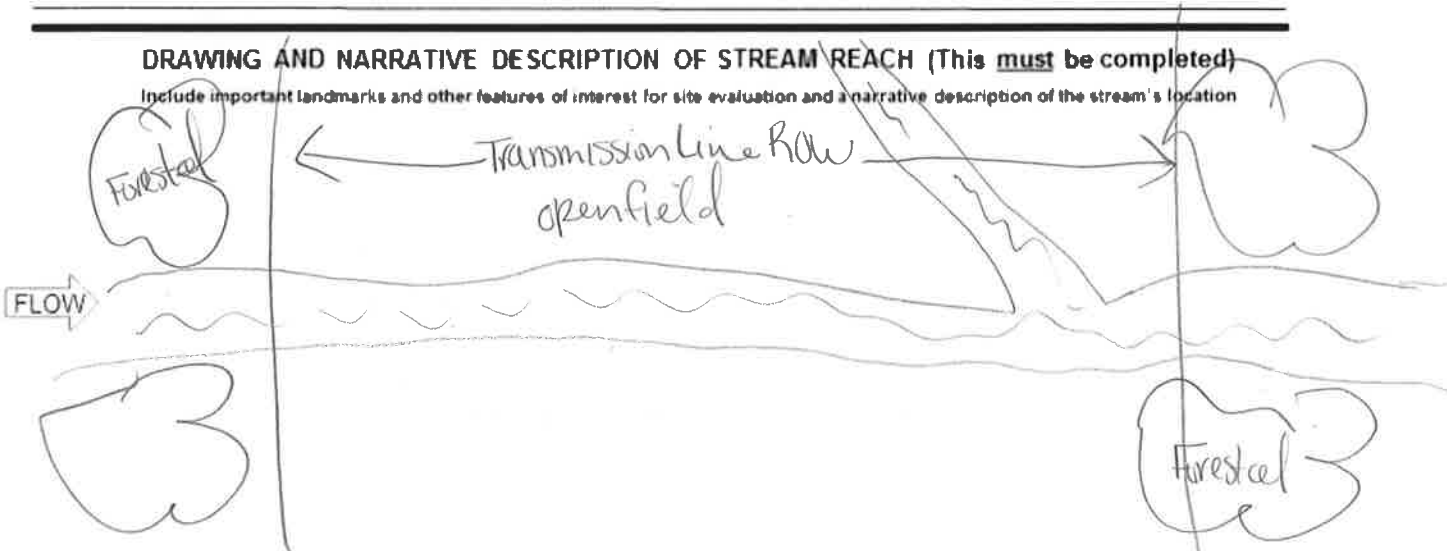
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

55

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brush Creek RIVER CODE 050400040001 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.71948 LONG -82.01631 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S017

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> SLT [3 pt]</td> <td><u>15</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 15 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input type="checkbox"/> SLT [3 pt] | <u>15</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 20 A + B</p> |
|--|---|---|---|---|--|--|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input type="checkbox"/> SLT [3 pt] | <u>15</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>6'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 20</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPIARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPIARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|---|--|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (if Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/19/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 75%
Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.): _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

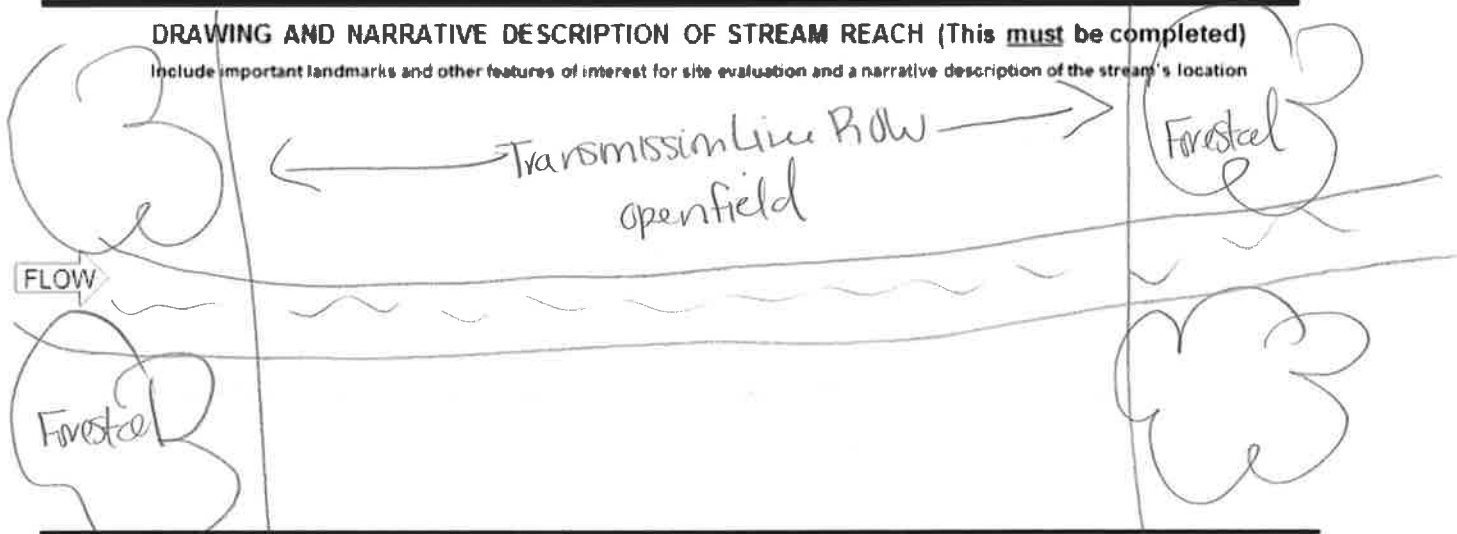
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

47

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Bush Creek RIVER CODE 050400040801 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.7186d LONG -82.01258 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S018

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|---|--|---|--|--------------------------------|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|--|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|--|---|--|---|--|---|
| <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pts]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pts] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pts] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOST CHANNEL [0 pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10</p> <p>15</p> | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOST CHANNEL [0 pts] |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pts] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOST CHANNEL [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4'</p> <p>15</p> | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max = 30</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|--------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100 ft) Flat to Moderate Moderate (2 to 100 ft) Moderate to Severe Severe (10 to 100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bushcreek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/19/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 60%
Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

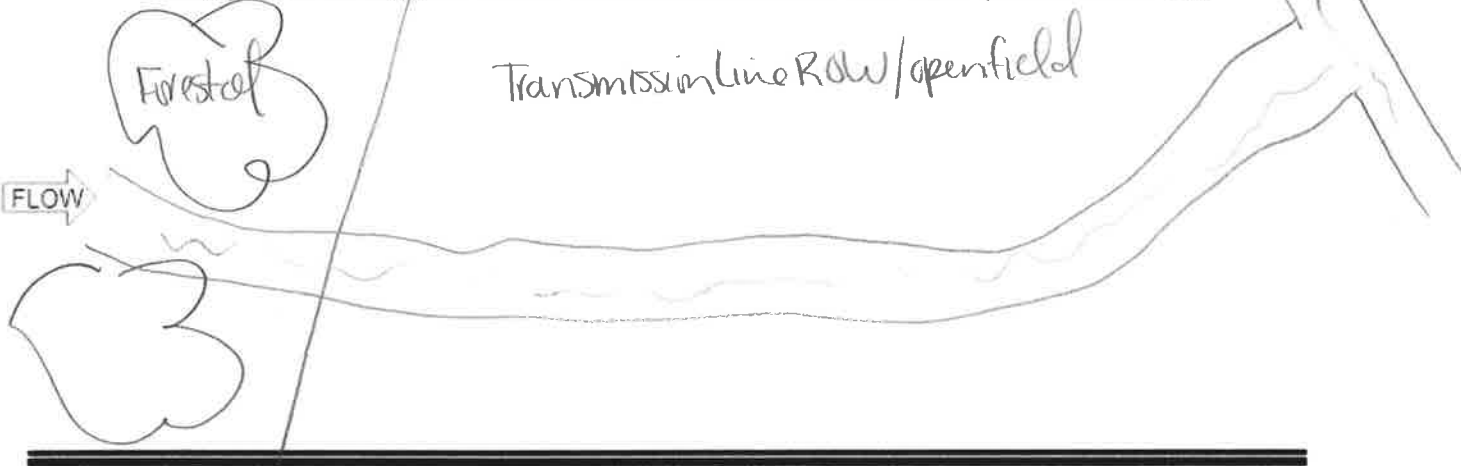
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 050400040001 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.71743 LONG -82.01802 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S019

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;">TYPE</th> <th style="width:35%;">PERCENT</th> <th style="width:15%;">TYPE</th> <th style="width:35%;">PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>12</u> (B) TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <div style="border: 1px solid black; padding: 5px; width: 40px; margin: 0 auto;">17</div> <p>A + B</p> |
|--|---|---|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>4.5</u></p> | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth</p> <p>Max = 30</p> <div style="border: 1px solid black; padding: 5px; width: 40px; margin: 0 auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>3'</u></p> | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width</p> <p>Max=30</p> <div style="border: 1px solid black; padding: 5px; width: 40px; margin: 0 auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bands per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|--|---|--|---|---|
| <input type="checkbox"/> Flat (0.5% to 0%) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2% to 10%) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10% to 100%) |
|--|---|--|---|---|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (if Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brushcreek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum CO. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/19/20 Quantity: 50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 90%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

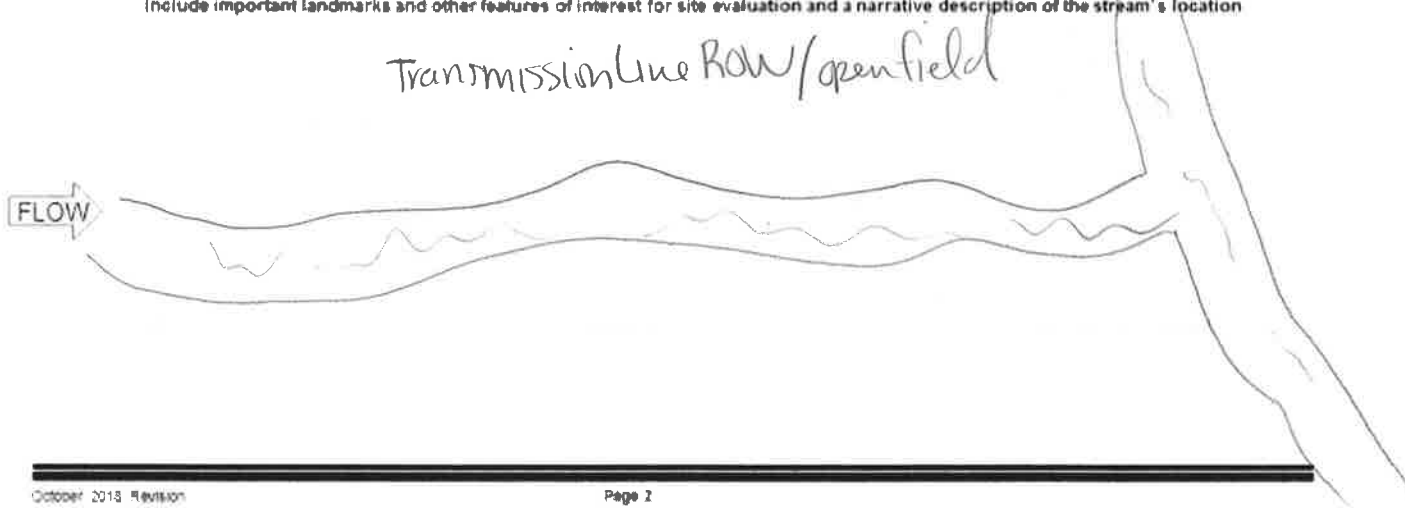
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Transmission Line ROW / open field

FLOW →





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 050400040821 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.791739 LONG -82.016027 RIVER MILE _____
 DATE 5/19/20 SCORER KLV COMMENTS S020

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|--|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|--|--|--|--|---|--|---|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5</p> | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 3'</p> | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskogee Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/19/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open) 100%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

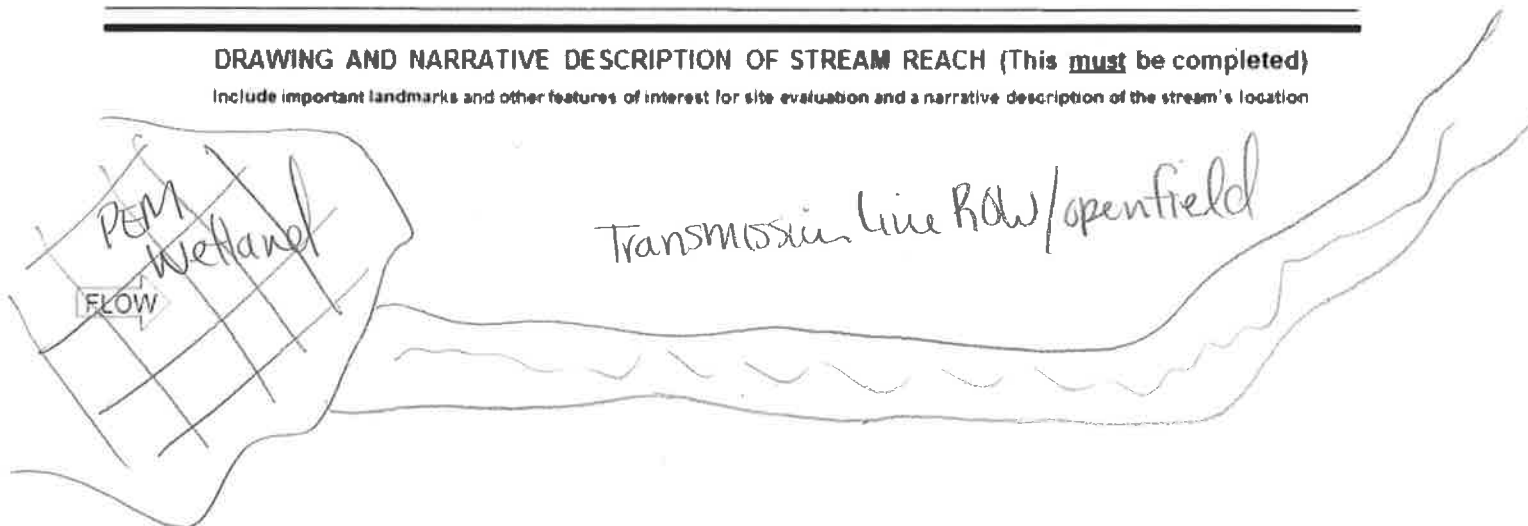
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN BrushCreek RIVER CODE 05040040301 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.787316 LONG -82.022412 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S021

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| 1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>wg</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B | | HHEI Metric Points Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 5px auto;">17</div> A + B | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|--|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): | | Pool Depth Max = 30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 5px auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <div style="border: 1px solid black; padding: 2px;">15</div></p> | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box): | | Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 5px auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <div style="border: 1px solid black; padding: 2px;">3'</div></p> | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|---|--|--|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input checked="" type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|------------------------------|---|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input checked="" type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft)
 Flat to Moderate
 Moderate (2 ft/100 ft)
 Moderate to Severe
 Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

LWWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/70 Quantity: 1.50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open): 60%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

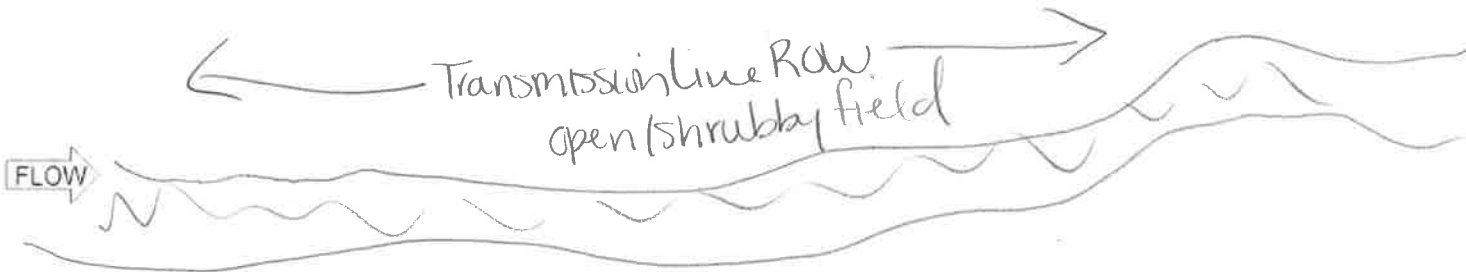
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

30

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 05040040201 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.786544 LONG -82.023718 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S022

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>30</u> (A) <u>15</u> TOTAL NUMBER OF SUBSTRATE TYPES: (B) <u>5</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>15</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>30</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40</p> <p>20</p> <p>A + B</p> |
|---|---|---|---|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|---|-----------|---|-------|---|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>30</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>5</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>2'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|---|
| <input type="checkbox"/> Stream Flowing | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> ≥3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 to 100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 to 100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 to 100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/20 Quantity: 50"
Photo-documentation Notes _____
Elevated Turbidity? (Y/N) N Canopy (% open): 90%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

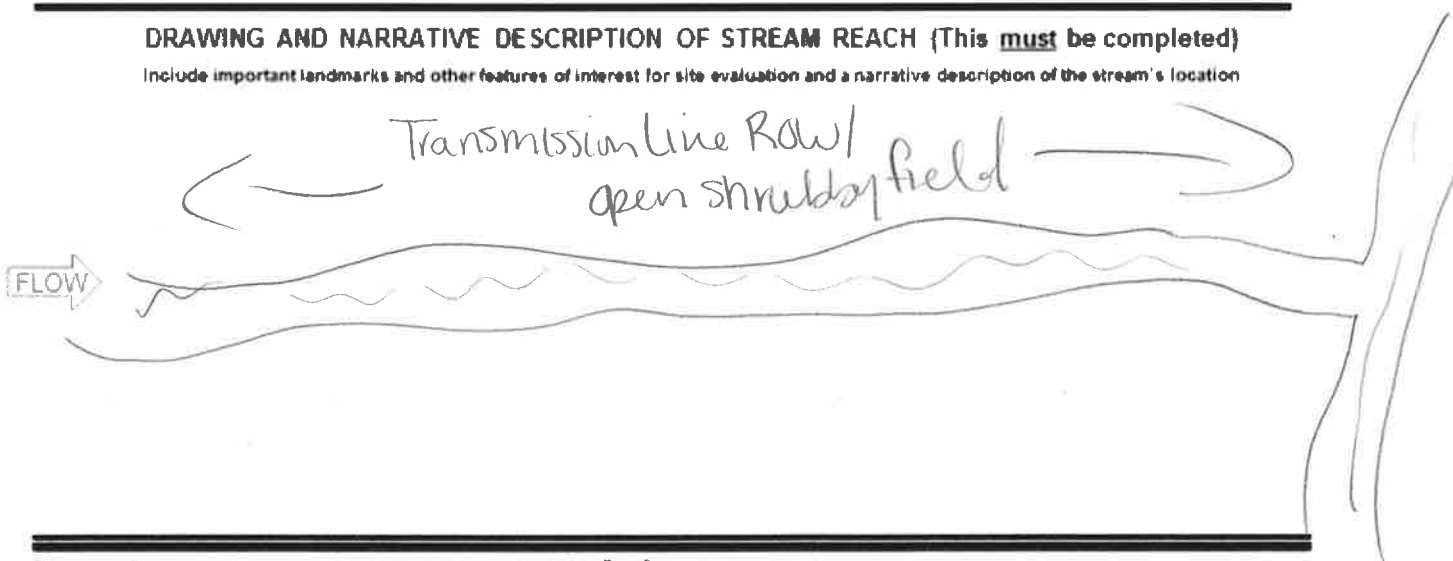
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

66

SITE NAME/LOCATION Crooksville, Ohio
 SITE NUMBER _____ RIVER BASIN Bushcreek RIVER CODE 0504004080 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.785981 LONG -82.04255 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S023

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> <tr> <td><input type="checkbox"/> BLDG SLABS [16 pts]</td> <td></td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td><u>10</u></td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td></td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>25</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td></td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td></td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td></td> </tr> <tr> <td colspan="2">Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>35</u></td> <td>(A) 15</td> <td>(B) 6</td> </tr> </table> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 15 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 6</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDG SLABS [16 pts] | | <input checked="" type="checkbox"/> SLT [3 pt] | <u>10</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | <u>10</u> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | | <input type="checkbox"/> FINE DETRITUS [3 pts] | | <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>25</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | | Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>35</u> | | (A) 15 | (B) 6 | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <p>21</p> <p>A + B</p> |
|--|---|---|---|---|--|--|--|---|-----------|---|-----------|---|-----------|---|--|--|--|---|-----------|---|--|---|-----------|---------------------------------------|--|---|-----------|---|--|--|--|---------------|--------------|--|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDG SLABS [16 pts] | | <input checked="" type="checkbox"/> SLT [3 pt] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | <u>10</u> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | | <input type="checkbox"/> FINE DETRITUS [3 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>25</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>35</u> | | (A) 15 | (B) 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | <p>Pool Depth</p> <p>Max = 30</p> <p>25</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 5</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width</p> <p>Max=30</p> <p>20</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (1 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Date of last precipitation: 5/20/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 90%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

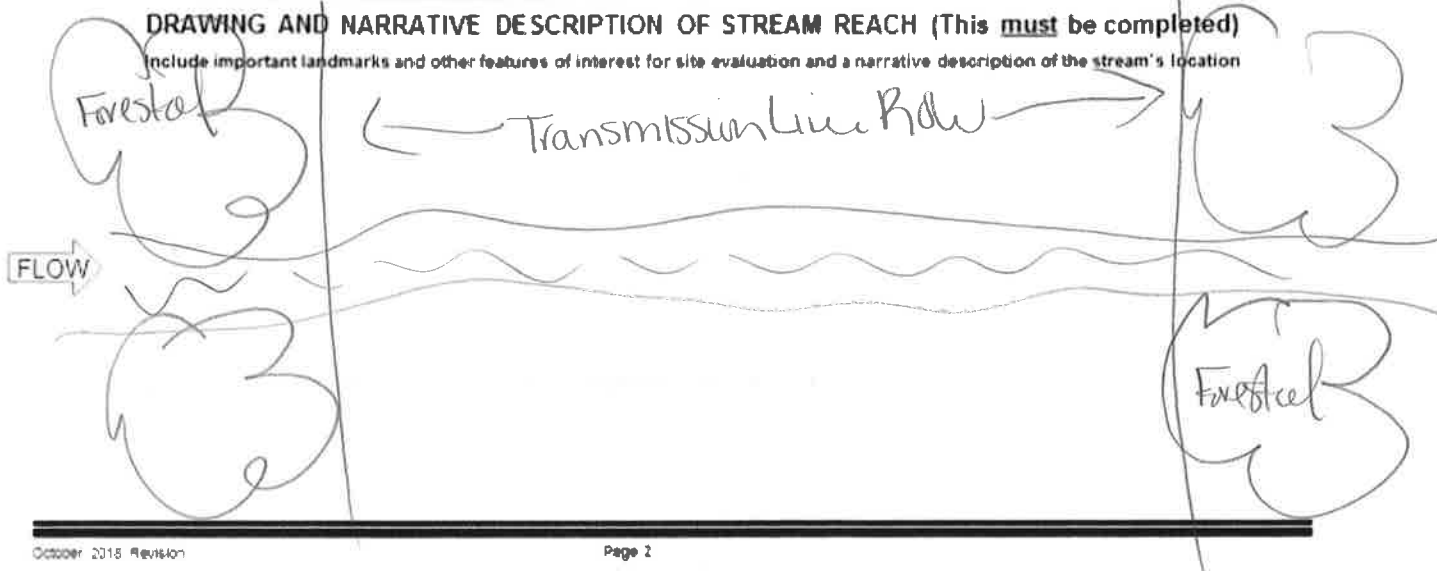
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

51

SITE NAME/LOCATION CROOKSVILLE Philo
 SITE NUMBER _____ RIVER BASIN Bushcreek RIVER CODE 050400040821 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.735899 LONG -82.024402 RIVER MILE _____
 DATE 5/19/20 SCORER KW COMMENTS S024

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40</p> <p>21</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|---|-----------|---|---------|--|--|---|-----------|---|----------|---|-----------|---|--|--|--|---|-----------|---|--|---|-----------|---------------------------------------|--|---|-----------|---|--|--|
| <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td></td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td><u>5</u></td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td></td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td></td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td></td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>10</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td></td> </tr> </tbody> </table> | TYPE | PERCENT | TYPE | | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | <u>5</u> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | | <input type="checkbox"/> FINE DETRITUS [3 pts] | | <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>30</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>10</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | | <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>35</u> (A) <u>15</u> (B) <u>6</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>15</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>6</u></p> |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | <u>5</u> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | | <input type="checkbox"/> FINE DETRITUS [3 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>30</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>10</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <p><input type="checkbox"/> > 30 centimeters [20 pts] <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</p> <p><input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts]</p> <p><input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</p> | | | | <p>Pool Depth Max = 30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <p><input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</p> <p><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</p> <p><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</p> | | | | <p>Bankfull Width Max=30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>4'</u></p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing Moist Channel, isolated pools, no flow (intermittent)

Subsurface flow with isolated pools (interstitial) Dry channel, no water (ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None 1.0 2.0 3.0

0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE

Flat 0.5 to 100 ‰ Flat to Moderate Moderate 10 to 100 ‰ Moderate to Severe Severe 10 to 100 ‰

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

LWWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open): 90%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

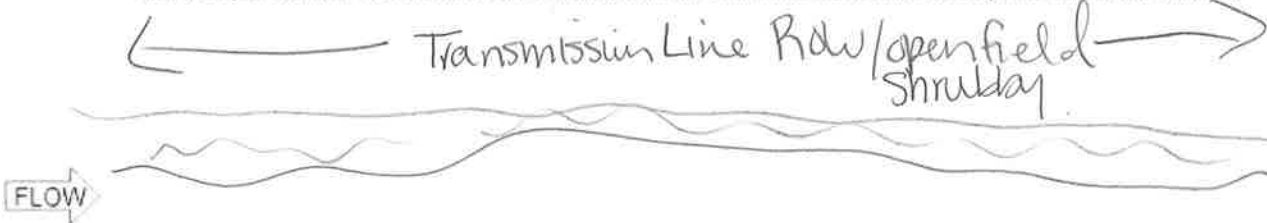
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

62

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 05041414001 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.782017 LONG -82.02967 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S025

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|---|-----------|---|---------|--|-------|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> | TYPE | PERCENT | TYPE | | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <p><input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts]</p> <p><input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5pts]</p> <p><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</p> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>20</u></p> | | | | <p>Pool Depth Max = 30</p> <p>25</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <p><input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</p> <p><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</p> <p><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</p> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>6'</u></p> | | | | <p>Bankfull Width Max=30</p> <p>20</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|--------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing Moist Channel, isolated pools, no flow (intermittent)

Subsurface flow with isolated pools (interstitial) Dry channel, no water (ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None 1.0 2.0 3.0

0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE

Flat (0.5 m/100 ft) Flat to Moderate Moderate (2 m/100 ft) Moderate to Severe Severe (10 m/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/20/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

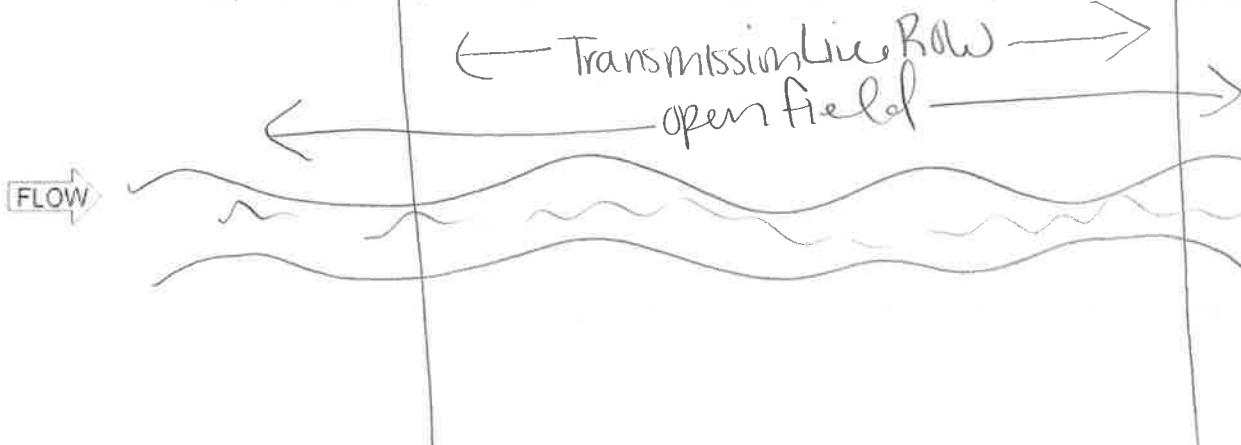
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

37

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 05400240801 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.781057 LONG -82.031356 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S026

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 2 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 2 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> |
|---|---|---|---|---|---|---|--|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|---|--|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|---|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> 0.5 | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> None | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat 0.5-1.00% Flat to Moderate Moderate 1.0-100% Moderate to Severe Severe 10-1000%

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/20 Quantity: .50"
Photo-documentation Notes: _____
Elevated Turbidity? (Y/N) N Canopy (% open): 90%
Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____
Additional comments/description of pollution impacts: _____

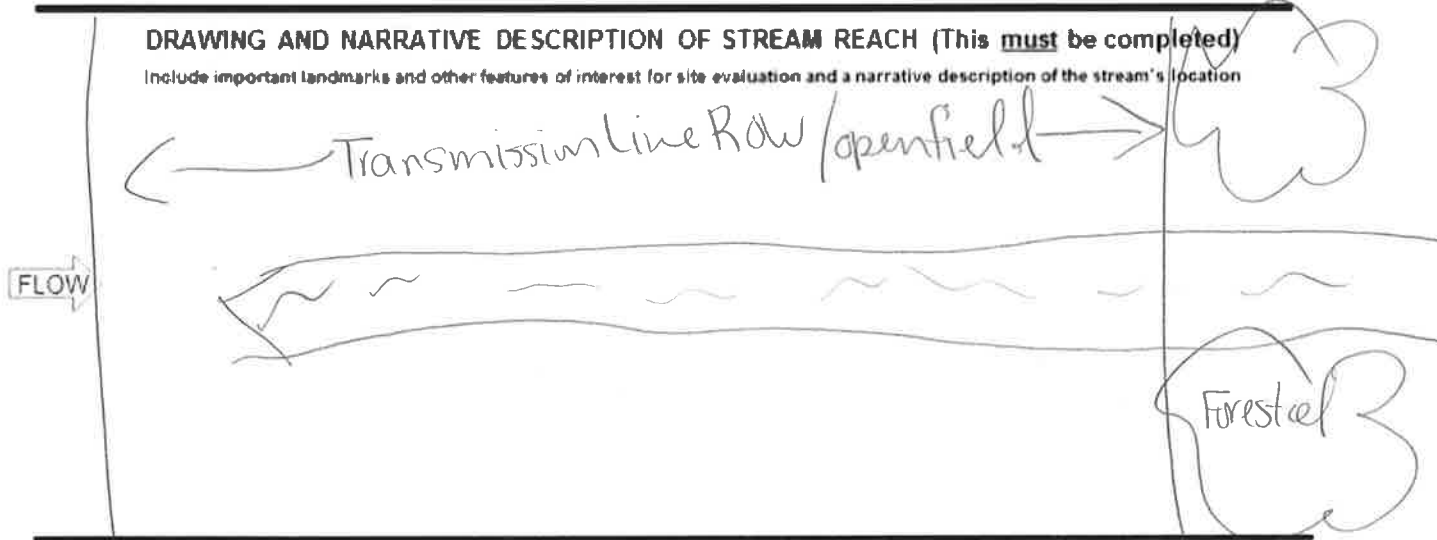
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
Salamanders Observed? (Y/N) N Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Ohio Primary Headwater Habitat Field Evaluation Form
HHEI Score (sum of metrics 1+2+3) 27

SITE NAME/LOCATION Crossville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 05040040001 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.77996 LONG 82.029809 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S027

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">TYPE</th> <th style="width: 35%;">PERCENT</th> <th style="width: 15%;">TYPE</th> <th style="width: 35%;">PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>32</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5</p> | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>32</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; font-size: 24px;">17</div> <p>A + B</p> |
|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>32</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5</p> | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; font-size: 24px;">5</div> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 3'</p> | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <div style="border: 1px solid black; width: 40px; height: 40px; margin: 0 auto; display: flex; align-items: center; justify-content: center; font-size: 24px;">5</div> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream•

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5% to 1%) Flat to Moderate Moderate (2% to 5%) Moderate to Severe Severe (10% to 100%)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Bush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA, CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/20 Quantity: 50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 60%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

59

SITE NAME/LOCATION Cracksville Philo
 SITE NUMBER _____ RIVER BASIN Bushcreek RIVER CODE 050400040801 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.79485 LONG -82.039486 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S028

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>20</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>40</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>9</u> (B) <u>5</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>20</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input checked="" type="checkbox"/> Sand (<2 mm) [6 pts] | <u>40</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 <u>14</u> A + B</p> |
|--|---|---|---|---|--|--|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>20</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Sand (<2 mm) [6 pts] | <u>40</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>20</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 <u>25</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>9'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 <u>20</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5% to 0%) Flat to Moderate Moderate (0.5% to 1%) Moderate to Severe Severe (1.0% to 2%)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/20/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 25%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

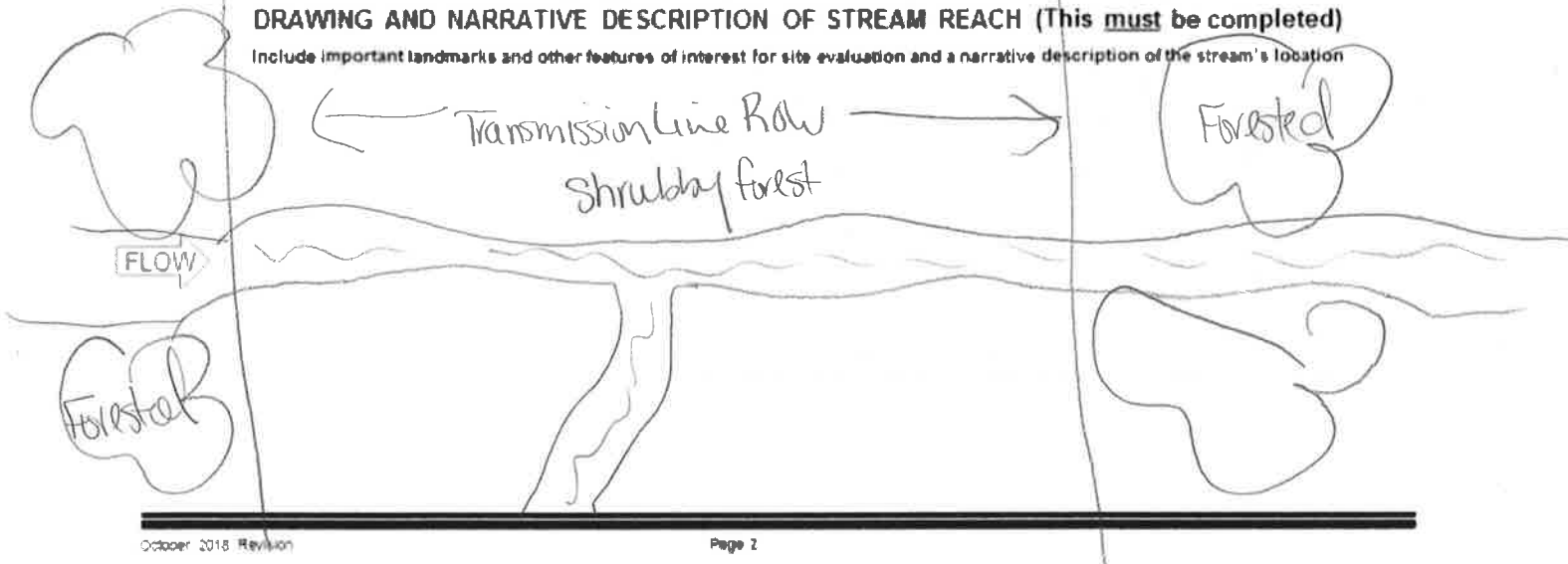
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 050400040301 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.779047 LONG -82.033575 RIVER MILE _____
 DATE 2/20/20 SCORER KLV COMMENTS S029

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> <tr> <td colspan="2">Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></td> <td>(A) <u>9</u></td> <td>(B) <u>5</u></td> </tr> </tbody> </table> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> | | (A) <u>9</u> | (B) <u>5</u> | <p>HHEI Metric Points Substrate Max = 40</p> <p>14 A + B</p> |
|--|---|---|---|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|--|--|--------------|--------------|--|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> | | (A) <u>9</u> | (B) <u>5</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>15</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPIARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPIARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wide >10m | | Mature Forest, Wetland | | Conservation Tillage | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Moderate 5-10m | | Immature Forest, Shrub or Old Field | | Urban or Industrial | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Narrow <5m | | Residential, Park, New Field | | Open Pasture, Row Crop | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| None | | Fenced Pasture | | Mining or Construction | |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100 ft) Flat to Moderate Moderate (2 to 100 ft) Moderate to Severe Severe (10 to 100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: _____ Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/20/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 75%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location

Transmission Line Row (open field/shrubby)

FLOW →



Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crossville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 054100408A DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.75280 LONG -82.038031 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S030

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 14 A + B</p> |
|--|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>15</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> ≥3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 to 100%) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 to 100%) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 to 100%) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

DWH Name: _____ Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/20/20 Quantity: .50"

Photo-documentation Notes

Elevated Turbidity? (Y/N): N Canopy (% open): 80%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

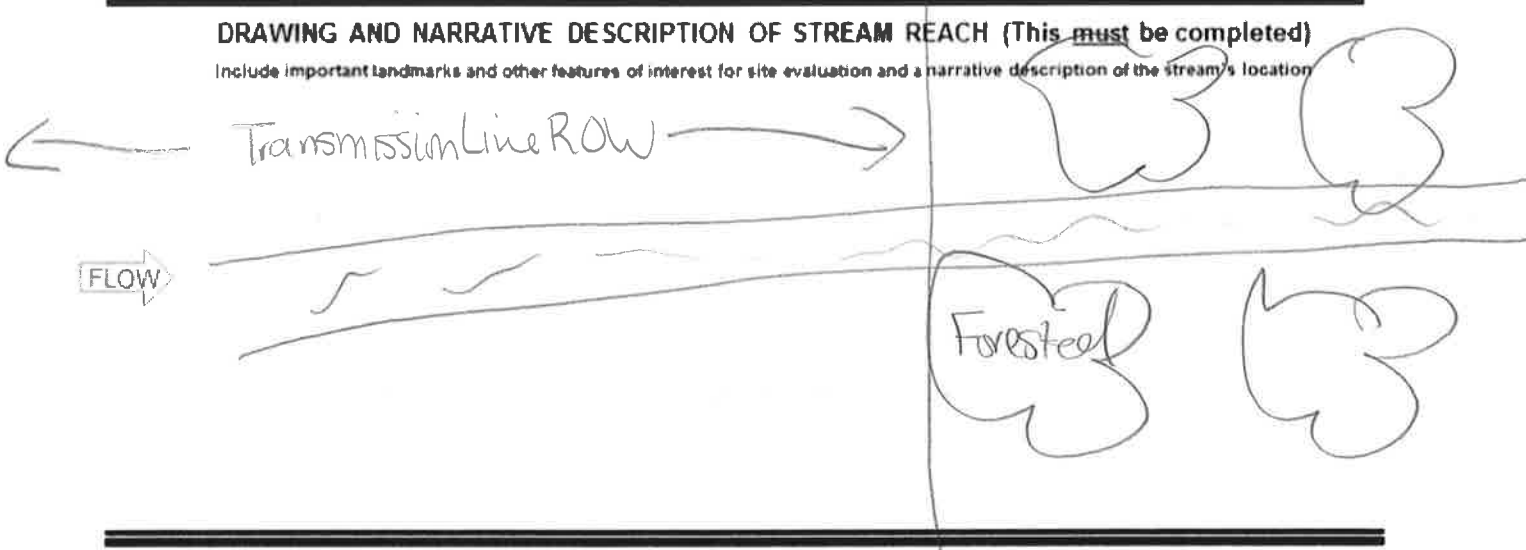
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville, Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 06400040321 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.75578 LONG -82.035826 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S031

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDG SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDG SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 14 A + B</p> |
|---|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDG SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>49</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream•

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|---|--|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|--|---|--|---|---|
| <input type="checkbox"/> Flat (< 5% slope) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2-10% slope) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (> 10% slope) |
|--|---|--|---|---|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Date of last precipitation: 5/20/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 40%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

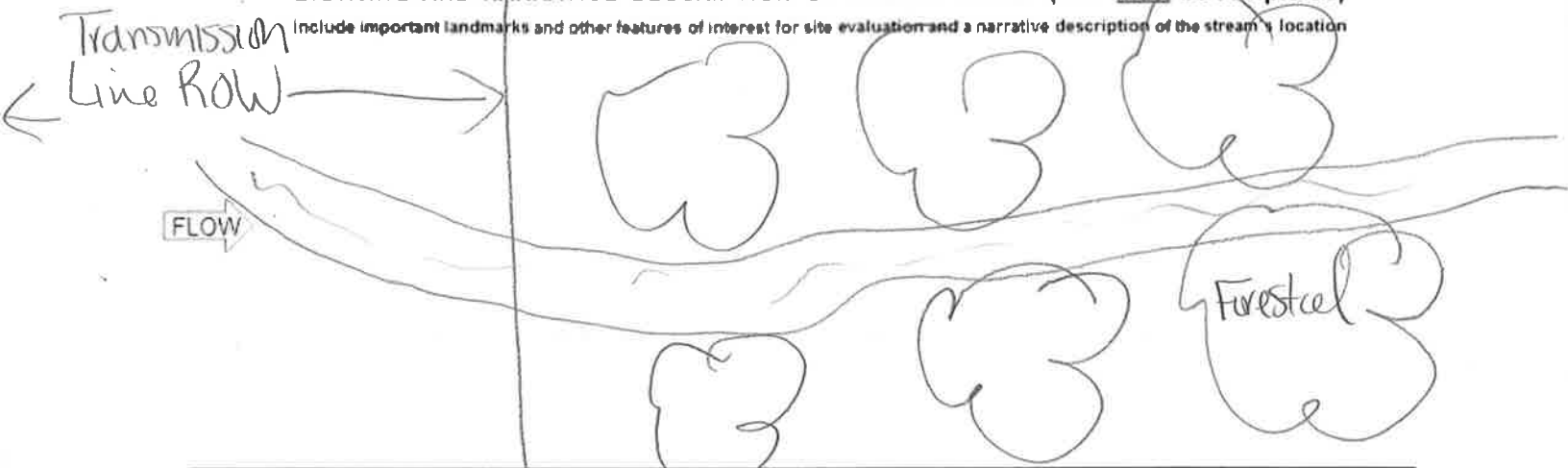
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Ohio Primary Headwater Habitat Field Evaluation Form
HHEI Score (sum of metrics 1+2+3) **24**

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN Brushcreek RIVER CODE 050400040821 DRAINAGE AREA (mf) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.77548 LONG -82.03885 RIVER MILE _____
 DATE 5/20/20 SCORER KLV COMMENTS S032

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>9</u> (B) <u>5</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <p>14</p> <p>A + B</p> |
|--|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>15</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|---|---|---|
| <input type="checkbox"/> Flat (>5% to 100%) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2% to 100%) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10% to 100%) |
|---|---|---|---|---|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

LWWH Name: Brush Creek Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/20/20 Quantity: .50"
Photo-documentation Notes _____
Elevated Turbidity? (Y/N) N Canopy (% open): 50%
Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

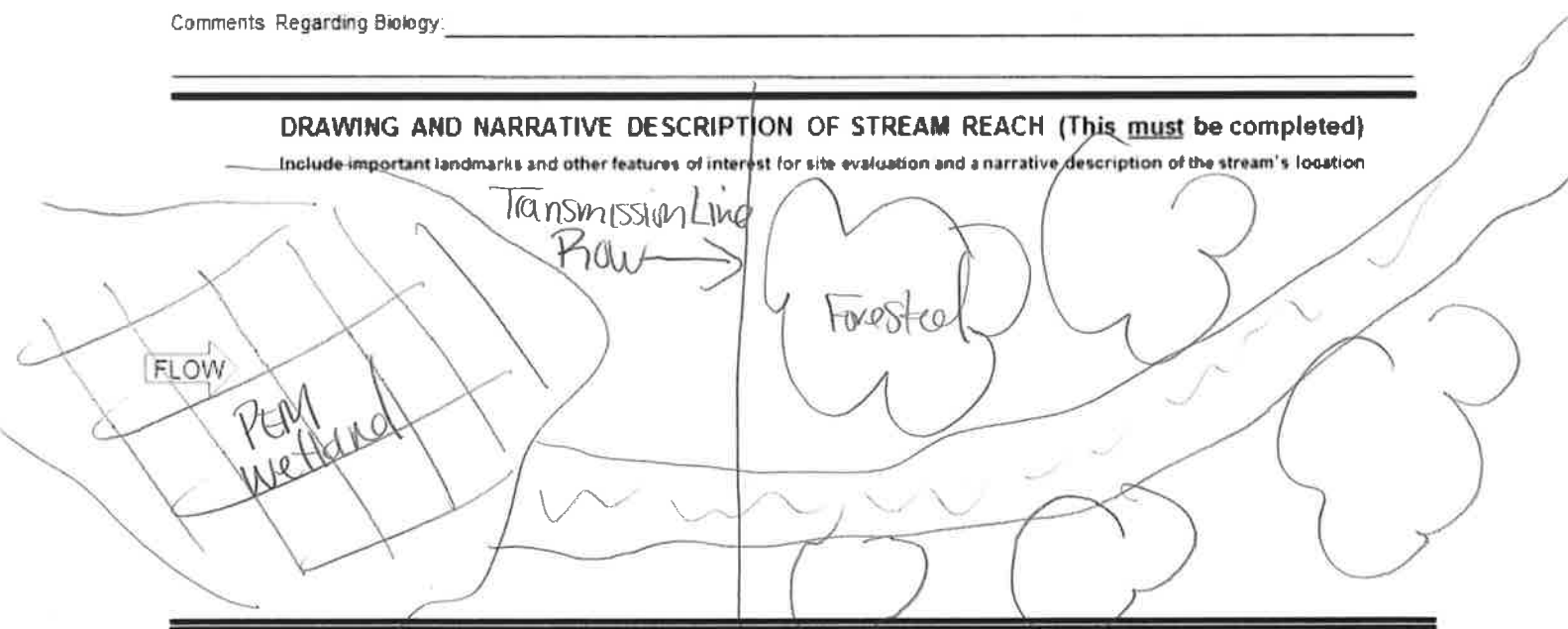
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) _____ Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) _____ Species observed (if known): _____
Salamanders Observed? (Y/N) _____ Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) _____ Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crooksville, Philo
 SITE NUMBER _____ RIVER BASIN 050400040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.77340 LONG -82.041984 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S033

NOTE: Complete ALL Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>9</u> (B) <u>5</u></p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 <u>14</u> A + B</p> |
|--|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>5</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 <u>5</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 <u>5</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream *

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|--------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.0-100%) Flat to Moderate Moderate (1-100%) Moderate to Severe Severe (10-100%)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Elk Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA, CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Muskingum Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N) N Canopy (% open): 30%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

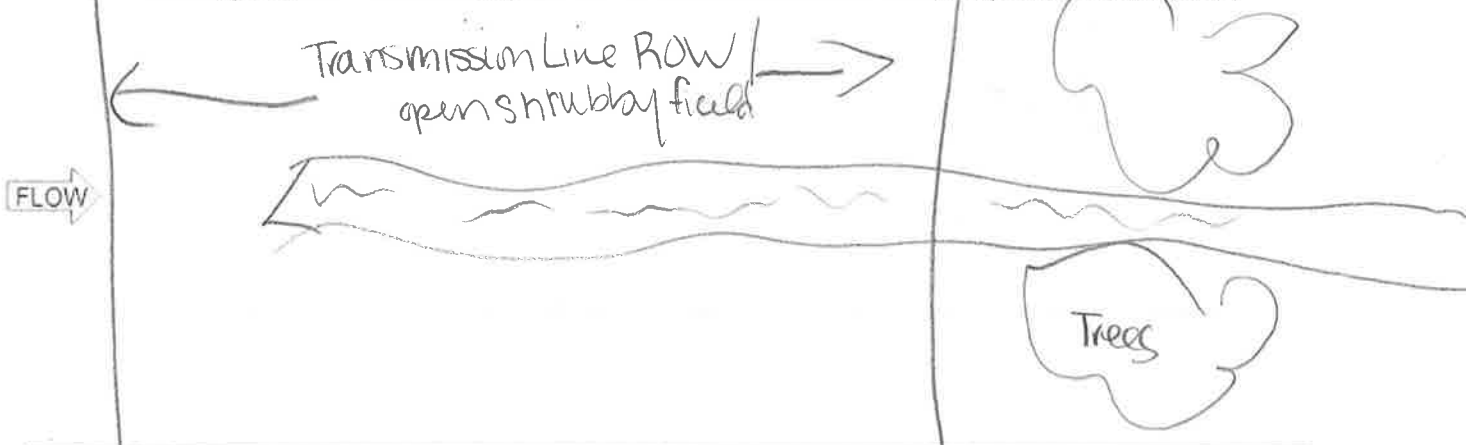
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

491

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN _____ RIVER CODE 050410040523 DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.767746 LONG -82.050716 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S036

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) <u>9</u> TOTAL NUMBER OF SUBSTRATE TYPES: (B) <u>5</u></p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input checked="" type="checkbox"/> Sand (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | <p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <p><u>14</u></p> <p>A + B</p> |
|---|---|---|---|---|--|--|--|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Sand (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box).</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | <p>Pool Depth Max = 30</p> <p><u>15</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>5</u></p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p><u>20</u></p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input checked="" type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100%) Flat to Moderate Moderate (2 to 100%) Moderate to Severe Severe (10 to 100%)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Arkrun Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N) N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

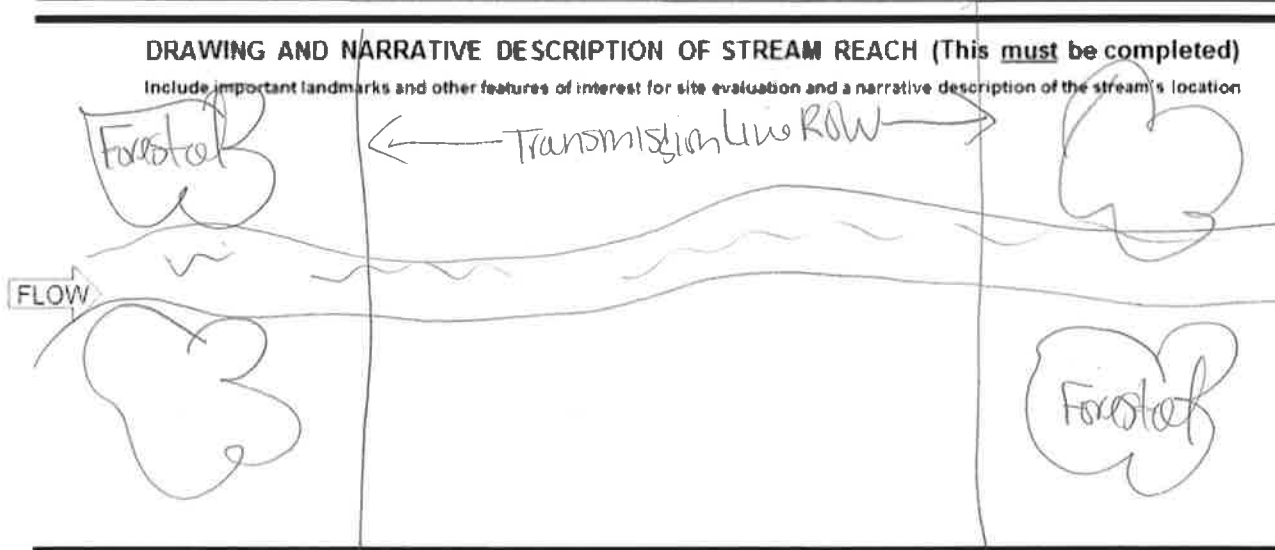
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 050400040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.76912 LONG -82.050503 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S034

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> |
|--|---|---|---|---|---|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|--|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100%) Flat to Moderate Moderate (2 to 100%) Moderate to Severe Severe (10 to 100%)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: TKRm Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N): Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N): N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N): N Species observed (if known): _____

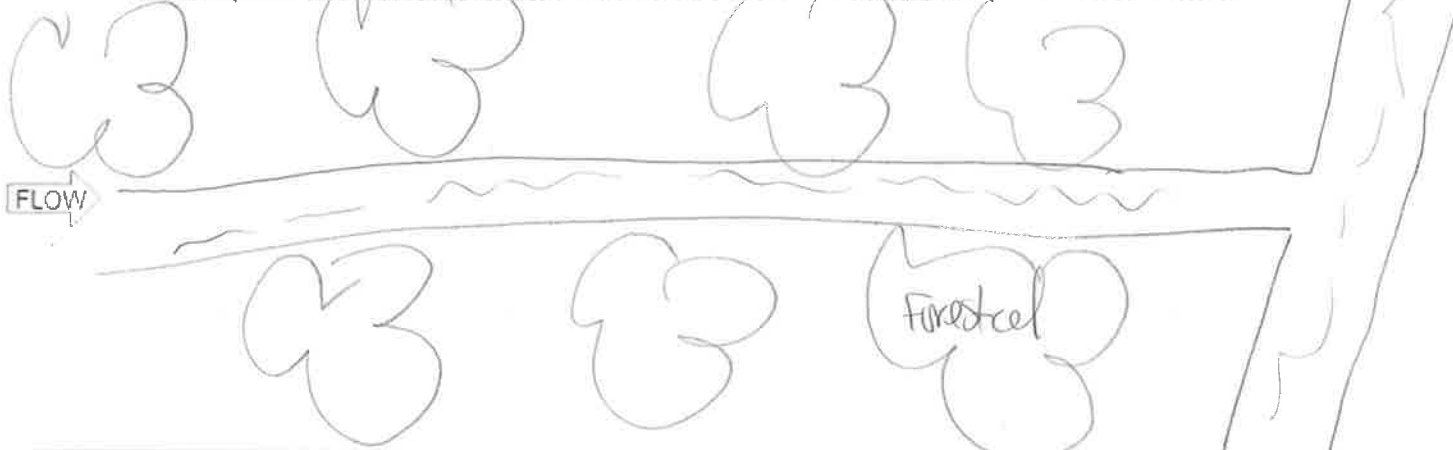
Salamanders Observed? (Y/N): N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N): N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crookside Philo
 SITE NUMBER _____ RIVER BASIN 050400040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT. 39.767946 LONG. -82.051026 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S035

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|--------------|---|---|---|---|---|---|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|--|--|--|
| <table border="0"> <tr><th>TYPE</th><th>PERCENT</th><th>TYPE</th><th>PERCENT</th></tr> <tr><td><input type="checkbox"/> BLDR SLABS [16 pts]</td><td>_____</td><td><input checked="" type="checkbox"/> SLT [3 pt]</td><td><u>30</u></td></tr> <tr><td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td><td>_____</td><td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td><td><u>10</u></td></tr> <tr><td><input type="checkbox"/> BEDROCK [16 pts]</td><td>_____</td><td><input type="checkbox"/> FINE DETRITUS [3 pts]</td><td>_____</td></tr> <tr><td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td><td><u>15</u></td><td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td><td><u>30</u></td><td><input type="checkbox"/> MUCK [0 pts]</td><td>_____</td></tr> <tr><td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td><td><u>15</u></td><td><input type="checkbox"/> ARTIFICIAL [3 pts]</td><td>_____</td></tr> </table> | TYPE | PERCENT | TYPE | | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> | | (A) 12 | (B) 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr><td><input type="checkbox"/> > 30 centimeters [20 pts]</td><td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td></tr> <tr><td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td><td><input checked="" type="checkbox"/> < 5 cm [5pts]</td></tr> <tr><td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td><td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td></tr> </table> | | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>45</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tr><td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td><td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td></tr> <tr><td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td><td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td></tr> <tr><td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td><td></td></tr> </table> | | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPIARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream

| RIPIARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|---|------------------------------|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input checked="" type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100) Flat to Moderate Moderate (10 to 100) Moderate to Severe Severe (10 to 100)

ADDITIONAL STREAM INFORMATION (This information must also be completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: AK Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 90%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

52

SITE NAME/LOCATION CROOKSVILLE Philo
 SITE NUMBER _____ RIVER BASIN 052400040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.767301 LONG -82.051802 RIVER MILE _____
 DATE 5/21/20 SCORER KLW COMMENTS S037

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pts]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 12 (B) 5</p> <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | TYPE | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pts] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> |
|--|---|---|---|---|--|--|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|---|
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pts] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): 5</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 20</p> | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 to 100%) Flat to Moderate Moderate (2 to 100%) Moderate to Severe Severe (10 to 100%)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: AKRUM Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

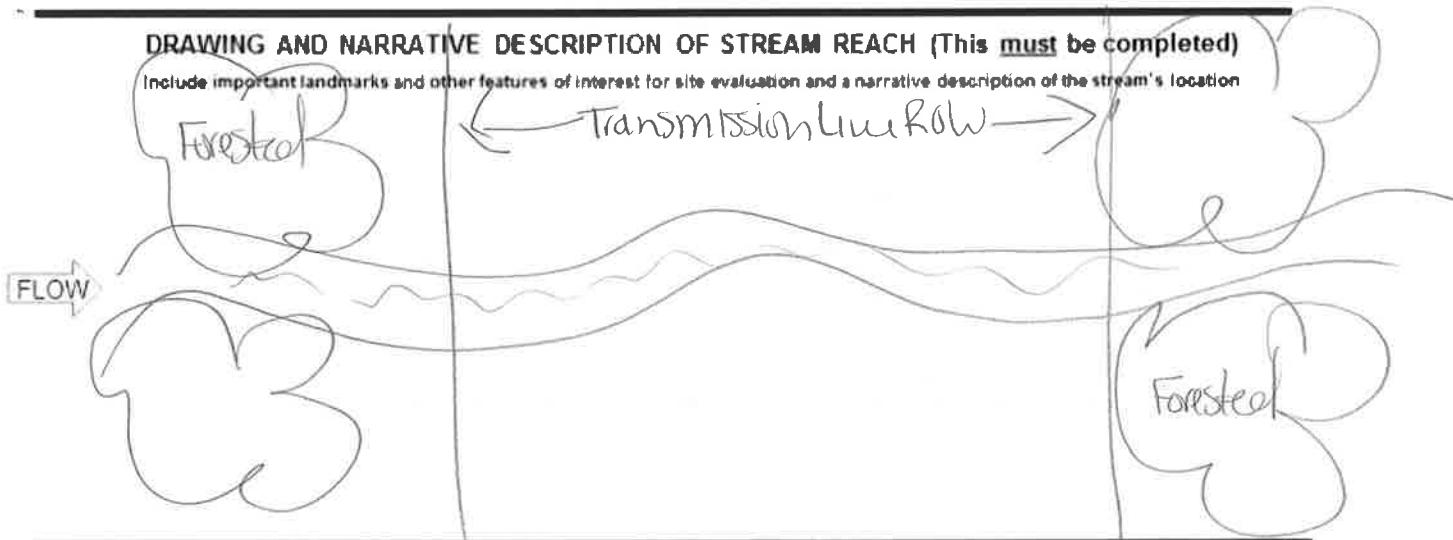
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

34

SITE NAME/LOCATION Crooksville Philb
 SITE NUMBER _____ RIVER BASIN 050400040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.767134 LONG -82.057259 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S038

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>14</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|---|--|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>50</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>50</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>50</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|--------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5% to 1%) Flat to Moderate Moderate (2% to 10%) Moderate to Severe Severe (10% to 100%)

ADDITIONAL STREAM INFORMATION (This information must also be completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: EIK Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/21/20 Quantity: 1.50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N) N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

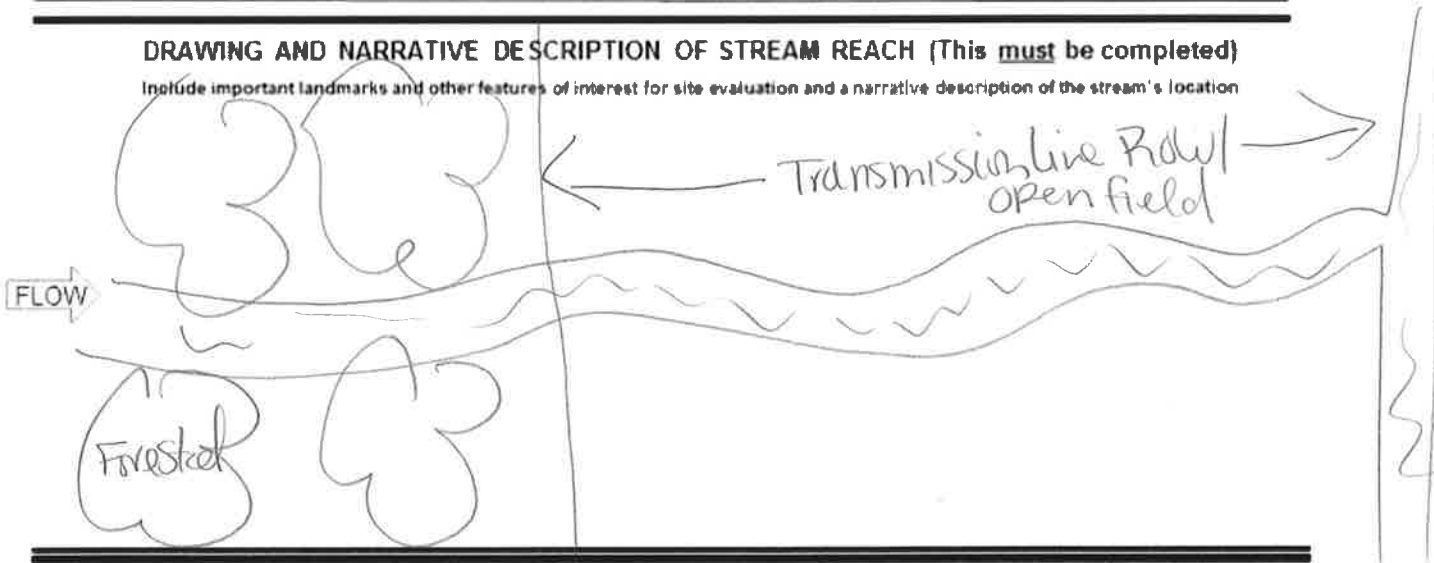
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

49

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 05040040501 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.765191 LONG -82.057894 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S040

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40 14 A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|--|--|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> | | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> | | <p>Bankfull Width Max=30 20</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| | | | |
|---|-------------------------------------|--|-------------------------------------|
| <p>RIPARIAN WIDTH (Per Bank)</p> | | <p>FLOODPLAIN QUALITY (Most Predominant per Bank)</p> | |
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score 1 (if Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
 County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"
 Photo-documentation Notes: _____
 Elevated Turbidity? (Y/N) N Canopy (% open): 70%
 Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____
 Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
 Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

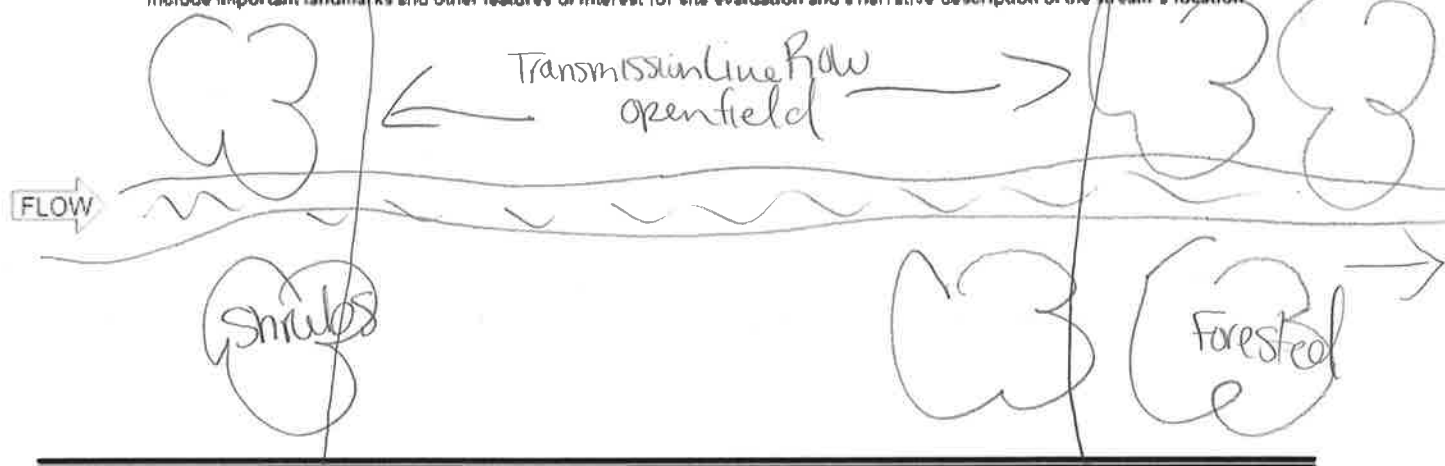
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____
 Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____
 Salamanders Observed? (Y/N) N Species observed (if known): _____
 Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____
 Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location.





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION Crookside Phlo
 SITE NUMBER _____ RIVER BASIN 05240040501 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.768318 LONG 82.057817 RIVER MILE _____
 DATE 5/21/20 SCORER KLW COMMENTS S039

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>14</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>32</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 9 (B) 5</p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>32</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>32</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>15</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 5</p> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'</p> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|--------------------------|--------------------------|--|-------------------------------------|-------------------------------------|-----------|--------------------------|--------------------------|----------------|--------------------------|--------------------------|------------|--------------------------|--------------------------|------|--|--|---|---|---|---|--------------------------|--------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <p>RIPARIAN WIDTH (Per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Wide >10m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Moderate 5-10m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Narrow <5m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>None</td> </tr> </table> | | L | R | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> | None | <p>FLOODPLAIN QUALITY (Most Predominant per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td>L</td> <td>R</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> | | L | R | L | R | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | R | L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|---|------------------------------|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input checked="" type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|---|---|--|---|--|
| <input type="checkbox"/> Flat (0.5 ft/100 ft) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (2 ft/100 ft) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (10 ft/100 ft) |
|---|---|--|---|--|

ADDITIONAL STREAM INFORMATION (This information must also be completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dryden Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 70%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

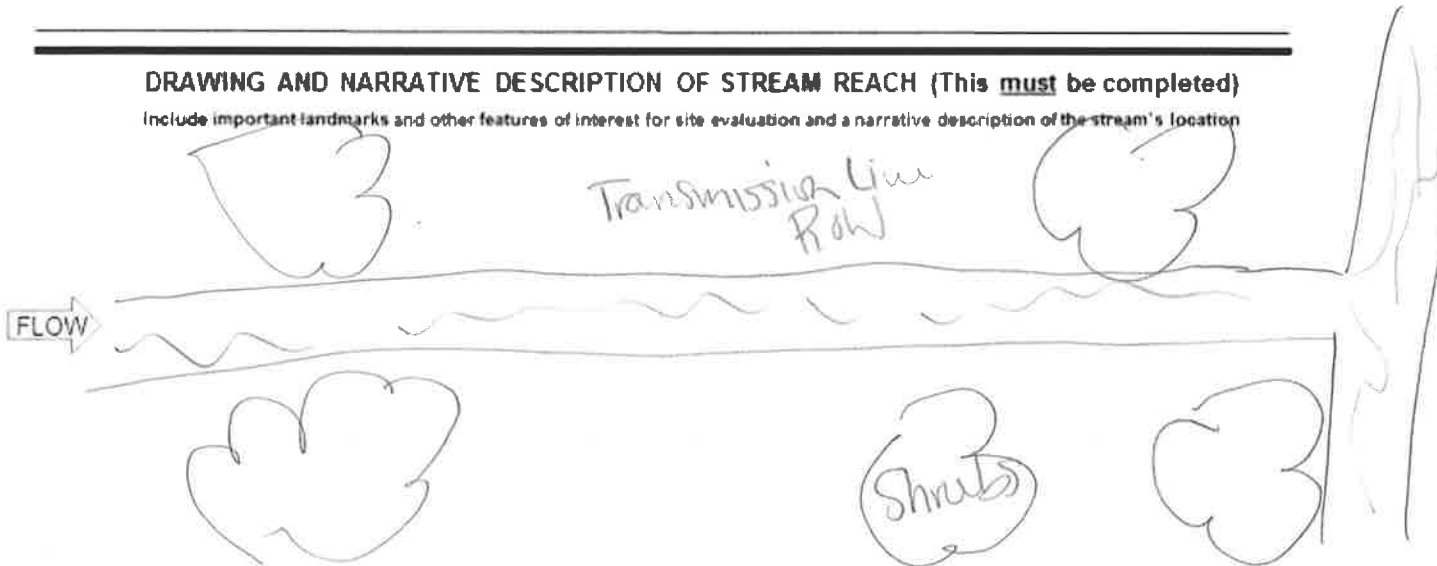
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

30

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 0540040501 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.76432 LONG -82.062092 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S041

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWHH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|-------------------------------------|--|---|--------------------------|-------------------------------|----------------------------|--|--------------------------|--|-------------------------------------|---------------------------|--------------------------|--|-----------------------------|----------------------------------|-----------|-------------------------------------|--------------------------|---------|-----------|-------------------------------------|----------------------|---------|-----------|--|--------------------------|------------|---------|-----------|--------------------------|--------------------------------|---------|-----------|--------------------------|-----------------------|---------|-------|--------------------------|------------------------|---------|-------|--------------------------|--------------|---------|-------|--------------------------|--------------------|---------|-------|---|
| 1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B | | | | HHEI Metric Points Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">20</div> A + B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr><td><input type="checkbox"/></td><td>BLDR SLABS [16 pts]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>BOULDER (>256 mm) [16 pts]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>BEDROCK [16 pts]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>COBBLE (65-256 mm) [12 pts]</td><td>PERCENT</td><td><u>15</u></td></tr> <tr><td><input checked="" type="checkbox"/></td><td>GRAVEL (2-64 mm) [9 pts]</td><td>PERCENT</td><td><u>30</u></td></tr> <tr><td><input checked="" type="checkbox"/></td><td>SAND (<2 mm) [6 pts]</td><td>PERCENT</td><td><u>30</u></td></tr> </table> | <input type="checkbox"/> | BLDR SLABS [16 pts] | PERCENT | | _____ | <input type="checkbox"/> | BOULDER (>256 mm) [16 pts] | PERCENT | _____ | <input type="checkbox"/> | BEDROCK [16 pts] | PERCENT | _____ | <input type="checkbox"/> | COBBLE (65-256 mm) [12 pts] | PERCENT | <u>15</u> | <input checked="" type="checkbox"/> | GRAVEL (2-64 mm) [9 pts] | PERCENT | <u>30</u> | <input checked="" type="checkbox"/> | SAND (<2 mm) [6 pts] | PERCENT | <u>30</u> | <table border="0"> <tr><td><input type="checkbox"/></td><td>SLT [3 pt]</td><td>PERCENT</td><td><u>15</u></td></tr> <tr><td><input type="checkbox"/></td><td>LEAF PACK/WOODY DEBRIS [3 pts]</td><td>PERCENT</td><td><u>10</u></td></tr> <tr><td><input type="checkbox"/></td><td>FINE DETRITUS [3 pts]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>CLAY or HARDPAN [0 pt]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>MUCK [0 pts]</td><td>PERCENT</td><td>_____</td></tr> <tr><td><input type="checkbox"/></td><td>ARTIFICIAL [3 pts]</td><td>PERCENT</td><td>_____</td></tr> </table> | <input type="checkbox"/> | SLT [3 pt] | PERCENT | <u>15</u> | <input type="checkbox"/> | LEAF PACK/WOODY DEBRIS [3 pts] | PERCENT | <u>10</u> | <input type="checkbox"/> | FINE DETRITUS [3 pts] | PERCENT | _____ | <input type="checkbox"/> | CLAY or HARDPAN [0 pt] | PERCENT | _____ | <input type="checkbox"/> | MUCK [0 pts] | PERCENT | _____ | <input type="checkbox"/> | ARTIFICIAL [3 pts] | PERCENT | _____ | Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u> (A) 15 (B) 5 |
| <input type="checkbox"/> | BLDR SLABS [16 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | BOULDER (>256 mm) [16 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | BEDROCK [16 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | COBBLE (65-256 mm) [12 pts] | PERCENT | <u>15</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | GRAVEL (2-64 mm) [9 pts] | PERCENT | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | SAND (<2 mm) [6 pts] | PERCENT | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | SLT [3 pt] | PERCENT | <u>15</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | LEAF PACK/WOODY DEBRIS [3 pts] | PERCENT | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | FINE DETRITUS [3 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | CLAY or HARDPAN [0 pt] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | MUCK [0 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | ARTIFICIAL [3 pts] | PERCENT | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box): | | | | Pool Depth Max = 30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr><td><input type="checkbox"/></td><td>> 30 centimeters [20 pts]</td><td><input type="checkbox"/></td><td>5 cm - 10 cm [15 pts]</td></tr> <tr><td><input type="checkbox"/></td><td>> 22.5 - 30 cm [30 pts]</td><td><input checked="" type="checkbox"/></td><td>< 5 cm [5pts]</td></tr> <tr><td><input type="checkbox"/></td><td>> 10 - 22.5 cm [25 pts]</td><td><input type="checkbox"/></td><td>NO WATER OR MOIST CHANNEL [0pts]</td></tr> </table> | | | | | <input type="checkbox"/> | > 30 centimeters [20 pts] | <input type="checkbox"/> | 5 cm - 10 cm [15 pts] | <input type="checkbox"/> | > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> | < 5 cm [5pts] | <input type="checkbox"/> | > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> | NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 30 centimeters [20 pts] | <input type="checkbox"/> | 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> | < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> | NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box): | | | | Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr><td><input type="checkbox"/></td><td>> 4.0 meters (> 13') [30 pts]</td><td><input type="checkbox"/></td><td>> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td></tr> <tr><td><input type="checkbox"/></td><td>> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td><td><input checked="" type="checkbox"/></td><td>≤ 1.0 m (≤ 3' 3") [5 pts]</td></tr> <tr><td><input type="checkbox"/></td><td>> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td><td></td><td></td></tr> </table> | | | | | <input type="checkbox"/> | > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> | > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> | > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> | ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> | > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> | > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> | ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3' | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| | | | |
|-------------------------------------|-------------------------------------|---|-------------------------------------|
| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | | | |
|-------------------------------------|--|--------------------------|---|
| <input checked="" type="checkbox"/> | Stream Flowing | <input type="checkbox"/> | Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> | Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> | Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | | | | | |
|--------------------------|------|-------------------------------------|-----|--------------------------|-----|--------------------------|-----|
| <input type="checkbox"/> | None | <input checked="" type="checkbox"/> | 1.0 | <input type="checkbox"/> | 2.0 | <input type="checkbox"/> | 3.0 |
| <input type="checkbox"/> | 0.5 | <input type="checkbox"/> | 1.5 | <input type="checkbox"/> | 2.5 | <input type="checkbox"/> | >3 |

STREAM GRADIENT ESTIMATE

| | | | | | | | | | |
|--------------------------|--------------------|--------------------------|------------------|-------------------------------------|----------------------|--------------------------|--------------------|--------------------------|---------------------|
| <input type="checkbox"/> | Flat (0.5 @100 ft) | <input type="checkbox"/> | Flat to Moderate | <input checked="" type="checkbox"/> | Moderate (2 @100 ft) | <input type="checkbox"/> | Moderate to Severe | <input type="checkbox"/> | Severe (10 @100 ft) |
|--------------------------|--------------------|--------------------------|------------------|-------------------------------------|----------------------|--------------------------|--------------------|--------------------------|---------------------|

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Hi. Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: 50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 70%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

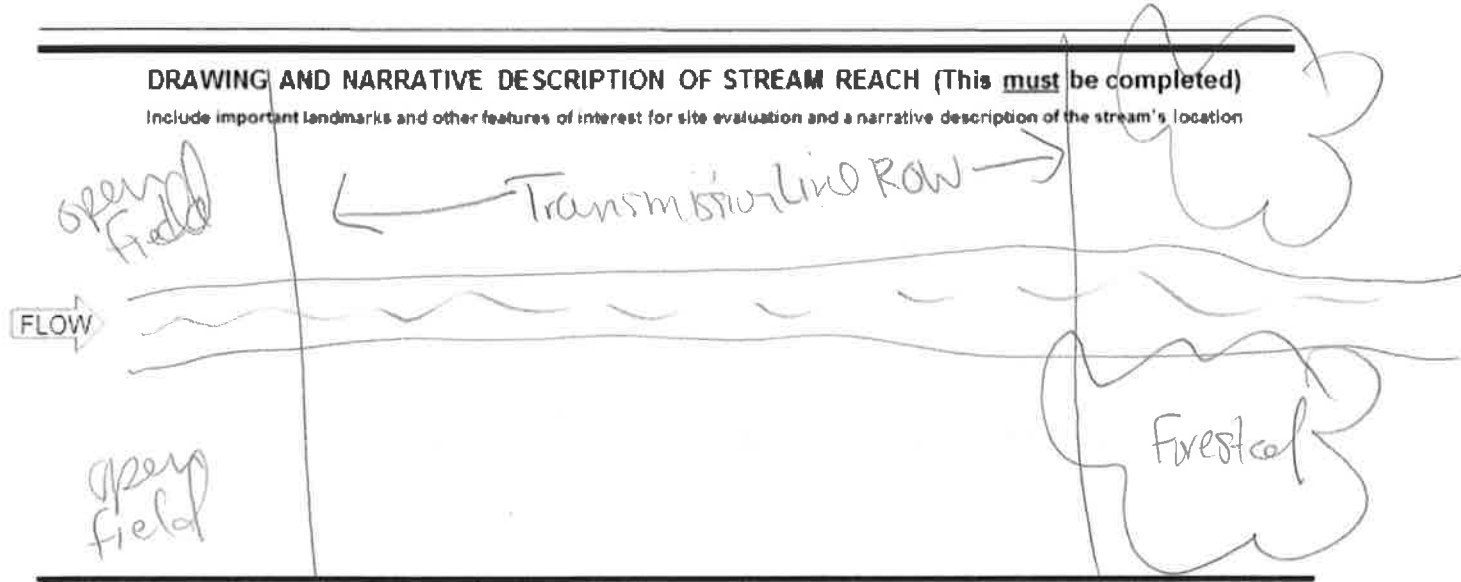
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

34

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 0540040501 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.761403 LONG -92.0759168 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S042

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40</p> <p>14</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|---|-----------|---|---------|---|-------|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|---|-----------|---------------------------------------|-------|--|-----------|---|-------|---|
| <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pts]</td> <td><u>32</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>13</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | PERCENT | TYPE | | PERCENT | <input checked="" type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pts] | <u>32</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>13</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | <p>(A) 9</p> <p>(B) 5</p> |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pts] | <u>32</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>13</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | <u>30</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <p><input type="checkbox"/> > 30 centimeters [20 pts] <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</p> <p><input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts]</p> <p><input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</p> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 10</p> | | | | <p>Pool Depth Max = 30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <p><input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</p> <p><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</p> <p><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</p> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 3'</p> | | | | <p>Bankfull Width Max=30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | | | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|--------------------------|--------------------------|
| L | R | L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing Moist Channel, isolated pools, no flow (intermittent)

Subsurface flow with isolated pools (interstitial) Dry channel, no water (ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None 1.0 2.0 3.0

0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE

Flat 0.5 to 100 Flat to Moderate Moderate 12 to 100 Moderate to Severe Severe 10 to 100

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed)

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

DWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: W. Morgan Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

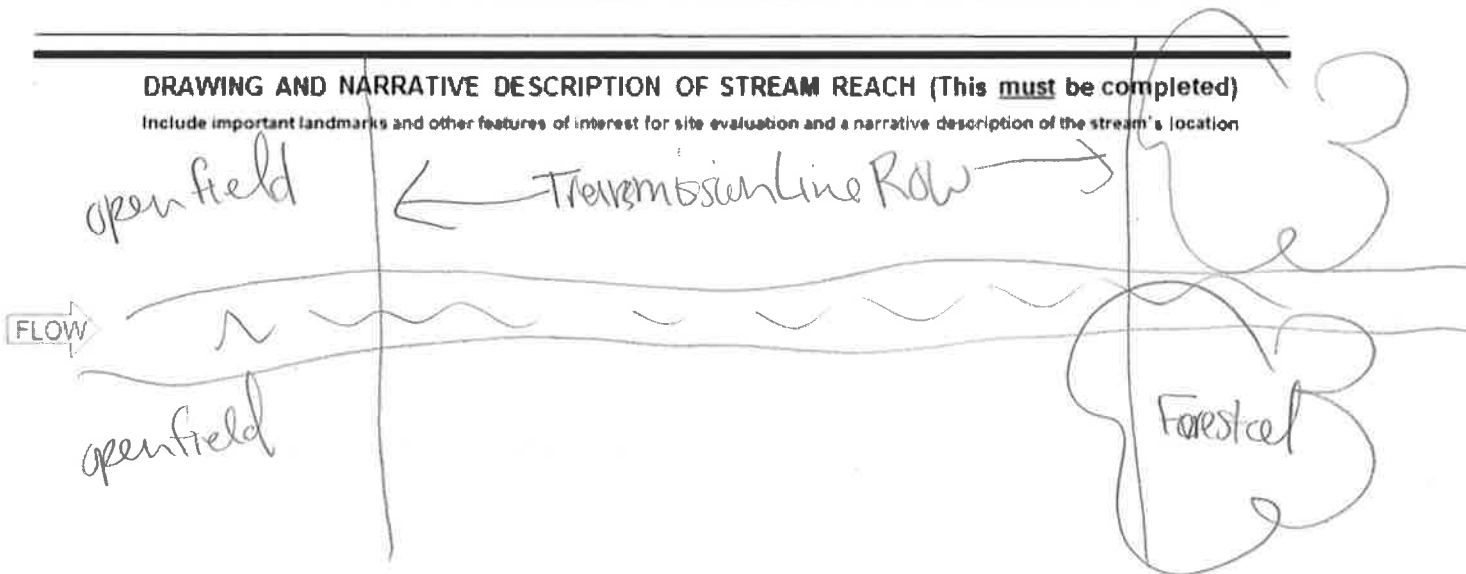
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

37

SITE NAME/LOCATION Crossville Philo
 SITE NUMBER _____ RIVER BASIN 0540004050 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.76461 LONG -82.079039 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S043

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|---|--|---|---|--|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>5</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 4'</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--|--------------------------|--------------------------|----------------|--------------------------|--------------------------|------------|--------------------------|--------------------------|------|--|--|---|---|------------------------|--------------------------|--------------------------|----------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|---------------------|--------------------------|--------------------------|------------------------------|--------------------------|--------------------------|------------------------|--------------------------|--------------------------|----------------|--------------------------|--------------------------|------------------------|
| <p>RIPARIAN WIDTH (Per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td>Wide >10m</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Moderate 5-10m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Narrow <5m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>None</td> </tr> </table> | | L | R | Wide >10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> | None | <p>FLOODPLAIN QUALITY (Most Predominant per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td>Mature Forest, Wetland</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Conservation Tillage</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Immature Forest, Shrub or Old Field</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Urban or Industrial</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Residential, Park, New Field</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Open Pasture, Row Crop</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Fenced Pasture</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Mining or Construction</td> </tr> </table> | | L | R | Mature Forest, Wetland | <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field | <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial | <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field | <input type="checkbox"/> | <input type="checkbox"/> | Open Pasture, Row Crop | <input type="checkbox"/> | <input type="checkbox"/> | Fenced Pasture | <input type="checkbox"/> | <input type="checkbox"/> | Mining or Construction |
| L | R | Wide >10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | R | Mature Forest, Wetland | <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field | <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field | <input type="checkbox"/> | <input type="checkbox"/> | Open Pasture, Row Crop | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Fenced Pasture | <input type="checkbox"/> | <input type="checkbox"/> | Mining or Construction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (>5 ±100 %) Flat to Moderate Moderate (2 ±100 %) Moderate to Severe Severe (10 ±100 %)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: W Perry Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

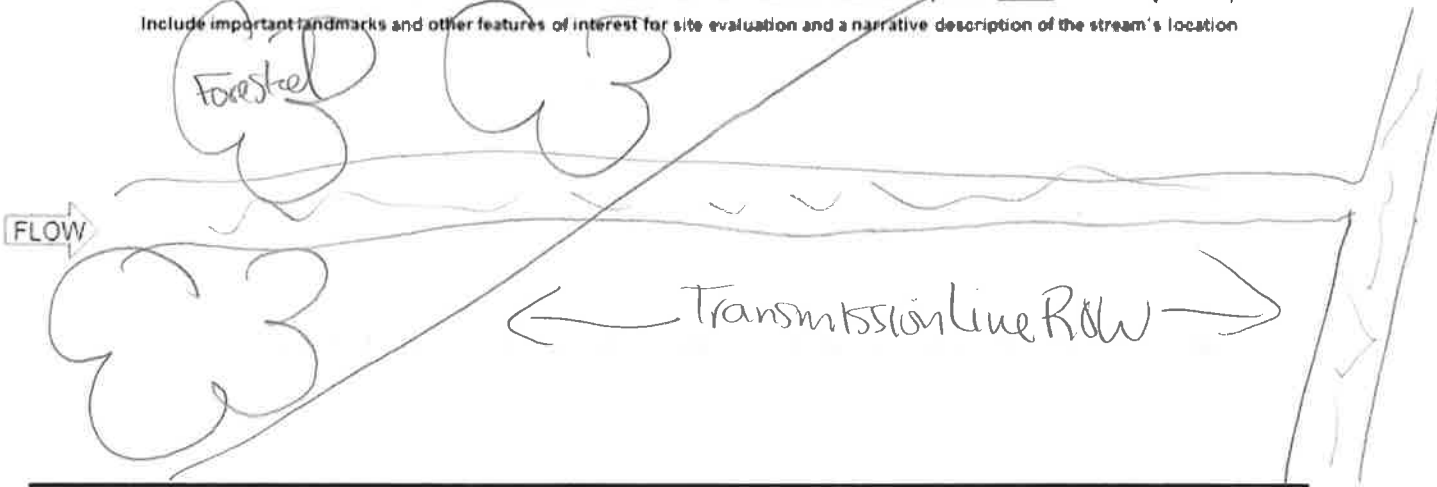
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

52

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 05040004050 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.76367 LONG -82.07959 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S045

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | <p>HHEI Metric Points Substrate Max = 40</p> <p>17</p> <p>A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|---|---|--|--|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|---|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input checked="" type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30</p> <p>15</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30</p> <p>20</p> | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|-------------------------------------|-----------|--------------------------|--------------------------|----------------|--------------------------|--------------------------|------------|--------------------------|--------------------------|------|---|--|---|---|--|---|---|--|--------------------------|--------------------------|------------------------|--------------------------|--------------------------|----------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|---------------------|--------------------------|--------------------------|------------------------------|--------------------------|--------------------------|------------------------|--------------------------|--------------------------|----------------|--------------------------|--------------------------|------------------------|
| <p>RIPARIAN WIDTH (Per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Wide >10m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Moderate 5-10m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Narrow <5m</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>None</td> </tr> </table> | | L | R | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> | None | <p>FLOODPLAIN QUALITY (Most Predominant per Bank)</p> <table border="0"> <tr> <td>L</td> <td>R</td> <td></td> <td>L</td> <td>R</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Mature Forest, Wetland</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Conservation Tillage</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td>Immature Forest, Shrub or Old Field</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Urban or Industrial</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Residential, Park, New Field</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Open Pasture, Row Crop</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Fenced Pasture</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Mining or Construction</td> </tr> </table> | | L | R | | L | R | | <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland | <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field | <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial | <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field | <input type="checkbox"/> | <input type="checkbox"/> | Open Pasture, Row Crop | <input type="checkbox"/> | <input type="checkbox"/> | Fenced Pasture | <input type="checkbox"/> | <input type="checkbox"/> | Mining or Construction |
| L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Moderate 5-10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Narrow <5m | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | R | | L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland | <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field | <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field | <input type="checkbox"/> | <input type="checkbox"/> | Open Pasture, Row Crop | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> | <input type="checkbox"/> | Fenced Pasture | <input type="checkbox"/> | <input type="checkbox"/> | Mining or Construction | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|------------------------------|---|------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input checked="" type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (1 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information must also be completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: W. Perry Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 50%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

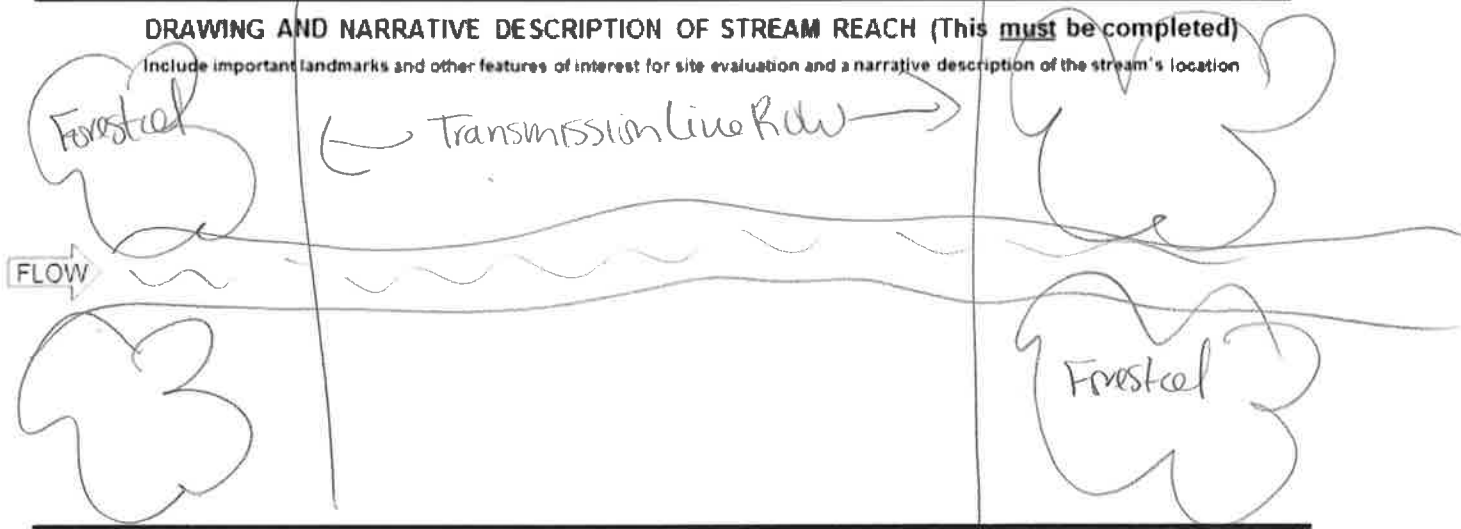
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 050400040501 RIVER CODE _____ DRAINAGE AREA (m²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG _____ RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S044

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| 1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B | | HHEI Metric Points Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 0 auto;">17</div> A + B | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|--|---|---|---|---|---|-----------|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> | TYPE | | PERCENT | TYPE | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): | | Pool Depth Max = 30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 0 auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input checked="" type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>5</u> | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input checked="" type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box): | | Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 0 auto;">5</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> COMMENTS _____ AVERAGE BANKFULL WIDTH (meters): <u>3'</u> | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY • NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|--|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

| | | | | |
|--|---|--|---|---|
| <input type="checkbox"/> Flat (< 0.5%) | <input type="checkbox"/> Flat to Moderate | <input checked="" type="checkbox"/> Moderate (0.5-10%) | <input type="checkbox"/> Moderate to Severe | <input type="checkbox"/> Severe (> 10%) |
|--|---|--|---|---|

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Dry Run Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: H. Perry Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Y Date of last precipitation: 5/21/20 Quantity: .50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N) N Canopy (% open): 30%

Were samples collected for water chemistry? (Y/N) N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

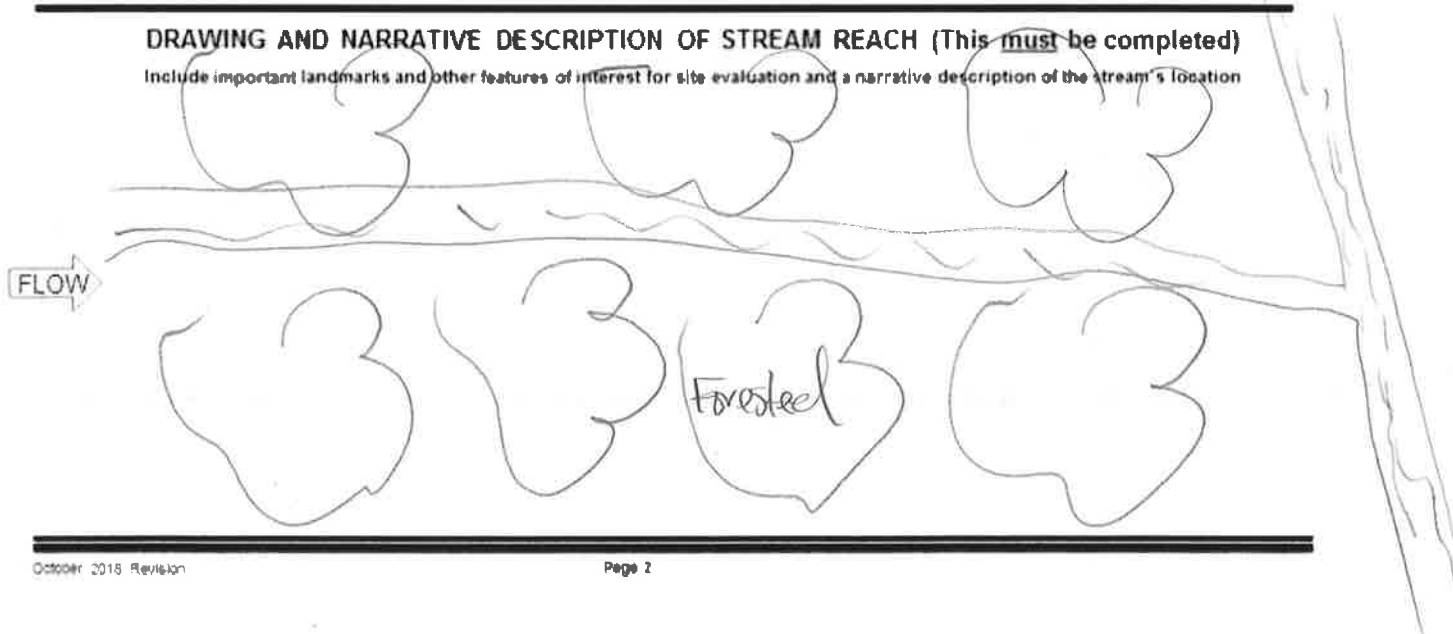
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

22

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 050400040502 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.739715 LONG -82.032558 RIVER MILE _____
 DATE 5/21/20 SCORER KLV COMMENTS S046

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>two</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|-----------|---|---|---|---|---|--|--|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="1"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> BLDR SLABS [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SLT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> BEDROCK [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> FINE DETRITUS [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> MUCK [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> ARTIFICIAL [3 pts]</td> <td>_____</td> </tr> </tbody> </table> <p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>15</u></p> | TYPE | PERCENT | TYPE | | PERCENT | <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BLDR SLABS [16 pts] | _____ | <input checked="" type="checkbox"/> SLT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts] | _____ | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> BEDROCK [16 pts] | _____ | <input type="checkbox"/> FINE DETRITUS [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> MUCK [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> SAND (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> ARTIFICIAL [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>0</u></p> | | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 0</p> | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="1"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>3'</u></p> | | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 5</p> | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream*

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|---|--|---|
| L | R | L | R |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Wide >10m | <input type="checkbox"/> | <input type="checkbox"/> Mature Forest, Wetland |
| <input type="checkbox"/> | <input type="checkbox"/> Moderate 5-10m | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> Narrow <5m | <input type="checkbox"/> | <input type="checkbox"/> Residential, Park, New Field |
| <input type="checkbox"/> | <input type="checkbox"/> None | <input type="checkbox"/> | <input type="checkbox"/> Fenced Pasture |
| <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> Conservation Tillage |
| <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> Urban or Industrial |
| <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> Open Pasture, Row Crop |
| <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> Mining or Construction |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input checked="" type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Black Fork Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Perry Co Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 5/21/20 Quantity: 50"

Photo-documentation Notes _____

Elevated Turbidity? (Y/N): N Canopy (% open): 20%

Were samples collected for water chemistry? (Y/N): N Lab Sample # or ID (attach results): _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, explain: _____

Additional comments/description of pollution impacts: _____

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) N Species observed (if known): _____

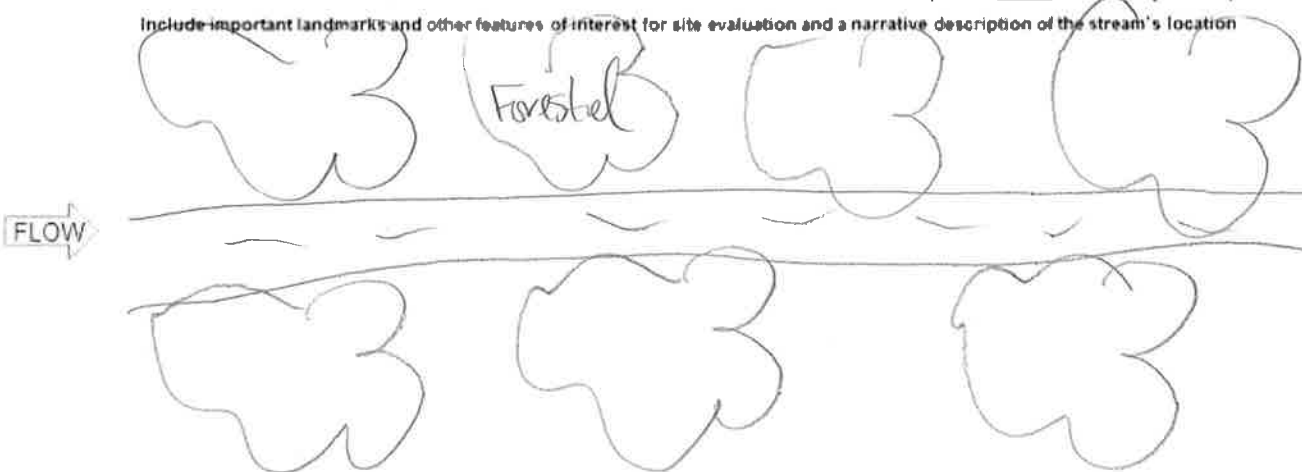
Salamanders Observed? (Y/N) N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) N Species observed (if known): _____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Field Evaluation Form

HHEI Score (sum of metrics 1+2+3)

52

SITE NAME/LOCATION Crooksville Philo
 SITE NUMBER _____ RIVER BASIN 05040040503 RIVER CODE _____ DRAINAGE AREA (mi²) _____
 LENGTH OF STREAM REACH (ft) _____ LAT 39.759426 LONG -82.085182 RIVER MILE _____
 DATE 5/21/20 SCORER KW COMMENTS S047

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

| <p>1. SUBSTRATE (Estimate percent of every type present). Check ONLY <u>wg</u> predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B</p> | | | | <p>HHEI Metric Points Substrate Max = 40 17 A + B</p> | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|-----------|---|---|---|--|--|---|---|-------|---|-----------|---|-------|--|-------|--|-----------|---|-------|--|-----------|---------------------------------------|-------|---|-----------|---|-------|
| <table border="0"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Bldr Slabs [16 pts]</td> <td>_____</td> <td><input checked="" type="checkbox"/> SILT [3 pt]</td> <td><u>30</u></td> </tr> <tr> <td><input type="checkbox"/> Boulder (>256 mm) [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Leaf Pack/Woody Debris [3 pts]</td> <td><u>10</u></td> </tr> <tr> <td><input type="checkbox"/> Bedrock [16 pts]</td> <td>_____</td> <td><input type="checkbox"/> Fine Detritus [3 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (65-256 mm) [12 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Clay or Hardpan [0 pt]</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts]</td> <td><u>30</u></td> <td><input type="checkbox"/> Muck [0 pts]</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sand (<2 mm) [6 pts]</td> <td><u>15</u></td> <td><input type="checkbox"/> Artificial [3 pts]</td> <td>_____</td> </tr> </tbody> </table> | TYPE | PERCENT | TYPE | | PERCENT | <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ |
| TYPE | PERCENT | TYPE | PERCENT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bldr Slabs [16 pts] | _____ | <input checked="" type="checkbox"/> SILT [3 pt] | <u>30</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Boulder (>256 mm) [16 pts] | _____ | <input type="checkbox"/> Leaf Pack/Woody Debris [3 pts] | <u>10</u> | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Bedrock [16 pts] | _____ | <input type="checkbox"/> Fine Detritus [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Cobble (65-256 mm) [12 pts] | <u>15</u> | <input type="checkbox"/> Clay or Hardpan [0 pt] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Gravel (2-64 mm) [9 pts] | <u>30</u> | <input type="checkbox"/> Muck [0 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Sand (<2 mm) [6 pts] | <u>15</u> | <input type="checkbox"/> Artificial [3 pts] | _____ | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>2. Maximum Pool Depth (Measure the <u>maximum</u> pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5pts]</td> </tr> <tr> <td><input type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]</td> </tr> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>10</u></p> | | | | <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | <p>Pool Depth Max = 30 15</p> | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input checked="" type="checkbox"/> 5 cm - 10 cm [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts] | <input type="checkbox"/> < 5 cm [5pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts] | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements) (Check ONLY one box):</p> <table border="0"> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]</td> <td></td> </tr> </table> <p>COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) <u>5'</u></p> | | | | <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | <p>Bankfull Width Max=30 20</p> | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts] | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] | <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY * NOTE: River Left (L) and Right (R) as looking downstream.

| RIPARIAN WIDTH (Per Bank) | | FLOODPLAIN QUALITY (Most Predominant per Bank) | |
|-------------------------------------|-------------------------------------|--|-------------------------------------|
| L | R | L | R |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

| | |
|---|--|
| <input checked="" type="checkbox"/> Stream Flowing | <input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (interstitial) | <input type="checkbox"/> Dry channel, no water (ephemeral) |

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

| | | | |
|-------------------------------|---|------------------------------|------------------------------|
| <input type="checkbox"/> None | <input checked="" type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3 |

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score _____ (If Yes, Attach Completed QHEI form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Black Fork Distance from Evaluated Stream _____
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION.

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Perry Co. Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) Date of last precipitation: 5/21/20 Quantity: .50"
Photo-documentation Notes _____
Elevated Turbidity? (Y/N) Canopy (% open): 75%
Were samples collected for water chemistry? (Y/N) Lab Sample # or ID (attach results): _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (umhos/cm) _____
Is the sampling reach representative of the stream (Y/N) If not, explain: _____

Additional comments/description of pollution impacts: _____

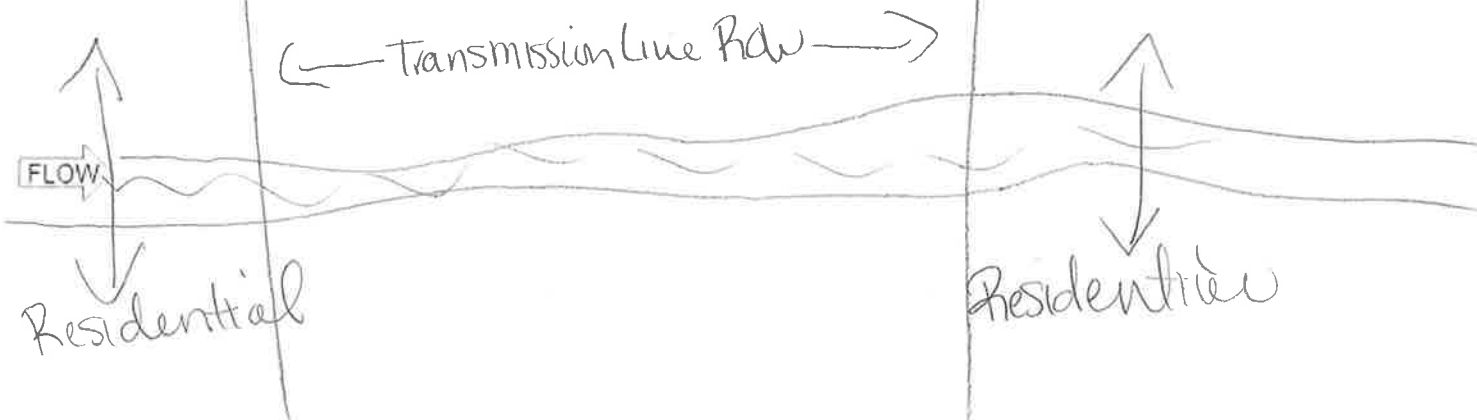
BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) Species observed (if known): _____
Frogs or Tadpoles Observed? (Y/N) Species observed (if known): _____
Salamanders Observed? (Y/N) Species observed (if known): _____
Aquatic Macroinvertebrates Observed? (Y/N) Species observed (if known): _____
Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed)

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



APPENDIX D

Ohio Rapid Assessment Method for Wetlands (ORAM) Data Forms

Site: Crooksville Philo Rater(s): KLV Date: 5/18/20

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W001-PEM-CAT2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 5 | 6 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 18 | 24 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | |
|---|---|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> None or none apparent (12) <input type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input |
| <ul style="list-style-type: none"> <input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input checked="" type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____ | |

| | |
|-------------|----------|
| 7 | 31 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.

| | |
|--|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input checked="" type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> mowing <input checked="" type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants |
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input checked="" type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment | |

| |
|--------------------|
| 31 |
| subtotal this page |

Site: Crooksville Philo Rater(s): KW Date: 5/18/20

31
subtotal first page

W001-PEM-CAT2

0 31
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0 31
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

31

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksville, Ohio Rater(s): KCV Date: 5/18/20

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W002-PEM-CATMOD2

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 8 | 9 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 16 | 25 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

| | |
|---|---|
| Check all disturbances observed | |
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input checked="" type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |

| | |
|-------------|----------|
| 11 | 36 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

| | |
|--|---|
| Check all disturbances observed | |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input checked="" type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> dredging |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |

| |
|--------------------|
| 36 |
| subtotal this page |

Site: Crooksville Ph16 Rater(s): KW Date: 5/18/20

36
subtotal first page

W002-PEM-CATMOD2

0 36
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

4 40
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

40

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksville Philo Rater(s): KLV Date: 5/18/20

2 2
max 6 pts. subtotal

Metric 1. Wetland Area (size).

W003-PSS-CATMOD2

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

8 10
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

13 23
max 30 pts. subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

| | |
|---|---|
| Check all disturbances observed | |
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input checked="" type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

12 35
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

| | |
|---|---|
| Check all disturbances observed | |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input checked="" type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |

35
subtotal this page

Site: Crossville Philo Rater(s): KLV Date: 5/18/20

35

subtotal first page

W003-PSS-CATMOD2

0 35

max 10 pts.

subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

8 43

max 20 pts.

subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

43

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksville Philo Rater(s): KW Date: 5/13/20

2 2
max 6 pts. subtotal

Metric 1. Wetland Area (size). W004-PEM-CAT2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

7 9
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

16 25
max 30 pts. subtotal

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.
- None or none apparent (12)
 - Recovered (7)
 - Recovering (3)
 - Recent or no recovery (1)
- Check all disturbances observed

 - ditch
 - tile
 - dike
 - weir
 - stormwater input
 - point source (nonstormwater)
 - filling/grading
 - road bed/RR track
 - dredging
 - other _____

7 32
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- None or none apparent (9)
 - Recovered (6)
 - Recovering (3)
 - Recent or no recovery (1)
- Check all disturbances observed

 - mowing
 - grazing
 - clearcutting
 - selective cutting
 - woody debris removal
 - toxic pollutants
 - shrub/sapling removal
 - herbaceous/aquatic bed removal
 - sedimentation
 - dredging
 - farming
 - nutrient enrichment

32
subtotal this page

Site: Crooksville Philo Rater(s): KLW Date: 5/18/20

32
subtotal first page

W004-PEM-CAT2

0 32
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

1 33
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

33

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksville Ponds Rater(s): KLV Date: 5/13/20

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W005-PEM-CAT2

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 11 | 12 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 13 | 25 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only one and assign score.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- | | |
|---|--|
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other |

| | |
|-------------|----------|
| 7 | 32 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- | | |
|---|---|
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |

| |
|--------------------|
| 32 |
| subtotal this page |

Site: Crooksville Pk Rater(s): KLV Date: 5/18/20

32
subtotal first page

W005-PEM-CAT2

0 32
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0 32
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

32

End of Quantitative Rating. Complete Categorization Worksheets.

| | | |
|--------------------------------|----------------------|----------------------|
| Site: <u>Crooksville Philo</u> | Rater(s): <u>KLV</u> | Date: <u>5/18/20</u> |
|--------------------------------|----------------------|----------------------|

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size). W006-PEM-CAT2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 11 | 12 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 16 | 28 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | |
|---|--|
| <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | Check all disturbances observed <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input <input checked="" type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other |
|---|--|

| | |
|-------------|----------|
| 7 | 35 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- | | |
|--|--|
| <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | Check all disturbances observed <input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment |
|--|--|

| |
|--------------------|
| 35 |
| subtotal this page |

Site: Crooksville Photo Rater(s): KLV Date: 5/18/20

35
subtotal first page

W006-PEM-CAT2

0 35
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2 37
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

37

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksville, Philo Rater(s): KLW Date: 5/18/20

2 2
max 6 pts. subtotal

Metric 1. Wetland Area (size).

W007-PEM/PUB-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

11 13
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

14 27
max 30 pts. subtotal

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | | | |
|---|--|---|---|
| <input type="checkbox"/> None or none apparent (12) | <input checked="" type="checkbox"/> Recovered (7) | <input type="checkbox"/> Recovering (3) | <input type="checkbox"/> Recent or no recovery (1) |
| Check all disturbances observed | | | |
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> tile | <input checked="" type="checkbox"/> dike | <input checked="" type="checkbox"/> weir |
| <input type="checkbox"/> stormwater input | <input checked="" type="checkbox"/> point source (nonstormwater) | <input checked="" type="checkbox"/> filling/grading | <input checked="" type="checkbox"/> road bed/RR track |
| | <input checked="" type="checkbox"/> dredging | <input type="checkbox"/> other | |

9 36
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.

| | | | |
|--|---|---|---|
| <input type="checkbox"/> None or none apparent (9) | <input checked="" type="checkbox"/> Recovered (6) | <input type="checkbox"/> Recovering (3) | <input type="checkbox"/> Recent or no recovery (1) |
| Check all disturbances observed | | | |
| <input type="checkbox"/> mowing | <input type="checkbox"/> grazing | <input checked="" type="checkbox"/> clearcutting | <input checked="" type="checkbox"/> selective cutting |
| <input checked="" type="checkbox"/> woody debris removal | <input type="checkbox"/> toxic pollutants | <input checked="" type="checkbox"/> shrub/sapling removal | <input type="checkbox"/> herbaceous/aquatic bed removal |
| | | <input type="checkbox"/> sedimentation | <input type="checkbox"/> dredging |
| | | <input type="checkbox"/> farming | <input type="checkbox"/> nutrient enrichment |

36
subtotal this page

Site: Crooksville Photo Rater(s): KLU Date: 5/18/20

36
subtotal first page

W007-PEM/PUB-CATMOD2

0 36
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

5 41
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersions.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummucks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

41

End of Quantitative Rating. Complete Categorization Worksheets.

| | | |
|-------------------------------|----------------------|----------------------|
| Site: Crooksville Phib | Rater(s): KLV | Date: 5/18/20 |
|-------------------------------|----------------------|----------------------|

| | |
|------------|----------|
| 2 | 2 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size). W008-PUB-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 11 | 13 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 16 | 29 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.
- | | | | | | | | | | | | |
|---|--|--------------------------------|---|-------------------------------|--|--|--|-------------------------------|--|---|--------------------------------------|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> ditch</td> <td><input type="checkbox"/> point source (nonstormwater)</td> </tr> <tr> <td><input type="checkbox"/> tile</td> <td><input type="checkbox"/> filling/grading</td> </tr> <tr> <td><input checked="" type="checkbox"/> dike</td> <td><input type="checkbox"/> road bed/RR track</td> </tr> <tr> <td><input type="checkbox"/> weir</td> <td><input checked="" type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> stormwater input</td> <td><input type="checkbox"/> other _____</td> </tr> </table> | <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) | <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | <input checked="" type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | <input type="checkbox"/> weir | <input checked="" type="checkbox"/> dredging | <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) | | | | | | | | | | |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | | | | | | | | | | |
| <input checked="" type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | | | | | | | | | | |
| <input type="checkbox"/> weir | <input checked="" type="checkbox"/> dredging | | | | | | | | | | |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ | | | | | | | | | | |

| | |
|-------------|----------|
| 8 | 37 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- | | | | | | | | | | | | | | |
|--|---|--|---|----------------------------------|---|--|--|---|-----------------------------------|---|----------------------------------|---|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input checked="" type="checkbox"/> mowing</td> <td><input checked="" type="checkbox"/> shrub/sapling removal</td> </tr> <tr> <td><input type="checkbox"/> grazing</td> <td><input type="checkbox"/> herbaceous/aquatic bed removal</td> </tr> <tr> <td><input checked="" type="checkbox"/> clearcutting</td> <td><input type="checkbox"/> sedimentation</td> </tr> <tr> <td><input checked="" type="checkbox"/> selective cutting</td> <td><input type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> woody debris removal</td> <td><input type="checkbox"/> farming</td> </tr> <tr> <td><input type="checkbox"/> toxic pollutants</td> <td><input type="checkbox"/> nutrient enrichment</td> </tr> </table> | <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | | | | | | | | | | | | |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | | | | | | | | | | | | |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | | | | | | | | | | | | |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment | | | | | | | | | | | | |

| |
|--------------------|
| 37 |
| subtotal this page |

| | | |
|--------------------------------|----------------------|----------------------|
| Site: Crooksville Philo | Rater(s): KLV | Date: 5/18/20 |
|--------------------------------|----------------------|----------------------|

37

subtotal first page

W008-PUB-CATMOD2

| | |
|---|----|
| 0 | 37 |
|---|----|

max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

| | |
|---|----|
| 6 | 43 |
|---|----|

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

43

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crooksmile Philo Rater(s): KW Date: 5/19/20

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W009-PEM-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 8 | 9 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 16 | 25 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | | | | | | | | | | | |
|---|--|--------------------------------|--|-------------------------------|--|-------------------------------|--|-------------------------------|-----------------------------------|---|--------------------------------------|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input type="checkbox"/> ditch</td> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> point source (nonstormwater)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> tile</td> <td style="border: none;"><input type="checkbox"/> filling/grading</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> dike</td> <td style="border: none;"><input type="checkbox"/> road bed/RR track</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> weir</td> <td style="border: none;"><input type="checkbox"/> dredging</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> stormwater input</td> <td style="border: none;"><input type="checkbox"/> other _____</td> </tr> </table> | <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) | <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | <input type="checkbox"/> weir | <input type="checkbox"/> dredging | <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) | | | | | | | | | | |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | | | | | | | | | | |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | | | | | | | | | | |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging | | | | | | | | | | |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ | | | | | | | | | | |

| | |
|-------------|----------|
| 10 | 35 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.

| | | | | | | | | | | | | | |
|--|---|--|---|----------------------------------|---|--|--|--|-----------------------------------|---|----------------------------------|---|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> mowing</td> <td style="width: 50%; border: none;"><input checked="" type="checkbox"/> shrub/sapling removal</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> grazing</td> <td style="border: none;"><input type="checkbox"/> herbaceous/aquatic bed removal</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> clearcutting</td> <td style="border: none;"><input type="checkbox"/> sedimentation</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> selective cutting</td> <td style="border: none;"><input type="checkbox"/> dredging</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> woody debris removal</td> <td style="border: none;"><input type="checkbox"/> farming</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> toxic pollutants</td> <td style="border: none;"><input type="checkbox"/> nutrient enrichment</td> </tr> </table> | <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | <input type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | | | | | | | | | | | | |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | | | | | | | | | | | | |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | | | | | | | | | | | | |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | | | | | | | | | | | | |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment | | | | | | | | | | | | |

| |
|--------------------|
| 35 |
| subtotal this page |

Site: Crooksville Philo Rater(s): KLV Date: 5/19/20

35

subtotal first page

W009-PEM-CATMOD2

0 35

max 10 pts.

subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0 35

max 20 pts.

subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

35

End of Quantitative Rating. Complete Categorization Worksheets.

| | | |
|--------------------------------|----------------------|----------------------|
| Site: Crooksville Philo | Rater(s): KLV | Date: 5/20/20 |
|--------------------------------|----------------------|----------------------|

| | |
|------------|----------|
| 2 | 2 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W010-PFO-CAT2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 12 | 14 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 14 | 28 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | | | | | | | | | | | |
|---|--|--------------------------------|---|-------------------------------|---|-------------------------------|--|-------------------------------|--|---|--------------------------------------|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> None or none apparent (12) <input type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> ditch</td> <td><input type="checkbox"/> point source (nonstormwater)</td> </tr> <tr> <td><input type="checkbox"/> tile</td> <td><input checked="" type="checkbox"/> filling/grading</td> </tr> <tr> <td><input type="checkbox"/> dike</td> <td><input type="checkbox"/> road bed/RR track</td> </tr> <tr> <td><input type="checkbox"/> weir</td> <td><input checked="" type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> stormwater input</td> <td><input type="checkbox"/> other _____</td> </tr> </table> | <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) | <input type="checkbox"/> tile | <input checked="" type="checkbox"/> filling/grading | <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | <input type="checkbox"/> weir | <input checked="" type="checkbox"/> dredging | <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) | | | | | | | | | | |
| <input type="checkbox"/> tile | <input checked="" type="checkbox"/> filling/grading | | | | | | | | | | |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | | | | | | | | | | |
| <input type="checkbox"/> weir | <input checked="" type="checkbox"/> dredging | | | | | | | | | | |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ | | | | | | | | | | |

| | |
|-------------|----------|
| 12 | 40 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- | | | | | | | | | | | | | | |
|--|---|---------------------------------|---|----------------------------------|---|--|--|--|-----------------------------------|---|----------------------------------|---|--|
| <ul style="list-style-type: none"> <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%;"> <tr> <td><input type="checkbox"/> mowing</td> <td><input checked="" type="checkbox"/> shrub/sapling removal</td> </tr> <tr> <td><input type="checkbox"/> grazing</td> <td><input type="checkbox"/> herbaceous/aquatic bed removal</td> </tr> <tr> <td><input checked="" type="checkbox"/> clearcutting</td> <td><input type="checkbox"/> sedimentation</td> </tr> <tr> <td><input type="checkbox"/> selective cutting</td> <td><input type="checkbox"/> dredging</td> </tr> <tr> <td><input type="checkbox"/> woody debris removal</td> <td><input type="checkbox"/> farming</td> </tr> <tr> <td><input type="checkbox"/> toxic pollutants</td> <td><input type="checkbox"/> nutrient enrichment</td> </tr> </table> | <input type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | <input type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |
| <input type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | | | | | | | | | | | | |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | | | | | | | | | | | | |
| <input type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | | | | | | | | | | | | |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | | | | | | | | | | | | |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment | | | | | | | | | | | | |

| |
|--------------------|
| 40 |
| subtotal this page |

Site: Crookville Philo Rater(s): KLW Date: 5/20/20

40
subtotal first page

W010-PFO-CAT2

0 40
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

9 49
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

49

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Crestville Philo Rater(s): KW Date: 5/20/20

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W011-PEM-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 12 | 13 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 13 | 26 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.
- None or none apparent (12)
 - Recovered (7)
 - Recovering (3)
 - Recent or no recovery (1)

| | |
|---|--|
| Check all disturbances observed | |
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other _____ |

| | |
|-------------|----------|
| 11 | 37 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.
- None or none apparent (9)
 - Recovered (6)
 - Recovering (3)
 - Recent or no recovery (1)

| | |
|---|---|
| Check all disturbances observed | |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |

| |
|--------------------|
| 37 |
| subtotal this page |

| | | |
|--------------------------------|----------------------|----------------------|
| Site: <u>Crooksville Philo</u> | Rater(s): <u>KLV</u> | Date: <u>5/20/20</u> |
|--------------------------------|----------------------|----------------------|

| |
|---------------------|
| 37 |
| subtotal first page |

W011-PEM-CATMOD2

| | |
|-------------|----------|
| 0 | 37 |
| max 10 pts. | subtotal |

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

| | |
|-------------|----------|
| 0 | 37 |
| max 20 pts. | subtotal |

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

| |
|----|
| 37 |
|----|

End of Quantitative Rating. Complete Categorization Worksheets.

| | | |
|--------------------------------|----------------------|----------------------|
| Site: <u>Crooksville Philo</u> | Rater(s): <u>KLV</u> | Date: <u>5/20/20</u> |
|--------------------------------|----------------------|----------------------|

| | |
|------------|----------|
| 1 | 1 |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W012-PEM-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|----------|
| 12 | 13 |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|----------|
| 12 | 25 |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"> <ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input </td> <td style="width:50%; border: none;"> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other </td> </tr> </table> | <ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other |
| <ul style="list-style-type: none"> <input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other | | |

| | |
|-------------|----------|
| 10 | 35 |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.

| | | | |
|--|---|--|---|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants </td> <td style="width:50%; border: none;"> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment </td> </tr> </table> | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment |
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input checked="" type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment | | |

| |
|--------------------|
| 35 |
| subtotal this page |

Site: Crooksville Philo Rater(s): KLW Date: 5/20/20

35
subtotal first page

W012-PEM-CATMOD2

0 35
max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

3 38
max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

38

End of Quantitative Rating. Complete Categorization Worksheets.

| | | |
|--------------------------------|----------------------|----------------------|
| Site: <u>Crooksville Philo</u> | Rater(s): <u>KLV</u> | Date: <u>5/20/20</u> |
|--------------------------------|----------------------|----------------------|

| | |
|------------|----------|
| <u>2</u> | <u>2</u> |
| max 6 pts. | subtotal |

Metric 1. Wetland Area (size).

W013-PEM-CATMOD2

- Select one size class and assign score.
- >50 acres (>20.2ha) (6 pts)
 - 25 to <50 acres (10.1 to <20.2ha) (5 pts)
 - 10 to <25 acres (4 to <10.1ha) (4 pts)
 - 3 to <10 acres (1.2 to <4ha) (3 pts)
 - 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
 - 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
 - <0.1 acres (0.04ha) (0 pts)

| | |
|-------------|-----------|
| <u>12</u> | <u>14</u> |
| max 14 pts. | subtotal |

Metric 2. Upland buffers and surrounding land use.

- 2a. Calculate average buffer width. Select only one and assign score. Do not double check.
- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
 - MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
 - NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
 - VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)
- 2b. Intensity of surrounding land use. Select one or double check and average.
- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
 - LOW. Old field (>10 years), shrub land, young second growth forest. (5)
 - MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
 - HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

| | |
|-------------|-----------|
| <u>16</u> | <u>30</u> |
| max 30 pts. | subtotal |

Metric 3. Hydrology.

- 3a. Sources of Water. Score all that apply.
- High pH groundwater (5)
 - Other groundwater (3)
 - Precipitation (1)
 - Seasonal/Intermittent surface water (3)
 - Perennial surface water (lake or stream) (5)
- 3b. Connectivity. Score all that apply.
- 100 year floodplain (1)
 - Between stream/lake and other human use (1)
 - Part of wetland/upland (e.g. forest), complex (1)
 - Part of riparian or upland corridor (1)
- 3c. Maximum water depth. Select only one and assign score.
- >0.7 (27.6in) (3)
 - 0.4 to 0.7m (15.7 to 27.6in) (2)
 - <0.4m (<15.7in) (1)
- 3d. Duration inundation/saturation. Score one or dbl check.
- Semi- to permanently inundated/saturated (4)
 - Regularly inundated/saturated (3)
 - Seasonally inundated (2)
 - Seasonally saturated in upper 30cm (12in) (1)
- 3e. Modifications to natural hydrologic regime. Score one or double check and average.

| | | | | | | | | | | | |
|---|---|--------------------------------|--|-------------------------------|--|-------------------------------|--|-------------------------------|-----------------------------------|---|--------------------------------|
| <input type="checkbox"/> None or none apparent (12) <input checked="" type="checkbox"/> Recovered (7) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input type="checkbox"/> ditch</td> <td style="width:50%; border: none;"><input checked="" type="checkbox"/> point source (nonstormwater)</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> tile</td> <td style="border: none;"><input type="checkbox"/> filling/grading</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> dike</td> <td style="border: none;"><input type="checkbox"/> road bed/RR track</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> weir</td> <td style="border: none;"><input type="checkbox"/> dredging</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> stormwater input</td> <td style="border: none;"><input type="checkbox"/> other</td> </tr> </table> | <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) | <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | <input type="checkbox"/> weir | <input type="checkbox"/> dredging | <input type="checkbox"/> stormwater input | <input type="checkbox"/> other |
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) | | | | | | | | | | |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading | | | | | | | | | | |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track | | | | | | | | | | |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging | | | | | | | | | | |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> other | | | | | | | | | | |

| | |
|-------------|-----------|
| <u>8</u> | <u>38</u> |
| max 20 pts. | subtotal |

Metric 4. Habitat Alteration and Development.

- 4a. Substrate disturbance. Score one or double check and average.
- None or none apparent (4)
 - Recovered (3)
 - Recovering (2)
 - Recent or no recovery (1)
- 4b. Habitat development. Select only one and assign score.
- Excellent (7)
 - Very good (6)
 - Good (5)
 - Moderately good (4)
 - Fair (3)
 - Poor to fair (2)
 - Poor (1)
- 4c. Habitat alteration. Score one or double check and average.

| | | | | | | | | | | | | | |
|--|---|--|---|----------------------------------|---|--|--|---|-----------------------------------|---|----------------------------------|---|--|
| <input type="checkbox"/> None or none apparent (9) <input checked="" type="checkbox"/> Recovered (6) <input type="checkbox"/> Recovering (3) <input type="checkbox"/> Recent or no recovery (1) | <p>Check all disturbances observed</p> <table style="width:100%; border: none;"> <tr> <td style="width:50%; border: none;"><input checked="" type="checkbox"/> mowing</td> <td style="width:50%; border: none;"><input checked="" type="checkbox"/> shrub/sapling removal</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> grazing</td> <td style="border: none;"><input type="checkbox"/> herbaceous/aquatic bed removal</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> clearcutting</td> <td style="border: none;"><input type="checkbox"/> sedimentation</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> selective cutting</td> <td style="border: none;"><input type="checkbox"/> dredging</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> woody debris removal</td> <td style="border: none;"><input type="checkbox"/> farming</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> toxic pollutants</td> <td style="border: none;"><input type="checkbox"/> nutrient enrichment</td> </tr> </table> | <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment |
| <input checked="" type="checkbox"/> mowing | <input checked="" type="checkbox"/> shrub/sapling removal | | | | | | | | | | | | |
| <input type="checkbox"/> grazing | <input type="checkbox"/> herbaceous/aquatic bed removal | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> clearcutting | <input type="checkbox"/> sedimentation | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging | | | | | | | | | | | | |
| <input type="checkbox"/> woody debris removal | <input type="checkbox"/> farming | | | | | | | | | | | | |
| <input type="checkbox"/> toxic pollutants | <input type="checkbox"/> nutrient enrichment | | | | | | | | | | | | |

| |
|--------------------|
| <u>38</u> |
| subtotal this page |

Site: Crooksville Philo Rater(s): KLV Date: 5/20/20

38

W013-PEM-CATMOD2

subtotal first page

0 38

max 10 pts. subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Prairies (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0 38

max 20 pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussocks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

Vegetation Community Cover Scale

| | |
|---|---|
| 0 | Absent or comprises <0.1ha (0.2471 acres) contiguous area |
| 1 | Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality |
| 2 | Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality |
| 3 | Present and comprises significant part, or more, of wetland's vegetation and is of high quality |

Narrative Description of Vegetation Quality

| | |
|------|--|
| low | Low spp diversity and/or predominance of nonnative or disturbance tolerant native species |
| mod | Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp |
| high | A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp |

Mudflat and Open Water Class Quality

| | |
|---|---|
| 0 | Absent <0.1ha (0.247 acres) |
| 1 | Low 0.1 to <1ha (0.247 to 2.47 acres) |
| 2 | Moderate 1 to <4ha (2.47 to 9.88 acres) |
| 3 | High 4ha (9.88 acres) or more |

Microtopography Cover Scale

| | |
|---|--|
| 0 | Absent |
| 1 | Present very small amounts or if more common of marginal quality |
| 2 | Present in moderate amounts, but not of highest quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality |

38

End of Quantitative Rating. Complete Categorization Worksheets.

APPENDIX E

ODNR and USFWS Correspondence

From: Ohio, FW3 <ohio@fws.gov>
Sent: Wednesday, July 15, 2020 8:31 AM
To: Kristen Vonderwish; Joshua Noble
Cc: nathan.reardon@dnr.state.oh.us; Parsons, Kate
Subject: AEP Crooksvills - Philo 138 kV Line Rebuild, Perry, Morgan, and Muskingum Co

EXTERNAL E-MAIL MESSAGE



UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
Ecological Services Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / Fax (614) 416-8994



TAILS# 03E15000-2020-TA-1809

Dear Ms. Vonderwish,

The U.S Fish and Wildlife Service (Service) has received your recent correspondence requesting information about the subject proposal. We offer the following comments and recommendations to assist you in minimizing and avoiding adverse impacts to threatened and endangered species pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq), as amended (ESA).

Federally Threatened and Endangered Species: The endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) occur throughout the State of Ohio. The Indiana bat and northern long-eared bat may be found wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and breed that may also include adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, woodlots, fallow fields, and pastures. Roost trees for both species include live and standing dead trees ≥ 3 inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities. These roost trees may be located in forested habitats as well as linear features such as fencerows, riparian forests, and other wooded corridors. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves, rock crevices and abandoned mines.

Seasonal Tree Clearing for Federally Listed Bat Species: Should the proposed project site contain trees ≥ 3 inches dbh, we recommend avoiding tree removal wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are

present and trees ≥ 3 inches dbh cannot be avoided, we recommend removal of any trees ≥ 3 inches dbh only occur between October 1 and March 31. Seasonal clearing is recommended to avoid adverse effects to Indiana bats and northern long-eared bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see <http://www.fws.gov/midwest/endangered/mammals/nleb/index.html>), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.

If implementation of this seasonal tree cutting recommendation is not possible, a summer presence/absence survey may be conducted for Indiana bats. If Indiana bats are not detected during the survey, then tree clearing may occur at any time of the year. Surveys must be conducted by an approved surveyor and be designed and conducted in coordination with the Ohio Field Office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

Section 7 Coordination: If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), then no tree clearing should occur on any portion of the project area until consultation under section 7 of the ESA, between the Service and the federal action agency, is completed. We recommend the federal action agency submit a determination of effects to this office, relative to the Indiana bat and northern long-eared bat, for our review and concurrence. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Stream and Wetland Avoidance: Over 90% of the wetlands in Ohio have been drained, filled, or modified by human activities, thus it is important to conserve the functions and values of the remaining wetlands in Ohio (https://epa.ohio.gov/portals/47/facts/ohio_wetlands.pdf). We recommend avoiding and minimizing project impacts to all wetland habitats (e.g., forests, streams, vernal pools) to the maximum extent possible in order to benefit water quality and fish and wildlife habitat. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the U.S. Army Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. Disturbed areas should be mulched and revegetated with native plant species. In addition, prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, or proposed species, or proposed or designated critical habitat. Should the project design change, or additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, coordination with the Service should be initiated to assess any potential impacts.

Thank you for your efforts to conserve listed species and sensitive habitats in Ohio. We recommend coordinating with the Ohio Department of Natural Resources due to the potential for the proposed project to affect state listed species and/or state lands. Contact Mike Pettegrew,

Acting Environmental Services Administrator, at (614) 265-6387 or at mike.pettegrew@dnr.state.oh.us.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patrice M. Ashfield". The signature is fluid and cursive, with a large initial "P" and "A".

Patrice M. Ashfield
Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW
Kate Parsons, ODNR-DOW



Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR

MARY MERTZ, DIRECTOR

Office of Real Estate
John Kessler, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6621
Fax: (614) 267-4764

September 17, 2020

Kristen Vonderwish
GAI Consultants
6000 Town Center Blvd., Suite 300
Canonsburg, PA 15317

Re: 20-707; Crooksville - Philo 138 kV Line Rebuild Project

Project: The proposed Project involves rebuilding approximately 6.7 miles of the existing Crooksville – Philo 138 kV transmission line and the installation of a new switch at the Cannelville station.

Location: The proposed project is located in Perry, Morgan, and Muskingum Counties, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has no records at or within a one-mile radius of the project area.

A review of the Ohio Natural Heritage Database indicates there are no other records of state endangered or threatened plants or animals within the project area. There are also no records of state potentially threatened plants, special interest or species of concern animals, or any federally listed species. In addition, we are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, state nature preserves, state or national parks, state or national forests, national wildlife refuges, or other protected natural areas within the project area. The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The entire state of Ohio is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species, the northern long-eared bat (*Myotis septentrionalis*), a state endangered and federally threatened species, the little brown bat (*Myotis lucifugus*), a state endangered species, and the tricolored bat (*Perimyotis subflavus*), a state endangered species. During the spring and summer (April 1 through September 30), these species of bats predominately roost in trees behind loose, exfoliating bark, in crevices and cavities, or in the leaves. However, these species are also dependent on the forest structure surrounding roost trees. If trees are present within the project area, and trees must be cut, the DOW recommends cutting only occur from October 1 through March 31, conserving trees with loose, shaggy bark and/or crevices, holes, or cavities, as well as trees with DBH \geq 20 if possible. If trees are present within the project area, and trees must be cut during the summer months, the DOW recommends a mist net survey or acoustic survey be conducted from June 1 through August 15, prior to any cutting. Mist net and acoustic surveys should be conducted in accordance with the most recent version of the “OHIO DIVISION OF WILDLIFE GUIDANCE FOR BAT SURVEYS AND TREE CLEARING”. If state listed bats are documented, DOW recommends cutting only occur from October 1 through March 31, however, limited summer tree cutting may be acceptable after consultation with DOW (contact Sarah Stankavich, sarah.stankavich@dnr.state.oh.us).

The DOW also recommends that a desktop or field-based habitat assessment is conducted to determine if there are potential hibernaculum(a) present within the project area. Habitat assessments should be conducted in accordance with the current USFWS “Range-wide Indiana Bat Survey Guidelines” and submitted to Sarah Stankavich, sarah.stankavich@dnr.state.oh.us if potential hibernacula are present within .25 miles of the project area. If a potential hibernaculum is found, the DOW recommends a 0.25-mile tree cutting and subsurface disturbance buffer around the hibernaculum entrance, however, limited summer or winter tree cutting may be acceptable after consultation with DOW. If no tree cutting or subsurface impacts to a hibernaculum are proposed, this project is not likely to impact these species.

The project is within the range of the following listed mussel species:

Federally Endangered

fanshell (*Cyprogenia stegaria*)
sheepnose (*Plethobasus cyphus*)
snuffbox (*Epioblasma triquetra*)

Federally Threatened

rabbitsfoot (*Quadrula cylindrica cylindrica*)

State Endangered

long-solid (*Fusconaia maculata maculata*)
Ohio pigtoe (*Pleurobema cordatum*)
sharp-ridged pocketbook (*Lampsilis ovata*)
wartyback (*Quadrula nodulata*),

State Threatened

black sandshell (*Ligumia recta*)

fawnsfoot (*Truncilla donaciformis*)
threehorn wartyback (*Obliquaria reflexa*)

This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol (2020), all Group 2, 3, and 4 streams (Appendix A) require a mussel survey. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 5 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2020) can be found at: <http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/licenses%20&%20permits/OH%20Mussel%20Survey%20Protocol.pdf>

The project is within the range of the following listed fish species:

State Endangered

northern madtom (*Noturus stigmosus*)

State Threatened

American eel (*Anguilla rostrata*)

blue sucker (*Cycleptus elongatus*)

channel darter (*Percina copelandi*)

mountain madtom (*Noturus eleutherus*)

paddlefish (*Polyodon spathula*)

The DOW recommends no in-water work in perennial streams from April 15 through June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), a state endangered species and a federal species of concern. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size to provide suitable habitat, this project is not likely to impact this species.

The project is also within the range of the eastern spadefoot toad (*Scaphiopus holbrookii*), a state endangered species. This species is found in areas of sandy soils that are associated with river valleys. Breeding habitats may include flooded agricultural fields or other water holding depressions. Due to the location, the type of habitat within the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the black tern (*Chlidonias niger*), a state endangered bird. The black tern prefers large, undisturbed inland marshes with fairly dense vegetation and pockets of open water. They nest in various kinds of marsh vegetation but cattail marshes are generally favored. Nests are built on top of muskrat houses or on top of floating vegetation. If this type of

habitat will be impacted, construction should be avoided in this habitat from April 1 to June 30 to reduce impacts to this species. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus hudsonis*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the sandhill crane (*Grus canadensis*), a state threatened species. Sandhill cranes are primarily a wetland-dependent species. On their wintering grounds, they will utilize agricultural fields; however, they roost in shallow, standing water or moist bottomlands. On breeding grounds they require a rather large tract of wet meadow, shallow marsh, or bog for nesting. If grassland, prairie, or wetland habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 1 to September 1. If this habitat will not be impacted, this project is not likely to have an impact on this species.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state threatened bird. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to June 15. If this habitat will not be impacted, this project is not likely to have an impact on this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water Resources: The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or Sarah.Tebbe@dnr.state.oh.us if you have questions about these comments or need additional information.

Mike Pettegrew
Environmental Services Administrator (Acting)

**This foregoing document was electronically filed with the Public Utilities
Commission of Ohio Docketing Information System on**

7/26/2024 3:23:42 PM

in

Case No(s). 24-0688-EL-BNR

Summary: Application Construction Notice Philo-Crooksville and Philo-Rutland,
Part 2 of 2 electronically filed by Hector Garcia-Santana on behalf of Ohio Power
Company.