


## Background Information

|   |   |
|---|---|
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| Date:   | 9/15/2018   |
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| Name of Wetland:  | WB_118  |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af  |
| HGM Class(es):  | depressional  |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  <p style="text-align: center;">North: Up</p> |
| Lat/Long or UTM Coordinate  | 300848.744153 4413456.10539   |
| USGS Quad Name  | Big Plain OH o39083g3   |
| County  | Madison   |
| Township  | Fairfield   |
| Section and Subsection  | No  |
| Hydrologic Unit Code  | 50600020106   |
| Site Visit  | 9/15/2018   |
| NWI Map   | No  |
| Ohio Wetland Inventory Map  | No  |
| Soil Survey   | CsB: Crosby-Lewisburg complex, 2 to 6 percent slopes  |
| Delineation report/map  | See Report Exhibits   |

Name of Wetland: WB\_118

Wetland Size (acres, hectares): 0.054

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 19

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_118**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

**Wetland: WB\_118**

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |



**Wetland: WB\_118**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br><br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br><br>Go to Question 9b  | <b>NO</b><br><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br><br>Go to Question 9d  | <b>NO</b><br><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br><br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br><br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinatum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Tofieldia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |           |                 |        |
|--------------|---------|------------------|----------------|--------------|-----------|-----------------|--------|
| <b>Site:</b> | Madison | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 9/15/2018 | <b>Wetland:</b> | WB 118 |
|--------------|---------|------------------|----------------|--------------|-----------|-----------------|--------|

|           |          |  |                           |
|-----------|----------|--|---------------------------|
| <b>0</b>  | <b>0</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> |
| max 6 pts | subtotal | select one size class and assign score | 0.054                     |

- ☐ >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)

|            |            |   |
|------------|------------|---|
| <b>1.0</b> | <b>1.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b>   |
| max 14 pts | subtotal   | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |

- ☐ 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)

|             |             |   |
|-------------|-------------|---|
| <b>15.0</b> | <b>16.0</b> | <b>Metric 3 Hydrology</b>                         |
| max 30 pts  | subtotal    | <b>3a. Sources of Water Score all that apply.</b> |

- ☐ 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 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 inlet | <input type="checkbox"/> other                        |

|            |             |  |
|------------|-------------|--|
| <b>3.0</b> | <b>19.0</b> | <b>Metric 4 Habitat Alteration and Development</b>                       |
| max 20 pts | subtotal    | <b>4a. Substrate disturbance. Score one or double check and average.</b> |

- ☐ 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 type="checkbox"/> mowing               | <input 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 type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> woody debris removal | <input checked="" type="checkbox"/> farming             |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enhancement           |

**19.0**

subtotal this page

last revised 1 February 2001 jjm

Site: Madison Rater(s): David Kuhlmann

Date: 9/15/2018 Wetland: WB 118

19

Subtotal first page

0

19

**Metric 5.**  
subtotal

**Special Wetlands**  
select one size class and assign score

max 6 pts subtotal

- ☐ 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

19

**Metric 6 Plant communities, interspersions, micro topography.**

**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

max 14 pts subtotal

**Score all present using 0 to 3 scale.**

- ☐ 1 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

**6b. Horizontal (plan view) Interspersions.**  
**Select only one.**

- ☐ 0 High (5)
- ☐ 0 Moderately high (4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage**

- ☐ 0 Extensive >75% cover (-5)
- ☐ 0 Moderate 25-75% cover (-3)
- ☒ X Sparse 5-25% cover (-1)
- ☐ 0 Nearly absent <5% cover (0)
- ☐ 0 Absent (1)

**6d. Microtopography**

**Score all present using 1 to 3 scale.**

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

|   |   |
|---|---|
| 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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

**End of Quantitative Rating. Complete Categorization Worksheets.**

19

Total Score

## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 0   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 15  |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 0   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_118 | <b>19</b> 1 Category based on score breakpoints      |


**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland <span style="float: right;">WB 118</span>  |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   |  | Evaluation of Categorization Result of ORAM  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br><br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br><br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br><br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
|  | Category 1  | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

### Background Information

|   |   |
|---|---|
| Name:   | David Kuhlmann  |
| Date:   | 9/15/2018   |
| Affiliation:  | Westwood Professional Services, Inc.  |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343  |
| Phone Number:   | (952) 937-5150  |
| e-mail address:   | david.Kuhlmann@westwoodps.com   |
| Name of Wetland:  | WB_119  |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af  |
| HGM Class(es):  | depressional  |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  <p style="text-align: center;">North: Up</p> |
| Lat/Long or UTM Coordinate  | 300728.527533 4412858.95504   |
| USGS Quad Name  | Big Plain OH o39083g3   |
| County  | Madison   |
| Township  | Fairfield   |
| Section and Subsection  | No  |
| Hydrologic Unit Code  | 50600020106   |
| Site Visit  | 9/15/2018   |
| NWI Map   | No  |
| Ohio Wetland Inventory Map  | No  |
| Soil Survey   | Ko: Kokomo silty clay loam, 0 to 2 percent slopes   |
| Delineation report/map  | See Report Exhibits   |



Name of Wetland: WB\_119

Wetland Size (acres, hectares): 0.076

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 19

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_119**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

**Wetland: WB\_119**

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_119**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br><br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br><br>Go to Question 9b  | <b>NO</b><br><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br><br>Go to Question 9d  | <b>NO</b><br><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | <b>YES</b><br><br>Wetland should be evaluated for possible Category 3 status. Go to Question 10     | NO<br><br>Go to Question 10                   |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br><br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinatum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Tofieldia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |           |                 |        |
|--------------|---------|------------------|----------------|--------------|-----------|-----------------|--------|
| <b>Site:</b> | Madison | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 9/15/2018 | <b>Wetland:</b> | WB 119 |
|--------------|---------|------------------|----------------|--------------|-----------|-----------------|--------|

|           |          |  |                           |       |
|-----------|----------|--|---------------------------|-------|
| <b>0</b>  | <b>0</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> | 0.076 |
| max 6 pts | subtotal | 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)

|            |            |   |
|------------|------------|---|
| <b>1.0</b> | <b>1.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b>   |
| max 14 pts | subtotal   | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |

- ☐ 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)

|             |             |   |
|-------------|-------------|---|
| <b>15.0</b> | <b>16.0</b> | <b>Metric 3 Hydrology</b>                         |
| max 30 pts  | subtotal    | <b>3a. Sources of Water Score all that apply.</b> |

- ☐ 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 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 inlet | <input type="checkbox"/> other                        |

|            |             |  |
|------------|-------------|--|
| <b>3.0</b> | <b>19.0</b> | <b>Metric 4 Habitat Alteration and Development</b>                       |
| max 20 pts | subtotal    | <b>4a. Substrate disturbance. Score one or double check and average.</b> |

- ☐ 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 type="checkbox"/> mowing               | <input 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 type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                       |
| <input type="checkbox"/> woody debris removal | <input checked="" type="checkbox"/> farming             |
| <input type="checkbox"/> toxic pollutants     | <input type="checkbox"/> nutrient enhancement           |

**19.0**  
 subtotal this page  
 last revised 1 February 2001 jjm

Site: Madison Rater(s): David Kuhlmann

Date: 9/15/2018 Wetland: WB 119

19

Subtotal first page

0

19

**Metric 5.**

subtotal

**Special Wetlands**

select one size class and assign score

max 6 pts subtotal

- ☐ 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

19

**Metric 6 Plant communities, interspersions, micro topography.**

**6a. Wetland Vegetation Communities.**

**Vegetation Community Cover Scale**

max 14 pts subtotal

**Score all present using 0 to 3 scale.**

- ☒ 1 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions. Select only one.**

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

**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                          |

**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)

**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           |

**6d. Microtopography**

**Score all present using 1 to 3 scale.**

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

**End of Quantitative Rating. Complete Categorization Worksheets.**

19

Total Score



## ORAM Summary Worksheet

| circle or highlight<br>answer or<br>insert<br>score                 |                 |        |           | Result   |
|---|-----------------|--------|-----------|--|
| <b>Narrative Rating</b>   |                 |        |           |  |
| Question 1. Critical Habitat  | YES             | NO     |           | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES             | NO     |           | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES             | NO     |           | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES             | NO     |           | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES             | NO     |           | If yes, Category 1.                                  |
| Question 6. Bogs  | YES             | NO     |           | If yes, Category 3.                                  |
| Question 7. Fens  | YES             | NO     |           | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES             | NO     |           | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES             | NO     |           | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES             | NO     |           | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES             | NO     |           | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES             | NO     |           | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES             | NO     |           | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES             | NO     |           | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |                 |        |           |  |
| Metric 1. Size  |                 | 0      |           |  |
| Metric 2. Buffers and surrounding land use                          |                 | 1      |           |  |
| Metric 3. Hydrology   |                 | 15     |           |  |
| Metric 4. Habitat   |                 | 3      |           |  |
| Metric 5. Special Wetland Communities                               |                 | 0      |           |  |
| Metric 6. Plant communities, interspersed, microtopography          |                 | 0      |           |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b> | WB_119 | <b>19</b> | <b>1</b> Category based on score breakpoints         |

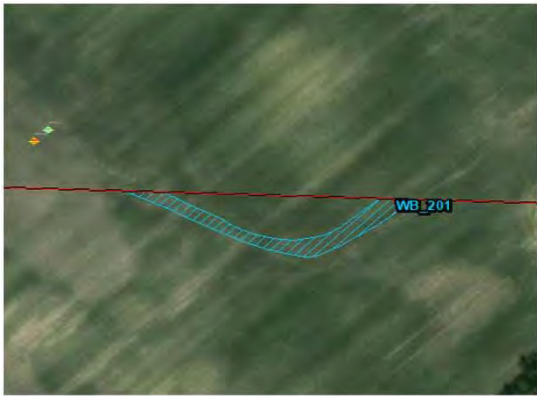
**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 119   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   |  | Evaluation of Categorization Result of ORAM  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
| Category 1   |   | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343                             |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_201   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  |
| North: Up   |  |
| Lat/Long or UTM Coordinate  | 301815.720.293 4415126.80255   |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | No   |
| Soil Survey   | Ko: Kokomo silty clay loam, 0 to 2 percent slopes                                  |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_201

Wetland Size (acres, hectares): 0.160

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

North: Up

See Wetland and Upland Sample Datasheets

Final score : 10

Category: 1

## Scoring Boundary Worksheet

**Wetland: WB\_201**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

### Wetland: WB\_201

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_201**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br><br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br><br>Go to Question 9b  | <b>NO</b><br><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br><br>Go to Question 9d  | <b>NO</b><br><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br><br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br><br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br><br>Complete Quantitative Rating |



Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinatum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 201 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|           |          |  |                           |
|-----------|----------|--|---------------------------|
| <b>1</b>  | <b>1</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> |
| max 6 pts | subtotal | select one size class and assign score | 0.160                     |

- ☐ >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)

|            |            |   |
|------------|------------|---|
| <b>1.0</b> | <b>2.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b>   |
| max 14 pts | subtotal   | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |

- ☐ 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)

|            |            |   |
|------------|------------|---|
| <b>4.0</b> | <b>6.0</b> | <b>Metric 3 Hydrology</b>                         |
| max 30 pts | subtotal   | <b>3a. Sources of Water Score all that apply.</b> |

- ☐ 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"/>        | 0 | ditch            | <input checked="" type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/>        | 0 | tile             | <input type="checkbox"/> filling/grading                         |
| <input type="checkbox"/>        | 0 | dike             | <input type="checkbox"/> road bed/RR track                       |
| <input type="checkbox"/>        | 0 | weir             | <input type="checkbox"/> dredging                                |
| <input type="checkbox"/>        | 0 | stormwater inlet | <input type="checkbox"/> other                                   |

|            |            |  |
|------------|------------|--|
| <b>3.0</b> | <b>9.0</b> | <b>Metric 4 Habitat Alteration and Development</b>                       |
| max 20 pts | subtotal   | <b>4a. Substrate disturbance. Score one or double check and average.</b> |

- ☐ 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 type="checkbox"/>        | 0 | mowing               | <input type="checkbox"/> shrub/sapling removal           |
| <input type="checkbox"/>        | 0 | grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal  |
| <input type="checkbox"/>        | 0 | clearcutting         | <input checked="" type="checkbox"/> sedimentation        |
| <input type="checkbox"/>        | 0 | selective cutting    | <input type="checkbox"/> dredging                        |
| <input type="checkbox"/>        | 0 | woody debris removal | <input checked="" type="checkbox"/> farming              |
| <input type="checkbox"/>        | 0 | toxic pollutants     | <input checked="" type="checkbox"/> nutrient enhancement |

**9.0**  
 subtotal this page  
 last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 201

9

Subtotal first page

0 9  
max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 10  
max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**  
**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions.**  
Select only one.

- ☐ 0 High (5)
- ☐ 0 Moderately high(4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**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                          |

**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)
- ☒ X Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

10 Total Score

## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 1   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 4   |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 1   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_201 | <b>10</b> 1 Category based on score breakpoints      |

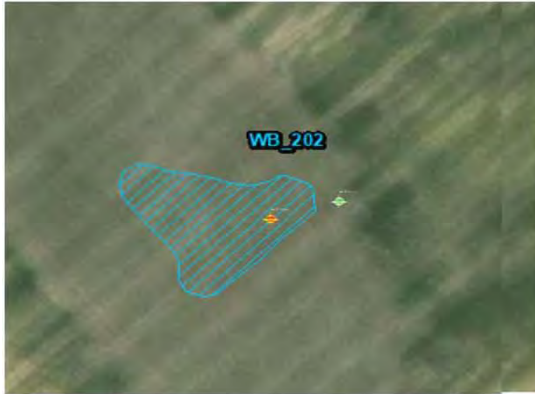
**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 201   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   |  | Evaluation of Categorization Result of ORAM  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
|  | Category 1  | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

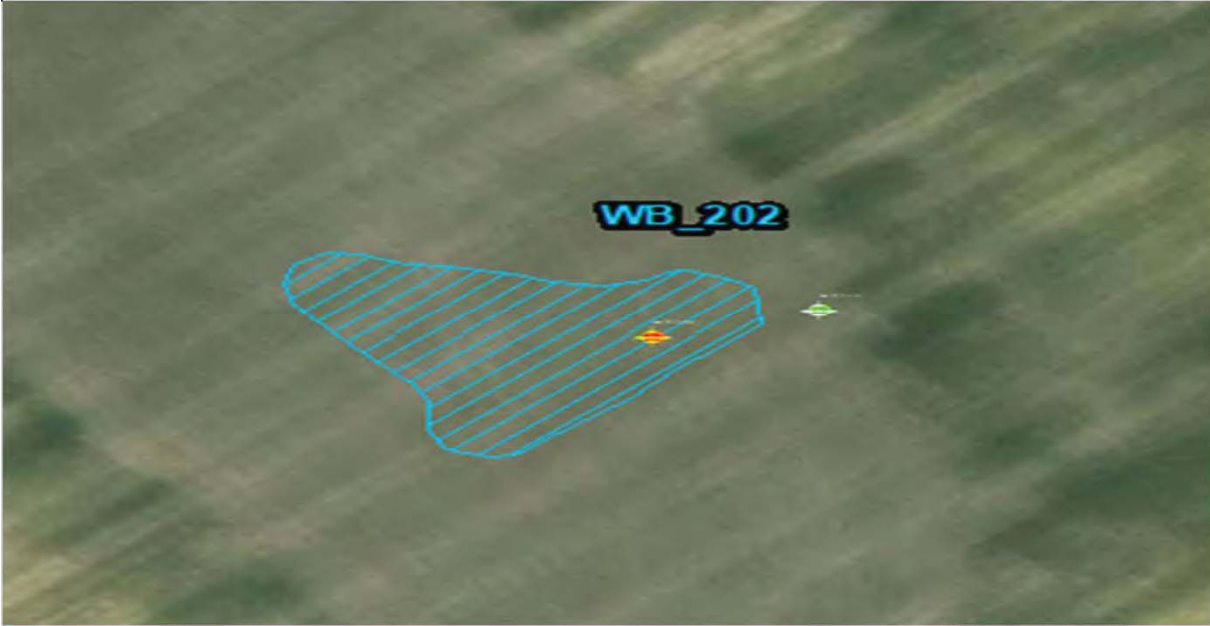
## Background Information

|   |   |
|---|---|
| Name:   | David Kuhlmann  |
| Date:   | 11/19/2019  |
| Affiliation:  | Westwood Professional Services, Inc.  |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343  |
| Phone Number:   | (952) 937-5150  |
| e-mail address:   | david.Kuhlmann@westwoodps.com   |
| Name of Wetland:  | WB_202  |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af  |
| HGM Class(es):  | depressional  |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  <p style="text-align: center;">North: Up</p> |
| Lat/Long or UTM Coordinate  | 301699.807662 4415024.657   |
| USGS Quad Name  | Big Plain OH o39083g3   |
| County  | Madison   |
| Township  | Fairfield   |
| Section and Subsection  | No  |
| Hydrologic Unit Code  | 50600020106   |
| Site Visit  | 11/19/2019  |
| NWI Map   | No  |
| Ohio Wetland Inventory Map  | No  |
| Soil Survey   | Ko: Kokomo silty clay loam, 0 to 2 percent slopes   |
| Delineation report/map  | See Report Exhibits   |

Name of Wetland: WB\_202

Wetland Size (acres, hectares): 0.315

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : **11**

Category: **1**



## Scoring Boundary Worksheet

**Wetland: WB\_202**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

**Narrative Rating**  
**Wetland: WB\_202**

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by Phalaris arundinacea, Lythrum salicaria, or Phragmites australis, or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly Sphagnum spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_202**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br>Go to Question 9b  | <b>NO</b><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br>Go to Question 9d  | <b>NO</b><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinarum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 202 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|           |          |  |                           |
|-----------|----------|--|---------------------------|
| <b>2</b>  | <b>2</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> |
| max 6 pts | subtotal | select one size class and assign score | 0.315                     |

- ☐ >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)

|            |            |   |
|------------|------------|---|
| <b>1.0</b> | <b>3.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b>   |
| max 14 pts | subtotal   | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |

- ☐ 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)

|            |            |   |
|------------|------------|---|
| <b>4.0</b> | <b>7.0</b> | <b>Metric 3 Hydrology</b>                         |
| max 30 pts | subtotal   | <b>3a. Sources of Water Score all that apply.</b> |

- ☐ 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 inlet | <input type="checkbox"/> other                                   |

|            |             |  |
|------------|-------------|--|
| <b>3.0</b> | <b>10.0</b> | <b>Metric 4 Habitat Alteration and Development</b>                       |
| max 20 pts | subtotal    | <b>4a. Substrate disturbance. Score one or double check and average.</b> |

- ☐ 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 type="checkbox"/> mowing               | <input type="checkbox"/> shrub/sapling removal           |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal  |
| <input type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation        |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                        |
| <input type="checkbox"/> woody debris removal | <input checked="" type="checkbox"/> farming              |
| <input type="checkbox"/> toxic pollutants     | <input checked="" type="checkbox"/> nutrient enhancement |

**10.0**  
 subtotal this page  
 last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 202

10

Subtotal first page

0 10

max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 11

max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**  
**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions. Select only one.**

- ☐ 0 High (5)
- ☐ 0 Moderately high(4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**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                          |

**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)
- ☒ X Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

11 Total Score

## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 2   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 4   |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 1   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_202 | <b>11</b> 1 Category based on score breakpoints      |

**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 202   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   |  | Evaluation of Categorization Result of ORAM  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
|  | Category 1  | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**



## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343                             |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_203   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  |
| North: Up   |  |
| Lat/Long or UTM Coordinate  | 301434.971808 4414719.30242  |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | Yes  |
| Soil Survey   | Pa: Patton silty clay loam, 0 to 2 percent slopes                                  |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_203

Wetland Size (acres, hectares): 0.188

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 10

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_203**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

### Wetland: WB\_203

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_203**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br>Go to Question 9b  | <b>NO</b><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br>Go to Question 9d  | <b>NO</b><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinarum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 203 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|  |          |                                     |   |
|--|----------|-------------------------------------|---|
| <b>1</b>                               | <b>1</b> | <b>Metric 1</b>                     | <b>Wetland Area (Ac.)</b>                   |
|  |          | subtotal                            | 0.188                                       |
| select one size class and assign score |          |                                     |   |
| max 6 pts                              | subtotal | <input type="checkbox"/>            | >50 acres (>20.2ha) (6 pts)                 |
|  |          | <input type="checkbox"/>            | 25 to <50 acres (10.1 to <20.2ha) (5 pts)   |
|  |          | <input type="checkbox"/>            | 10 to <25 acres (4 to <10.1ha) (4 pts)      |
|  |          | <input type="checkbox"/>            | 3 to <10 acres (1.2 to <4ha) (3 pts)        |
|  |          | <input type="checkbox"/>            | 0.3 to <3 acres (0.12 to <1.2ha) (2pts)     |
|  |          | <input checked="" type="checkbox"/> | 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt.) |
|  |          | <input type="checkbox"/>            | <0.1 acres (0.04ha) (0 pts)                 |

|  |            |   |
|--|------------|---|
| <b>1.0</b>   | <b>2.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b> |
| 2a. Calculate average buffer width. Select only one and assign score. Do not double check. |            |   |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 14 pts | subtotal | <input type="checkbox"/>            | WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)           |
|            |          | <input type="checkbox"/>            | MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  |
|            |          | <input type="checkbox"/>            | NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) |
|            |          | <input checked="" type="checkbox"/> | VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)           |

2b. Intensity of surrounding land use. Select one or double check and average.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)                |
| <input type="checkbox"/>            | LOW. Old field (>10 years), shrub land, young second growth forest. (5)                         |
| <input type="checkbox"/>            | MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3) |
| <input checked="" type="checkbox"/> | HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)                  |

|  |            |                           |
|--|------------|---------------------------|
| <b>4.0</b>                                 | <b>6.0</b> | <b>Metric 3 Hydrology</b> |
| 3a. Sources of Water Score all that apply. |            |                           |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 30 pts | subtotal | <input type="checkbox"/>            | High pH groundwater (5)                      |
|            |          | <input type="checkbox"/>            | Other groundwater (3)                        |
|            |          | <input checked="" type="checkbox"/> | Precipitation (1)                            |
|            |          | <input type="checkbox"/>            | Seasonal/Intermittent surface water (3)      |
|            |          | <input type="checkbox"/>            | Perennial surface water (lake or stream) (5) |

3b. Connectivity. Score all that apply.

|                          |   |
|--------------------------|---|
| <input type="checkbox"/> | 100 year floodplain (1)                           |
| <input type="checkbox"/> | Between stream/lake and other human use (1)       |
| <input type="checkbox"/> | Part of wetland/upland (e.g. forest), complex (1) |
| <input type="checkbox"/> | Part of riparian or upland corridor (1)           |

3c. Maximum water depth. Select only one and assign score.

|                                     |                                  |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/>            | >0.7 (27.6in) (3)                |
| <input type="checkbox"/>            | 0.4 to 0.7m (15.7 to 27.6in) (2) |
| <input checked="" type="checkbox"/> | <0.4m (<15.7in) (1)              |

3d. Duration inundation/saturation. Score one or dbl check.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | Semi- to permanently inundated/saturated (4)  |
| <input type="checkbox"/>            | Regularly inundated/saturated (3)             |
| <input type="checkbox"/>            | Seasonally inundated (2)                      |
| <input checked="" type="checkbox"/> | 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) | Check all disturbances observed     |                              |
| <input type="checkbox"/>            | Recovered (7)              | <input type="checkbox"/>            | ditch                        |
| <input checked="" type="checkbox"/> | Recovering (3)             | <input checked="" type="checkbox"/> | point source (nonstormwater) |
| <input checked="" type="checkbox"/> | Recent or no recovery (1)  | <input type="checkbox"/>            | filling/grading              |
|                                     |                            | <input type="checkbox"/>            | road bed/RR track            |
|                                     |                            | <input type="checkbox"/>            | dredging                     |
|                                     |                            | <input type="checkbox"/>            | other                        |

|            |            |  |
|------------|------------|--|
| <b>3.0</b> | <b>9.0</b> | <b>Metric 4 Habitat Alteration and Development</b> |
|------------|------------|--|

4a. Substrate disturbance. Score one or double check and average.

|            |          |                                     |                           |
|------------|----------|-------------------------------------|---------------------------|
| max 20 pts | subtotal | <input type="checkbox"/>            | None or none apparent (4) |
|            |          | <input type="checkbox"/>            | Recovered (3)             |
|            |          | <input type="checkbox"/>            | Recovering (2)            |
|            |          | <input checked="" type="checkbox"/> | Recent or no recovery (1) |

4b. Habitat development. Select only one and assign score.

|                                     |                     |
|-------------------------------------|---------------------|
| <input type="checkbox"/>            | Excellent (7)       |
| <input type="checkbox"/>            | Very good (6)       |
| <input type="checkbox"/>            | Good (5)            |
| <input type="checkbox"/>            | Moderately good (4) |
| <input type="checkbox"/>            | Fair (3)            |
| <input type="checkbox"/>            | Poor to fair (2)    |
| <input checked="" type="checkbox"/> | Poor (1)            |

4c. Habitat alteration. Score one or double check and average.

|                                     |                           |                                     |                                |
|-------------------------------------|---------------------------|-------------------------------------|--------------------------------|
| <input type="checkbox"/>            | None or none apparent (9) | Check all disturbances observed     |                                |
| <input type="checkbox"/>            | Recovered (6)             | <input type="checkbox"/>            | mowing                         |
| <input type="checkbox"/>            | Recovering (3)            | <input type="checkbox"/>            | shrub/sapling removal          |
| <input checked="" type="checkbox"/> | Recent or no recovery (1) | <input type="checkbox"/>            | herbaceous/aquatic bed removal |
|                                     |                           | <input type="checkbox"/>            | clearcutting                   |
|                                     |                           | <input checked="" type="checkbox"/> | sedimentation                  |
|                                     |                           | <input type="checkbox"/>            | dredging                       |
|                                     |                           | <input type="checkbox"/>            | selective cutting              |
|                                     |                           | <input checked="" type="checkbox"/> | farming                        |
|                                     |                           | <input type="checkbox"/>            | woody debris removal           |
|                                     |                           | <input checked="" type="checkbox"/> | nutrient enhancement           |
|                                     |                           | <input type="checkbox"/>            | toxic pollutants               |

**9.0**  
 subtotal this page  
 last revised 1 February 2001 jjm



ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 203

9

Subtotal first page

0 9

max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 10

max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**

**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions. Select only one.**

- ☐ 0 High (5)
- ☐ 0 Moderately high(4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**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                          |

**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)
- ☒ X Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

10 Total Score



## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 1   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 4   |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 1   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_203 | <b>10</b> 1 Category based on score breakpoints      |

**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 203   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   | Evaluation of Categorization Result of ORAM                      |  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
| Category 1   |   | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

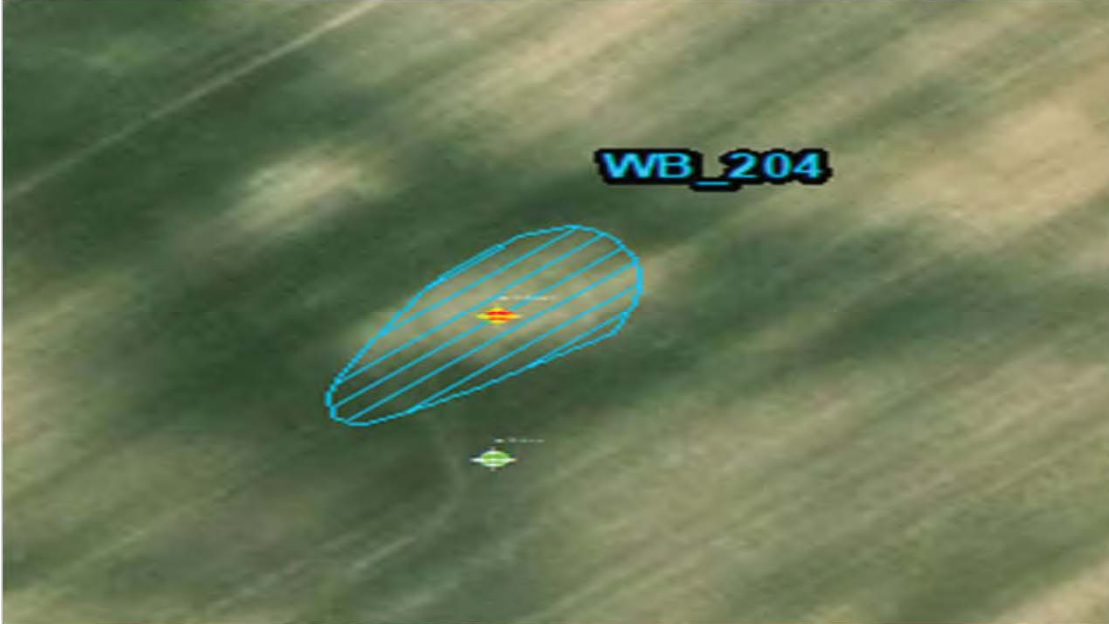
## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343                             |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_204   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  |
|   | North: Up  |
| Lat/Long or UTM Coordinate  | 301331.538821 4414999.19285  |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | No   |
| Soil Survey   | Pa: Patton silty clay loam, 0 to 2 percent slopes                                  |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_204

Wetland Size (acres, hectares): 0.125

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 10

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_204**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

**Wetland: WB\_204**

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_204**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br>Go to Question 9b  | <b>NO</b><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br>Go to Question 9d  | <b>NO</b><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinatum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.



ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 204 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|  |          |                                     |   |
|--|----------|-------------------------------------|---|
| <b>1</b>                               | <b>1</b> | <b>Metric 1</b>                     | <b>Wetland Area (Ac.)</b>                   |
|  |          | subtotal                            | 0.125                                       |
| select one size class and assign score |          |                                     |   |
| max 6 pts                              | subtotal | <input type="checkbox"/>            | >50 acres (>20.2ha) (6 pts)                 |
|  |          | <input type="checkbox"/>            | 25 to <50 acres (10.1 to <20.2ha) (5 pts)   |
|  |          | <input type="checkbox"/>            | 10 to <25 acres (4 to <10.1ha) (4 pts)      |
|  |          | <input type="checkbox"/>            | 3 to <10 acres (1.2 to <4ha) (3 pts)        |
|  |          | <input type="checkbox"/>            | 0.3 to <3 acres (0.12 to <1.2ha) (2pts)     |
|  |          | <input checked="" type="checkbox"/> | 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt.) |
|  |          | <input type="checkbox"/>            | <0.1 acres (0.04ha) (0 pts)                 |

|  |            |   |
|--|------------|---|
| <b>1.0</b>   | <b>2.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b> |
| 2a. Calculate average buffer width. Select only one and assign score. Do not double check. |            |   |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 14 pts | subtotal | <input type="checkbox"/>            | WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)           |
|            |          | <input type="checkbox"/>            | MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  |
|            |          | <input type="checkbox"/>            | NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) |
|            |          | <input checked="" type="checkbox"/> | VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)           |

2b. Intensity of surrounding land use. Select one or double check and average.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)                |
| <input type="checkbox"/>            | LOW. Old field (>10 years), shrub land, young second growth forest. (5)                         |
| <input type="checkbox"/>            | MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3) |
| <input checked="" type="checkbox"/> | HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)                  |

|  |            |                           |
|--|------------|---------------------------|
| <b>4.0</b>                                 | <b>6.0</b> | <b>Metric 3 Hydrology</b> |
| 3a. Sources of Water Score all that apply. |            |                           |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 30 pts | subtotal | <input type="checkbox"/>            | High pH groundwater (5)                      |
|            |          | <input type="checkbox"/>            | Other groundwater (3)                        |
|            |          | <input checked="" type="checkbox"/> | Precipitation (1)                            |
|            |          | <input type="checkbox"/>            | Seasonal/Intermittent surface water (3)      |
|            |          | <input type="checkbox"/>            | Perennial surface water (lake or stream) (5) |

3b. Connectivity. Score all that apply.

|                          |   |
|--------------------------|---|
| <input type="checkbox"/> | 100 year floodplain (1)                           |
| <input type="checkbox"/> | Between stream/lake and other human use (1)       |
| <input type="checkbox"/> | Part of wetland/upland (e.g. forest), complex (1) |
| <input type="checkbox"/> | Part of riparian or upland corridor (1)           |

3c. Maximum water depth. Select only one and assign score.

|                                     |                                  |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/>            | >0.7 (27.6in) (3)                |
| <input type="checkbox"/>            | 0.4 to 0.7m (15.7 to 27.6in) (2) |
| <input checked="" type="checkbox"/> | <0.4m (<15.7in) (1)              |

3d. Duration inundation/saturation. Score one or dbl check.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | Semi- to permanently inundated/saturated (4)  |
| <input type="checkbox"/>            | Regularly inundated/saturated (3)             |
| <input type="checkbox"/>            | Seasonally inundated (2)                      |
| <input checked="" type="checkbox"/> | 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) | Check all disturbances observed     |                              |
| <input type="checkbox"/>            | Recovered (7)              | <input type="checkbox"/>            | ditch                        |
| <input checked="" type="checkbox"/> | Recovering (3)             | <input checked="" type="checkbox"/> | point source (nonstormwater) |
| <input checked="" type="checkbox"/> | Recent or no recovery (1)  | <input type="checkbox"/>            | filling/grading              |
|                                     |                            | <input type="checkbox"/>            | road bed/RR track            |
|                                     |                            | <input type="checkbox"/>            | dredging                     |
|                                     |                            | <input type="checkbox"/>            | other                        |

|            |            |  |
|------------|------------|--|
| <b>3.0</b> | <b>9.0</b> | <b>Metric 4 Habitat Alteration and Development</b> |
|------------|------------|--|

4a. Substrate disturbance. Score one or double check and average.

|            |          |                                     |                           |
|------------|----------|-------------------------------------|---------------------------|
| max 20 pts | subtotal | <input type="checkbox"/>            | None or none apparent (4) |
|            |          | <input type="checkbox"/>            | Recovered (3)             |
|            |          | <input type="checkbox"/>            | Recovering (2)            |
|            |          | <input checked="" type="checkbox"/> | Recent or no recovery (1) |

4b. Habitat development. Select only one and assign score.

|                                     |                     |
|-------------------------------------|---------------------|
| <input type="checkbox"/>            | Excellent (7)       |
| <input type="checkbox"/>            | Very good (6)       |
| <input type="checkbox"/>            | Good (5)            |
| <input type="checkbox"/>            | Moderately good (4) |
| <input type="checkbox"/>            | Fair (3)            |
| <input type="checkbox"/>            | Poor to fair (2)    |
| <input checked="" type="checkbox"/> | Poor (1)            |

4c. Habitat alteration. Score one or double check and average.

|                                     |                           |                                     |                                |
|-------------------------------------|---------------------------|-------------------------------------|--------------------------------|
| <input type="checkbox"/>            | None or none apparent (9) | Check all disturbances observed     |                                |
| <input type="checkbox"/>            | Recovered (6)             | <input type="checkbox"/>            | mowing                         |
| <input type="checkbox"/>            | Recovering (3)            | <input type="checkbox"/>            | shrub/sapling removal          |
| <input checked="" type="checkbox"/> | Recent or no recovery (1) | <input type="checkbox"/>            | herbaceous/aquatic bed removal |
|                                     |                           | <input type="checkbox"/>            | clearcutting                   |
|                                     |                           | <input checked="" type="checkbox"/> | sedimentation                  |
|                                     |                           | <input type="checkbox"/>            | selective cutting              |
|                                     |                           | <input type="checkbox"/>            | dredging                       |
|                                     |                           | <input type="checkbox"/>            | woody debris removal           |
|                                     |                           | <input checked="" type="checkbox"/> | farming                        |
|                                     |                           | <input type="checkbox"/>            | toxic pollutants               |
|                                     |                           | <input checked="" type="checkbox"/> | nutrient enhancement           |

**9.0**  
 subtotal this page  
 last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 204

9

Subtotal first page

0 9  
max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 10  
max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**  
**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions.**  
Select only one.

- ☐ 0 High (5)
- ☐ 0 Moderately high(4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**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                          |

**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)
- ☒ X Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

10 Total Score

## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 1   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 4   |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 1   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_204 | <b>10</b> 1 Category based on score breakpoints      |

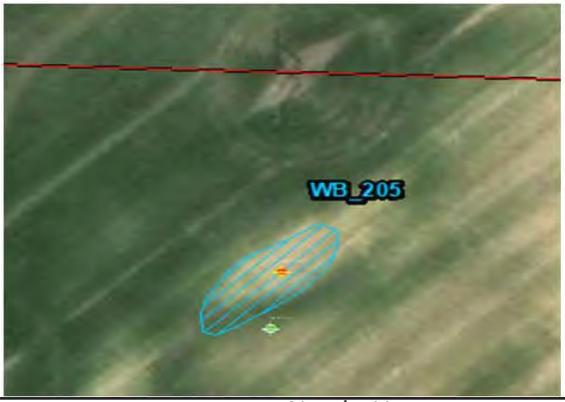
**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 204   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   |  | Evaluation of Categorization Result of ORAM  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
|  | Category 1  | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

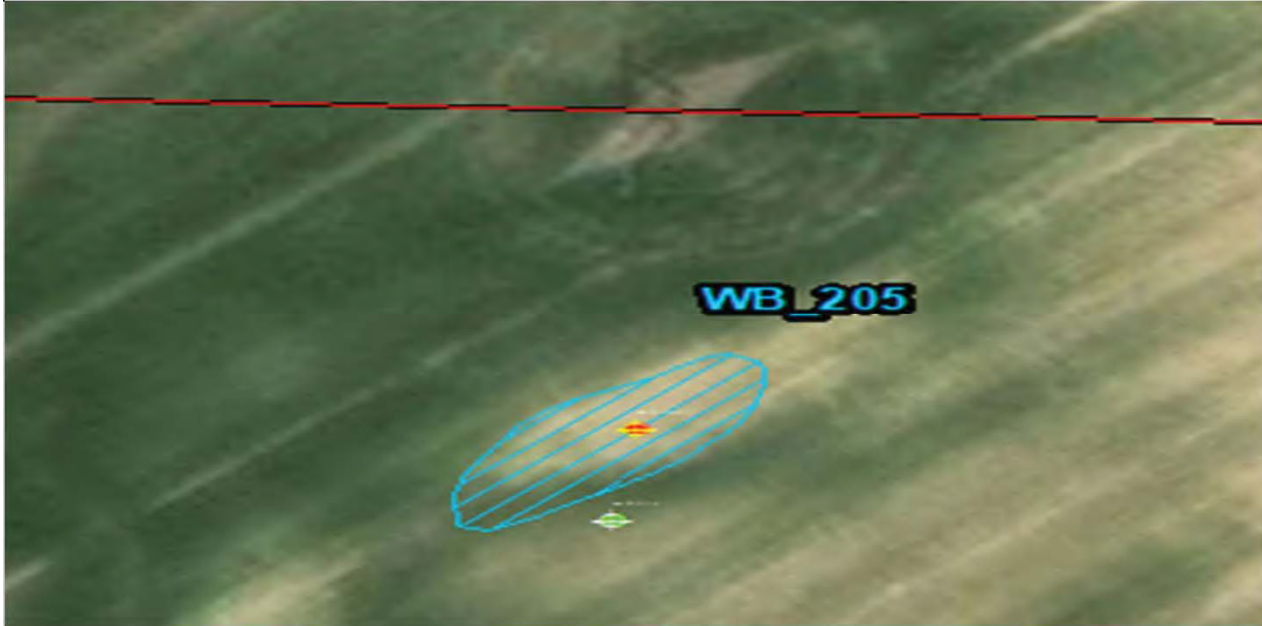
## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343   |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_205   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  <p style="text-align: center;">North: Up</p> |
| Lat/Long or UTM Coordinate  | 301413.526819 4415112.62038  |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | No   |
| Soil Survey   | CsA: Crosby -Lewisburg silt loams, 0 to 2 percent slopes   |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_205

Wetland Size (acres, hectares): 0.074

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 9

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_205**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**



## Narrative Rating

### Wetland: WB\_205

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                             |
|----|--|---|-----------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | NO<br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | NO<br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | NO<br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | NO<br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | NO<br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | NO<br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | NO<br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | NO<br><br>Go to Question 8b |



**Wetland: WB\_205**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br><br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br><br>Go to Question 9b  | <b>NO</b><br><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br><br>Go to Question 9d  | <b>NO</b><br><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br><br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br><br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br><br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinarum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 205 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|           |          |  |                           |       |
|-----------|----------|--|---------------------------|-------|
| <b>0</b>  | <b>0</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> | 0.074 |
| max 6 pts | subtotal | 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)

|            |            |   |
|------------|------------|---|
| <b>1.0</b> | <b>1.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b>   |
| max 14 pts | subtotal   | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |

- ☐ 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)

|            |            |   |
|------------|------------|---|
| <b>4.0</b> | <b>5.0</b> | <b>Metric 3 Hydrology</b>                         |
| max 30 pts | subtotal   | <b>3a. Sources of Water Score all that apply.</b> |

- ☐ 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 inlet | <input type="checkbox"/> other                                   |

|            |            |  |
|------------|------------|--|
| <b>3.0</b> | <b>8.0</b> | <b>Metric 4 Habitat Alteration and Development</b>                       |
| max 20 pts | subtotal   | <b>4a. Substrate disturbance. Score one or double check and average.</b> |

- ☐ 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 type="checkbox"/> mowing               | <input type="checkbox"/> shrub/sapling removal           |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal  |
| <input type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation        |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                        |
| <input type="checkbox"/> woody debris removal | <input checked="" type="checkbox"/> farming              |
| <input type="checkbox"/> toxic pollutants     | <input checked="" type="checkbox"/> nutrient enhancement |

**8.0**

subtotal this page

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 205

8

Subtotal first page

0 8  
max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 9  
max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**  
**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions.**  
Select only one.

- ☐ 0 High (5)
- ☐ 0 Moderately high(4)
- ☐ 0 Moderate (3)
- ☐ 0 Moderately low (2)
- ☐ 0 Low (1)
- ☒ X None (0)

**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                          |

**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)
- ☒ X Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

9 Total Score

## ORAM Summary Worksheet

| circle or highlight<br>answer or<br>insert<br>score                 |                 |        |          | Result   |
|---|-----------------|--------|----------|--|
| <b>Narrative Rating</b>   |                 |        |          |  |
| Question 1. Critical Habitat  | YES             | NO     |          | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES             | NO     |          | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES             | NO     |          | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES             | NO     |          | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES             | NO     |          | If yes, Category 1.                                  |
| Question 6. Bogs  | YES             | NO     |          | If yes, Category 3.                                  |
| Question 7. Fens  | YES             | NO     |          | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES             | NO     |          | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES             | NO     |          | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES             | NO     |          | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES             | NO     |          | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES             | NO     |          | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES             | NO     |          | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES             | NO     |          | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |                 |        |          |  |
| Metric 1. Size  |                 | 0      |          |  |
| Metric 2. Buffers and surrounding land use                          |                 | 1      |          |  |
| Metric 3. Hydrology   |                 | 4      |          |  |
| Metric 4. Habitat   |                 | 3      |          |  |
| Metric 5. Special Wetland Communities                               |                 | 0      |          |  |
| Metric 6. Plant communities, interspersed, microtopography          |                 | 1      |          |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b> | WB_205 | <b>9</b> | <b>1</b> Category based on score breakpoints         |

**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 205   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   | Evaluation of Categorization Result of ORAM                      |  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
| Category 1   |   | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

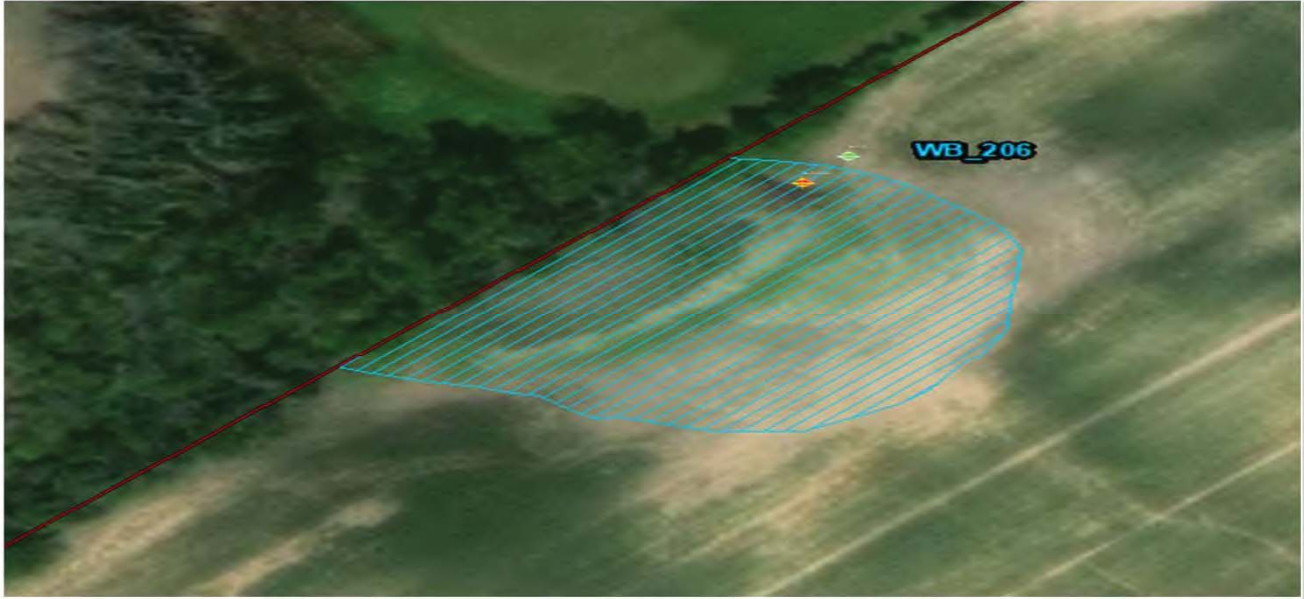
## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343   |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_206   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  <p style="text-align: center;">North: Up</p> |
| Lat/Long or UTM Coordinate  | 301169.047636 4415019.8617   |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | No   |
| Soil Survey   | CsB: Crosby -Lewisburg silt loams, 2 to 6 percent slopes   |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_206

Wetland Size (acres, hectares): 1.010

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 21.5

Category: 1



### Scoring Boundary Worksheet

**Wetland: WB\_206**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

**Wetland: WB\_206**

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_206**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br>Go to Question 9b  | <b>NO</b><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br>Go to Question 9d  | <b>NO</b><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinarum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

End of Narrative Rating. Begin Quantitative Rating on next page.

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 206 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|           |          |  |                           |       |
|-----------|----------|--|---------------------------|-------|
| <b>0</b>  | <b>0</b> | <b>Metric 1</b>                        | <b>Wetland Area (Ac.)</b> | 1.010 |
| max 6 pts | subtotal | 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)

|            |            |   |   |
|------------|------------|---|---|
| <b>3.0</b> | <b>3.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b> | <b>2a. Calculate average buffer width. Select only one and assign score. Do not double check.</b> |
| max 14 pts | subtotal   |   |   |

- ☐ 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)

|            |             |                           |   |
|------------|-------------|---------------------------|---|
| <b>7.0</b> | <b>10.0</b> | <b>Metric 3 Hydrology</b> | <b>3a. Sources of Water Score all that apply.</b> |
| max 30 pts | subtotal    |                           |   |

- ☐ 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 checked="" 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 inlet | <input type="checkbox"/> other                                   |

|            |             |  |
|------------|-------------|--|
| <b>4.5</b> | <b>14.5</b> | <b>Metric 4 Habitat Alteration and Development</b> |
| max 20 pts | subtotal    |  |

**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 type="checkbox"/> mowing               | <input type="checkbox"/> shrub/sapling removal           |
| <input type="checkbox"/> grazing              | <input type="checkbox"/> herbaceous/aquatic bed removal  |
| <input type="checkbox"/> clearcutting         | <input checked="" type="checkbox"/> sedimentation        |
| <input type="checkbox"/> selective cutting    | <input type="checkbox"/> dredging                        |
| <input type="checkbox"/> woody debris removal | <input checked="" type="checkbox"/> farming              |
| <input type="checkbox"/> toxic pollutants     | <input checked="" type="checkbox"/> nutrient enhancement |

**14.5**

subtotal this page

last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 206

14.5

Subtotal first page

0 14.5

max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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)

7 21.5

max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**

**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☒ 1 Aquatic bed
- ☐ 0 Emergent
- ☒ 2 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

**6b. Horizontal (plan view) Interspersions. Select only one.**

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ 0 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)
- ☐ 0 Sparse 5-25% cover (-1)
- ☒ X Nearly absent <5% cover (0)
- ☐ 0 Absent (1)

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☒ 1 Coarse woody debris >15cm (6in)
- ☒ 2 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

|   |   |
|---|---|
| 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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

21.5 Total Score

## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 0   |        |  |
| Metric 2. Buffers and surrounding land use                          | 3   |        |  |
| Metric 3. Hydrology   | 7   |        |  |
| Metric 4. Habitat   | 4.5   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 7   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_206 | <b>21.5</b> 1 Category based on score breakpoints    |

**Complete Wetland Categorization Worksheet.**

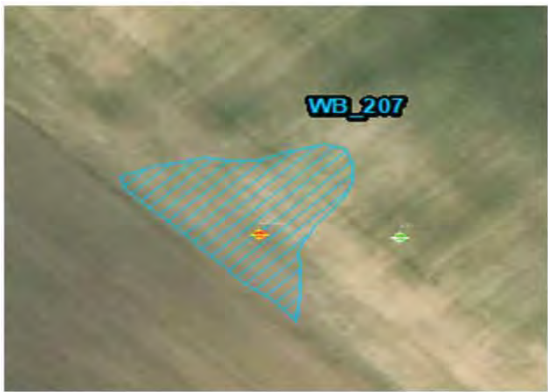
## Wetland Categorization Worksheet

| Wetland WB 206   |  |  |  |
|--|--|--|--|
| Choices  | Circle or highlight one  | Evaluation of Categorization Result of ORAM                |  |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES  | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
|  | Wetland is categorized as a Category 3 wetland   |  |  |
| Did you answer "Yes" to any of the following questions:<br><br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES  | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
|  | Wetland should be evaluated for possible Category 3 status   |  |  |
| Did you answer "Yes" to<br><br>Narrative Rating Nos. 5   | YES  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
|  | Wetland should be categorized as a Category 1 wetland  |  |  |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES  | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES  | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES  | NO   | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
|  | Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | Wetland is assigned to category as determined by the ORAM. |  |
| Choose one   | <b>Final Category : 1</b>  |  |  |
| Category 1   |  | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**



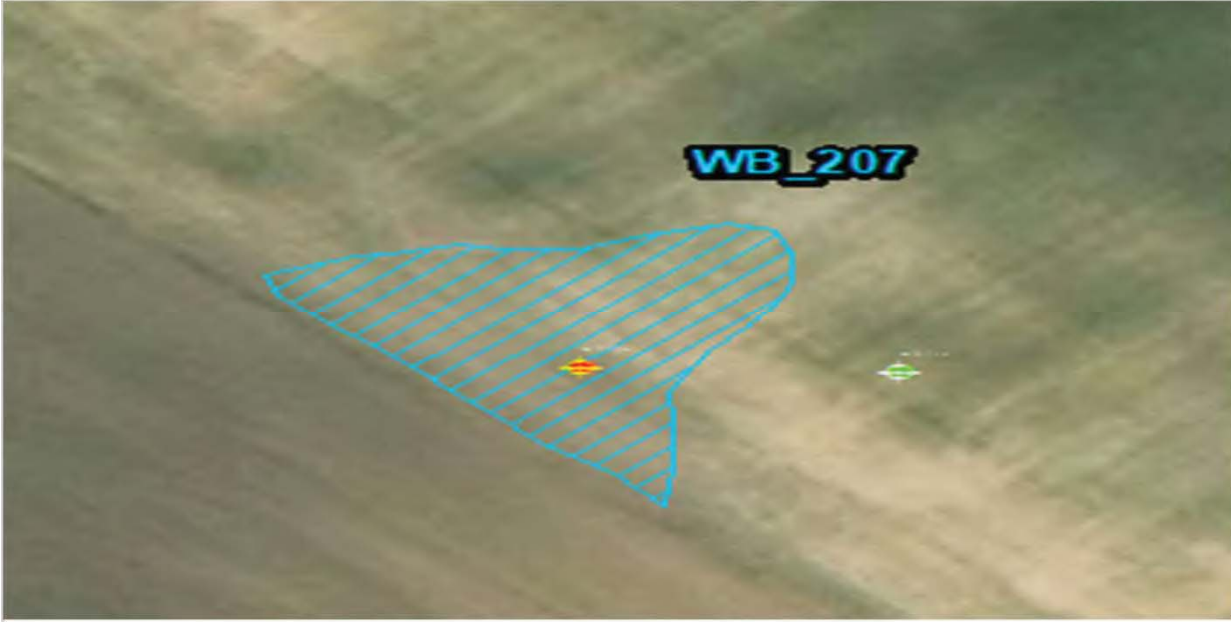
## Background Information

|   |  |
|---|--|
| Name:   | David Kuhlmann   |
| Date:   | 11/19/2019   |
| Affiliation:  | Westwood Professional Services, Inc.   |
| Address:  | 12701 Whitewater Drive, Suite 300 Minnetonka, MN 55343                             |
| Phone Number:   | (952) 937-5150   |
| e-mail address:   | david.Kuhlmann@westwoodps.com  |
| Name of Wetland:  | WB_207   |
| Vegetation Community(ies):  | Farmed, Type 1, PEM1Af   |
| HGM Class(es):  | depressional   |
| Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. |  |
| North: Up   |  |
| Lat/Long or UTM Coordinate  | 301144.357855 4414663.57495  |
| USGS Quad Name  | Big Plain OH o39083g3  |
| County  | Madison  |
| Township  | Fairfield  |
| Section and Subsection  | No   |
| Hydrologic Unit Code  | 50600020106  |
| Site Visit  | 11/19/2019   |
| NWI Map   | No   |
| Ohio Wetland Inventory Map  | No   |
| Soil Survey   | Ko: Kokomo silty clay loam, 0 to 2 percent slopes                                  |
| Delineation report/map  | See Report Exhibits  |

Name of Wetland: WB\_207

Wetland Size (acres, hectares): 0.184

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.



Comments, Narrative Discussion, Justification of Category Changes:

**North: Up**

See Wetland and Upland Sample Datasheets

Final score : 10

Category: 1

### Scoring Boundary Worksheet

**Wetland: WB\_207**

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

| #             | Steps in properly establishing scoring boundaries   | done? | not applicable |
|---------------|---|-------|----------------|
| <b>Step 1</b> | Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.   | Yes   | Not Applicable |
| <b>Step 2</b> | Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland. | Yes   | Not Applicable |
| <b>Step 3</b> | Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.   | Yes   | Not Applicable |
| <b>Step 4</b> | Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.  | Yes   | Not Applicable |
| <b>Step 5</b> | In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.   | Yes   | Not Applicable |
| <b>Step 6</b> | Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.   | Yes   | Not Applicable |

**End of Scoring Boundary Determination. Begin Narrative Rating on next page.**

## Narrative Rating

### Wetland: WB\_207

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

| #  | Question   | Circle or highlight one   |                                    |
|----|--|---|------------------------------------|
| 1  | <b>Critical Habitat.</b> Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 1812 July 6, 2000). | YES<br><br>Wetland should be evaluated for possible Category 3 status<br><br>Go to Question 2 | <b>NO</b><br><br>Go to Question 2  |
| 2  | <b>Threatened or Endangered Species.</b> Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 3                                  | <b>NO</b><br><br>Go to Question 3  |
| 3  | <b>Documented High Quality Wetland.</b> Is the wetland on record in Natural Heritage Database as a high quality wetland?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 4                                  | <b>NO</b><br><br>Go to Question 4  |
| 4  | <b>Significant Breeding or oncentration Area.</b> Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?  | YES<br><br>Wetland is a Category 3 wetland. Go to Question 5                                  | <b>NO</b><br><br>Go to Question 5  |
| 5  | <b>Category 1 Wetlands.</b> Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?  | YES<br><br>Wetland is a Category 1 wetland. Go to Question 6                                  | <b>NO</b><br><br>Go to Question 6  |
| 6  | <b>Bogs.</b> Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 7                                  | <b>NO</b><br><br>Go to Question 7  |
| 7  | <b>Fens.</b> Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8a                                 | <b>NO</b><br><br>Go to Question 8a |
| 8a | <b>"Old Growth Forest."</b> Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?                   | YES<br><br>Wetland is a Category 3 wetland. Go to Question 8b                                 | <b>NO</b><br><br>Go to Question 8b |

**Wetland: WB\_207**

|    |   |   |   |
|----|---|---|---|
| 8b | <b>Mature forested wetlands.</b> Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast eight (dbh), generally diameters greater than 45cm (17.7in) dbh?   | YES<br>Wetland should be evaluated for possible Go to Question 9a Category 3 status.            | <b>NO</b><br>Go to Question 9a            |
| 9a | <b>Lake Erie coastal and tributary wetlands.</b> Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?   | YES<br>Go to Question 9b  | <b>NO</b><br>Go to Question 10            |
| 9b | Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?  | YES   | <b>NO</b><br>Go to Question 9c            |
| 9c | Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.   | YES<br>Go to Question 9d  | <b>NO</b><br>Go to Question 10            |
| 9d | Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?   | YES<br>Wetland is a Category 3 wetland. Go to Question 10                                       | <b>NO</b><br>Go to Question 9e            |
| 9e | Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?  | YES<br>Wetland should be evaluated for possible Category 3 status. Go to Question 10            | <b>NO</b><br>Go to Question 10            |
| 10 | <b>Lake Plain Sand Prairies (Oak Openings)</b> Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality. | YES<br>Wetland is a Category 3 wetland. Go to Question 11                                       | <b>NO</b><br>Go to Question 11            |
| 11 | <b>Relict Wet Prairies.</b> Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).   | YES<br>Wetland should be evaluated for possible Category 3 status. Complete Quantitative Rating | <b>NO</b><br>Complete Quantitative Rating |

Table 1. Characteristic plant species.

| invasive/exotic spp          | fen species                                  | bog species                                   | Oak Opening species             | wet prairie species              |
|------------------------------|--|---|---------------------------------|----------------------------------|
| <i>Lythrum salicaria</i>     | <i>Zygadenus elegans</i> var. <i>glaucus</i> | <i>Calla palustris</i>                        | <i>Carex cryptolepis</i>        | <i>Calamagrostis canadensis</i>  |
| <i>Myriophyllum spicatum</i> | <i>Cacalia plantaginea</i>                   | <i>Carex atlantica</i> var. <i>capillacea</i> | <i>Carex lasiocarpa</i>         | <i>Calamagrostis stricta</i>     |
| <i>Najas minor</i>           | <i>Carex flava</i>                           | <i>Carex echinata</i>                         | <i>Carex stricta</i>            | <i>Carex atherodes</i>           |
| <i>Phalaris arundinacea</i>  | <i>Carex sterilis</i>                        | <i>Carex oligosperma</i>                      | <i>Cladium mariscoides</i>      | <i>Carex buxbaumii</i>           |
| <i>Phragmites australis</i>  | <i>Carex stricta</i>                         | <i>Carex trisperma</i>                        | <i>Calamagrostis stricta</i>    | <i>Carex pellita</i>             |
| <i>Potamogeton crispus</i>   | <i>Deschampsia caespitosa</i>                | <i>Chamaedaphne calyculata</i>                | <i>Calamagrostis canadensis</i> | <i>Carex sartwellii</i>          |
| <i>Ranunculus ficaria</i>    | <i>Eleocharis rostellata</i>                 | <i>Decodon verticillatus</i>                  | <i>Quercus palustris</i>        | <i>Gentiana andrewsii</i>        |
| <i>Rhamnus frangula</i>      | <i>Eriophorum viridicarinatum</i>            | <i>Eriophorum virginicum</i>                  |                                 | <i>Helianthus grosseserratus</i> |
| <i>Typha angustifolia</i>    | <i>Gentianopsis</i> spp.                     | <i>Larix laricina</i>                         |                                 | <i>Liatris spicata</i>           |
| <i>Typha xglauc</i>          | <i>Lobelia kalmii</i>                        | <i>Nemopanthus mucronatus</i>                 |                                 | <i>Lysimachia quadriflora</i>    |
|                              | <i>Parnassia glauca</i>                      | <i>Scheuchzeria palustris</i>                 |                                 | <i>Lythrum alatum</i>            |
|                              | <i>Potentilla fruticosa</i>                  | <i>Sphagnum</i> spp.                          |                                 | <i>Pycnanthemum virginianum</i>  |
|                              | <i>Rhamnus alnifolia</i>                     | <i>Vaccinium corymbosum</i>                   |                                 | <i>Silphium terebinthinaceum</i> |
|                              | <i>Rhynchospora capillacea</i>               | <i>Vaccinium oxycoccos</i>                    |                                 | <i>Sorghastrum nutans</i>        |
|                              | <i>Salix candida</i>                         | <i>Woodwardia virginica</i>                   |                                 | <i>Spartina pectinata</i>        |
|                              | <i>Salix myricoides</i>                      | <i>Xyris difformis</i>                        |                                 | <i>Solidago riddellii</i>        |
|                              | <i>Salix serissima</i>                       |   |                                 |                                  |
|                              | <i>Solidago ohioensis</i>                    |   |                                 |                                  |
|                              | <i>Toxifolia glutinosa</i>                   |   |                                 |                                  |
|                              | <i>Triglochin maritimum</i>                  |   |                                 |                                  |
|                              | <i>Triglochin palustre</i>                   |   |                                 |                                  |

**End of Narrative Rating. Begin Quantitative Rating on next page.**

ORAM v. 5.0 Field Form Quantitative Rating

|              |         |                  |                |              |            |                 |        |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|
| <b>Site:</b> | Francis | <b>Rater(s):</b> | David Kuhlmann | <b>Date:</b> | 11/19/2019 | <b>Wetland:</b> | WB 207 |
|--------------|---------|------------------|----------------|--------------|------------|-----------------|--------|

|  |          |                                     |   |
|--|----------|-------------------------------------|---|
| <b>1</b>                               | <b>1</b> | <b>Metric 1</b>                     | <b>Wetland Area (Ac.)</b>                   |
|  |          | subtotal                            | 0.184                                       |
| select one size class and assign score |          |                                     |   |
| max 6 pts                              | subtotal | <input type="checkbox"/>            | >50 acres (>20.2ha) (6 pts)                 |
|  |          | <input type="checkbox"/>            | 25 to <50 acres (10.1 to <20.2ha) (5 pts)   |
|  |          | <input type="checkbox"/>            | 10 to <25 acres (4 to <10.1ha) (4 pts)      |
|  |          | <input type="checkbox"/>            | 3 to <10 acres (1.2 to <4ha) (3 pts)        |
|  |          | <input type="checkbox"/>            | 0.3 to <3 acres (0.12 to <1.2ha) (2pts)     |
|  |          | <input checked="" type="checkbox"/> | 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt.) |
|  |          | <input type="checkbox"/>            | <0.1 acres (0.04ha) (0 pts)                 |

|  |            |   |
|--|------------|---|
| <b>1.0</b>   | <b>2.0</b> | <b>Metric 2 Upland Buffers and Surrounding Land use</b> |
| 2a. Calculate average buffer width. Select only one and assign score. Do not double check. |            |   |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 14 pts | subtotal | <input type="checkbox"/>            | WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)           |
|            |          | <input type="checkbox"/>            | MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)  |
|            |          | <input type="checkbox"/>            | NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1) |
|            |          | <input checked="" type="checkbox"/> | VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)           |

2b. Intensity of surrounding land use. Select one or double check and average.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)                |
| <input type="checkbox"/>            | LOW. Old field (>10 years), shrub land, young second growth forest. (5)                         |
| <input type="checkbox"/>            | MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3) |
| <input checked="" type="checkbox"/> | HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)                  |

|  |            |                           |
|--|------------|---------------------------|
| <b>4.0</b>                                 | <b>6.0</b> | <b>Metric 3 Hydrology</b> |
| 3a. Sources of Water Score all that apply. |            |                           |

|            |          |                                     |  |
|------------|----------|-------------------------------------|--|
| max 30 pts | subtotal | <input type="checkbox"/>            | High pH groundwater (5)                      |
|            |          | <input type="checkbox"/>            | Other groundwater (3)                        |
|            |          | <input checked="" type="checkbox"/> | Precipitation (1)                            |
|            |          | <input type="checkbox"/>            | Seasonal/Intermittent surface water (3)      |
|            |          | <input type="checkbox"/>            | Perennial surface water (lake or stream) (5) |

3b. Connectivity. Score all that apply.

|                          |   |
|--------------------------|---|
| <input type="checkbox"/> | 100 year floodplain (1)                           |
| <input type="checkbox"/> | Between stream/lake and other human use (1)       |
| <input type="checkbox"/> | Part of wetland/upland (e.g. forest), complex (1) |
| <input type="checkbox"/> | Part of riparian or upland corridor (1)           |

3c. Maximum water depth. Select only one and assign score.

|                                     |                                  |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/>            | >0.7 (27.6in) (3)                |
| <input type="checkbox"/>            | 0.4 to 0.7m (15.7 to 27.6in) (2) |
| <input checked="" type="checkbox"/> | <0.4m (<15.7in) (1)              |

3d. Duration inundation/saturation. Score one or dbl check.

|                                     |   |
|-------------------------------------|---|
| <input type="checkbox"/>            | Semi- to permanently inundated/saturated (4)  |
| <input type="checkbox"/>            | Regularly inundated/saturated (3)             |
| <input type="checkbox"/>            | Seasonally inundated (2)                      |
| <input checked="" type="checkbox"/> | 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) | Check all disturbances observed     |                              |
| <input type="checkbox"/>            | Recovered (7)              | <input type="checkbox"/>            | ditch                        |
| <input type="checkbox"/>            | Recovering (3)             | <input checked="" type="checkbox"/> | tile                         |
| <input checked="" type="checkbox"/> | Recent or no recovery (1)  | <input type="checkbox"/>            | dike                         |
|                                     |                            | <input type="checkbox"/>            | weir                         |
|                                     |                            | <input type="checkbox"/>            | stormwater inlet             |
|                                     |                            | <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                        |

|            |            |  |
|------------|------------|--|
| <b>3.0</b> | <b>9.0</b> | <b>Metric 4 Habitat Alteration and Development</b> |
|------------|------------|--|

4a. Substrate disturbance. Score one or double check and average.

|            |          |                                     |                           |
|------------|----------|-------------------------------------|---------------------------|
| max 20 pts | subtotal | <input type="checkbox"/>            | None or none apparent (4) |
|            |          | <input type="checkbox"/>            | Recovered (3)             |
|            |          | <input type="checkbox"/>            | Recovering (2)            |
|            |          | <input checked="" type="checkbox"/> | Recent or no recovery (1) |

4b. Habitat development. Select only one and assign score.

|                                     |                     |
|-------------------------------------|---------------------|
| <input type="checkbox"/>            | Excellent (7)       |
| <input type="checkbox"/>            | Very good (6)       |
| <input type="checkbox"/>            | Good (5)            |
| <input type="checkbox"/>            | Moderately good (4) |
| <input type="checkbox"/>            | Fair (3)            |
| <input type="checkbox"/>            | Poor to fair (2)    |
| <input checked="" type="checkbox"/> | Poor (1)            |

4c. Habitat alteration. Score one or double check and average.

|                                     |                           |                                     |                                |
|-------------------------------------|---------------------------|-------------------------------------|--------------------------------|
| <input type="checkbox"/>            | None or none apparent (9) | Check all disturbances observed     |                                |
| <input type="checkbox"/>            | Recovered (6)             | <input type="checkbox"/>            | mowing                         |
| <input type="checkbox"/>            | Recovering (3)            | <input type="checkbox"/>            | grazing                        |
| <input checked="" type="checkbox"/> | Recent or no recovery (1) | <input type="checkbox"/>            | clearcutting                   |
|                                     |                           | <input type="checkbox"/>            | selective cutting              |
|                                     |                           | <input type="checkbox"/>            | woody debris removal           |
|                                     |                           | <input type="checkbox"/>            | toxic pollutants               |
|                                     |                           | <input type="checkbox"/>            | shrub/sapling removal          |
|                                     |                           | <input type="checkbox"/>            | herbaceous/aquatic bed removal |
|                                     |                           | <input checked="" type="checkbox"/> | sedimentation                  |
|                                     |                           | <input type="checkbox"/>            | dredging                       |
|                                     |                           | <input checked="" type="checkbox"/> | farming                        |
|                                     |                           | <input checked="" type="checkbox"/> | nutrient enhancement           |

**9.0**  
 subtotal this page  
 last revised 1 February 2001 jjm

ORAM v. 5.0 Field Form Quantitative Rating

Site: Francis Rater(s): David Kuhlmann

Date: 11/19/2019 Wetland: WB 207

9

Subtotal first page

0 9

max 6 pts subtotal

**Metric 5. Special Wetlands**  
select one size class and assign score

- ☐ 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 10

max 14 pts subtotal

**Metric 6 Plant communities, interspersions, micro topography.**  
**6a. Wetland Vegetation Communities. Vegetation Community Cover Scale**

Score all present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other

|   |   |
|---|---|
| 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   |

**6b. Horizontal (plan view) Interspersions. Select only one.**

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

**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                          |

**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)
- ☐ 0 Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☒ Absent (1)

**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           |

**6d. Microtopography**

Score all present using 1 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

**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 higher quality or in small amounts of highest quality |
| 3 | Present in moderate or greater amounts and of highest quality                                 |

End of Quantitative Rating. Complete Categorization Worksheets.

10 Total Score



## ORAM Summary Worksheet

|   | circle or highlight<br>answer or<br>insert<br>score |        | Result   |
|---|---|--------|--|
| <b>Narrative Rating</b>   |   |        |  |
| Question 1. Critical Habitat  | YES   | NO     | If yes, Category 3.                                  |
| Question 2. Threatened or Endangered Species                        | YES   | NO     | If yes, Category 3.                                  |
| Question 3. High Quality Natural Wetland                            | YES   | NO     | If yes, Category 3.                                  |
| Question 4. Significant bird habitat                                | YES   | NO     | If yes, Category 3.                                  |
| Question 5. Category 1 Wetlands                                     | YES   | NO     | If yes, Category 1.                                  |
| Question 6. Bogs  | YES   | NO     | If yes, Category 3.                                  |
| Question 7. Fens  | YES   | NO     | If yes, Category 3.                                  |
| Question 8a. Old Growth Forest                                      | YES   | NO     | If yes, Category 3.                                  |
| Question 8b. Mature Forested Wetland                                | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9b. Lake Erie Wetlands - Restricted                        | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 9d. Lake Erie Wetlands – Unrestricted with native plants   | YES   | NO     | If yes, Category 3.                                  |
| Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| Question 10. Oak Openings   | YES   | NO     | If yes, Category 3.                                  |
| Question 11. Relict Wet Prairies                                    | YES   | NO     | If yes, evaluate for Category 3; may also be 1 or 2. |
| <b>Quantitative Rating</b>  |   |        |  |
| Metric 1. Size  | 1   |        |  |
| Metric 2. Buffers and surrounding land use                          | 1   |        |  |
| Metric 3. Hydrology   | 4   |        |  |
| Metric 4. Habitat   | 3   |        |  |
| Metric 5. Special Wetland Communities                               | 0   |        |  |
| Metric 6. Plant communities, interspersed, microtopography          | 1   |        |  |
| <b>TOTAL SCORE</b>  | <b>Wetland:</b>                                     | WB_207 | <b>10</b> 1 Category based on score breakpoints      |

**Complete Wetland Categorization Worksheet.**

## Wetland Categorization Worksheet

| Wetland WB 207   |   |  |  |
|--|---|--|--|
| Choices  | Circle or highlight one   | Evaluation of Categorization Result of ORAM                      |  |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10   | YES<br>Wetland is categorized as a Category 3 wetland   | NO   | Is quantitative rating score less than the Category 2 scoring threshold (excluding gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM   |
| Did you answer "Yes" to any of the following questions:<br>Narrative Rating Nos. 1, 8b, 9b, 9e, 11   | YES<br>Wetland should be evaluated for possible Category 3 status   | NO   | Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.   |
| Did you answer "Yes" to<br>Narrative Rating Nos. 5   | YES<br>Wetland should be categorized as a Category 1 wetland  | NO   | Is quantitative rating score greater than the Category 2 scoring threshold (including any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM   |
| Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?  | YES<br>Wetland is assigned to the appropriate category based on the scoring range   | NO   | If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.   |
| Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?   | YES<br>Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria   | NO   | Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1-54(C).   |
| Does the wetland otherwise exhibit moderate OR superior hydrologic OR habitat, OR recreational functions AND the wetland was not categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method? | YES<br>Wetland was under categorized by this method. A written justification for recategorization should be provided on Background Information Form | NO<br>Wetland is assigned to category as determined by the ORAM. | A wetland may be under categorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this |
| Choose one   | <b>Final Category : 1</b>   |  |  |
| Category 1   |   | Category 2   | Category 3   |

**End of Ohio Rapid Assessment Method for Wetlands.**

## Appendix B2

### QHEI & HHEI Forms

Stream &amp; Location: Glade Run; WC-01

RM: 0.8 Date: 12/16/16

River Code: - STORET #: -

Scorers Full Name &amp; Affiliation: David Kohlmann - Westwood

Lat./Long.: 39.8635 183.3476

Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

Check ONE (Or 2 &amp; average)

| BEST TYPES   |                                      | OTHER TYPES                             |                                      | ORIGIN  |                                       | QUALITY  |                            |
|--|--------------------------------------|---|--------------------------------------|---|---------------------------------------|--|----------------------------|
| <input type="checkbox"/> BLDR/SLABS [10]   | <input type="checkbox"/> POOL RIFFLE | <input type="checkbox"/> HARDPAN [4]    | <input type="checkbox"/> POOL RIFFLE | <input type="checkbox"/> LIMESTONE [1]        | <input type="checkbox"/> SILT         | <input type="checkbox"/> HEAVY [-2]            | Substrate<br>Maximum<br>20 |
| <input type="checkbox"/> BOULDER [9]   |                                      | <input type="checkbox"/> DETRITUS [3]   |                                      | <input checked="" type="checkbox"/> TILLS [1] |                                       | <input type="checkbox"/> MODERATE [-1]         |                            |
| <input type="checkbox"/> COBBLE [8]  |                                      | <input type="checkbox"/> MUCK [2]       |                                      | <input type="checkbox"/> WETLANDS [0]         |                                       | <input checked="" type="checkbox"/> NORMAL [0] |                            |
| <input checked="" type="checkbox"/> GRAVEL [7]   | 90                                   | <input type="checkbox"/> SILT [2]       |                                      | <input type="checkbox"/> HARDPAN [0]          |                                       | <input type="checkbox"/> FREE [1]              |                            |
| <input checked="" type="checkbox"/> SAND [6]   | 60                                   | <input type="checkbox"/> ARTIFICIAL [0] |                                      | <input type="checkbox"/> SANDSTONE [0]        |                                       | <input type="checkbox"/> EXTENSIVE [-2]        |                            |
| <input type="checkbox"/> BEDROCK [5]   |                                      |   |                                      | <input type="checkbox"/> RIP/RAP [0]          |                                       | <input type="checkbox"/> MODERATE [-1]         |                            |
| (Score natural substrates; ignore sludge from point-sources)   |                                      |   |                                      | <input type="checkbox"/> LACUSTURINE [0]      | <input type="checkbox"/> EMBEDDEDNESS | <input checked="" type="checkbox"/> NORMAL [0] |                            |
| NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0] |                                      |   |                                      | <input type="checkbox"/> SHALE [-1]           |                                       | <input type="checkbox"/> NONE [1]              |                            |
| Comments   |                                      |   |                                      | <input type="checkbox"/> COAL FINES [-2]      |                                       |  |                            |

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 &amp; average)

|  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> UNDERCUT BANKS [1]                    | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   | <input type="checkbox"/> EXTENSIVE >75% [11]            |
| <input checked="" type="checkbox"/> OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]          | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] | <input checked="" type="checkbox"/> SPARSE 5-<25% [3]   |
| <input type="checkbox"/> ROOTMATS [1]                          |   |   | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |

Comments

Cover  
Maximum  
20

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY  | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY  |
|--|--|--|--|
| <input type="checkbox"/> HIGH [4]                | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]                |
| <input checked="" type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]                 | <input checked="" type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]                | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |  |

Comments

Channel  
Maximum  
20

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

River right looking downstream

| EROSION  | RIPIARIAN WIDTH                                      | FLOOD PLAIN QUALITY   |  |
|--|--|---|--|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input type="checkbox"/> WIDE > 50m [4]              | <input checked="" type="checkbox"/> FOREST, SWAMP [3]         | <input type="checkbox"/> CONSERVATION TILLAGE [1]  |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> MODERATE 10-50m [3]         | <input type="checkbox"/> SHRUB OR OLD FIELD [2]               | <input type="checkbox"/> URBAN OR INDUSTRIAL [0]   |
| <input type="checkbox"/> HEAVY / SEVERE [1]      | <input checked="" type="checkbox"/> NARROW 5-10m [2] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]     | <input type="checkbox"/> MINING / CONSTRUCTION [0] |
|  | <input type="checkbox"/> VERY NARROW < 5m [1]        | <input type="checkbox"/> FENCED PASTURE [1]                   |  |
|  | <input type="checkbox"/> NONE [0]                    | <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0] |  |

Comments

Indicate predominant land use(s)  
past 100m riparian.Riparian  
Maximum  
10

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

- ☐ > 1m [6]  
☐ 0.7-<1m [4]  
☒ 0.4-<0.7m [2]  
☐ 0.2-<0.4m [1]  
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 &amp; average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]  
☒ POOL WIDTH = RIFFLE WIDTH [1]  
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1] ☐ SLOW [1]  
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]  
☐ FAST [1] ☐ INTERMITTENT [-2]  
☒ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Comments

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /  
Current  
Maximum  
12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH

RUN DEPTH

RIFFLE / RUN SUBSTRATE

RIFFLE / RUN EMBEDDEDNESS

- ☒ BEST AREAS > 10cm [2] ☒ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2]  
☒ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☒ MOD. STABLE (e.g., Large Gravel) [1]  
☐ BEST AREAS < 5cm [metric=0] ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

- ☐ NONE [2]  
☐ LOW [1]  
☒ MODERATE [0]  
☐ EXTENSIVE [-1]

Comments

Riffle /  
Run  
Maximum  
86] GRADIENT (3.34 ft/mi) ☒ VERY LOW - LOW [2-4]  
DRAINAGE AREA (19.5 mi<sup>2</sup>) ☐ MODERATE [6-10]  
☐ HIGH - VERY HIGH [10-6]%POOL: 25 %GLIDE: 5  
%RUN: 10 %RIFFLE: 60Gradient  
Maximum  
10

Check ALL that apply

**METHOD**

1st-sample pass-2nd

- |   |  |                          |
|---|--|--------------------------|
| <input type="checkbox"/> BOAT             | <input type="checkbox"/> HIGH              | <input type="checkbox"/> |
| <input type="checkbox"/> WADE             | <input type="checkbox"/> UP                | <input type="checkbox"/> |
| <input type="checkbox"/> L. LINE          | <input checked="" type="checkbox"/> NORMAL | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> OTHER | <input type="checkbox"/> LOW               | <input type="checkbox"/> |
| DISTANCE                                  | <input type="checkbox"/> DRY               | <input type="checkbox"/> |

## DISTANCE

- ☐ 0.5 Km ☐ 1st --sample pass-- 2
- ☐ 0.2 Km ☐ CLARITY
- ☐ 0.15 Km ☐ < 20 cm
- ☒ 0.12 Km ☒ 20-<40 cm
- ☐ OTHER ☐ 40-70 cm

## CLARITY

- 1st --sample pass-- 2nd
- ☐ < 20 cm ☐
- ☒ 20-<40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

## meters

## CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☐ 10%-<30%  
☒ <10%- CLOSED

## C1 RECREATION

POOL:  $\square > 100ft^2$   $\square > 3ft$

## B7AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

## D1 MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCOURED  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT & GRIME  
CONTAMINATED / LANDFILL  
BMPs - CONSTRUCTION - SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

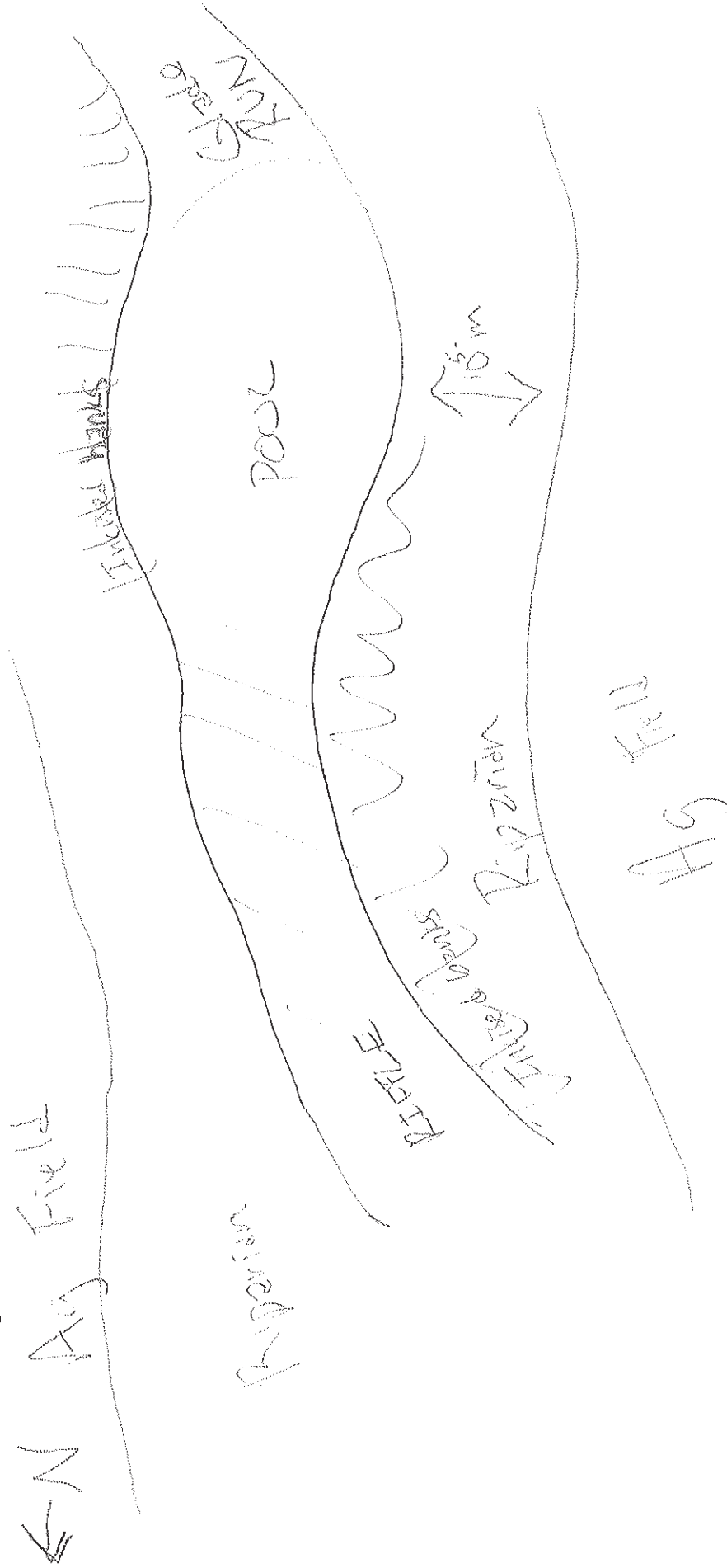
## ISSUES

- $\bar{x}$  width  
 $\bar{x}$  depth  
 max. depth  
 $\bar{x}$  bankfull width  
 bankfull  $\bar{x}$  depth  
 W/D ratio  
 bankfull max. depth  
 floodprone  $x^2$  width  
 entrench. ratio  
 Legacy Tree:

## FI MEASUREMENTS

Legacy Tree:

Stream Drawing:







# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: **67.5**

Stream & Location: Deer Creek ; WC-02

RM: 52.8 Date: 2/16/16

River Code: - - - - STORET #: - - - -

Scorers Full Name & Affiliation: David Kuhlmann - westwood

Lat./Long.: 39.2536 183.3473

Office verified location ☐

1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

| BEST TYPES                                     |                          | POOL RIFFLE                         |                          | OTHER TYPES  |                          | POOL RIFFLE              |                          |
|--|--------------------------|-------------------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> BLDR/SLABS [10]       | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> HARDPAN [4]                         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> BOULDER [9]           | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> DETRITUS [3]                        | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> COBBLE [8]            | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> MUCK [2]                            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> GRAVEL [7] | <u>60</u>                | <input checked="" type="checkbox"/> | <u>30</u>                | <input checked="" type="checkbox"/> SILT [2]                 | <u>10</u>                | <input type="checkbox"/> | <u>30</u>                |
| <input type="checkbox"/> SAND [6]              | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> ARTIFICIAL [0]                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> BEDROCK [5]           | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | (Score natural substrates; ignore sludge from point-sources) |                          |                          |                          |

| ORIGIN  |                          |
|---|--------------------------|
| <input type="checkbox"/> LIMESTONE [1]        | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> TILLS [1] | <input type="checkbox"/> |
| <input type="checkbox"/> WETLANDS [0]         | <input type="checkbox"/> |
| <input type="checkbox"/> HARDPAN [0]          | <input type="checkbox"/> |
| <input type="checkbox"/> SANDSTONE [0]        | <input type="checkbox"/> |
| <input type="checkbox"/> RIP/RAP [0]          | <input type="checkbox"/> |
| <input type="checkbox"/> LACUSTURINE [0]      | <input type="checkbox"/> |
| <input type="checkbox"/> SHALE [-1]           | <input type="checkbox"/> |
| <input type="checkbox"/> COAL FINES [-2]      | <input type="checkbox"/> |

| QUALITY  |                          |
|--|--------------------------|
| <input type="checkbox"/> HEAVY [-2]            | <input type="checkbox"/> |
| <input type="checkbox"/> MODERATE [-1]         | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> NORMAL [0] | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> FREE [1]   | <input type="checkbox"/> |
| <input type="checkbox"/> EXTENSIVE [-2]        | <input type="checkbox"/> |
| <input type="checkbox"/> MODERATE [-1]         | <input type="checkbox"/> |
| <input type="checkbox"/> NORMAL [0]            | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> NONE [1]   | <input type="checkbox"/> |

Substrate  
**11**  
Maximum  
20

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments: Gravel, silt, sand, boulders, bedrock

2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 & average)

|                                       |                           |                                   |
|---------------------------------------|---------------------------|-----------------------------------|
| <u>1</u> UNDERCUT BANKS [1]           | <u>1</u> POOLS > 70cm [2] | <u>0</u> OXBOWS, BACKWATERS [1]   |
| <u>2</u> OVERHANGING VEGETATION [1]   | <u>0</u> ROOTWADS [1]     | <u>1</u> AQUATIC MACROPHYTES [1]  |
| <u>1</u> SHALLOWS (IN SLOW WATER) [1] | <u>0</u> BOULDERS [1]     | <u>1</u> LOGS OR WOODY DEBRIS [1] |
| <u>1</u> ROOTMATS [1]                 |                           |                                   |

|  |   |
|--|---|
| <input type="checkbox"/> EXTENSIVE >75% [11] | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <input type="checkbox"/> SPARSE 5-<25% [3]   | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |

Cover  
Maximum  
20  
**15**

Comments:

3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)

| SINUOSITY  | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY  |
|--|--|--|--|
| <input type="checkbox"/> HIGH [4]                | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]                |
| <input checked="" type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]                 | <input checked="" type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]                | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |  |

Channel  
Maximum  
20  
**18**

Comments:

4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

| EROSION  |  | RIPARIAN WIDTH                                     |   | FLOOD PLAIN QUALITY   |   | CONSERVATION TILLAGE                               |  |
|--|--|--|---|---|---|--|--|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> MODERATE 10-50m [3]  | <input checked="" type="checkbox"/> FOREST, SWAMP [3]         | <input type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> CONSERVATION TILLAGE [1]  | <input type="checkbox"/> URBAN OR INDUSTRIAL [0] |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]     | <input type="checkbox"/> FENCED PASTURE [1]     | <input type="checkbox"/> MINING / CONSTRUCTION [0] | <input type="checkbox"/>                         |
| <input type="checkbox"/> HEAVY / SEVERE [1]      |  | <input type="checkbox"/> NONE [0]                  |   | <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0] |   |  |  |

Indicate predominant land use(s) past 100m riparian.

Riparian  
Maximum  
10  
**7.5**

Comments:

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

|  |
|--|
| <input type="checkbox"/> > 1m [6]              |
| <input checked="" type="checkbox"/> 0.7-1m [4] |
| <input type="checkbox"/> 0.4-0.7m [2]          |
| <input type="checkbox"/> 0.2-0.4m [1]          |
| <input type="checkbox"/> < 0.2m [0]            |

CHANNEL WIDTH

Check ONE (Or 2 & average)

|   |
|---|
| <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            |
| <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] |
| <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            |

CURRENT VELOCITY

Check ALL that apply

|  |  |
|--|--|
| <input type="checkbox"/> TORRENTIAL [-1]         | <input type="checkbox"/> SLOW [1]          |
| <input type="checkbox"/> VERY FAST [1]           | <input type="checkbox"/> INTERSTITIAL [-1] |
| <input type="checkbox"/> FAST [1]                | <input type="checkbox"/> INTERMITTENT [-2] |
| <input checked="" type="checkbox"/> MODERATE [1] | <input type="checkbox"/> EDDIES [1]        |

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /  
Current  
Maximum  
12  
**6**

Comments:

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH

RUN DEPTH

RIFFLE / RUN SUBSTRATE

RIFFLE / RUN EMBEDDEDNESS

|   |
|---|
| <input checked="" type="checkbox"/> BEST AREAS > 10cm [2] |
| <input type="checkbox"/> BEST AREAS 5-10cm [1]            |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |

|  |
|--|
| <input checked="" type="checkbox"/> MAXIMUM > 50cm [2] |
| <input type="checkbox"/> MAXIMUM < 50cm [1]            |

|  |
|--|
| <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]              |
| <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] |
| <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]          |

|   |
|---|
| <input type="checkbox"/> NONE [2]           |
| <input checked="" type="checkbox"/> LOW [1] |
| <input type="checkbox"/> MODERATE [0]       |
| <input type="checkbox"/> EXTENSIVE [-1]     |

Riffle /  
Run  
Maximum  
8  
**6**

Comments:

6] GRADIENT (ft/mi)

DRAINAGE AREA

(60.3 mi<sup>2</sup>)

|  |
|--|
| <input checked="" type="checkbox"/> VERY LOW - LOW [2-4] |
| <input checked="" type="checkbox"/> MODERATE [6-10]      |
| <input type="checkbox"/> HIGH - VERY HIGH [10-6]         |

|                  |                     |
|------------------|---------------------|
| %POOL: <u>40</u> | %GLIDE: <u>5</u>    |
| %RUN: <u>100</u> | %RIFFLE: <u>100</u> |

Gradient  
Maximum  
10  
**8**

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Observed from bank

# AJ SAMPLED REACH

Check ALL that apply

## METHOD

- ☐ BOAT
- ☒ WADE
- ☐ LINE
- ☒ OTHER

## STAGE

- ☐ HIGH
- ☐ UP
- ☒ NORMAL
- ☐ LOW
- ☐ DRY

## DISTANCE

- ☒ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☒ 0.12 Km
- ☐ OTHER

## CLARITY

- 1st sample pass-- 2nd
- ☐ < 20 cm
- ☐ 20-40 cm
- ☒ 40-70 cm
- ☐ > 70 cm/ CTB
- ☐ SECCHI DEPTH

meters

## CANOPY

- ☐ > 85% - OPEN
- ☐ 55% - 85%
- ☐ 30% - 55%
- ☐ 10% - 30%
- ☒ < 10% - CLOSED

## CJ RECREATION

AREA DEPTH

POOL: ☐ > 100m2 ☐ > 3ft

## BJ AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

## DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA
- ACTIVE / HISTORIC / BOTH / NA
- YOUNG-SUCCESSION-OLD
- SPRAY / SNAG / REMOVED
- MODIFIED / DIPPED OUT / NA
- LEVEED / ONE SIDED
- RELOCATED / CUTOFFS
- MOVING-BEDLOAD-STABLE
- ARMOURED / SLUMPS
- ISLANDS / SCoured
- IMPOUNDED / DESICCATED
- FLOOD CONTROL / DRAINAGE

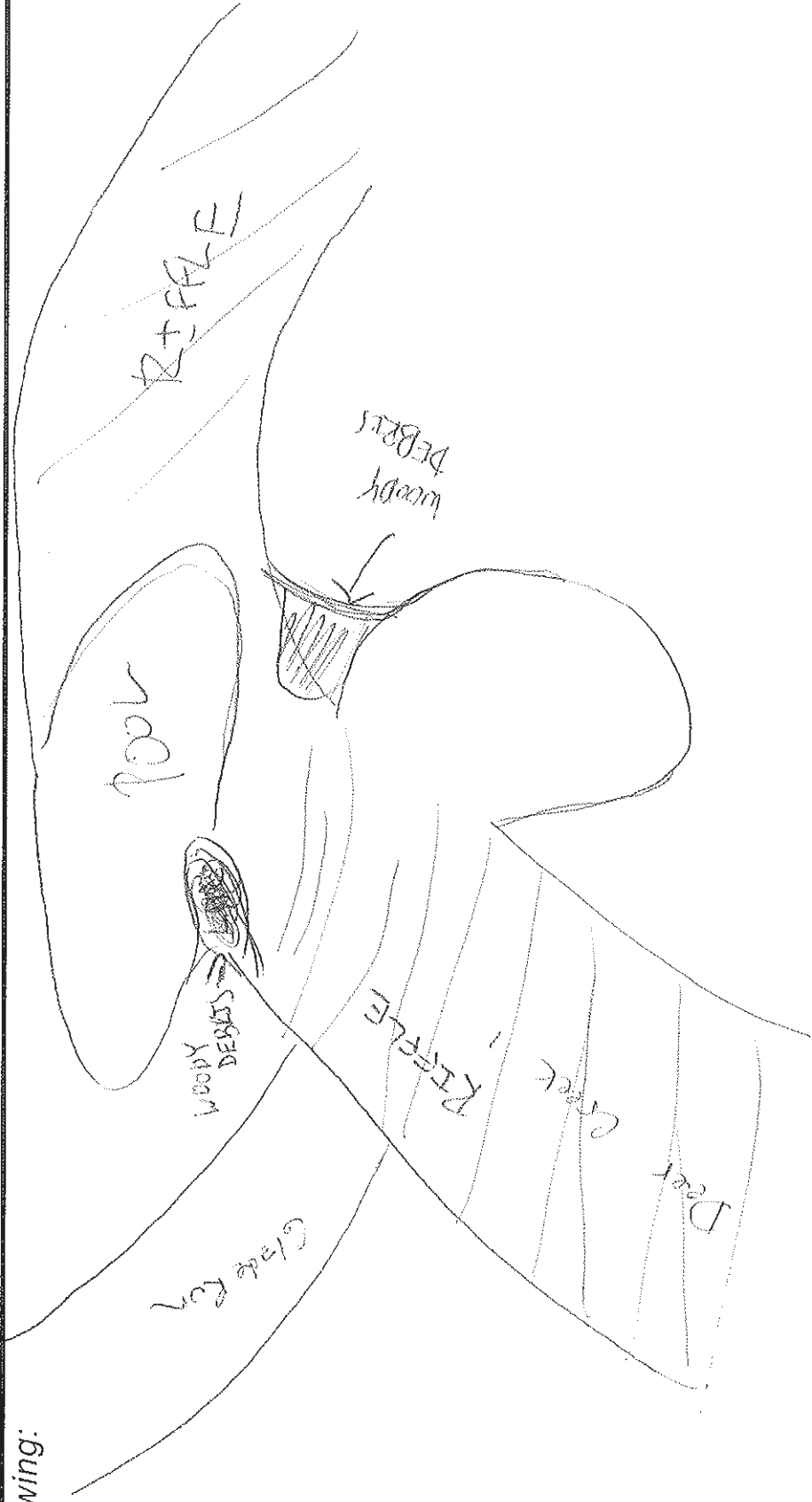
## EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY
- HARDENED / URBAN / DIRT&GRIME
- CONTAMINATED / LANDFILL
- BMPs-CONSTRUCTION-SEDIMENT
- LOGGING / IRRIGATION / COOLING
- BANK / EROSION / SURFACE
- FALSE BANK / MANURE / LAGOON
- WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE
- ACID / MINE / QUARRY / FLOW
- NATURAL / WETLAND / STAGNANT
- PARK / GOLF / LAWN / HOME
- ATMOSPHERE / DATA PAUCITY

## FJ MEASUREMENTS

- ☐ width
- ☐ depth
- max. depth
- ☐ bankfull width
- bankfull x depth
- W/D ratio
- bankfull max. depth
- floodprone x<sup>2</sup> width
- entrench. ratio
- Legacy Tree:

Stream Drawing:





Stream &amp; Location: WC-100

RM: Date: 9/15/18

Scorers Full Name &amp; Affiliation: David Kuhlmann

River Code: STORET #:

Lat./Long.: 39.830 0183.3205

Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 &amp; average)

| BEST TYPES                                     |  | OTHER TYPES                                   |   |
|--|--|---|---|
| POOL RIFFLE                                    | POOL RIFFLE                                  | POOL RIFFLE                                   | POOL RIFFLE                                       |
| <input type="checkbox"/> BLDG / SLABS [10]     | <input type="checkbox"/> HARDPAN [4]         | <input type="checkbox"/> LIMESTONE [1]        | <input type="checkbox"/> HEAVY [-2]               |
| <input type="checkbox"/> BOULDER [9]           | <input type="checkbox"/> DETRITUS [3]        | <input checked="" type="checkbox"/> TILLS [1] | <input checked="" type="checkbox"/> MODERATE [-1] |
| <input type="checkbox"/> COBBLE [8]            | <input type="checkbox"/> MUCK [2]            | <input type="checkbox"/> WETLANDS [0]         | <input type="checkbox"/> NORMAL [0]               |
| <input checked="" type="checkbox"/> GRAVEL [7] | <input checked="" type="checkbox"/> SILT [2] | <input type="checkbox"/> HARDPAN [0]          | <input type="checkbox"/> FREE [1]                 |
| <input type="checkbox"/> SAND [6]              | <input type="checkbox"/> ARTIFICIAL [0]      | <input type="checkbox"/> SANDSTONE [0]        | <input type="checkbox"/> EXTENSIVE [-2]           |
| <input type="checkbox"/> BEDROCK [5]           |  | <input type="checkbox"/> RIP/RAP [0]          | <input type="checkbox"/> MODERATE [-1]            |

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments

| ORIGIN                                   |  | QUALITY                               |                                   |
|--|--|---------------------------------------|-----------------------------------|
| <input type="checkbox"/> LACUSTURINE [0] | <input type="checkbox"/> COAL FINES [-2] | <input type="checkbox"/> SILT         | <input type="checkbox"/> NONE [1] |
| <input type="checkbox"/> SHALE [-1]      |  | <input type="checkbox"/> EMBEDDEDNESS |                                   |

Substrate  
Maximum  
20

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.)

AMOUNT

Check ONE (Or 2 &amp; average)

|   |   |   |
|---|---|---|
| <input type="checkbox"/> UNDERCUT BANKS [1]           | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   |
| <input type="checkbox"/> OVERHANGING VEGETATION [1]   | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] |
| <input type="checkbox"/> ROOTMATS [1]                 |   |   |

☐ EXTENSIVE >75% [1]  
☐ MODERATE 25-75% [7]  
☒ SPARSE 5-25% [3]  
☐ NEARLY ABSENT <5% [1]Cover  
Maximum  
20

Comments

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                   | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                    |
|---|--|--|--|
| <input type="checkbox"/> HIGH [4]           | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input checked="" type="checkbox"/> HIGH [3] |
| <input type="checkbox"/> MODERATE [3]       | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input type="checkbox"/> MODERATE [2]        |
| <input checked="" type="checkbox"/> LOW [2] | <input type="checkbox"/> FAIR [3]            | <input checked="" type="checkbox"/> RECOVERING [3] | <input type="checkbox"/> LOW [1]             |
| <input type="checkbox"/> NONE [1]           | <input checked="" type="checkbox"/> POOR [1] | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |  |

Channel  
Maximum  
20

Comments

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION  |  | RIPARIAN WIDTH                                  |   | FLOOD PLAIN QUALITY                              |   |
|--|--|---|---|--|---|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input type="checkbox"/> WIDE > 50m [4]                  | <input type="checkbox"/> FOREST, SWAMP [3]      | <input type="checkbox"/> CONSERVATION TILLAGE [1]         | <input type="checkbox"/> URBAN OR INDUSTRIAL [0] | <input type="checkbox"/> MINING / CONSTRUCTION [0]            |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> MODERATE 10-50m [3]             | <input type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]      | <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0] |
| <input type="checkbox"/> HEAVY / SEVERE [1]      | <input checked="" type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> NONE [0]               |   |  |   |

Indicate predominant land use(s)  
past 100m riparian.Riparian  
Maximum  
10

Comments

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

☐ > 1m [6]  
☐ 0.7-1m [4]  
☐ 0.4-0.7m [2]  
☒ 0.2-0.4m [1]  
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 &amp; average)

☐ POOL WIDTH > RIFFLE WIDTH [2]  
☐ POOL WIDTH = RIFFLE WIDTH [1]  
☒ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

☐ TORRENTIAL [-1]  
☐ VERY FAST [1]  
☐ FAST [1]  
☐ MODERATE [1]  
☐ SLOW [1]  
☒ INTERSTITIAL [-1]  
☒ INTERMITTENT [-2]  
☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool /  
Current  
Maximum  
12

Comments

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

| RIFFLE DEPTH  | RUN DEPTH  | RIFFLE / RUN SUBSTRATE   | RIFFLE / RUN EMBEDDEDNESS                        |
|---|--|--|--|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]                |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]              | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |  | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input checked="" type="checkbox"/> MODERATE [0] |
|   |  |  | <input type="checkbox"/> EXTENSIVE [-1]          |

Riffle /  
Run  
Maximum  
8

Comments

6) GRADIENT (ft/mi) DRAINAGE AREA (mi<sup>2</sup>)
☒ VERY LOW - LOW [2-4]  
☒ MODERATE [6-10]  
☐ HIGH - VERY HIGH [10-6]

|           |             |
|-----------|-------------|
| %POOL: 20 | %GLIDE: 40  |
| %RUN: 20  | %RIFFLE: 20 |

Gradient  
Maximum  
10



Comment RE: Reach consistency/Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

A) SAMPLED REACH  
Check ALL that apply

METHOD STAGE

- ☐ BOAT ☐ WADE ☐ L LINE ☐ OTHER ☐ DISTANCE
- ☐ 0.5 Km ☐ 0.2 Km ☐ 0.15 Km ☒ 0.12 Km ☐ OTHER
- ☐ BOAT ☐ HIGH ☐ UP ☒ NORMAL ☐ LOW ☐ DRY

CLARITY

- 1st -sample pass- 2nd
- ☐ < 20 cm ☐ 20-<40 cm ☐ 40-70 cm ☐ > 70 cm/CTB ☐ SECCHI DEPTH

meters

CANOPY

- ☐ > 85%/- OPEN ☐ 55%-<85% ☐ 30%-<55% ☐ 10%-<30% ☒ <10%-CLOSED

- 1st \_\_\_\_\_ cm  
2nd \_\_\_\_\_ cm

C) RECREATION

POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

B) AESTHETICS

- ☐ NUISANCE ALGAE ☐ INVASIVE MACROPHYTES ☒ EXCESS TURBIDITY ☐ DISCOLORATION ☒ FOAM / SCUM ☐ OIL SHEEN ☐ TRASH / LITTER ☐ NUISANCE ODOR ☐ SLUDGE DEPOSITS ☐ CSOs/SSOs/OUTFALLS

D) MAINTENANCE

- ☐ PUBLIC / PRIVATE / BOTH / NA ☐ ACTIVE / HISTORIC / BOTH / NA ☐ YOUNG-SUCCESSION-OLD ☐ SPRAY / SNAG / REMOVED ☐ MODIFIED / DIPPED OUT / NA ☐ LEVEED / ONE SIDED ☐ RELOCATED / CUTOFFS ☐ MOVING-BEDLOAD-STABLE ☐ ARMoured / SLUMPS ☐ ISLANDS / SCoured ☐ IMPOUNDED / DESICCATED ☐ FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

E) ISSUES

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS

- ☐ width  
☐ depth  
☐ max. depth  
☐ bankfull width  
☐ bankfull x depth  
☐ W/D ratio  
☐ bankfull max. depth  
☐ floodprone x<sup>2</sup> width  
☐ entrench. ratio  
Legacy Tree:

Stream Drawing:



# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

63

SITE NAME/LOCATION Glade Run

SITE NUMBER WC-02

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

19.5

LENGTH OF STREAM REACH (ft) 100

LAT. 39.8635

LONG. 83.3476

RIVER CODE

RIVER MILE

0.8

DATE 12/16/16

SCORER David Kuhnmann

COMMENTS

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]                    |         |
| <input type="checkbox"/>            | BOULDER (>256 mm) [16 pts]  |           | <input type="checkbox"/> | LEAF PACK/WOODY DEBRIS [3 pts] |         |
| <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 checked="" type="checkbox"/> | GRAVEL (2-64 mm) [9 pts]    | <u>50</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]             |         |

Total of Percentages of  
Blldr Slabs, Boulder, Cobble, Bedrock

0

(A)

15

(B)

28

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 checked="" 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 type="checkbox"/>            | > 10 - 22.5 cm [25 pts]   | <input type="checkbox"/> | NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

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 checked="" 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)

25

HHEI  
Metric  
Points

Substrate  
Max = 40



A + B

Pool Depth  
Max = 30



Bankfull  
Width  
Max=30



This information must also be completed

**RIPARIAN ZONE AND FLOODPLAIN QUALITY**

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

|                                     |                                     |                |
|-------------------------------------|-------------------------------------|----------------|
| L                                   | R                                   | (Per Bank)     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m      |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS

FLOODPLAIN QUALITY

|                          |                          |                                     |
|--------------------------|--------------------------|-------------------------------------|
| L                        | R                        | (Most Predominant per Bank)         |
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mining or Construction |

**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)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

64

SITE NAME/LOCATION Deer Creek; Wc-02

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 60.3

LENGTH OF STREAM REACH (ft) 200 LAT. 39.8536 LONG. -83.3473 RIVER CODE RIVER MILE 52.8

DATE 12/16/16 SCORER David Kuhling COMMENTS

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>30</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]          |           | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] |           |
| <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 checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <u>70</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

0

(A) 12

(B) 2

HHEI  
Metric  
Points

Substrate  
Max = 40

14

A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 checked="" 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 type="checkbox"/> > 10 - 22.5 cm [25 pts]              | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

20

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

|   |   |
|---|---|
| <input checked="" 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 type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] |   |

Bankfull  
Width  
Max=30

30

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

30

This information must also be completed

**RIPARIAN ZONE AND FLOODPLAIN QUALITY**

☆NOTE: River Left (L) and Right (R) as looking downstream☆

**RIPARIAN WIDTH**

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

**FLOODPLAIN QUALITY**

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/> | <input type="checkbox"/>            | Mining or Construction |

COMMENTS adjacent to mature forest on right side, followed by open crop field w/ the floodplain

**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)







# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :



SITE NAME/LOCATION WC-03

SITE NUMBER \_\_\_\_\_

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) 0.03

LENGTH OF STREAM REACH (ft) 100

LAT. 39.8678

LONG. -83.3487

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 12/16/16

SCORER David Kuhlman

COMMENTS \_\_\_\_\_

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



BLDR SLABS [16 pts]



BOULDER (>256 mm) [16 pts]



BEDROCK [16 pt]



COBBLE (65-256 mm) [12 pts]



GRAVEL (2-64 mm) [9 pts]



SAND (<2 mm) [6 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TYPE



SILT [3 pt]



LEAF PACK/WOODY DEBRIS [3 pts]



FINE DETRITUS [3 pts]



CLAY or HARDPAN [0 pt]



MUCK [0 pts]



ARTIFICIAL [3 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

100

\_\_\_\_\_

\_\_\_\_\_

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 0

(A)



(B)



SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):



> 30 centimeters [20 pts]



> 22.5 - 30 cm [30 pts]



> 10 - 22.5 cm [25 pts]



> 5 cm - 10 cm [15 pts]



< 5 cm [5 pts]



NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):



> 4.0 meters (> 13') [30 pts]



> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]



> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]



> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]



≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

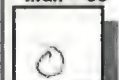
HHEI  
Metric  
Points

Substrate  
Max = 40



A + B

Pool Depth  
Max = 30



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

L

R

(Per Bank)



Wide >10m



Moderate 5-10m



Narrow <5m



None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L

R

(Most Predominant per Bank)



Mature Forest, Wetland



Immature Forest, Shrub or Old



Field



Residential, Park, New Field



Fenced Pasture

L

R



Conservation Tillage



Urban or Industrial



Open Pasture, Row



Crop



Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):



Stream Flowing



Subsurface flow with isolated pools (Interstitial)



Moist Channel, isolated pools, no flow (Intermittent)



Dry channel, no water (Ephemeral)

COMMENTS \_\_\_\_\_

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):



None



0.5



1.0



1.5



2.0



2.5



3.0



>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)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

166

SITE NAME/LOCATION WC-04

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) <1

LENGTH OF STREAM REACH (ft)

LAT. 39.86

LONG. 83.3495

RIVER CODE

RIVER MILE

DATE 12/16/16

SCORER David Kuhlmann

COMMENTS

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

☐

Bldr Slabs [16 pts]

☐

BOULDER (>256 mm) [16 pts]

☐

BEDROCK [16 pt]

☐

COBBLE (65-256 mm) [12 pts]

☐

GRAVEL (2-64 mm) [9 pts]

☐

SAND (<2 mm) [6 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TYPE

☒

SILT [3 pt]

☐

LEAF PACK/WOODY DEBRIS [3 pts]

☐

FINE DETRITUS [3 pts]

☐

CLAY or HARDPAN [0 pt]

☒

MUCK [0 pts]

☐

ARTIFICIAL [3 pts]

PERCENT

50

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

50

\_\_\_\_\_

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 0

(A) 3

(B) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☐

> 30 centimeters [20 pts]

☐

> 22.5 - 30 cm [30 pts]

☐

> 10 - 22.5 cm [25 pts]

☐

> 5 cm - 10 cm [15 pts]

☒

< 5 cm [5 pts]

☐

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

> 4.0 meters (> 13') [30 pts]

☐

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

☐

> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

☐

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

☒

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
Points

Substrate  
Max = 40

6

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**

L R

☐ ☐

(Per Bank)

☐ ☐

Wide >10m

☐ ☐

Moderate 5-10m

☒ ☒

Narrow <5m

☐ ☐

None

COMMENTS

**FLOODPLAIN QUALITY**

L R

☐ ☐

(Most Predominant per Bank)

☐ ☐

Mature Forest, Wetland

☐ ☐

Immature Forest, Shrub or Old

☐ ☒

Residential, Park, New Field

☐ ☐

Fenced Pasture

L R

☐ ☐

Conservation Tillage

☐ ☐

Urban or Industrial

☒ ☒

Open Pasture, Row

☐ ☐

Crop

☐ ☐

Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

☒

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☐

Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☒

None

☐

0.5

☐

1.0

☐

1.5

☐

2.0

☐

2.5

☐

3.0

☐

>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)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

25  
20

SITE NAME/LOCATION

SITE NUMBER WC-05

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

0.15

LENGTH OF STREAM REACH (ft)

LAT. 39.2602

LONG. -83.3514

RIVER CODE

RIVER MILE

DATE 1

SCORER

David Kuhlman

COMMENTS

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>30</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  |         | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] |           |
| <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]    |         | <input checked="" type="checkbox"/> MUCK [0 pts]        | <u>30</u> |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        |         | <input type="checkbox"/> ARTIFICIAL [3 pts]             |           |

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

0

(A)

3

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

5

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 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):

15

Pool Depth  
Max = 30

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 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)

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 type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> |
| Wide >10m                           |                                     | (Most Predominant per Bank)         |                          |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              | <input type="checkbox"/> |
| Moderate 5-10m                      |                                     | Immature Forest, Shrub or Old Field | <input type="checkbox"/> |
| <input checked="" type="checkbox"/> | <input checked="" 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                                |                                     |                                     | Conservation Tillage     |
|                                     |                                     |                                     | Urban or Industrial      |
|                                     |                                     |                                     | Open Pasture, Row Crop   |
|                                     |                                     |                                     | 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"/> 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 ft/100 ft)

☐ Flat to Moderate

☒ Moderate (2 ft/100 ft)

☐ Moderate to Severe

☐ Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

15

SITE NAME/LOCATION wa-06

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 4

LENGTH OF STREAM REACH (ft) 100

LAT. 39.8595

LONG. -83.3523

RIVER CODE

RIVER MILE

DATE 12/16/16

SCORER David Kuhlmann

COMMENTS

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 type="checkbox"/> SILT [3 pt]                               |           |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  |         | <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <u>30</u> |
| <input type="checkbox"/> BEDROCK [16 pt]             |         | <input type="checkbox"/> FINE DETRITUS [3 pts]                     |           |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] |         | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]         | <u>70</u> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    |         | <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 0

(A) 3

(B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

5

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)

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)         | L                        | R                        |                        |
|-------------------------------------|-------------------------------------|----------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m      | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              | <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m | <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field | <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial    |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     | <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"/>            | None           | <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 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 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 ft/100 ft)

☐ Flat to Moderate

☒ Moderate (2 ft/100 ft)

☐ Moderate to Severe

☐ Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

22

SITE NAME/LOCATION WC-07

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 0.05

LENGTH OF STREAM REACH (ft) 50

LAT. 39.8416

LONG. -83.3323

RIVER CODE

RIVER MILE

DATE 2/16/16

SCORER Dave Kuhmar

COMMENTS

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

☐

BLDR SLABS [16 pts]

☐

BOULDER (>256 mm) [16 pts]

☐

BEDROCK [16 pt]

☐

COBBLE (65-256 mm) [12 pts]

☐

GRAVEL (2-64 mm) [9 pts]

☐

SAND (<2 mm) [6 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TYPE

☐

SILT [3 pt]

☐

LEAF PACK/WOODY DEBRIS [3 pts]

☐

FINE DETRITUS [3 pts]

☒

CLAY or HARDPAN [0 pt]

☐

MUCK [0 pts]

☐

ARTIFICIAL [3 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

100

\_\_\_\_\_

\_\_\_\_\_

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

0

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☐

> 30 centimeters [20 pts]

☐

> 22.5 - 30 cm [30 pts]

☐

> 10 - 22.5 cm [25 pts]

☐

> 5 cm - 10 cm [15 pts]

☒

< 5 cm [5 pts]

☐

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

> 4.0 meters (> 13') [30 pts]

☐

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

☐

> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

☒

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

☐

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

L

R

(Per Bank)

☐

Wide >10m

☐

Moderate 5-10m

☐

Narrow <5m

☒

None

COMMENTS

FLOODPLAIN QUALITY

L

R

(Most Predominant per Bank)

☐

Mature Forest, Wetland

☐

Immature Forest, Shrub or Old

☐

Field

☐

Residential, Park, New Field

☐

Fenced Pasture

L

R

Conservation Tillage

☐

☐

Urban or Industrial

☐

☐

Open Pasture, Row

☒

☒

Crop

☐

☐

Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

☒

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☐

Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☒

None

☐

0.5

☐

1.0

☐

1.5

☐

2.0

☐

2.5

☐

3.0

☐

>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)

HHEI  
Metric  
Points

Substrate  
Max = 40

2

A + B

Pool Depth  
Max = 30

5

Bankfull  
Width  
Max=30

15





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

55

SITE NAME/LOCATION WC-08

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 0.29

LENGTH OF STREAM REACH (ft) 100

LAT. 39.8517

LONG. -83.3356

RIVER CODE

RIVER MILE

DATE 12/16/16

SCORER David Kuhlmann

COMMENTS

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  
☐ BLD  
☐ BOU  
☐ BED  
☐ COB  
☒ GRA  
☐ SAND

BLDR SLABS [16 pts]  
BOULDER (>256 mm) [16 pts]  
BEDROCK [16 pt]  
COBBLE (65-256 mm) [12 pts]  
GRAVEL (2-64 mm) [9 pts]  
SAND (<2 mm) [6 pts]

PERCENT

50

TYPE  
☒ SIL  
☐ LEA  
☐ FINE  
☐ CLAY  
☐ MUCK  
☐ ART

SILT [3 pt]  
LEAF PACK/WOODY DEBRIS [3 pts]  
FINE DETRITUS [3 pts]  
CLAY or HARDPAN [0 pt]  
MUCK [0 pts]  
ARTIFICIAL [3 pts]

PERCENT

50

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

20

(A)

12

(B)

3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☒  
☐  
☐

> 30 centimeters [20 pts]  
> 22.5 - 30 cm [30 pts]  
> 10 - 22.5 cm [25 pts]

☐  
☐  
☐

> 5 cm - 10 cm [15 pts]  
< 5 cm [5 pts]  
NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐  
☐  
☒

> 4.0 meters (> 13') [30 pts]  
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]  
> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

☐  
☐  
☐

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]  
≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

20

HHEI  
Metric  
Points

Substrate  
Max = 40

15

A + B

Pool Depth  
Max = 30

20

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**

L R



(Per Bank)



Wide >10m



Moderate 5-10m



Narrow <5m



None



None

COMMENTS

**FLOODPLAIN QUALITY**

L R



(Most Predominant per Bank)



Mature Forest, Wetland



Immature Forest, Shrub or Old



Field



Residential, Park, New Field



Fenced Pasture

L R



Conservation Tillage



Urban or Industrial



Open Pasture, Row



Crop



Mining or Construction

**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 ft/100 ft)



Flat to Moderate



Moderate (2 ft/100 ft)



Moderate to Severe



Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3):

13

SITE NAME/LOCATION WC-09

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 21 wide

LENGTH OF STREAM REACH (ft) 80 LAT. 39.8523 LONG. -83.3346 RIVER CODE RIVER MILE

DATE 12/16/16 SCORER David Kuhlman COMMENTS

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>50</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  |         | <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts] |           |
| <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]    |         | <input checked="" type="checkbox"/> MUCK [0 pts]       | <u>50</u> |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        |         | <input type="checkbox"/> ARTIFICIAL [3 pts]            |           |

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 0

(A) 3

(B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

5

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):

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)

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

|                                     |                                     |                |
|-------------------------------------|-------------------------------------|----------------|
| L                                   | R                                   | (Per Bank)     |
| <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           |

COMMENTS

### FLOODPLAIN QUALITY

|                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|
| L                                   | R                                   | (Most Predominant per Bank)         |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

### 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 very shallow low flow, nearly moist channel

### 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 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

25

SITE NAME/LOCATION WC-10

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

LENGTH OF STREAM REACH (ft) 100 LAT. 39.8521 LONG. -83.3362 RIVER CODE RIVER MILE

DATE 12/16/16 SCORER David Kuhlmann COMMENTS

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



BLDR SLABS [16 pts]

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pt]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

PERCENT

TYPE



SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

30

50

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

0

(A)

3

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):



> 30 centimeters [20 pts]



> 22.5 - 30 cm [30 pts]



> 10 - 22.5 cm [25 pts]



> 5 cm - 10 cm [15 pts]



< 5 cm [5 pts]



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):



> 4.0 meters (> 13') [30 pts]



> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]



> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]



> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]



≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

5

HHEI  
Metric  
Points

Substrate  
Max = 40

5

A + B

Pool Depth  
Max = 30

15

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

L

R

(Per Bank)



Wide >10m



Moderate 5-10m



Narrow <5m



None



None

COMMENTS

FLOODPLAIN QUALITY

L

R

(Most Predominant per Bank)



Mature Forest, Wetland



Immature Forest, Shrub or Old Field



Residential, Park, New Field



Fenced Pasture

L

R



Conservation Tillage



Urban or Industrial



Open Pasture, Row Crop



Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):



Stream Flowing



Subsurface flow with isolated pools (Interstitial)



Moist Channel, isolated pools, no flow (Intermittent)



Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):



None



0.5



1.0



1.5



2.0



2.5



3.0



>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)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

15

SITE NAME/LOCATION

SITE NUMBER WC-11

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

21

LENGTH OF STREAM REACH (ft)

200

LAT. 39.8525

LONG. -83.3377

RIVER CODE

RIVER MILE

DATE 12/16/16

SCORER

David Kuhlman

COMMENTS

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  
☐  
☐  
☐  
☐  
☐  
☐  
☐

BLDR SLABS [16 pts]  
BOULDER (>256 mm) [16 pts]  
BEDROCK [16 pt]  
COBBLE (65-256 mm) [12 pts]  
GRAVEL (2-64 mm) [9 pts]  
SAND (<2 mm) [6 pts]

PERCENT

TYPE

☒  
☐  
☐  
☐  
☐  
☐  
☐

SILT [3 pt]  
LEAF PACK/WOODY DEBRIS [3 pts]  
FINE DETRITUS [3 pts]  
CLAY or HARDPAN [0 pt]  
MUCK [0 pts]  
ARTIFICIAL [3 pts]

PERCENT

50  
50

Total of Percentages of  
Bltr Slabs, Boulder, Cobble, Bedrock

0

(A)

2

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☐  
☐  
☐

> 30 centimeters [20 pts]  
> 22.5 - 30 cm [30 pts]  
> 10 - 22.5 cm [25 pts]

☐  
☒  
☐

> 5 cm - 10 cm [15 pts]  
< 5 cm [5 pts]  
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):

☐  
☐  
☐

> 4.0 meters (> 13') [30 pts]  
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]  
> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

☐  
☒  
☐

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]  
≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

5

HHEI  
Metric  
Points

Substrate  
Max = 40

5

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

L R

☒ ☒ (Per Bank)

☐ ☐ Wide >10m

☐ ☐ Moderate 5-10m

☐ ☐ Narrow <5m

☐ ☐ None

COMMENTS

FLOODPLAIN QUALITY

L R

☒ ☒ (Most Predominant per Bank)

☐ ☐ Mature Forest, Wetland

☐ ☐ Immature Forest, Shrub or Old Field

☐ ☐ Residential, Park, New Field

☐ ☐ Fenced Pasture

L R

☐ ☐ Conservation Tillage

☐ ☐ Urban or Industrial

☐ ☐ Open Pasture, Row Crop

☐ ☐ Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

☒

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☐

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 ft/100 ft)

☐

Flat to Moderate

☒

Moderate (2 ft/100 ft)

☐

Moderate to Severe

☐

Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

15

SITE NAME/LOCATION WC-12

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 41

LENGTH OF STREAM REACH (ft) 100 LAT. 39.8529 LONG. -83.3404 RIVER CODE RIVER MILE

DATE 12/16/16 SCORER David Kohlman COMMENTS

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] |           |
| <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]    |         | <input checked="" type="checkbox"/> MUCK [0 pts]        | <u>50</u> |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        |         | <input type="checkbox"/> ARTIFICIAL [3 pts]             |           |

Total of Percentages of  
Blldr Slabs, Boulder, Cobble, Bedrock 0

(A) 3

(B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

5

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):

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)

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

|                                     |                                     |                |
|-------------------------------------|-------------------------------------|----------------|
| L                                   | R                                   | (Per Bank)     |
| <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           |

COMMENTS

FLOODPLAIN QUALITY

|                                     |                                     |                                     |
|-------------------------------------|-------------------------------------|-------------------------------------|
| L                                   | R                                   | (Most Predominant per Bank)         |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

**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 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

54

SITE NAME/LOCATION

SITE NUMBER WC-13

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 0.17

LENGTH OF STREAM REACH (ft)

LAT. 39.8544

LONG. -83.3442

RIVER CODE

RIVER MILE

DATE 12/16/16

SCORER David Kuhlmann

COMMENTS

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

☐

BLDR SLABS [16 pts]

☐

BOULDER (>256 mm) [16 pts]

☐

BEDROCK [16 pt]

☐

COBBLE (65-256 mm) [12 pts]

☒

GRAVEL (2-64 mm) [9 pts]

☐

SAND (<2 mm) [6 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TYPE

☒

SILT [3 pt]

☐

LEAF PACK/WOODY DEBRIS [3 pts]

☐

FINE DETRITUS [3 pts]

☐

CLAY or HARDPAN [0 pt]

☐

MUCK [0 pts]

☐

ARTIFICIAL [3 pts]

PERCENT

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

0

(A)

12

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☒

> 30 centimeters [20 pts]

☐

> 22.5 - 30 cm [30 pts]

☐

> 10 - 22.5 cm [25 pts]

☐

> 5 cm - 10 cm [15 pts]

☐

< 5 cm [5 pts]

☐

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

> 4.0 meters (> 13') [30 pts]

☐

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

☒

> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]

☐

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

☐

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

20

HHEI  
Metric  
Points

Substrate  
Max = 40

14

A + B

Pool Depth  
Max = 30

20

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

L

R

(Per Bank)

☒

☒

Wide >10m

☐

☐

Moderate 5-10m

☐

☐

Narrow <5m

☐

☐

None

COMMENTS

FLOODPLAIN QUALITY

L

R

(Most Predominant per Bank)

☒

☒

Mature Forest, Wetland

☐

☐

Immature Forest, Shrub or Old  
Field

☐

☐

Residential, Park, New Field

☐

☐

Fenced Pasture

L

R

Conservation Tillage

☐

☐

Urban or Industrial

☐

☐

Open Pasture, Row  
Crop

☐

☐

Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

☒

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☐

Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐

None

☐

0.5

☐

1.0

☐

1.5

☒

2.0

☐

2.5

☐

3.0

☐

>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)





# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

46

SITE NAME/LOCATION

SITE NUMBER WC-14 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) 0.42

LENGTH OF STREAM REACH (ft) 200 LAT. 39.8510 LONG. -83.3525 RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_

DATE 12/16/16 SCORER David Kuhnmann COMMENTS \_\_\_\_\_

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]    | _____     |
| <input type="checkbox"/> BEDROCK [16 pt]             | _____   | <input type="checkbox"/> FINE DETRITUS [3 pts]             | _____     |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | _____   | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <u>50</u> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | _____   | <input type="checkbox"/> MUCK [0 pts]                      | _____     |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | _____   | <input type="checkbox"/> ARTIFICIAL [3 pts]                | _____     |

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock 0

(A) 3

(B) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

6

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 checked="" 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 type="checkbox"/> > 10 - 22.5 cm [25 pts]              | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

20

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

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] |   |

Bankfull  
Width  
Max=30

20

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

20

This information must also be completed

**RIPARIAN ZONE AND FLOODPLAIN QUALITY**

☆NOTE: River Left (L) and Right (R) as looking downstream☆

| RIPARIAN ZONE                                  |                          | FLOODPLAIN QUALITY   |                          |
|--|--------------------------|--|--------------------------|
| L  | R                        | L  | R                        |
| <input type="checkbox"/>                       | <input type="checkbox"/> | <input type="checkbox"/>                                     | <input type="checkbox"/> |
| (Per Bank)                                     |                          | (Most Predominant per Bank)                                  |                          |
| <input type="checkbox"/> Wide >10m             |                          | <input type="checkbox"/> Mature Forest, Wetland              |                          |
| <input type="checkbox"/> Moderate 5-10m        |                          | <input type="checkbox"/> Immature Forest, Shrub or Old Field |                          |
| <input checked="" type="checkbox"/> Narrow <5m |                          | <input type="checkbox"/> Residential, Park, New Field        |                          |
| <input type="checkbox"/> None                  |                          | <input type="checkbox"/> Fenced Pasture                      |                          |
| <input type="checkbox"/>                       |                          | <input checked="" type="checkbox"/> Open Pasture, Row Crop   |                          |
|  |                          | <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)







# Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

29

SITE NAME/LOCATION WC-14

SITE NUMBER WC-14

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 4.10

LENGTH OF STREAM REACH (ft) 100

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE 9/23/17 SCORER David Kuhman

COMMENTS

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 32). 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]         | 70      |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]          |         | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] |         |
| <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 checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | 30      | <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

(A)

12

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

## HHEI Metric Points

Substrate  
Max = 40

14

A + B

Pool Depth  
Max = 30

0

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

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

COMMENTS

### FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

**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 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 ft/100 ft)

☒ Flat to Moderate

☐ Moderate (2 ft/100 ft)

☐ Moderate to Severe

☐ Severe (10 ft/100 ft)

Andrix

**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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: \_\_\_\_\_ Quantity: \_\_\_\_\_

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

29

SITE NAME/LOCATION WC-15

SITE NUMBER WC-15

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

4.10

LENGTH OF STREAM REACH (ft) 100

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE 9/18/17

SCORER

David Kuhlmann

COMMENTS

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 32). 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]         | 80      |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]          |         | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] |         |
| <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 checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | 70      | <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

(A)

912

(B)

14

## HHEI Metric Points

Substrate  
Max = 40

14

A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

0

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

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 (> 9' 7" - 4' 8") [20 pts] |  |

Bankfull  
Width  
Max=30

15

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream☆

### RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS

### FLOODPLAIN QUALITY

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mining or Construction |

## 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 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 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: \_\_\_\_\_ 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: Madison County Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: \_\_\_\_\_ Quantity: \_\_\_\_\_

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 10

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

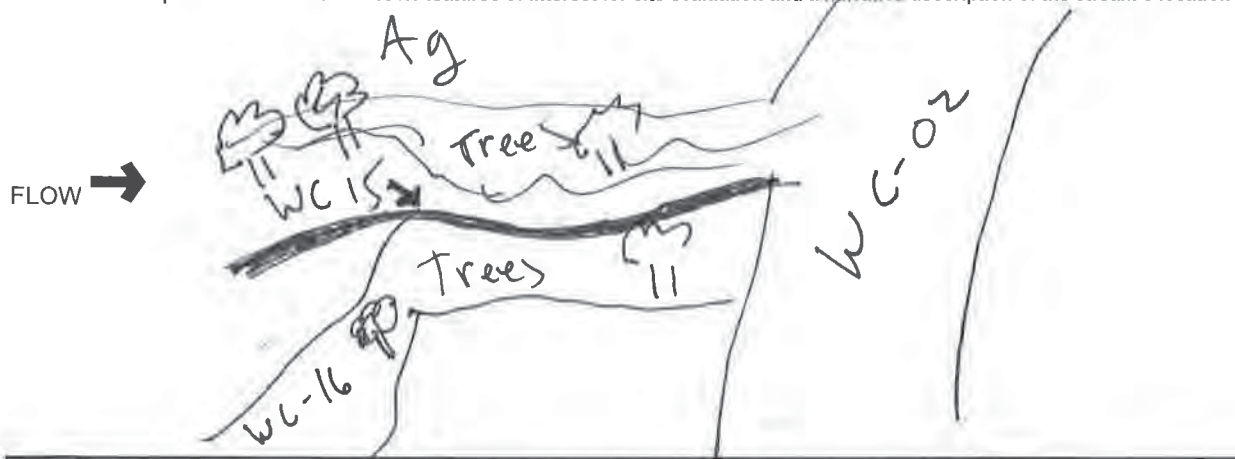
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

19

SITE NAME/LOCATION WC-16

SITE NUMBER WC-16

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) 2.10

LENGTH OF STREAM REACH (ft) 100

LAT

LONG

RIVER CODE

RIVER MILE

DATE 9/19/17

SCORER David Kuhlmann

COMMENTS

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 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE

☐ ☐

BLDR SLABS [16 pts]

☐ ☐

BOULDER (>256 mm) [16 pts]

☐ ☐

BEDROCK [16 pt]

☐ ☐

COBBLE (65-256 mm) [12 pts]

☒ ☐

GRAVEL (2-64 mm) [9 pts]

☐ ☐

SAND (<2 mm) [6 pts]

PERCENT

20

TYPE

☒ ☐

SILT [3 pt]

☐ ☐

LEAF PACK/WOODY DEBRIS [3 pts]

☐ ☐

FINE DETRITUS [3 pts]

☐ ☐

CLAY or HARDPAN [0 pt]

☐ ☐

MUCK [0 pts]

☐ ☐

ARTIFICIAL [3 pts]

PERCENT

90

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock

(A)

12

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

☐

> 30 centimeters [20 pts]

☐

> 22.5 - 30 cm [30 pts]

☐

> 10 - 22.5 cm [25 pts]

☐

> 5 cm - 10 cm [15 pts]

☐

< 5 cm [5 pts]

☒

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

☐

> 4.0 meters (> 13') [30 pts]

☐

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

☐

> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]

☐

> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

☒

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
Points

Substrate  
Max = 40

14

A + B

Pool Depth  
Max = 30

0

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**

L R

☐ ☐

(Per Bank)

Wide >10m

☒ ☒

Moderate 5-10m

☐ ☐

Narrow <5m

☐ ☐

None

COMMENTS

**FLOODPLAIN QUALITY**

L R

☐ ☐

(Most Predominant per Bank)

Mature Forest, Wetland

☐ ☐

Immature Forest, Shrub or Old

☐ ☐

Field

☐ ☐

Residential, Park, New Field

☐ ☐

Fenced Pasture

L R

☐ ☐

Conservation Tillage

☐ ☐

Urban or Industrial

☒ ☒

Open Pasture, Row

☐ ☐

Crop

☐ ☐

Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check ONLY one box):

☐

Stream Flowing

☐

Subsurface flow with isolated pools (Interstitial)

☐

Moist Channel, isolated pools, no flow (Intermittent)

☒

Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

☐

None

☒

0.5

☐

1.0

☐

1.5

☐

2.0

☐

2.5

☐

3.0

☐

>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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: \_\_\_\_\_ Quantity: \_\_\_\_\_

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 10

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

10

SITE NAME/LOCATION WC-17 SITE NUMBER WC-17 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) 4.1  
LENGTH OF STREAM REACH (ft) 100 LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_  
DATE 9/19/17 SCORER David Kuhn COMMENTS \_\_\_\_\_

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 32). 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]    | _____     |
| <input type="checkbox"/> BEDROCK [16 pt]             | _____   | <input type="checkbox"/> FINE DETRITUS [3 pts]             | _____     |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | _____   | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <u>50</u> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | _____   | <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 \_\_\_\_\_

(A)

3

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
Points

Substrate  
Max = 40

5

A + B

Pool Depth  
Max = 30

0

Bankfull  
Width  
Max=30

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

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)         | 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"/> | Conservation Tillage   |
| <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"/> | Urban or Industrial    |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     | <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"/>            | None           | <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 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 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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5"

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 0

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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)

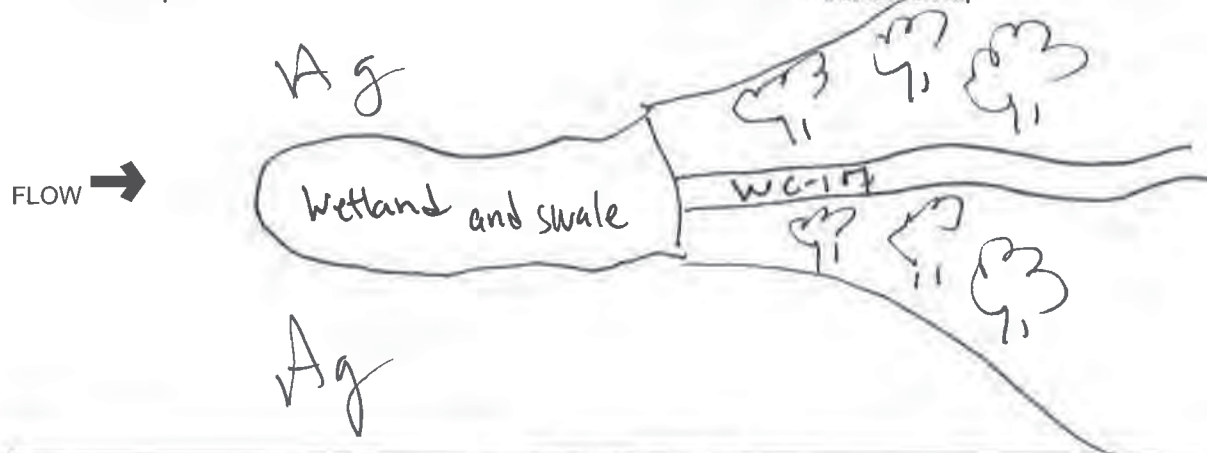
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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):

10

SITE NAME/LOCATION

WC-18

SITE NUMBER

WC-18

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

4.01

LENGTH OF STREAM REACH (ft)

100

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE

9/18/17

SCORER

David Kuhlmann

COMMENTS

**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 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE



BLDR SLABS [16 pts]

BOULDER (&gt;256 mm) [16 pts]

BEDROCK [16 pt]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (&lt;2 mm) [6 pts]

PERCENT

TYPE



SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

50

50

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock

(A)

3

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):



&gt; 30 centimeters [20 pts]



&gt; 22.5 - 30 cm [30 pts]



&gt; 10 - 22.5 cm [25 pts]



&gt; 5 cm - 10 cm [15 pts]



&lt; 5 cm [5 pts]



NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check **ONLY one** box):



&gt; 4.0 meters (&gt; 13') [30 pts]



&gt; 3.0 m - 4.0 m (&gt; 9' 7" - 13') [25 pts]



&gt; 1.5 m - 3.0 m (&gt; 9' 7" - 4' 8") [20 pts]



&gt; 1.0 m - 1.5 m (&gt; 3' 3" - 4' 8") [15 pts]



≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
PointsSubstrate  
Max = 40

5

A + B

Pool Depth  
Max = 30

0

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)

Wide &gt;10m



Moderate 5-10m



Narrow &lt;5m



None



COMMENTS

L R



(Most Predominant per Bank)

Mature Forest, Wetland



Immature Forest, Shrub or Old



Field



Residential, Park, New Field



Fenced Pasture

L R



Conservation Tillage



Urban or Industrial



Open Pasture, Row



Crop



Mining or Construction

**FLOW REGIME** (At Time of Evaluation) (Check **ONLY one** box):

Stream Flowing



Subsurface flow with isolated pools (Interstitial)



Moist Channel, isolated pools, no flow (Intermittent)



Dry channel, no water (Ephemeral)

COMMENTS

**SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check **ONLY one** box):

None



0.5



1.0



1.5



2.0



2.5



3.0



&gt;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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5"

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 0

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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)

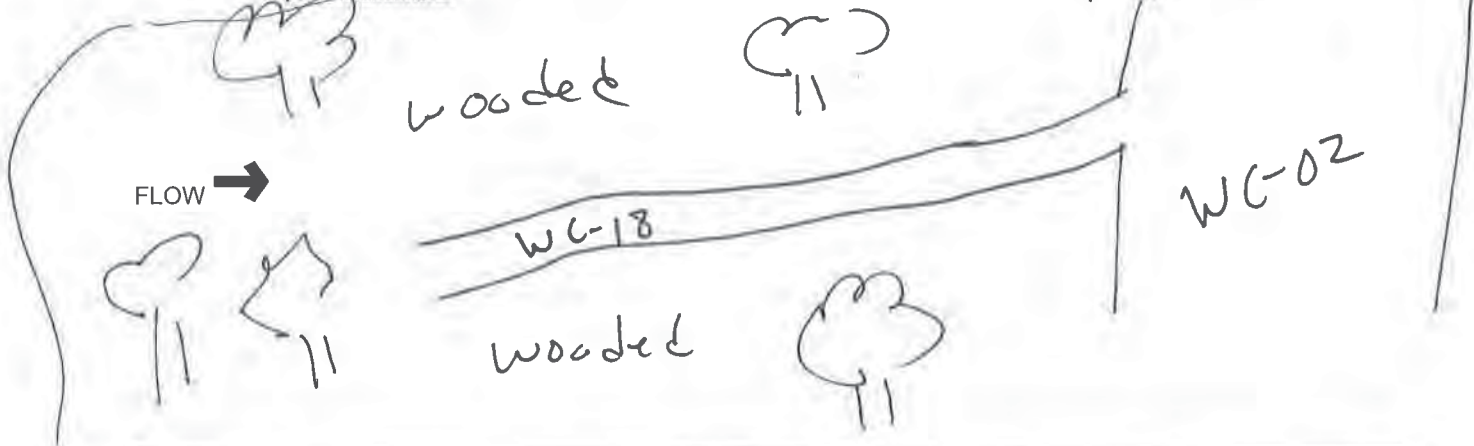
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

19

SITE NAME/LOCATION

WC-19

SITE NUMBER

WC-19

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

< .01

LENGTH OF STREAM REACH (ft)

100

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE

9/18/17

SCORER

David Kuhlmann

COMMENTS

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 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE



BLDR SLABS [16 pts]

BOULDER (>256 mm) [16 pts]

BEDROCK [16 pt]

COBBLE (65-256 mm) [12 pts]

GRAVEL (2-64 mm) [9 pts]

SAND (<2 mm) [6 pts]

PERCENT

30

TYPE



SILT [3 pt]

LEAF PACK/WOODY DEBRIS [3 pts]

FINE DETRITUS [3 pts]

CLAY or HARDPAN [0 pt]

MUCK [0 pts]

ARTIFICIAL [3 pts]

PERCENT

70

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock

(A)

12

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):



> 30 centimeters [20 pts]

> 22.5 - 30 cm [30 pts]

> 10 - 22.5 cm [25 pts]



> 5 cm - 10 cm [15 pts]

< 5 cm [5 pts]

NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):



> 4.0 meters (> 13') [30 pts]

> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]

> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]



> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]

≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
Points

Substrate  
Max = 40

14

A + B

Pool Depth  
Max = 30

0

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)

Wide >10m



Moderate 5-10m



Narrow <5m



None

COMMENTS

L R



(Most Predominant per Bank)

Mature Forest, Wetland



Immature Forest, Shrub or Old

Field



Residential, Park, New Field



Fenced Pasture

L R



Conservation Tillage



Urban or Industrial



Open Pasture, Row

Crop



Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):



Stream Flowing

Subsurface flow with isolated pools (Interstitial)



Moist Channel, isolated pools, no flow (Intermittent)

Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):



None

0.5



1.0

1.5



2.0

2.5



3.0

>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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5"

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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)

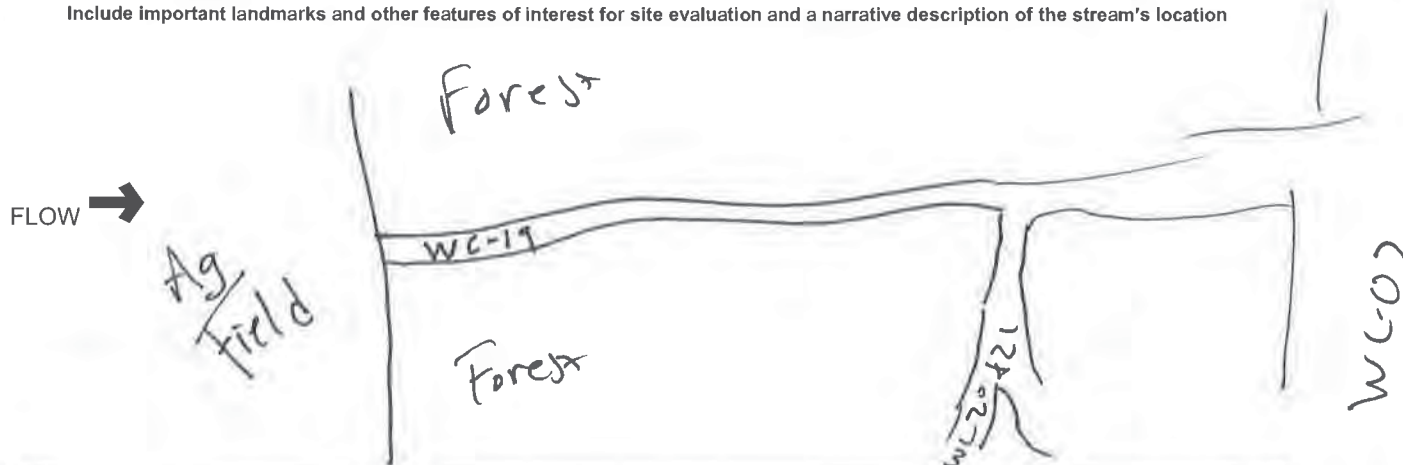
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

1

SITE NAME/LOCATION

WC-20

SITE NUMBER

WC-20

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

4.01

LENGTH OF STREAM REACH (ft)

106

LAT.

LONG.

RIVER CODE

RIVER MILE

DATE

9/12/17

SCORER

David Kuhnmann

COMMENTS

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 32). 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]                       |         |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  |         | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    |         |
| <input type="checkbox"/> BEDROCK [16 pt]             |         | <input type="checkbox"/> FINE DETRITUS [3 pts]             |         |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] |         | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | 100     |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    |         | <input type="checkbox"/> MUCK [0 pts]                      |         |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        |         | <input type="checkbox"/> ARTIFICIAL [3 pts]                |         |

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock

(A)

0

(B)

1

HHEI  
Metric  
PointsSubstrate  
Max = 40

1

A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

0

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

0

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

0

COMMENTS

AVERAGE BANKFULL WIDTH (meters)

0

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

COMMENTS

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

- 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 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 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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

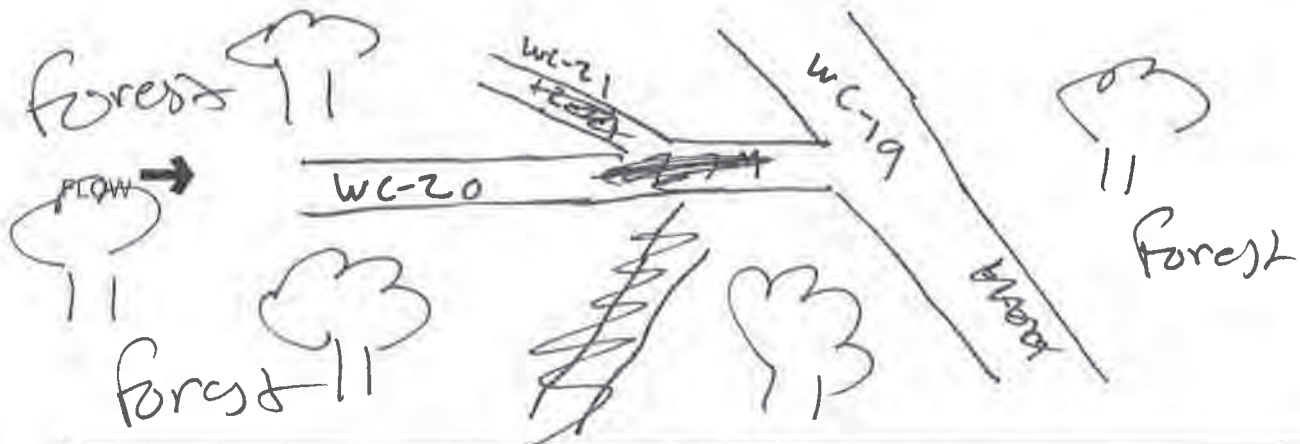
Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5"  
Photograph Information: See attached report  
Elevated Turbidity? (Y/N): N Canopy (% open): 5  
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_  
Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A  
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) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

10

SITE NAME/LOCATION WC-21 SITE NUMBER WC-21 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) 4.01  
LENGTH OF STREAM REACH (ft) 100 LAT \_\_\_\_\_ LONG \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_  
DATE 9/18/17 SCORER David Kuhmar COMMENTS \_\_\_\_\_

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 32). 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>20</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | _____   | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | _____     |
| <input type="checkbox"/> BEDROCK [16 pt]             | _____   | <input type="checkbox"/> FINE DETRITUS [3 pts]             | _____     |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | _____   | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <u>5</u>  |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | _____   | <input type="checkbox"/> MUCK [0 pts]                      | _____     |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | _____   | <input type="checkbox"/> ARTIFICIAL [3 pts]                | _____     |

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

3

(B)

2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
Points

Substrate  
Max = 40

5

A + B

Pool Depth  
Max = 30

0

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"/> | (Per Bank)     | <input type="checkbox"/> <input type="checkbox"/>                       | (Most Predominant per Bank)         |
| <input 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 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                      |
| COMMENTS _____  |                | <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              |

- 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 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 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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5"

Photograph Information: See attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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)

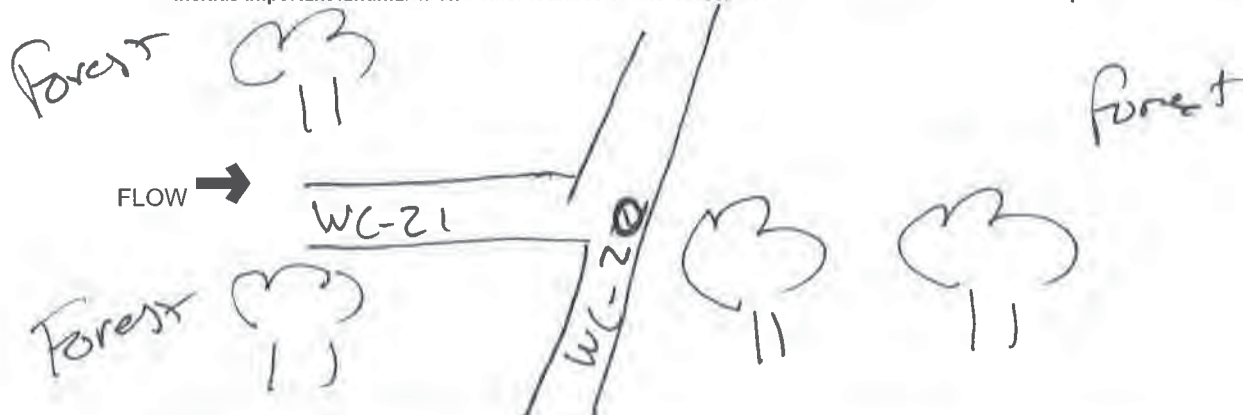
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

19

SITE NAME/LOCATION WC-22 SITE NUMBER WC-22 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) 4.01  
LENGTH OF STREAM REACH (ft) 100 LAT \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_  
DATE 9/18/17 SCORER David Kuhlmann COMMENTS \_\_\_\_\_

**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 32). 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>80</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]          | _____     | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | _____     |
| <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 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 \_\_\_\_\_

(A)

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

**HHEI  
Metric  
Points**

Substrate  
Max = 40

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

**This information must also be completed**

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 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 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 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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: ~0.5

Photograph Information: see attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

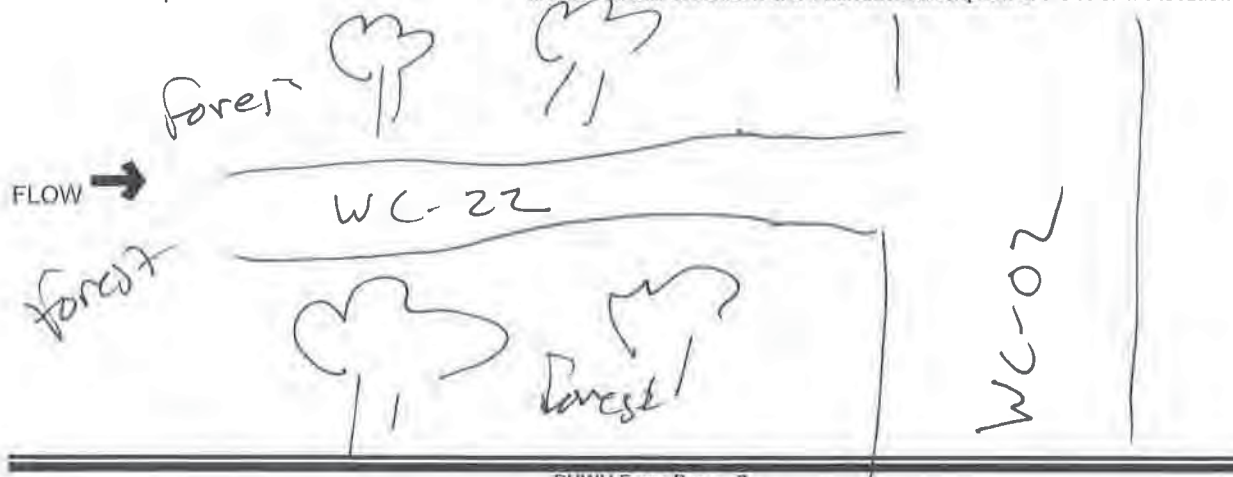
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

22

SITE NAME/LOCATION W623 SITE NUMBER W623 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) 4.01  
LENGTH OF STREAM REACH (ft) 100 LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_  
DATE 9/18/17 SCORER David Kuhlman COMMENTS \_\_\_\_\_

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 32). 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>80</u> |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]             |           | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] |           |
| <input type="checkbox"/> BEDROCK [16 pt]                        |           | <input type="checkbox"/> FINE DETRITUS [3 pts]          |           |
| <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <u>20</u> | <input type="checkbox"/> CLAY or HARDPAN [0 pt]         |           |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]               |           | <input type="checkbox"/> MUCK [0 pts]                   |           |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]                   |           | <input type="checkbox"/> ARTIFICIAL [3 pts]             |           |

Total of Percentages of  
Blr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

15

(B)

2

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

0

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

0

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

5

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters):

5

This information must also be completed

**RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

- 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 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 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: \_\_\_\_\_ 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: Madison Township / City: \_\_\_\_\_

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-17-17 Quantity: ~0.5"

Photograph Information: see attached report

Elevated Turbidity? (Y/N): N Canopy (% open): 5%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A 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): Y (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)

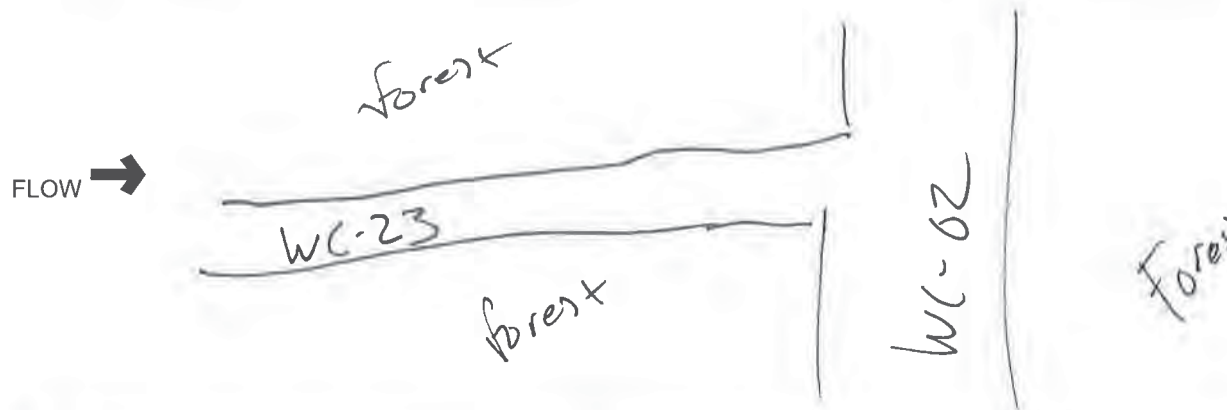
Fish Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

Frogs or Tadpoles Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_ Aquatic Macroinvertebrates Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/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) :

423

SITE NAME/LOCATION WC-24  
SITE NUMBER WC-24 RIVER BASIN                      DRAINAGE AREA (mi<sup>2</sup>) 0.2 mi.  
LENGTH OF STREAM REACH (ft) 100 LAT.                      LONG.                      RIVER CODE                      RIVER MILE                       
DATE 9/17/17 SCORER David K. Korman COMMENTS                     

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 of substrate 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.

| TYPE  | PERCENT                                 | TYPE  | PERCENT                                |
|---|---|---|--|
| <input type="checkbox"/> BLDR SLABS [16 pts]                    | <input type="checkbox"/> 0%             | <input checked="" type="checkbox"/> SILT [3 pt]         | <input checked="" type="checkbox"/> 0% |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]             | <input type="checkbox"/> 0%             | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <input type="checkbox"/> 0%            |
| <input type="checkbox"/> BEDROCK [16 pt]                        | <input type="checkbox"/> 0%             | <input type="checkbox"/> FINE DETRITUS [3 pts]          | <input type="checkbox"/> 0%            |
| <input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input checked="" type="checkbox"/> 20% | <input type="checkbox"/> CLAY or HARDPAN [0 pt]         | <input type="checkbox"/> 0%            |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]               | <input type="checkbox"/> 0%             | <input type="checkbox"/> MUCK [0 pts]                   | <input type="checkbox"/> 0%            |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]                   | <input type="checkbox"/> 0%             | <input type="checkbox"/> ARTIFICIAL [3 pts]             | <input type="checkbox"/> 0%            |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00% (A)

Substrate Percentages (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 20TOTAL NUMBER OF SUBSTRATE TYPES: 2

## 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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS                     MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30

0

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS                     AVERAGE BANKFULL WIDTH (meters): 5

Bankfull Width Max=30

65

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

COMMENTS                     

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

## 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:  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: Madison Township / City:

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: 9/17/17 Quantity: 0.5"

Photograph Information: see attached report

Elevated Turbidity? (Y/N): ☒ N Canopy (% open):  0%

Were samples collected for water chemistry? (Y/N): ☒ N (Note lab sample no. or id. and attach results) Lab Number:

Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

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)

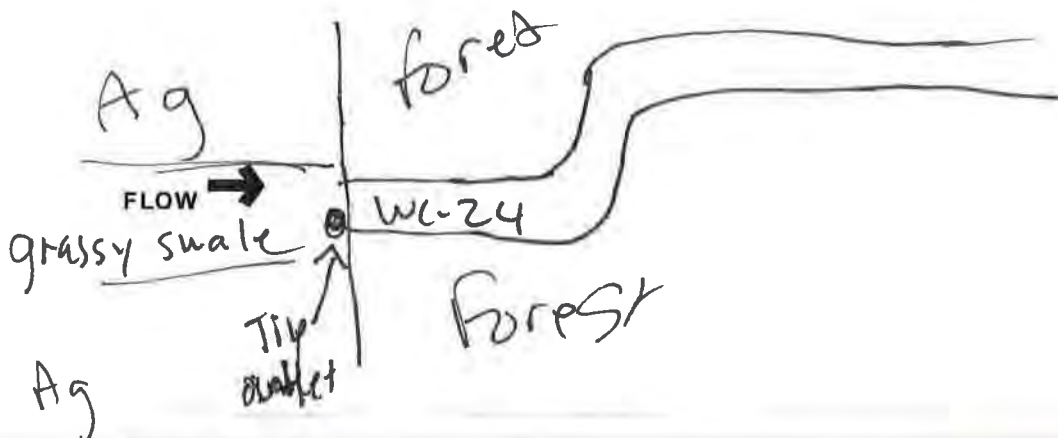
Fish Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A Salamanders Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A

Frogs or Tadpoles Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A Aquatic Macroinvertebrates Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A

Comments Regarding Biology:

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for data evaluation and a narrative description of the stream's location







## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

10

SITE NAME/LOCATION WL-25

SITE NUMBER WL-25 RIVER BASIN                      DRAINAGE AREA (mi<sup>2</sup>) 4.01

LENGTH OF STREAM REACH (ft) 100 LAT.                      LONG.                      RIVER CODE                      RIVER MILE                     

DATE 9/17/17 SCORER David Kuhn COMMENTS                     

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                         | TYPE   | PERCENT                          |
|--|---------------------------------|--|----------------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text" value="0%"/> | <input type="checkbox"/> SILT [3 pt]                       | <input type="text" value="0%"/>  |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text" value="0%"/> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text" value="0%"/>  |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text" value="0%"/> | <input checked="" type="checkbox"/> FINE DETRITUS [3 pts]  | <input type="text" value="50%"/> |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text" value="0%"/> | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text" value="50%"/> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text" value="0%"/> | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text" value="0%"/>  |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text" value="0%"/> | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text" value="0%"/>  |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00%

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 93TOTAL NUMBER OF SUBSTRATE TYPES: 2

## HHEI Metric Points

Substrate Max = 40

5

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

0

COMMENTS                     MAXIMUM POOL DEPTH (centimeters): 9

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 (> 9' 7" - 4' 8") [20 pts] |  |

Bankfull Width Max=30

95

COMMENTS                     AVERAGE BANKFULL WIDTH (meters): 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) Mature Forest, Wetland             |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m Residential, Park, New Field   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m Fenced Pasture                     |
| <input type="checkbox"/>            | <input type="checkbox"/>            |                                     |                                     | None Conservation Tillage                     |
|                                     |                                     |                                     |                                     | Urban or Industrial                           |
|                                     |                                     |                                     |                                     | Open Pasture, Row Crop                        |
|                                     |                                     |                                     |                                     | Mining or Construction                        |

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

☐ 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:  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: Windsor Madison Township / City:

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9/17/17 Quantity: 0.00 0.5"  
Photograph Information: see attached report  
Elevated Turbidity? (Y/N): N Canopy (% open): 0%  
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:   
Field Measures: Temp (°C) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A  
Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

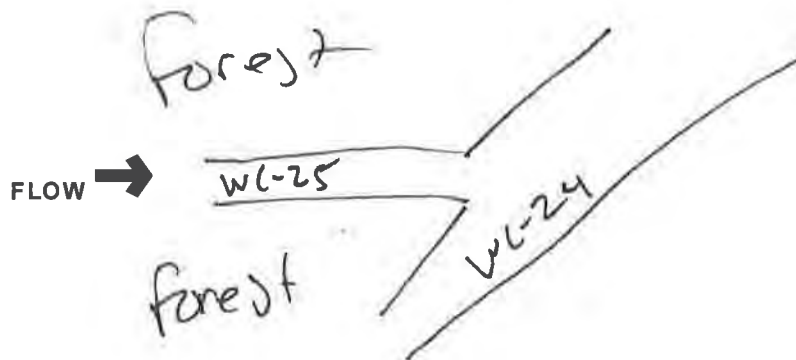
Additional comments/description of pollution impacts:

**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/A Voucher? (Y/N) N/A Salamanders Observed? (Y/N) N/A Voucher? (Y/N) N/A  
Frogs or Tadpoles Observed? (Y/N) N/A Voucher? (Y/N) N/A Aquatic Macroinvertebrates Observed? (Y/N) N/A Voucher? (Y/N) N/A  
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):

35

SITE NAME/LOCATION WL-26  
SITE NUMBER WL-26 RIVER BASIN                      DRAINAGE AREA (mi<sup>2</sup>) 4.1  
LENGTH OF STREAM REACH (ft) 750 LAT.                      LONG.                      RIVER CODE                      RIVER MILE                       
DATE 9/17/17 SCORER David Kuhlmann COMMENTS                     

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 of substrate 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.

| TYPE   | PERCENT                         | TYPE   | PERCENT                           |
|--|---------------------------------|--|-----------------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text" value="0%"/> | <input type="checkbox"/> SILT [3 pt]                       | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text" value="0%"/> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text" value="0%"/> | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text" value="0%"/>   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text" value="0%"/> | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text" value="100%"/> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text" value="0%"/> | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text" value="0%"/>   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text" value="0%"/> | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text" value="0%"/>   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A) **0** (B) **1**

## HHEI Metric Points

Substrate Max = 40

A + B

Pool Depth Max = 30

0

Bankfull Width Max=30

05

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS                     MAXIMUM POOL DEPTH (centimeters): 0

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS                     AVERAGE BANKFULL WIDTH (meters): 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                                   | L                        | R                        |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/> | <input type="checkbox"/> |
| (Per Bank) 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 checked="" type="checkbox"/> | <input checked="" 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 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

☐ 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:  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: Washington Madison Township / City:

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: 9/17/17 Quantity: 0.60 0.5"

Photograph Information: See attached report

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) N/A Dissolved Oxygen (mg/l) N/A pH (S.U.) N/A Conductivity (µmhos/cm) N/A

Is the sampling reach representative of the stream (Y/N): ☒ Y If not, please explain:

Additional comments/description of pollution impacts:

**BIOTIC EVALUATION**

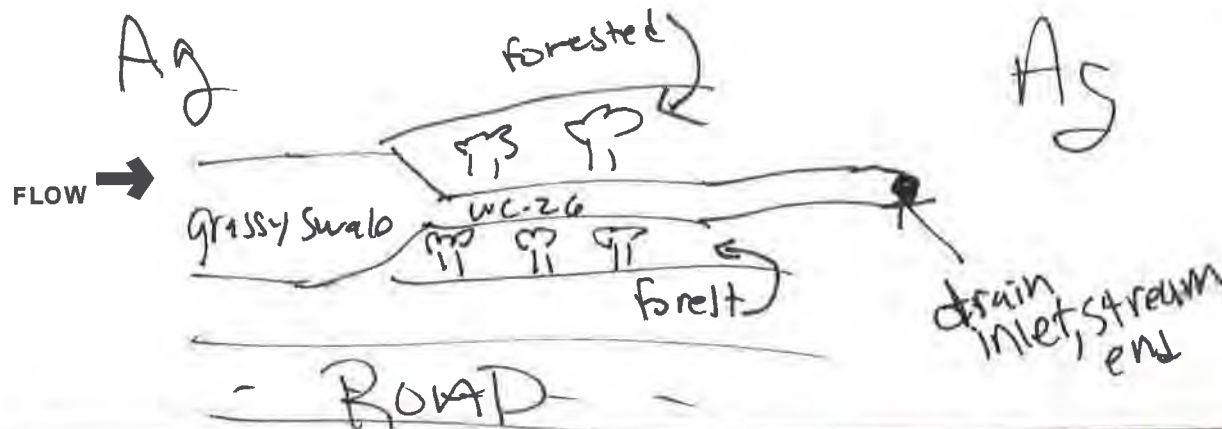
Performed? (Y/N): ☒ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A Salamanders Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A  
Frogs or Tadpoles Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A Aquatic Macroinvertebrates Observed? (Y/N) ☒ N/A Voucher? (Y/N) ☒ N/A

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

56

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **WC-100**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **1.12**

LENGTH OF STREAM REACH (ft) **6,190** LAT. **39.82694** LONG. **-83.32017** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                  | TYPE  | PERCENT                  |
|--|--------------------------|---|--------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]                 | <input type="text"/> 0%  | <input type="checkbox"/> SILT [3 pt]                    | <input type="text"/> 40% |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]          | <input type="text"/> 0%  | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | <input type="text"/> 0%  |
| <input type="checkbox"/> BEDROCK [16 pt]                     | <input type="text"/> 10% | <input type="checkbox"/> FINE DETRITUS [3 pts]          | <input type="text"/> 0%  |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]         | <input type="text"/> 0%  | <input type="checkbox"/> CLAY or HARDPAN [0 pt]         | <input type="text"/> 0%  |
| <input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts] | <input type="text"/> 40% | <input type="checkbox"/> MUCK [0 pts]                   | <input type="text"/> 10% |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]                | <input type="text"/> 0%  | <input type="checkbox"/> ARTIFICIAL [3 pts]             | <input type="text"/> 0%  |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **10.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **4**

HHEI Metric Points

Substrate Max = 40

16

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 checked="" 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 type="checkbox"/> > 10 - 22.5 cm [25 pts]              | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **45**

Pool Depth Max = 30

20

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS  AVERAGE BANKFULL WIDTH (meters): 

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

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS 

## FLOODPLAIN QUALITY

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mining or Construction |

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 40.0 (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: see Wetland Delineation Map NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): ☒ N Date of last precipitation: 9-10-2018 Quantity: 0.41"  
Photograph Information: See Wetland Delineation Photolog  
Elevated Turbidity? (Y/N): ☒ N Canopy (% open): 10%  
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) ☒ Y Voucher? (Y/N) ☒ N Salamanders Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N  
Frogs or Tadpoles Observed? (Y/N) ☒ Y Voucher? (Y/N) ☒ N Aquatic Macroinvertebrates Observed? (Y/N) ☒ Y 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

Ag Ag Forest WC-100 WC-104 Ag Ag  
FLOW →





## Primary Headwater Habitat Evaluation Form

6

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **WC-101**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **50** LAT. **39.83550** LONG. **-83.33840** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT   | TYPE   | PERCENT     |
|--|-----------|--|-------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <b>0%</b> | <input type="checkbox"/> SILT [3 pt]                       | <b>0%</b>   |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <b>0%</b> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <b>0%</b>   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <b>0%</b> | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <b>0%</b>   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <b>0%</b> | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <b>100%</b> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <b>0%</b> | <input type="checkbox"/> MUCK [0 pts]                      | <b>0%</b>   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <b>0%</b> | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <b>0%</b>   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**TOTAL NUMBER OF SUBSTRATE TYPES: **1**

HHEI Metric Points

Substrate Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

0

COMMENTS  MAXIMUM POOL DEPTH (centimeters): 

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull Width Max=30

5

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.00**

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | None           |

## FLOODPLAIN QUALITY

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" 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 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 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 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:  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:  **see Wetland Delineation report maps** NRCS Soil Map Page:  NRCS Soil Map Stream Order:   
County: **Madison** ☐ Township / City: **Fairfield**

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: **9-10-2018** Quantity: **0.41"**  
Photograph Information: **see photolog**  
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): ☒ N If not, please explain:  
**only the beginning 50 ft of WC-101 extend into the Project Area. Stream characteristics offsite cannot be determined**

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) :

25

SITE NAME/LOCATION **WC-102**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.38**

LENGTH OF STREAM REACH (ft) **10** LAT. **39.82613** LONG. **-83.32000** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                  | TYPE   | PERCENT                  |
|--|--------------------------|--|--------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0%  | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> 60% |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0%  | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%  |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> 0%  | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%  |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0%  | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> %   |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> 15% | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> 25% |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0%  | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%  |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **3**TOTAL NUMBER OF SUBSTRATE TYPES: **2**

HHEI Metric Points

Substrate Max = 40

5

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 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 (> 9' 7" - 4' 8") [20 pts] |  |

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

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

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS 

## FLOODPLAIN QUALITY

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mining or Construction |

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 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:  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: see Wetland Delineation report maps NRCS Soil Map Page:  NRCS Soil Map Stream Order   
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-2018 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): ☒ Canopy (% open): 100%  
Were samples collected for water chemistry? (Y/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) ☒ If not, please explain: only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

Additional comments/description of pollution impacts:

**BIDOTIC EVALUATION**

Performed? (Y/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) ☒ Voucher? (Y/N) ☒ Salamanders Observed? (Y/N) ☒ Voucher? (Y/N) ☒  
Frogs or Tadpoles Observed? (Y/N) ☒ Voucher? (Y/N) ☒ Aquatic Macroinvertebrates Observed? (Y/N) ☒ Voucher? (Y/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

Ag  
FLOW → WC-102 Forest  
Ag  
↓ N







**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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-2018 Quantity: 0.41"  
Photograph Information: see photolog  
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): N If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

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) :

6

SITE NAME/LOCATION **WC-104**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **140** LAT. **39.82487** LONG. **-83.32290** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS **field drainage**

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 of substrate 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.

| TYPE   | PERCENT                 | TYPE   | PERCENT                   |
|--|-------------------------|--|---------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0% | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> %    |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0% | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> 0% | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0% | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 100% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %  | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %    |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0% | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**

TOTAL NUMBER OF SUBSTRATE TYPES: **1**

HHEI Metric Points

Substrate Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

0

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull Width Max=30

5

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

### RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS

### FLOODPLAIN QUALITY

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mining or Construction |

### 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 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 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): ☒ Canopy (% open): 20%  
Were samples collected for water chemistry? (Y/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): ☒ If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/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): ☒ Voucher? (Y/N): ☒ Salamanders Observed? (Y/N): ☒ Voucher? (Y/N): ☒  
Frogs or Tadpoles Observed? (Y/N): ☒ Voucher? (Y/N): ☒ Aquatic Macroinvertebrates Observed? (Y/N): ☒ Voucher? (Y/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

6

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **WC-105**

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) **0.01**LENGTH OF STREAM REACH (ft) **460**LAT. **39.82650**LONG. **-83.32418**

RIVER CODE

RIVER MILE

DATE **09/15/18**SCORER **David K.**COMMENTS **field drainage****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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                         | TYPE   | PERCENT                           |
|--|---------------------------------|--|-----------------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text" value="0%"/> | <input type="checkbox"/> SILT [3 pt]                       | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text" value="0%"/> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text" value="0%"/> | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text" value="0%"/>   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text" value="0%"/> | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text" value="100%"/> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text" value="0%"/> | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text" value="0%"/>   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text" value="0%"/> | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text" value="0%"/>   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**TOTAL NUMBER OF SUBSTRATE TYPES: **1****HHEI Metric Points**

Substrate Max = 40

**1**

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

**0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

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**

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

**FLOODPLAIN QUALITY**

| L                        | R                        | (Most Predominant per Bank)         |
|--------------------------|--------------------------|-------------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/> | <input type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/> | <input type="checkbox"/> | Residential, Park, New Field        |
| <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 checked="" type="checkbox"/> | <input checked="" 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 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 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): N Canopy (% open): 20%  
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): N If not, please explain: only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

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

FLOW →

N  
↙

WC-105

Forest

WC-109

A<sub>2</sub>



## Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

6

SITE NAME/LOCATION **WC-106**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **640** LAT. **39.83100** LONG. **-83.32710** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS **field drainage**

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                 | TYPE   | PERCENT                   |
|--|-------------------------|--|---------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0% | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> %    |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0% | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> 0% | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0% | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 100% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %  | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %    |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0% | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A) Substrate Percentage Check (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**TOTAL NUMBER OF SUBSTRATE TYPES: **1**

HHEI Metric Points

Substrate Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

0

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull Width Max=30

5

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 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 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 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:  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: see Wetland Delineation report maps NRCS Soil Map Page:  NRCS Soil Map Stream Order:   
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): ☒ Canopy (% open): 20%  
Were samples collected for water chemistry? (Y/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): ☒ If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

Additional comments/description of pollution impacts:

**BIOTIC EVALUATION**

Performed? (Y/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) ☒ Voucher? (Y/N) ☒ Salamanders Observed? (Y/N) ☒ Voucher? (Y/N) ☒  
Frogs or Tadpoles Observed? (Y/N) ☒ Voucher? (Y/N) ☒ Aquatic Macroinvertebrates Observed? (Y/N) ☒ Voucher? (Y/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

46

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **WC-107**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.51**

LENGTH OF STREAM REACH (ft) **2,000** LAT. **39.82550** LONG. **-83.32460** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                  | TYPE   | PERCENT                  |
|--|--------------------------|--|--------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0%  | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> 30% |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0%  | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%  |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> 20% | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%  |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0%  | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 50% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %   | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0%  | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%  |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **20.00%** (A)

Substrate Percentage Check (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **3**TOTAL NUMBER OF SUBSTRATE TYPES: **3**HHEI  
Metric  
PointsSubstrate  
Max = 40

6

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 checked="" 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 type="checkbox"/> > 10 - 22.5 cm [25 pts]              | <input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

20

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

20

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): ☒ Canopy (% open): 20%  
Were samples collected for water chemistry? (Y/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): ☒ If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

Performed? (Y/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): ☒ Voucher? (Y/N): ☒ Salamanders Observed? (Y/N): ☒ Voucher? (Y/N): ☒  
Frogs or Tadpoles Observed? (Y/N): ☒ Voucher? (Y/N): ☒ Aquatic Macroinvertebrates Observed? (Y/N): ☒ Voucher? (Y/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) :

12

SITE NAME/LOCATION **WC-108**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.31**

LENGTH OF STREAM REACH (ft) **560** LAT. **39.82780** LONG. **-83.32620** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                 | TYPE   | PERCENT                  |
|--|-------------------------|--|--------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0% | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> 10% |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0% | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%  |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> %  | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%  |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0% | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 90% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %  | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0% | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%  |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**TOTAL NUMBER OF SUBSTRATE TYPES: **2**

HHEI Metric Points

Substrate Max = 40

2

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 (> 9' 7" - 4' 8") [20 pts] |   |

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

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

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS 

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input type="checkbox"/>            | <input type="checkbox"/>            | Mature Forest, Wetland              |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

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

☐ 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): N Canopy (% open): 20%  
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): N If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

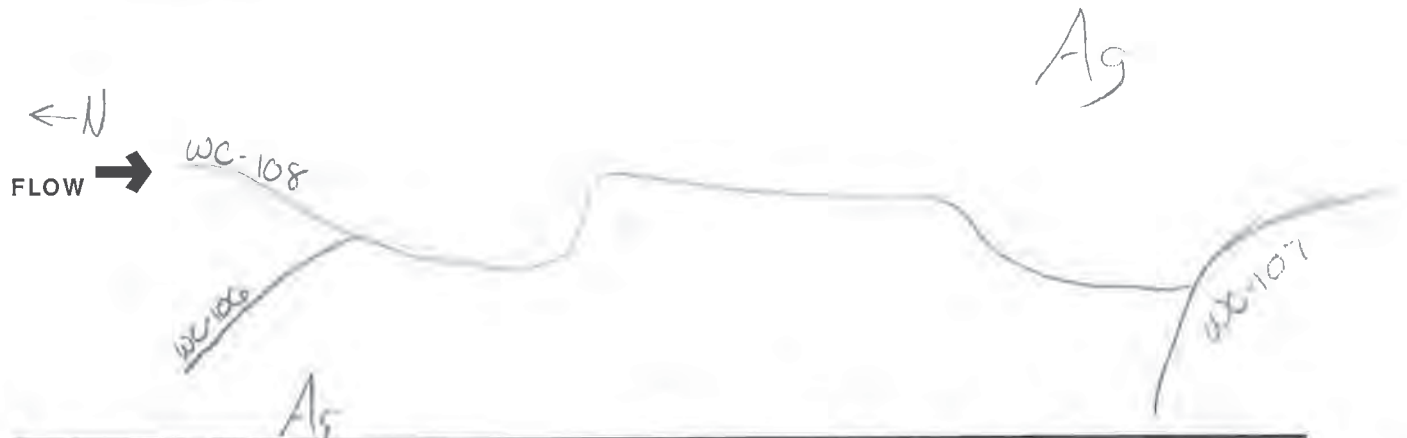
Additional comments/description of pollution impacts: \_\_\_\_\_

**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) :

6

SITE NAME/LOCATION **WC-109**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.02**

LENGTH OF STREAM REACH (ft) **510** LAT. **39.82650** LONG. **-83.32460** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS **field drainage**

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                 | TYPE   | PERCENT                   |
|--|-------------------------|--|---------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0% | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> %    |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0% | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> 0% | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0% | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 100% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %  | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %    |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0% | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0** TOTAL NUMBER OF SUBSTRATE TYPES: **1**HHEI  
Metric  
PointsSubstrate  
Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

0

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

5

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.50**

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 type="checkbox"/>            | <input 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 checked="" 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 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 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)**

|  |                                      |
|--|--------------------------------------|
| <input type="checkbox"/> WWH Name: _____ | Distance from Evaluated Stream _____ |
| <input type="checkbox"/> CWH Name: _____ | Distance from Evaluated Stream _____ |
| <input type="checkbox"/> EWH Name: _____ | Distance from Evaluated Stream _____ |

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"

Photograph Information: see photolog

Elevated Turbidity? (Y/N): N Canopy (% open): 20%

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): N If not, please explain: \_\_\_\_\_

only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

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

6

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **WC-110**

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>) **0.01**LENGTH OF STREAM REACH (ft) **280**LAT. **39.83060**LONG. **-83.32680**

RIVER CODE

RIVER MILE

DATE **09/15/18**SCORER **David K.**COMMENTS **field drainage**

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                         | TYPE   | PERCENT                           |
|--|---------------------------------|--|-----------------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text" value="0%"/> | <input type="checkbox"/> SILT [3 pt]                       | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text" value="0%"/> | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text" value="0%"/>   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text" value="0%"/> | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text" value="0%"/>   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text" value="0%"/> | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text" value="100%"/> |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text" value="0%"/> | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text" value="0%"/>   |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text" value="0%"/> | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text" value="0%"/>   |

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage  
Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**TOTAL NUMBER OF SUBSTRATE TYPES: **1**HHEI  
Metric  
PointsSubstrate  
Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth  
Max = 30

0

COMMENTS

MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull  
Width  
Max=30

5

COMMENTS

AVERAGE BANKFULL WIDTH (meters): **1.50**

## This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

## RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

COMMENTS

## FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 |

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 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 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): N Canopy (% open): 20%  
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): N If not, please explain:  
only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

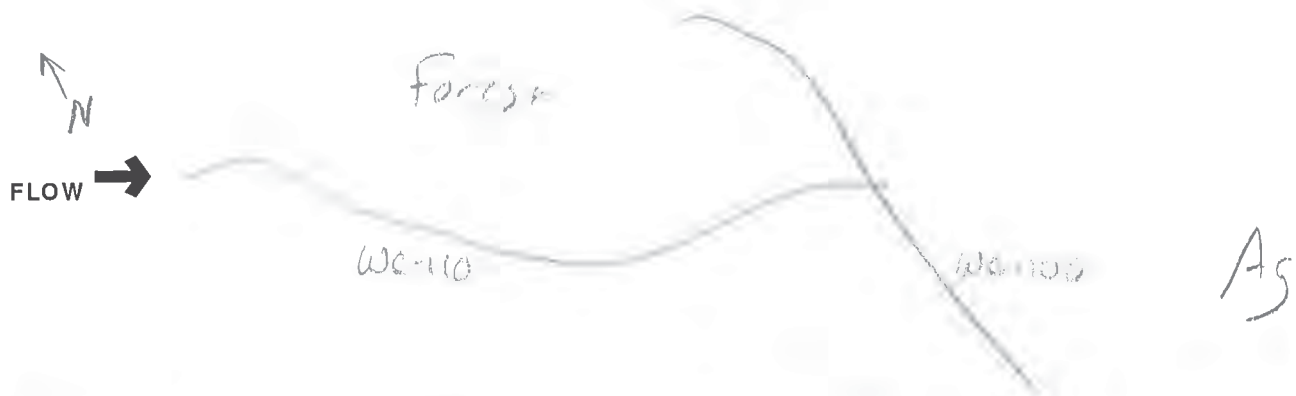
Additional comments/description of pollution impacts: \_\_\_\_\_

**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) :

6

SITE NAME/LOCATION **WC-111**

SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **250** LAT. **39.83020** LONG. **-83.31960** RIVER CODE  RIVER MILE

DATE **09/15/18** SCORER **David K.** COMMENTS

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

1. **SUBSTRATE** (Estimate percent of every type of substrate 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.

| TYPE   | PERCENT                 | TYPE   | PERCENT                   |
|--|-------------------------|--|---------------------------|
| <input type="checkbox"/> BLDR SLABS [16 pts]         | <input type="text"/> 0% | <input type="checkbox"/> SILT [3 pt]                       | <input type="text"/> %    |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]  | <input type="text"/> 0% | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]    | <input type="text"/> 0%   |
| <input type="checkbox"/> BEDROCK [16 pt]             | <input type="text"/> %  | <input type="checkbox"/> FINE DETRITUS [3 pts]             | <input type="text"/> 0%   |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts] | <input type="text"/> 0% | <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt] | <input type="text"/> 100% |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]    | <input type="text"/> %  | <input type="checkbox"/> MUCK [0 pts]                      | <input type="text"/> %    |
| <input type="checkbox"/> SAND (<2 mm) [6 pts]        | <input type="text"/> 0% | <input type="checkbox"/> ARTIFICIAL [3 pts]                | <input type="text"/> 0%   |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **0**

TOTAL NUMBER OF SUBSTRATE TYPES: **1**

HHEI Metric Points

Substrate Max = 40

1

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 type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

0

COMMENTS  MAXIMUM POOL DEPTH (centimeters): **0**

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 (> 9' 7" - 4' 8") [20 pts] |   |

Bankfull Width Max=30

5

COMMENTS  AVERAGE BANKFULL WIDTH (meters): **1.00**

This information must also be completed

## RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

### RIPARIAN WIDTH

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <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           |

### FLOODPLAIN QUALITY

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <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 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 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 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: \_\_\_\_\_ 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: see Wetland Delineation report maps NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order: \_\_\_\_\_  
County: Madison Township / City: Fairfield

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 9-10-18 Quantity: 0.41"  
Photograph Information: see photolog  
Elevated Turbidity? (Y/N): N Canopy (% open): 20%  
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): N If not, please explain only the beginning 10 ft of WC-102 extend into the Project Area. Stream characteristics offsite cannot be determined

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

forest  
WC 111  
WC - 100  
FLOW →  
N  
forest

# **Appendix C**

## **Wetland and Watercourse Photo Points**





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-01   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-02   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-03   |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-04   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-05   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-06   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-07   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-08   |

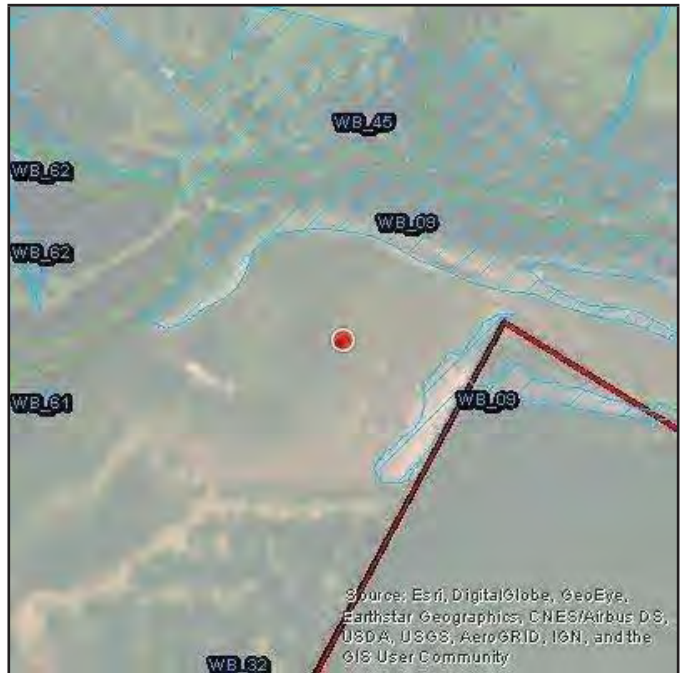




#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-09   |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_09   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_09   |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community



Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_09   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-09   |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

#### Attributes

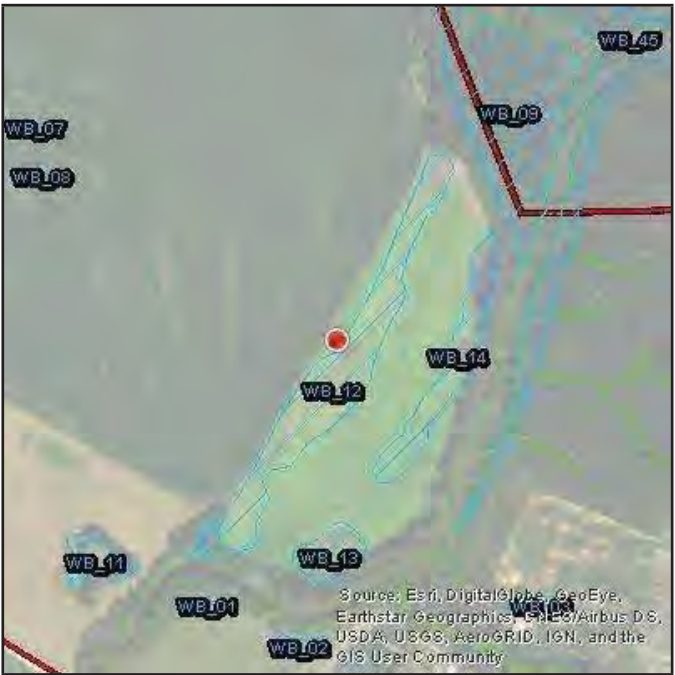
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-10   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-11   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-12   |





| Attributes |              |
|------------|--------------|
| Locked     | Wetland      |
| Wetland ID | WB-13 and 14 |





#### Attributes

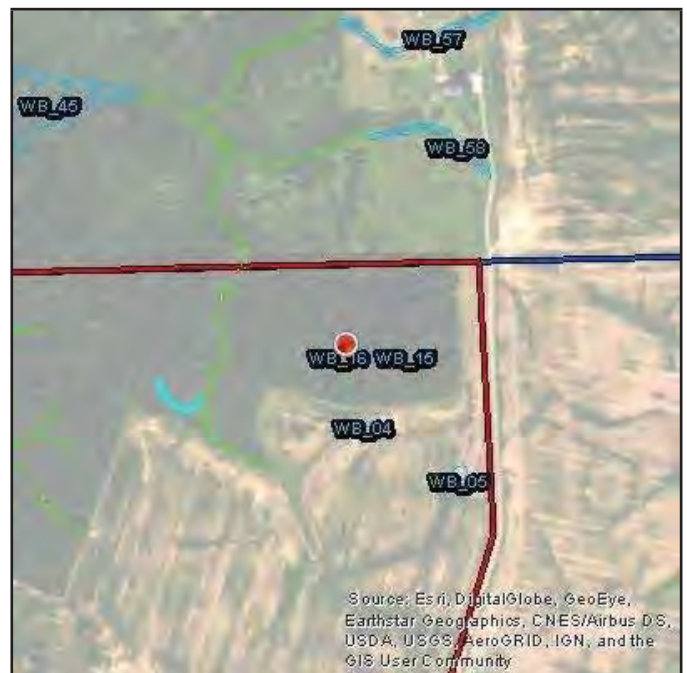
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| Locked     | Wetland |
| Wetland ID | WB-16   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-16   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-17   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_17   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_18   |





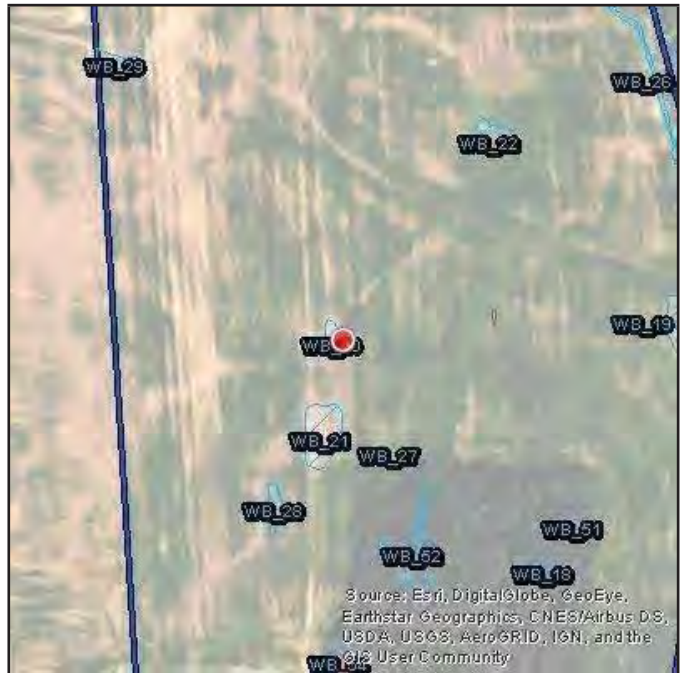
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_19   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_20   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_21   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_22   |





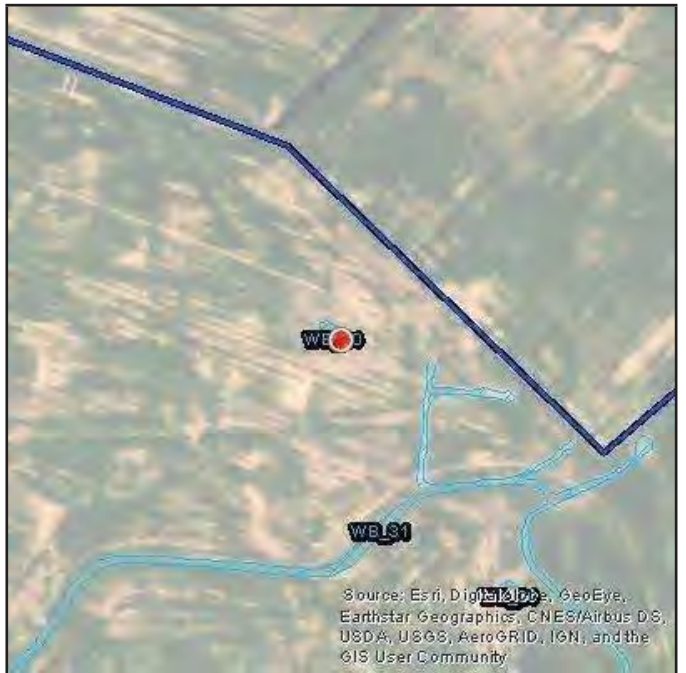
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_24   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_25   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_25   |

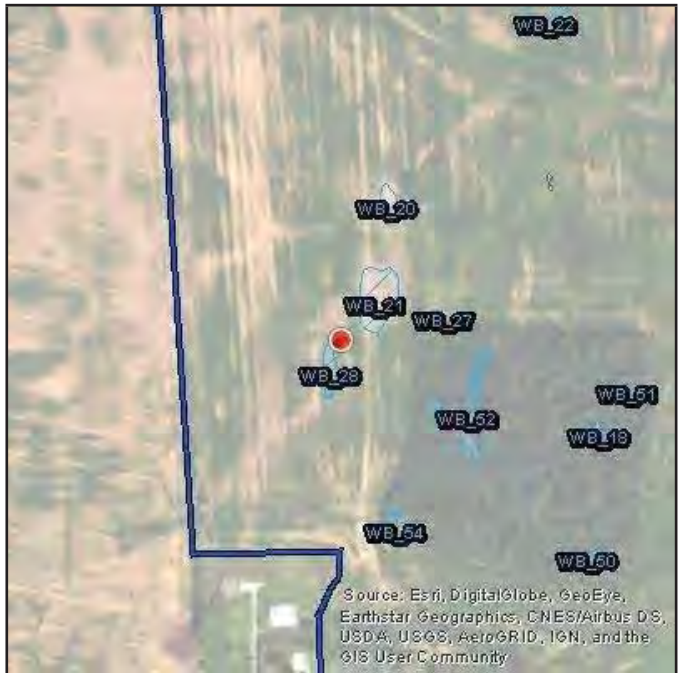




#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_26   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_28   |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community



Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_29   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | P13     |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community



Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_30   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_31   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_32   |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_33   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_34   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_35   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB35    |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_35   |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

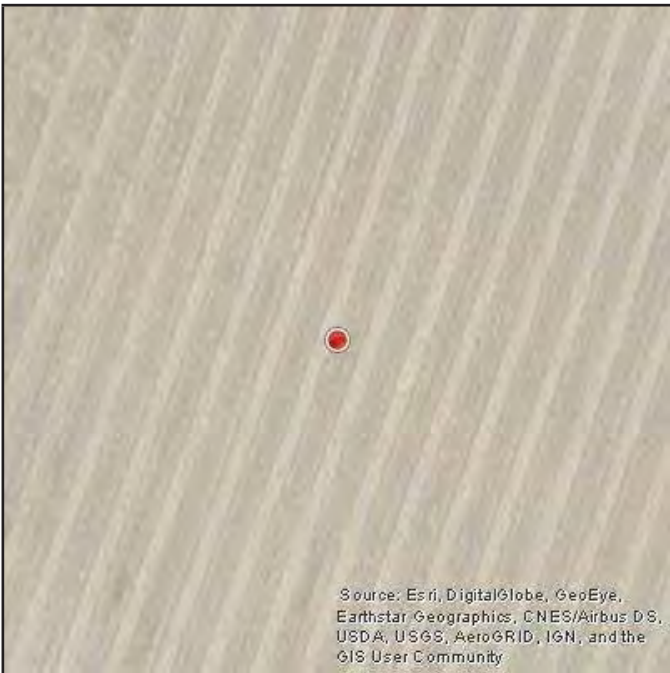
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| Locked     | Wetland |
| Wetland ID | WB_36   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_36   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_37   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_37   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_38   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_39   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_40   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_41   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_42   |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community



Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_43   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_43   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_44   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_45   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_45   |



| Attributes |                 |
|------------|-----------------|
| Locked     | Wetland         |
| Wetland ID | Stormwater Pond |





#### Attributes

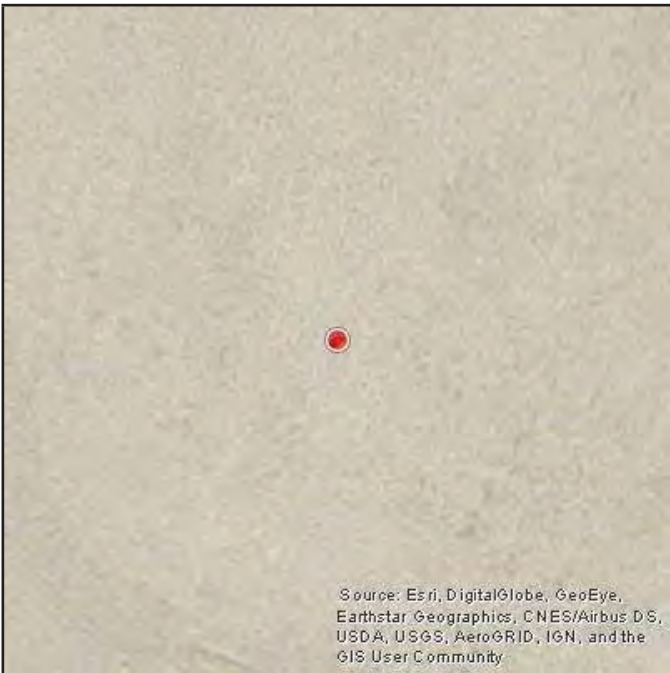
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|------------|-----------------|
| Locked     | Wetland         |
| Wetland ID | Stormwater Pond |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_46   |



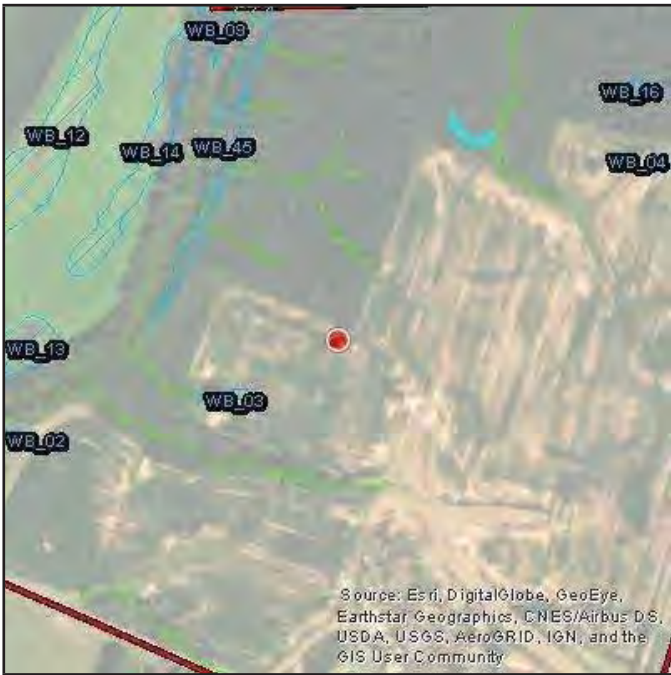


| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_47   |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_48   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_49   |



| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_51   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_52   |





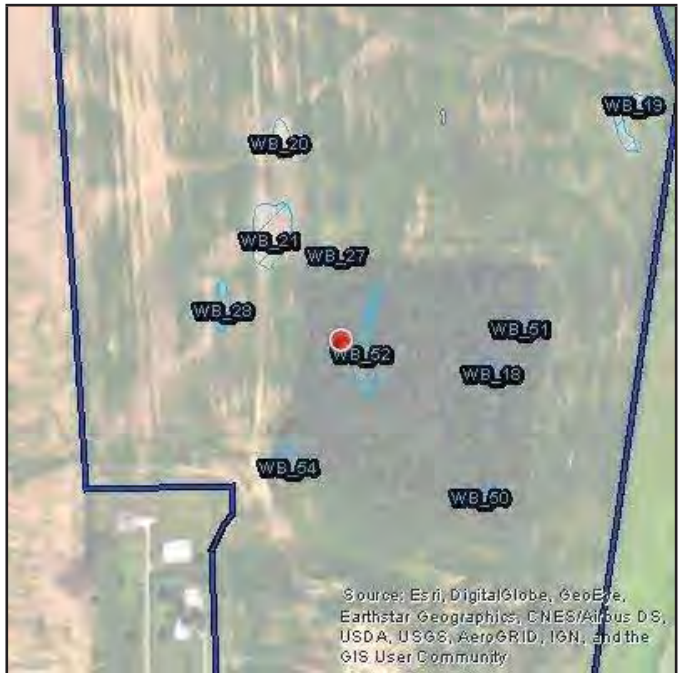
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_52   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_52   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_53   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_53   |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_54   |





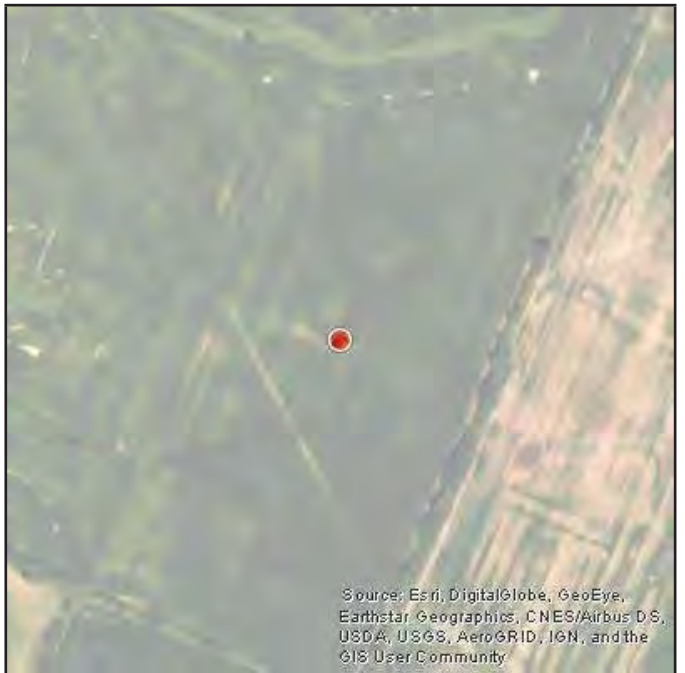
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|------------|---------|
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| Wetland ID | WB_54   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_55   |





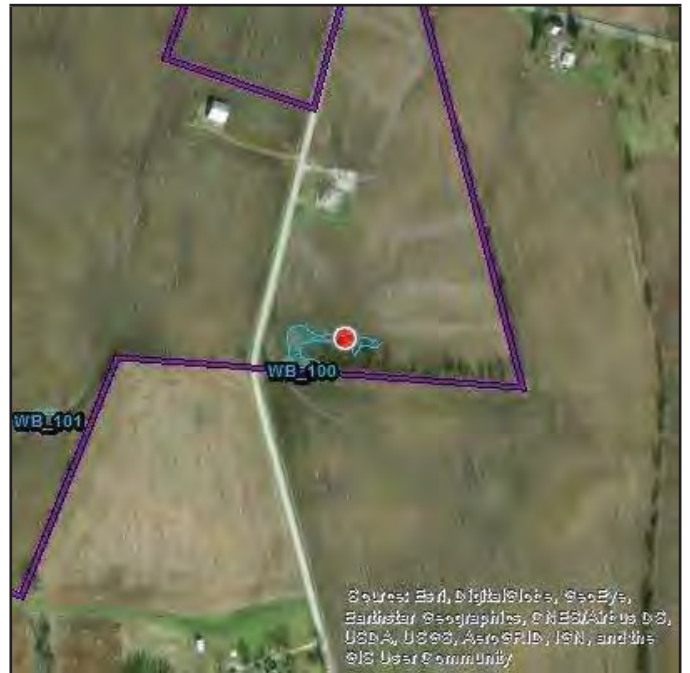
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_58   |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB_58   |

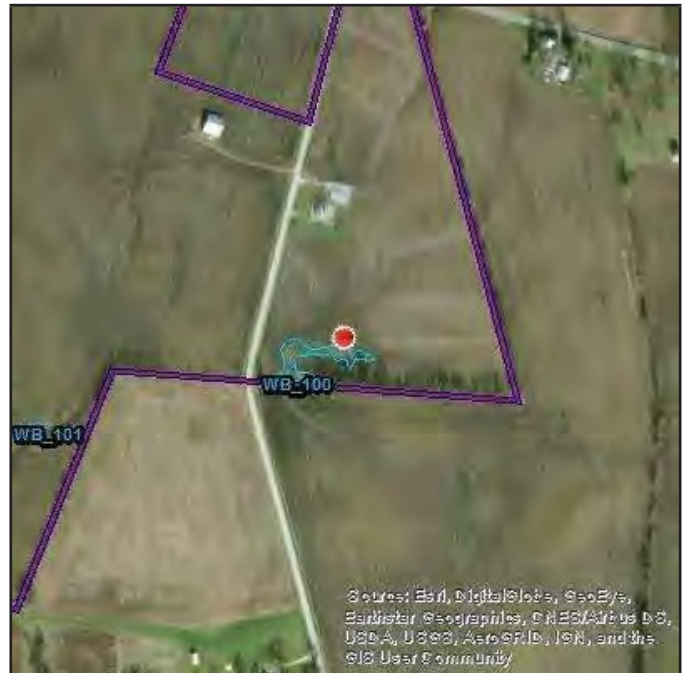




#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-100  |

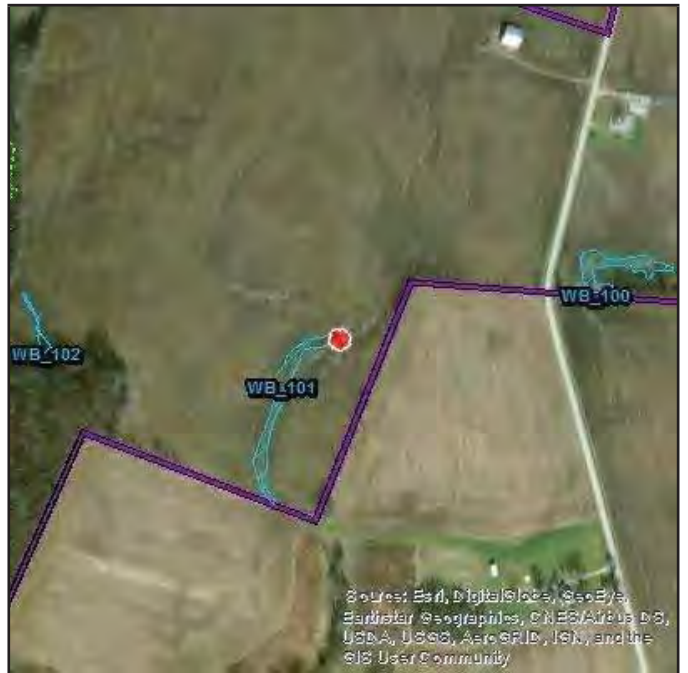




#### Attributes

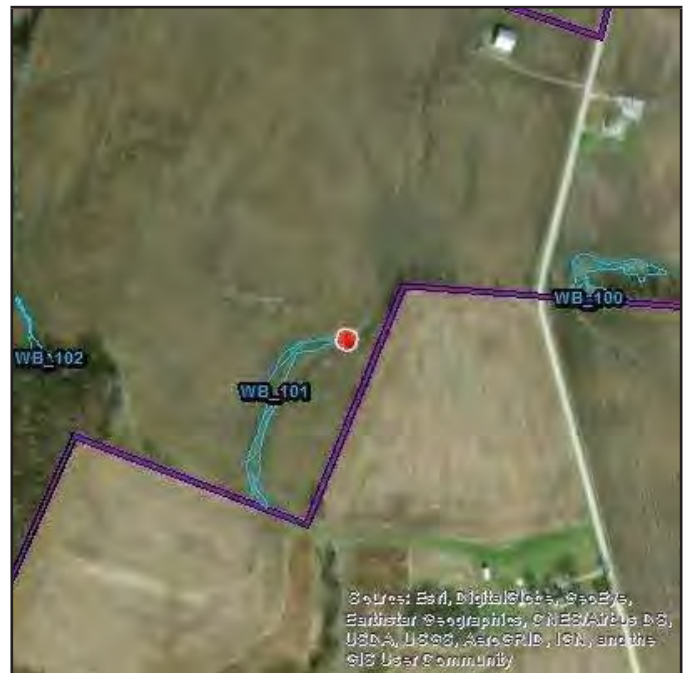
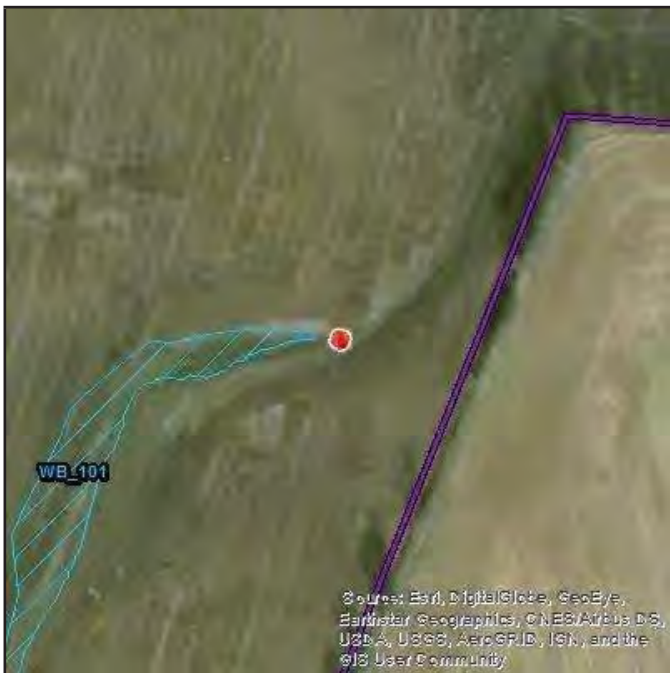
|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-100  |





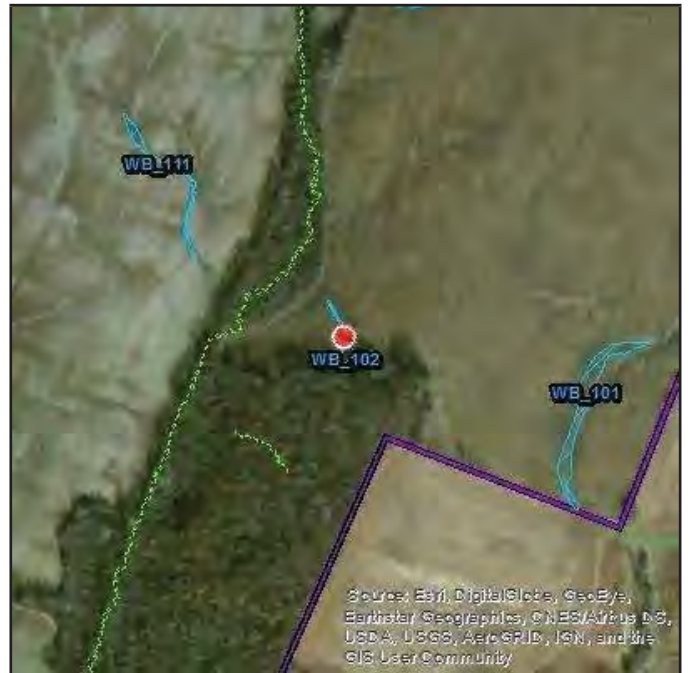
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-101  |





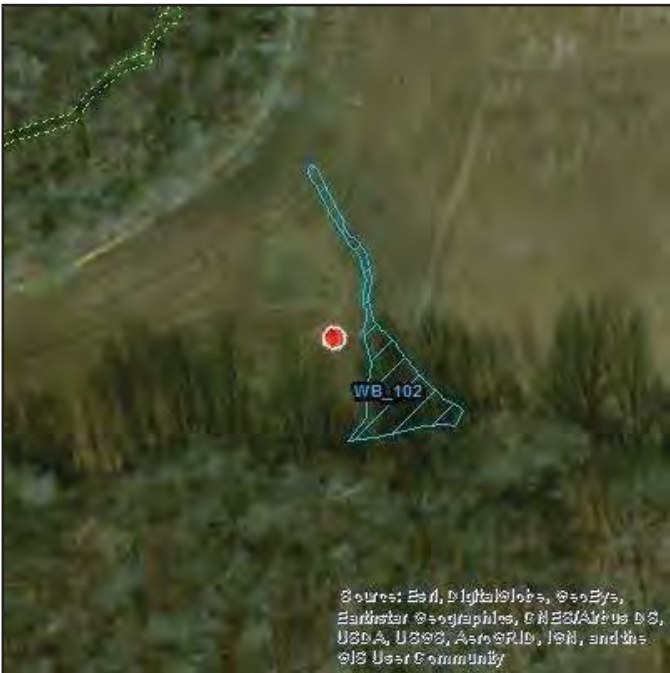
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-101  |





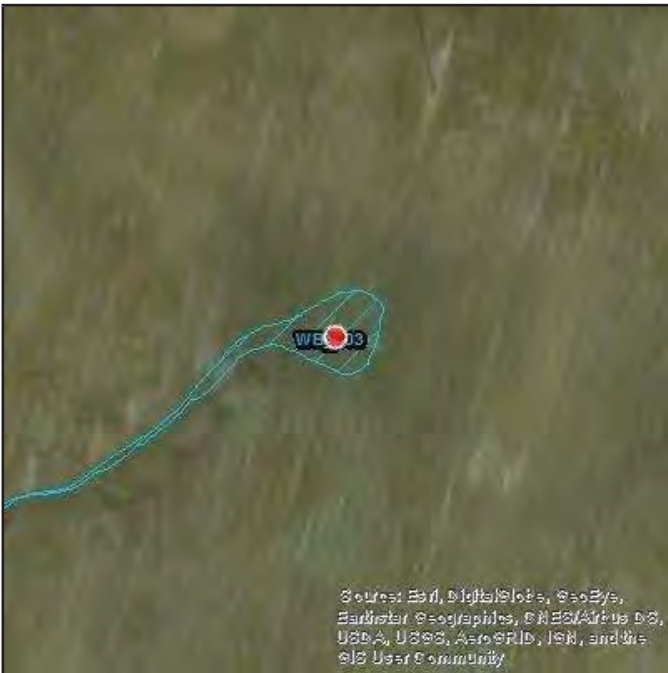
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-102  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-102  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WET-103 |





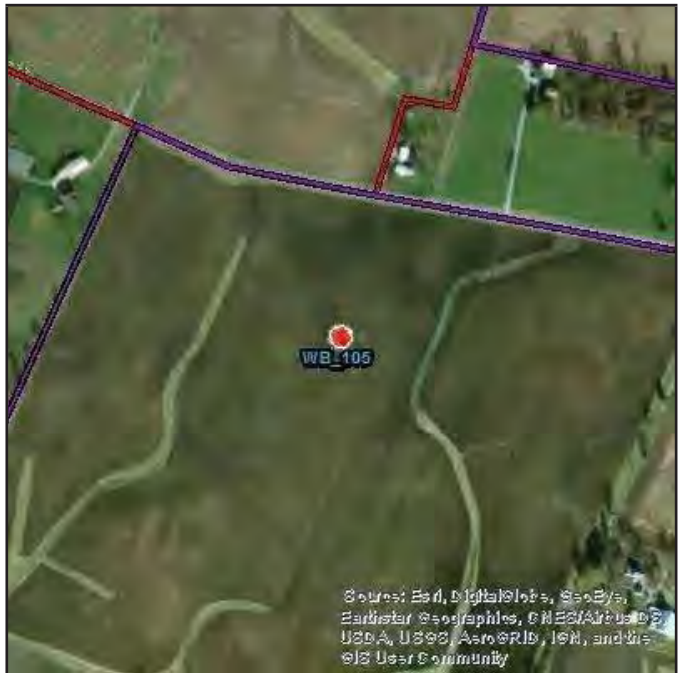
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-103  |





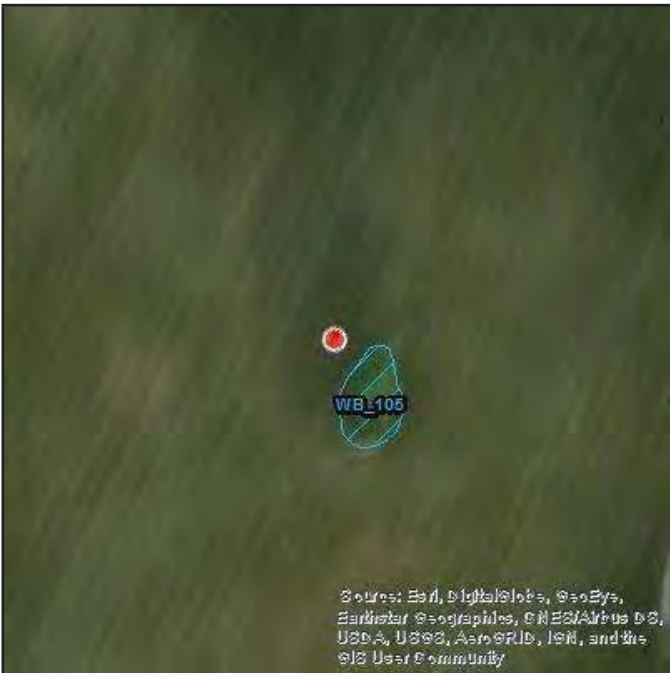
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-104  |





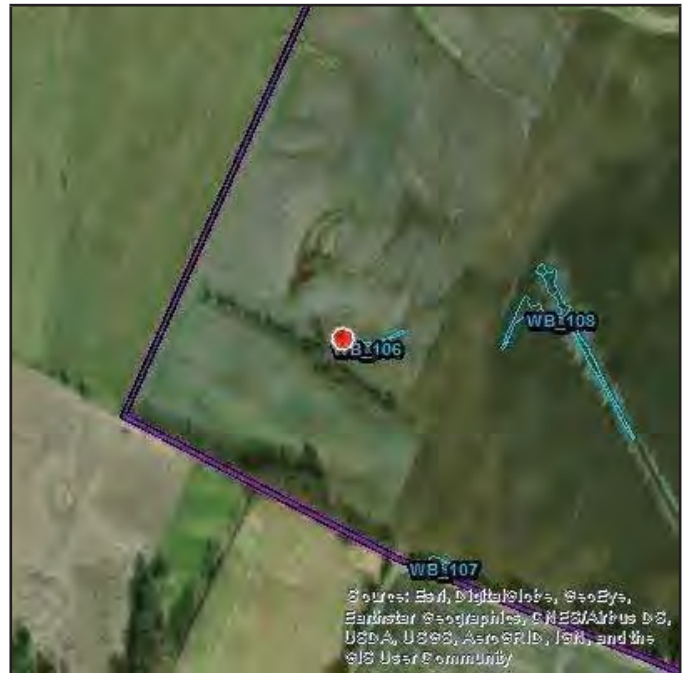
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-105  |





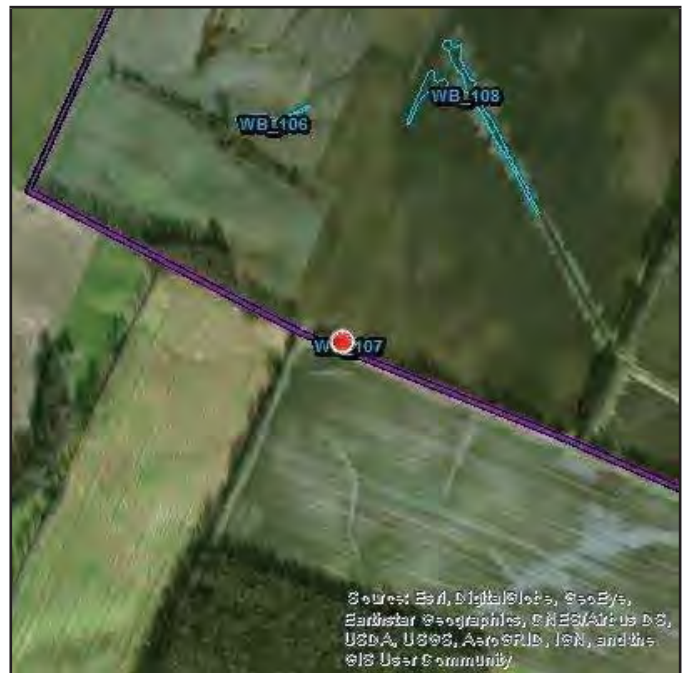
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-105  |





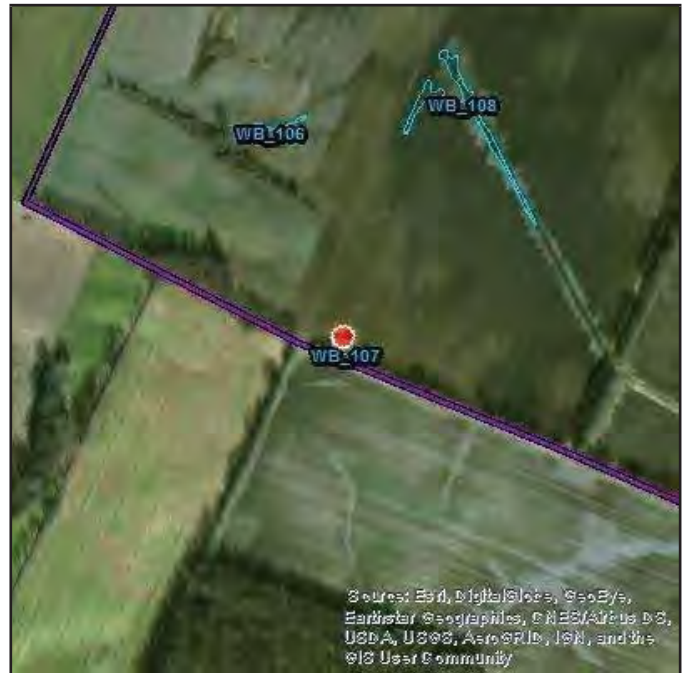
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-106  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-107  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-107  |





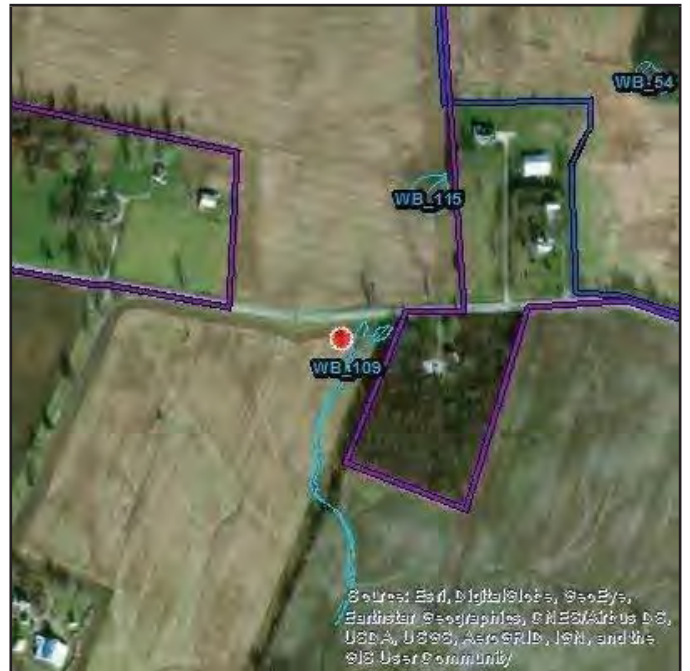
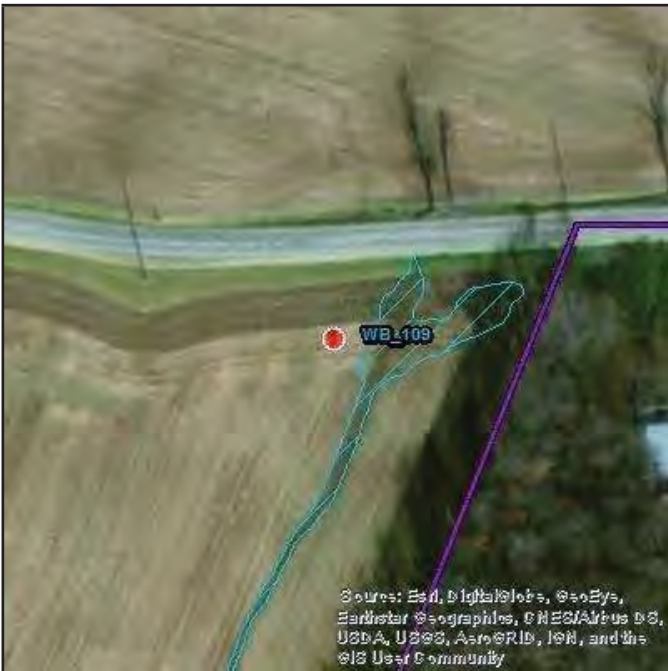
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-108  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-109  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-109  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-110  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-111  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-104  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-112  |





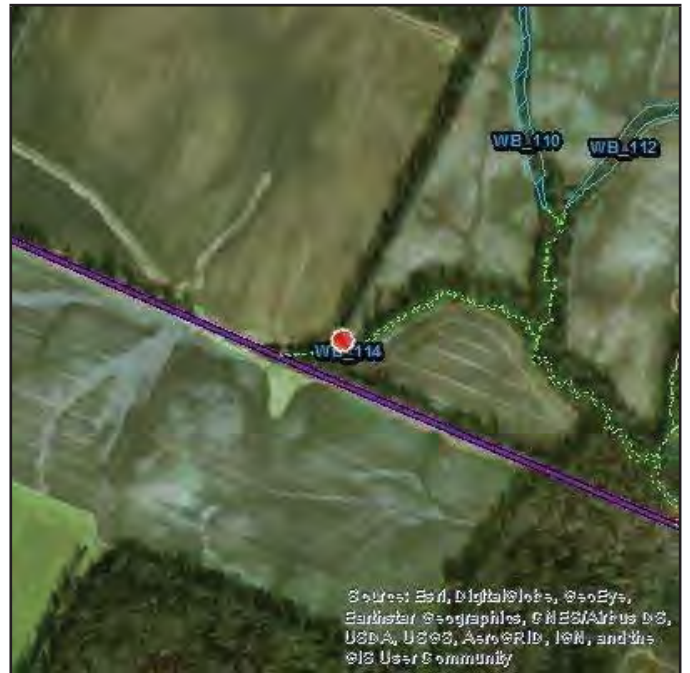
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|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-113  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-113  |





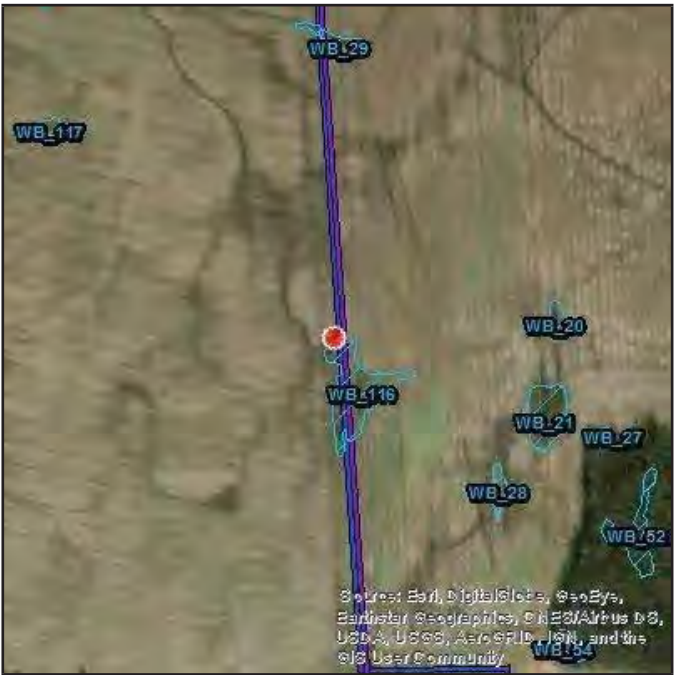
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|------------|---------|
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| Wetland ID | WB-114  |





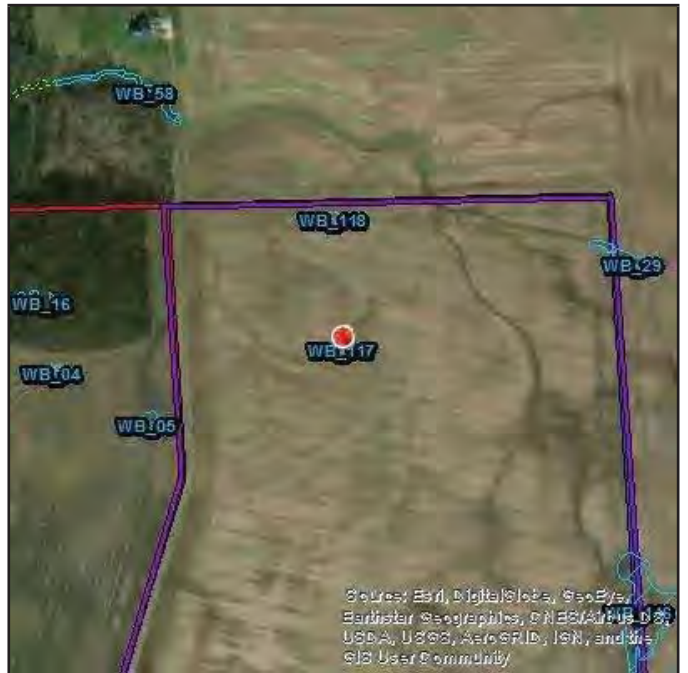
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-115  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-116  |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | WB-117  |







#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC_15       |





#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC_16       |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographic, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community



Source: Esri, DigitalGlobe, GeoEye,  
Earthstar, Geographic, CNES/Airbus DS,  
USDA, USGS, AeroGRID, IGN, and the  
GIS User Community

Attributes

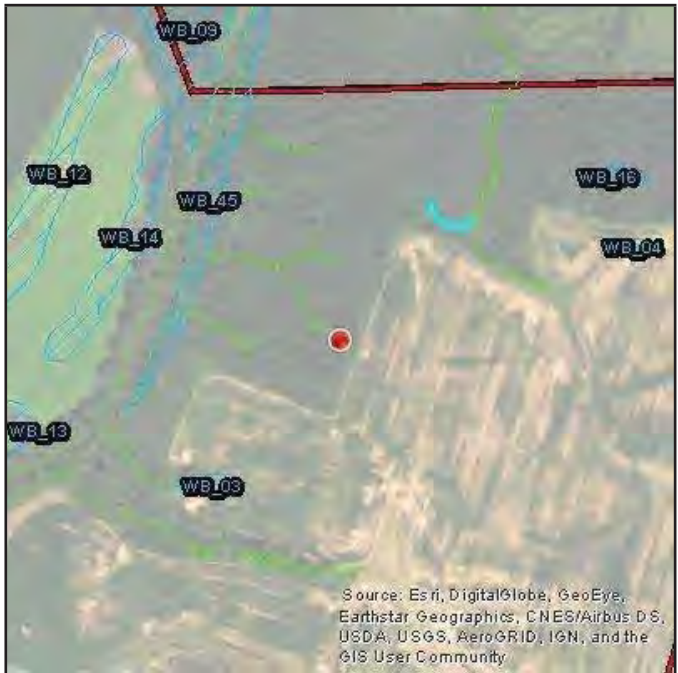
|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-17       |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-18       |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-19       |

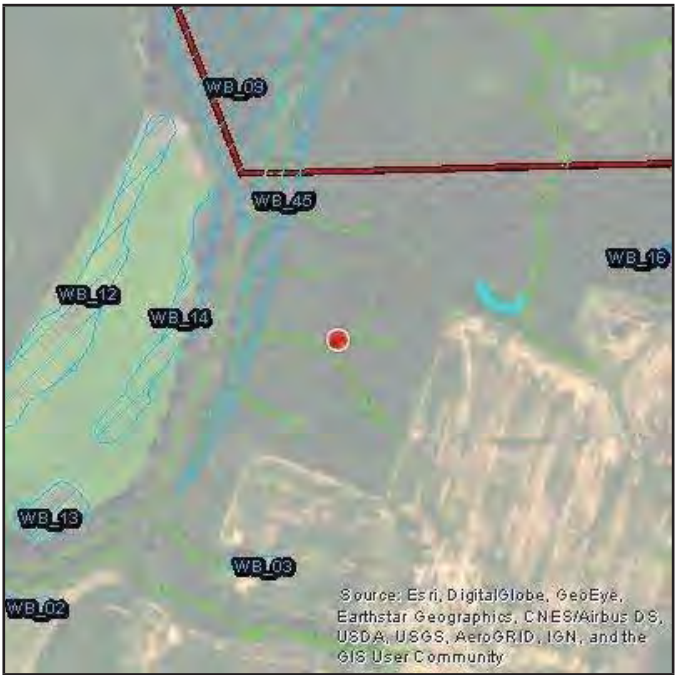




#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-20       |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-21       |





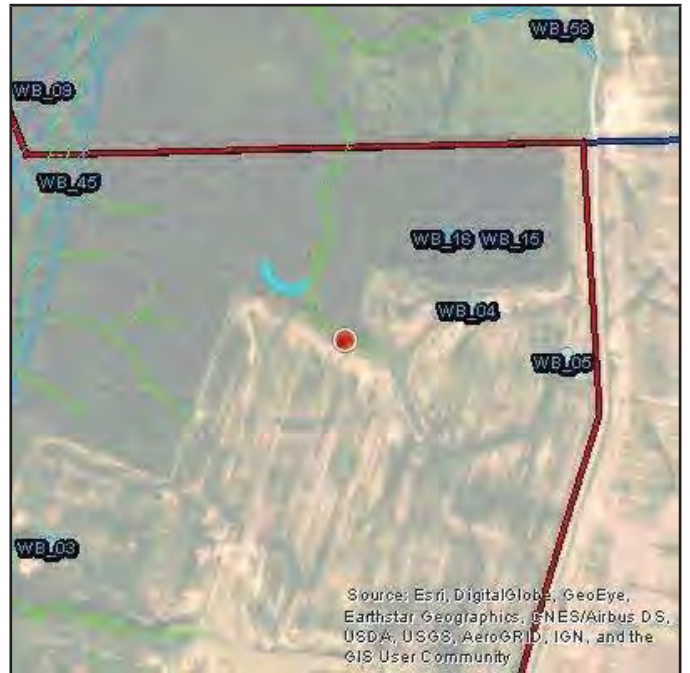
| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-22       |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-24       |





#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-24       |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-25       |

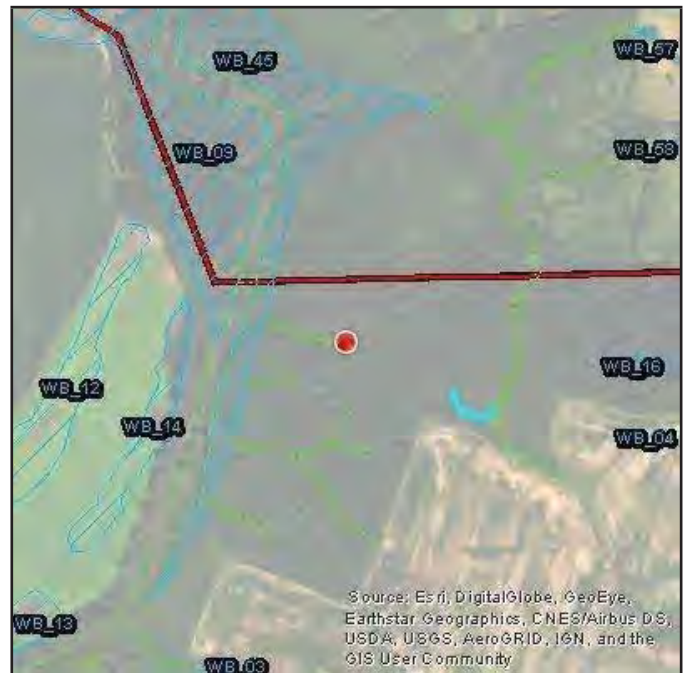




#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-26       |

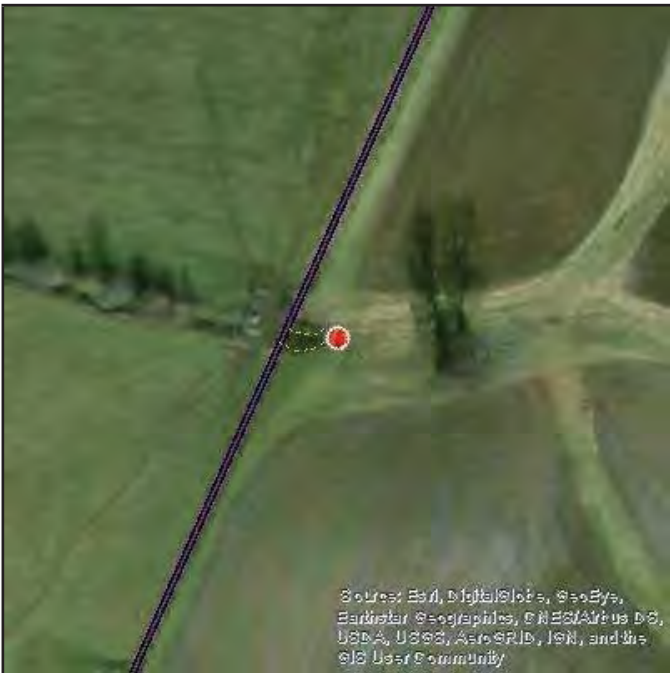




#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-26       |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-100      |





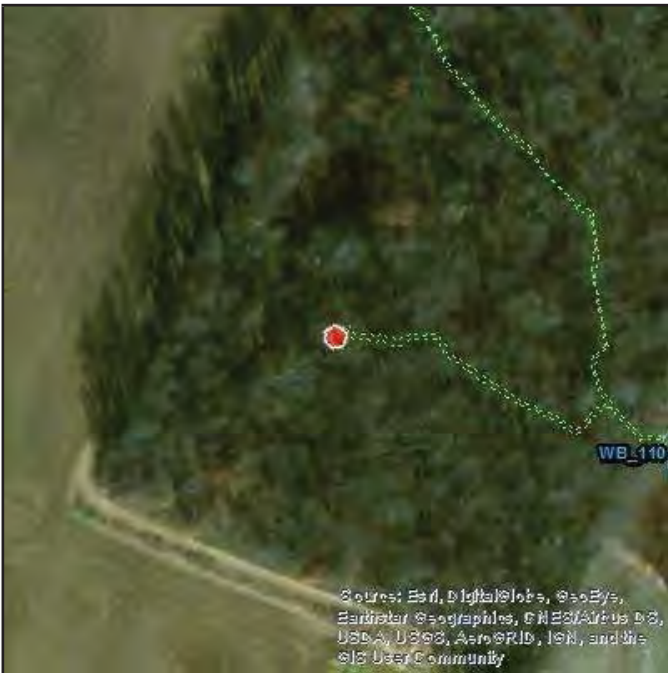
| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-101      |





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-102      |





#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-103      |





Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USA, USDA, AeroGRID, IGN, and the  
GIS User Community

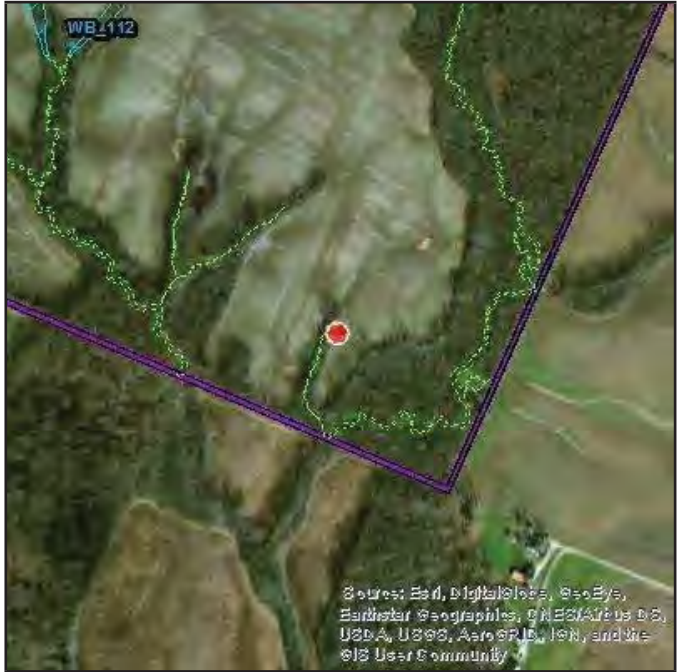


Source: Esri, DigitalGlobe, GeoEye,  
Earthstar Geographics, CNES/Airbus DS,  
USA, USDA, AeroGRID, IGN, and the  
GIS User Community

#### Attributes

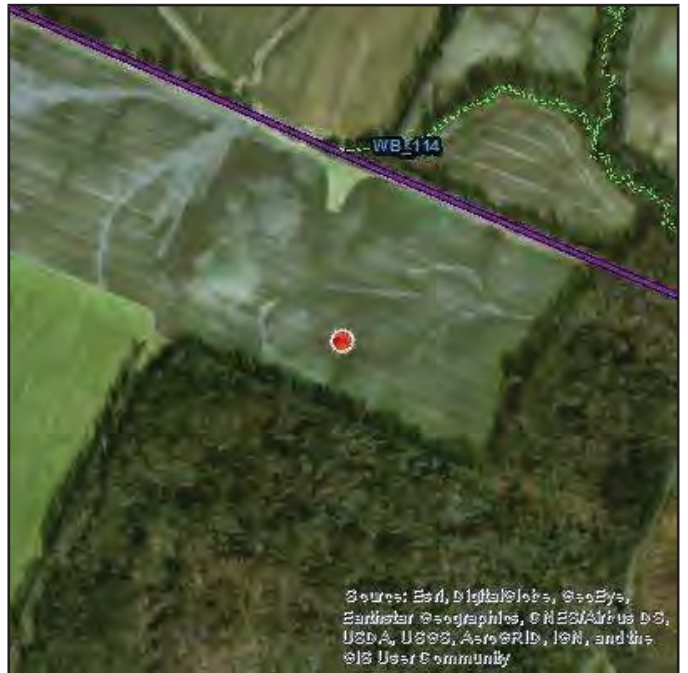
|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-104      |





| Attributes |                    |
|------------|--------------------|
| Locked     | Watercourse        |
| Wetland ID | Bat area by wc 104 |





#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-105      |





#### Attributes

Locked

Watercourse

Feature ID

WC-106





| Attributes |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-107      |

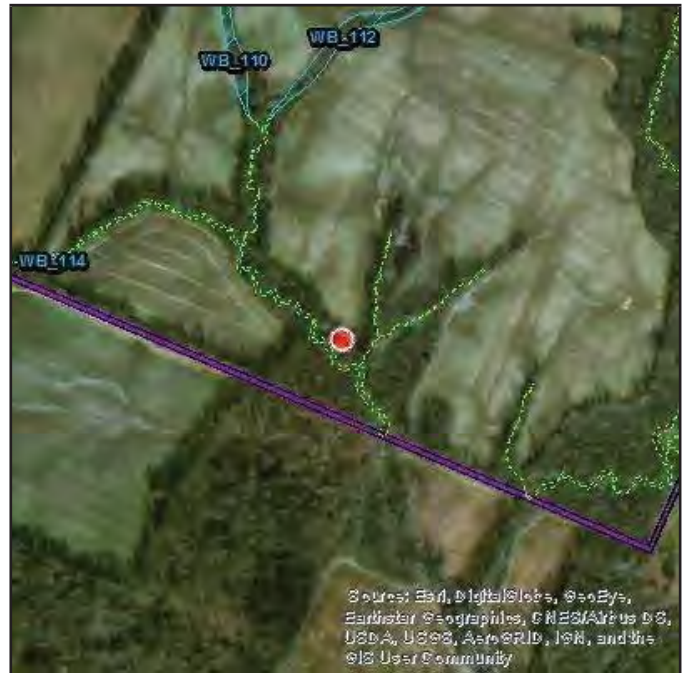
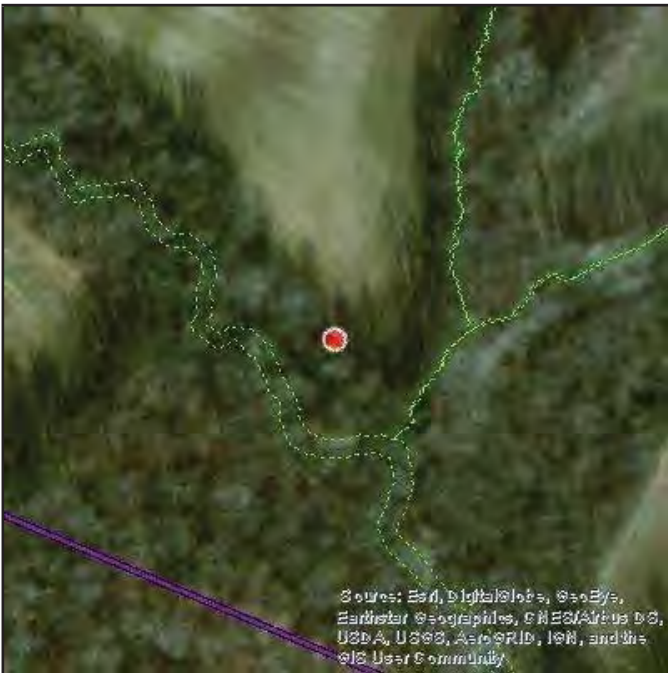




#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-108      |





#### Attributes

|            |             |
|------------|-------------|
| Locked     | Watercourse |
| Feature ID | WC-109      |







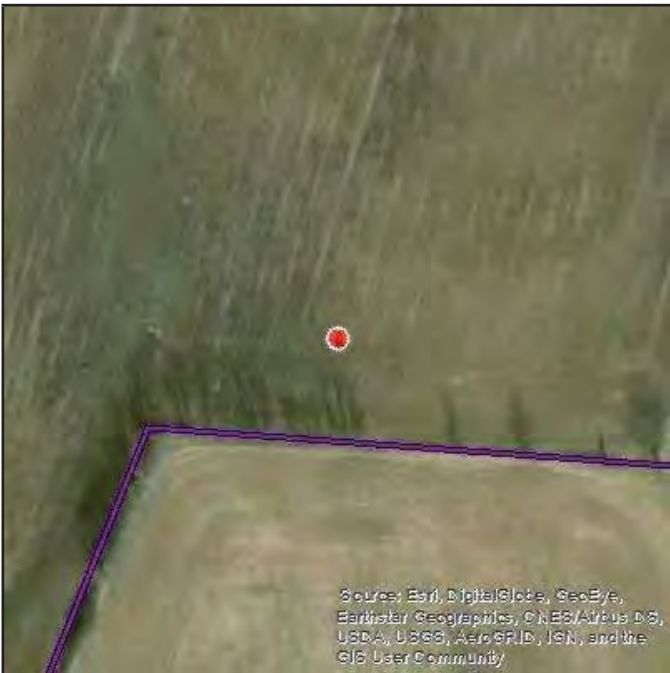
| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-100      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-101      |





| Attributes |     |
|------------|-----|
| Locked     | TBD |
| Wetland ID | TBD |





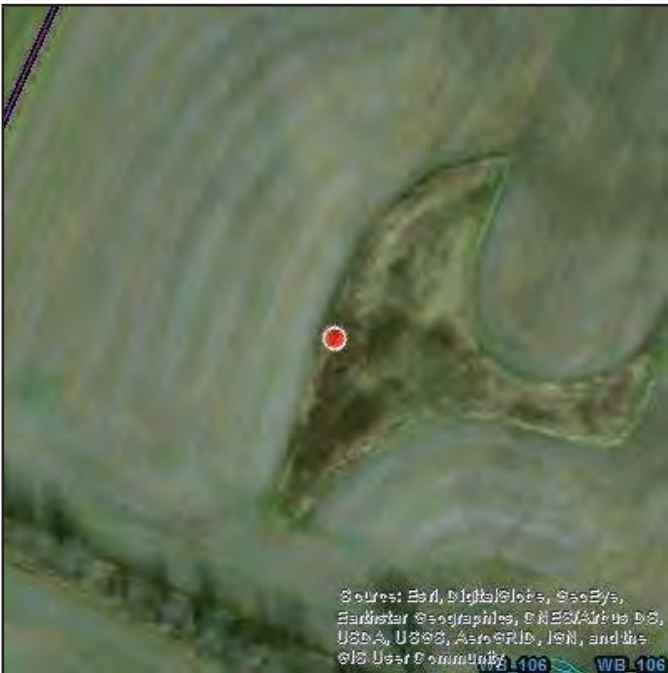
| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-103      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-104      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-105      |





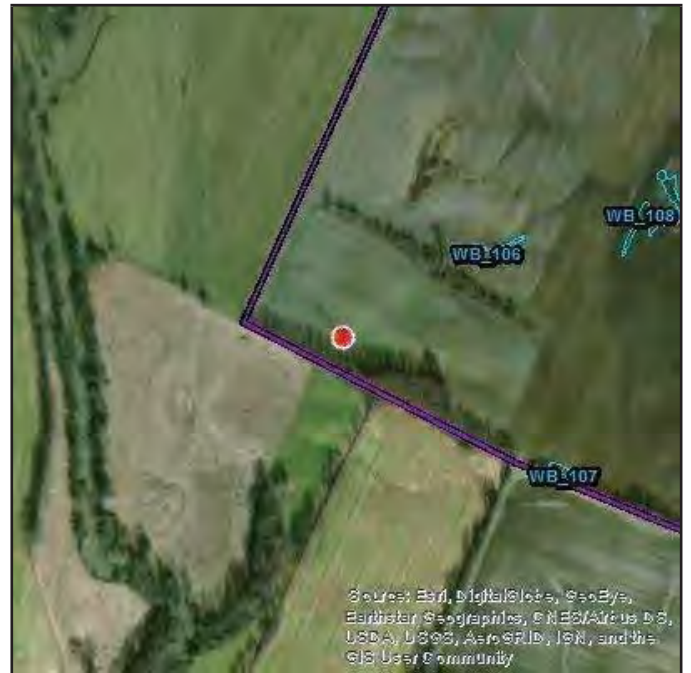
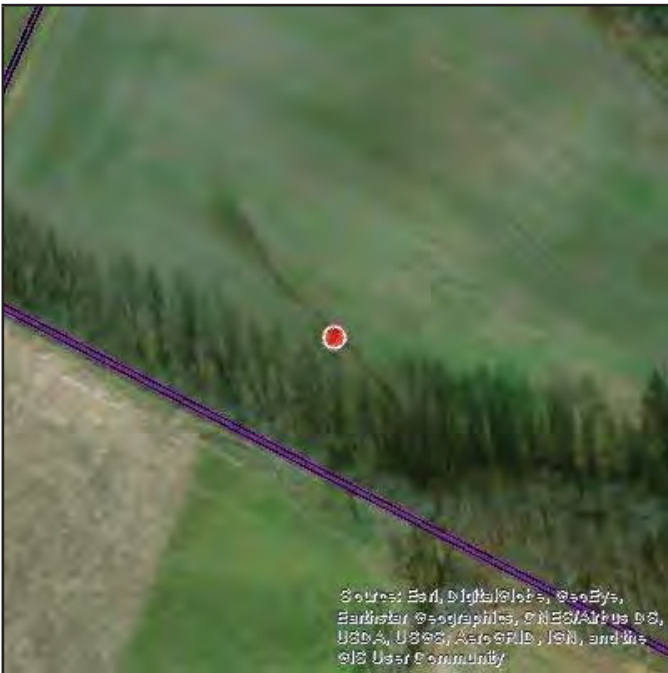
| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-106      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-106      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-107      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-108      |





| Attributes |             |
|------------|-------------|
| Locked     | Non-wetland |
| Wetland ID | NW-109      |





#### Attributes

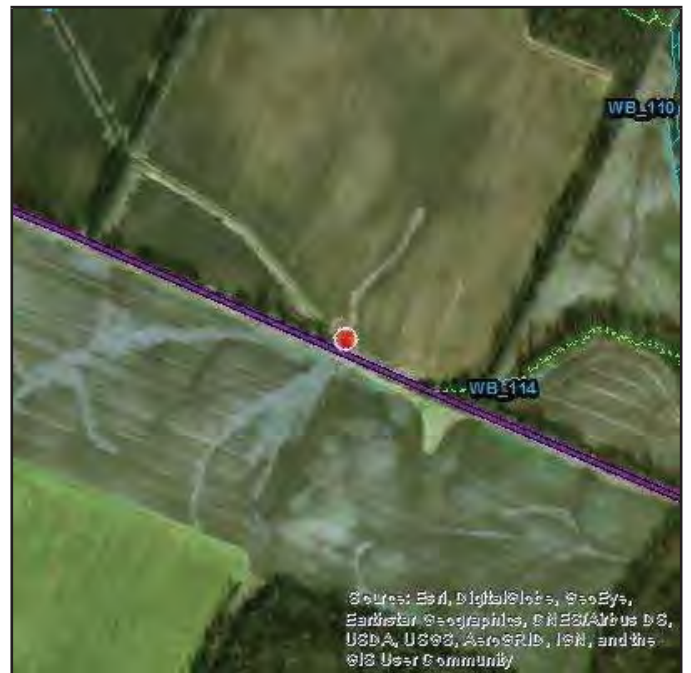
|            |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-110      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-110      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-111      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-112      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-113      |





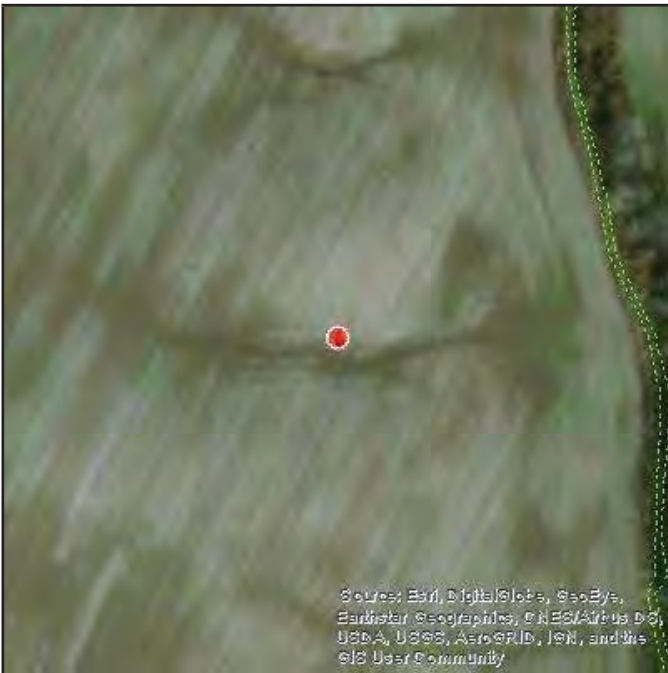
| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-114      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-115      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-116      |

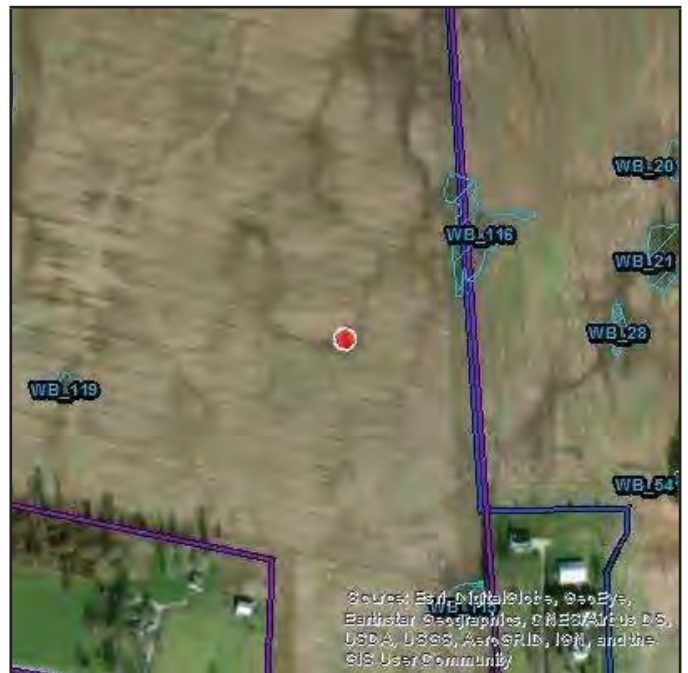




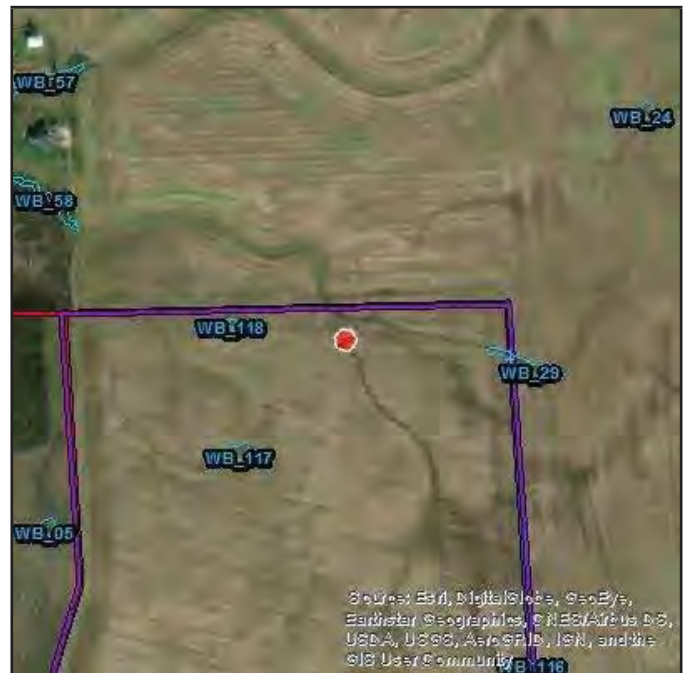
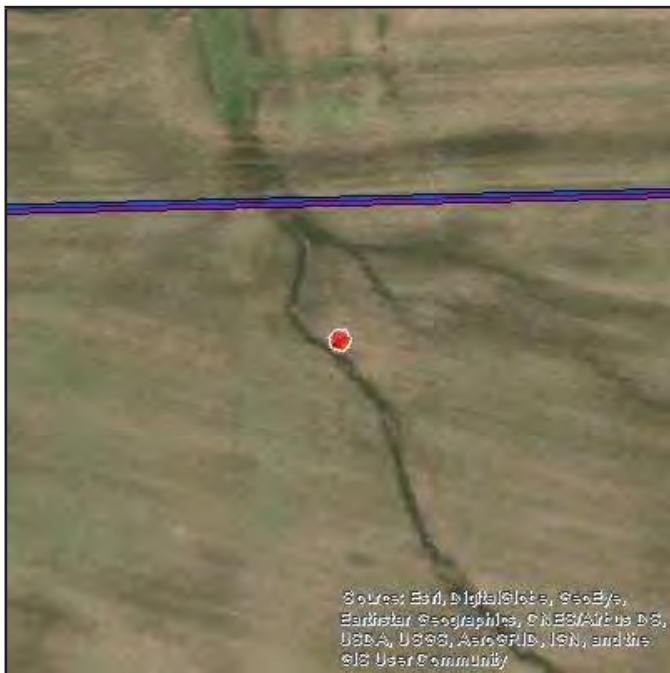
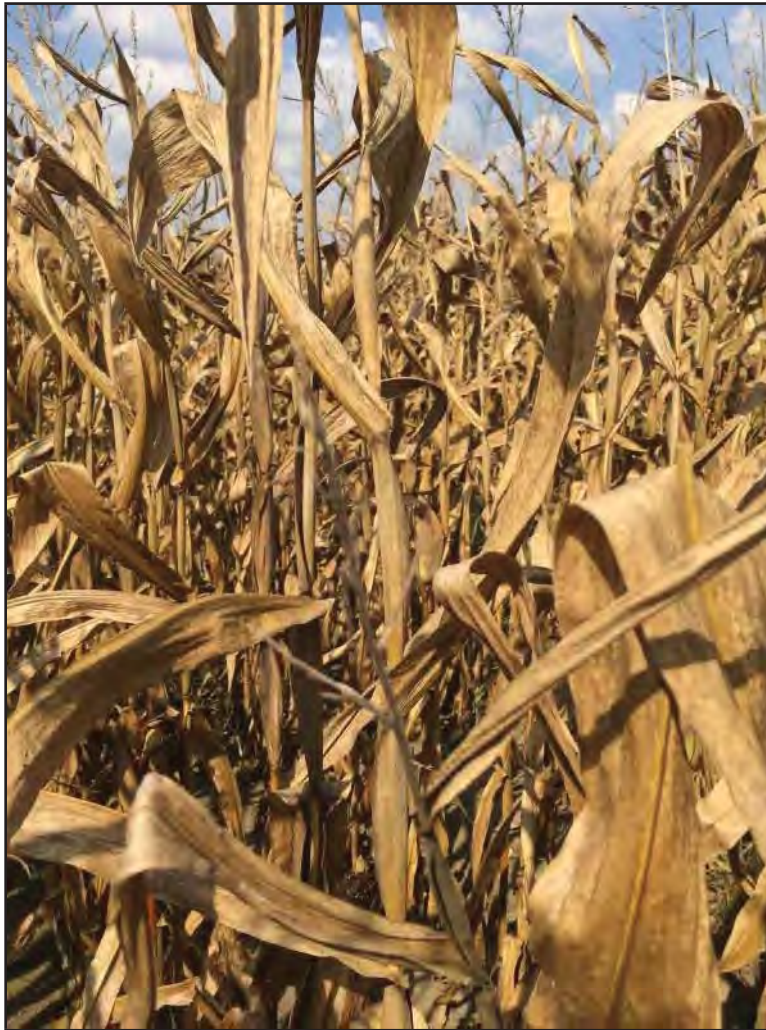
#### Attributes

|            |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-117      |





| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-118      |



| Attributes |             |
|------------|-------------|
| Locked     | Not-wetland |
| Wetland ID | NW-119      |



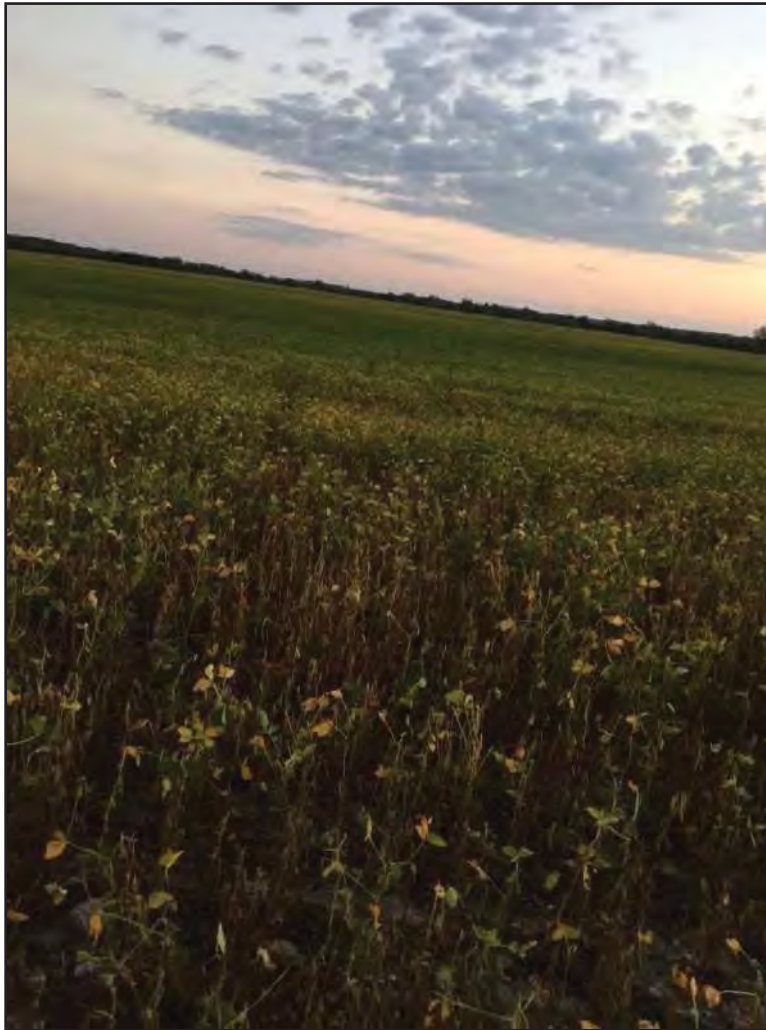


| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A1      |



| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A2      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A5      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A2      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A3      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A\$     |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A6      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A7      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A7      |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A8      |



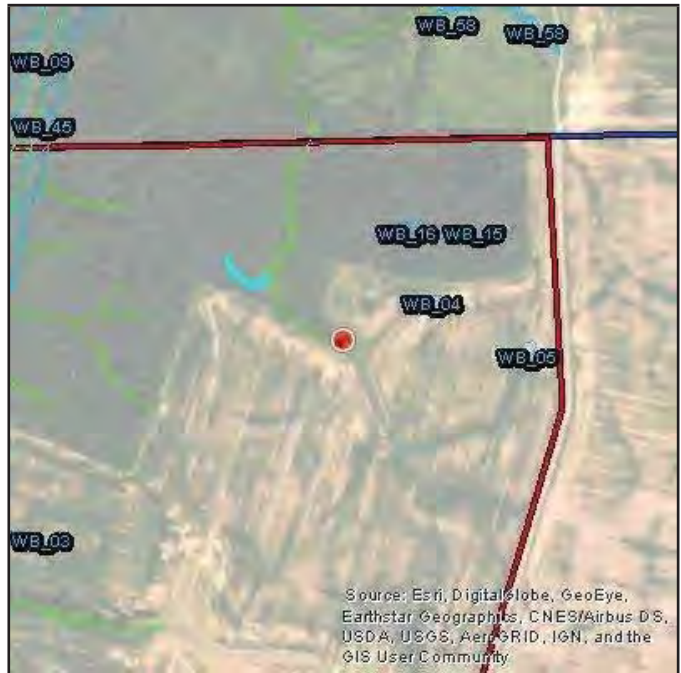


| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A8      |





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

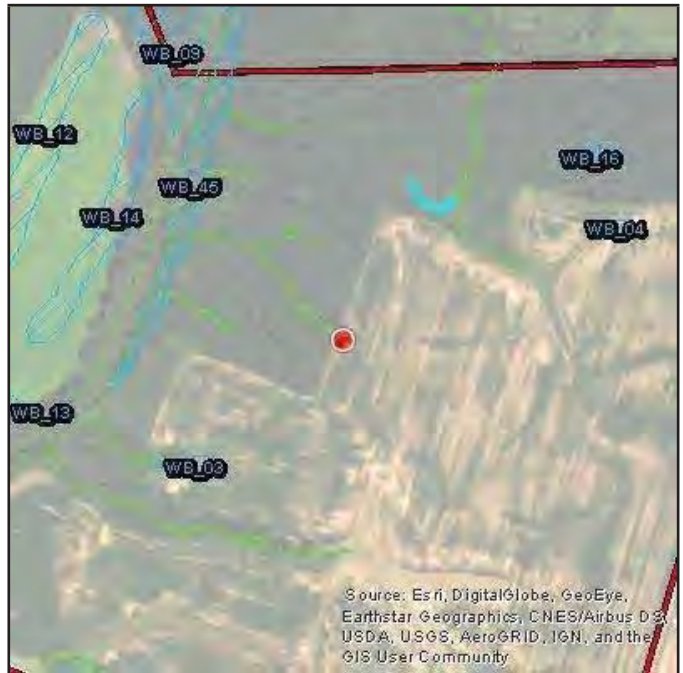
| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A-10    |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A-10    |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A11     |





| Attributes |     |
|------------|-----|
| Parcel ID  |     |
| Site ID    | A12 |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A-19    |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A-20    |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A21     |





| Attributes |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A22     |





#### Attributes

|            |         |
|------------|---------|
| Locked     | Wetland |
| Wetland ID | A-22    |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-201 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-203 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-203 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-202 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-202 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-204 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-204 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-204 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW203  |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-206 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





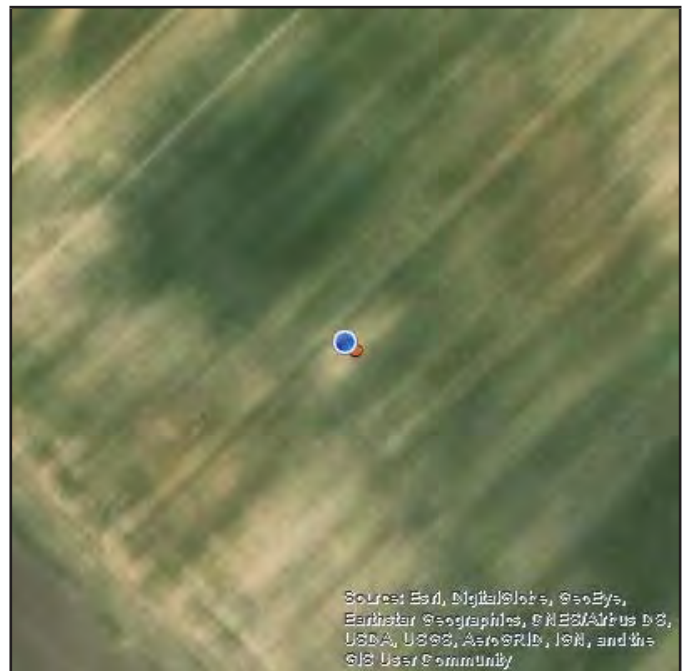
| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-206 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-204 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-204 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-207 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-207 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-205 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | WB-205 |
| Cir 39 Wetland Type at Photo Point | Type 1 |
| Cowardin                           | PEMA   |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-201 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |





| Attributes                         |        |
|------------------------------------|--------|
| Wetland ID                         | NW-201 |
| Cir 39 Wetland Type at Photo Point | Upland |
| Cowardin                           | Upland |

# **Appendix D**

## **Custom Soils Report**





United States  
Department of  
Agriculture



Natural  
Resources  
Conservation  
Service

A product of the National  
Cooperative Soil Survey,  
a joint effort of the United  
States Department of  
Agriculture and other  
Federal agencies, State  
agencies including the  
Agricultural Experiment  
Stations, and local  
participants

# Custom Soil Resource Report for **Madison County, Ohio**



November 13, 2019

# Preface

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Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist ([http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2\\_053951](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

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Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil



scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

## Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

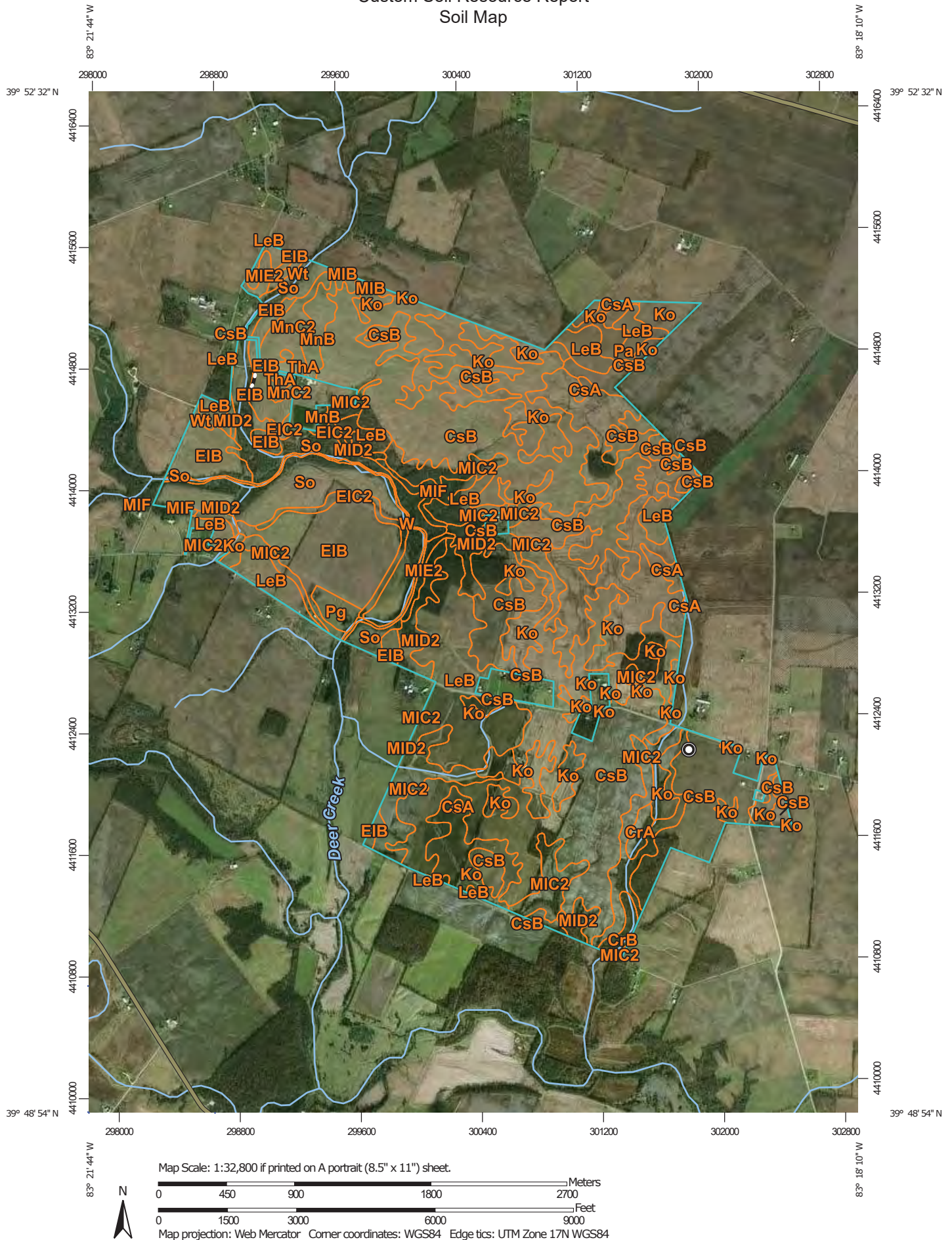


# Soil Map

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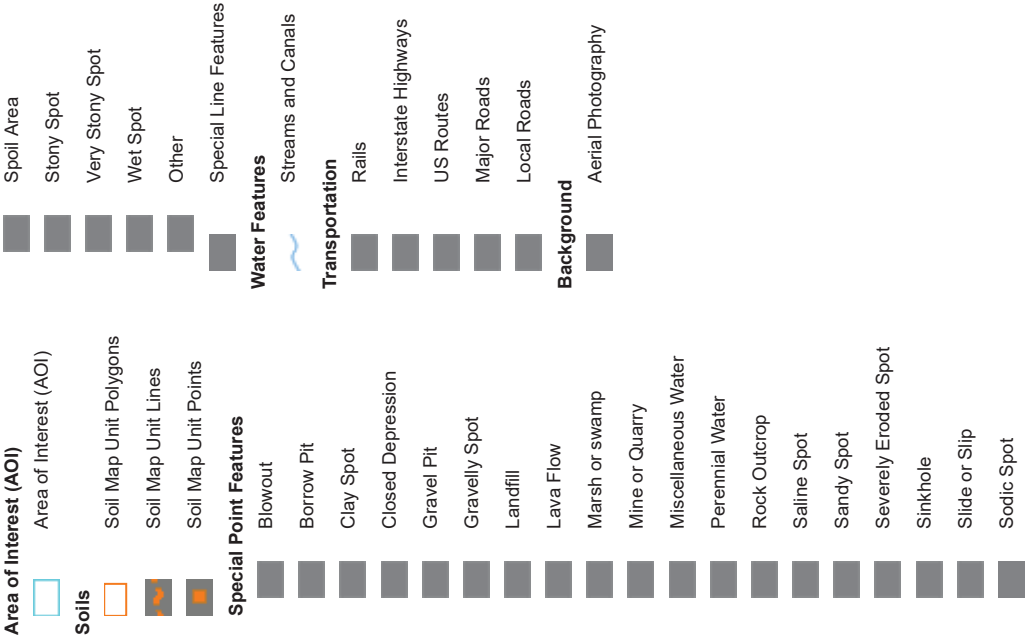
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report Soil Map





MAP LEGEND



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL:  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County, Ohio  
Survey Area Data: Version 18, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 5, 2012—Mar 4, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**This foregoing document was electronically filed with the Public Utilities**

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Summary: Application Exhibit I (Part 2-3) electronically filed by Mr. Michael J. Settineri on behalf of Big Plain Solar, LLC