Narrative Rating

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	Check One	
1	**Critical Habitat.** 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 41812 July 6, 2000).	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 2	☒ NO Go to Question 2
2	**Threatened or Endangered Species.** 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 Wetland is a Category 3 wetland. Go to Question 3	☒ NO Go to Question 3
3	**Documented High-Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high-quality wetland?	☐ YES Wetland is a Category 3 wetland. Go to Question 4	☒ NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	☐ YES Wetland is a Category 3 wetland. Go to Question 5	☒ NO Go to Question 5
5	**Category 1 Wetlands.** 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 80% areal cover) by *Phalaris arundinacea*, *Lythrum salicaria*, or *Phragmites australis;* or 2) an acidic pond created or excavated on mined lands that have little or no vegetation>	☐ YES Wetland is a Category 1 wetland. Go to Question 6	☒ NO Go to Question 6
6	**Bogs.** 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 Wetland is a Category 3 wetland. Go to Question 7	☒ NO Go to Question 7
7	**Ferns.** 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 Wetland is a Category 3 wetland. Go to Question 8a	☒ NO Go to Question 8a

8a	**"Old Growth Forest."** 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 multi-layered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	☐ YES Wetland is a Category 3 wetland. Go to Question 8b	☒ NO Go to Question 8b
8b	**Mature forested wetlands.** 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 height (dbh), generally diameters greater than 45cm (17.7in) dbh?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	☒ NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** 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 Go to Question 9b	☒ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO 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 Go to Question 9d	☐ NO 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 Wetland is a Category 3 wetland. Go to Question 10	☐ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings).** 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 Wetland is a Category 3 wetland. Go to Question 11	☒ NO Go to Question 11
11	**Relict Wet Prairies.** 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 Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	☒ NO Complete Quantitative Rating

Table 1. Characteristic Plant Species

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

End of Narrative Rating. Begin Quantitative Rating On Next Page.

Site: Guernsey to Lewis, 12 Miles				**Date:** December 12, 2011	
Wetlands:	Wetland 41			**Rater:** Todd Crandall	
Wetland Acreage:	**0.024**	**ORAM Score:**	**51**	**ORAM Category:**	**Category 2**

Subtotal	Points
2	2

Metric 1. Wetland Area (size). (max 6 pts)

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)
x	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)

Subtotal	Points
10	8

Metric 2. Upland buffers and surrounding land use. (max 14 pts)

2a. Calculate average buffer width (select one, do not double check)

	WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
x	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 & average)

	VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
x	LOW. Old field (>10 years), shrubland, young second growth forest. (5)
x	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
	HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Subtotal	Points
31.5	21.5

Metric 3. Hydrology. (max 30 pts)

3a. Sources of Water. Score all that apply.

	High pH groundwater (5)
	Other groundwater (3)
x	Precipitation (1)
	Seasonal/Intermittent surface water (3)
x	Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

x	100 year floodplain (1)
	Between stream/lake and other human use (1)
	Part of wetland/upland (e.g. forest), complex (1)
x	Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only 1.

	>0.7 (27.6in) (3)
x	0.4 to 0.7m (15.7 to 27.6in) (2)
	<0.4m (<15.7in) (1)

3d. Duration inundation/saturation.
(select one or double check & average)

	Semi- to permanently inundated/saturated (4)
	Regularly inundated/saturated (3)
x	Seasonally inundated (2)
	Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime.
(select one or double check & average)

x	None or none apparent (12)
x	Recovered (7)
	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

✓	ditch		point source (nonstormwater)
	dike	✓	filling/grading
	tile		road bed/RR track
	weir		dredging
	stormwater input		other- list

Subtotal	Points
46	14.5

Metric 4. Habitat Alteration and Development. (max 20 pts.)

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

x	None or none apparent (4)
x	Recovered (3)
	Recovering (2)
	Recent or no recovery (1)

4b. Habitat development. Select one.

	Excellent (7)
	Very good (6)
x	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)
x	Recovered (6)
	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

✓	mowing		shrub/sapling removal
	grazing		herbaceous/aquatic bed removal
	clearcutting		sedimentation
	selective cutting		dredging
	woody debris removal		farming
	toxic pollutants		nutrient emrichment

46 subtotal this page

Site:	Guernsey to Lewis, 12 Miles	**Date:**	December 12, 2011
Wetland:	Wetland 41	**Rater:**	Todd Crandall

46	subtotal first page

46	0
Subtotal	Points

Metric 5. Special Wetlands. (max 10 pts.)

Check all that apply and score as indicated

	Bog (10 pts)
	Fen (10 pts)
	Old Growth Forest (10 pts)
	Mature forested wetland (5 pts)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10 pts)
	Lake Erie coastal/tributary wetland-restricted hydrology (5 pts)
	Lake Plain Sand Prairies (Oak Openings) (10 pts)
	Relict Wet Prairies (10 pts)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migatory songbird/waterfowl habitat or usage (10 pts)
	Category 1 Wetland. See Question 1 of Qualitative Rating. (-10 pts)

51	5
Subtotal	Points

Metric 6. Plant Communities, interspersion, microtopography. (max 20 pts.)

6a. Wetland Vegetation Communities

Score all present using 0 to 3 scale

	Aquatic bed
1	Emergent
0	Shrub
2	Forest
	Mudflats
	Open water
	Other (list)

6b. Horizontal (plan view) interspersion

Select only one

	High (5)
	Moderately high (4)
	Moderate (3)
	Moderately low (2)
x	Low (1)
	None (0)

6c. Coverage of invasive plants.

Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

	Extensive >75 % cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
x	Nearly Absent <5% cover (0)
	Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale

	Vegetated hummocks/tussocks
1	Coarse woody debris >15 cm (6")
	Standing dead > 25 cm (10") dbh
	Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1 ha (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
moderate	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 <0.1 ha (0.2471 acres)
1	Low 0.1 ha to <1 ha (0.2471 acres to 2.47 acres)
2	Moderate 1 ha to <4 ha (2.47 acres 9.88 acres)
3	High 4 ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

51	**GRAND TOTAL (max 100 pts)**

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		Check Answer or Insert Score	Result
Narrative Rating	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, 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.
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	8	
	Metric 3. Hydrology	21.5	
	Metric 4. Habitat	14.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	5	
	TOTAL SCORE	51	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

Choices	Check One		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	☐ YES 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, re-evaluate 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: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	☐ YES 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 Narrative Rating No. 5	☐ YES Wetland is categorized as a Category 1 wetland	☒ NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, re-evaluate 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 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 within the "*gray zone*" for Category 1 or 2 or Category 2 or 3 wetlands?	☐ YES 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 Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	☒ NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized 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 determination should be provided.

Final Category

Choose One	☐ Category 1	☒ Category 2	☐ Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Todd Crandall
Date:	December 12, 2011
Affiliation:	Davey Resource Group
Address:	3728 Fishcreek Road, Stow, Ohio 44224
Phone Number:	330-673-5685, ext. 8033
E-Mail Address:	Todd.crandall@davey.com
Name of Wetland: Wetland 42	
Vegetation Communit(ies): Emergent	
HGM Class(es): Depression	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. See Wetland Delineation Report	
Lat/Long or UTM Coordinate:	40.3533, 81.3012
USGS Quad Name:	Gnadenhutten
County:	Tuscarawas
Township:	Mill
Section and Subsection:	n/a
Hydrologic Unit Code:	05040001
Site Visit:	December 12, 2011
National Wetland Inventory Map:	See Wetland Delineation Report
Ohio Wetland Inventory Map:	See Wetland Delineation Report
Soil Survey:	See Wetland Delineation Report
Delineation Report/Map:	See Wetland Delineation Report

Name of Wetland:	Wetland 42
Wetland Size (acres, hectacres)	0.055 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.
See Wetland Delineation Report

Comments, Narrative Discussion, Justification of Category Changes:

Final Score:	40	**Category:**	Modified 2

Scoring Boundary Worksheet

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 continguous 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
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	x	
Step 2	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.	x	
Step 3	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.	x	
Step 4	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.	x	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		x
Step 6	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.		x

End of Scoring Boundary Determination.
Begin Narrative Rating On Next Page.

Narrative Rating

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	Check One	
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2	**Threatened or Endangered Species.** 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 Wetland is a Category 3 wetland. Go to Question 3	☒ NO Go to Question 3
3	**Documented High-Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high-quality wetland?	☐ YES Wetland is a Category 3 wetland. Go to Question 4	☒ NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	☐ YES Wetland is a Category 3 wetland. Go to Question 5	☒ NO Go to Question 5
5	**Category 1 Wetlands.** 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 80% areal cover) by *Phalaris arundinacea*, *Lythrum salicaria*, or *Phragmites australis;* or 2) an acidic pond created or excavated on mined lands that have little or no vegetation>	☐ YES Wetland is a Category 1 wetland. Go to Question 6	☒ NO Go to Question 6
6	**Bogs.** 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 Wetland is a Category 3 wetland. Go to Question 7	☒ NO Go to Question 7
7	**Ferns.** 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 Wetland is a Category 3 wetland. Go to Question 8a	☒ NO Go to Question 8a

8a	**"Old Growth Forest."** 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 multi-layered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	☐ YES Wetland is a Category 3 wetland. Go to Question 8b	☒ NO Go to Question 8b
8b	**Mature forested wetlands.** 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 height (dbh), generally diameters greater than 45cm (17.7in) dbh?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	☒ NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** 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 Go to Question 9b	☒ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO 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 Go to Question 9d	☐ NO 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 Wetland is a Category 3 wetland. Go to Question 10	☐ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings).** 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 Wetland is a Category 3 wetland. Go to Question 11	☒ NO Go to Question 11
11	**Relict Wet Prairies.** 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 Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	☒ NO Complete Quantitative Rating

Table 1. Characteristic Plant Species

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

End of Narrative Rating. Begin Quantitative Rating On Next Page.

Site: Guernsey to Lewis, 12 Miles				**Date:** December 12, 2011	
Wetlands:	Wetland 42			**Rater:** Todd Crandall	
Wetland Acreage:	**0.055**	**ORAM Score:**	**40**	**ORAM Category:**	**modified 2**

Subtotal	Points
3	3

Metric 1. Wetland Area (size). (max 6 pts)

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)
x	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)

Subtotal	Points
4	1

Metric 2. Upland buffers and surrounding land use. (max 14 pts)

2a. Calculate average buffer width (select one, do not double check)

	WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
	MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
	NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
x	VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use (select one or double check & average)

	VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
	LOW. Old field (>10 years), shrubland, young second growth forest. (5)
	MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
x	HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Subtotal	Points
20	16

Metric 3. Hydrology. (max 30 pts)

3a. Sources of Water. Score all that apply.

	High pH groundwater (5)
	Other groundwater (3)
x	Precipitation (1)
x	Seasonal/Intermittent surface water (3)
	Perennial surface water (lake or stream) (5)

3b. Connectivity. Score all that apply.

x	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 1.

	>0.7 (27.6in) (3)
x	0.4 to 0.7m (15.7 to 27.6in) (2)
	<0.4m (<15.7in) (1)

3d. Duration inundation/saturation.
(select one or double check & average)

	Semi- to permanently inundated/saturated (4)
	Regularly inundated/saturated (3)
x	Seasonally inundated (2)
	Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime.
(select one or double check & average)

	None or none apparent (12)
x	Recovered (7)
	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

✓	ditch		point source (nonstormwater)
✓	dike		filling/grading
	tile	✓	road bed/RR track
	weir		dredging
✓	stormwater input		other- list

Subtotal	Points
32	12

Metric 4. Habitat Alteration and Development. (max 20 pts.)

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

x	None or none apparent (4)
x	Recovered (3)
	Recovering (2)
	Recent or no recovery (1)

4b. Habitat development. Select one.

	Excellent (7)
	Very good (6)
	Good (5)
x	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)
x	Recovered (6)
x	Recovering (3)
	Recent or no recovery (1)

Check all disturbances observed

	mowing		shrub/sapling removal
	grazing		herbaceous/aquatic bed removal
	clearcutting	✓	sedimentation
	selective cutting		dredging
	woody debris removal	✓	farming
	toxic pollutants		nutrient emrichment

32 subtotal this page

Site:	Guernsey to Lewis, 12 Miles	**Date:**	December 12, 2011
Wetland:	Wetland 42	**Rater:**	Todd Crandall

32	subtotal first page

Subtotal	Points
32	0

Metric 5. Special Wetlands. (max 10 pts.)

Check all that apply and score as indicated

	Bog (10 pts)
	Fen (10 pts)
	Old Growth Forest (10 pts)
	Mature forested wetland (5 pts)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10 pts)
	Lake Erie coastal/tributary wetland-restricted hydrology (5 pts)
	Lake Plain Sand Prairies (Oak Openings) (10 pts)
	Relict Wet Prairies (10 pts)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migatory songbird/waterfowl habitat or usage (10 pts)
	Category 1 Wetland. See Question 1 of Qualitative Rating. (-10 pts)

Subtotal	Points
40	8

Metric 6. Plant Communities, interspersion, microtopography. (max 20 pts.)

6a. Wetland Vegetation Communities

Score all present using 0 to 3 scale

	Aquatic bed
1	Emergent
0	Shrub
2	Forest
	Mudflats
	Open water
	Other (list)

6b. Horizontal (plan view) interspersion

Select only one

	High (5)
	Moderately high (4)
	Moderate (3)
x	Moderately low (2)
	Low (1)
	None (0)

6c. Coverage of invasive plants.

Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

	Extensive >75 % cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
x	Nearly Absent <5% cover (0)
	Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale

	Vegetated hummocks/tussocks
1	Coarse woody debris >15 cm (6")
1	Standing dead > 25 cm (10") dbh
1	Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1 ha (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
moderate	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 <0.1 ha (0.2471 acres)
1	Low 0.1 ha to <1 ha (0.2471 acres to 2.47 acres)
2	Moderate 1 ha to <4 ha (2.47 acres 9.88 acres)
3	High 4 ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

40	**GRAND TOTAL (max 100 pts)**

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		Check Answer or Insert Score	Result
Narrative Rating	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, 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.
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	1	
	Metric 3. Hydrology	16	
	Metric 4. Habitat	12	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	8	
	TOTAL SCORE	40	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

Choices	Check One		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	☐ YES 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, re-evaluate 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: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	☐ YES 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 Narrative Rating No. 5	☐ YES Wetland is categorized as a Category 1 wetland	☒ NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, re-evaluate 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 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 within the "*gray zone*" for Category 1 or 2 or Category 2 or 3 wetlands?	☐ YES 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 Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	☒ NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized 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 determination should be provided.

Final Category

Choose One	☐ Category 1	☒ Category 2	☐ Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Todd Crandall
Date:	December 12, 2011
Affiliation:	Davey Resource Group
Address:	3728 Fishcreek Road, Stow, Ohio 44224
Phone Number:	330-673-5685, ext. 8033
E-Mail Address:	Todd.crandall@davey.com
Name of Wetland: Wetland 43	
Vegetation Communit(ies): Emergent, lowland woods	
HGM Class(es): Riverine headwater	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. See Wetland Delineation Report	
Lat/Long or UTM Coordinate:	40.3591, 81.2822
USGS Quad Name:	Tippecanoe
County:	Tuscarawas
Township:	Mill
Section and Subsection:	n/a
Hydrologic Unit Code:	05040001
Site Visit:	December 12, 2011
National Wetland Inventory Map:	See Wetland Delineation Report
Ohio Wetland Inventory Map:	See Wetland Delineation Report
Soil Survey:	See Wetland Delineation Report
Delineation Report/Map:	See Wetland Delineation Report

Name of Wetland:	Wetland 43
Wetland Size (acres, hectacres)	0.99 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.
See Wetland Delineation Report

Comments, Narrative Discussion, Justification of Category Changes:

Final Score:	54	**Category:**	2

Scoring Boundary Worksheet

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 continguous 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
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	x	
Step 2	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.	x	
Step 3	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.	x	
Step 4	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.	x	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		x
Step 6	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.		x

End of Scoring Boundary Determination.
Begin Narrative Rating On Next Page.

Narrative Rating

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	Check One	
1	**Critical Habitat.** 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 41812 July 6, 2000).	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 2	☒ NO Go to Question 2
2	**Threatened or Endangered Species.** 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 Wetland is a Category 3 wetland. Go to Question 3	☒ NO Go to Question 3
3	**Documented High-Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high-quality wetland?	☐ YES Wetland is a Category 3 wetland. Go to Question 4	☒ NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	☐ YES Wetland is a Category 3 wetland. Go to Question 5	☒ NO Go to Question 5
5	**Category 1 Wetlands.** 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 80% areal cover) by *Phalaris arundinacea*, *Lythrum salicaria*, or *Phragmites australis;* or 2) an acidic pond created or excavated on mined lands that have little or no vegetation>	☐ YES Wetland is a Category 1 wetland. Go to Question 6	☒ NO Go to Question 6
6	**Bogs.** 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 Wetland is a Category 3 wetland. Go to Question 7	☒ NO Go to Question 7
7	**Ferns.** 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 Wetland is a Category 3 wetland. Go to Question 8a	☒ NO Go to Question 8a

8a	**"Old Growth Forest."** 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 multi-layered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	☐ YES Wetland is a Category 3 wetland. Go to Question 8b	☒ NO Go to Question 8b
8b	**Mature forested wetlands.** 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 height (dbh), generally diameters greater than 45cm (17.7in) dbh?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	☒ NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** 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 Go to Question 9b	☒ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO 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 Go to Question 9d	☐ NO 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 Wetland is a Category 3 wetland. Go to Question 10	☐ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings).** 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 Wetland is a Category 3 wetland. Go to Question 11	☒ NO Go to Question 11
11	**Relict Wet Prairies.** 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 Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	☒ NO Complete Quantitative Rating

Table 1. Characteristic Plant Species

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

End of Narrative Rating. Begin Quantitative Rating On Next Page.

Site: Guernsey to Lewis, 12 Miles				**Date:** December 12, 2011	
Wetlands:	Wetland 43			**Rater:** Todd Crandall	
Wetland Acreage:	**0.990**	**ORAM Score:**	**54**	**ORAM Category:**	**Category 2**

Subtotal	Points
3	3

Metric 1. Wetland Area (size). (max 6 pts)

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)
- [x] 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)

Subtotal	Points
15	12

Metric 2. Upland buffers and surrounding land use. (max 14 pts)

2a. Calculate average buffer width (select one, do not double check)

- [x] 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 & average)

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Subtotal	Points
34.5	19.5

Metric 3. Hydrology. (max 30 pts)

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [x] Other groundwater (3)
- [x] Precipitation (1)
- [x] 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)
- [x] Part of riparian or upland corridor (1)

3c. Maximum water depth. Select only 1.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation.
(select one or double check & average)

- [ ] Semi- to permanently inundated/saturated (4)
- [x] Regularly inundated/saturated (3)
- [ ] Seasonally inundated (2)
- [ ] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime.
(select one or double check & average)

- [x] None or none apparent (12)
- [ ] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] dike
- [ ] tile
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [x] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other- list

Subtotal	Points
46	11.5

Metric 4. Habitat Alteration and Development. (max 20 pts.)

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

- [x] None or none apparent (4)
- [ ] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select one.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [x] 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)
- [x] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [x] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient emrichment

46 subtotal this page

Site:	Guernsey to Lewis, 12 Miles	**Date:**	December 12, 2011
Wetland:	Wetland 43	**Rater:**	Todd Crandall

46	subtotal first page

Subtotal	Points
46	0

Metric 5. Special Wetlands. (max 10 pts.)

Check all that apply and score as indicated

	Bog (10 pts)
	Fen (10 pts)
	Old Growth Forest (10 pts)
	Mature forested wetland (5 pts)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10 pts)
	Lake Erie coastal/tributary wetland-restricted hydrology (5 pts)
	Lake Plain Sand Prairies (Oak Openings) (10 pts)
	Relict Wet Prairies (10 pts)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migatory songbird/waterfowl habitat or usage (10 pts)
	Category 1 Wetland. See Question 1 of Qualitative Rating. (-10 pts)

Subtotal	Points
54	8

Metric 6. Plant Communities, interspersion, microtopography. (max 20 pts.)

6a. Wetland Vegetation Communities

Score all present using 0 to 3 scale

	Aquatic bed
2	Emergent
2	Shrub
1	Forest
	Mudflats
	Open water
	Other (list)

6b. Horizontal (plan view) interspersion

Select only one

	High (5)
	Moderately high (4)
	Moderate (3)
x	Moderately low (2)
	Low (1)
	None (0)

6c. Coverage of invasive plants.

Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

	Extensive >75 % cover (-5)
	Moderate 25-75% cover (-3)
x	Sparse 5-25% cover (-1)
	Nearly Absent <5% cover (0)
	Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale

1	Vegetated hummocks/tussocks
1	Coarse woody debris >15 cm (6")
	Standing dead > 25 cm (10") dbh
	Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1 ha (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
moderate	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 <0.1 ha (0.2471 acres)
1	Low 0.1 ha to <1 ha (0.2471 acres to 2.47 acres)
2	Moderate 1 ha to <4 ha (2.47 acres 9.88 acres)
3	High 4 ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

54	**GRAND TOTAL (max 100 pts)**

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		Check Answer or Insert Score	Result
Narrative Rating	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, 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.
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	12	
	Metric 3. Hydrology	19.5	
	Metric 4. Habitat	11.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	8	
	TOTAL SCORE	54	Category based on score breakpoints 2

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

Choices	Check One		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	☐ YES 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, re-evaluate 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: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	☐ YES 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 Narrative Rating No. 5	☐ YES Wetland is categorized as a Category 1 wetland	☒ NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, re-evaluate 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 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 within the "*gray zone*" for Category 1 or 2 or Category 2 or 3 wetlands?	☐ YES 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 Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	☒ NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized 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 determination should be provided.

Final Category

Choose One	☐ Category 1	☒ Category 2	☐ Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Background Information

Name:	Todd Crandall
Date:	December 12, 2011
Affiliation:	Davey Resource Group
Address:	3728 Fishcreek Road, Stow, Ohio 44224
Phone Number:	330-673-5685, ext. 8033
E-Mail Address:	Todd.crandall@davey.com
Name of Wetland: Wetland 44	
Vegetation Communit(ies): Emergent	
HGM Class(es): Depression	
Location of Wetland: Include map, address, north arrow, landmarks, distances, roads, etc. See Wetland Delineation Report	
Lat/Long or UTM Coordinate:	40.3595, 81.2801
USGS Quad Name:	Tippecanoe
County:	Tuscarawas
Township:	Mill
Section and Subsection:	n/a
Hydrologic Unit Code:	05040001
Site Visit:	December 12, 2011
National Wetland Inventory Map:	See Wetland Delineation Report
Ohio Wetland Inventory Map:	See Wetland Delineation Report
Soil Survey:	See Wetland Delineation Report
Delineation Report/Map:	See Wetland Delineation Report

Name of Wetland:	Wetland 44
Wetland Size (acres, hectacres)	0.012 acre

Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.
See Wetland Delineation Report

Comments, Narrative Discussion, Justification of Category Changes:

Final Score:	28	**Category:**	1

Scoring Boundary Worksheet

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 continguous 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
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	x	
Step 2	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.	x	
Step 3	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.	x	
Step 4	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.	x	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		x
Step 6	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.		x

End of Scoring Boundary Determination.
Begin Narrative Rating On Next Page.

Narrative Rating

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	Check One	
1	**Critical Habitat.** 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 41812 July 6, 2000).	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 2	☒ NO Go to Question 2
2	**Threatened or Endangered Species.** 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 Wetland is a Category 3 wetland. Go to Question 3	☒ NO Go to Question 3
3	**Documented High-Quality Wetland.** Is the wetland on record in Natural Heritage Database as a high-quality wetland?	☐ YES Wetland is a Category 3 wetland. Go to Question 4	☒ NO Go to Question 4
4	**Significant Breeding or Concentration Area.** Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	☐ YES Wetland is a Category 3 wetland. Go to Question 5	☒ NO Go to Question 5
5	**Category 1 Wetlands.** 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 80% areal cover) by *Phalaris arundinacea*, *Lythrum salicaria*, or *Phragmites australis;* or 2) an acidic pond created or excavated on mined lands that have little or no vegetation>	☐ YES Wetland is a Category 1 wetland. Go to Question 6	☒ NO Go to Question 6
6	**Bogs.** 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 Wetland is a Category 3 wetland. Go to Question 7	☒ NO Go to Question 7
7	**Ferns.** 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 Wetland is a Category 3 wetland. Go to Question 8a	☒ NO Go to Question 8a

8a	**"Old Growth Forest."** 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 multi-layered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	☐ YES Wetland is a Category 3 wetland. Go to Question 8b	☒ NO Go to Question 8b
8b	**Mature forested wetlands.** 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 height (dbh), generally diameters greater than 45cm (17.7in) dbh?	☐ YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	☒ NO Go to Question 9a
9a	**Lake Erie coastal and tributary wetlands.** 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 Go to Question 9b	☒ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO 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 Go to Question 9d	☐ NO 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 Wetland is a Category 3 wetland. Go to Question 10	☐ NO 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 Wetland should be evaluated for possible Category 3 status. Go to Question 10	☐ NO Go to Question 10
10	**Lake Plain Sand Prairies (Oak Openings).** 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 Wetland is a Category 3 wetland. Go to Question 11	☒ NO Go to Question 11
11	**Relict Wet Prairies.** 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 Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	☒ NO Complete Quantitative Rating

Table 1. Characteristic Plant Species

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

End of Narrative Rating. Begin Quantitative Rating On Next Page.

Site: Guernsey to Lewis, 12 Miles				**Date:** December 12, 2011	
Wetlands:	Wetland 44			**Rater:** Todd Crandall	
Wetland Acreage:	**0.012**	**ORAM Score:**	**28**	**ORAM Category:**	**Category 1**

Subtotal	Points
0	0

Metric 1. Wetland Area (size). (max 6 pts)

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)
- [x] <0.1 acres (0.04ha) (0 pts)

Subtotal	Points
5	5

Metric 2. Upland buffers and surrounding land use. (max 14 pts)

2a. Calculate average buffer width (select one, do not double check)

- [s] 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 & average)

- [x] VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- [ ] LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Subtotal	Points
15.5	10.5

Metric 3. Hydrology. (max 30 pts)

3a. Sources of Water. Score all that apply.

- [ ] High pH groundwater (5)
- [ ] Other groundwater (3)
- [x] 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 1.

- [ ] >0.7 (27.6in) (3)
- [ ] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [x] <0.4m (<15.7in) (1)

3d. Duration inundation/saturation.
(select one or double check & average)

- [ ] Semi- to permanently inundated/saturated (4)
- [ ] Regularly inundated/saturated (3)
- [x] Seasonally inundated (2)
- [x] Seasonally saturated in upper 30cm (12in) (1)

3e. Modifications to natural hydrologic regime.
(select one or double check & average)

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] dike
- [ ] tile
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [✓] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other- list

Subtotal	Points
25	9.5

Metric 4. Habitat Alteration and Development. (max 20 pts.)

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

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [ ] Recovering (2)
- [ ] Recent or no recovery (1)

4b. Habitat development. Select one.

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

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

- [ ] None or none apparent (9)
- [x] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [✓] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient emrichment

25 subtotal this page

Site:	Guernsey to Lewis, 12 Miles	**Date:**	December 12, 2011
Wetland:	Wetland 44	**Rater:**	Todd Crandall

25	subtotal first page

Subtotal	Points
25	0

Metric 5. Special Wetlands. (max 10 pts.)

Check all that apply and score as indicated

	Bog (10 pts)
	Fen (10 pts)
	Old Growth Forest (10 pts)
	Mature forested wetland (5 pts)
	Lake Erie coastal/tributary wetland-unrestricted hydrology (10 pts)
	Lake Erie coastal/tributary wetland-restricted hydrology (5 pts)
	Lake Plain Sand Prairies (Oak Openings) (10 pts)
	Relict Wet Prairies (10 pts)
	Known occurrence state/federal threatened or endangered species (10)
	Significant migatory songbird/waterfowl habitat or usage (10 pts)
	Category 1 Wetland. See Question 1 of Qualitative Rating. (-10 pts)

Subtotal	Points
28	3

Metric 6. Plant Communities, interspersion, microtopography. (max 20 pts.)

6a. Wetland Vegetation Communities

Score all present using 0 to 3 scale

	Aquatic bed
1	Emergent
0	Shrub
0	Forest
	Mudflats
	Open water
	Other (list)

6b. Horizontal (plan view) interspersion

Select only one

	High (5)
	Moderately high (4)
	Moderate (3)
	Moderately low (2)
x	Low (1)
	None (0)

6c. Coverage of invasive plants.

Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

	Extensive >75 % cover (-5)
	Moderate 25-75% cover (-3)
	Sparse 5-25% cover (-1)
	Nearly Absent <5% cover (0)
x	Absent (1)

6d. Microtopography

Score all present using 0 to 3 scale

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

Vegetation Community Cover Scale

0	Absent or comprises <0.1 ha (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
moderate	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 <0.1 ha (0.2471 acres)
1	Low 0.1 ha to <1 ha (0.2471 acres to 2.47 acres)
2	Moderate 1 ha to <4 ha (2.47 acres 9.88 acres)
3	High 4 ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

28	**GRAND TOTAL (max 100 pts)**

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		Check Answer or Insert Score	Result
Narrative Rating	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, 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.
Quantitative Rating	Metric 1. Size	3	
	Metric 2. Buffers and surrounding land use	5	
	Metric 3. Hydrology	10.5	
	Metric 4. Habitat	9.5	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	28	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet

Wetland Categorization Worksheet

Choices	Check One		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	☐ YES 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, re-evaluate 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: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	☐ YES 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 Narrative Rating No. 5	☐ YES Wetland is categorized as a Category 1 wetland	☒ NO	Is quantitative rating score *greater* than the Category 2 scoring threshold (*including* any gray zone)? If yes, re-evaluate 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 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 within the "*gray zone*" for Category 1 or 2 or Category 2 or 3 wetlands?	☐ YES 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 Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	☒ NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized 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 determination should be provided.

Final Category

Choose One	☒ Category 1	☐ Category 2	☐ Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Appendix K
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Appendix L
Davey Resource Group Personnel Profiles

Shawn W. Bruzda is a senior urban forester, biologist, and technical specialist with Davey Resource Group, having served in this capacity for over 10 years. As a biologist with Davey Resource Group, Mr. Bruzda focuses on ecological surveys involving fish and macroinvertebrate identification and data analysis. He is proficient with the Index of Biotic Integrity (IBI), the Modified Index of Well-Being (MIWB), and the Invertebrate Community Index (ICI), all used by Ohio Environmental Protection Agency to set minimum criteria index scores for use designations in water quality standards. He works on large- and small-scale bat survey projects, assisting with mist-net surveys, habitat evaluations, and radio tracking studies to determine foraging patterns; endangered species and habitat studies; invasive species management; secondary source reviews; technical report writing; and water quality studies. Mr. Bruzda has completed training through Ohio Environmental Protection Agency for conducting the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). Proficient with AutoCAD® and ArcGIS™ software, Mr. Bruzda creates maps for a wide variety of natural resource and tree-related projects. Mr. Bruzda is also responsible for safety and fleet vehicle management. He is an International Society of Arboriculture (ISA) Certified Arborist (OH-1342A). Mr. Bruzda is a graduate of Kent State University, having received a Bachelor of Science degree in biological sciences with an emphasis in aquatic ecology.

Ana Burns, M.S.E.S., is a biologist and Coordinator of Ecological Services for Davey's Natural Resource Consulting group. Ms. Burns has 11 years of experience in the natural resources and environmental planning fields and at Davey is responsible for overseeing all ecological surveys and environmental planning studies, as well as the specialized management of ecological and wetlands permitting projects, mitigation bank planning and monitoring projects, and natural resource restoration projects. She is knowledgeable of state and federal stream and wetlands regulations, all aspects of Section 401 and 404 permitting, isolated wetlands regulations, and the federal mitigation rule for compensatory mitigation and its application to mitigation banking. Ms. Burns has managed multiple Section 401 and 404 permitting projects along with numerous natural resource inventories and planning projects. In addition, Ms. Burns has provided assistance with grant writing and managing grant-funded projects. Ms. Burns has coordinated and facilitated public meetings and hearings and has assisted in the development of various planning documents including greenways planning, watershed planning, and urban forestry management plans. In addition to public meetings, Ms. Burns has developed many informational public outreach publications and prepared electronic sources of information for distribution. With a background in urban and rural planning, she is well versed in working with planning commissions, steering committees, and local political groups and has given many presentations at a variety of venues. Ms. Burns is a board member of the Tinkers Creek Watershed Partnership and active in the Ohio Lake Management Society. Ms. Burns graduated from Indiana University with a Bachelor of Science degree in biology and holds a Master of Science degree in environmental science from IU's School of Public and Environmental Affairs.

Ken Christensen is a senior biologist with more than 25 years of experience in the natural resource field. Mr. Christensen is involved in all aspects of wetlands and stream restoration projects, including design, planting, and implementation. He is also involved with the subsequent monitoring of mitigation and restoration projects to ensure that such endeavors reach an expected successful conclusion. Mr. Christensen assists in plant surveys and wetlands delineations and in the field identification of vertebrate populations, especially amphibians, reptiles, and mammals. Proficient with AutoCAD® software, Mr. Christensen is responsible for managing the Global Positioning System (GPS) data collection and AutoCAD® mapping operations for all natural resource studies. As an International Society of Arboriculture Certified Arborist (OH-0690A), he performs tree appraisals and inventories and also develops tree preservation plans. Mr. Christensen is a LEED® Accredited Professional and

has received the following training: Certificate of Completion for LEED® for New Construction Technical Review Workshop from U.S. Green Building Council; Certificate of Completion for American Ecological Engineering Society Wetland Mitigation Design from Virginia Polytechnic Institute and State University; Certificate of Completion for AutoCAD® for Stream Restoration and Monitoring from North Carolina Cooperative Extension; Certificate of Completion from North Carolina Stream Restoration Institute's Stream Classification and Assessment Program; and Certificate of Completion from North Carolina Stream Restoration Institute's Stream Restoration Design Principles. Mr. Christensen is prequalified by the Ohio Department of Transportation for wetland mitigation. He has also completed training through Ohio Environmental Protection Agency for conducting the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). Clients for these mitigation, stream restoration, and tree preservation projects have included the Holden Arboretum, Ohio Wetlands Foundation, Medina County Park District, Metro Parks Serving Summit County, Portage Park District, and Western Reserve Land Conservancy. He is a member of the American Ecological Engineering Society, Breakneck Creek Watershed Coalition, the Ecological Landscaping Association, the Northeast Ohio Association of Herpetologists, American Ecological Engineering Society, and Association of State Wetlands Managers. Mr. Christensen holds a Bachelor of Science degree in conservation from Kent State University.

Judith Mitchell is a biologist and project manager with 14 years of experience in wetland delineation and mitigation, Section 401 and 404 and isolated wetlands permitting, stream and wetland restoration and monitoring, and water quality testing. She also performs ecological surveys, including bat habitat and emergence studies, macroinvertebrate and amphibian studies, and vegetation surveys. Ms. Mitchell has provided planting and construction oversight for wetland and stream restoration projects. She has managed multiple Section 401 and 404 permitting projects and a wide variety of ecological survey and compensatory mitigation projects. Ms. Mitchell has completed training through Ohio Environmental Protection Agency for the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). Ms. Mitchell graduated from Kent State University with a Bachelor of Science degree in conservation with an emphasis in water resources.

Todd A. Crandall, M.En., is a senior wetlands scientist with 19 years of experience performing wetlands delineations in Ohio and adjacent states. Mr. Crandall also performs ecological surveys, vegetation cover mapping, plant identification, and Section 401 and 404 and isolated wetlands permitting. He also contributes to the planning and design of restoration wetlands and prepares wetland mitigation reports. Mr. Crandall is responsible for vegetation monitoring at numerous wetlands mitigation sites throughout Ohio. He has completed large-scale wetlands and natural resource inventories for the Cuyahoga Valley National Park, as well as Cuyahoga, Medina, Portage, and Summit Counties in Northeast Ohio. He is certified to perform wetlands studies by the U.S. Army Wetlands Delineator Certification Program, and is a certified Professional Wetland Scientist through the Society of Wetland Scientists. He has completed the 40-hour OSHA health and safety training (OSHA Standard 29 CFR 1910.120). Mr. Crandall has successfully completed the Ohio Department of Transportation's (ODOT) Ecological Training hosted by the Office of Environmental Services. He is ODOT prequalified for ecological surveys and wetland mitigation. Mr. Crandall has also completed training through the Ohio Environmental Protection Agency for the following: Headwater Habitat Evaluation Index (HHEI); Qualitative Habitat Evaluation Index (QHEI); Ohio Rapid Assessment Method (ORAM) v.5; and Vegetation Index of Biotic Integrity (VIBI). He holds a Bachelor of Science degree from Hiram College in biology and a Master's degree in environmental science from Miami University.

Holly Richards is a Geographic Information Systems Technician with 3 years of experience applying GIS technology to environmental analysis. She joined Davey Resource Group in May of 2008. Ms. Richards graduated with a Bachelor of Arts in Geography from Kent State University with an emphasis on natural resource management and conservation, as well as a minor in Anthropology.

Her routine work involves data acquisition, manipulation, interpretation, and conversion for natural resource and utility projects. In addition, Ms. Richards is responsible for the creation of final cartographic products and the setup and testing of mobile mapping projects utilizing Davey's custom field inventory programs for urban forest and asset management inventories.

Benjamin Schuplin is a field technician and inventory arborist with Davey Resource Group. His ecological duties include assistance with a variety of natural resource projects, including invasive species treatment, bat mist-net surveys, wetlands studies, field data collection, and ecological surveys on sites throughout Ohio and adjoining states. His urban forestry duties include conducting municipal and park tree inventories throughout the U.S. He has experience with GPS and GIS systems and is proficient at woody plant identification. He has worked on ecological projects in Nelsonville, Medina, Gates Mills, and Conneaut, Ohio. Prior to joining Davey, Mr. Schuplin performed biological sampling to assess stream water quality for the Ohio Environmental Protection Agency, Division of Surface Water. He is proficient with the Index of Biotic Integrity (IBI) and the Qualitative Habitat Evaluation Index (QHEI) used to set minimum criteria index scores for use designations in water quality standards in 2010. In 2008, he was involved with monitoring the progression of invasive emerald ash borer in the Lake Erie islands and protecting the populations of endangered Lake Erie water snakes for research facility Stone Laboratory. Mr. Schuplin received a Bachelor of Science degree in natural resources and environmental sciences with a concentration in forest ecosystem management from The Ohio State University.

Attachment 5.6 – Water Resource Documentation

Attachment 5.6.1 – Stream Assessments

Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 46

Stream/Location Watson Creek - Guernsey to Lewis WGC Project **RM:** **Date:** 12/15/2011

Scorers Full Name & Affiliation: Todd Crandall, Ben Schuplin

River Code: 5040001 **STORET #:** **Lat/Long.:** 40.30812 / -81.49615 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 T	POOL	RIFFLE
☐	☐	BLDR /SLABS [10]			☐	☐	HARDPAN [4]		5
☐	☐	BOULDER [9]			☐	☐	DETRITUS [3]	5	5
☐	☐	COBBLE [8]	3	10	✓	☐	MUCK [2]	40	5
☐	☐	GRAVEL [7]	15	25	☐	☐	SILT [2]	10	
☐	✓	SAND [6]	27	50	☐	☐	ARTIFICIAL [0]		
☐	☐	BEDROCK [5]					(Score natural substrates; ignore sludge from point-sources)		

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

ORIGIN		QUALITY
☐ LIMESTONE [1]		☐ HEAVY [-2]
☐ TILLS [1]		☐ MODERATE [-1]
☐ WETLANDS [0]	SILT	✓ NORMAL [0]
✓ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	Embeddedness	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		✓ MODERATE [-1]
☐ LACUSTRINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Substrate 9 *Maximum* 20

Comments

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.

1	UNDERCUT BANKS [1]	0	POOLS >70CM [2]	0	OXBOWS/BACKWATERS [1]
1	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES[1]
1	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	0	LOGS or WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT Check ONE (Or 2 & Average)

☐ EXTENSIVE >75% [11]
✓ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Cover 10 *Maximum* 20

Comments

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	✓ RECOVERED [4]	✓ MODERATE [2]
✓ LOW [2]	✓ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVEREY [1]	

Channel 11 *Maximum* 20

Comments

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for **EACH BANK** (*Or 2 per bank & average*)

River right looking downstream

L	R	EROSION	L	R	RIPARIAN WIDTH	L	R	FLOOD PLAIN QUALI	L	R	
☐	☐	NONE / LITTLE [3]	☐	☐	WIDE > 50 M [4]	☐	☐	Forest, Swamp [3]	☐	☐	Conservation Tillage [1]
✓	✓	MODERATE [2]	☐	☐	MODERATE 10-50m [3]	☐	☐	Shrub or Old Field [2]	☐	☐	URBAN or INDUSTRIAL [0]
☐	☐	HEAVY / SEVERE [1]	☐	☐	NARROW 5-1-m [2]	✓	✓	Fenced Pasture [1]	☐	☐	Mining/Construction [0]
			✓	✓	VERY NARROW <5m [1]	☐	☐	Residential, Park, New Field [1]			
			☐	☐	NONE [0]	☐	☐	Open Pasture, Rowcrop [0]			

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

Riparian 4 *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]
✓ 0.2m-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & 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]

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool/ Current 5 *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 & 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]	☐ NONE [2]
✓ BEST AREAS 5-10 CM [1]	✓ MAXIMUM < 50CM [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	✓ LOW [1]
☐ BEST AREAS < 5 CM [metric=0]		✓ UNSTABLE (e.g. Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Riffle/ Run 3 *Maximum 8*

Comments
4 cm

6] GRADIENT

42
DRAINAGE AREA
6.11

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
✓ HIGH - VERY HIGH [10-6]

%POOL: 25 **%GLIDE:** 0
%RUN: 60 **%RIFFLE:** 15

Gradient 4 *Maximum 10*

Stream & Location: **Watson Creek - Guernsey to Lewis WGC Project**

A] *SAMPLED REACH*

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

40.30812 / -81.49615

Check ALL that apply

METHOD
- [ ] BOAT
- [ ] WADE
- [ ] L. LINE
- [ ] OTHER

DISTANCE
- [ ] 0.5 Km
- [ ] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CANOPY
- [x] > 85% OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%-CLOSED

METHOD (1st -sample pass- 2nd)
- [ ] HIGH
- [ ] UP
- [ ] NORMAL
- [ ] LOW
- [ ] DRY

CLARITY (1st --sample pass-- 2nd)
- [ ] <20 cm
- [ ] 20-<40 cm
- [ ] 40-70 cm
- [ ] > 70 cm/ CTB
- [ ] Secchi Dpth

pass
1st _____ cm
2nd _____ cm

C] RECREATION

POOL: AREA [ ] >100ft² DEPTH [ ] >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*

Circle some & *COMMENT*

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

E] *ISSUES*

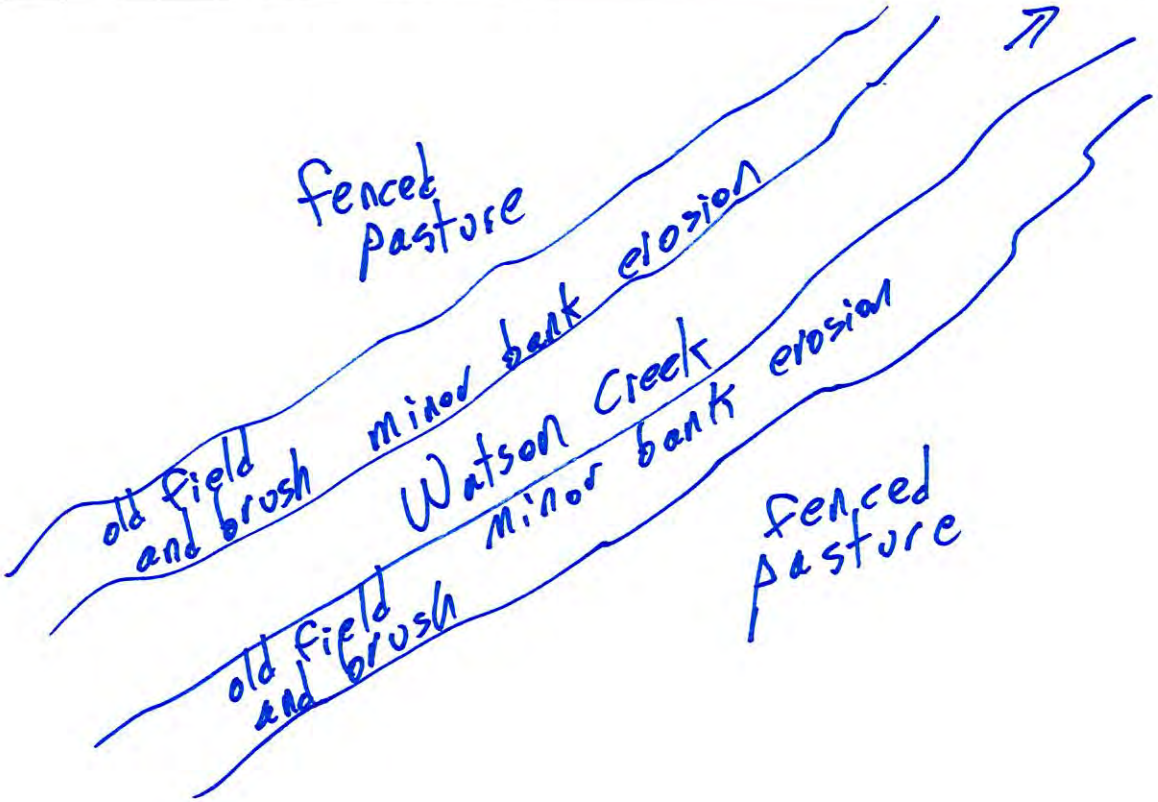
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_2O / TILE / H_2O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] *MEASUREMENTS*

$\bar{x}$ width
$\bar{x}$ depth
max. depth
$\bar{x}$ bankfull width
bankfull $\bar{x}$ depth
W/D ratio
bankfulll max. depth
floodprone x^2 width
entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 41

Stream/Location Crooked Creek - Guernsey to Lewis WGC Project **RM:** **Date:** 12/15/2011

Scorers Full Name & Affiliation: Todd Crandall, Ben Schuplin

River Code: 5040001 **STORET #:** **Lat/Long.:** 40.31676 / -81.37972 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES:* estimate % or note every type present

		BEST TYPES	POOL	RIFFLE			OTHER T	POOL	RIFFLE
☐	☐	BLDR /SLABS [10]			☐	☐	HARDPAN [4]	20	30
☐	☐	BOULDER [9]		2	☐	☐	DETRITUS [3]	10	3
☐	☐	COBBLE [8]	3	5	☐	☐	MUCK [2]		
☐	✓	GRAVEL [7]	20	40	☐	☐	SILT [2]	7	
✓	☐	SAND [6]	40	20	☐	☐	ARTIFICIAL [0]		
☐	☐	BEDROCK [5]					(Score natural substrates; ignore sludge from point-sources)		

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

Check ONE (*Or 2 & average*)

ORIGIN		QUALITY
☐ LIMESTONE [1]		☐ HEAVY [-2]
☐ TILLS [1]		✓ MODERATE [-1]
☐ WETLANDS [0]	SILT	☐ NORMAL [0]
✓ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	Embeddedness	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		✓ MODERATE [-1]
☐ LACUSTRINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Comments

Substrate 13 *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.

1	UNDERCUT BANKS [1]	0	POOLS >70CM [2]	0	OXBOWS/BACKWATERS [1]
0	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES[1]
1	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	0	LOGS or WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT Check ONE (Or 2 & Average)

☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
✓ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 5 *Maximum* 20

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☐ MODERATE [2]
✓ LOW [2]	✓ FAIR [3]	✓ RECOVERING [3]	✓ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVEREY [1]	

Comments

Channel 9 *Maximum* 20

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for **EACH BANK** (*Or 2 per bank & average*)

River right looking downstream

L	R	EROSION	L	R	RIPARIAN WIDTH	L	R	FLOOD PLAIN QUALI	L	R	
☐	☐	NONE / LITTLE [3]	☐	☐	WIDE > 50 M [4]	☐	☐	Forest, Swamp [3]	☐	☐	Conservation Tillage [1]
✓	✓	MODERATE [2]	☐	☐	MODERATE 10-50m [3]	☐	✓	Shrub or Old Field [2]	☐	☐	URBAN or INDUSTRIAL [0]
☐	☐	HEAVY / SEVERE [1]	☐	☐	NARROW 5-1-m [2]	☐	☐	Fenced Pasture [1]	☐	☐	Mining/Construction [0]
			☐	☐	VERY NARROW <5m [1]	☐	☐	Residential, Park, New Field [1]			
			✓	✓	NONE [0]	✓	☐	Open Pasture, Rowcrop [0]			

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

Comments

Riparian 3 *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]
✓ 0.2m-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & 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]

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool/ Current 5 *Maximum 12*

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
☐ BEST AREAS > 10CM [2]	☐ MAXIMUM > 50CM [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
✓ BEST AREAS 5-10 CM [1]	✓ MAXIMUM < 50CM [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5 CM [metric=0]		✓ UNSTABLE (e.g. Fine Gravel, Sand) [0]	✓ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

4 cm

Riffle/ Run 2 *Maximum 8*

6] GRADIENT

DRAINAGE AREA 51 (3.09 mi^2)

☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
✓ HIGH - VERY HIGH [10-6]

%POOL: 25 **%GLIDE:** 0 **%RUN:** 50 **%RIFFLE:** 25

Gradient 4 *Maximum 10*

Stream & Location: Crooked Creek - Guernsey to Lewis WGC Project

A] SAMPLED REACH — Check ALL that apply

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

40.31676 / -81.37972

METHOD
- [ ] BOAT
- [ ] WADE
- [ ] L. LINE
- [ ] OTHER

DISTANCE
- [ ] 0.5 Km
- [ ] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

METHOD (1st -sample pass- 2nd)
- [ ] HIGH
- [ ] UP
- [ ] NORMAL
- [ ] LOW
- [ ] DRY

CLARITY (1st --sample pass-- 2nd)
- [ ] <20 cm
- [ ] 20-<40 cm
- [ ] 40-70 cm
- [ ] > 70 cm/ CTB
- [ ] Secchi Dpth

1st _____ cm

2nd _____ cm

CANOPY (pass)
- [x] > 85% OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%-CLOSED

C] RECREATION — POOL: AREA [ ] >100ft² DEPTH [ ] >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 — Circle some & *COMMENT*

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

E] ISSUES

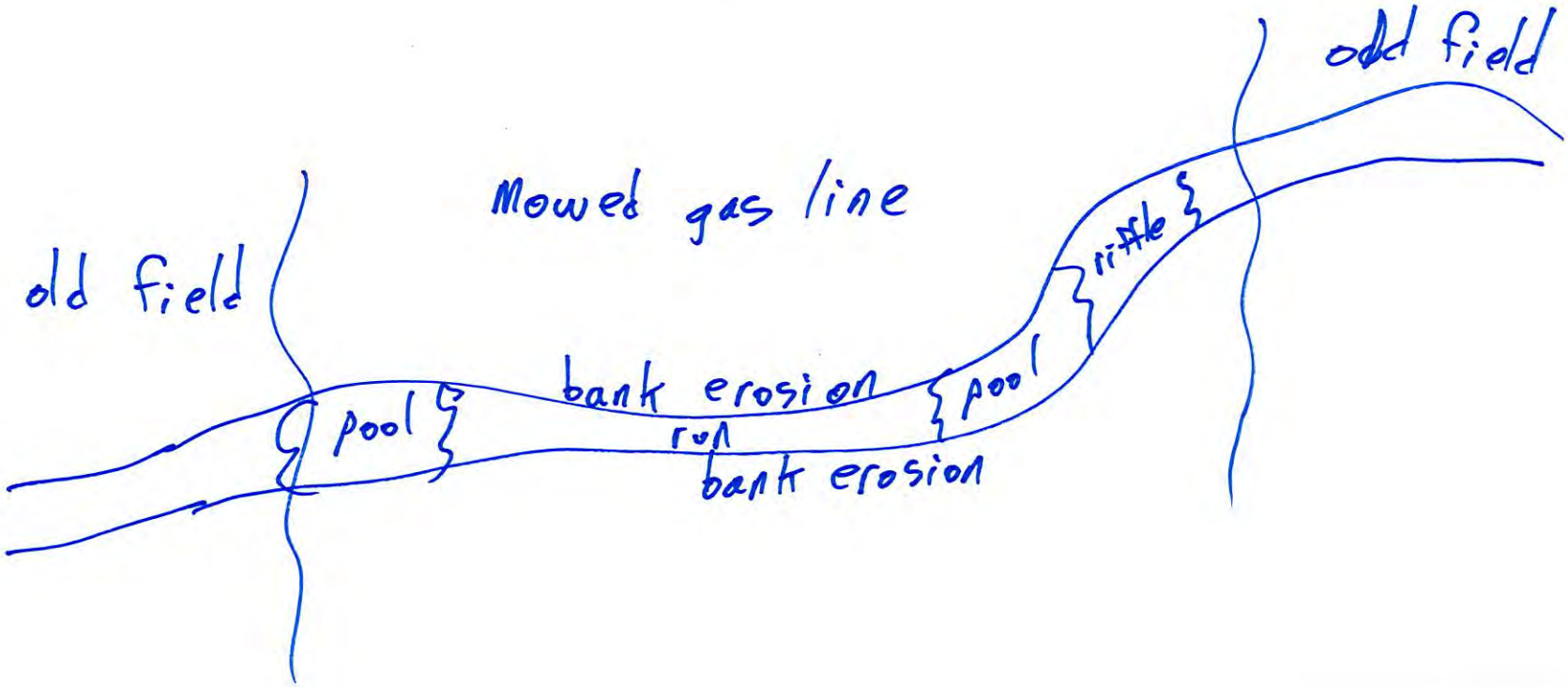
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_2O / TILE / H_2O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

$\bar{x}$ width
$\bar{x}$ depth
max. depth
$\bar{x}$ bankfull width
bankfull $\bar{x}$ depth
W/D ratio
bankfulll max. depth
floodprone x^2 width
entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 57

Stream/Location: Stillwater Creek (First Crossing) - Guernsey to Lewis WGC **RM:** **Date:** 1/11/2012

Scorers Full Name & Affiliation: Todd Crandall, Ben Schuplin, Davey Resource Group

River Code: 105040001 **STORET #:** **Lat/Long.:** 40.3417 / -81.3287 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES:* estimate % or note every type present

BEST TYPES		POOL	RIFFLE	OTHER T		POOL	RIFFLE
☐	☐ BLDR /SLABS [10]			☐	☐ HARDPAN [4]	x	
☐	☐ BOULDER [9]			☐	☐ DETRITUS [3]	x	
☐	☐ COBBLE [8]	x		☐	✓ MUCK [2]	x	
☐	☐ GRAVEL [7]	x		☐	☐ SILT [2]	x	
✓	☐ SAND [6]	x		☐	☐ ARTIFICIAL [0]	x	
☐	☐ BEDROCK [5]						

(Score natural substrates; ignore sludge from point-sources)

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

ORIGIN		QUALITY
☐ LIMESTONE [1]		☐ HEAVY [-2]
✓ TILLS [1]		✓ MODERATE [-1]
☐ WETLANDS [0]	SILT	☐ NORMAL [0]
☐ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]	Embeddedness	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		✓ MODERATE [-1]
☐ LACUSTRINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Comments

Substrate 7 *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.

1	UNDERCUT BANKS [1]	1	POOLS >70CM [2]	0	OXBOWS/BACKWATERS [1]
1	OVERHANGING VEGETATION [1]	1	ROOTWADS [1]	0	AQUATIC MACROPHYTES[1]
0	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	1	LOGS or WOODY DEBRIS [1]
1	ROOTMATS [1]				

AMOUNT Check ONE (Or 2 & Average)

☐ EXTENSIVE >75% [11]
✓ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Comments

Cover 14 *Maximum* 20

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	✓ HIGH [3]
✓ MODERATE [3]	☐ GOOD [5]	✓ RECOVERED [4]	☐ MODERATE [2]
☐ LOW [2]	✓ FAIR [3]	☐ RECOVERING [3]	☐ LOW [1]
☐ NONE [1]	☐ POOR [1]	☐ RECENT OR NO RECOVEREY [1]	

Comments

Channel 13 *Maximum* 20

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for **EACH BANK** (*Or 2 per bank & average*)

River right looking downstream

L	R	EROSION	L	R	RIPARIAN WIDTH	L	R	FLOOD PLAIN QUALI	L	R	
✓	✓	NONE / LITTLE [3]			WIDE > 50 M [4]		✓	Forest, Swamp [3]			Conservation Tillage [1]
		MODERATE [2]			MODERATE 10-50m [3]			Shrub or Old Field [2]			URBAN or INDUSTRIAL [0]
		HEAVY / SEVERE [1]	✓	✓	NARROW 5-1-m [2]			Fenced Pasture [1]			Mining/Construction [0]
					VERY NARROW <5m [1]			Residential, Park, New Field [1]			
					NONE [0]		✓	Open Pasture, Rowcrop [0]			

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

Comments

Riparian 7 *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]
☐ 0.2m-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & 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]

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool/ Current 8 *Maximum 12*

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
☐ BEST AREAS > 10CM [2]	☐ MAXIMUM > 50CM [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☐ BEST AREAS 5-10 CM [1]	☐ MAXIMUM < 50CM [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5 CM [metric=0]		☐ UNSTABLE (e.g. Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

4 cm

Riffle/ Run 0 *Maximum 8*

6] GRADIENT

(10 ft/mi)

DRAINAGE AREA

(305 mi^2)

☐ VERY LOW - LOW [2-4]
✓ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 0 **%GLIDE:** 100
%RUN: 0 **%RIFFLE:** 0

Gradient 8 *Maximum 10*

Stream & Location: **Stillwater Creek (First Crossing) - Guernsey to Lewis WGC**

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

Check ALL that apply

METHOD
- [ ] BOAT
- [ ] WADE
- [ ] L. LINE
- [ ] OTHER

METHOD *1st -sample pass- 2nd*
- [ ] HIGH [ ]
- [ ] UP [ ]
- [ ] NORMAL [ ]
- [ ] LOW [ ]
- [ ] DRY [ ]

40.3417 / -81.3287

DISTANCE
- [ ] 0.5 Km
- [ ] 0.2 Km
- [ ] 0.15 Km
- [ ] 0.12 Km
- [ ] OTHER

_____ meters

CLARITY *1st --sample pass-- 2nd*
- [ ] <20 cm [ ]
- [ ] 20-<40 cm [ ]
- [ ] 40-70 cm [ ]
- [ ] > 70 cm/ CTB [ ]
- [ ] Secchi Dpth [ ]

1st _____ cm
pass
2nd _____ cm

CANOPY
- [ ] > 85% OPEN
- [ ] 55%-<85%
- [ ] 30%-<55%
- [ ] 10%-<30%
- [ ] <10%-CLOSED

C] RECREATION *POOL:* AREA [ ] >100ft² DEPTH [ ] >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* Circle some & *COMMENT*

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

E] *ISSUES*

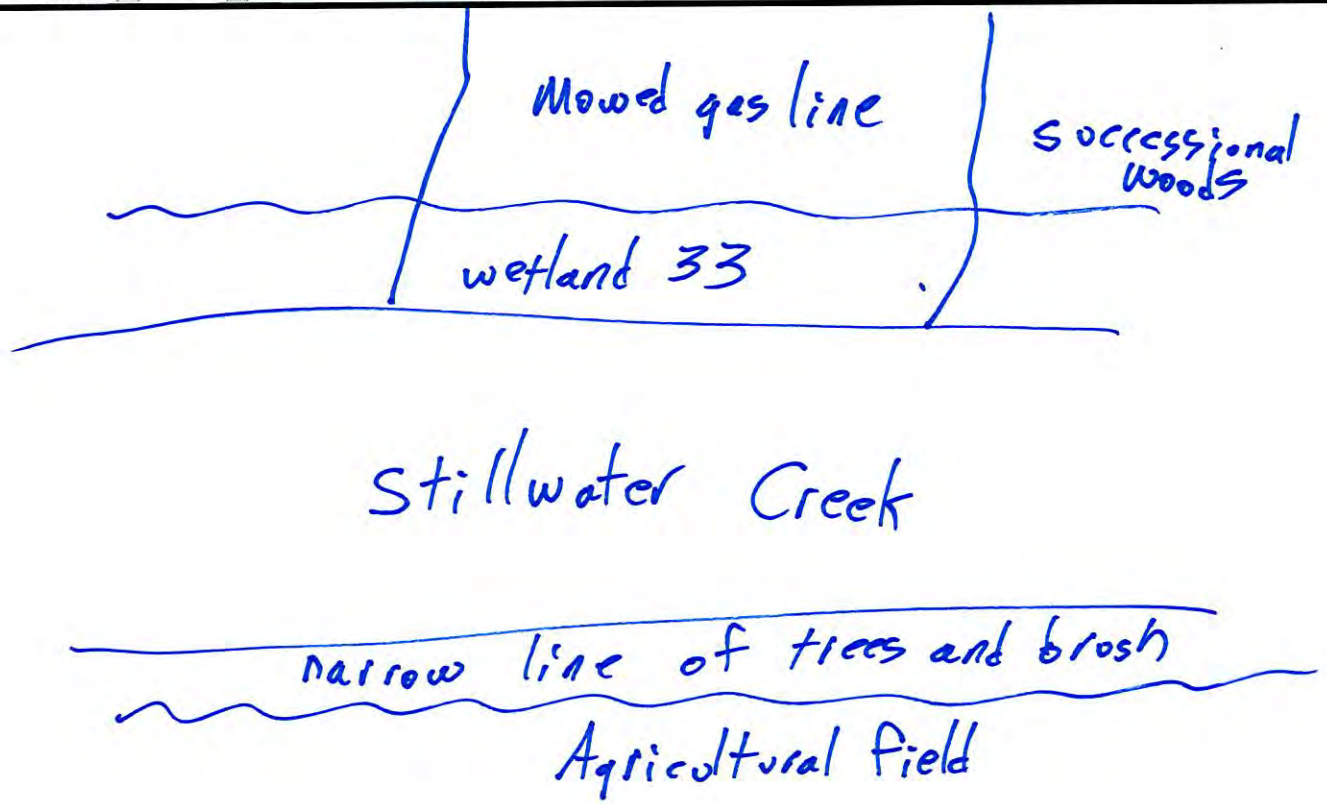
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_2O / TILE / H_2O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] *MEASUREMENTS*

$\bar{x}$ width
$\bar{x}$ depth
max. depth
$\bar{x}$ bankfull width
bankfull $\bar{x}$ depth
W/D ratio
bankfulll max. depth
floodprone x^2 width
entrench. ratio

Legacy Tree:

Stream Drawing:



Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 41

Stream/Location: Stream 31 - Guernsey to Lewis WGC Project **RM:** **Date:** 1/11/2012

Scorers Full Name & Affiliation: Todd Crandall, Ben Schuplin, Davey Resource Group

River Code: 5040001 **STORET #:** **Lat/Long.:** 40.34943 / -81.31151 Office verified location ☐

1] SUBSTRATE

Check **ONLY Two** substrate *TYPE BOXES:* estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER T	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☑ ☐ HARDPAN [4]	35	26
☐ ☐ BOULDER [9]			☐ ☑ DETRITUS [3]	30	70
☐ ☐ COBBLE [8]			☐ ☐ MUCK [2]		
☐ ☐ GRAVEL [7]			☐ ☐ SILT [2]	18	
☐ ☐ SAND [6]	15	4	☐ ☐ ARTIFICIAL [0]	2	
☐ ☐ BEDROCK [5]					

(Score natural substrates; ignore sludge from point-sources)

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

Check ONE (*Or 2 & average*)

ORIGIN	QUALITY
☐ LIMESTONE [1]	☐ HEAVY [-2]
☐ TILLS [1]	☑ MODERATE [-1]
☑ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☐ EXTENSIVE [-2]
☐ RIP/RAP [0]	☑ MODERATE [-1]
☐ LACUSTRINE [0]	☐ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT Embeddedness

Substrate 5 (Maximum 20)

Comments

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.

0	UNDERCUT BANKS [1]	0	POOLS >70CM [2]	0	OXBOWS/BACKWATERS [1]
1	OVERHANGING VEGETATION [1]	0	ROOTWADS [1]	0	AQUATIC MACROPHYTES[1]
0	SHALLOWS (IN SLOW WATER) [1]	0	BOULDERS [1]	2	LOGS or WOODY DEBRIS [1]
0	ROOTMATS [1]				

AMOUNT Check ONE (Or 2 & Average)

☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☑ SPARSE 5-<25% [3]
☐ NEARLY ABSENT <5% [1]

Cover 6 (Maximum 20)

Comments

3] CHANNEL MORPHOLOGY

Check ONE in each category (*Or 2 & average*)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☑ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☐ LOW [2]	☐ FAIR [3]	☑ RECOVERING [3]	☑ LOW [1]
☐ NONE [1]	☑ POOR [1]	☐ RECENT OR NO RECOVEREY [1]	

Channel 10 (Maximum 20)

Comments

4] BANK EROSION AND RIPARIAN ZONE

Check **ONE** in each category for **EACH BANK** (*Or 2 per bank & average*)

River right looking downstream

L	R	EROSION	L	R	RIPARIAN WIDTH	L	R	FLOOD PLAIN QUALI	L	R	
☐	☐	NONE / LITTLE [3]	☐	☐	WIDE > 50 M [4]	☑	☑	Forest, Swamp [3]	☐	☐	Conservation Tillage [1]
☑	☑	MODERATE [2]	☐	☐	MODERATE 10-50m [3]	☐	☐	Shrub or Old Field [2]	☐	☐	URBAN or INDUSTRIAL [0]
☐	☐	HEAVY / SEVERE [1]	☐	☑	NARROW 5-1-m [2]	☐	☐	Fenced Pasture [1]	☐	☐	Mining/Construction [0]
			☑	☐	VERY NARROW <5m [1]	☐	☐	Residential, Park, New Field [1]			
			☐	☐	NONE [0]	☐	☐	Open Pasture, Rowcrop [0]			

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

Riparian 7 (Maximum 10)

Comments

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check **ONE** (*ONLY!*))	CHANNEL WIDTH (Check ONE (*Or 2 & average*))	CURRENT VELOCITY (Check ALL that apply)	
☐ > 1m [6]	☑ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1]	☑ SLOW [1]
☐ 0.7-<1m [4]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☐ POOL WIDTH < RIFFLE WIDTH [0]	☐ FAST [1]	☐ INTERMITTENT [-2]
☑ 0.2m-<0.4m [1]		☑ MODERATE [1]	☐ EDDIES [1]
☐ < 0.2m [0]			

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool/ Current 5 (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 & 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]	☐ NONE [2]
☐ BEST AREAS 5-10 CM [1]	☐ MAXIMUM < 50CM [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☑ LOW [1]
☑ BEST AREAS < 5 CM [metric=0]		☑ UNSTABLE (e.g. Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Riffle/ Run 1 (Maximum 8)

Comments
4 cm

6] GRADIENT

DRAINAGE AREA (1.07 mi^2)

(10 ft/mi)
☐ VERY LOW - LOW [2-4]
☑ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 0 **%GLIDE:** 90
%RUN: 0 **%RIFFLE:** 10

Gradient 8 (Maximum 10)

Stream & Location: Stream 31 - Guernsey to Lewis WGC Project

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

Check ALL that apply

40.34943 / -81.31151

METHOD	METHOD (1st -sample pass- 2nd)	
☐ BOAT	☐ HIGH	☐
☐ WADE	☐ UP	☐
☐ L. LINE	☐ NORMAL	☐
☐ OTHER	☐ LOW	☐
	☐ DRY	☐

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

_____ meters

CLARITY

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

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

pass: 1st _____ cm; 2nd _____ cm

C] RECREATION POOL: ☐ AREA >100ft² ☐ DEPTH >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 Circle some & *COMMENT*

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

E] ISSUES

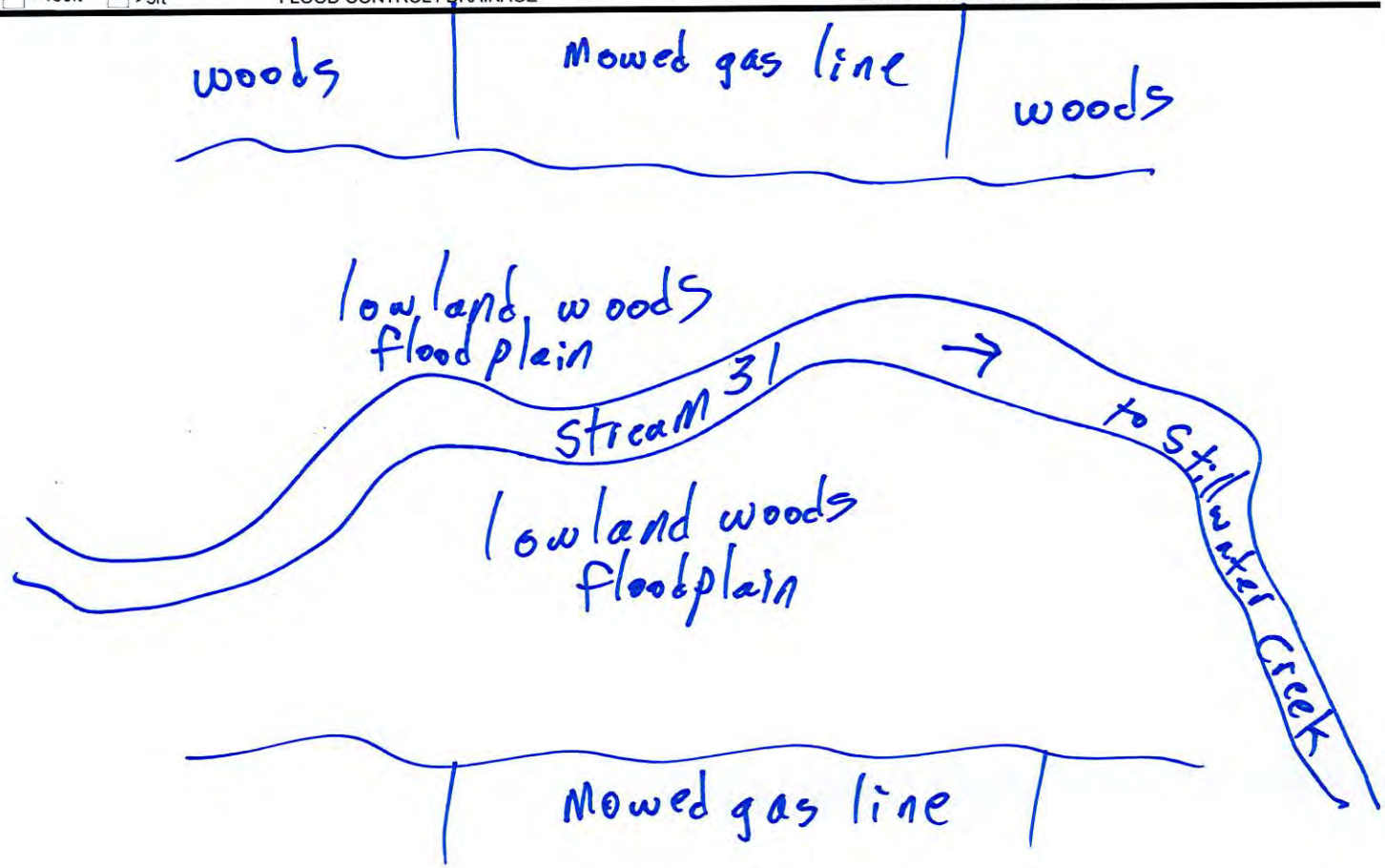
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_2O / TILE / H_2O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

$\bar{x}$ width
$\bar{x}$ depth
max. depth
$\bar{x}$ bankfull width
bankfull $\bar{x}$ depth
W/D ratio
bankfulll max. depth
floodprone x^2 width
entrench. ratio

Legacy Tree:

Stream Drawing:



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 56

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 1 RIVER BASIN Tuscarawas Drainage Area (mi^2) 0.26

Length of Stream Reach (200 ft Lat. 40.28918 Long. -81.45586 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	10%
☐	BOULDER (>256 mm) **[16 pts]**		☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	5%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	5%	☐	CLAY or HARDPAN **[0 pts]**	5%
☑	GRAVEL (2-64 mm) **[9 pts]**	35%	☑	MUCK **[0 pts]**	30%
☐	SAND (<2 mm) **[6 pts]**	10%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 5%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 9

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 7

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL**[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 20

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☑	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☐	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 1.1

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☑ Stream Flowing ☐ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 1

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: Dunlap Creek Distance from Evaluated Stream 4 miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 100% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

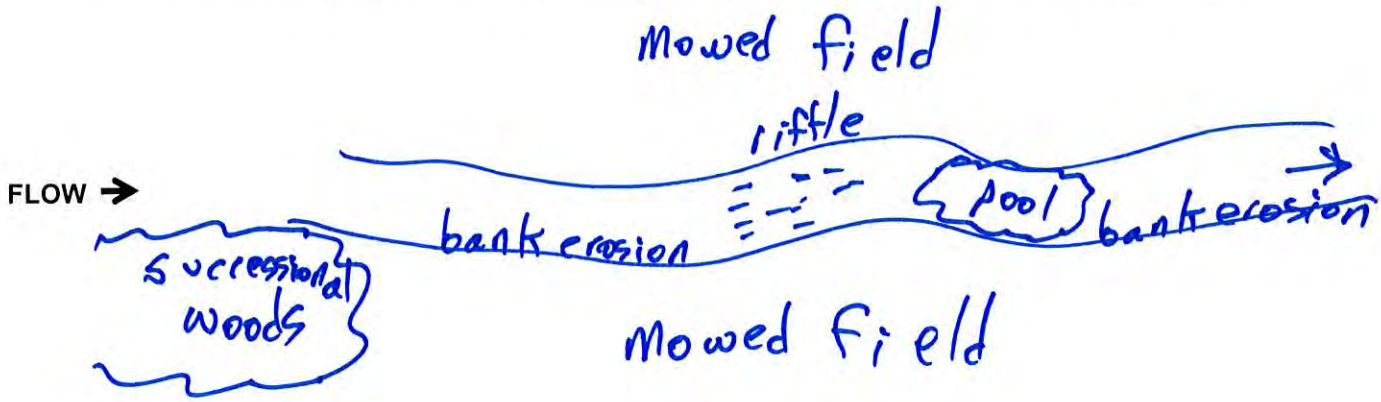
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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 / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 2 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29014 Long. -81.4535 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	10%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	45%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	2%	☑	CLAY or HARDPAN **[0 pts]**	35%
☐	GRAVEL (2-64 mm) **[9 pts]**	4%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	4%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 2% (A)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

HHEI Metric Points

Substrate Max = 40

9

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☑	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/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):

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.7

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☑ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 2

Additional Stream Information (This Information Must Also Be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S): _____

☑ WWH Name: Dunlap Creek Distance from Evaluated Stream 5 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 70% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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/Tadpoles Observed? _____ 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 featurs 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 / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 3 RIVER BASIN Tuscarawas Drainage Area (mi^2) <.1

Length of Stream Reach (200 ft Lat. 40.29178 Long. -81.44936 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**	3%	☐	SILT **[3 pts]**	5%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	20%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	60%
☐	GRAVEL (2-64 mm) **[9 pts]**	10%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	2%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 3%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 3

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

HHEI Metric Points

Substrate Max = 40

9

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):

☐	>30 centimeters **[20 pts]**		☑	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 8

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.7

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☑	☑	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☑	☑	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 3

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: Dunlap Creek Distance from Evaluated Stream 5 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

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

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

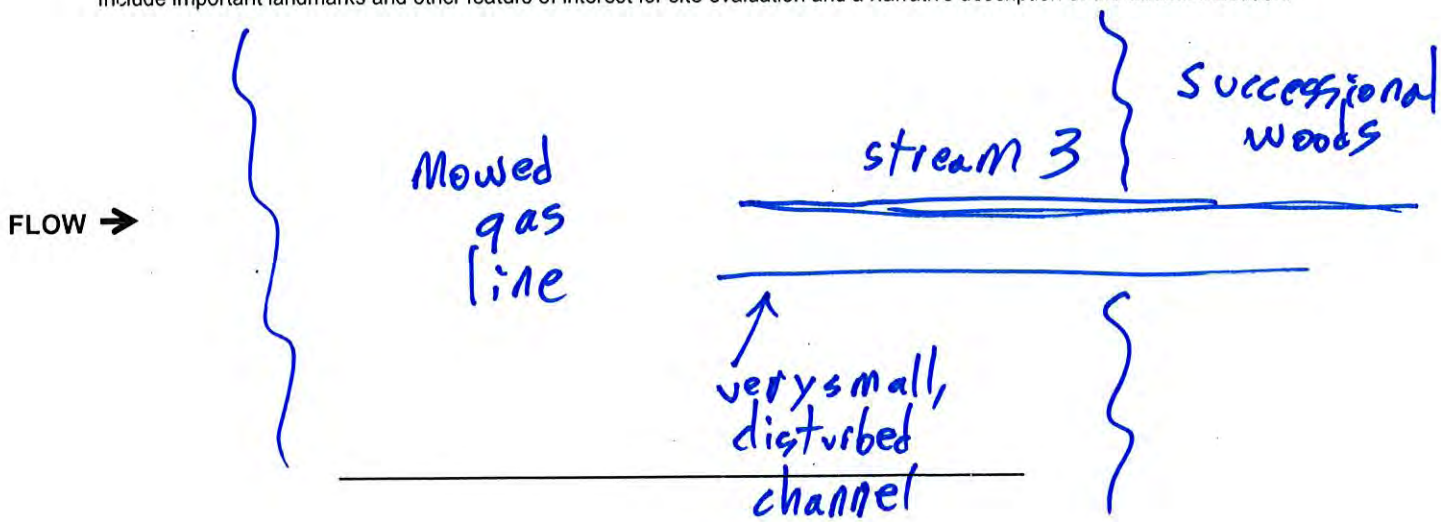
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 26

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 4 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29485 Long. -81.44191 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	5%
☐	BOULDER (>256 mm) **[16 pts]**		☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	5%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	70%
☐	GRAVEL (2-64 mm) **[9 pts]**	5%	☐	MUCK **[0 pts]**	10%
☐	SAND (<2 mm) **[6 pts]**	5%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 0% (A)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 0

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

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):

☐	>30 centimeters **[20 pts]**		☑	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 8

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.5

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 4

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: Dunlap Creek Distance from Evaluated Stream 6 miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 100% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

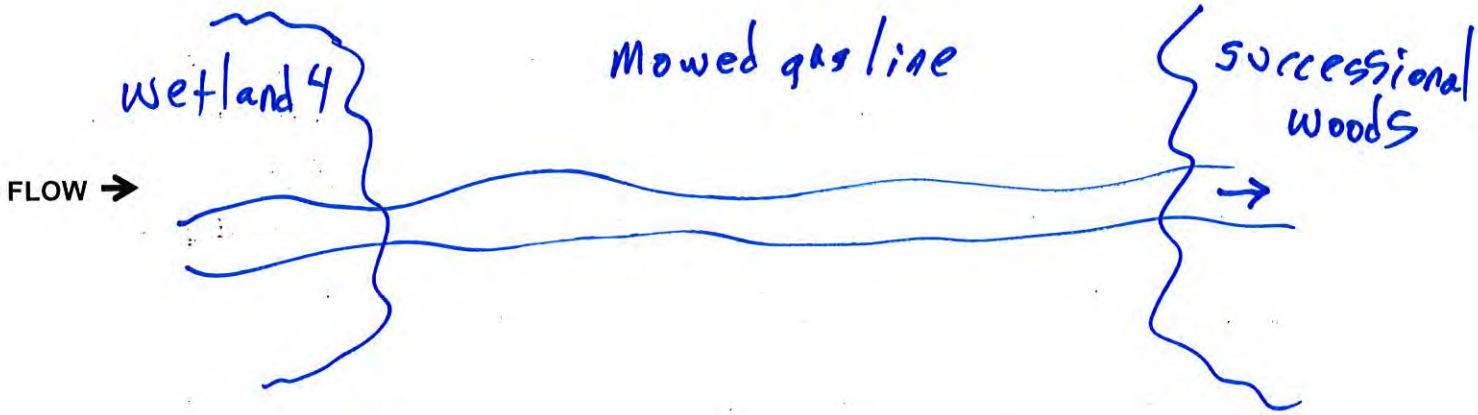
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 16

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 5 RIVER BASIN Tusacarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29469 Long. -81.44174 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	35%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	60%
☐	GRAVEL (2-64 mm) **[9 pts]**	5%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**		☐	ARTIFICIAL **[3pts]**	

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

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 3

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 3

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☑	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 3

Pool Depth Max=30

5

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.6

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☑	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☑	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☑	Narrow < 5 m	☐	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☐ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☑ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 5

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: Dunlap Creek Distance from Evaluated Stream 6 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

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

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

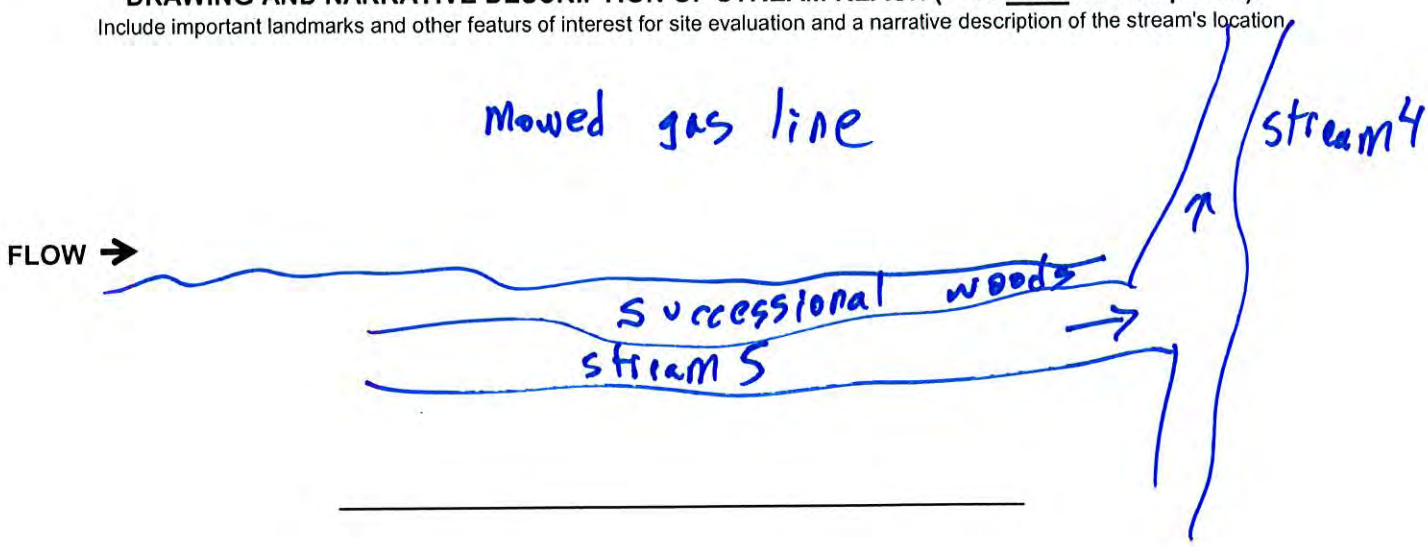
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 36

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 6 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29572 Long. -81.43891 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	5%
☐	BOULDER (>256 mm) **[16 pts]**	5%	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	5%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	5%	☑	CLAY or HARDPAN **[0 pts]**	50%
☑	GRAVEL (2-64 mm) **[9 pts]**	25%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	5%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 10%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 9 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 7

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):

☐	>30 centimeters **[20 pts]**	☑	>5 cm - 10 cm **[15 pts]**
☐	>22.5 - 30 cm **[30 pts]**	☐	≤5 cm **[5 pts]**
☐	>10 - 22.5 cm **[25 pts]**	☐	NO WATER/MOIST CHANNEL **[0 pts]**

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 10

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**	☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**	☑	≤1.0 m (≤ 3'3") **[5 pts]**
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**		

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.8

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☑ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 6

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: Dunlap Creek Distance from Evaluated Stream 6 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 90% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

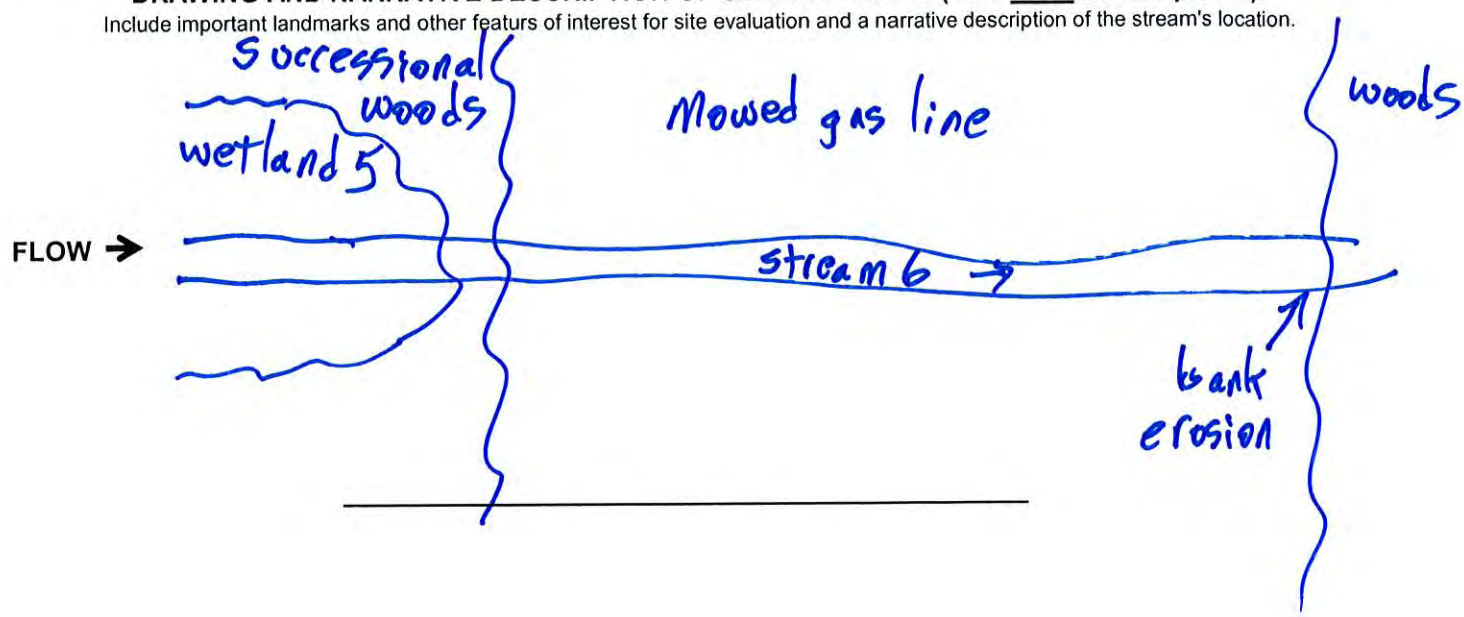
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 50

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 7 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29615 Long. -81.43767 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	10%
☐	BOULDER (>256 mm) **[16 pts]**		☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	12%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	8%	☐	CLAY or HARDPAN **[0 pts]**	
☑	GRAVEL (2-64 mm) **[9 pts]**	30%	☐	MUCK **[0 pts]**	
☑	SAND (<2 mm) **[6 pts]**	40%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 8%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

20

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 13

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.3

Bankfull Width Max=30

5

This information must also be completed.

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

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☑	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☑ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 7

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: Dunlap Creek Distance from Evaluated Stream 6 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 70% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

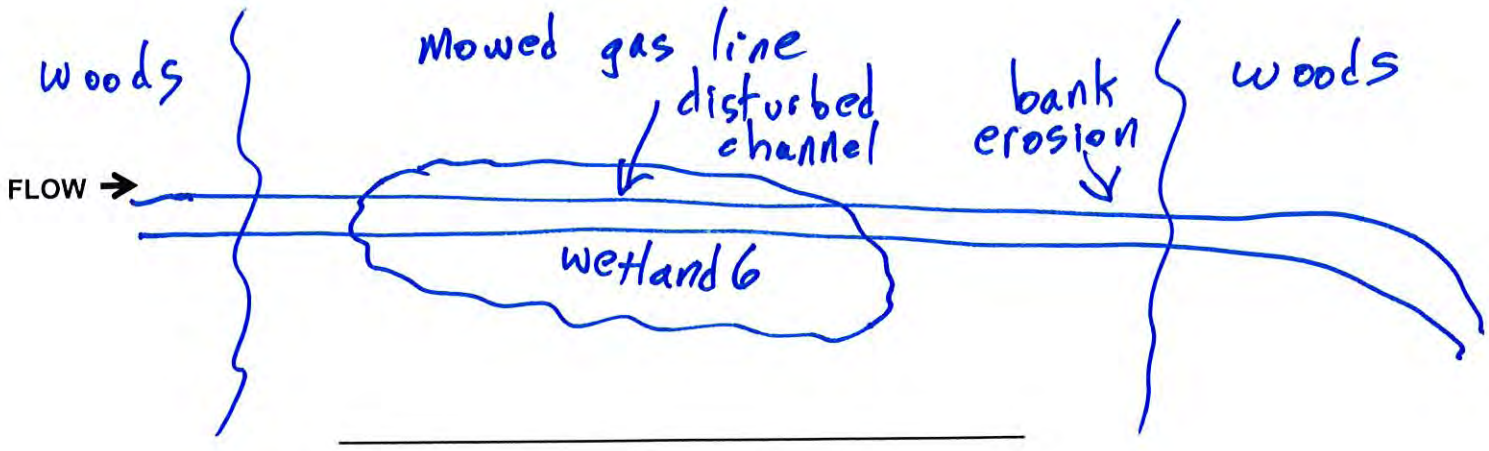
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 38

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 8 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.29714 Long. -81.4349 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	2%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	15%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	70%
☐	GRAVEL (2-64 mm) **[9 pts]**	10%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	3%	☐	ARTIFICIAL **[3pts]**	

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

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 3 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 5

HHEI Metric Points

Substrate Max = 40

8

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 15

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.8

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 8

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: Dunlap Creek Distance from Evaluated Stream 6 Miles

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 100% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

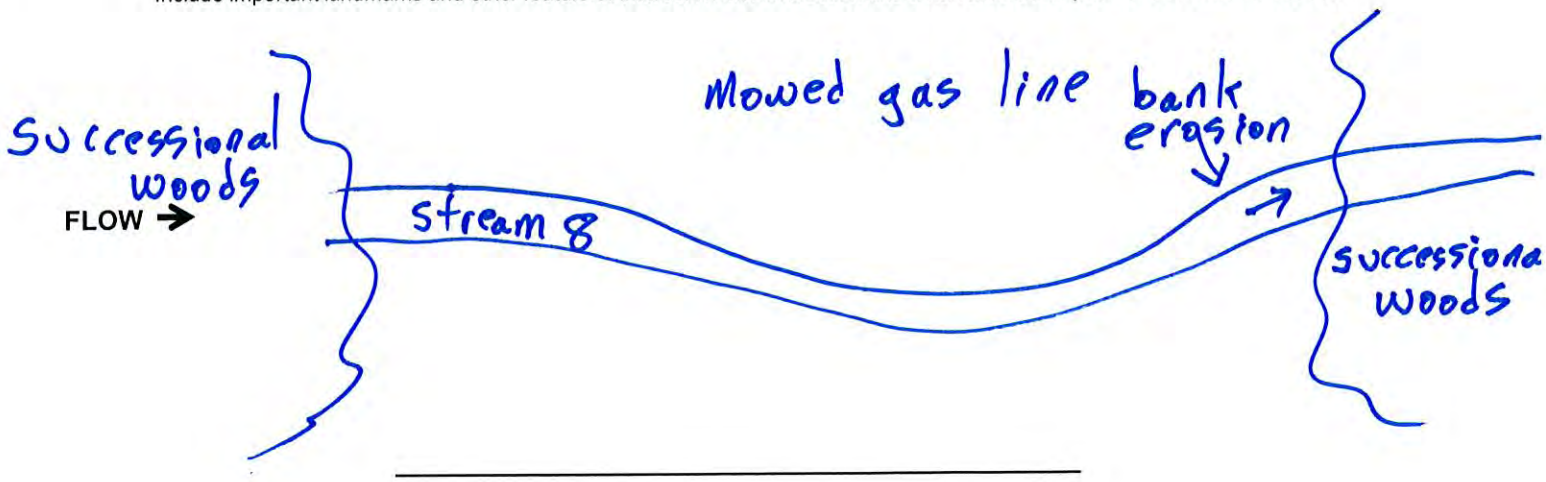
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 39

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 9 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.298225 Long. -81.43161 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	20%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	35%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	30%
☐	GRAVEL (2-64 mm) **[9 pts]**		☐	MUCK **[0 pts]**	5%
☐	SAND (<2 mm) **[6 pts]**	4%	☐	ARTIFICIAL **[3pts]**	6%

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

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 3 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 6

HHEI Metric Points

Substrate Max = 40

9

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 20

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.4

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☐ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☑ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 9

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: Watson Creek — Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 90% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

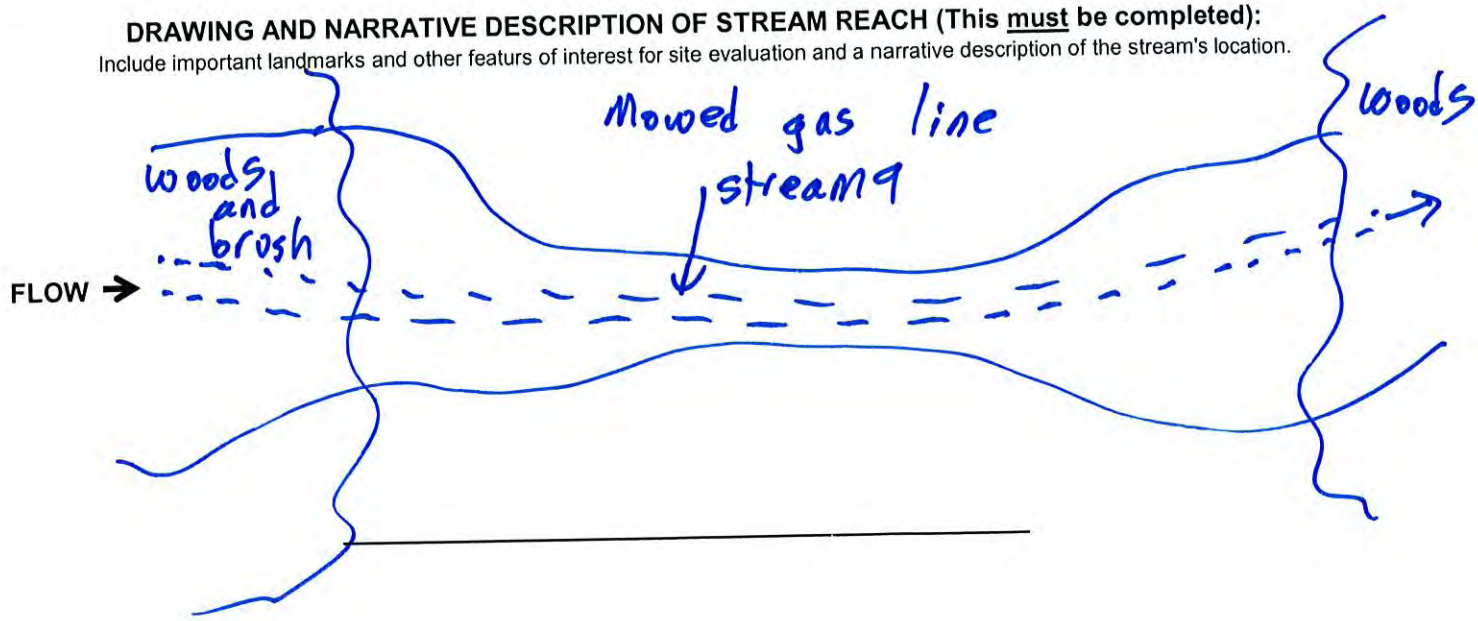
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 40

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 10 RIVER BASIN Tuscarawas Drainage Area (mi^2) 0.5

Length of Stream Reach (200 ft Lat. 40.30144 Long. -81.42375 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	3%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	40%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☐	CLAY or HARDPAN **[0 pts]**	15%
☐	GRAVEL (2-64 mm) **[9 pts]**	5%	☑	MUCK **[0 pts]**	25%
☐	SAND (<2 mm) **[6 pts]**	7%	☐	ARTIFICIAL **[3pts]**	5%

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

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 3 **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 7

HHEI Metric Points

Substrate Max = 40

10

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 20

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.3

Bankfull Width Max=30

5

This information must also be completed.

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

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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

☐ Stream Flowing ☑ Moist channel, isolated pools, no flow (Intermittent)

☐ Subsurface flow with isolated pools (Interstitial) ☐ Dry channel, no water, (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 200 ft (61 m) 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)

Location / Stream Name: Stream 10

Additional Stream Information (This Information Must Also Be Completed):

QHEI PERFORMED? ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S): _____

☑ WWH Name: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 90% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

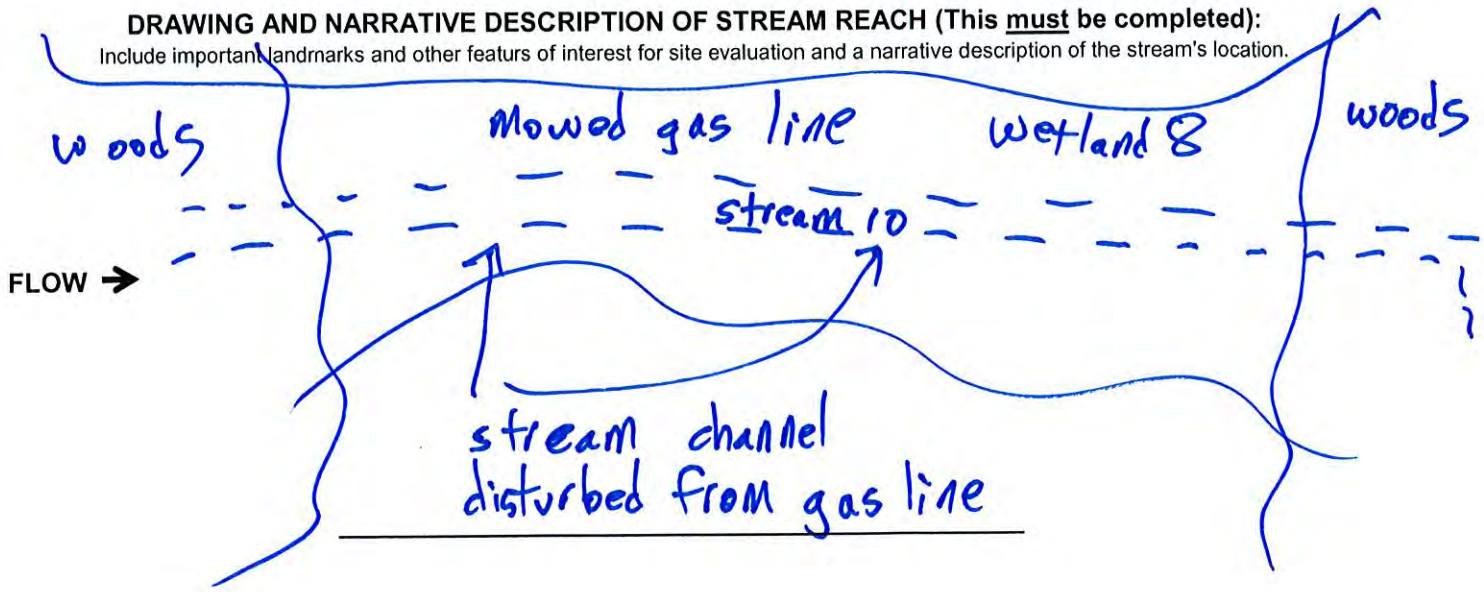
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 51

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 11 RIVER BASIN Tuscarawas Drainage Area (mi^2) 0.4

Length of Stream Reach (200 ft Lat. 40.3034 Long. -81.41953 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	☐	BLDR SLABS **[16 pts]**		☐	☐	SILT **[3 pts]**	6%
☐	☐	BOULDER (>256 mm) **[16 pts]**	2%	☐	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	2%
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	
☐	☐	COBBLE (65-256 mm) **[12 pts]**	15%	☐	☐	CLAY or HARDPAN **[0 pts]**	
☑	☐	GRAVEL (2-64 mm) **[9 pts]**	50%	☐	☐	MUCK **[0 pts]**	
☐	☑	SAND (<2 mm) **[6 pts]**	25%	☐	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 17%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 6

HHEI Metric Points

Substrate Max = 40

21

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):

☐	>30 centimeters **[20 pts]**		☑	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 10

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**		☑	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☐	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 1.1

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 11

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: Watson Creek Distance from Evaluated Stream < 1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 90% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

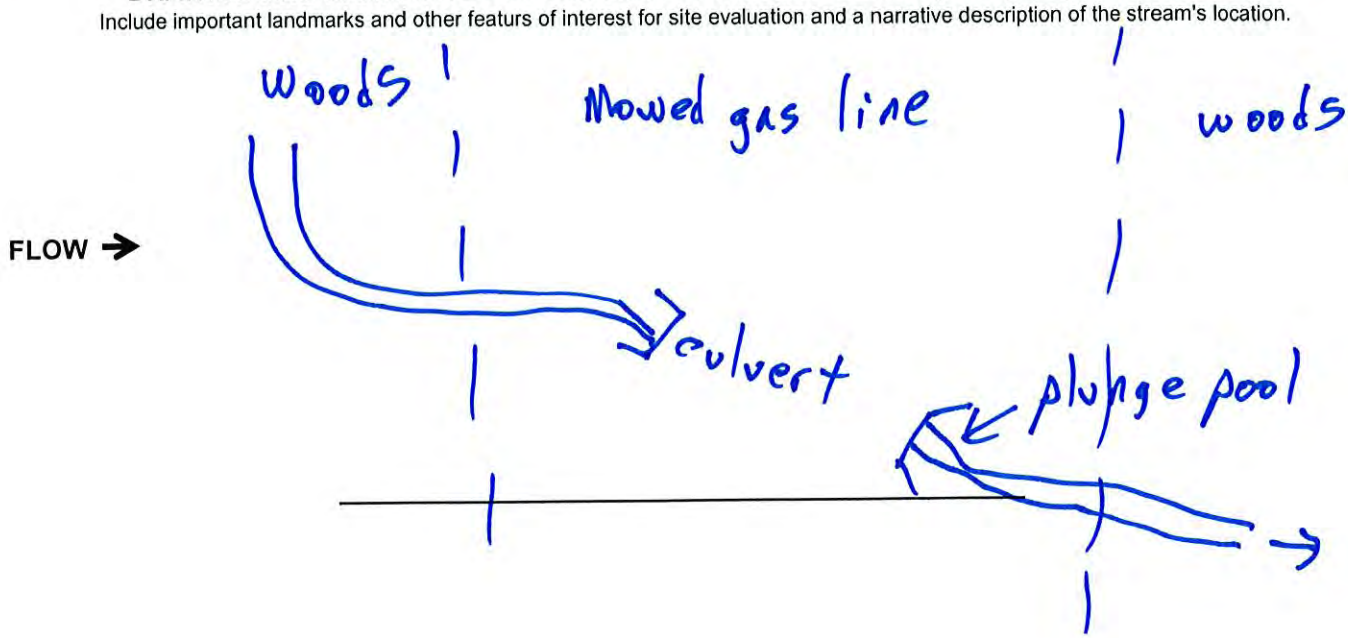
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 42

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 12 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.30429 Long. -81.41719 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	☐	BLDR SLABS **[16 pts]**	10%	☐	☐	SILT **[3 pts]**	5%
☐	☐	BOULDER (>256 mm) **[16 pts]**	15%	☐	☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	10%
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	
☐	☐	COBBLE (65-256 mm) **[12 pts]**	5%	☐	☐	CLAY or HARDPAN **[0 pts]**	
☑	☐	GRAVEL (2-64 mm) **[9 pts]**	30%	☐	☐	MUCK **[0 pts]**	
☐	☑	SAND (<2 mm) **[6 pts]**	25%	☐	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 30%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 7

HHEI Metric Points

Substrate Max = 40

22

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):

☐	>30 centimeters **[20 pts]**		☑	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 8

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.9

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 12

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 100% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

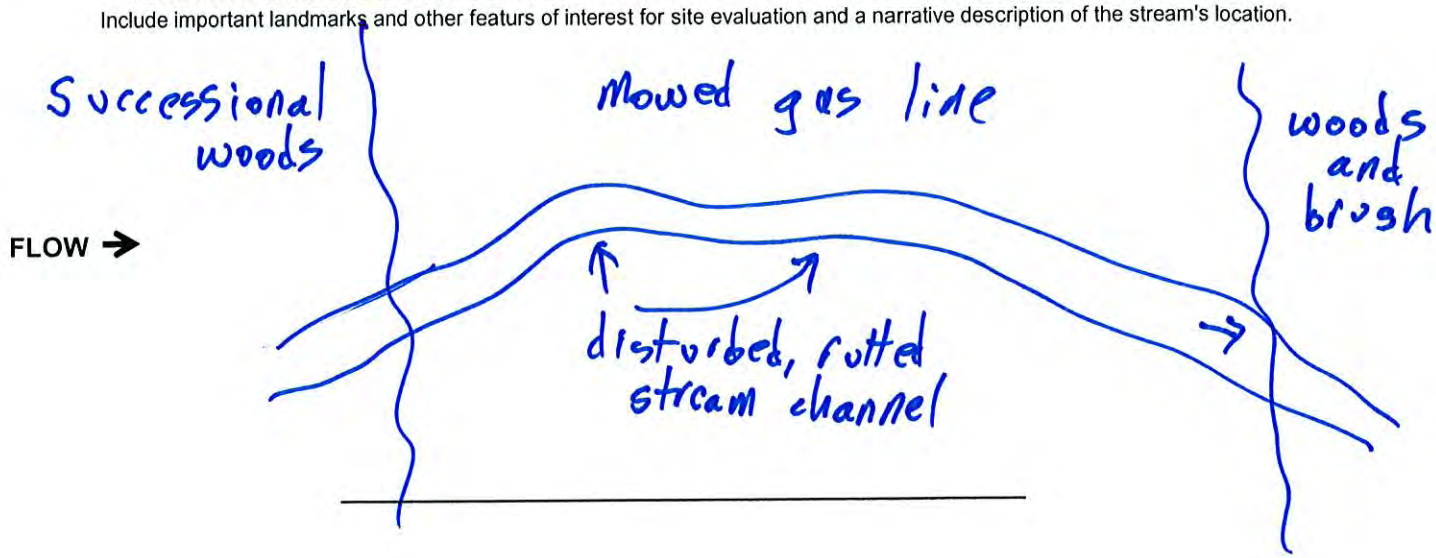
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 50

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 13 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.30549 Long. -81.41316 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	☐	BLDR SLABS **[16 pts]**		☐	☐	SILT **[3 pts]**	10%
☐	☐	BOULDER (>256 mm) **[16 pts]**		☐	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	8%
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	
☐	☐	COBBLE (65-256 mm) **[12 pts]**	2%	☐	☐	CLAY or HARDPAN **[0 pts]**	
☑	☐	GRAVEL (2-64 mm) **[9 pts]**	45%	☐	☐	MUCK **[0 pts]**	
☐	☑	SAND (<2 mm) **[6 pts]**	35%	☐	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 2%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

20

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 15

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.4

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)	(FLOODPLAIN QUALITY) L	R	(Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 13

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 70% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

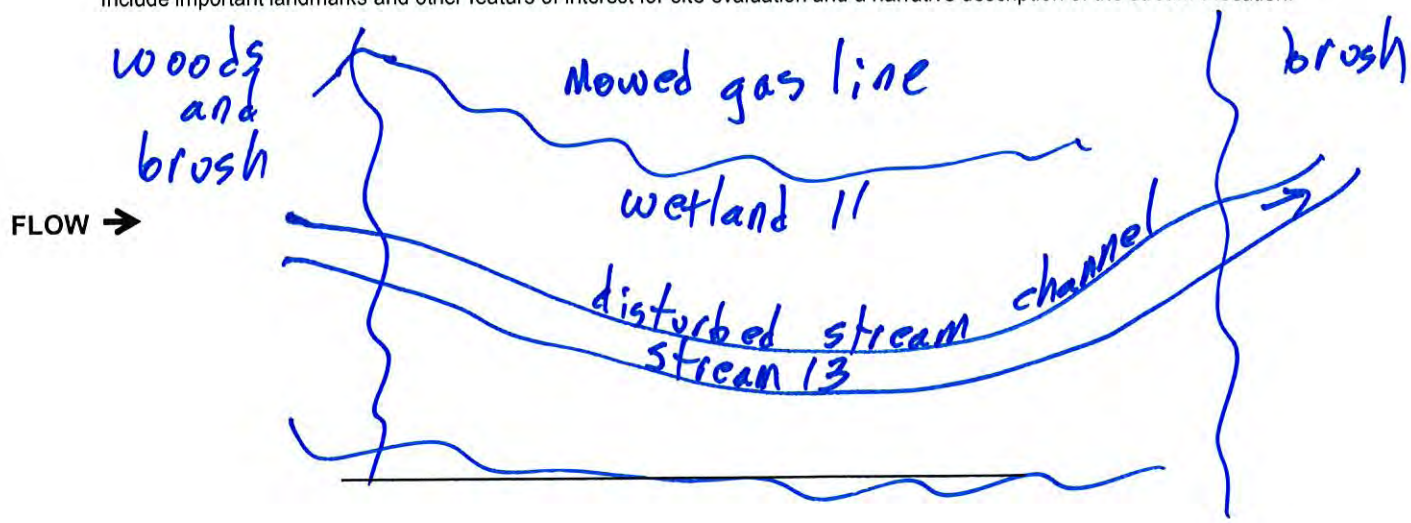
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 38

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 14 RIVER BASIN Tuscarawas Drainage Area (mi^2) 0.76

Length of Stream Reach (200 ft Lat. 40.30923 Long. -81.40011 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	10%
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	25%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	31%
☐	GRAVEL (2-64 mm) **[9 pts]**	18%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	16%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 0% (A)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

8

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 18

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.3

Bankfull Width Max=30

5

This information must also be completed.

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

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☑	Narrow < 5 m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 14

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 70% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

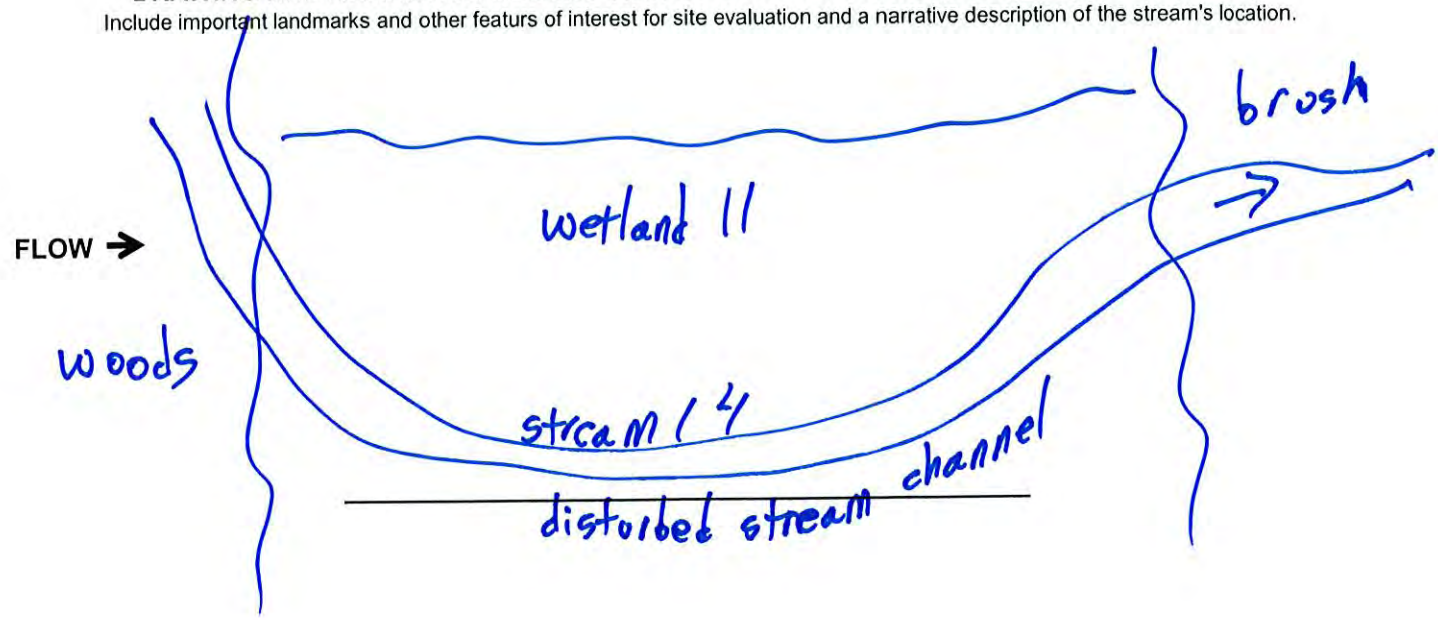
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs 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): 64

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 15 RIVER BASIN Tuscarawas Drainage Area (mi^2)

Length of Stream Reach (200 ft Lat. 40.31019 Long. -81.39469 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	9%
☐	BOULDER (>256 mm) **[16 pts]**		☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	6%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**		☑	CLAY or HARDPAN **[0 pts]**	25%
☑	GRAVEL (2-64 mm) **[9 pts]**	40%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	20%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 0% (A)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

14

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☑	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 26

Pool Depth Max=30

30

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☐	≤1.0 m (≤ 3'3") **[5 pts]**	
☑	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 1.7

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 15

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 100% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.

FLOW →

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 38

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 16 RIVER BASIN Tuscarawas Drainage Area (mi^2) 0.15

Length of Stream Reach (200 ft Lat. 40.31197 Long. -81.3884 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	25%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	3%	☑	CLAY or HARDPAN **[0 pts]**	60%
☐	GRAVEL (2-64 mm) **[9 pts]**	7%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	5%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 3%

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 3

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 5

HHEI Metric Points

Substrate Max = 40

8

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 15

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.5

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☑	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 16

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

Elevated Turbidity? (Y/N): N Canopy (% open): 70% open

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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)

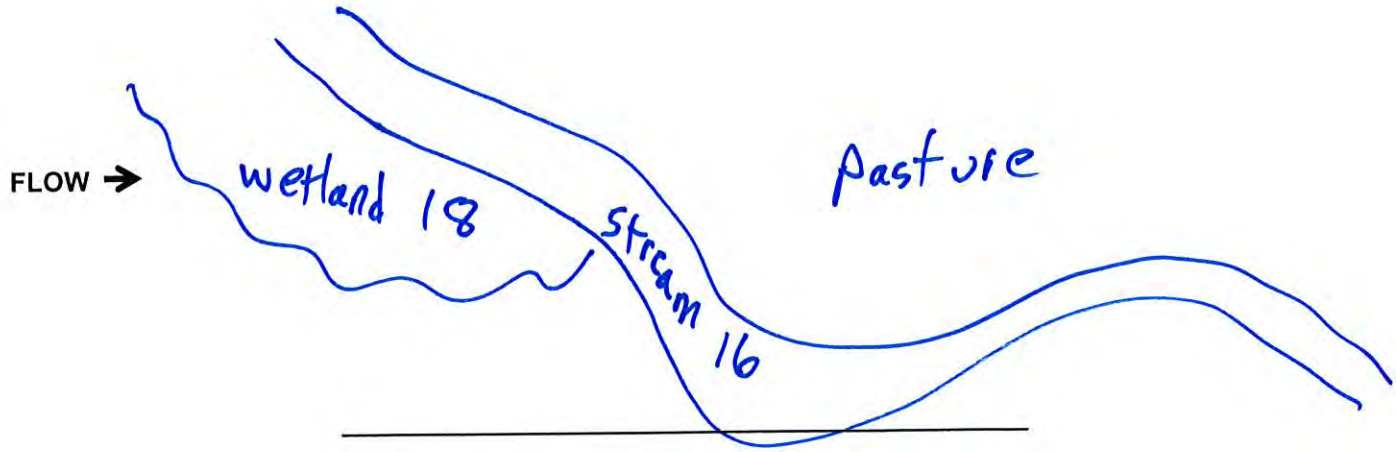
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

Frogs/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 50

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 17 RIVER BASIN Tuscarawas Drainage Area (mi^2)

Length of Stream Reach (200 ft Lat. 40.31197 Long. -81.38804 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	☐	BLDR SLABS **[16 pts]**		☐	☐	SILT **[3 pts]**	5%
☐	☐	BOULDER (>256 mm) **[16 pts]**		☐	☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	10%
☐	☐	BEDROCK **[16 pts]**		☐	☐	FINE DETRITUS **[3 pts]**	
☐	☐	COBBLE (65-256 mm) **[12 pts]**	10%	☐	☐	CLAY or HARDPAN **[0 pts]**	
☑	☐	GRAVEL (2-64 mm) **[9 pts]**	55%	☐	☐	MUCK **[0 pts]**	
☐	☑	SAND (<2 mm) **[6 pts]**	20%	☐	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 10%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 15

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

20

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):

☐	>30 centimeters **[20 pts]**		☐	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☑	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 18

Pool Depth Max=30

25

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.9

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.

L	R	RIPARIAN WIDTH (Per Bank)	L	R	(FLOODPLAIN QUALITY) (Most Predominant per Bank)	L	R	
☐	☐	Wide > 10 m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5 - 10 m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow < 5 m	☑	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☑	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS:

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 200 ft (61 m) 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)

Location / Stream Name: Stream 17

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: Watson Creek Distance from Evaluated Stream <1 Mile

☐ 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 Quad Name: Gnadenhutten NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____

County: Tuscarawas Township/City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N) N Date of Last Precipitation: 15-Dec-11 Quantity: _____

Photograph Information: See Attached

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

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

Field Measures: Temp (C) _____ Dissolved Oxygen (mg/l) _____ pH(S.U.) _____ Conductivity(pmhos/cm) _____

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

Additional comments/description pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N) N (If yes, Record all osbervations. 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/Tadpoles Observed? _____ 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 featurs of interest for site evaluation and a narrative description of the stream's location.

FLOW →

minor bank erosion

stream 17 →

Mowed gas line

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3): 28

SITE NAME / LOC. 12-Mile Guernsey to Lewis, Tuscarawas and Harrison Counties, Ohio

SITE NUMBER Stream 18 RIVER BASIN Tuscarawas Drainage Area (mi^2) <0.1

Length of Stream Reach (200 ft Lat. 40.31247 Long. -81.38813 RIVER MILE

DATE 12/15/2011 SCORER TCrandall Bschuplin 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
☐	BLDR SLABS **[16 pts]**		☐	SILT **[3 pts]**	
☐	BOULDER (>256 mm) **[16 pts]**		☑	LEAF PACK/WOODY DEBRIS **[3 pts]**	25%
☐	BEDROCK **[16 pts]**		☐	FINE DETRITUS **[3 pts]**	
☐	COBBLE (65-256 mm) **[12 pts]**	15%	☑	CLAY or HARDPAN **[0 pts]**	35%
☐	GRAVEL (2-64 mm) **[9 pts]**	15%	☐	MUCK **[0 pts]**	
☐	SAND (<2 mm) **[6 pts]**	10%	☐	ARTIFICIAL **[3pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock = 15%

(A) **SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:** 3

(B) **TOTAL NUMBER OF SUBSTRATE TYPES:** 5

HHEI Metric Points

Substrate Max = 40

8

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):

☐	>30 centimeters **[20 pts]**		☑	>5 cm - 10 cm **[15 pts]**	
☐	>22.5 - 30 cm **[30 pts]**		☐	≤5 cm **[5 pts]**	
☐	>10 - 22.5 cm **[25 pts]**		☐	NO WATER/MOIST CHANNEL **[0 pts]**	

COMMENTS:

MAXIMUM POOL DEPTH (centimeters) 10

Pool Depth Max=30

15

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

☐	>4.0 meters (13') **[30 pts]**		☐	>1.0 m - 1.5 m (>3'3"-4'8") **[15 pts]**	
☐	>3.0-4.0 m (>9' 7"-13') **[25 pts]**		☑	≤1.0 m (≤ 3'3") **[5 pts]**	
☐	>1.5-3.0 m (>9' 7"-4' 8") **[20 pts]**				

COMMENTS:

AVERAGE BANKFULL WIDTH (meters) 0.5

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.

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COMMENTS:

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