

***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Walker Ditch 2.2
Stream Segment Location: At French Creek Road
QHEI Score: 23.5 HHEI Score: 61

FIELD NOTES: 21 AUG 2002

This section of Walker Ditch is located on the north side of French Creek Road to the west of I-90. The ditch is maintained and of poor quality. It flows via culvert under I-90 and just westward before continuing to the north. The channel is overgrown with cattails and purple loosestrife. The west bank is dominated by a shrub community with green ash saplings, along with silky and gray-stemmed dogwood. The east bank has an old-field community dominated by Canada goldenrod, and teasel. The stream depth was 25 cm and the width was 20'. Industrial development is located on the west side of the ditch approximately 400' from French Creek Road. There is a potential for restoration although the close proximity to I-90 and industrial development may make restoration impractical.

PHOTOS:



1) Walker Ditch 2.2 – Facing downstream from overpass



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 23.5

River Code: RM: 2.2 Stream: WALKER DITCH
 Date: 8-21-82 Location: AT FRENCH CREEK ROAD
 Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1] SUBSTRATE (Check ONLY Two SubstrateTYPE BOXES; Estimate % present)

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY	
<input type="checkbox"/> -BLDR /SLBS[10] _____	<input type="checkbox"/> -GRAVEL [7] _____	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)	Substrate <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">0</div> Max 20
<input type="checkbox"/> -BOULDER [9] _____	<input type="checkbox"/> -SAND [6] _____	<input type="checkbox"/> -LIMESTONE [1] _____	SILT:	<input checked="" type="checkbox"/> -SILT HEAVY [-2]	
<input type="checkbox"/> -COBBLE [8] _____	<input type="checkbox"/> -BEDROCK[5] _____	<input type="checkbox"/> -TILLS [1] _____		<input type="checkbox"/> -SILT MODERATE [-1]	
<input type="checkbox"/> -HARDPAN [4] _____	<input type="checkbox"/> -DETRITUS[3] <u>20</u> <u>70</u>	<input checked="" type="checkbox"/> -WETLANDS[0]		<input type="checkbox"/> -SILT NORMAL [0]	
<input checked="" type="checkbox"/> -MUCK [2] <u>40</u> <u>40</u>	<input type="checkbox"/> -ARTIFICIAL[0] _____	<input type="checkbox"/> -HARDPAN [0] _____		<input type="checkbox"/> -SILT FREE [1] _____	
<input type="checkbox"/> -SILT [2] <u>40</u> <u>40</u>	NOTE: Ignore Sludge Originating From Point Sources	<input type="checkbox"/> -SANDSTONE [0] EMBEDDED		<input checked="" type="checkbox"/> -EXTENSIVE [-2]	
NUMBER OF SUBSTRATE TYPES: (High Quality Only, Score 5 or >)		<input type="checkbox"/> -4 or More [2]	<input type="checkbox"/> -RIP/RAP [0] NESS:	<input type="checkbox"/> -MODERATE [-1]	
		<input checked="" type="checkbox"/> -3 or Less [0]	<input type="checkbox"/> -LACUSTRINE [0]	<input type="checkbox"/> -NORMAL [0]	
COMMENTS		<input type="checkbox"/> -SHALE [-1]	<input type="checkbox"/> -COAL FINES [-2]	<input type="checkbox"/> -NONE [1]	

2] INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions)

(Structure)	TYPE: Score All That Occur	AMOUNT: (Check ONLY One or check 2 and AVERAGE)	Cover <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">5</div> Max 20
<u>0</u> UNDERCUT BANKS [1]	<u>0</u> POOLS > 70 cm [2]	<input type="checkbox"/> - EXTENSIVE > 75% [11]	
<u>1</u> OVERHANGING VEGETATION [1]	<u>0</u> ROOTWADS [1]	<input type="checkbox"/> - MODERATE 25-75% [7]	
<u>2</u> SHALLOWS (IN SLOW WATER) [1]	<u>0</u> BOULDERS [1]	<input type="checkbox"/> - SPARSE 5-25% [3]	
<u>0</u> ROOTMATS [1]	COMMENTS: _____	<input type="checkbox"/> - NEARLY ABSENT < 5%[1]	

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER	Channel <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">4</div> Max 20
<input type="checkbox"/> - HIGH [4]	<input type="checkbox"/> - EXCELLENT [7]	<input type="checkbox"/> - NONE [6]	<input type="checkbox"/> - HIGH [3]	<input type="checkbox"/> - SNAGGING <input type="checkbox"/> - IMPOUND.	
<input type="checkbox"/> - MODERATE [3]	<input type="checkbox"/> - GOOD [5]	<input type="checkbox"/> - RECOVERED [4]	<input type="checkbox"/> - MODERATE [2]	<input checked="" type="checkbox"/> - RELOCATION <input type="checkbox"/> - ISLANDS	
<input type="checkbox"/> - LOW [2]	<input type="checkbox"/> - FAIR [3]	<input type="checkbox"/> - RECOVERING [3]	<input checked="" type="checkbox"/> - LOW [1]	<input type="checkbox"/> - CANOPY REMOVAL <input type="checkbox"/> - LEVEED	
<input checked="" type="checkbox"/> - NONE [1]	<input checked="" type="checkbox"/> - POOR [1]	<input checked="" type="checkbox"/> - RECENT OR NO RECOVERY [1]		<input type="checkbox"/> - DREDGING <input checked="" type="checkbox"/> - BANK SHAPING	
				<input type="checkbox"/> - ONE SIDE CHANNEL MODIFICATIONS	

4] RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) River Right Looking Downstream

RIPARIAN WIDTH	FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN)	BANK EROSION	Riparian <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">7.5</div> Max 10
L R (Per Bank)	L R (Most Predominant Per Bank)	L R	
<input checked="" type="checkbox"/> - WIDE > 50m [4]	<input type="checkbox"/> - FOREST, SWAMP [3]	<input type="checkbox"/> - CONSERVATION TILLAGE [1]	
<input type="checkbox"/> - MODERATE 10-50m [3]	<input checked="" type="checkbox"/> - SHRUB OR OLD FIELD [2]	<input checked="" type="checkbox"/> - URBAN OR INDUSTRIAL [0]	
<input type="checkbox"/> - NARROW 5-10 m [2]	<input type="checkbox"/> - RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> - OPEN PASTURE, ROWCROP [0]	
<input checked="" type="checkbox"/> - VERY NARROW <5 m[1]	<input type="checkbox"/> - FENCED PASTURE [1]	<input type="checkbox"/> - MINING/CONSTRUCTION [0]	
<input type="checkbox"/> - NONE [0]			

COMMENTS: _____

5.] POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH	MORPHOLOGY	CURRENT VELOCITY (POOLS & RIFFLES!)	Pool/Current <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">1</div> Max 12
(Check 1 ONLY!)	(Check 1 or 2 & AVERAGE)	(Check All That Apply)	
<input type="checkbox"/> - >1m [6]	<input type="checkbox"/> - POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> - EDDIES[1] <input type="checkbox"/> - TORRENTIAL[-1]	
<input type="checkbox"/> - 0.7-1m [4]	<input checked="" type="checkbox"/> - POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> - FAST[1] <input type="checkbox"/> - INTERSTITIAL[-1]	
<input type="checkbox"/> - 0.4-0.7m [2]	<input type="checkbox"/> - POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> - MODERATE [1] <input checked="" type="checkbox"/> - INTERMITTENT[-2]	
<input checked="" type="checkbox"/> - 0.2- 0.4m [1]		<input checked="" type="checkbox"/> - SLOW [1] <input type="checkbox"/> - VERY FAST[1]	
<input type="checkbox"/> - < 0.2m [POOL=0]	COMMENTS: _____		

CHECK ONE OR CHECK 2 AND AVERAGE

RIFFLE DEPTH	RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	Riffle/Run <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">0</div> Max 8 Gradient <div style="border: 1px solid black; width: 40px; height: 40px; text-align: center; margin: 0 auto;">6</div> Max 10
<input type="checkbox"/> - Best Areas >10 cm [2]	<input type="checkbox"/> - MAX > 50 [2]	<input type="checkbox"/> - STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> - NONE [2]	
<input type="checkbox"/> - Best Areas 5-10 cm[1]	<input type="checkbox"/> - MAX < 50[1]	<input type="checkbox"/> - MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> - LOW [1]	
<input type="checkbox"/> - Best Areas < 5 cm [RIFFLE=0]		<input type="checkbox"/> - UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> - MODERATE [0]	
COMMENTS: _____		<input checked="" type="checkbox"/> - NO RIFFLE [Metric=0]	<input type="checkbox"/> - EXTENSIVE [-1]	

6] GRADIENT (ft/mi): 8.3 DRAINAGE AREA (sq.mi.): 0.7

% POOL: <input type="text"/>	% GLIDE: <input type="text" value="100%"/>
% RIFFLE: <input type="text"/>	% RUN: <input type="text"/>

Is Sampling Reach Representative of the Stream (Y/N) ___ If Not, Explain:

Subjective Rating (1-10)

Aesthetic Rating (1-10)

Gradient:

- Low, - Moderate, - High

Gear: _____ Distance: _____ Water Clarity: _____ Water Stage: _____ Canopy -% Open _____

First Sampling Pass _____

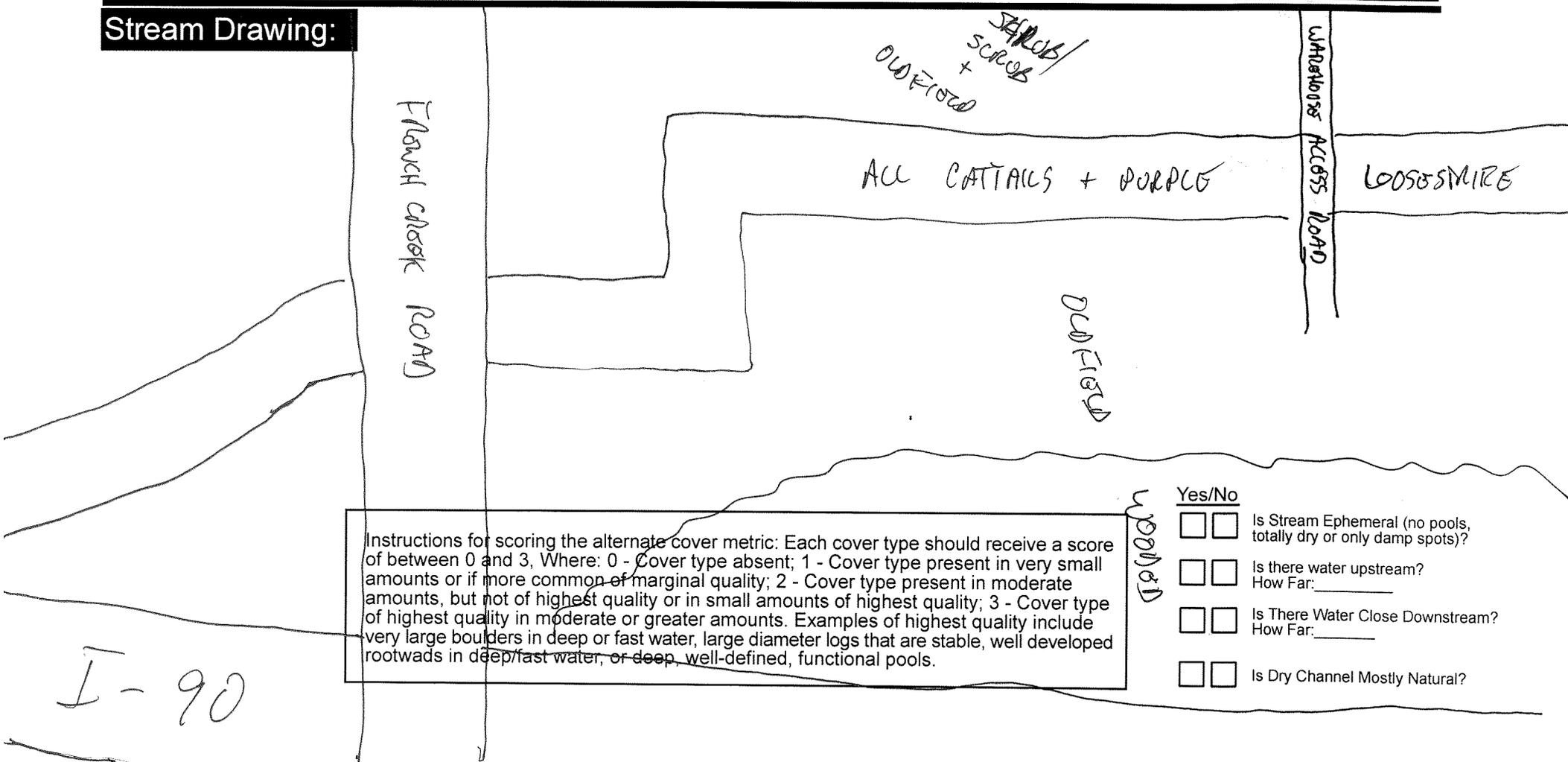
Stream Measurements:									
Average Width	Average Depth	Maximum Depth	Average Bankfull Width	Bankfull Mean Depth	W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrenchment Ratio	

Major Suspected Sources of Impacts (Check All That Apply):

- None
- Industrial
- WWTP
- Ag
- Livestock
- Silviculture
- Construction
- Urban Runoff
- CSOs
- Suburban Impacts
- Mining
- Channelization
- Riparian Removal
- Landfills
- Natural Dams
- Other Flow Alteration
- Other: _____

INDUSTRIAL FACILITY AND ACCESS ROAD

Stream Drawing:



Instructions for scoring the alternate cover metric: Each cover type should receive a score of between 0 and 3, Where: 0 - Cover type absent; 1 - Cover type present in very small amounts or if more common of marginal quality; 2 - Cover type present in moderate amounts, but not of highest quality or in small amounts of highest quality; 3 - Cover type of highest quality in moderate or greater amounts. Examples of highest quality include very large boulders in deep or fast water, large diameter logs that are stable, well developed rootwads in deep/fast water, or deep, well-defined, functional pools.

Yes/No

Is Stream Ephemeral (no pools, totally dry or only damp spots)?

Is there water upstream? How Far: _____

Is There Water Close Downstream? How Far: _____

Is Dry Channel Mostly Natural?

I-90



Primary Headwater Habitat Evaluation Form

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

61

SITE NAME/LOCATION WALKER DITCH AT EDENCHA CREEK ROAD
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 0.7
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 2.2
 DATE 8-21-02 SCORER JAY MILLER COMMENTS MAINTAINED DITCH

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<u>40</u>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<u>20</u>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> <input checked="" type="checkbox"/> MUCK [0 pts]	<u>40</u>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	_____

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

(A)

3

(B)

3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40

6

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30

30

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

25

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

Bankfull Width Max=30

25

COMMENTS 3.6, 3.3, 3.9

AVERAGE BANKFULL WIDTH (meters)

3.6

This information must also be completed

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

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

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

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

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

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score 23.5 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: FRENCH CREEK Distance from Evaluated Stream 2.2 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 Quadrangle Name: AVON, OH NRCS Soil Map Page: 7 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: SHEFFIELD

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 19 AUG 02 Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): Y Canopy (% open): 100
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: RUNOFF FROM I-90, INDUSTRIAL DEVELOPMENT IN AREA

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____
Comments Regarding Biology: STRAIGHT, SLOW TO STAGNANT FLOWING VEGETATED DITCH

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

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

FLOW → SEE QHEI SHEET

***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Walker Ditch 3.3

Stream Segment Location: At Reserve Way

QHEI Score: 31.5

HHEI Score: 52

FIELD NOTES:

This portion of Walker Ditch is located in a residential subdivision (Reserve Way). A shrub/forested buffer 10-15' wide separates the ditch from the adjoining residential lawns. Dominant species in the buffer include: staghorn sumac, gray-stemmed dogwood, swamp white oak, boxelder, and riverbank grape. The channel is mostly un-vegetated, although spotted touch-me-not, cattails and rice cutgrass were noted. The substrate is mostly hardpan with some silt. Water depth was generally 5-10 cm deep with slow flow. No restoration opportunities were noted.

PHOTOS:



1) Walker Ditch 3.3 – Facing North from Reserve Way



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 31.5

River Code: RM: 3.3 Stream: WALKER DITCH
 Date: 8-27-02 Location: AT RESERVE WAY
 Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1) SUBSTRATE (Check ONLY Two SubstrateTYPE BOXES; Estimate % present)

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY
<input type="checkbox"/> -BLDR /SLBS[10] _____	<input type="checkbox"/> -GRAVEL [7] <u>20</u>	<u>20</u>	Check ONE (OR 2 & AVERAGE)	Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> -BOULDER [9] _____	<input type="checkbox"/> -SAND [6] _____	_____	<input type="checkbox"/> -LIMESTONE [1] SILT:	<input checked="" type="checkbox"/> -SILT HEAVY [-2]
<input type="checkbox"/> -COBBLE [8] <u>5</u> <u>5</u>	<input type="checkbox"/> -BEDROCK[5] _____	_____	<input checked="" type="checkbox"/> -TILLS [1]	<input type="checkbox"/> -SILT MODERATE [-1]
<input checked="" type="checkbox"/> -HARDPAN [4] <u>30</u> <u>30</u>	<input type="checkbox"/> -DETRITUS[3] _____	_____	<input type="checkbox"/> -WETLANDS[0]	<input type="checkbox"/> -SILT NORMAL [0]
<input type="checkbox"/> -MUCK [2] _____	<input type="checkbox"/> -ARTIFICIAL[0] _____	_____	<input checked="" type="checkbox"/> -HARDPAN [0]	<input type="checkbox"/> -SILT FREE [1]
<input checked="" type="checkbox"/> -SILT [2] <u>45</u> <u>45</u>	NOTE: Ignore Sludge Originating From Point Sources	_____	<input type="checkbox"/> -SANDSTONE [0] EMBEDDED	<input checked="" type="checkbox"/> -EXTENSIVE [-2]
			<input type="checkbox"/> -RIP/RAP [0] NESS:	<input type="checkbox"/> -MODERATE [-1]
			<input type="checkbox"/> -LACUSTRINE [0]	<input type="checkbox"/> -NORMAL [0]
			<input type="checkbox"/> -SHALE [-1]	<input type="checkbox"/> -NONE [1]
			<input type="checkbox"/> -COAL FINES [-2]	

Substrate
2.5
Max 20

NUMBER OF SUBSTRATE TYPES: 4 or More [2]
 (High Quality Only, Score 5 or >) 3 or Less [0]

COMMENTS: _____

2) INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions)
 (Structure) TYPE: Score All That Occur

TYPE	AMOUNT: (Check ONLY One or check 2 and AVERAGE)
<u>0</u> UNDERCUT BANKS [1]	<input type="checkbox"/> - EXTENSIVE > 75% [11]
<u>2</u> OVERHANGING VEGETATION [1]	<input type="checkbox"/> - MODERATE 25-75% [7]
<u>2</u> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> - SPARSE 5-25% [3]
<u>0</u> ROOTMATS [1]	<input type="checkbox"/> - NEARLY ABSENT < 5%[1]
<u>0</u> POOLS> 70 cm [2]	
<u>0</u> ROOTWADS [1]	
<u>0</u> BOULDERS [1]	
<u>0</u> OXBOWS, BACKWATERS [1]	
<u>2</u> AQUATIC MACROPHYTES [1]	
<u>1</u> LOGS OR WOODY DEBRIS [1]	

Cover
7
Max 20

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
<input type="checkbox"/> - HIGH [4]	<input type="checkbox"/> - EXCELLENT [7]	<input type="checkbox"/> - NONE [6]	<input type="checkbox"/> - HIGH [3]	<input type="checkbox"/> - SNAGGING <input type="checkbox"/> - IMPOUND.
<input type="checkbox"/> - MODERATE [3]	<input type="checkbox"/> - GOOD [5]	<input type="checkbox"/> - RECOVERED [4]	<input type="checkbox"/> - MODERATE [2]	<input checked="" type="checkbox"/> - RELOCATION <input type="checkbox"/> - ISLANDS
<input checked="" type="checkbox"/> - LOW [2]	<input type="checkbox"/> - FAIR [3]	<input checked="" type="checkbox"/> - RECOVERING [3]	<input checked="" type="checkbox"/> - LOW [1]	<input type="checkbox"/> - CANOPY REMOVAL <input type="checkbox"/> - LEVEED
<input type="checkbox"/> - NONE [1]	<input checked="" type="checkbox"/> - POOR [1]	<input type="checkbox"/> - RECENT OR NO RECOVERY [1]	<input type="checkbox"/> - DREDGING <input type="checkbox"/> - BANK SHAPING	<input type="checkbox"/> - ONE SIDE CHANNEL MODIFICATIONS

Channel
7
Max 20

COMMENTS: _____

4) RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) River Right Looking Downstream

RIPARIAN WIDTH		FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN)		BANK EROSION	
L R (Per Bank)	L R (Most Predominant Per Bank)	L R	L R	L R (Per Bank)	Riparian
<input type="checkbox"/> - WIDE > 50m [4]	<input type="checkbox"/> - FOREST, SWAMP [3]	<input type="checkbox"/> - CONSERVATION TILLAGE [1]	<input type="checkbox"/> - URBAN OR INDUSTRIAL [0]	<input type="checkbox"/> - NONE/LITTLE [3]	4 Max 10
<input type="checkbox"/> - MODERATE 10-50m [3]	<input type="checkbox"/> - SHRUB OR OLD FIELD [2]	<input type="checkbox"/> - OPEN PASTURE, ROWCROP [0]	<input type="checkbox"/> - MINING/CONSTRUCTION [0]	<input checked="" type="checkbox"/> - MODERATE [2]	
<input type="checkbox"/> - NARROW 5-10 m [2]	<input checked="" type="checkbox"/> - RESIDENTIAL, PARK, NEW FIELD [1]			<input type="checkbox"/> - HEAVY/SEVERE [1]	
<input checked="" type="checkbox"/> - VERY NARROW <5 m [1]	<input type="checkbox"/> - FENCED PASTURE [1]				
<input type="checkbox"/> - NONE [0]					

COMMENTS: _____

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH	MORPHOLOGY	CURRENT VELOCITY [POOLS & RIFFLES!]
(Check 1 ONLY!)	(Check 1 or 2 & AVERAGE)	(Check All That Apply)
<input type="checkbox"/> - >1m [6]	<input type="checkbox"/> - POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> - EDDIES[1] <input type="checkbox"/> - TORRENTIAL[-1]
<input type="checkbox"/> - 0.7-1m [4]	<input type="checkbox"/> - POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> - FAST[1] <input type="checkbox"/> - INTERSTITIAL[-1]
<input type="checkbox"/> - 0.4-0.7m [2]	<input checked="" type="checkbox"/> - POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> - MODERATE [1] <input type="checkbox"/> - INTERMITTENT[-2]
<input type="checkbox"/> - 0.2- 0.4m [1]		<input checked="" type="checkbox"/> - SLOW [1] <input type="checkbox"/> - VERY FAST[1]
<input checked="" type="checkbox"/> - < 0.2m [POOL=0]		

Pool/Current
1
Max 12

COMMENTS: _____

CHECK ONE OR CHECK 2 AND AVERAGE

RIFFLE DEPTH	RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input type="checkbox"/> - Best Areas >10 cm [2]	<input type="checkbox"/> - MAX > 50 [2]	<input type="checkbox"/> - STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> - NONE [2]
<input type="checkbox"/> - Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> - MAX < 50 [1]	<input type="checkbox"/> - MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> - LOW [1]
<input checked="" type="checkbox"/> - Best Areas < 5 cm [RIFFLE=0]		<input checked="" type="checkbox"/> - UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> - MODERATE [0]
			<input checked="" type="checkbox"/> - EXTENSIVE [-1]
		<input type="checkbox"/> - NO RIFFLE [Metric=0]	

Riffle/Run
0
Max 8
Gradient
10
Max 10

COMMENTS: _____

6) GRADIENT (ft/mi): 17.4 DRAINAGE AREA (sq. mi.): 0.2
 %POOL: 30 %GLIDE: 40
 %RIFFLE: 20 %RUN: 10

** Best areas must be large enough to support a population of riffle-obligate species

Is Sampling Reach Representative of the Stream (Y/N)___ If Not, Explain:

- Major Suspected Sources of Impacts (Check All That Apply):
- None
 - Industrial
 - WWTP
 - Ag
 - Livestock
 - Silviculture
 - Construction
 - Urban Runoff
 - CSOs
 - Suburban Impacts
 - Mining
 - Channelization
 - Riparian Removal
 - Landfills
 - Natural
 - Dams
 - Other Flow Alteration
 - Other: _____

	Gear:	Distance:	Water Clarity:	Water Stage:	Canopy -% Open
First Sampling Pass					

		Stream Measurements:									
Subjective Rating (1-10)	Aesthetic Rating (1-10)	Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrench. Width Ratio	
<input type="checkbox"/> - Low, <input type="checkbox"/> - Moderate, <input type="checkbox"/> -High Gradient:	<input type="checkbox"/> - Low, <input type="checkbox"/> - Moderate, <input type="checkbox"/> -High										

Stream Drawing:

SEE THE FORM

Instructions for scoring the alternate cover metric: Each cover type should receive a score of between 0 and 3, Where: 0 - Cover type absent; 1 - Cover type present in very small amounts or if more common of marginal quality; 2 - Cover type present in moderate amounts, but not of highest quality or in small amounts of highest quality; 3 - Cover type of highest quality in moderate or greater amounts. Examples of highest quality include very large boulders in deep or fast water, large diameter logs that are stable, well developed rootwads in deep/fast water, or deep, well-defined, functional pools.

- Yes/No
- Is Stream Ephemeral (no pools, totally dry or only damp spots)?
 - Is there water upstream? How Far: _____
 - Is There Water Close Downstream? How Far: _____
 - Is Dry Channel Mostly Natural?



Primary Headwater Habitat Evaluation Form

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

52

SITE NAME/LOCATION WALKER DITCH AT RESERVE WAY
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 0.2
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 3.3
 DATE 8-22-02 SCORER JAY MILLER COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>45</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>20</u>	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 3 (B) 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: _____ TOTAL NUMBER OF SUBSTRATE TYPES: _____

HHEI Metric Points

Substrate Max = 40

7

A + B

Pool Depth Max = 30

25

Bankfull Width Max=30

20

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS VERY NARROW, SLOW MOVING CHANNEL MAXIMUM POOL DEPTH (centimeters): 12cm

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 2.3

This information must also be completed

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

RIPARIAN WIDTH		FLOODPLAIN QUALITY			
L	R	L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide >10m		Mature Forest, Wetland		Conservation Tillage	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field		Urban or Industrial	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow <5m		Residential, Park, New Field		Open Pasture, Row Crop	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture		Mining or Construction	

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):
 Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)
 Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)
 COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
 None 1.0 2.0 3.0
 0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score 31.5 (If Yes, Attach Completed QHEI Form)

DOWNSIDE DESIGNATED USE(S)
 WWH Name: FRENCH CREEK Distance from Evaluated Stream 3.3 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 Quadrangle Name: AVON, OH NRCS Soil Map Page: 12 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: SHEFFIELD

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 8/19 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 25%

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

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

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

Additional comments/description of pollution impacts: COLLECTED UNDER ROAD, RUNS THROUGH NEW RESIDENTIAL DEVELOPMENT

BIOTIC EVALUATION

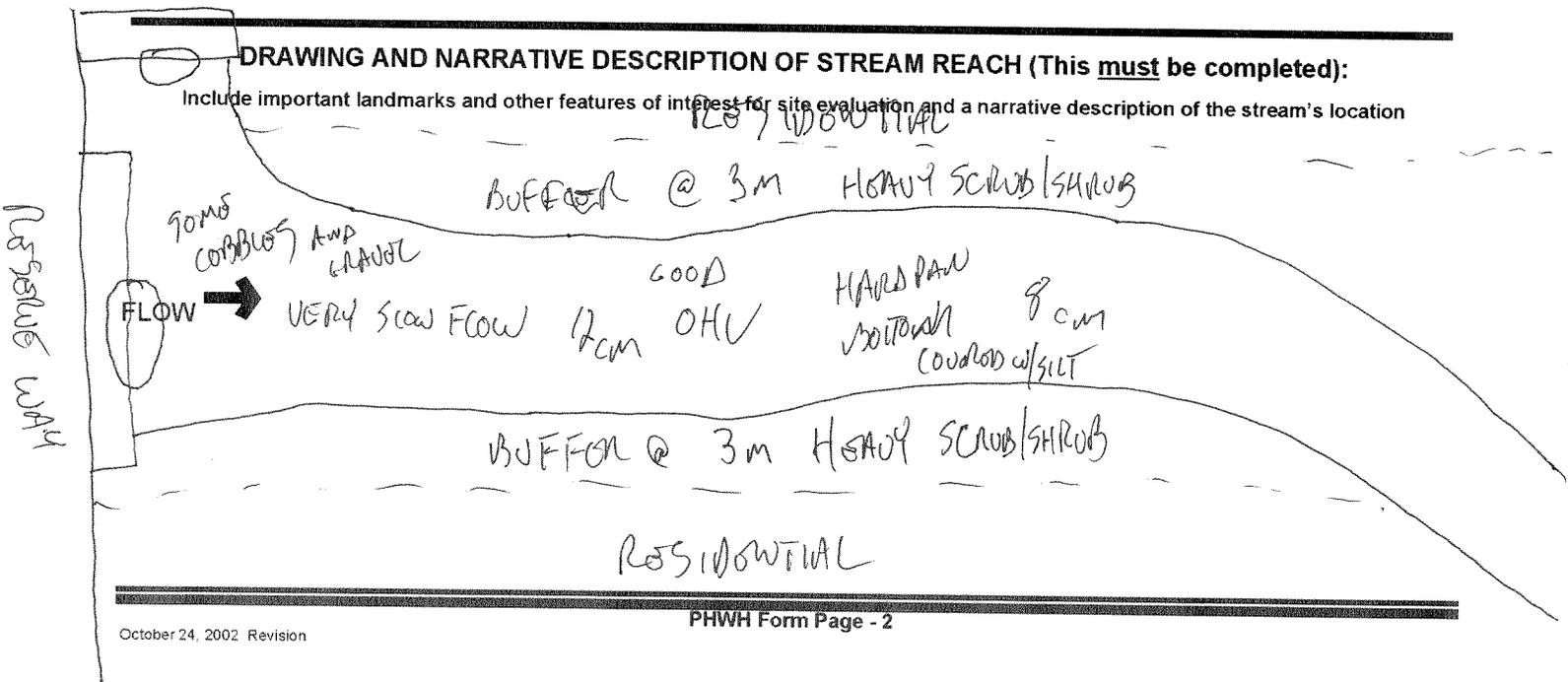
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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

Comments Regarding Biology: SOME FROGS NOTED ALONG BANKS

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

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



***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Walker Ditch 3.45
Stream Segment Location: End – at Reserve Way by Pond
QHEI Score: 29.5 HHEI Score: 73

FIELD NOTES: 22 AUG 2002

This site is located on the west side of Reserve Way, a residential subdivision. It encompasses the headwaters of Walker Ditch. The creek is 10' wide, 25 cm. deep with very little flow. A tree line (American elm, green ash, crab apple, black cherry) buffers the north bank (20' wide) from the maintained lawns. The south bank is maintained lawn between the ditch and an adjacent retention pond. The sediment is dominated by silt and sand with obvious signs of pollution (oily film). Portions of the channel contain cattails. The ditch appears to be intermittently maintained. Input from storm sewers and outflow from the pond provide hydrological inputs. The ditch has been piped to the west. No opportunities for restoration were noted.

PHOTOS:



1) Walker Ditch 3.45 – Retention Pond and Walker Ditch west



2) Walker Ditch 3.45 – Retention Pond and Walker Ditch west



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **29.5**

River Code: RM: 3.45 Stream: WALKER DITCH
 Date: 8-22-03 Location: AT END - RESERVE WAY
 Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1) SUBSTRATE (Check ONLY Two SubstrateTYPE BOXES; Estimate % present)

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY
<input type="checkbox"/> -BLDR /SLBS[10]	<input type="checkbox"/> -GRAVEL [7] <u>20</u> <u>20</u>	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> -BOULDER [9]	<input checked="" type="checkbox"/> -SAND [6] <u>30</u> <u>30</u>	<input type="checkbox"/> -LIMESTONE [1]	SILT:	<input checked="" type="checkbox"/> -SILT HEAVY [-2]
<input type="checkbox"/> -COBBLE [8] <u>10</u> <u>10</u>	<input type="checkbox"/> -BEDROCK[5]	<input checked="" type="checkbox"/> -TILLS [1]	<input type="checkbox"/> -WETLANDS[0]	<input type="checkbox"/> -SILT MODERATE [-1]
<input type="checkbox"/> -HARDPAN [4]	<input type="checkbox"/> -DETRITUS[3]	<input type="checkbox"/> -WETLANDS[0]	<input type="checkbox"/> -HARDPAN [0]	<input type="checkbox"/> -SILT NORMAL [0]
<input type="checkbox"/> -MUCK [2]	<input type="checkbox"/> -ARTIFICIAL[0]	<input type="checkbox"/> -SANDSTONE [0] EMBEDDED	<input type="checkbox"/> -RIP/RAP [0] NESS:	<input type="checkbox"/> -SILT FREE [1]
<input checked="" type="checkbox"/> -SILT [2] <u>40</u> <u>40</u>	NOTE: Ignore Sludge Originating From Point Sources	<input type="checkbox"/> -LACUSTRINE [0]	<input type="checkbox"/> -SHALE [-1]	<input checked="" type="checkbox"/> -EXTENSIVE [-2]
		<input type="checkbox"/> -COAL FINES [-2]	<input type="checkbox"/> -MODERATE [-1]	<input type="checkbox"/> -NORMAL [0]
			<input type="checkbox"/> -NONE [1]	

NUMBER OF SUBSTRATE TYPES: 4 or More [2] 3 or Less [0]
 (High Quality Only, Score 5 or >)

COMMENTS: _____

2) INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions) AMOUNT: (Check ONLY One or check 2 and AVERAGE)

TYPE: Score All That Occur	AMOUNT:
<u>0</u> UNDERCUT BANKS [1]	<input type="checkbox"/> - EXTENSIVE > 75% [11]
<u>1</u> OVERHANGING VEGETATION [1]	<input type="checkbox"/> - MODERATE 25-75% [7]
<u>2</u> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> - SPARSE 5-25% [3]
<u>0</u> ROOTMATS [1]	<input type="checkbox"/> - NEARLY ABSENT < 5%[1]
<u>0</u> POOLS > 70 cm [2]	
<u>0</u> ROOTWADS [1]	
<u>0</u> BOULDERS [1]	
<u>0</u> OXBOWS, BACKWATERS [1]	
<u>2</u> AQUATIC MACROPHYTES [1]	
<u>0</u> LOGS OR WOODY DEBRIS [1]	

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
<input type="checkbox"/> - HIGH [4]	<input type="checkbox"/> - EXCELLENT [7]	<input type="checkbox"/> - NONE [6]	<input type="checkbox"/> - HIGH [3]	<input type="checkbox"/> - SNAGGING
<input type="checkbox"/> - MODERATE [3]	<input type="checkbox"/> - GOOD [5]	<input type="checkbox"/> - RECOVERED [4]	<input type="checkbox"/> - MODERATE [2]	<input type="checkbox"/> - IMPOUND.
<input type="checkbox"/> - LOW [2]	<input type="checkbox"/> - FAIR [3]	<input type="checkbox"/> - RECOVERING [3]	<input checked="" type="checkbox"/> - LOW [1]	<input checked="" type="checkbox"/> - RELOCATION
<input checked="" type="checkbox"/> - NONE [1]	<input checked="" type="checkbox"/> - POOR [1]	<input checked="" type="checkbox"/> - RECENT OR NO RECOVERY [1]	<input checked="" type="checkbox"/> - CANOPY REMOVAL	<input type="checkbox"/> - ISLANDS
			<input checked="" type="checkbox"/> - DREDGING	<input type="checkbox"/> - LEVEED
			<input type="checkbox"/> - ONE SIDE CHANNEL MODIFICATIONS	<input checked="" type="checkbox"/> - BANK SHAPING

COMMENTS: _____

4) RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) River Right Looking Downstream

RIPARIAN WIDTH	FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN)	BANK EROSION
L R (Per Bank)	L R (Most Predominant Per Bank)	L R (Per Bank)
<input type="checkbox"/> - WIDE > 50m [4]	<input type="checkbox"/> - FOREST, SWAMP [3]	<input type="checkbox"/> - NONE/LITTLE [3]
<input type="checkbox"/> - MODERATE 10-50m [3]	<input checked="" type="checkbox"/> - SHRUB OR OLD FIELD [2]	<input checked="" type="checkbox"/> - MODERATE [2]
<input type="checkbox"/> - NARROW 5-10 m [2]	<input checked="" type="checkbox"/> - RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> - HEAVY/SEVERE [1]
<input checked="" type="checkbox"/> - VERY NARROW < 5 m [1]	<input type="checkbox"/> - FENCED PASTURE [1]	<input type="checkbox"/> - MINING/CONSTRUCTION [0]
<input checked="" type="checkbox"/> - NONE [0]		

COMMENTS: _____

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1 ONLY!)	MORPHOLOGY (Check 1 or 2 & AVERAGE)	CURRENT VELOCITY (Check All That Apply)
<input type="checkbox"/> - >1m [6]	<input type="checkbox"/> - POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> - EDDIES[1]
<input type="checkbox"/> - 0.7-1m [4]	<input type="checkbox"/> - POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> - TORRENTIAL[-1]
<input type="checkbox"/> - 0.4-0.7m [2]	<input checked="" type="checkbox"/> - POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> - FAST[1]
<input checked="" type="checkbox"/> - 0.2- 0.4m [1]		<input type="checkbox"/> - MODERATE [1]
<input type="checkbox"/> - < 0.2m [POOL=0]		<input checked="" type="checkbox"/> - SLOW [1]
		<input type="checkbox"/> - INTERSTITIAL[-1]
		<input type="checkbox"/> - INTERMITTENT[-2]
		<input type="checkbox"/> - VERY FAST[1]

COMMENTS: _____

CHECK ONE OR CHECK 2 AND AVERAGE

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

COMMENTS: - NO RIFFLE [Metric=0]

6) GRADIENT (ft/mi): 17.4 DRAINAGE AREA (sq. mi.): 0.1
 %POOL: — %GLIDE: 100
 %RIFFLE: — %RUN: —

* Best areas must be large enough to support a population of riffle-obligate species

Is Sampling Reach Representative of the Stream (Y/N) ___ If Not, Explain:

- Major Suspected Sources of Impacts (Check All That Apply):
- None
 - Industrial
 - WWTP
 - Ag
 - Livestock
 - Silviculture
 - Construction
 - Urban Runoff
 - CSOs
 - Suburban Impacts
 - Mining
 - Channelization
 - Riparian Removal
 - Landfills
 - Natural
 - Dams
 - Other Flow Alteration
 - Other: _____

	Gear:	Distance:	Water Clarity:	Water Stage:	Canopy -% Open
First Sampling Pass	_____	_____	_____	_____	_____

Stream Measurements:									
Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Width	Entrench. Ratio

Subjective Rating (1-10) - Low, - Moderate, - High

Aesthetic Rating (1-10) - Low, - Moderate, - High

Gradient: _____

Stream Drawing:

SEE HHOT FORM

Instructions for scoring the alternate cover metric: Each cover type should receive a score of between 0 and 3, Where: 0 - Cover type absent; 1 - Cover type present in very small amounts or if more common of marginal quality; 2 - Cover type present in moderate amounts, but not of highest quality or in small amounts of highest quality; 3 - Cover type of highest quality in moderate or greater amounts. Examples of highest quality include very large boulders in deep or fast water, large diameter logs that are stable, well developed rootwads in deep/fast water, or deep, well-defined, functional pools.

- Yes/No
- Is Stream Ephemeral (no pools, totally dry or only damp spots)?
 - Is there water upstream? How Far: _____
 - Is There Water Close Downstream? How Far: _____
 - Is Dry Channel Mostly Natural?



Primary Headwater Habitat Evaluation Form

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

73

SITE NAME/LOCATION WALKER DITCH AT END - RESERVE WAY
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 0.1
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 3.45
 DATE 8-22-02 SCORER JAY MILLER COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>40</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACKWOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>10</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>20</u>	<input type="checkbox"/> MUCK [0 pts]	_____
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<u>30</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10 (A) 9 (B) 4

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

HHEI Metric Points

Substrate Max = 40

13

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 25

Pool Depth Max = 30

30

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

<input checked="" type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS _____ AVERAGE BANKFULL WIDTH (meters) 6.2

Bankfull Width Max=30

30

This information must also be completed

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

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

COMMENTS _____

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

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

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

<input type="checkbox"/> None	<input checked="" type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score 29.5 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: FRENCH CREEK Distance from Evaluated Stream 3.45 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 Quadrangle Name: AVON, OH NRCS Soil Map Page: 12 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: SHEFFIELD

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 8/19 Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 95%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

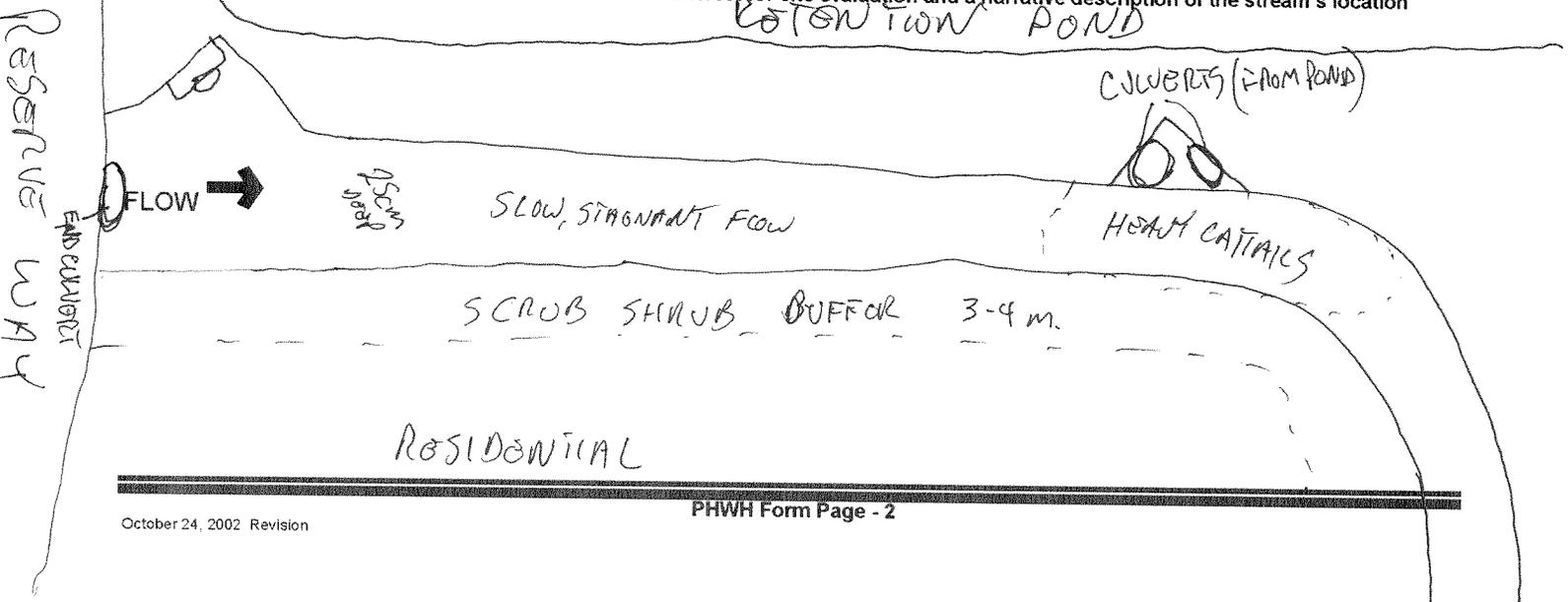
Additional comments/description of pollution impacts: ENDS IN RESIDENTIAL AREA, ADJACENT TO RETENTION POND (FOR STORM WATER + OVERLAND FLOW) - RECEIVES DISCHARGES FROM POND

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____
Comments Regarding Biology: SOME FISH, FROGS, AND AQUATIC INSECTS WERE OBSERVED IN THIS STRETCH OF THE STREAM.

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

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



KLINE DITCH NOTES

***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Kline Ditch 0.0
Stream Segment Location: Mouth of Ditch (French Creek RM 3.9)
QHEI Score: 65 HHEI Score: 58

FIELD NOTES: 21 AUG 2002

Kline Ditch enters French Creek from the south to the south of Colorado Ave. The stretch is straight, 4-5' wide and flows over a hardpan substrate, with boulders, cobbles, gravel and sand at the immediate surface. The deepest point is 21 cm, with 10' high banks on both sides. The west bank is a shrub/field (power line right-of-way) dominated by gray-stemmed dogwood, multiflora rose, ragweed, goldenrod and field bindweed. The east bank is a 50' wide shrub/sapling area dominated by orchard grass, pussy willow, reed canary grass, tartarian honeysuckle, multiflora rose, quaking aspen and silky dogwood. There is a good mix of riffles and pools. Restoration potential exists.

PHOTOS:



1) Kline Ditch 0.0 – Mouth of ditch facing upstream



2) Kline Ditch 0.0 – Facing downstream, 150' from mouth



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **65**

River Code: RM: 0.0 Stream: KLING DITCH
Date: 8-21-02 Location: MOUTH - ADRENCH CREEK
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1] SUBSTRATE (Check ONLY Two SubstrateTYPE BOXES; Estimate % present)

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY
<input type="checkbox"/> BLDR /SLBS[10]	<input checked="" type="checkbox"/> GRAVEL [7] <u>30</u> <u>30</u>	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9] <u>25</u> <u>25</u>	<input type="checkbox"/> SAND [6]	<input type="checkbox"/> LIMESTONE [1]	SILT:	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8] <u>15</u> <u>15</u>	<input type="checkbox"/> BEDROCK[5]	<input checked="" type="checkbox"/> TILLS [1]		<input type="checkbox"/> SILT MODERATE [-1]
<input checked="" type="checkbox"/> HARDPAN [4] <u>30</u> <u>30</u>	<input type="checkbox"/> DETRITUS[3]	<input type="checkbox"/> WETLANDS[0]		<input type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> ARTIFICIAL[0]	<input checked="" type="checkbox"/> HARDPAN [0]		<input checked="" type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> SILT [2]	NOTE: Ignore Sludge Originating From Point Sources	<input type="checkbox"/> SANDSTONE [0] EMBEDDED		<input type="checkbox"/> EXTENSIVE [-2]
		<input type="checkbox"/> RIP/RAP [0] NESS:		<input type="checkbox"/> MODERATE [-1]
		<input type="checkbox"/> LACUSTRINE [0]		<input type="checkbox"/> NORMAL [0]
		<input type="checkbox"/> SHALE [-1]		<input checked="" type="checkbox"/> NONE [1]
		<input type="checkbox"/> COAL FINES [-2]		

NUMBER OF SUBSTRATE TYPES: 4 or More [2]
(High Quality Only, Score 5 or >) 3 or Less [0]

COMMENTS:

2] INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions)
(Structure) TYPE: Score All That Occur

<u>1</u> UNDERCUT BANKS [1]	<u>0</u> POOLS > 70 cm [2]	<u>0</u> OXBOWS, BACKWATERS [1]
<u>2</u> OVERHANGING VEGETATION [1]	<u>0</u> ROOTWADS [1]	<u>1</u> AQUATIC MACROPHYTES [1]
<u>1</u> SHALLOWS (IN SLOW WATER) [1]	<u>3</u> BOULDERS [1]	<u>1</u> LOGS OR WOODY DEBRIS [1]
<u>2</u> ROOTMATS [1]	COMMENTS:	

AMOUNT: (Check ONLY One or check 2 and AVERAGE)

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

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY	MODIFICATIONS/OTHER
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input checked="" type="checkbox"/> HIGH [3]	<input type="checkbox"/> SNAGGING <input type="checkbox"/> IMPOUND.
<input type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> RELOCATION <input type="checkbox"/> ISLANDS
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	<input type="checkbox"/> CANOPY REMOVAL <input type="checkbox"/> LEVEED
<input checked="" type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		<input checked="" type="checkbox"/> DREDGING <input type="checkbox"/> BANK SHAPING
				<input checked="" type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) River Right Looking Downstream

RIPARIAN WIDTH	FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN)	BANK EROSION
L R (Per Bank)	L R (Most Predominant Per Bank)	L R (Per Bank)
<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> NONE/LITTLE [3]
<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> NARROW 5-10 m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> HEAVY/SEVERE [1]
<input checked="" type="checkbox"/> VERY NARROW <5 m [1]	<input type="checkbox"/> FENCED PASTURE [1]	
<input type="checkbox"/> NONE [0]		

COMMENTS:

5.] POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH	MORPHOLOGY	CURRENT VELOCITY (POOLS & RIFFLES!)
(Check 1 ONLY!)	(Check 1 or 2 & AVERAGE)	(Check All That Apply)
<input type="checkbox"/> >1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> EDDIES[1] <input type="checkbox"/> TORRENTIAL[-1]
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> FAST[1] <input type="checkbox"/> INTERSTITIAL[-1]
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input checked="" type="checkbox"/> MODERATE [1] <input type="checkbox"/> INTERMITTENT[-2]
<input checked="" type="checkbox"/> 0.2- 0.4m [1]		<input checked="" type="checkbox"/> SLOW [1] <input type="checkbox"/> VERY FAST[1]
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS:	

CHECK ONE OR CHECK 2 AND AVERAGE

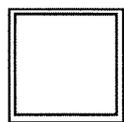
RIFFLE DEPTH	RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input type="checkbox"/> Best Areas >10 cm [2]	<input type="checkbox"/> MAX > 50 [2]	<input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input checked="" type="checkbox"/> NONE [2]
<input checked="" type="checkbox"/> Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> MAX < 50 [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> Best Areas < 5 cm [RIFFLE=0]		<input type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]
COMMENTS:		<input type="checkbox"/> NO RIFFLE [Metric=0]	

6] GRADIENT (ft/mi): 17.4 DRAINAGE AREA (sq.mi.): 1.0
%POOL: 30 %GLIDE: 10
%RIFFLE: 35 %RUN: 25

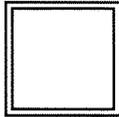
** Best areas must be large enough to support a population of riffle-obligate species

Is Sampling Reach Representative of the Stream (Y/N) ___ If Not, Explain:

- Major Suspected Sources of Impacts (Check All That Apply):
- None
 - Industrial
 - WWTP
 - Ag
 - Livestock
 - Silviculture
 - Construction
 - Urban Runoff
 - CSOs
 - Suburban Impacts
 - Mining
 - Channelization
 - Riparian Removal
 - Landfills
 - Natural
 - Dams
 - Other Flow Alteration
 - Other: _____



Subjective Rating (1-10)



Aesthetic Rating (1-10)

Gradient:

- Low, - Moderate, - High

Gear: _____ Distance: _____ Water Clarity: _____ Water Stage: _____ Canopy -% Open _____

First Sampling Pass _____

Stream Measurements:

Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrench. Ratio

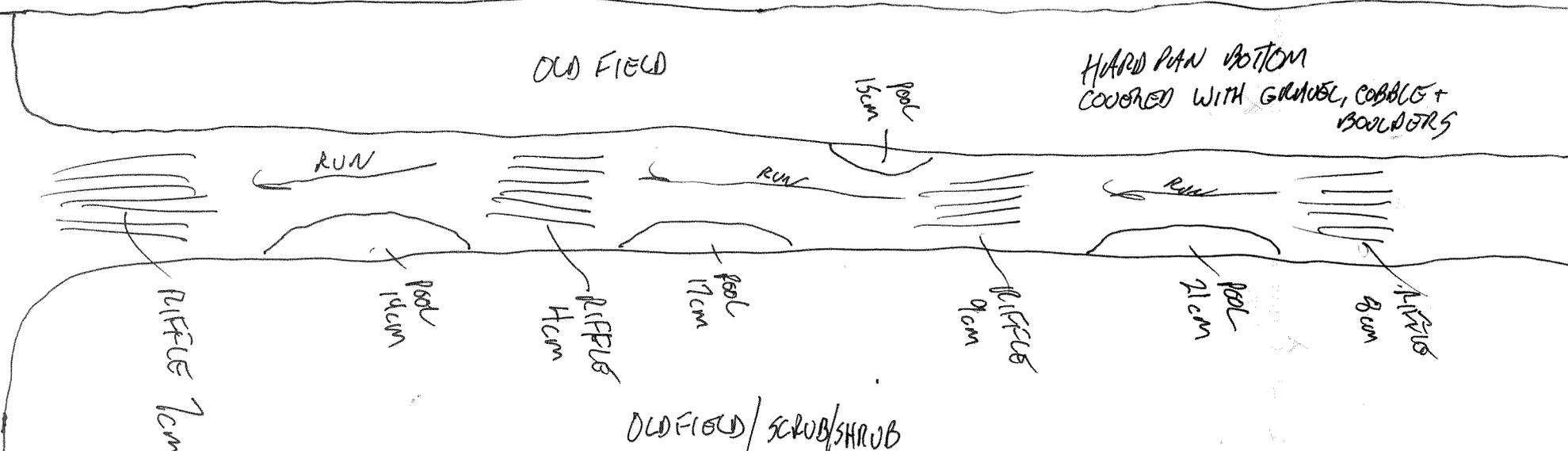
Stream Drawing:

ACCESS ROAD

FRENCH CREEK

OLD FIELD

HARD PAN BOTTOM COVERED WITH GRASS, COBBLES + BOULDERS



Instructions for scoring the alternate cover metric: Each cover type should receive a score of between 0 and 3, Where: 0 - Cover type absent; 1 - Cover type present in very small amounts or if more common of marginal quality; 2 - Cover type present in moderate amounts, but not of highest quality or in small amounts of highest quality; 3 - Cover type of highest quality in moderate or greater amounts. Examples of highest quality include very large boulders in deep or fast water, large diameter logs that are stable, well developed rootwads in deep/fast water, or deep, well-defined, functional pools.

- Yes/No
- Is Stream Ephemeral (no pools, totally dry or only damp spots)?
 - Is there water upstream? How Far: _____
 - Is There Water Close Downstream? How Far: _____
 - Is Dry Channel Mostly Natural?



Primary Headwater Habitat Evaluation Form

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

58

SITE NAME/LOCATION KLINE DITCH AT THE MOUTH (FELSNCH CREEK)
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 1.0
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 0.0
 DATE 8-21-02 SCORER JAY MILLER COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]		<input type="checkbox"/> SILT [3 pt]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>25</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pt]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>15</u>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>30</u>	<input checked="" type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 40 (A) 9 (B) 4

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

HHEI Metric Points
Substrate Max = 40
13
A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 21

Pool Depth Max = 30
25

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS VIRTUALLY UNIFORM WIDTH ALONG STRETCH AVERAGE BANKFULL WIDTH (meters) 2.2

Bankfull Width Max=30
20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

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

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):
 Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)
 Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)
 COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
 None 1.0 2.0 3.0
 0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE
 Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score 65 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: FRENCH CREEK Distance from Evaluated Stream 0.0 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 Quadrangle Name: AVON, OH NRCS Soil Map Page: 7 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: AVON

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 8/19 Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 60

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

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

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

Additional comments/description of pollution impacts: RUNS ADJACENT TO AN ACCESS ROAD FOR A POWER FACILITY?

BIOTIC EVALUATION

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

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

Comments Regarding Biology: SIGNIFICANT AMOUNT OF FISH AND AQUATIC INSECTS NOTED VISUALLY DURING INVESTIGATION

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

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

FLOW → SEE QHEI SHEET

***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Kline Ditch 0.85
Stream Segment Location: At Greenfield Drive
QHEI Score: NA HHEI Score: 46

FIELD NOTES:

This portion of Kline Ditch is located south of Greenfield Drive, a stub road in a residential subdivision. The 6-8' wide ditch has been channelized and dredged, apparently at the time of the subdivision construction. The ditch crosses I-90 approximately 600-800 feet to the north. The east bank has no buffer with maintained lawns to the homes. The west bank has a 15-20' wide tree line with red oak, black cherry, and apple trees. A soybean field is located beyond the tree line. The channel is vegetated, mostly by rice cutgrass, with smaller amounts of spotted touch-me-not, purple loosestrife, and duck potato. Maximum depth was 8 cm. and the substrate is dominated by silt and muck, with some detritus. The opportunity for restoration includes tree plantings and buffer formation along the east bank. However, it is unlikely that this is realistic due to the many landowners and fact that residents would have to sacrifice lawn area.

PHOTOS:



1) Kline Ditch 0.85 – Facing south from Greenfield Drive



Primary Headwater Habitat Evaluation Form

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

46

SITE NAME/LOCATION KLINE DITCH AT GREENFIELD DRIVE
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 0.4
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 0.85
 DATE 8-22-02 SCORER JAY MILLOR COMMENTS RUNS THROUGH RESIDENTIAL DEVELOPMENT

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<u>40</u>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<u>20</u>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> <input checked="" type="checkbox"/> MUCK [0 pts]	<u>40</u>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	_____

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

(A)

3

(B)

3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40

6

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

COMPLETELY VEGETATED (MOW-CUT GRASS) CHANNEL
SLOW - STAGNANT FLOW

MAXIMUM POOL DEPTH (centimeters):

8cm

Pool Depth Max = 30

15

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS

CHANNELIZED - UNIFORM WIDTH

AVERAGE BANKFULL WIDTH (meters)

3.3m

Bankfull Width Max=30

25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

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

COMMENTS MOWED TO BANKS ON LEFT, ROW CROPS (CORN) ON RIGHT

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

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

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

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

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: FRENCH CREEK Distance from Evaluated Stream 0.85 mi
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: AVON, OH NRCS Soil Map Page: 7 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: SHEFFIELD

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 8/19 Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 95%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

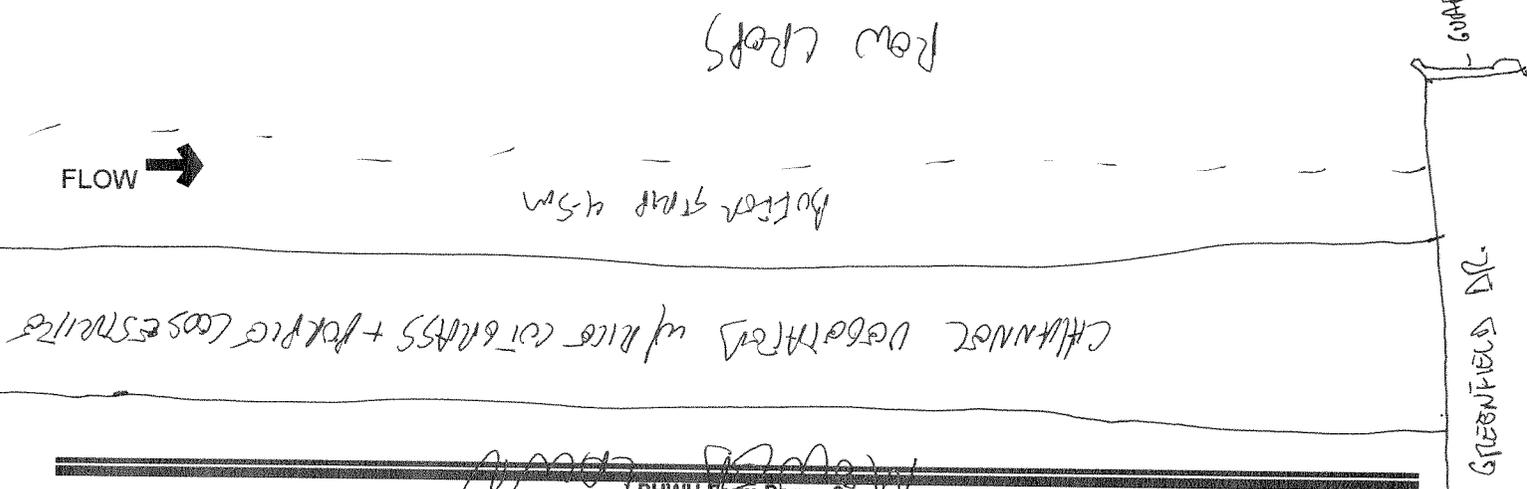
Additional comments/description of pollution impacts: STRAIGHT CHANNEL BEHIND RESIDENTIAL DEVELOPMENT, SEPARATION BY A SMALL (4-5m) BUFFER STRIP FROM ROW CROPS

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____
Comments Regarding Biology: _____

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

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



***U.S. ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT
FRENCH CREEK WATERSHED SURVEY***

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Kline Ditch 1.22
Stream Segment Location: At French Creek Road
QHEI Score: 32.75 HHEI Score: 50

FIELD NOTES: 22 AUG 2002

This portion of Kline Ditch is located on the south side of French Creek Road. Each bank has a wooded/shrub buffer dominated by American elm, staghorn sumac, reed canary grass, multiflora rose, black cherry, spotted touch-me-nots, northern arrowwood, silky dogwood, gray-stemmed dogwood and red oak. The channel is generally un-vegetated (8-10'), but a few patches of rice cutgrass exist. The substrate is dominated by silt and hardpan clay. Old-field is the dominant habitat beyond the woody buffer. Many frogs were seen in the ditch. No restoration opportunities were noted, although a series of agricultural ditches empty into the ditch, which is a source of siltation and pesticide/eutrophication input.

PHOTOS:



1) Kline Ditch 1.22 - Facing upstream from French Creek Road



2) Kline Ditch 1.22 – Facing downstream from French Creek Road (150' from photo 1)



Qualitative Habitat Evaluation Index Field Sheet QHEI Score:

32 3/4

River Code: RM: 1.22 Stream: KLINE DITCH
Date: 8-22-02 Location: AT FRENCH CREEK ROAD
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1] SUBSTRATE (Check ONLY Two SubstrateTYPE BOXES; Estimate % present)

TYPE POOL RIFFLE POOL RIFFLE SUBSTRATE ORIGIN SUBSTRATE QUALITY
BLDR /SLBS[10] GRAVEL [7] SAND [6] BEDROCK[5] DETRITUS[3] ARTIFICIAL[0] SILT: SILT HEAVY [-2] SILT MODERATE [-1] SILT NORMAL [0] SILT FREE [1] EXTENSIVE [-2] MODERATE [-1] NORMAL [0] NONE [1]
MUCK [2] SILT [2]
NOTE: Ignore Sludge Originating From Point Sources

NUMBER OF SUBSTRATE TYPES: 4 or More [2] 3 or Less [0]

COMMENTS:

2] INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions) TYPE: Score All That Occur

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

3] CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)

SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY MODIFICATIONS/OTHER
HIGH [4] EXCELLENT [7] NONE [6] HIGH [3] SNAGGING IMPOUND.
MODERATE [3] GOOD [5] RECOVERED [4] MODERATE [2] RELOCATION ISLANDS
LOW [2] FAIR [3] RECOVERING [3] LOW [1] CANOPY REMOVAL LEVEED
NONE [1] POOR [1] RECENT OR NO RECOVERY [1] DREDGING BANK SHAPING
ONE SIDE CHANNEL MODIFICATIONS

COMMENTS:

4] RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) River Right Looking Downstream

RIPARIAN WIDTH FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN) BANK EROSION
WIDE > 50m [4] FOREST, SWAMP [3] CONSERVATION TILLAGE [1] NONE/LITTLE [3]
MODERATE 10-50m [3] SHRUB OR OLD FIELD [2] URBAN OR INDUSTRIAL [0] MODERATE [2]
NARROW 5-10 m [2] RESIDENTIAL, PARK, NEW FIELD [1] OPEN PASTURE, ROWCROP [0] HEAVY/SEVERE [1]
VERY NARROW < 5 m [1] FENCED PASTURE [1] MINING/CONSTRUCTION [0]
NONE [0]

COMMENTS:

5.] POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH MORPHOLOGY CURRENT VELOCITY [POOLS & RIFFLES!]
> 1m [6] POOL WIDTH > RIFFLE WIDTH [2] EDDIES [1] TORRENTIAL [-1]
0.7-1m [4] POOL WIDTH = RIFFLE WIDTH [1] FAST [1] INTERSTITIAL [-1]
0.4-0.7m [2] POOL WIDTH < RIFFLE W. [0] MODERATE [1] INTERMITTENT [-2]
0.2-0.4m [1] SLOW [1] VERY FAST [1]
< 0.2m [POOL=0]

COMMENTS:

CHECK ONE OR CHECK 2 AND AVERAGE
RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNESS
Best Areas > 10 cm [2] MAX > 50 [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2]
Best Areas 5-10 cm [1] MAX < 50 [1] MOD. STABLE (e.g., Large Gravel) [1] LOW [1]
Best Areas < 5 cm [RIFFLE=0] UNSTABLE (Fine Gravel, Sand) [0] MODERATE [0] EXTENSIVE [-1]
NO RIFFLE [Metric=0]

COMMENTS:

6] GRADIENT (ft/mi): 12.7 DRAINAGE AREA (sq.mi.): 0.2
% POOL: 20 % GLIDE: 60
% RIFFLE: 10 % RUN: 10

** Best areas must be large enough to support a population of riffle-obligate species

Is Sampling Reach Representative of the Stream (Y/N) ___ If Not, Explain:

- Major Suspected Sources of Impacts (Check All That Apply):
- None
 - Industrial
 - WWTP
 - Ag
 - Livestock
 - Silviculture
 - Construction
 - Urban Runoff
 - CSOs
 - Suburban Impacts
 - Mining
 - Channelization
 - Riparian Removal
 - Landfills
 - Natural
 - Dams
 - Other Flow Alteration
 - Other: _____

Subjective Rating (1-10)

Aesthetic Rating (1-10)

Gradient: - Low, - Moderate, - High

Gear: _____ Distance: _____ Water Clarity: _____ Water Stage: _____ Canopy -% Open _____

First Sampling Pass _____

Stream Measurements:											
Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Mean Depth	W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrench. Width	Entrench. Ratio		

Stream Drawing:

SEE HHEI SHEET

Instructions for scoring the alternate cover metric: Each cover type should receive a score of between 0 and 3, Where: 0 - Cover type absent; 1 - Cover type present in very small amounts or if more common of marginal quality; 2 - Cover type present in moderate amounts, but not of highest quality or in small amounts of highest quality; 3 - Cover type of highest quality in moderate or greater amounts. Examples of highest quality include very large boulders in deep or fast water, large diameter logs that are stable, well developed rootwads in deep/fast water, or deep, well-defined, functional pools.

Yes/No

- Is Stream Ephemeral (no pools, totally dry or only damp spots)?
- Is there water upstream? How Far: _____
- Is There Water Close Downstream? How Far: _____
- Is Dry Channel Mostly Natural?



Primary Headwater Habitat Evaluation Form

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

50

SITE NAME/LOCATION KLINE DITCH AT FRENCH CREEK ROAD
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 0.2
 LENGTH OF STREAM REACH (ft) 200 LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 1.22
 DATE 9-22-02 SCORER JAY MILLER COMMENTS _____

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY
 MODIFICATIONS:

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<u>65</u>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input type="checkbox"/> <input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>35</u>
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 3 (B) 7

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

HHEI Metric Points

Substrate Max = 40

5

A + B

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS MOSTLY SHALLOW, BUT SOME ISOLATED 10-15cm POOLS MAXIMUM POOL DEPTH (centimeters): 15cm

Pool Depth Max = 30

25

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS AVERAGE OF 2.5, BUT SOME VERY NARROW - SOME WIDER AVERAGE BANKFULL WIDTH (meters) 2.5

Bankfull Width Max=30

20

This information must also be completed

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

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

COMMENTS RIGHT BANK - FARMER HAS TWO DRAINAGE DITCHES TO KLINE, ONE ON LEFT

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 VERY SLOW FLOW

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):
 None 1.0 2.0 3.0
 0.5 1.5 2.5 >3

STREAM GRADIENT ESTIMATE
 Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score 32 3/4 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

VWH Name: FRENCH CREEK Distance from Evaluated Stream 1.22 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 Quadrangle Name: AVON, OH NRCS Soil Map Page: 7 NRCS Soil Map Stream Order _____
County: LORAIN Township / City: SHEFFIELD

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 8/19 Quantity: _____
Photograph Information: _____
Elevated Turbidity? (Y/N): N Canopy (% open): 20
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____
Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

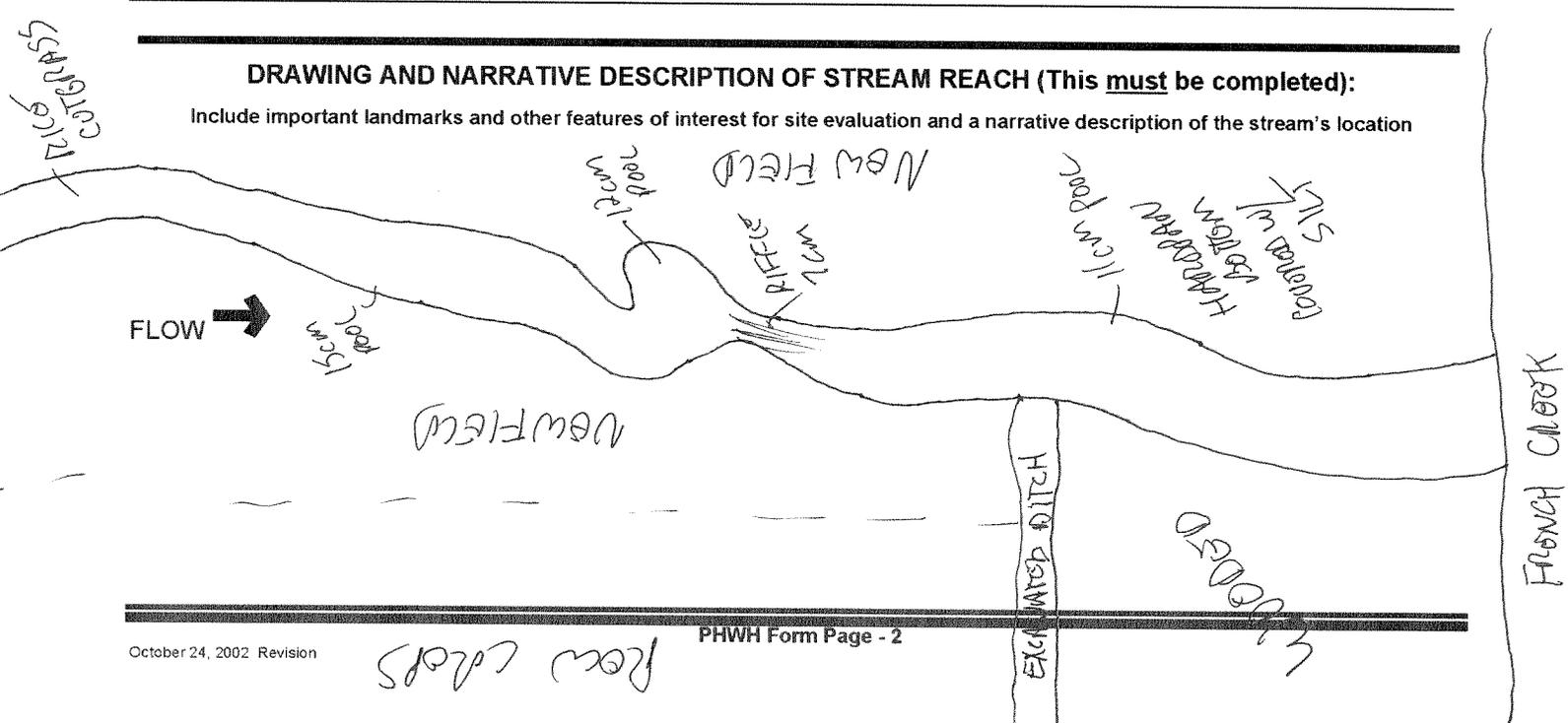
Additional comments/description of pollution impacts: DITCH IMPACTS FROM ROW CROP FIELDS

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) _____ Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____
Frogs or Tadpoles Observed? (Y/N) _____ Voucher? (Y/N) _____ Aquatic Macroinvertebrates Observed? (Y/N) _____ Voucher? (Y/N) _____
Comments Regarding Biology: _____

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

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



Rec'd colors