

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Schwartz Ditch 1.25  
Stream Segment Location: At Williams Street  
QHEI Score: NA HHEI Score: NA

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FIELD NOTES: 10 SEP 2002

This stretch of Schwartz Ditch is located crossing Williams Court, a one-lane paved road. No data was taken due to a lack of access. A 10-15' wide buffer of green ash, American elm, gray-stemmed dogwood and pin oak located on each bank separates the ditch from nearby residential development.

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PHOTOS:



1) Schwartz Ditch 1.25 – Facing upstream from bridge



2) Schwartz Ditch 1.25 – Facing downstream from bridge

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Schwartz Ditch 2.12  
Stream Segment Location: At Bradley/Hillard Roads (Cuyahoga County)  
QHEI Score: NA HHEI Score: NA

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FIELD NOTES: 10 SEP 2002

This stretch of Schwartz Ditch is located crossing Bradley and Hillard Roads in the town of Westlake, Cuyahoga County. Long sections of the ditch flow through culverts, including a stretch from the west side of Bradley to the east side of Hillard. The stream appears to enter a fenced detention pond on the east side of Hillard, surrounded by residential development.

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PHOTOS:



1) Schwartz Ditch 2.12 – Facing downstream from Bradley Road

**MILLS CREEK NOTES**

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 0.22

Stream Segment Location: At Jaycox Road

QHEI Score: 31.5

HHEI Score: NA

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**FIELD NOTES:**

This stretch of Mills Creek is located downstream (east) of Jaycox Road. Parts of the creek were dry with intermittent pools up to 15-cm. deep. The pools contained minnows. Long-leaf pondweed was seen growing in portions of the creek bed. Although the substrate was a mix of sand, silt, muck, cobbles, clay and gravel, a high concentration of cobbles was noted immediately upstream of the Jaycox Road bridge. Crayfish and minnows were also noted in the pools in the 10' wide creek. The 5-6' high banks provided a narrow (10' wide) buffer to the adjacent residential lawns. This herbaceous buffer is dominated by Canada goldenrod, Canada thistle, and teasel. The channel has apparently been reshaped to accommodate residential development.

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**PHOTOS:**



1) Mills Creek 0.22 – Facing downstream from Jaycox Road



2) Mills Creek 0.22 – Facing upstream from Jaycox Road



Qualitative Habitat Evaluation Index Field Sheet

QHEI Score: 31.5

River Code: RM: 0.22 Stream: MILLS CREEK
Date: 9/11/02 Location: AT JAYCOX ROAD
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

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

TYPE POOL RIFFLE POOL RIFFLE SUBSTRATE ORIGIN SUBSTRATE QUALITY
BLDR /SLBS [10] GRAVEL [7] 25 Check ONE (OR 2 & AVERAGE)
BOULDER [9] SAND [6] 15 LESTONE [1] SILT: SILT HEAVY [-2]
COBBLE [8] 5 BEDROCK [5] TILLS [1] SILT MODERATE [-1]
HARDPAN [4] 25 DETRITUS [3] WETLANDS [0] SILT NORMAL [0]
MUCK [2] 20 ARTIFICIAL [0] HARDPAN [0] SILT FREE [1]
SILT [2] 10 NOTE: Ignore Sludge Originating From Point Sources
SANDSTONE [0] EMBEDDED EXTENSIVE [-2]
RIP/RAP [0] NESS: MODERATE [-1]
LACUSTRINE [0] NORMAL [0]
SHALE [-1] NONE [1]
COAL FINES [-2]

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

UNDERCUT BANKS [1] POOLS > 70 cm [2] OXBOWS, BACKWATERS [1]
OVERHANGING VEGETATION [1] ROOTWADS [1] AQUATIC MACROPHYTES [1]
SHALLOWS (IN SLOW WATER) [1] BOULDERS [1] LOGS OR WOODY DEBRIS [1]
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
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
L R (Per Bank) L R (Most Predominant Per Bank) L R L R (Per Bank)
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]

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)
>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 UNSTABLE (Fine Gravel, Sand) [0] MODERATE [0]
[RIFFLE=0] COMMENTS: NO RIFFLE [Metric=0] EXTENSIVE [-1]

6) GRADIENT (ft/mi): 19.6 DRAINAGE AREA (sq.mi.): 4.7
%POOL: 10 %GLIDE: 90
%RIFFLE: %RUN:

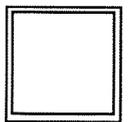
Is Sampling Reach Representative of the Stream (Y/N) \_\_\_ If Not, Explain:

\_\_\_\_\_

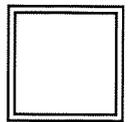
\_\_\_\_\_

\_\_\_\_\_

- 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 \_\_\_\_\_

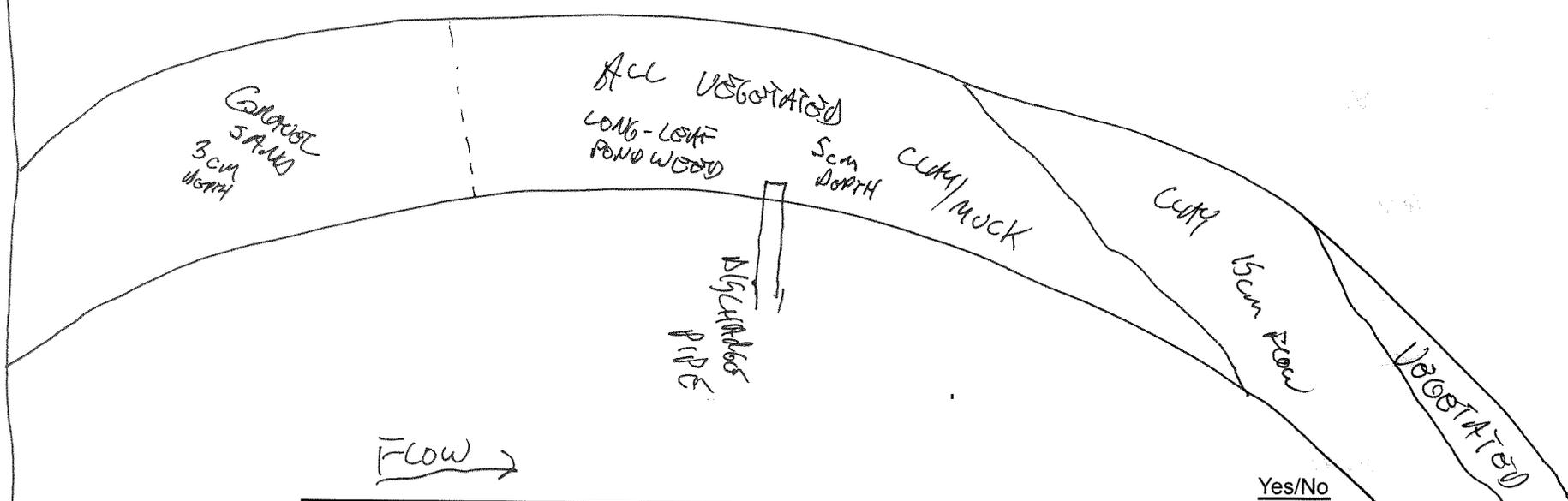
First Sampling Pass \_\_\_\_\_

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:**

SANDY ROAD



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?

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 0.75  
Stream Segment Location: At St. Maron Blvd.  
QHEI Score: NA HHEI Score: NA

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FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located north and south of St. Maron Boulevard within the Red Tail Subdivision and Golf Club. No data were taken at this location due to lack of access and severe modifications which made QHEI evaluation inapplicable. This portion of Mills Creek has been recently severely altered through culverting, reshaping, rerouting and the development of several ponds within the creek. Some herbaceous vegetation has re-established on the re-shaped topography. A golf course is located on the west bank to the south of St. Maron.

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PHOTOS:



- 1) Mills Creek 0.75 – Mills Creek at Saint Maron Blvd pond/dam on east side of road



2) Mills Creek 0.75 – Saint Maron Blvd detention basin on west side of road

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 1.32

Stream Segment Location: At Nagle Road

QHEI Score: 45.5

HHEI Score: NA

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FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located upstream (east) of Nagle Road. The 40-50' wide herbaceous riparian buffer contained perennial ryegrass, Canada goldenrod, blue vervain, reed canary grass, spotted touch-me-not, and purple loosestrife. The 9-12' wide, 5-25 cm. deep channel contained frogs, minnows, and crayfish. Some algae was noted, indicating eutrophication. The substrate was dominated by hardpan and gravel with lesser amounts of cobble, boulders, sand, and silt.

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PHOTOS:



1) Mills Creek 1.32 – Facing upstream at Nagle Road



2) Mills Creek 1.32 – Mills Creek at Nagle Road, downstream from end of site



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **45.5**

River Code: RM: 1.32 Stream: MILLS CREEK  
 Date: 9/11/02 Location: AT NAGEL 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 checked="" type="checkbox"/> -GRAVEL [7]	<u>25</u> <u>25</u>	Check ONE (OR 2 & AVERAGE)	Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> -BOULDER [9]	<u>10</u>		<input type="checkbox"/> -SAND [6]	<u>10</u> <u>5</u>	<input type="checkbox"/> -LIMESTONE [1]	<input type="checkbox"/> - SILT HEAVY [-2]
<input type="checkbox"/> -COBBLE [8]	<u>10</u> <u>20</u>		<input type="checkbox"/> -BEDROCK[5]		<input checked="" type="checkbox"/> -TILLS [1]	<input checked="" type="checkbox"/> -SILT MODERATE [-1]
<input checked="" type="checkbox"/> -HARDPAN [4]	<u>40</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 type="checkbox"/> -SILT [2]	<u>15</u> <u>10</u>		NOTE: Ignore Sludge Originating From Point Sources		<input type="checkbox"/> -SANDSTONE [0]	<input type="checkbox"/> -EXTENSIVE [-2]
					<input type="checkbox"/> -RIP/RAP [0]	<input checked="" 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  
 11/2  
 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

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

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 checked="" type="checkbox"/> - MODERATE [2]	<input type="checkbox"/> - RELOCATION <input type="checkbox"/> - ISLANDS
<input checked="" type="checkbox"/> - LOW [2]	<input checked="" type="checkbox"/> - FAIR [3]	<input checked="" type="checkbox"/> - RECOVERING [3]	<input type="checkbox"/> - LOW [1]	<input checked="" type="checkbox"/> - CANOPY REMOVAL <input type="checkbox"/> - LEVEED
<input type="checkbox"/> - NONE [1]	<input type="checkbox"/> - POOR [1]	<input type="checkbox"/> - RECENT OR NO RECOVERY [1]		<input type="checkbox"/> - DREDGING <input type="checkbox"/> - BANK SHAPING
				<input checked="" type="checkbox"/> - ONE SIDE CHANNEL MODIFICATIONS

Channel  
 10  
 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 (Per Bank)
<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]	<input checked="" type="checkbox"/> - MODERATE [2]
<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"/> - HEAVY/SEVERE [1]	
<input type="checkbox"/> - NARROW 5-10 m [2]	<input checked="" type="checkbox"/> - RESIDENTIAL, PARK, NEW FIELD [1]				
<input checked="" type="checkbox"/> - VERY NARROW <5 m [1]	<input type="checkbox"/> - FENCED PASTURE [1]				
<input type="checkbox"/> - NONE [0]					

Riparian  
 4  
 Max 10

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 checked="" 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 type="checkbox"/> - POOL WIDTH < RIFFLE W. [0]	<input 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: _____	

Pool/  
 Current  
 4  
 Max 12

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 checked="" type="checkbox"/> - Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> - MAX < 50 [1]	<input checked="" 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 checked="" type="checkbox"/> - MODERATE [0]
			<input type="checkbox"/> - EXTENSIVE [-1]
COMMENTS: _____		<input type="checkbox"/> - NO RIFFLE [Metric=0]	

Riffle/Run  
 3  
 Max 8

Gradient  
 6  
 Max 10

6) GRADIENT (ft/mi): 6.1 DRAINAGE AREA (sq.mi.): 2.5  
 %POOL: 25 %GLIDE: 45  
 %RIFFLE: 20 %RUN: 10

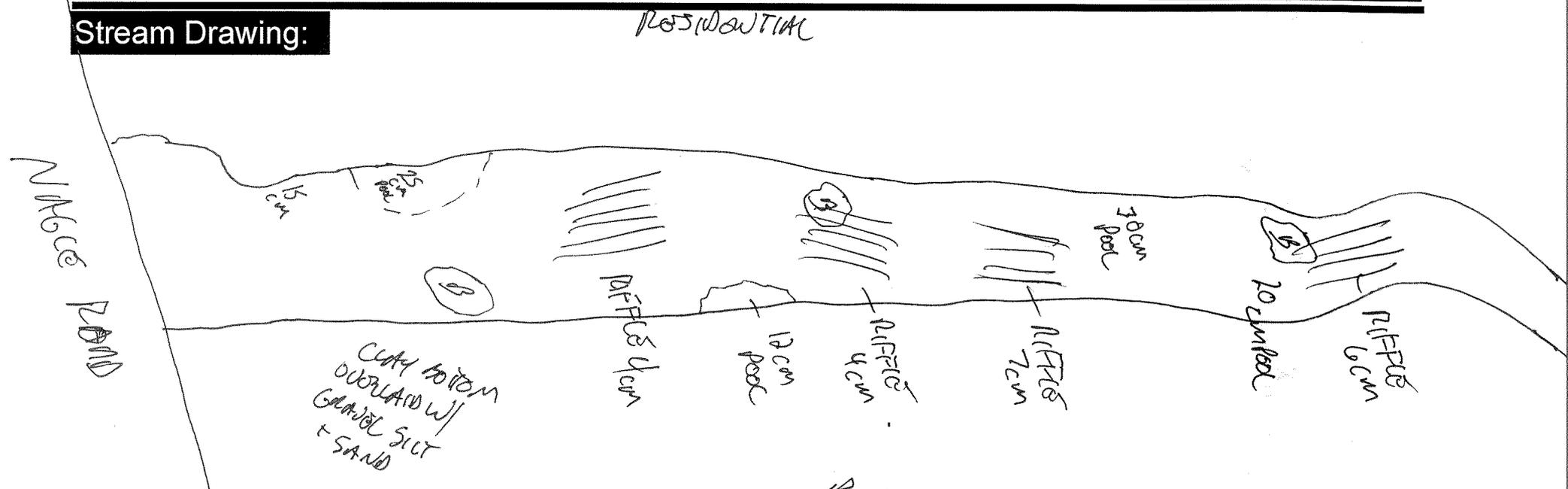
\*: Best areas must be large enough to support a population of riffle-obligate species

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: \_\_\_\_\_

<input style="width: 100%; height: 100%;" type="text"/>	<input style="width: 100%; height: 100%;" type="text"/>	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. Ratio					
Gradient:						
<input type="checkbox"/> - Low, <input type="checkbox"/> - Moderate, <input type="checkbox"/> - High						

**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?

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 1.55

Stream Segment Location: At Mills Road

QHEI Score: 51.5

HHEI Score: NA

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FIELD NOTES: 11 SEP 2002

This stretch of Mills Creek is located upstream (south) of Mills Road. The 10-14' wide, 0-15 cm. deep channel had a gravel-dominated substrate with lesser amounts of sand, silt, boulders and cobbles. The west bank has no riparian buffer (lawn) with a 10' +/- wide buffer on the east bank dominated by Canada goldenrod, multiflora rose, boxelder, green ash, red maple and black willow. Minnows were noted along with minor amounts of algae. A culvert discharges water from the residential area to the east approximately 300' from Mills Road.

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PHOTOS:



1) Mills Creek 1.55 – Facing upstream at Mills Road



2) Mills Creek 1.55 – Facing downstream at Mills Road



Qualitative Habitat Evaluation Index Field Sheet QHEI Score:

51.5

River Code: RM: 1.55 Stream: MILLS CREEK
Date: 9/11/02 Location: AT MILLS ROAD
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1] SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Estimate % present)
TYPE POOL RIFFLE POOL RIFFLE SUBSTRATE ORIGIN SUBSTRATE QUALITY
[ ] -BLDR /SLBS[10] [ ] -GRAVEL [7] 35 40 Check ONE (OR 2 & AVERAGE) Check ONE (OR 2 & AVERAGE)
[ ] -BOULDER [9] 5 [ ] -SAND [6] 25 30 [ ] -LIMESTONE [1] SILT: [ ] -SILT HEAVY [-2]
[ ] -COBBLE [8] 5 5 [ ] -BEDROCK[5] [ ] -TILLS [1] [ ] -SILT MODERATE [-1]
[ ] -HARDPAN [4] 20 15 [ ] -DETRITUS[3] [ ] -WETLANDS[0] [ ] -SILT NORMAL [0]
[ ] -MUCK [2] [ ] -ARTIFICIAL[0] [ ] -HARDPAN [0] [ ] -SILT FREE [1]
[ ] -SILT [2] 15 5 NOTE: Ignore Sludge Originating From Point Sources [ ] -SANDSTONE [0] EMBEDDED [ ] -EXTENSIVE [-2]
[ ] -RIP/RAP [0] NESS: [ ] -MODERATE [-1]
[ ] -LACUSTRINE [0] [ ] -NORMAL [0]
[ ] -SHALE [-1] [ ] -NONE [1]
[ ] -COAL FINES [-2]

Substrate
15 1/2
Max 20

NUMBER OF SUBSTRATE TYPES: (High Quality Only, Score 5 or >) [ ] 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) AMOUNT: (Check ONLY One or check 2 and AVERAGE)
(Structure) TYPE: Score All That Occur Cover
0 UNDERCUT BANKS [1] 1 POOLS > 70 cm [2] 0 OXBOWS, BACKWATERS [1] [ ] - EXTENSIVE > 75% [11]
1 OVERHANGING VEGETATION [1] 0 ROOTWADS [1] 1 AQUATIC MACROPHYTES [1] [ ] - MODERATE 25-75% [7]
2 SHALLOWS (IN SLOW WATER) [1] 1 BOULDERS [1] 0 LOGS OR WOODY DEBRIS [1] [ ] - SPARSE 5-25% [3]
0 ROOTMATS [1] COMMENTS: [ ] - NEARLY ABSENT < 5%[1]

Cover
6
Max 20

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

Channel
9
Max 20

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 (Per Bank)
[ ] - 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]

Riparian
4
Max 10

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)
[ ] - >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:

Pool/Current
7
Max 12

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]
COMMENTS: [ ] - NO RIFFLE [Metric=0] [ ] - EXTENSIVE [-1]

Riffle/Run
4
Max 8

Gradient
6
Max 10

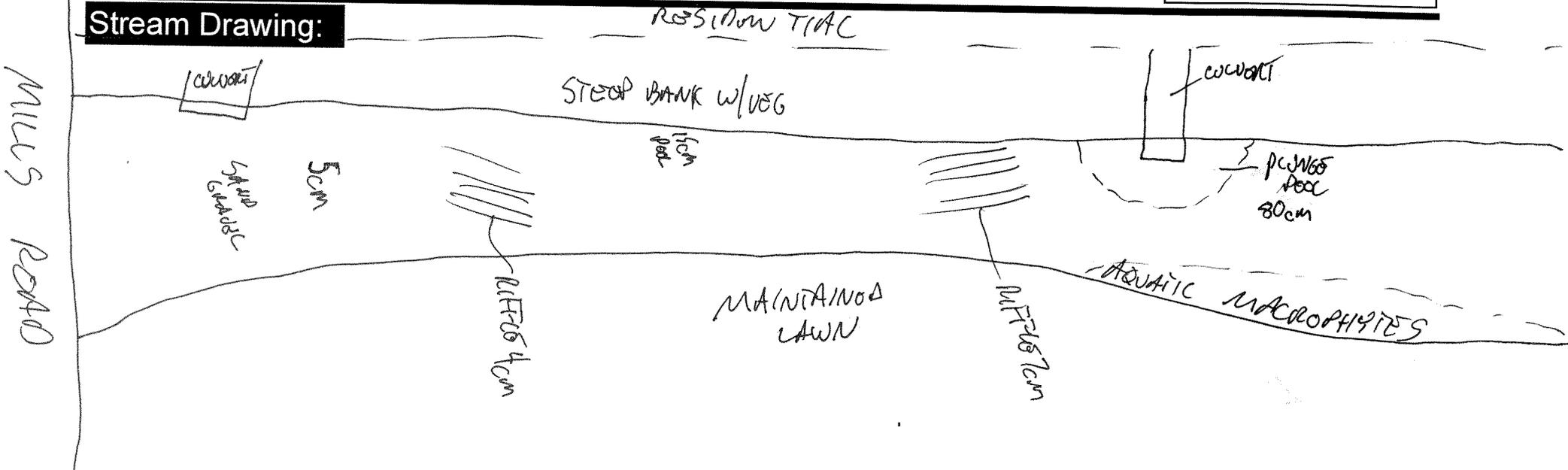
6] GRADIENT (ft/mi): 6.4 DRAINAGE AREA (sq.mi.): 2.5
%POOL: 30 %GLIDE: 35
%RIFFLE: 15 %RUN: 20

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 _____					
<input style="width: 50px; height: 50px; border: 1px solid black;" type="text"/> Subjective Rating (1-10)	<input style="width: 50px; height: 50px; border: 1px solid black;" type="text"/> Aesthetic Rating (1-10)	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	Ratio
		Gradient: <input type="checkbox"/> - Low, <input type="checkbox"/> - Moderate, <input type="checkbox"/> - High									

**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?

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 2.5  
Stream Segment Location: At Mills Creek Lane (in sports park)  
QHEI Score: 52.75 HHEI Score: NA

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FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located in Frontier Park, operated by the city of North Ridgeville. The 13-20' wide, 5-20 cm deep portion of creek has a substrate dominated by cobbles with lesser amounts of boulders, gravel, sand and silt. The 10-15' wide herbaceous buffer contains Canada goldenrod, reed canary grass, silky dogwood, purple loosestrife, blue vervain, eastern cottonwood, perennial ryegrass, cattails, peppermint and Queen Anne's lace. Minnows were noted in the pools. A football field is located to the east of the creek with a parking lot to the west. A footbridge connects the two. Garbage was noted on either side of the bridge. There is a potential for restoration at this site.

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PHOTOS:



1) Mills Creek 2.5 – Creek at Mills Creek Lane (Football Park), upstream from end



2) Mills Creek 2.5 – Creek at Mills Creek Lane (Football Park), downstream from end



Qualitative Habitat Evaluation Index Field Sheet QHEI Score:

52 3/4

River Code: RM: 2.5 Stream: MILLS CREEK

Date: 9/11/07 Location: MILLS CREEK LAKE (IN SPORTS PARK)

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] 20 25 Check ONE (OR 2 & AVERAGE)
[ ] -BOULDER [9] 5 10 [ ] -SAND [6] 10 5 [ ] -LIMESTONE [1] SILT:
[ ] -COBBLE [8] 35 50 [ ] -BEDROCK[5] [ ] -TILLS [1] [ ] -SILT HEAVY [-2]
[ ] -HARDPAN [4] 20 5 [ ] -DETRITUS[3] [ ] -WETLANDS[0] [ ] -SILT MODERATE [-1]
[ ] -MUCK [2] [ ] -ARTIFICIAL[0] [ ] -HARDPAN [0] [ ] -SILT NORMAL [0]
[ ] -SILT [2] 10 5 NOTE: Ignore Sludge Originating From Point Sources
[ ] -SANDSTONE [0] EMBEDDED [ ] -SILT FREE [1]
[ ] -RIP/RAP [0] NESS: [ ] -EXTENSIVE [-2]
[ ] -LACUSTRINE [0] [ ] -MODERATE [-1]
[ ] -SHALE [-1] [ ] -NONE [1]
[ ] -COAL FINES [-2]

Substrate 16 Max 20

NUMBER OF SUBSTRATE TYPES: (High Quality Only, Score 5 or >) 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 AMOUNT: (Check ONLY One or check 2 and AVERAGE)
0 UNDERCUT BANKS [1] 0 POOLS> 70 cm [2] 0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1] 0 ROOTWADS [1] 1 AQUATIC MACROPHYTES [1]
2 SHALLOWS (IN SLOW WATER) [1] 2 BOULDERS [1] 0 LOGS OR WOODY DEBRIS [1]
2 ROOTMATS [1] COMMENTS: [ ] - EXTENSIVE > 75% [11]
[ ] - MODERATE 25-75% [7]
[ ] - SPARSE 5-25% [3]
[ ] - NEARLY ABSENT < 5%[1]

Cover 8 Max 20

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

Channel 11 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 (Per Bank)
[ ] - 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]

Riparian 4 3/4 Max 10

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)
[ ] - >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:

Pool/Current 4 Max 12

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]

Riffle/Run 3 Max 8

Gradient 6 Max 10

COMMENTS:

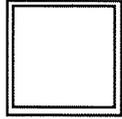
6] GRADIENT (ft/mi): 8.8 DRAINAGE AREA (sq.mi.): 2.0 %POOL: 35 %GLIDE: 10
%RIFFLE: 35 %RUN: 20

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

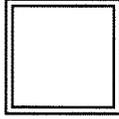
Is Sampling Reach Representative of the Stream (Y/N)\_\_\_ If Not, Explain:

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:

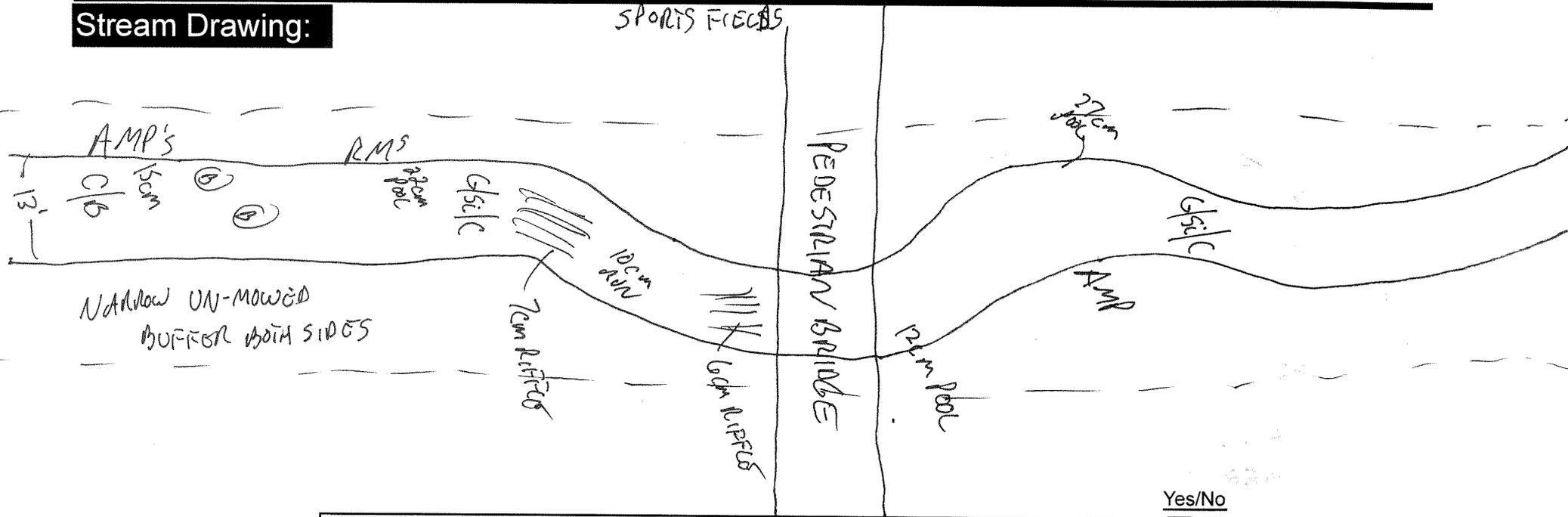
- Low,  - Moderate,  - High

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:**



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?

PARKING LOT

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 2.7  
Stream Segment Location: At Center Ridge Road  
QHEI Score: 63 HHEI Score: NA

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**FIELD NOTES:**

This portion of Mills Creek is located upstream (south) of Center Ridge Road. This 12-17' wide, 5-20 cm deep channel is dominated by a substrate of cobbles, boulders, gravel and sand. Frogs, minnows, and crayfish were noted. The 15' +/- wide buffer on each bank is forested and dominated by red maple, green ash, European buckthorn, tartarian honeysuckle, black walnut, boxelder, sugar maple, black cherry, and multiflora rose. The developers of the adjacent condominiums did a fantastic job incorporating the creek while maintaining its natural course and functions.

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**PHOTOS:**



1) Mills Creek 2.7 – Facing upstream from Center Ridge Road



2) Mills Creek 2.7 – Facing downstream from Center Ridge Road



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 63

River Code: RM: 207 Stream: MILLS CREEK  
Date: 9/11/02 Location: AT CENTER RIDGE ROAD  
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1) SUBSTRATE (Check ONLY Two Substrate TYPE 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>25</u>	Check ONE (OR 2 & AVERAGE)	Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9] <u>15</u> <u>20</u>		<input type="checkbox"/> SAND [6] <u>25</u> <u>15</u>	<input type="checkbox"/> LIMESTONE [1] SILT:	<input type="checkbox"/> SILT HEAVY [-2]
<input checked="" type="checkbox"/> COBBLE [8] <u>30</u> <u>40</u>		<input type="checkbox"/> BEDROCK [5]	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> HARDPAN [4]		<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> MUCK [2]		<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> HARDPAN [0]	<input 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 checked="" type="checkbox"/> NORMAL [0]
			<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NONE [1]
			<input type="checkbox"/> COAL FINES [-2]	

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

COMMENTS: \_\_\_\_\_

Substrate  
18  
Max 20

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

TYPE: Score All That Occur	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>1</u> ROOTMATS [1]	<input type="checkbox"/> NEARLY ABSENT < 5% [1]
<u>0</u> POOLS > 70 cm [2]	
<u>1</u> ROOTWADS [1]	
<u>0</u> OXBOWS, BACKWATERS [1]	
<u>0</u> AQUATIC MACROPHYTES [1]	
<u>1</u> BOULDERS [1]	
<u>1</u> LOGS OR WOODY DEBRIS [1]	

COMMENTS: \_\_\_\_\_

Cover  
9  
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"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> IMPOUND.
<input checked="" type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	<input type="checkbox"/> ISLANDS
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		<input checked="" type="checkbox"/> CANOPY REMOVAL
				<input type="checkbox"/> LEVEED
				<input type="checkbox"/> DREDGING
				<input type="checkbox"/> BANK SHAPING
				<input checked="" type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: \_\_\_\_\_

Channel  
13  
Max 20

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)	
<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]	
<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 checked="" type="checkbox"/> NARROW 5-10 m [2]	<input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]			<input type="checkbox"/> HEAVY/SEVERE [1]	
<input type="checkbox"/> VERY NARROW < 5 m [1]	<input type="checkbox"/> FENCED PASTURE [1]				
<input type="checkbox"/> NONE [0]					

COMMENTS: \_\_\_\_\_

Riparian  
5  
Max 10

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 checked="" 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 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: \_\_\_\_\_

Pool/Current  
4  
Max 12

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 checked="" type="checkbox"/> Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> MAX < 50 [1]	<input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input checked="" 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]
			<input type="checkbox"/> NO RIFFLE [Metric=0]

COMMENTS: \_\_\_\_\_

Riffle/Run  
4  
Max 8

Gradient  
10  
Max 10

6) GRADIENT (ft/mi): 15.9 DRAINAGE AREA (sq.mi.): 1.9  
%POOL: 30 %GLIDE: 20  
%RIFFLE: 20 %RUN: 30

\* 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)

Gear: \_\_\_\_\_ Distance: \_\_\_\_\_ Water Clarity: \_\_\_\_\_ Water Stage: \_\_\_\_\_ Canopy -% Open: \_\_\_\_\_

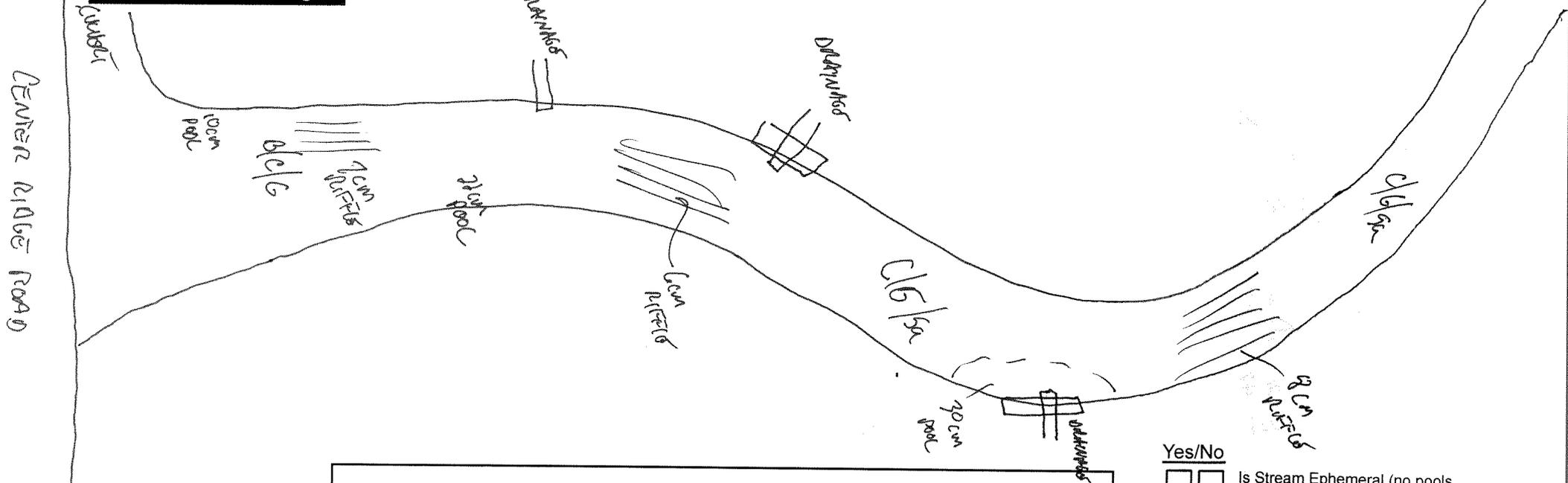
First Sampling Pass \_\_\_\_\_

Gradient:  - Low,  - Moderate,  - High

Stream Measurements:

Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrench. Width	Entrench. Ratio
<input type="text"/>									

**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?

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

**FIELD NOTES AND PHOTOS**

Stream Name and River Mile: Mills Creek 3.21  
Stream Segment Location: At Woodland Drive  
QHEI Score: 41 HHEI Score: 65

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FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located upstream (east) of Woodland Drive. The 5-12' wide, 0-15 cm deep channel has a substrate of gravel, bedrock, clay, cobbles, boulders, and silt. Minnows, frogs, and crayfish were noted in the pools. The narrow wooded buffer on each bank is dominated by sugar maple, black cherry, American basswood, green ash, tulip tree and English ivy.

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PHOTOS:



1) Mills Creek 3.21 – Facing upstream of Woodland Drive



2) Mills Creek 3.21 – Facing downstream of Woodland Drive



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 41

River Code: RM: 321 Stream: MILLS CREEK  
Date: 9/11/02 Location: AT WOODLAND DRIVE  
Scorers Full Name: JAY MILLER Affiliation: USACE - BUFFALO

1] SUBSTRATE (Check ONLY Two Substrate TYPE 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>10</u> <u>10</u>		<input type="checkbox"/> SAND [6] <u>10</u> <u>10</u>	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT: <input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8] <u>15</u> <u>15</u>		<input type="checkbox"/> BEDROCK [5] <u>10</u> <u>10</u>	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> SILT MODERATE [-1]
<input checked="" type="checkbox"/> HARDPAN [4] <u>20</u> <u>20</u>		<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> WETLANDS [0]	<input checked="" 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 type="checkbox"/> SILT [2] <u>5</u> <u>5</u>		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 checked="" type="checkbox"/> NORMAL [0]
			<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NONE [1]
			<input type="checkbox"/> COAL FINES [-2]	

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

COMMENTS: \_\_\_\_\_

Substrate  
13 1/2  
Max 20

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
<u>1</u> UNDERCUT BANKS [1]	<u>0</u> POOLS > 70 cm [2]	<input type="checkbox"/> EXTENSIVE > 75% [11]	<span style="border: 1px solid black; padding: 5px;">9</span> Max 20
<u>2</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>2</u> BOULDERS [1]	<input type="checkbox"/> SPARSE 5-25% [3]	
<u>1</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
<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.	<span style="border: 1px solid black; padding: 5px;">9</span> Max 20
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION <input type="checkbox"/> ISLANDS	
<input checked="" type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	<input checked="" 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 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		Riparian
L R (Per Bank)	L R (Most Predominant Per Bank)	L R	L R	L R (Per Bank)		
<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]		<span style="border: 1px solid black; padding: 5px;">3 1/2</span> 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 type="checkbox"/> MODERATE [2]		
<input checked="" type="checkbox"/> NARROW 5-10 m [2]	<input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]			<input checked="" 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 (Check 1 ONLY!)	MORPHOLOGY (Check 1 or 2 & AVERAGE)	CURRENT VELOCITY [ POOLS & RIFFLES! ] (Check All That Apply)	Pool/Current
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> EDDIES [1] <input type="checkbox"/> TORRENTIAL [-1]	<span style="border: 1px solid black; padding: 5px;">0</span> Max 12
<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 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 type="checkbox"/> SLOW [1] <input type="checkbox"/> VERY FAST [1]	
<input checked="" 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
<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]	<span style="border: 1px solid black; padding: 5px;">0</span> Max 8
<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 checked="" type="checkbox"/> Best Areas < 5 cm [RIFFLE=0]		<input type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]	<span style="border: 1px solid black; padding: 5px;">6</span> Max 10
COMMENTS: _____		<input type="checkbox"/> NO RIFFLE [Metric=0]	<input type="checkbox"/> EXTENSIVE [-1]	

6] GRADIENT (ft/mi): 7.6 DRAINAGE AREA (sq.mi.): 1.1  
% POOL: 60 % GLIDE: 25  
% RIFFLE: 15 % 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: \_\_\_\_\_

Subjective Rating (1-10)

Aesthetic Rating (1-10)

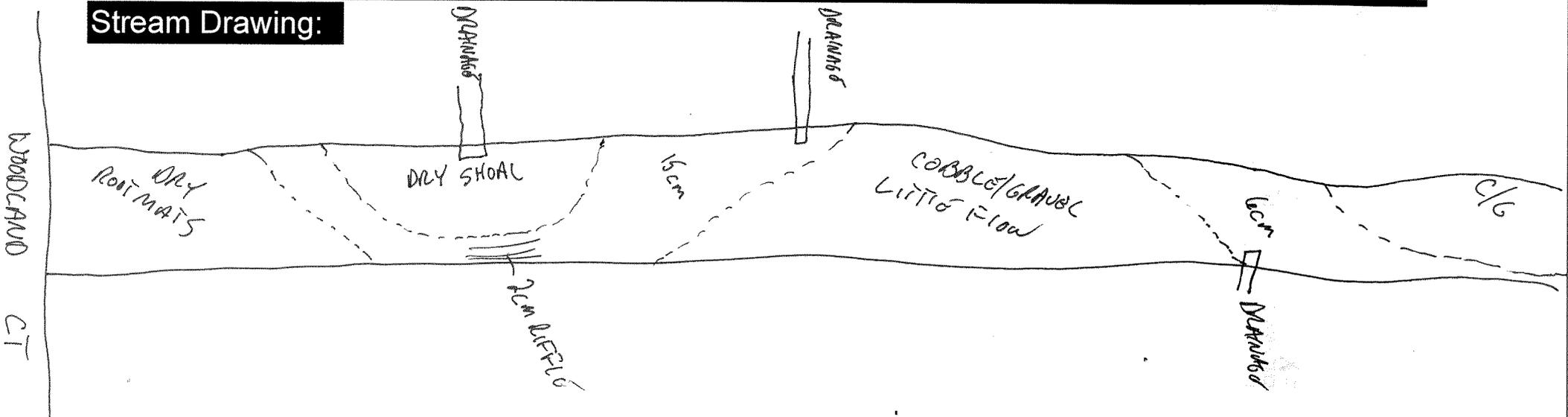
Gradient:

- 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:



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) :

65

SITE NAME/LOCATION MILLS CREEK AT WOODLAND DRIVE  
 SITE NUMBER \_\_\_\_\_ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi<sup>2</sup>) 1.0/mi<sup>2</sup>  
 LENGTH OF STREAM REACH (ft) 200 LAT. \_\_\_\_\_ LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE 3.21  
 DATE 9/11/07 SCORER SAY 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 type="checkbox"/> SILT [3 pt]	<u>15</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>10</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pt]	<u>10</u>	<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>20</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>30</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]		<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 35

(A) 9

(B) 6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40

15

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):

15

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 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 \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

3.3

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

COMMENTS \_\_\_\_\_

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

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

COMMENTS \_\_\_\_\_

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

<input 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 41 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)  
 WWH Name: FRENCH CREEK Distance from Evaluated Stream 3.2/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: ADON, OH (INSET 3) NRCS Soil Map Page: 3 NRCS Soil Map Stream Order \_\_\_\_\_  
County: LOPAIN Township / City: NORTH RIDGEVILLE

**MISCELLANEOUS**

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

Photograph Information: \_\_\_\_\_

Elevated Turbidity? (Y/N): N Canopy (% open): 65

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

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

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

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

**BIOTIC EVALUATION**

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

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

FLOW → SEE QHEI FORM