

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Mills Creek 3.45
Stream Segment Location: At Fieldstone Circle
QHEI Score: 46.5 HHEI Score: 77

FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located upstream (southeast) of Fieldstone Circle. The 5-10' wide, 5-15 cm deep portion of the creek has a cobble-boulder dominated substrate with lesser amounts of gravel and sand. A 5-10' wide vegetated buffer separates the creek from the adjacent residential development. Dominant species include multiflora rose, silky dogwood, American elm, Norway maple, staghorn sumac, green ash, tartarian honeysuckle, red oak and black cherry. Minnows were seen in the pools. No restoration potential was noted in this established neighborhood.

PHOTOS:



1) Mills Creek 3.45 – Mills Creek at Fieldstone Court, facing upstream of bridge



2) Mills Creek 3.45 – Mills Creek at Fieldstone Court, facing downstream of bridge



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **46.5**

River Code: RM: 3.45 Stream: MILLS CREEK
Date: 9/11/02 Location: AT FIELDSTONE CIRCLE
Scorers Full Name: JAY MILLON 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 type="checkbox"/> -GRAVEL [7] <u>15</u> <u>15</u>	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input checked="" type="checkbox"/> -BOULDER [9] <u>20</u> <u>20</u>	<input type="checkbox"/> -SAND [6] <u>10</u> <u>10</u>	<input type="checkbox"/> -LIMESTONE [1]	SILT:	<input type="checkbox"/> - SILT HEAVY [-2]
<input checked="" type="checkbox"/> -COBBLE [8] <u>55</u> <u>55</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]		

Substrate
20
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	AMOUNT: (Check ONLY One or check 2 and AVERAGE)
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> - EXTENSIVE > 75% [11]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> - MODERATE 25-75% [7]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> - SPARSE 5-25% [3]
<input type="checkbox"/> ROOTMATS [1]	COMMENTS: _____	<input type="checkbox"/> - NEARLY ABSENT < 5% [1]

Cover
5
Max 20

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 checked="" type="checkbox"/> - HIGH [3]	<input type="checkbox"/> - SNAGGING	10 Max 20
<input type="checkbox"/> - MODERATE [3]	<input type="checkbox"/> - GOOD [5]	<input checked="" type="checkbox"/> - RECOVERED [4]	<input type="checkbox"/> - MODERATE [2]	<input checked="" type="checkbox"/> - RELOCATION	
<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"/> - 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	

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 (Per Bank)	5 1/2 Max 10
<input 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 type="checkbox"/> - SHRUB OR OLD FIELD [2]	<input type="checkbox"/> - URBAN OR INDUSTRIAL [0]	
<input checked="" type="checkbox"/> - NARROW 5-10 m [2]	<input checked="" type="checkbox"/> - RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> - OPEN PASTURE, ROWCROP [0]	
<input 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 (Check 1 ONLY!)	MORPHOLOGY (Check 1 or 2 & AVERAGE)	CURRENT VELOCITY (Check All That Apply)	Pool/Current
<input type="checkbox"/> - >1m [6]	<input type="checkbox"/> - POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> - EDDIES [1]	0 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"/> - 0.4-0.7m [2]	<input type="checkbox"/> - POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> - MODERATE [1]	
<input type="checkbox"/> - 0.2- 0.4m [1]		<input type="checkbox"/> - SLOW [1]	
<input checked="" type="checkbox"/> - < 0.2m [POOL=0]	COMMENTS: _____	<input type="checkbox"/> - TORRENTIAL [-1]	
		<input type="checkbox"/> - INTERSTITIAL [-1]	
		<input type="checkbox"/> - INTERMITTENT [-2]	
		<input type="checkbox"/> - VERY FAST [1]	

CHECK ONE OR CHECK 2 AND AVERAGE

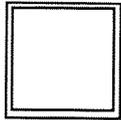
RIFFLE DEPTH	RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS	Riffle/Run
<input type="checkbox"/> - Best Areas >10 cm [2]	<input type="checkbox"/> - MAX > 50 [2]	<input type="checkbox"/> - STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> - NONE [2]	0 Max 8
<input type="checkbox"/> - 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]	
COMMENTS: _____		<input type="checkbox"/> - NO RIFFLE [Metric=0]	<input type="checkbox"/> - EXTENSIVE [-1]	Gradient

6
Max 10

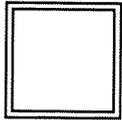
6) GRADIENT (ft/mi): 7.6 DRAINAGE AREA (sq.mi.): 1.0
% POOL: 30 % GLIDE: 55
% RIFFLE: 15 % RUN: -

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

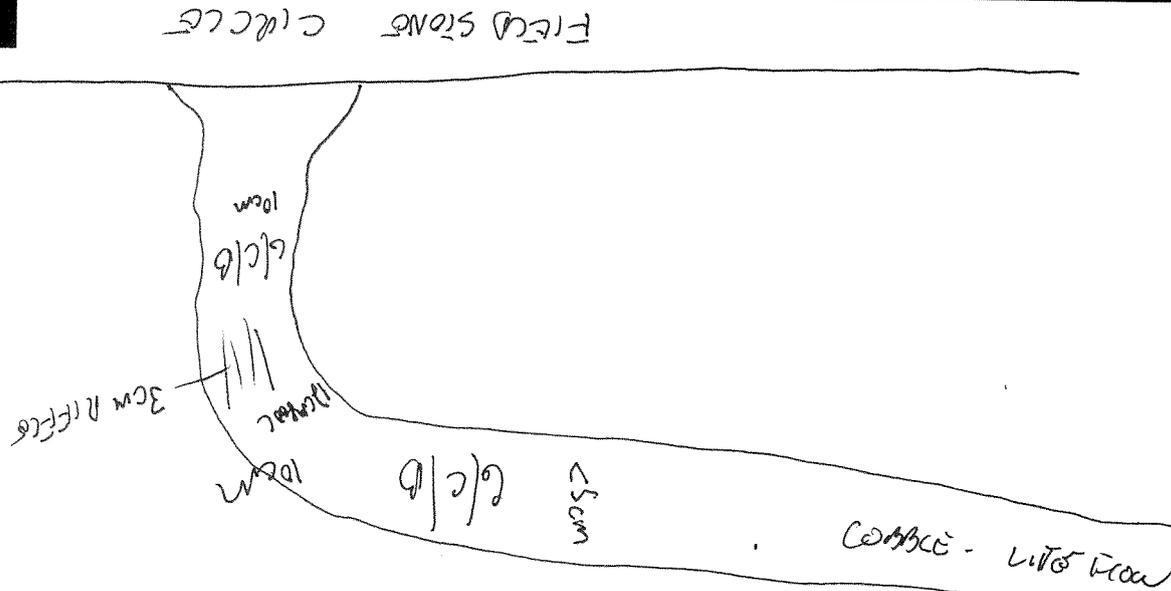
Gear: _____ Distance: _____ Water Clarity: _____ Water Stage: _____ Canopy -% Open _____

First Sampling Pass _____

Stream Measurements:

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

77

SITE NAME/LOCATION MILLS CREEK AT FIELDSTONE CIRCLE
 SITE NUMBER _____ RIVER BASIN BLACK RIVER DRAINAGE AREA (mi²) 1.0 mi²
 LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE 3.45
 DATE 9/11/02 SCORER JOY 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]	
<input checked="" type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>20</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> BEDROCK [16 pt]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>55</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>15</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>10</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 75 (A) 28 (B) 4

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

HHEI Metric Points

Substrate Max = 40

32

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): 12cm

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 BANKFULL WIDTH (meters): 2.3m

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

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 46.5 (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: FRENCH CREEK Distance from Evaluated Stream 3.45 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 ^(INSET C) NRCS Soil Map Page: 3 NRCS Soil Map Stream Order _____
County: LORAIN 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): 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) _____ If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

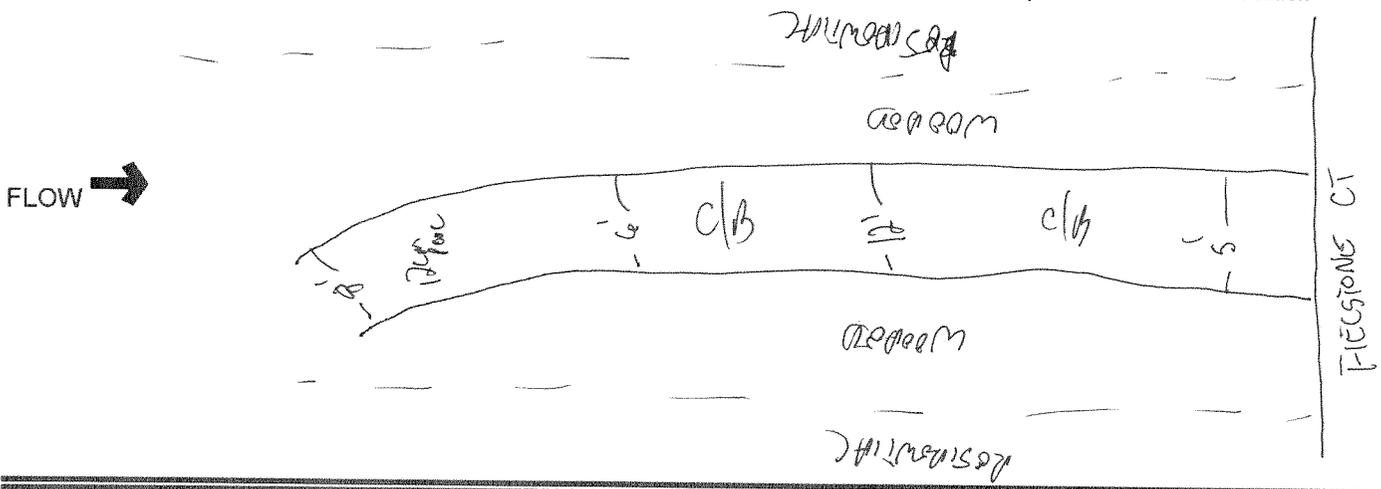
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Mills Creek 3.79

Stream Segment Location: At Barton Road

QHEI Score: NA

HHEI Score: NA

FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located downstream (southwest) of Barton Road. The creek was less than five feet wide, carries little water, is straight with riprap in the channel and surrounded by residential development.

PHOTOS:



- 1) Mills Creek 3.79 – Mills Creek at Barton Road, facing downstream from road.

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Mills Creek 3.95

Stream Segment Location: At Bradley Road

QHEI Score: NA

HHEI Score: NA

FIELD NOTES: 11 SEP 2002

This portion of Mills Creek is located downstream (west) of Bradley Road. The channel was dry, less than 5' wide and has a narrow wooded buffer dominated by green ash, pin oak, and red maple.

PHOTOS:



1) Mills Creek 3.95 – Facing west off of Bradley Road

FRENCH DITCH NOTES

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: French Ditch 0.0
Stream Segment Location: Mouth of Ditch (French Creek RM 12.85)
QHEI Score: 50.75 HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This portion of French Ditch is located near the convergence with French Creek upstream. The gravel and bedrock dominated substrate also contains sand, cobbles, and silt. The 10' wide, 5-10 cm deep channel is straight. Frogs and minnows were noted, along with some algae. The west bank has a wide (>100') forested buffer with species including silver maple, boxelder, multiflora rose, red maple, black cherry, and staghorn sumac. The east bank has a 50' +/- wide herbaceous buffer dominated by Canada goldenrod, reed canary grass, blue grass, boxelder, and thistle. Beyond the sample area there is no buffer on the east bank (residential lawn).

PHOTOS:



1) French Ditch 0.0 – Facing upstream at the mouth of French Ditch



2) French Ditch 0.0 – Facing downstream from the end of sample area



3) French Ditch 0.0 – Facing upstream from the end of sample area



Qualitative Habitat Evaluation Index Field Sheet QHEI Score:

50 3/4

River Code: RM: 0.0 Stream: FRENCH DITCH
Date: 9-12-02 Location: AT FRENCH CREEK CONFLUENCE (RM 12.85)
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, BOULDER, COBBLE, HARDPAN, MUCK, SILT, GRAVEL, SAND, BEDROCK, DETRITUS, ARTIFICIAL, LIMESTONE, TILLS, WETLANDS, HARDPAN, SANDSTONE, RIP/RAP, SHALE, COAL FINES, SILT HEAVY, SILT MODERATE, SILT NORMAL, SILT FREE, EXTENSIVE, MODERATE, NORMAL, NONE

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, OVERHANGING VEGETATION, SHALLOWS, ROOTMATS, POOLS, ROOTWADS, OXBOWS, AQUATIC MACROPHYTES, LOGS OR WOODY DEBRIS

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY MODIFICATIONS/OTHER
HIGH, MODERATE, LOW, NONE, EXCELLENT, GOOD, FAIR, POOR, NONE, RECOVERED, RECOVERING, RECENT OR NO RECOVERY, HIGH, MODERATE, LOW, SNAGGING, RELOCATION, CANOPY REMOVAL, DREDGING, IMPOUND, ISLANDS, LEVEED, BANK SHAPING, ONE SIDE CHANNEL MODIFICATIONS

4) RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank)
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, MODERATE, NARROW, VERY NARROW, NONE, FOREST, SHRUB, RESIDENTIAL, FENCED PASTURE, CONSERVATION TILLAGE, URBAN, OPEN PASTURE, MINING, NONE/LITTLE, MODERATE, HEAVY/SEVERE

5) POOL/GLIDE AND RIFFLE/RUN QUALITY
MAX. DEPTH MORPHOLOGY CURRENT VELOCITY [POOLS & RIFFLES!]
>1m, 0.7-1m, 0.4-0.7m, 0.2-0.4m, <0.2m, POOL WIDTH > RIFFLE WIDTH, POOL WIDTH = RIFFLE WIDTH, POOL WIDTH < RIFFLE W., EDDIES, FAST, MODERATE, SLOW, TORRENTIAL, INTERSTITIAL, INTERMITTENT, VERY FAST

CHECK ONE OR CHECK 2 AND AVERAGE
RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNESS
Best Areas >10 cm, Best Areas 5-10 cm, Best Areas <5 cm, MAX >50, MAX <50, STABLE, MOD. STABLE, UNSTABLE, NONE, LOW, MODERATE, EXTENSIVE, NO RIFFLE

6) GRADIENT (ft/mi): 14.7 DRAINAGE AREA (sq.mi.): 5.2
%POOL: 15 %GLIDE: 55
%RIFFLE: 10 %RUN: 20

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: French Ditch 0.5
Stream Segment Location: At Bainbridge Road
QHEI Score: 40.34 HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This stretch of French Ditch is located upstream (south) of Bainbridge Road. The gravel and sand dominated substrate contains lesser amounts of cobbles, boulders, and silt. The 6-10' wide, 12 cm deep channel contained minnows. Water milfoil was noted in the channel near the bridge. The east bank has a buffer of Norway spruce along a residential lot. The west bank has a wooded buffer dominated by silver maple and boxelder between the creek and adjacent residential lot.

PHOTOS:



1) French Ditch 0.5 – Facing upstream from bridge at Bainbridge road



2) French Ditch 0.5 – Facing downstream from bridge at Bainbridge road



Qualitative Habitat Evaluation Index Field Sheet QHEI Score:

40 3/4

River Code: RM: 0.5 Stream: FRENCH DITCH
Date: 9/12/03 Location: AT BAMBRIDGE 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] 40 40 Check ONE (OR 2 & AVERAGE) Check ONE (OR 2 & AVERAGE)
[] -BOULDER [9] 5 5 [] -SAND [6] 30 30 [] -LIMESTONE [1] SILT: [] -SILT HEAVY [-2]
[] -COBBLE [8] 5 5 [] -BEDROCK [5] [] -TILLS [1] [] -SILT MODERATE [-1]
[] -HARDPAN [4] [] -DETRITUS [3] [] -WETLANDS [0] [] -SILT NORMAL [0]
[] -MUCK [2] [] -ARTIFICIAL [0] [] -HARDPAN [0] [] -SILT FREE [1]
[] -SILT [2] 20 20 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]

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)
(Structure) 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] [] - EXTENSIVE > 75% [11]
2 OVERHANGING VEGETATION [1] 0 ROOTWADS [1] 2 AQUATIC MACROPHYTES [1] [] - MODERATE 25-75% [7]
2 SHALLOWS (IN SLOW WATER) [1] 1 BOULDERS [1] 1 LOGS OR WOODY DEBRIS [1] [] - SPARSE 5-25% [3]
1 ROOTMATS [1] COMMENTS: [] - 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

4]. RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank)
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]

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

6] GRADIENT (ft/mi): 13.2 DRAINAGE AREA (sq.mi.): 5.1
%POOL: 20 %GLIDE: 40
%RIFFLE: 20 %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:

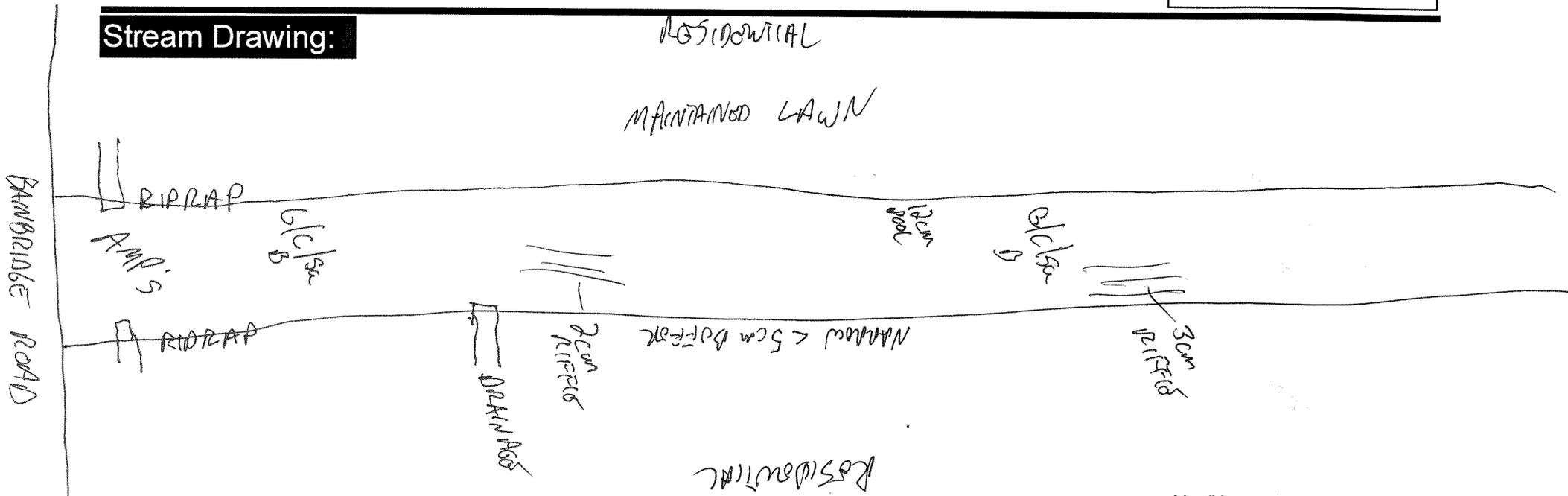
- Low, - Moderate, - High

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

First Sampling Pass _____

Stream Measurements:									
Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Bankfull Mean Ratio	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?

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: French Ditch 1.3
Stream Segment Location: At Chestnut Ridge Road
QHEI Score: 32.5 HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This stretch of French Ditch is located upstream (south) of Chestnut Ridge Road along the east side of Root Road. The west bank consists of a 50' +/- herbaceous buffer between the creek and Root Road. The east bank is adjacent to a detention pond for the residential development on the south side of Chestnut Ridge Road. The 10-12' wide, 12-25 cm deep channel contained long-leaf pondweed and patches of algae. The gravel and sand dominated substrate also contained silt. The buffer areas contained boxelder, Canada goldenrod, field bindweed, Canada thistle, redtop grass, bluegrass, silky dogwood, raspberry and Queen Anne's lace. Minnows were noted. A culvert discharges water from the detention pond to the east.

PHOTOS:



- 2) French Ditch 1.3 – Facing upstream from Chestnut Ridge Road towards Root Road



2) French Ditch 1.3 – Facing downstream from end of sample area.



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 32.5

River Code: RM: 1.3 Stream: FRENCH DITCH
 Date: 9/12/02 Location: AT CHESTNUT 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>40</u> <u>40</u>	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9]	<input checked="" type="checkbox"/> SAND [6] <u>40</u> <u>40</u>	<input type="checkbox"/> LIMESTONE [1]	SILT:	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> TILLS [1]		<input checked="" type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> HARDPAN [4]	<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 type="checkbox"/> HARDPAN [0]		<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> SILT [2] <u>20</u> <u>20</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 checked="" type="checkbox"/> MODERATE [-1]
		<input checked="" 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]		

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

COMMENTS: _____

Substrate
11
 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)
<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]

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

Channel
5
 Max 20

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

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 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 type="checkbox"/> NONE [0]		

COMMENTS: _____

Riparian
3 1/2
 Max 10

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)
<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 type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> FAST [1]
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> MODERATE [1]
<input checked="" type="checkbox"/> < 0.2m [POOL=0]	COMMENTS: _____	<input type="checkbox"/> INTERMITTENT [-2]
		<input type="checkbox"/> SLOW [1]
		<input type="checkbox"/> VERY FAST [1]

Pool/Current
0
 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 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]
			<input type="checkbox"/> EXTENSIVE [-1]
COMMENTS: _____		<input type="checkbox"/> NO RIFFLE [Metric=0]	

Riffle/Run
0
 Max 8

Gradient
8
 Max 10

6) GRADIENT (ft/mi): 12.5 DRAINAGE AREA (sq.mi.): 4.7

%POOL: 20	%GLIDE: 20
%RIFFLE: 30	%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:

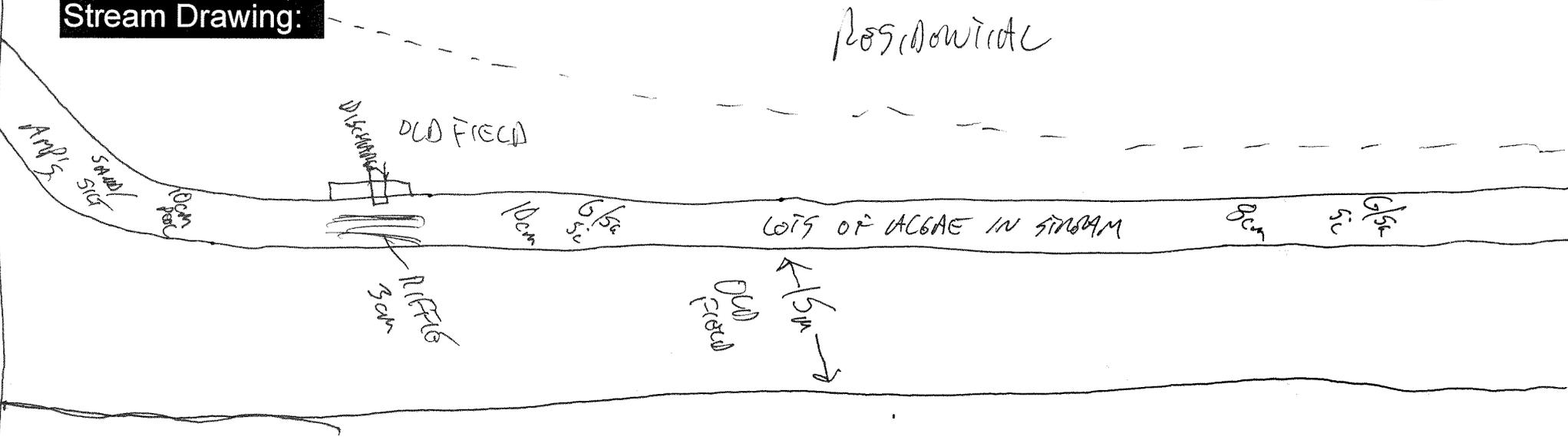
Major Suspected Sources of Impacts (Check All That Apply):

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

<input style="width: 100%; height: 50px;" type="text"/>	<input style="width: 100%; height: 50px;" 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 Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrench. Ratio
[]	[]	[]	[]	[]	[]	[]	[]	[]

- Low, - Moderate, - 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: French Ditch 1.93

Stream Segment Location: At Lorain Road

QHEI Score: 57.25

HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This portion of French Ditch is located upstream (south) of Lorain Road. The 7-12' wide, 25 cm deep channel has a sand-dominated substrate with lesser amounts of gravel, silt and cobbles. The wide (25- >100') vegetated buffers are dominated by silver maple, Canada goldenrod, riverbank grape, spotted touch-me-not, American elm, green ash, tartarian honeysuckle, black walnut, black nightshade, eastern cottonwood, multiflora rose and common apple. Minnows and tadpoles were noted. Downstream, two culverts have created plunge pools over 1 meter deep. A strong odor of petroleum was noted along the entire stretch, but was strongest at the culvert discharges.

PHOTOS:



1) French Ditch 1.93 – Facing upstream from bridge at Lorain Road



2) French Ditch 1.93 – Facing downstream from end of sample



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 57 1/4

River Code: RM: 1.93 Stream: FLORENCE DITCH
 Date: 9/12/03 Location: AT LORAIN 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>20</u> <u>25</u>		Check ONE (OR 2 & AVERAGE)	Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9]	<input checked="" type="checkbox"/> SAND [6] <u>55</u> <u>50</u>		<input type="checkbox"/> LIMESTONE [1] SILT:	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8] <u>10</u> <u>15</u>	<input type="checkbox"/> BEDROCK [5]		<input type="checkbox"/> TILLS [1]	<input checked="" type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> HARDPAN [4]	<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 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] EMBEDDED	<input type="checkbox"/> EXTENSIVE [-2]

Substrate
11
 Max 20

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	AMOUNT: (Check ONLY One or check 2 and AVERAGE)
<u>2</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]

Cover
12
 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 checked="" type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> RELOCATION
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]	<input type="checkbox"/> CANOPY REMOVAL
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		<input type="checkbox"/> DREDGING

Channel
11 1/2
 Max 20

4] RIPARIAN ZONE AND BANK EROSION (check ONE box per bank or check 2 and AVERAGE per bank) ^R 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 type="checkbox"/> SHRUB OR OLD FIELD [2]	<input checked="" type="checkbox"/> MODERATE [2]
<input checked="" 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"/> MINING/CONSTRUCTION [0]
<input type="checkbox"/> NONE [0]		

Riparian
3 1/4
 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 checked="" 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 type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> INTERSTITIAL [-1]
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS: _____	<input type="checkbox"/> MODERATE [1]

Pool/Current
9
 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 checked="" type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input checked="" type="checkbox"/> MODERATE [0]
COMMENTS: _____		<input type="checkbox"/> NO RIFFLE [Metric=0]	<input type="checkbox"/> EXTENSIVE [-1]

Riffle/Run
2 1/2
 Max 8
 Gradient
8
 Max 10

6] GRADIENT (ft/mi): 11.5 DRAINAGE AREA (sq. mi.): 4.0
 %POOL: 35 %GLIDE: 40
 %RIFFLE: 15 %RUN: 10

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 _____

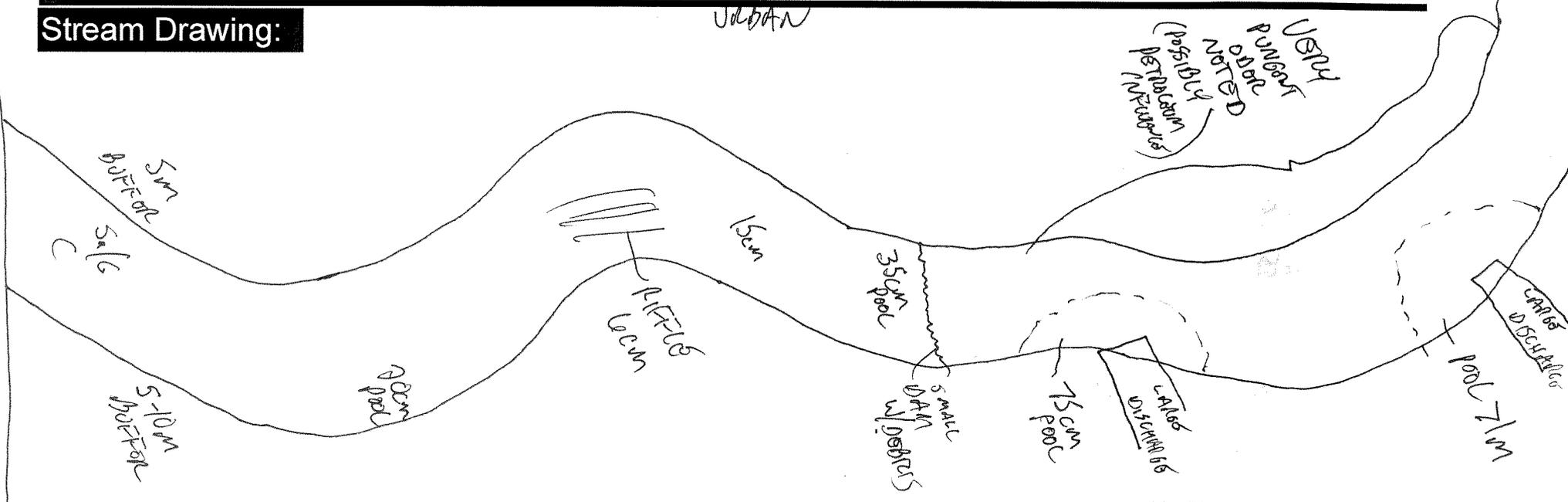
Stream Measurements:											
Average Width	Average Depth	Maximum Depth	Av. Bankfull Width	Bankfull Depth	Mean W/D Ratio	Bankfull Max Depth	Floodprone Area	Entrenchment Width	Ratio		

Stream Drawing:

URBAN

UPSTREAM
POSSIBLE
NOTED
DOWNSTREAM
PERMANENT
INTERMITTENT

LOCAL
ROADS



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?

INDUSTRIAL

NAGLE DITCH NOTES

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Nagle Ditch 0.37

Stream Segment Location: At Boulder Drive

QHEI Score: 32.5

HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This portion of Nagle Ditch is located upstream (south) of Boulder Drive and is artificially deep from the damming effect of the box culvert under Boulder Drive which was installed much higher than the natural creek bottom. The 15-25' wide, 25-50 cm deep "pool" has a substrate of silt, sand, muck, gravel, cobbles and boulders. The 6-8' high banks that act as a buffer to the adjacent residential development contain boxelder, stinging nettle, silver maple, black walnut, choke cherry, green ash and multiflora rose. Minnows were noted. A rust-colored contamination was observed entering the creek from the west through a 12" PVC pipe.

PHOTOS:



1) Nagle Ditch 0.37 – Facing upstream from bridge at Boulder Drive



2) Nagle Ditch 0.37 – Discharge pipe entering ditch from the west



3) Nagle Ditch 0.37 – Facing downstream from end of sample



4) Nagle Ditch 0.37 – Bridge culvert under Boulder Drive



5) Nagle Ditch 0.37 – Facing downstream from bridge at Boulder Drive



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 34

River Code: RM: 0.37 Stream: NAGLE DITCH
 Date: 9/12/03 Location: AT BOULDER DRIVE
 Scorers Full Name: JAY MILLER Affiliation: USACE - BOONEVILLE

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

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY
<input type="checkbox"/> B-LDR /SLBS[10]	<input type="checkbox"/> GRAVEL [7] <u>10</u>	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9] <u>5</u>	<input type="checkbox"/> SAND [6] <u>10</u>	<input type="checkbox"/> LIMESTONE [1]	SILT:	<input checked="" type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8] <u>10</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 type="checkbox"/> SILT NORMAL [0]
<input checked="" type="checkbox"/> MUCK [2] <u>30</u>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> HARDPAN [0]		<input type="checkbox"/> SILT FREE [1]
<input checked="" type="checkbox"/> SILT [2] <u>35</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
3
Max 20

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

COMMENTS: Very mucky w/ embedded cobbles/boulders/gravel
 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)

<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>1</u> ROOTWADS [1]	<u>0</u> AQUATIC MACROPHYTES [1]
<u>0</u> SHALLOWS (IN SLOW WATER) [1]	<u>1</u> BOULDERS [1]	<u>1</u> LOGS OR WOODY DEBRIS [1]
<u>2</u> ROOTMATS [1]	COMMENTS:	

<input type="checkbox"/> EXTENSIVE > 75% [11]
<input type="checkbox"/> MODERATE 25-75% [7]
<input type="checkbox"/> SPARSE 5-25% [3]
<input type="checkbox"/> 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
<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 checked="" 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 checked="" type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]	<input checked="" type="checkbox"/> CANOPY REMOVAL <input type="checkbox"/> LEVEED
<input checked="" 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
6
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)	
<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"/> URBAN OR INDUSTRIAL [0]	<input type="checkbox"/> OPEN PASTURE, ROWCROP [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"/> OPEN PASTURE, ROWCROP [0]	<input type="checkbox"/> MINING/CONSTRUCTION [0]	<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 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 checked="" 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 checked="" type="checkbox"/> SLOW [1] <input type="checkbox"/> VERY FAST [1]
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS:	

Pool/Current
5
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 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		<input type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
[RIFFLE=0]			<input type="checkbox"/> EXTENSIVE [-1]

COMMENTS: ALL STAGNANT GLIDE NO RIFFLE [Metric=0]

Riffle/Run
0
Max 8
Gradient
8
Max 10

6) GRADIENT (ft/mi): 14.3 DRAINAGE AREA (sq.mi.): 2.1
 %POOL: %GLIDE:
 %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: _____

Subjective Rating (1-10)

Aesthetic Rating (1-10)

Gradient:

- Low, - Moderate, - High

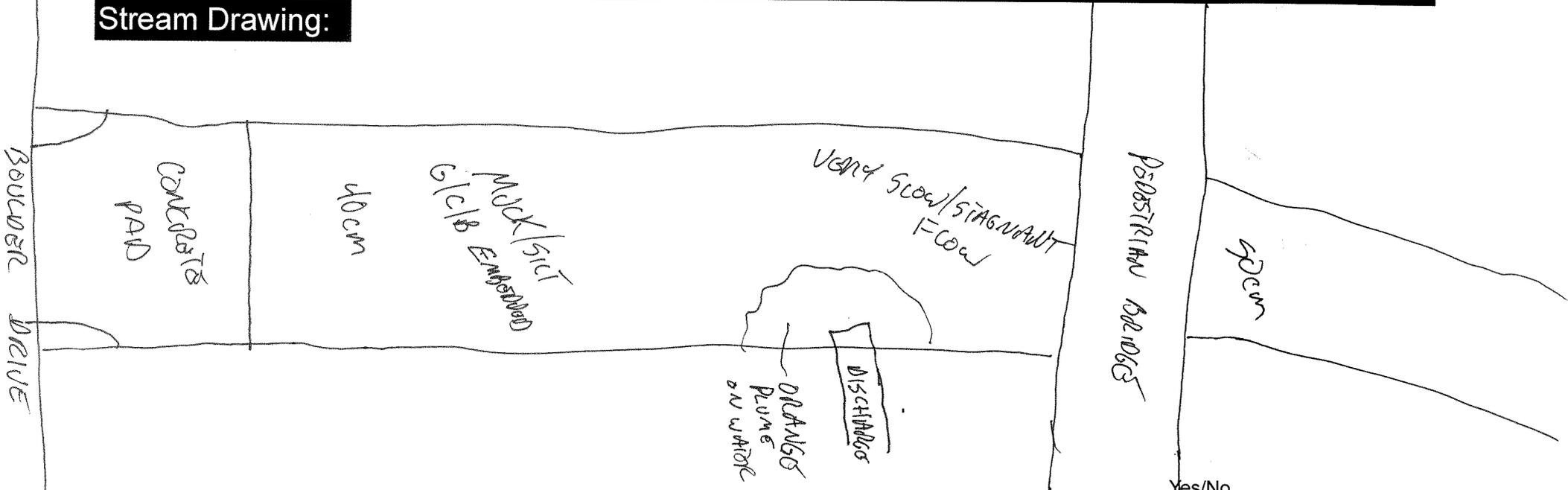
Gear: _____ Distance: _____ Water Clarity: _____ Water Stage: _____ Canopy -% Open _____

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?

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

FIELD NOTES AND PHOTOS

Stream Name and River Mile: Nagle Ditch 0.65
Stream Segment Location: At Lear-Nagle Road
QHEI Score: 32.5 HHEI Score: NA

FIELD NOTES: 12 SEP 2002

This portion of Nagle Ditch is located upstream (east) of Lear-Nagle Road. No data was collected in the dry streambed that appeared to be dominated by cobbles, boulders, gravel and sand. Green ash, staghorn sumac, silky dogwood and gray-stemmed dogwood was noted on the banks.

PHOTOS:



1) Nagle Ditch 0.65 – Facing upstream from bridge at Lear-Nagle Road