

APPENDIX 7

Stream Assessments

Macroinvertebrate Collection

This page intentionally blank

Introduction

Macroinvertebrate monitoring is a valuable tool to measure the ecological health of a stream. Because they are considered to be more sensitive to local conditions and respond relatively rapidly to change, benthic (bottom-dwelling) organisms are considered to be the primary tool to document the biological condition of the streams. The numbers and kinds of animals present at a study site can be compared to an unimpacted reference site. For example, the presence of mayflies, stoneflies, and caddisflies (also called “EPT taxa”) are indicators of good biological integrity, while many midge species are considered to be tolerant of degraded conditions. A stream with good biological integrity will have a good diversity of organisms present and not be dominated by one or two kinds of animals. This bioassessment technique results in a biological integrity value; the higher the value, the more ecologically healthy the stream.

Methods

Study Sites

1. Sand Creek at Brooks School Road
2. Sand Creek at 116th Street
3. Mud Creek at Madison/Hamilton County Line
4. Mud Creek at 116th Street
5. Mud Creek at 75th Street
6. Indian Creek at Marion/Hancock County Line
7. Indian Creek at 52nd Street
8. Indian Creek at Sunnyside Drive
9. Indian Creek below Indian Lake
10. Fall Creek below Geist Dam
11. Fall Creek at Emerson Avenue
12. Fall Creek at Meridian Street

Habitat Evaluation

The aquatic habitat at each study site was evaluated according to the method described by Ohio EPA [2]. This method results in values being assigned to various habitat parameters (e.g. substrate quality, riparian vegetation, channel morphology, etc.) and results in a numerical score for each site. Higher scores indicate higher aquatic habitat value. The maximum value for habitat using this assessment technique is 100. For quality control purposed, a duplicate assessment was conducted by a second person at site 3.

Sample Collection

Macroinvertebrate samples in this study were collected by dipnet in riffle areas where current speed approached 30 cm/sec. All samples were preserved in the field with 70% isopropanol and returned to the lab for sorting and analysis. Spring samples were collected on April 24 and 25, 2008. Fall samples were collected on October 15 and 20, 2008. A duplicate sample for quality control was collected at site 3 during the spring collections.

Laboratory Analysis

In the laboratory, a 100 organism subsample was prepared from each site by evenly distributing the animals collected in a white, gridded pan. Grids were randomly selected and all organisms within grids were removed until 100 organisms had been selected from the entire sample.

Each animal was identified to the lowest practical taxon (usually genus or species) using standard taxonomic references [4,5,6]. As each new taxon was identified, a representative specimen was preserved as a "voucher." All voucher specimens will ultimately be deposited in the Purdue University Department of Entomology collection. The list of animals found at each site number for both spring and fall collections may be found in the appendix.

Data Analysis (Macroinvertebrates)

Following identification of the animals in the sample, "metrics" were calculated for each site. These metrics are based on knowledge about the sensitivity of each species to changes in environmental conditions. The macroinvertebrate data from this study were analyzed by two different sets of metrics. Data were analyzed with the mIBI protocol developed by the Indiana Department of Environmental Management [3], which is based on taxonomic identification to the family level, and an adaptation of the Ohio EPA protocol [2], which is based on taxonomic identifications to the genus and species level. The maximum possible score with the Ohio EPA method is 60, while the mIBI has a maximum possible score of 8. To facilitate comparisons to habitat values, both biotic indices are also expressed as a percentage of the maximum possible score

Results

During spring collections, 41 macroinvertebrate genera belonging to 24 families were identified. Predominant families were Chironomidae (midges) and Elmidae (riffle beetles). The sediment-tolerant midge species *Orthocladius obumbratus* was the dominant organism at all but two sites (sites 10 and 11).

During fall collections, 63 macroinvertebrate genera belonging to 27 families were collected. Predominant families were Chironomidae (midges), Hydropsychidae (net-spinning caddisflies), especially *Cheumatopsyche* spp., and Heptageniidae (flatheaded mayflies). Macroinvertebrate raw data are listed in the appendix.

Table 1. Results for habitat (QHEI) and macroinvertebrate (Ohio EPA and IDEM mIBI) assessments. Macroinvertebrate scores are expressed as a percentage of the total possible score. Derivation of scores is listed in the appendix.

Site Number	QHEI	Ohio EPA (spring)	Ohio EPA (fall)	IDEM mIBI (spring)	IDEM mIBI (fall)
1	28	23	47	18	30
2	50	20	57	23	55
3	53	28	47	32	68
3 duplicate	56	20	*	20	*
4	50	37	53	38	68
5	67	37	30	28	38
6	31	23	50	28	50
7	58	20	43	18	30
8	59	47	60	18	65
9	70	33	37	28	40
10	73	17	37	23	53
11	76	33	67	33	70
12	54	33	47	23	50

* not applicable

Diagnosis

Comparison of habitat quality and biotic integrity

One of the most useful aspects of biological monitoring is the ability to use information about the way aquatic animals respond to different types of stress to diagnose a problem. For example, when aquatic habitat and biotic integrity are graphed in relation to each other, they form a straight line unless water quality is degraded [1]. Plus or minus 10% can be added to the graph to allow for a certain degree of measurement error. When values fall outside this range, water quality problems are suspected. A comparison of biotic integrity to habitat for this study is shown in Figures 1 and 2.

Figure 1. Comparison of Ohio EPA biotic index values to habitat values. Biotic index values are an average of spring and fall data and are expressed as a percentage of the total possible value.

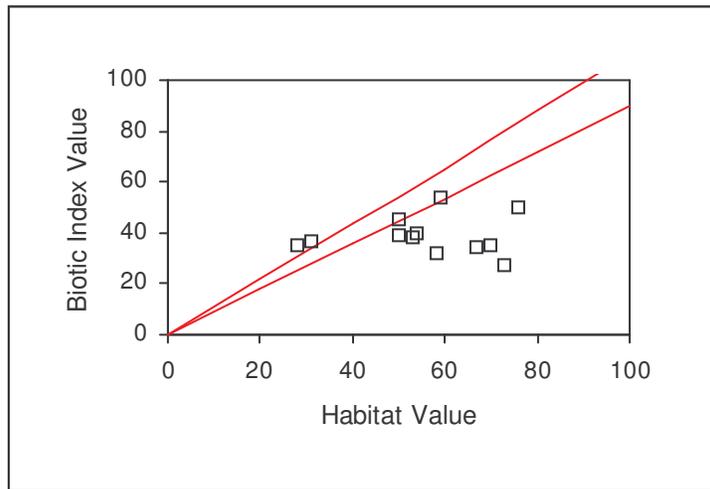
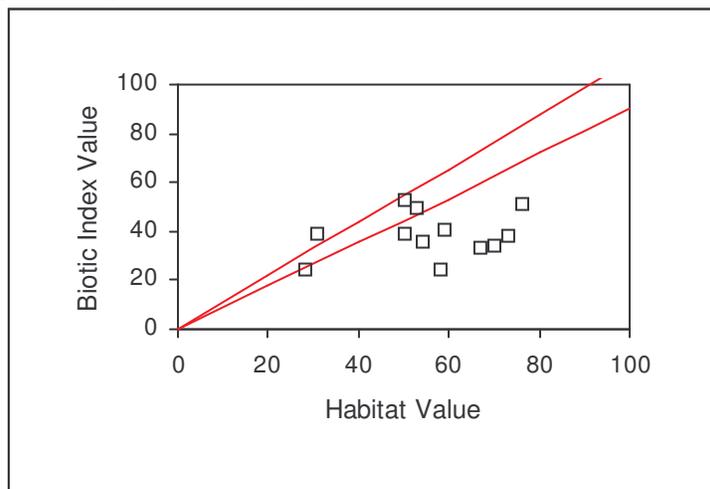


Figure 2. Comparison of IDEM macroinvertebrate biotic index values and habitat values. Biotic index values are an average of spring and fall data and are expressed as a percentage of the total possible value.



Examination of both graphs show similar patterns. Sites 5, 7, 9, 10, and 11 fall the farthest from the expected range in both graphs, which is likely the result of degraded water quality. When looking at the graph of Ohio EPA scores, sites 2, 3 and 12 group together moderately below the expected range, while on the graph of IDEM mIBI scores, sites 2, 8 and 12 are grouped together. These sites also have impaired water quality. The biotic integrity values at sites 1, 4 and 6 are within the range predicted by their habitat scores.

Primary water quality problem

The primary water quality problem in the study area appears to be silt. Extensive silt deposits were noted at several sites. Table 2 lists the silt tolerances of selected organisms

collected during the study. Although some silt intolerant organisms were present, the dominant forms were more frequently silt tolerant.

Table 2. Silt tolerances of selected organisms collected during 2008 study. [7]

<u>Organism</u>	<u>Silt Tolerance</u>
<i>Stenacron interpunctatum</i>	Tolerant
<i>Baetis intercalaris</i>	Tolerant
<i>Caenis</i> spp.	Tolerant
<i>Cheumatopsyche</i> spp.	Tolerant
<i>Hydropsyche betteni</i>	Tolerant
<i>Ceratopsyche bifida</i>	Intolerant
<i>Ceratopsyche sparna</i>	Intolerant
<i>Chimarra obscura</i>	Intolerant
<i>Orthocladius obumbratus</i>	Tolerant

Prioritization of sub-watersheds

1. Indian Creek (sites 6, 7, 8, and 9). Heavy silt deposits were observed at all sites in the Indian Creek subwatershed. Habitat at the most upstream site (6) was poor and was limited by lack of instream cover and riparian vegetation. Site 7 had the highest percentage (90%) of the sediment-tolerant midge *Orthocladius obumbratus* of any site during spring sampling. Site 8 had unstable riffle substrates that were embedded from silt deposits. Site 9 had few mayflies, was dominated by the planarian flatworm *Dugesia* in the fall collection, and had the most extensive silt deposits of any site in the study.

2. Fall Creek (sites 10, 11, and 12): Despite having a habitat score of 73, Site 10 had few mayflies, and was dominated by midges in the spring and the caddisfly *Cheumatopsyche* and blackfly larva (*Simulium* spp.) in the fall. This site is immediately below Geist Dam and may be affected by water quality problems within the reservoir, such as periodic dissolved oxygen deficits. Site 11 had the best habitat score (76) of all the study sites, but only had only fair biotic integrity, with one mayfly in the spring sample. The fall sample had good biotic integrity, with four mayfly species and three caddisfly species represented. Site 12 had few mayflies present, primarily *Stenacron interpunctatum*. Dominant organisms were the midge species *Orthocladius obumbratus* in the spring and the caddisfly genus *Cheumatopsyche* in the fall. Habitat quality was limited by a lack of in-stream cover and riparian vegetation.

3. Mud Creek (sites 3, 4, and 5): Habitat at the Mud Creek sites was good (QHEI scores of 50 to 67). The most downstream site (5) was observed to have moderate silt deposits and had impaired biotic integrity. The spring sample was dominated (50%) by *Orthocladius obumbratus* but had few mayflies, while the fall sample had no mayflies. Sites 3 and 4 had biotic integrity values closer to what would be expected based on the available habitat. Habitat quality at these sites was reduced by past channelization.

4. Sand Creek (sites 1 and 2). Site 1 had the poorest habitat (QHEI score of 28) of any of the study sites. There were heavy silt deposits, unstable substrates and evidence of recent channelization. Biotic integrity scores were close to what would be expected based on

available habitat. Site 2 had much better habitat (QHEI score of 50) with moderate levels of silt observed, but had very few mayflies in either the spring or fall collections. Both sites 1 and 2 were dominated by the midge *Orthocladius obumbratus* in the spring.

Recommendations

1. Control inflow of sediment and silt into streams throughout the Fall Creek watershed. Special emphasis should be placed on sediment control within the Indian Creek subwatershed.
2. Investigate the status of water quality in Geist Reservoir. Water quality problems within Geist Reservoir may be affecting biotic integrity downstream in Fall Creek.
3. Enhance habitat by planting riparian vegetation at sites where it is sparse or absent, for example, at the upstream site (6) of Indian Creek and the downstream site (12) of Fall Creek.
4. Avoid future channelization of streams. Sites 3 and 4 on Mud Creek are in the process of natural recovery from past channelization. Site 1 on Sand Creek showed evidence of recent channelization but also of a two-stage ditch construction project which holds the potential to improve habitat and water quality in the future.

References

1. Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid Bioassessment Protocols for use in Streams and Rivers: Benthic Macroinvertebrates and Fish. US Environmental Protection Agency, Office of Water, Washington, D.C. EPA/444/4-89-001.
2. Ohio EPA. 1987. Biological criteria for the protection of aquatic life: Vol. II. Users manual for biological field assessment of Ohio surface waters. Div. of Water Quality Monitoring and Assessment, Columbus, OH.
3. Indiana Department of Environmental Management, 1999. Metrics for analysis of benthic macroinvertebrate samples collected from artificial substrates. PowerPoint Presentation to the Ohio Valley Chapter of SETAC. Office of Water Management, Biological Studies Section, Indianapolis, IN.
4. Simpson, K.W. and R.W. Bode. 1980. Common Larvae of Chironomidae (Diptera) from New York State Streams and Rivers. Bull. No. 439. NY State Museum, Albany, NY. 105 pp.
5. Schuster, G.A. and D.A. Etnier. 1978. A manual for the identification of the larvae of the caddisfly genera *Hydropsyche* and *Symphitopsyche* in Eastern and Central North America. U.S. EPA Environmental Support Laboratory, Cincinnati, OH (EPA-600/4-78-060).

6. Merritt, R.W. and K.W. Cummins. 1996. An Introduction to the Aquatic Insects of North America. Third Edition. Kendall/Hunt Publishing Company, Dubuque, Iowa. 862 pp.

7. Roback, S.S. 1974. Insecta (Arthropoda: Insecta), in Hart, C.W. and S.L.H. Fuller, eds. Pollution Ecology of Freshwater Invertebrates. Academic Press, New York. 389 pp.

APPENDIX
Macroinvertebrate Site Data
Macroinvertebrate Metrics Data and Scoring
Qualitative Habitat Evaluation Index (QHEI) Data

Spring macroinvertebrate data, con't.

			7	8	9	10	11	12
Ephemeroptera	Baetidae	Baetis amplus						
	Heptagenidae	Stenacrom interpunctatum	2	1	2		1	9
		Stenonema femoratum		15				
		S. terminatum						4
	Caenidae	Caenis spp.	4	3	4			
Trichoptera	Hydropsychidae	Hydropsyche betteni						
		Ceratopsyche bifida					8	2
		Cheumatopsyche spp.			1	7	4	10
	Hydroptilidae	Ochotrichia spp.				1		
	Philopotamidae	Chimarra obscura						
	Polycentropidae	Neureclipsis spp.						
	Lepidostomatidae						1	
Plecoptera	Perlodidae	Isoperla spp.						
Coleoptera	Elmidae	Stenelmis spp.		2	2	1	24	
		Optioservus fastiditus		2	1			
		Macronychus glabratus						
	Psenpenidae	Psephenus herricki		8				
Odonata	Calopterygidae	Argia spp.	1					
	Coenagrionidae	Hetaerina spp.						1
Diptera	Simuliidae	Simulium spp.		10	32	14	46	
	Tipulidae	Hexatoma spp.					1	
	Ceratopogonidae							
	Chironomidae	Thienemannimyia spp.			14			6
		Orthocladius obumbratus	90	19	12	5	9	53
		Parametriocnemus lundbecki						
		Cricotopus bicinctus			2	5	4	12
		C. tremulus						
		Eukiefferiella claripennis		7	19			
		Polypedilum convictum		2	4	33	2	
		P. fallax		5				
		Dicrotendipes spp.		2		5		
		Paratendipes albimanus		17				
		Glyptotendipes lobiferus			7	24		
		Cryptochironomus fulvus		2				
		Parachironomus frequens						3
		Rheotanytarus spp.		2				
Crustacea		Decapoda	1					
Isopoda		Caecodotea spp.						
		Lirceus spp.		1				
Amphipoda			1			1		
Annelida		Oligochaeta		2		1		
		Hirudinea				1		
Bivalvia		Corbicula fluminea	1					
Platyhelminthes		Dugesia spp.				2		
total			100	100	100	100	100	100

Fall Macroinvertebrate Data

						1	2	3	4	5	6	
Ephemeroptera	Baetidae	Baetis flavistrigia					1					
		B. hageni							3			
	Heptageniidae	Stenacrom interpunctatum				3	1		1		1	
		Stenonema femoratum				4						
	Caenidae	Caenis spp.				46						
Trichoptera	Hydropsychidae	Hydropsyche betteni					12	4	43	2	8	
		Ceratopsyche bifida					2	1	8	2		
		C. sparna						4	8	11		
		Cheumatopsyche spp.					3	37	43	9	12	12
	Philopotamidae	Chimarra obscura						6				
Plecoptera	Perlidae	Perlinella spp.										
	Perlodidae									2		
Coleoptera	Elmidae	Stenelmis spp.						13	8		26	
		Optioservus fastiditus					11		4	4	15	
		Dubiraphia spp.					1					
	Psephenidae	Psephenus herricki						12				
	Hydrophilidae	Berosus spp.									3	
	Heliodidae										1	
	Odonata	Coenagrionidae	Argia spp.				3		1		1	
	Aeshnidae	Boyeria spp.						1				
Diptera	Simuliidae	Simulium spp.					5		6	60		
		Tipulidae	Tipula spp.					1	5	1	2	6
			Antocha spp.					3	1	1	1	
	Chironomidae	Ablabesmyia mallochi					4					
		Thienemannimyia spp.						4	2	1		6
		Orthocladus obumbratus						4		2	9	
		Parametrioctenus lundbecki						1			1	1
		Cricotopus bicinctus						2				1
		Eukiefferiella bavarica							2		3	
		Thienemanniella xena						2				
		Polypedilum convictum						2		1	1	7
		Dicrotendipes spp.					4					
		Glyptotendipes lobiferus					3					
		Cryptochironomus fulvus					2					
		Endochironomus nigricans					4					
		Microtendipes caelum							5			
		Rheotanytarus spp.					4					
Crustacea		Isopoda	Caecodotea spp.									2
	Lirceus spp.						11					
	Amphipoda						2		1			
Annelida	Oligochaeta					3				1		
	Hirudinea					3	1					
Bivalvia	Sphaeriidae					1						
Gastropoda	Ancylidae	Ferrissia spp.										
	Physidae	Physella spp.				1						
Platyhelminthes		Dugesia spp.						1			10	
total						100	100	100	100	100	100	

Fall Macroinvertebrate Data, con't.

			7	8	9	10	11	12
Ephemeroptera	Baetidae	B. intercalaris		1	2		18	6
	Heptageniidae	Stenacrom interpunctatum	53					
		Stenonema femoratum	5	5				
		S. terminatum					22	
		S. pulchellum					2	2
	Caenidae	Caenis spp.	1					
	Tricoryhidae	Tricorythodes spp.				4	5	
Trichoptera	Hydropsychidae	Hydropsyche betteni		14				
		H. orris					4	
		Ceratopsyche bifida		5			17	9
		C. sparna		9				
		Cheumatopsyche spp.		35	11	47	9	39
	Philopotamidae	Chimarra obscura		1	1			
Plecoptera	Perlidae	Perlinella spp.					1	
Coleoptera	Elmidae	Stenelmis spp.	2	6	17			9
		Macronychus glabratus					1	
	Psephenidae	Psephenus herricki		9				
Odonata	Coenagrionidae	Argia spp.	4					
Megaloptera	Corydalidae	Corydalus cornutus					2	
Lepidoptera	Pyrilidae						4	
Diptera	Simuliidae	Simulium spp.		2	6	26		11
	Tipulidae	Tipula spp.		4				
	Chironomidae	Thienemannimyia spp.	2		4			4
		Orthocladus obumbratus	3	1			2	4
		Parametriocnemus lundbecki	1					
		Cricotopus bicinctus		1		7	5	13
		C. trifascia						1
		Rheocricotopus robacki						1
		Thienemanniella xena		1	3			
		Polypedilum convictum		4	10	8		
		Phaenopsectra spp.	2					
		Dicrotendipes spp.	3		2		1	
		Chironomus spp.	5					
		Glyptotendipes lobiferus	3		12	1	1	
		Microtendipes caelum	3	1	1		6	
		Rheotanytarus spp.	2					1
Crustacea	Isopoda	Caecodotea spp.		1				
		Lirceus spp.	2					
Annelida	Oligochaeta		1			1		
	Hirudinea		1		1	1		
Bivalvia	Sphaeriidae				3			
Gastropoda	Ancylidae	Ferrissia spp.	7					
Platyhelminthes		Dugesia spp.			27	5		
total			100	100	100	100	100	100

Qualitative Habitat Evaluation Index (QHEI) site data

Site	1	2	3	3 dpl	4	5	6
Substrate	6	12	16	16	14	15	5
Cover	3	7	7	10	7	11	4
Channel	3	11	9	10	9	14	7
Riparian	4	6	6	3	6	7	3
Pool/Current	4	5	5	4	5	8	4
Riffle/Rum	2	3	6	5	3	6	2
Gradient	6	6	6	8	6	6	6
Total QHEI	28	50	53	56	50	67	31

Qualitative Habitat Evaluation Index (QHEI) site data

Site	7	8	9	10	11	12
Substrate	10	10	14	14	18	12
Cover	12	12	12	14	14	5
Channel	12	14	16	14	14	12
Riparian	8	8	9	10	8	3
Pool/Current	7	8	8	10	11	11
Riffle/Rum	3	1	3	5	5	5
Gradient	6	6	8	6	6	6
Total QHEI	58	59	70	73	76	54

Ohio EPA metrics data (spring)

Site	1	2	3	3 dpl.	4	5	6	7	8	9	10	11	12
# genera	9	7	11	8	10	14	8	7	16	12	13	10	9
# mayfly taxa	1	0	1	0	2	2	0	2	3	2	0	1	2
# caddisfly taxa	2	2	2	1	2	4	1	0	0	1	2	3	2
#diptera taxa	3	2	4	3	4	6	4	1	8	7	6	5	4
% tanitarsini	0	0	0	0	0	0	0	0	2	0	0	0	0
% mayflies	1	0	1	0	5	4	0	6	19	6	0	1	13
% caddisflies	2	4	4	1	26	5	3	0	0	1	8	13	12
% tolerant	1	2	1	1	0	4	3	0	9	9	35	4	12
%nontanytarsids & non-insects	96	79	62	81	66	75	74	93	67	90	91	62	74
% dominant	73	69	51	73	47	50	40	90	19	32	33	46	53

Ohio EPA metrics scoring (spring)

Site	1	2	3	3 dupl	4	5	6	7	8	9	10	11	12
# genera	2	2	2	2	2	4	2	2	4	2	2	2	2
# mayfly taxa	0	0	0	0	2	2	0	2	2	2	0	0	2
# caddisfly taxa	2	2	2	2	2	4	2	0	0	2	2	2	2
#diptera taxa	0	0	2	0	2	2	2	0	4	2	2	2	2
% tanitarsini	0	0	0	0	0	0	0	0	2	0	0	0	0
% mayflies	2	0	1	0	2	2	0	2	4	2	0	2	4
% caddisflies	2	2	2	2	6	2	2	0	0	2	2	4	4
% tolerant	6	6	6	6	6	6	6	6	6	6	0	6	4
%nontanytarsids & non-insects	0	0	2	0	0	0	0	0	0	0	0	2	0
% dominant	0	0	0	0	0	0	0	0	6	2	2	0	0
Ohio EPA score	14	12	17	12	22	22	14	12	28	20	10	20	20
standardized score	23	20	28.3	20	37	37	23	20	47	33	17	33	33

Ohio EPA metrics data (fall)

Site	1	2	3	4	5	6	7	8	9	10	11	12
# genera	17	18	13	14	13	15	18	16	14	9	15	11
# mayfly taxa	3	2	0	2	0	1	3	2	1	1	4	2
# caddisfly taxa	1	4	5	4	3	2	0	5	2	1	3	2
#diptera taxa	6	10	4	6	7	5	9	7	7	4	5	7
% tanitarsini	4	0	0	0	0	0	2	0	0	0	0	1
% mayflies	53	2	0	4	0	1	59	6	2	4	47	8
% caddisflies	3	55	62	71	16	20	0	64	12	47	30	48
% tolerant	11	2	0	0	1	1	19	1	14	9	7	13
%nontanytarsids & non-insects	36	32	11	13	78	33	33	15	69	49	15	34
% dominant	46	37	43	43	60	26	53	35	27	47	22	39

Ohio EPA metrics scoring (fall)

Site	1	2	3	4	5	6	7	8	9	10	11	12
# genera	4	4	2	4	2	4	4	4	4	2	4	2
# mayfly taxa	2	2	0	2	0	0	2	2	0	0	2	2
# caddisfly taxa	2	4	6	4	4	2	0	6	2	2	4	2
#diptera taxa	2	4	2	2	2	2	4	2	2	2	2	2
% tanitarsini	2	0	0	0	0	0	2	0	0	0	0	2
% mayflies	6	2	0	2	0	2	6	2	2	2	6	2
% caddisflies	2	6	6	6	4	6	0	6	4	6	6	6
% tolerant	4	6	6	6	6	6	4	6	4	6	6	4
%nontanytarsids & non-insects	4	4	6	6	0	4	4	6	0	2	6	4
% dominant	0	2	0	0	0	4	0	2	4	0	4	2
Ohio EPA score	28	34	28	32	18	30	26	36	22	22	40	28
Standardized score	47	57	47	53	30	50	43	60	37	37	67	47

IDEM mIBI metrics data (spring)

Site	1	2	3	3 dpl	4	5	6	7	8	9	10	11	12
Family HBI	6.01	5.66	5.29	5.7	5.48	5.52	6.22	5.97	5.57	5.9	5.86	5.19	5.69
No. of taxa	7	5	8	6	6	7	6	7	8	6	9	7	4
no. of individuals	200	>350	>350	>350	>350	200	>350	150	110	>350	200	160	150
% dominant	93	69	60	80	56	72	40	90	56	58	72	46	74
EPT index	2	1	3	1	3	4	2	2	2	3	2	3	2
ept count	6	20	25	5	155	18	31.5	9	22	25	16	22.4	37.5
ept count/total count	0.03	0.04	0.05	0.01	0.31	0.09	0.09	0.06	0.2	0.1	0.08	0.14	0.25
ept/chironomids	0.03	0.06	0.08	0.01	0.06	0.12	0.346	0.07	0.36	0.1	0.11	0.93	0.34
chironomid count	>146	>146	>146	>146	>146	144	>146	135	62	>149	144	24	111
ind/squares	>410	>410	>410	>410	>410	>410	>410	>410	<30	>410	>410	>410	>410

IDEM mIBI metrics scoring (spring)

Site	1	2	3	3 dpl	4	5	6	7	8	9	10	11	12
Family HBI	0	0	2	0	2	2	0	0	2	0	0	2	0
No. of taxa	0	0	2	0	0	0	0	0	2	0	2	0	0
no. of individuals	6	8	8	8	8	6	8	4	2	8	6	4	4
% dominant	0	0	2	0	2	0	4	0	2	2	0	2	0
EPT index	0	0	2	0	2	4	0	0	0	2	0	2	0
ept count	0	2	2	0	6	0	2	0	2	2	0	2	2
ept count/total count	0	0	0	0	2	0	0	0	2	0	0	2	2
ept/chironomids	0	0	0	0	0	0	0	0	0	0	0	0	0
chironomid count	0	0	0	0	0	2	0	2	2	0	2	4	2
ind/squares	8	8	8	8	8	8	8	8	0	8	8	8	8
mIBI	1.4	1.8	2.6	1.6	3	2.2	2.2	1.4	1.4	2.2	1.8	2.6	1.8
% of total possible	17.5	22.5	32.5	20	37.5	27.5	27.5	17.5	17.5	28	22.5	32.5	22.5

IDEM mIBI metrics data (fall)

Site	1	2	3	4	5	6	7	8	9	10	11	12
Family HBI	7.01	4.5	4.01	4.18	5.41	4.6	5.32	4.21	5.99	5.06	4.45	4.7
No. of taxa	11	9	9	8	7	10	9	11	9	7	9	6
no. of individuals	100	>350	>350	>350	>350	>350	120	>350	>350	>350	>350	>350
% dominant	46	55	56	71	60	41	58	63	32	47	30	48
EPT index	3	3	2	3	2	2	2	4	3	2	5	3
ept count	56	57	62	75	18	21	59	70	14	51	78	56
ept count/total count	0.56	0.57	0.62	0.75	0.18	0.21	0.59	0.7	0.14	0.51	0.78	0.56
ept/chironomids	2.667	2.85	15.5	18.75	1.286	1.4	2.46	10	0.438	3.188	5.2	2.33
chironomid count	21	20	4	4	14	15	24	7	32	16	15	24
ind/squares	<30	>410	>410	>410	>410	>410	<30	>410	>410	>410	>410	>410

IDEM mIBI metrics scoring (fall)

Site	1	2	3	4	5	6	7	8	9	10	11	12
Family HBI	0	6	8	6	2	6	2	6	0	4	6	4
No. of taxa	4	2	2	2	0	2	2	4	2	0	2	0
no. of individuals	2	8	8	8	8	8	2	8	8	8	8	8
% dominant	2	2	2	0	2	4	2	0	4	2	6	2
EPT index	2	2	0	2	0	0	0	4	2	0	4	2
ept count	4	4	4	4	0	2	4	4	0	4	4	4
ept count/total count	4	6	6	8	2	2	6	6	4	6	8	6
ept/chironomids	2	2	8	8	2	2	2	6	0	4	4	2
chironomid count	4	4	8	8	6	6	4	6	4	6	6	4
ind/squares	0	8	8	8	8	8	0	8	8	8	8	8
mIBI	2.4	4.4	5.4	5.4	3	4	2.4	5.2	3.2	4.2	5.6	4
% of total possible	30	55	68	67.5	38	50	30	65	40	52.5	70	50



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **28**

River Code: **01** RMI: _____ Stream: **Fish Creek**
Date: **4/25/08** Location: **Philmont Brooks School Rd.**
Scorers Full Name: **GRB** Affiliation: _____

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] _____	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9] _____	<input checked="" type="checkbox"/> SAND [6] _____	<input type="checkbox"/> LIMESTONE [1] _____	SILT:	<input checked="" type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8] _____	<input type="checkbox"/> BEDROCK [5] _____	<input type="checkbox"/> TILLS [1] _____	<input type="checkbox"/> WETLANDS [0] _____	<input type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> HARDPAN [4] _____	<input type="checkbox"/> DETRITUS [3] _____	<input type="checkbox"/> HARDPAN [0] _____	<input type="checkbox"/> SANDSTONE [0] EMBEDDED	<input type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> MUCK [2] _____	<input type="checkbox"/> ARTIFICIAL [0] _____	<input checked="" type="checkbox"/> RIP/RAP [0] _____	NESS:	<input type="checkbox"/> SILT FREE [1]
<input checked="" type="checkbox"/> SILT [2] _____	<small>Ignore Sludge Originating From Point Sources</small>	<input type="checkbox"/> LACUSTRINE [0] _____	<input checked="" type="checkbox"/> NORMAL [0]	<input type="checkbox"/> EXTENSIVE [-2]
		<input type="checkbox"/> SHALE [-1] _____	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> MODERATE [-1]
		<input type="checkbox"/> COAL FINES [-2] _____	<input type="checkbox"/> NONE [1]	

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

COMMENTS: _____

Substrate
6
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)	Cover
<input type="checkbox"/> UNDERCUT BANKS [1] _____	<input type="checkbox"/> POOLS > 70 cm [2] _____	<input type="checkbox"/> OXBOWS, BACKWATERS [1] _____
<input type="checkbox"/> OVERHANGING VEGETATION [1] _____	<input type="checkbox"/> ROOTWADS [1] _____	<input type="checkbox"/> AQUATIC MACROPHYTES [1] _____
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] _____	<input type="checkbox"/> BOULDERS [1] _____	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1] _____
<input type="checkbox"/> ROOTMATS [1] _____	COMMENTS: _____	<input checked="" type="checkbox"/> NEARLY ABSENT < 5% [1]

Cover
3
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 type="checkbox"/> HIGH [3] _____	<input type="checkbox"/> SNAGGING _____	<input type="checkbox"/> IMPOUND.
<input type="checkbox"/> MODERATE [3] _____	<input type="checkbox"/> GOOD [5] _____	<input type="checkbox"/> RECOVERED [4] _____	<input type="checkbox"/> MODERATE [2] _____	<input type="checkbox"/> RELOCATION _____	<input type="checkbox"/> ISLANDS
<input type="checkbox"/> LOW [2] _____	<input type="checkbox"/> FAIR [3] _____	<input type="checkbox"/> RECOVERING [3] _____	<input checked="" type="checkbox"/> LOW [1] _____	<input type="checkbox"/> CANOPY REMOVAL _____	<input type="checkbox"/> LEVEED
<input checked="" type="checkbox"/> NONE [1] _____	<input checked="" type="checkbox"/> POOR [1] _____	<input checked="" type="checkbox"/> RECENT OR NO RECOVERY [1] _____		<input type="checkbox"/> DREDGING _____	<input checked="" type="checkbox"/> BANK SHAPING
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS	3 Max 20

recent 2-stake ditch constr.

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 (Per Bank)
<input type="checkbox"/> WIDE > 50m [4] _____	<input type="checkbox"/> FOREST, SWAMP [3] _____	<input checked="" type="checkbox"/> CONSERVATION TILLAGE [1] _____	<input type="checkbox"/> NONE/LITTLE [3] _____
<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"/> MODERATE [2] _____
<input type="checkbox"/> NARROW 5-10m [2] _____	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] _____	<input type="checkbox"/> OPEN PASTURE, ROW CROP [0] _____	<input type="checkbox"/> HEAVY/SEVERE [1] _____
<input checked="" type="checkbox"/> VERY NARROW < 5m [1] _____	<input type="checkbox"/> FENCED PASTURE [1] _____	<input type="checkbox"/> MINING/CONSTRUCTION [0] _____	
<input type="checkbox"/> NONE [0] _____			4 Max 10

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH	MORPHOLOGY	CURRENT VELOCITY (POOLS & RIFFLES)	Pool/Current
(Check 1 ONLY!)	(Check 1 or 2 & AVERAGE)	(Check All That Apply)	
<input type="checkbox"/> > 1m [6] _____	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2] _____	<input type="checkbox"/> EDDIES [1] _____	<input type="checkbox"/> TORRENTIAL [-1] _____
<input type="checkbox"/> 0.7-1m [4] _____	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] _____	<input type="checkbox"/> FAST [1] _____	<input type="checkbox"/> INTERSTITIAL [-1] _____
<input type="checkbox"/> 0.4-0.7m [3] _____	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0] _____	<input checked="" type="checkbox"/> MODERATE [1] _____	<input type="checkbox"/> INTERMITTENT [-2] _____
<input checked="" type="checkbox"/> 0.2-0.4m [1] _____	COMMENTS: _____	<input checked="" type="checkbox"/> SLOW [1] _____	<input type="checkbox"/> VERY FAST [1] _____
<input type="checkbox"/> < 0.2m [POOL=0] _____			4 Max 12

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] _____	<input type="checkbox"/> NONE [2] _____
<input checked="" type="checkbox"/> Best Areas 5-10 cm [1] _____	<input checked="" type="checkbox"/> MAX < 50 [1] _____	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] _____	<input type="checkbox"/> LOW [1] _____	<input type="checkbox"/> MODERATE [0] _____
<input type="checkbox"/> Best Areas < 5 cm [RIFFLE=0] _____		<input checked="" 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) _____		2 Max 8

Gradient
6
Max 10

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

% POOL: % GLIDE:
% RIFFLE: % RUN:

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

River Code: 2 RMI: _____ Stream: Sand Cr.
 Date: 4/25/08 Location: 116th St
 Scorers Full Name: GRB Affiliation: _____

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] <input checked="" type="checkbox"/>	<input type="checkbox"/> SAND [6] <input checked="" type="checkbox"/>	<input type="checkbox"/> LIMESTONE [1] _____	<input type="checkbox"/> SILT HEAVY [-2] _____
<input type="checkbox"/> BOULDER [9] _____	<input type="checkbox"/> BEDROCK [5] _____	<input type="checkbox"/> DETRITUS [3] _____	<input checked="" type="checkbox"/> TILLS [1] _____	<input checked="" type="checkbox"/> SILT MODERATE [-1] _____
<input type="checkbox"/> COBBLE [8] _____	<input type="checkbox"/> ARTIFICIAL [0] _____	<input type="checkbox"/> WETLANDS [0] _____	<input type="checkbox"/> HARDPAN [0] _____	<input type="checkbox"/> SILT NORMAL [0] _____
<input type="checkbox"/> HARDPAN [4] _____	<small>NOTE: Ignore Sludge Originating From Point Sources.</small>	<input type="checkbox"/> SANDSTONE [0] EMBEDDED _____	<input type="checkbox"/> RIP/RAP [0] _____	<input checked="" type="checkbox"/> SILT FREE [1] _____
<input type="checkbox"/> MUCK [2] _____		<input type="checkbox"/> LACUSTRINE [0] _____	<input type="checkbox"/> SHALE [-1] _____	<input type="checkbox"/> EXTENSIVE [-2] _____
<input type="checkbox"/> SLT [2] _____		<input type="checkbox"/> COAL FINES [-2] _____		<input checked="" type="checkbox"/> MODERATE [-1] _____
				<input type="checkbox"/> NORMAL [0] _____
				<input type="checkbox"/> NONE [1] _____

Check ONE (OR 2 & AVERAGE) Check ONE (OR 2 & AVERAGE)

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

(High Quality Only, Score 5 or >)

12

 Max 20

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

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"/> MODERATE [3] _____	<input type="checkbox"/> GOOD [5] _____	<input checked="" type="checkbox"/> RECOVERED [4] _____	<input checked="" type="checkbox"/> MODERATE [2] _____	<input type="checkbox"/> RELOCATION _____
<input checked="" type="checkbox"/> LOW [2] _____	<input checked="" type="checkbox"/> FAIR [3] _____	<input type="checkbox"/> RECOVERING [3] _____	<input 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 _____
				<input type="checkbox"/> LEVEED _____
				<input type="checkbox"/> BANK SHAPING _____
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS _____

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 (Per Bank)
<input type="checkbox"/> WIDE > 50m [4] _____	<input checked="" 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 type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] _____	<input type="checkbox"/> HEAVY/SEVERE [1] _____
<input checked="" type="checkbox"/> VERY NARROW < 5m [1] _____	<input type="checkbox"/> FENCED PASTURE [1] _____	<input type="checkbox"/> MINING/CONSTRUCTION [0] _____
<input type="checkbox"/> NONE [0] _____		

6

 Max 10

COMMENTS: _____

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH (Check 1 ONLY)	MORPHOLOGY (Check 1 of 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 checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] _____	<input type="checkbox"/> TORRENTIAL [-1] _____
<input checked="" type="checkbox"/> 0.4-0.7m [2] _____	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0] _____	<input type="checkbox"/> INTERSTITIAL [-1] _____
<input type="checkbox"/> 0.2- 0.4m [1] _____		<input type="checkbox"/> INTERMITTENT [-2] _____
<input type="checkbox"/> < 0.2m [POOL=0] _____		<input checked="" type="checkbox"/> SLOW [1] _____
		<input type="checkbox"/> VERY FAST [1] _____

5

 Max 12

COMMENTS: _____

CHECK ONE OR CHECK 2 AND AVERAGE			
RIFFLE DEPTH	RUN DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input type="checkbox"/> Best Areas > 10 cm [2] _____	<input type="checkbox"/> MAX > 50 [2] _____	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2] _____	<input type="checkbox"/> NONE [2] _____
<input 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] _____
			<input type="checkbox"/> EXTENSIVE [-1] _____
			<input type="checkbox"/> NO RIFFLE [Metric=0] _____

3

 Max 8
 Gradient

6

 Max 10

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

% POOL: % GLIDE:
 % RIFFLE: % RUN:

* Best areas must be large enough to support a population of rhabdophyte species

plankton growth thick on rocks

River Code: J RMI: Stream: Mud Creek
Date: 4/25/08 Location: Madison/Hamilton Co. Line
Scorers Full Name: GRB Affiliation:

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

Form for Substrate evaluation including sections for TYPE, POOL RIFFLE, SUBSTRATE QUALITY, and SUBSTRATE ORIGIN. Includes checkboxes for various substrate types and quality levels.

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

Form for Instream Cover evaluation including sections for TYPE, AMOUNT, and COMMENTS. Includes checkboxes for cover types like undercut banks, overhanging vegetation, etc.

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

Form for Channel Morphology evaluation including sections for SINUOSITY, DEVELOPMENT, CHANNELIZATION, STABILITY, and MODIFICATIONS/OTHER. Includes checkboxes for various channel characteristics.

COMMENTS:

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

Form for Riparian Zone and Bank Erosion evaluation including sections for RIPARIAN WIDTH, FLOOD PLAIN QUALITY, and BANK EROSION. Includes checkboxes for various riparian zone characteristics.

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

Form for Pool/Glide and Riffle/Run Quality evaluation including sections for MAX. DEPTH, MORPHOLOGY, and CURRENT VELOCITY. Includes checkboxes for various pool and riffle characteristics.

CHECK ONE OR CHECK 2 AND AVERAGE

Form for Riffle/Run evaluation including sections for RIFFLE DEPTH, RUN DEPTH, RIFFLE/RUN SUBSTRATE, and RIFFLE/RUN EMBEDDEDNESS. Includes checkboxes for various riffle and run characteristics.

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

Form for Gradient and Drainage Area evaluation including input boxes for % POOL, % GLIDE, % RIFFLE, and % RUN.

* Best areas must be large enough to support a population of native wildlife species



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **56**

River Code: 3 R.M.: Stream: Mud Creek
Date: 4/25/08 Location: Madison/Hamilton Co. Line
Scorers Full Name: MMK Affiliation:

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]	<input checked="" type="checkbox"/> SAND [6]	<input checked="" type="checkbox"/> LESTONE [1]	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> SILT MODERATE [-1]
<input checked="" type="checkbox"/> COBBLE [8]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SILT [2]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> EXTENSIVE [-2]
				<input type="checkbox"/> MODERATE [-1]
				<input checked="" type="checkbox"/> NORMAL [0]
				<input type="checkbox"/> NONE [1]

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

COMMENTS:

Substrate
16
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)
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]
	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1]

COMMENTS:

Cover
10
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 checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input 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"/> LEVEED
				<input type="checkbox"/> DREDGING
				<input type="checkbox"/> BANK SHAPING
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS

COMMENTS:

Channel
10
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 ^L

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 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> HEAVY/SEVERE [1]
<input checked="" type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> CONSERVATION TILLAGE [1]
<input type="checkbox"/> NONE [0]		<input type="checkbox"/> URBAN OR INDUSTRIAL [0]
		<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]
		<input type="checkbox"/> MINING/CONSTRUCTION [0]

COMMENTS:

Riparian
3
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 checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> FAST [1]
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input checked="" type="checkbox"/> MODERATE [1]
<input checked="" type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> SLOW [1]
<input type="checkbox"/> < 0.2m [POOL=0]		<input type="checkbox"/> TORRENTIAL [-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	RIFFLE DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input type="checkbox"/> Best Areas > 10 cm [2]	<input type="checkbox"/> MAX > 50 [2]	<input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input checked="" type="checkbox"/> Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> MAX < 50 [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input 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
5
Max 8

Gradient
8
Max 10

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

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



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **50**

River Code: 7 RM: Stream: Mud Creek
Date: 4/25/09 Location: 116th St.
Scorer's Full Name: GRB Affiliation: _____

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]	<input checked="" type="checkbox"/> Check ONE (OR 2 & AVERAGE)	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT: Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> SAND [6]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/>	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/>	<input type="checkbox"/> HARDPAN [0]	<input checked="" type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/>	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> SILT [2]	NOTE: Ignore Sludge Originating From Point Sources		<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> EXTENSIVE [-2]
			<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> MODERATE [-1]
			<input type="checkbox"/> SHALE [-1]	<input checked="" type="checkbox"/> NORMAL [0]
			<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NONE [1]

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

Substrate
14
Max 20

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)	Cover
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> EXTENSIVE > 75% [11]	7 Max 20
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> MODERATE 25-75% [7]	
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input checked="" type="checkbox"/> SPARSE 5-25% [3]	
<input checked="" type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> NEARLY ABSENT < 5% [1]	
COMMENTS: _____	<input type="checkbox"/> AQUATIC MACROPHYTES [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	9 Max 20
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION	
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input 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"/> LEVEED	
				<input type="checkbox"/> DREDGING	

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)	6 Max 10
<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FODREST, SWAMP [3]	<input type="checkbox"/> NONE/LITTLE [3]	
<input type="checkbox"/> MODERATE 10-50m [3]	<input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2]	<input checked="" type="checkbox"/> MODERATE [2]	
<input checked="" type="checkbox"/> NARROW 5-10 m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> HEAVY/SEVERE [1]	
<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> MINING/CONSTRUCTION [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]	5 Max 12
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> FAST [3]	
<input checked="" type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input checked="" type="checkbox"/> MODERATE [1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> TORRENTIAL [-1]	
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS: _____	<input type="checkbox"/> INTERSTITIAL [-1]	

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]	3 Max 8
<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]	6 Max 10
COMMENTS: _____		<input type="checkbox"/> NO RIFFLE [Metric=0]	<input type="checkbox"/> EXTENSIVE [-1]	

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

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

River Code: 5 RM: Stream: Mud Creek
Date: 4/24/08 Location: Fall Cr. Parkway
Scorers Full Names: GRB Affiliation:

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Estimate % present)
TYPE POOL RIFFLE POOL RIFFLE SUBSTRATE ORIGIN SUBSTRATE QUALITY
Check ONE (OR 2 & AVERAGE) Check ONE (OR 2 & AVERAGE)
Substrate 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)
Cover Max 20

3) CHANNEL MORPHOLOGY (Check ONLY One PER Category OR check 2 and AVERAGE)
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY MODIFICATIONS/OTHER
Channel Max 20

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
Riparian Max 10

5) POOL/GLIDE AND RIFFLE/RUN QUALITY
MAX. DEPTH MORPHOLOGY CURRENT VELOCITY (POOLS & RIFFLES)
Pool/Current Max 12

CHECK ONE OR CHECK 2 AND AVERAGE
RIFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNESS
Riffle/Run Max 8
Gradient Max 10

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

fat mucket (w.d.) (clam) typical



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 31

River Code: 6 RM: Stream: Indian Creek
Date: 4/25/08 Location: County Line
Scorer's Full Name: GRB Affiliation: _____

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] _____	Check ONE (OR 2 & AVERAGE)		Check ONE (OR 2 & AVERAGE)	
<input type="checkbox"/> BOULDER [9] _____	<input type="checkbox"/> SAND [6] <input checked="" type="checkbox"/>	<input type="checkbox"/> LIMESTONE [1]	SILT:	<input checked="" type="checkbox"/> SILT HEAVY [-2]	Substrate 5 Max 20
<input type="checkbox"/> COBBLE [8] _____	<input type="checkbox"/> BEDROCK [5] _____	<input checked="" type="checkbox"/> FILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> SILT MODERATE [-1]	
<input type="checkbox"/> HARDPAN [4] _____	<input type="checkbox"/> DETRITUS [3] _____	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> SILT NORMAL [0]	
<input type="checkbox"/> MUCK [2] _____	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> RIP/RAP [0]	NESS:	<input checked="" type="checkbox"/> EXTENSIVE [-2]	
<input checked="" type="checkbox"/> SILT [2] <input checked="" type="checkbox"/>	<small>NOTE: Ignore Sludge Originating From Point Sources</small>	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> MODERATE [-1]	
NUMBER OF SUBSTRATE TYPES: <input checked="" type="checkbox"/> 4 or More [2]	<input checked="" type="checkbox"/> 3 or Less [0]	<input type="checkbox"/> COAL FINES [-2]		<input type="checkbox"/> NORMAL [0]	
(High Quality Only, Score 5 or >)				<input type="checkbox"/> NONE [1]	

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

<input checked="" type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	Cover 4 Max 20
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1]	
<input type="checkbox"/> ROOTMATS [1]	COMMENTS: _____	<input checked="" 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 7 Max 20	
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	<input type="checkbox"/> SNAGGING		<input type="checkbox"/> IMPOUND.
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input 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 checked="" type="checkbox"/> LOW [1]	<input type="checkbox"/> CANOPY REMOVAL		<input type="checkbox"/> LEVEED
<input type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		<input type="checkbox"/> DREDGING		<input type="checkbox"/> BANK SHAPING
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS		

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	Riparian 3 Max 10
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 checked="" 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 type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input checked="" type="checkbox"/> OPEN PASTURE, ROW CROP [1]	
<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> MINING/CONSTRUCTION [0]	
<input checked="" type="checkbox"/> NONE [0]			

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

MAX. DEPTH	MORPHOLOGY	CURRENT VELOCITY (POOLS & RIFFLES)	Pool/ Current 4 Max 12
(Check 1 ONLY)	(Check 1 or 2 & AVERAGE)	(Check All That Apply)	
<input type="checkbox"/> > 1m [6]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> EDDIES [1]	
<input type="checkbox"/> 0.7-1m [4]	<input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> FAST [3]	
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input checked="" type="checkbox"/> MODERATE [1]	
<input checked="" type="checkbox"/> 0.2-0.4m [1]	COMMENTS: _____	<input checked="" type="checkbox"/> SLOW [1]	
<input type="checkbox"/> < 0.2m [POOL=0]		<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 2 Max 8 Gradient 6 Max 10
<input type="checkbox"/> Best Areas > 10 cm [2]	<input type="checkbox"/> MAX > 50 [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]	
<input checked="" type="checkbox"/> Best Areas 5-10 cm [1]	<input checked="" type="checkbox"/> MAX < 50 [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]	
<input type="checkbox"/> Best Areas < 5 cm [RIFFLE=0]	COMMENTS: _____	<input checked="" type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]	
		<input type="checkbox"/> NO RIFFLE (Metric=0)	<input checked="" type="checkbox"/> EXTENSIVE [-1]	

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

** Best areas must be large enough to support a population of rife-obligate species
EPA 4520 06/24/01

River Code: 7 RMI: _____ Stream: Indian Creek
 Date: 4/24/08 Location: 52nd St.
 Scorers Full Name: GRB Affiliation: _____

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]	<input checked="" type="checkbox"/> GRAVEL [7]	Check ONE (OR 2 & AVERAGE)	Check ONE (OR 2 & AVERAGE)
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> SAND [6]	<input checked="" type="checkbox"/> SAND [6]	<input type="checkbox"/> LIMESTONE [1]	<input checked="" type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> BEDROCK [5]	<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"/> 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"/> ARTIFICIAL [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> SALT [2]	NOTE: Ignore Sludge Originating From Point Sources		<input type="checkbox"/> SANDSTONE [0]	<input checked="" type="checkbox"/> EXTENSIVE [-2]
			<input type="checkbox"/> RIP/RAP [0]	<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]	

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

COMMENTS: _____

Substrate
10
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)
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> EXTENSIVE > 75% [11]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/> MODERATE 25-75% [7]
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> SPARSE 5-25% [3]
<input checked="" type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> NEARLY ABSENT < 5% [1]
<input type="checkbox"/> POOLS > 70 cm [2]	
<input checked="" type="checkbox"/> ROOTWADS [1]	
<input type="checkbox"/> BOULDERS [1]	
<input type="checkbox"/> OXBOWS, BACKWATERS [1]	
<input type="checkbox"/> AQUATIC MACROPHYTES [1]	
<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1]	

COMMENTS: _____

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 checked="" type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	<input type="checkbox"/> SNAGGING
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION
<input checked="" 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
				<input type="checkbox"/> BANK SHAPING
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS

COMMENTS: _____

Channel
12
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 checked="" type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> NONE/LITTLE [3]
<input checked="" 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 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"/> MINING/CONSTRUCTION [0]
<input type="checkbox"/> NONE [0]		

COMMENTS: _____

Riparian
8
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 checked="" type="checkbox"/> 0.7-1m [4]	<input checked="" 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"/> INTERSTITIAL [-1]
<input type="checkbox"/> 0.2-0.4m [1]		<input checked="" type="checkbox"/> INTERMITTENT [-2]
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS: _____	<input checked="" type="checkbox"/> SLOW [1]
		<input type="checkbox"/> VERY FAST [1]

COMMENTS: _____

Pool/Current
7
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 checked="" 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 type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> Best Areas < 5 cm [RIFFLE=0]		<input type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input checked="" type="checkbox"/> EXTENSIVE [-1]
			<input type="checkbox"/> NO RIFFLE [Metric=0]

COMMENTS: _____

Riffle/Run
3
Max 8
6
Max 10

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

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



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: 6 59

River Code: 8 RMI: _____ Stream: Indian Creek
 Date: 4/24/08 Location: Sunnyside
 Scorers Full Name: GRB Affiliation: _____

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]	<input checked="" type="checkbox"/> SAND [6]	<input type="checkbox"/> LIMESTONE [1]	<input checked="" type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> BEDROCK [5]	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> SILT MODERATE [-1]
<input type="checkbox"/> COBBLE [8]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> COAL FINES [-2]	<input checked="" type="checkbox"/> EXTENSIVE [-2]
<input checked="" type="checkbox"/> SILT [2]				<input type="checkbox"/> MODERATE [-1]
				<input type="checkbox"/> NORMAL [0]
				<input type="checkbox"/> NONE [1]

NOTE: Ignore Sludge Originating From Point Sources

Substrate
10
 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

<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/> ROOTWADS [1]	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1]
<input checked="" type="checkbox"/> 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
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 checked="" 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 type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input 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
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS
				<input type="checkbox"/> IMPOUND.
				<input type="checkbox"/> ISLANDS
				<input type="checkbox"/> LEVEED
				<input type="checkbox"/> BANK SHAPING

Channel
14
 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 River Left

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 checked="" type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> NONE/LITTLE [3]
<input checked="" 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 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"/> CONSERVATION TILLAGE [1]
<input type="checkbox"/> NONE [0]	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]	<input type="checkbox"/> OPEN PASTURE, ROW CROP [0]
	<input type="checkbox"/> MINING/CONSTRUCTION [0]	

Riparian
8
 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)
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> EDDIES [1]
<input checked="" 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"/> INTERSTITIAL [-1]
<input type="checkbox"/> 0.2- 0.4m [1]		<input checked="" type="checkbox"/> MODERATE [1]
<input type="checkbox"/> < 0.2m [POOL=0]	COMMENTS: _____	<input checked="" type="checkbox"/> SLOW [1]
		<input type="checkbox"/> INTERMITTENT [-2]
		<input type="checkbox"/> VERY FAST [1]

Pool/Current
8
 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 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 type="checkbox"/> MODERATE [0]
COMMENTS: _____		<input type="checkbox"/> NO RIFFLE (Metric=0)	<input checked="" type="checkbox"/> EXTENSIVE [-1]

Riffle/Run
1
 Max 8
 Gradient
6
 Max 10

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

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

fat mucket (w. d.)



Qualitative Habitat Evaluation Index Field Sheet QHEI Score: **70**

River Code: 9 RMI: Stream: Indian Creek
Date: 4/24/08 Location: D/S Indian Lake
Scorers Full Name: GRB Affiliation:

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

TYPE	POOL RIFFLE	POOL RIFFLE	SUBSTRATE ORIGIN	SUBSTRATE QUALITY	
<input type="checkbox"/> BLDG / SLBS [10]	<input type="checkbox"/> GRAVEL [7]	<input checked="" type="checkbox"/> Check ONE (OR 2 & AVERAGE)	<input type="checkbox"/> LIMESTONE [1]	<input checked="" type="checkbox"/> SILT HEAVY [-2]	Substrate 14 Max 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> SAND [6]	<input type="checkbox"/> TILLS [1]	<input checked="" type="checkbox"/> SILT MODERATE [-1]	<input type="checkbox"/> SILT MODERATE [-1]	
<input checked="" type="checkbox"/> COBBLE [8]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> SILT NORMAL [0]	
<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> SANDSTONE [0] EMBEDDED	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SILT FREE [1]	
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> RIP/RAP [0] NESS:	<input type="checkbox"/> SILT [2]	<input checked="" type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> SILT [2]	<small>NOTE: Ignore Sludge Originating From Point Sources.</small>	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/> MODERATE [-1]	
NUMBER OF SUBSTRATE TYPES: (High Quality Only, Score 5 or >)		<input checked="" type="checkbox"/> 4 or More [2]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> NORMAL [0]	
		<input type="checkbox"/> 3 or Less [0]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NONE [1]	

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

(Structure)	TYPE: Score All That Occur	AMOUNT: (Check ONLY One or check 2 and AVERAGE)	Cover
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> EXTENSIVE > 75% [11]	12 Max 20
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/> ROOTWADS [1]	<input checked="" type="checkbox"/> MODERATE 25-75% [7]	
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> SPARSE 5-25% [3]	
<input checked="" type="checkbox"/> ROOTMATS [1]	COMMENTS: <u> </u>	<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 checked="" type="checkbox"/> EXCELLENT [7]	<input checked="" type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	<input type="checkbox"/> SNAGGING	16 Max 20
<input checked="" type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION	
<input type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	<input type="checkbox"/> CANOPY REMOVAL	
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]		<input type="checkbox"/> DREDGING	
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS	

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

RIPARIAN WIDTH	FLOOD PLAIN QUALITY (PAST 100 Meter RIPARIAN)	BANK EROSION	Riparian
L R (Per Bank)	L R (Most Predominant Per Bank)	L R (Per Bank)	9 Max 10
<input type="checkbox"/> WIDE > 50m [4]	<input checked="" type="checkbox"/> FOREST, SWAMP [3]	<input checked="" type="checkbox"/> NONE/LITTLE [3]	
<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> MODERATE [2]	
<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> HEAVY/SEVERE [1]	
<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/> MINING/CONSTRUCTION [0]	
<input type="checkbox"/> NONE [0]			

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 checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> EDDIES [1]	8 Max 12
<input checked="" 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 [3]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input type="checkbox"/> INTERSTITIAL [-1]	
<input type="checkbox"/> 0.2-0.4m [1]	COMMENTS: <u> </u>	<input checked="" type="checkbox"/> MODERATE [1]	
<input type="checkbox"/> < 0.2m [POOL=0]		<input checked="" type="checkbox"/> SLOW [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 checked="" type="checkbox"/> MAX > 50 [2]	<input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]	3 Max 8
<input checked="" type="checkbox"/> Best Areas 5-10 cm [1]	<input type="checkbox"/> MAX < 50 [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]	
<input type="checkbox"/> Best Areas < 5 cm. [RIFFLE=0]		<input type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]	Gradient
COMMENTS: <u> </u>		<input type="checkbox"/> NO RIFFLE (Metric=0)	<input checked="" type="checkbox"/> EXTENSIVE [-1]	8 Max 10

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

% POOL: % GLIDE:
% RIFFLE: % RUN:

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

EPA 4520 fat mucket (w.d.)
paper shell (f.d.)
extensive silt deposits

River Code: 10 RMA: _____ Stream: Fall Creek
 Date: 4/25/08 Location: Geist Dam
 Scorers Full Names: GRB Affiliation: _____

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

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

14

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

14

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 checked="" type="checkbox"/> EXCELLENT [7] <u>X</u>	<input checked="" type="checkbox"/> NONE [6] <u>X</u>	<input type="checkbox"/> HIGH [3] _____	<input type="checkbox"/> SNAGGING _____
<input checked="" type="checkbox"/> MODERATE [3] <u>X</u>	<input type="checkbox"/> GOOD [5] _____	<input type="checkbox"/> RECOVERED [4] _____	<input checked="" type="checkbox"/> MODERATE [2] <u>X</u>	<input type="checkbox"/> RELOCATION _____
<input type="checkbox"/> LOW [2] _____	<input checked="" type="checkbox"/> FAIR [3] <u>X</u>	<input type="checkbox"/> RECOVERING [3] _____	<input 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 _____
				<input type="checkbox"/> BANK SHAPING _____
				<input type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS _____

14

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 (Per Bank)
<input checked="" type="checkbox"/> WIDE > 50m [4] <u>X</u>	<input checked="" type="checkbox"/> FOREST, SWAMP [3] <u>X</u>	<input checked="" type="checkbox"/> NONE/LITTLE [3] <u>X</u>
<input type="checkbox"/> MODERATE 10-50m [3] _____	<input type="checkbox"/> SHRUB OR OLD FIELD [2] _____	<input type="checkbox"/> MODERATE [2] _____
<input type="checkbox"/> NARROW 5-10 m [2] _____	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] _____	<input type="checkbox"/> HEAVY/SEVERE [1] _____
<input type="checkbox"/> VERY NARROW < 5m [1] _____	<input type="checkbox"/> FENCED PASTURE [1] _____	<input type="checkbox"/> MINING/CONSTRUCTION [0] _____
<input type="checkbox"/> NONE [0] _____		

10

Max 10

5) POOL/GLIDE AND RIFFLE/RUN QUALITY

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

10

Max 12

CHECK ONE OR CHECK 2 AND AVERAGE

RIFFLE DEPTH	RIFFLE DEPTH	RIFFLE/RUN SUBSTRATE	RIFFLE/RUN EMBEDDEDNESS
<input checked="" type="checkbox"/> Best Areas > 10 cm [2] <u>X</u>	<input checked="" type="checkbox"/> MAX > 50 [2] <u>X</u>	<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 checked="" type="checkbox"/> LOW [1] <u>X</u>
<input type="checkbox"/> Best Areas < 5 cm. [RIFFLE=0] _____		<input checked="" type="checkbox"/> UNSTABLE (Fine Gravel, Sand) [0] <u>X</u>	<input type="checkbox"/> MODERATE [0] _____
		<input type="checkbox"/> NO RIFFLE [Metric=0] _____	<input type="checkbox"/> EXTENSIVE [-1] _____

5

Max 8

6

Max 10

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

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

River Code: 11 RMI: _____ Stream: Fall Creek
 Date: 4/24/08 Location: Emerson St.
 Scorers Full Name: GRB Affiliation: _____

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]	<input checked="" type="checkbox"/> SAND [6]	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT HEAVY [-2]
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/> DETRITUS [3]	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> MODERATE [-1]
<input checked="" type="checkbox"/> COBBLE [8]	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> WETLANDS [0]	<input checked="" type="checkbox"/> SILT NORMAL [0]
<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> SANDSTONE [0] EMBEDDED	<input type="checkbox"/> SILT FREE [1]
<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> LACUSTRINE [0]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> RIP/RAP [0] NESS:	<input type="checkbox"/> EXTENSIVE [-2]
<input type="checkbox"/> SILT [2]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> LACUSTRINE [0]	<input checked="" type="checkbox"/> MODERATE [-1]
			<input type="checkbox"/> SHALE [-1]	<input checked="" type="checkbox"/> NORMAL [0]
			<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> NONE [1]

NOTE: Ignore Sludge Originating From Point Sources

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

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)	Cover
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70 cm [2]	<input type="checkbox"/> EXTENSIVE > 75% [11]
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input checked="" type="checkbox"/> ROOTWADS [1]	<input checked="" type="checkbox"/> MODERATE 25-75% [7]
<input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]	<input type="checkbox"/> SPARSE 5-25% [3]
<input checked="" type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> NEARLY ABSENT < 5% [1]
<input type="checkbox"/> COMMENTS:	<input type="checkbox"/> AQUATIC MACROPHYTES [1]	
	<input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [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 checked="" type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]	<input type="checkbox"/> SNAGGING	<input type="checkbox"/> IMPOUND.
<input checked="" type="checkbox"/> MODERATE [3]	<input checked="" type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> RELOCATION	<input type="checkbox"/> ISLANDS
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]	<input 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 type="checkbox"/> ONE SIDE CHANNEL MODIFICATIONS	

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

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

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 checked="" 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 checked="" type="checkbox"/> FAST [3]	<input type="checkbox"/> INTERSTITIAL [-1]
<input type="checkbox"/> 0.4-0.7m [3]	<input type="checkbox"/> POOL WIDTH < RIFFLE W. [0]	<input checked="" 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:		

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

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

% POOL: % GLIDE:
 % RIFFLE: % RUN:

mucket (live)
 white heelsplitter (f.d.)
 wabash pigtoe } (w.d.)
 fat mucket }
 creeper

River Code: 12 RM: Stream: Fall Creek
Date: 4/24/08 Location: Meridian St., Indpls
Scorers Full Name: GRB Affiliation:

1) SUBSTRATE (Check ONLY Two Substrate TYPE BOXES; Estimate % present)
TYPE POC POOL RIFFLE POOL RIFFLE SUBSTRATE ORIGIN SUBSTRATE QUALITY
Check ONE (OR 2 & AVERAGE) Check ONE (OR 2 & AVERAGE)
Substrat Max 20

2) INSTREAM COVER (Give each cover type a score of 0 to 3; see back for instructions)
TYPE: Score All Types Occur
AMOUNT: (Check ONLY One or check 2 and AVERAGE)
Cover Max 20

3) CHANNEL MORPHOLOGY: (Check ONLY One PER Category OR check 2 and AVERAGE)
SINOUSITY DEVELOPMENT CHANNELIZATION STABILITY MODIFICATIONS/OTHER
Channel Max 20

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
Riparian Max 10

5) POOL/GLIDE AND RIFFLE/RUN QUALITY
MAX. DEPTH MORPHOLOGY CURRENT VELOCITY (POOLS & RIFFLES)
Pool/Current Max 12

CHECK ONE OR CHECK 2 AND AVERAGE
RIFFLE DEPTH RUN DEPTH RIFFLE/RUN SUBSTRATE RIFFLE/RUN EMBEDDEDNESS
Riffle/Run Max 8

6] GRADIENT (ft/mi): DRAINAGE AREA (sq.mi.): %POOL: %GLIDE:
%RIFFLE: %RUN:

* Best areas must always enough to support a population of rife-obligate species

Rapid Stream Assessment Field Notes

Stream Name: Sand Creek
 Location: 79th St, Brooks School Rd
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment ID: 101
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1 Valley and River Corridor

1.1 Watershed Zone:

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep	steep	x-steep	steep
Roads			moderate	<u>gentle</u>	moderate	<u>gentle</u>
Railroads			Continuous w/bank	<u>A / S / N</u>	Continuous w/bank	<u>A / S / N</u>
Improved Paths			Within 1x Wbkf	<u>A / S / N</u>	Within 1x Wbkf	<u>A / S / N</u>
Development			Texture of Exposed Slope		Texture of Exposed Slope	
			till	boulder/cobble	gravel	sand
			silt	<u>clay</u>	bedrock	other NE

None

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width: <input type="checkbox"/> Gorge	Location in Reach (record locations on field map)							
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Weir	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2 Stream Channel

2.1 Bankfull Width: 100 ft. 2.2 Max. Bankfull Depth: 5 ft. 2.3 Mean Bankfull Depth: 4 ft.
 2.4 ^{Stream} Flood-prone Width: 8 ft. 2.5 Low Bank Height: 3 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous NA 2.11 Riffle/Step Spacing: _____ ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine 0.1-0.6 in 2-16 mm Coarse 0.6-2.5 in 16-64 mm		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: <u>sand</u> Bar: <u>sand</u> circle: inches or millimeters
						<1	<1	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a h c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

2-stage ditch construction (photo)

Rapid Stream Assessment Field Notes

Stream Name: Sand Creek
 Location: 116th St
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 2
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep <u>steep</u>		x-steep <u>steep</u>	
Roads			moderate gentle		moderate gentle	
Railroads			Continuous w/bank <u>A</u> / S / N		Continuous w/bank <u>A</u> / S / N	
Improved Paths			Within 1x Wbkf <u>A</u> / S / N		Within 1x Wbkf <u>A</u> / S / N	
Development		✓	<u>Texture of Exposed Stone</u>		<u>Texture of Exposed Stone</u>	
			till boulder/cobble gravel sand		till boulder/cobble gravel sand	
			silt <u>clay</u> bedrock other NE		silt <u>clay</u> bedrock other NE	

1.5 Confinement	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
<i>Valley width / Channel width</i>	Fill out height fields for grade control with greatest total height								
Valley Width: <input checked="" type="checkbox"/> Gorge	Location in Reach (record locations on field map)								
Narrowly Confined <u>(1-2)</u>	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Weir	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2. Stream Channel

2.1 Bankfull Width: 20 ft. 2.2 Max. Bankfull Depth: 8 ft. 2.3 Mean Bankfull Depth: 6 ft.
 2.4 ^{Stream} Floodprone Width: 15 ft. 2.5 Low Bank Height: 5 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: _____ ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: Sand Bar: sand circle: inches or millimeters
			Fine 0.1-0.6in 2-16 mm	Coarse 0.6-2.5in 16-64 mm					
			30	30	40	<1	<1	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c

Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

riffles only at bridge crossing (rip rap)

Rapid Stream Assessment Field Notes

Stream Name: Mud Cr.
 Location: Madison/Hamilton Co. Line
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 3
 Date: 4/25/08
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____ 1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes					
	Left	Right	Left Corridor		Right Corridor			
Berms	None		x-steep	steep	x-steep	steep		
Roads			moderate	gentle	moderate	gentle		
Railroads			Continuous w/bank	A / S / N		Continuous w/bank	A / S / N	
Improved Paths			Within 1x Wbkf	A / S / N		Within 1x Wbkf	A / S / N	
Development			Texture of Exposed Slope	till boulder/cobble gravel sand silt clay bedrock other NE		till boulder/cobble gravel sand silt clay bedrock other NE		

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)				Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width:	Location in Reach (record locations on field map)	Fill our height fields for grade control with greatest total height					
<input checked="" type="checkbox"/> Gorge								
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	none			
Semi-confined (>2-4)	Ledge	upstream	downstream	both	none			
Narrow (>4-6)	Dam	upstream	downstream	both	none			
Broad (>6-10)	Weir	upstream	downstream	both	none			
Very Broad (>10)	Culverts	upstream	downstream	both	none			

2. Stream Channel

2.1 Bankfull Width: 20 ft. 2.2 Max. Bankfull Depth: 8 ft. 2.3 Mean Bankfull Depth: 6 ft.
 2.4 ^{stream} Flood-prone Width: 10 ft. 2.5 Low Bank Height: 6 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 100 ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: Bar: circle: inches or millimeters
			Fine 0.1 - 0.6 in 2-16 mm	Coarse 0.6-2.5 in 16-64 mm				Y / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Rapid Stream Assessment Field Notes

Stream Name: Mud Creek
 Location: 116 th St.
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 4
 Date: 4/25/08
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____ 1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			<u>x-steep</u> steep		<u>x-steep</u> steep	
Roads			moderate gentle		moderate gentle	
Railroads			Continuous w/bank A / S <u>N</u>		Continuous w/bank A / S <u>N</u>	
Improved Paths			Within 1x Wbkf A / S / N		Within 1x Wbkf A / S / N	
Development			Texture of Exposed Slope		Texture of Exposed Slope	
			till boulder/cobble gravel sand		till boulder/cobble gravel sand	
			silt <u>clay</u> bedrock other NE		silt <u>clay</u> bedrock other NE	

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Location in Reach (record locations on field map)	Waterfall	upstream	downstream	both				
Valley Width: <u>X</u> Gorge									
Narrowly Confined (1-2)					<u>none</u>				
Semi-confined (>2-4)					<u>none</u>				
Narrow (>4-6)					<u>none</u>				
Broad (>6-10)					<u>none</u>				
Very Broad (>10)					<u>none</u>				

2. Stream Channel

2.1 Bankfull Width: 25 ft. 2.2 Max. Bankfull Depth: 10 ft. 2.3 Mean Bankfull Depth: 8 ft.
 2.4 ^{Stream} Floodprone Width: 20 ft. 2.5 Low Bank Height: 8 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous (NA) 2.11 Riffle/Step Spacing: _____ ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand <0.1 in <2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: <u>sand</u> Bar: <u>gravel</u> circle: inches or millimeters
			Fine 0.1-0.6in 2-16 mm	Coarse 0.6-2.5in 16-64 mm					
		<u>5</u>	<u>30</u>	<u>20</u>	<u>45</u>	<u><1</u>	<u><1</u>	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool (Plane Bed) Riffle-Pool Ripple-Dune Braided

riffle at bridge (rip rap)

Rapid Stream Assessment Field Notes

Stream Name: Mud Creek
 Location: Ford Creek Pkwy
 Observers: CAB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 5
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: _____ ft.

1 Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			<u>x-steep</u> steep	steep	<u>x-steep</u> steep	steep
Roads			moderate	gentle	<u>moderate</u> gentle	gentle
Railroads			Continuous w/bank	A / S / <u>N</u>	Continuous w/bank	A / S / <u>N</u>
Improved Paths			Within 1x Wbkt	A / S / N	Within 1x Wbkt	A / S / N
Development			<u>Texture of Exposed Slope</u>		<u>Texture of Exposed Slope</u>	
			till boulder/cobble	gravel <u>sand</u>	till boulder/cobble	gravel <u>sand</u>
			silt clay bedrock	other NE	silt clay bedrock	other NE

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)				Fill out height fields for grade control with greatest total height	Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width: <input type="checkbox"/> Gorge	Location in Reach (record locations on field map)							
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Weir	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2 Stream Channel

2.1 Bankfull Width: 30 ft. 2.2 Max. Bankfull Depth: 4 ft. 2.3 Mean Bankfull Depth: 3 ft.
 2.4 ^{Stream} Floodprone Width: 20 ft. 2.5 Low Bank Height: 2 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 100 ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine Coarse 0.1-0.6in 0.6-2.5in 2-16 mm 16-64 mm		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: gravel Bar: gravel circle: inches or millimeters
		10	20	20	50	1	1	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Rapid Stream Assessment Field Notes

Stream Name: Indian Creek
 Location: County Line
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: Sunny 70° F
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 6
 Date: 4/25/08
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No _____

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep	<u>steep</u>	x-steep	<u>steep</u>
Roads			moderate	gentle	moderate	gentle
Railroads			Continuous w/bank	A / S / <u>N</u>	Continuous w/bank	A / S / <u>N</u>
Improved Paths			Within 1x Wbkf	A / S / N	Within 1x Wbkf	A / S / N
Development			<u>Texture of Exposed Slope</u>		<u>Texture of Exposed Slope</u>	
			till	boulder/cobble gravel sand	till	boulder/cobble gravel sand
			silt	<u>clay</u> bedrock other NE	silt	<u>clay</u> bedrock other NE

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width:	Location in Reach (record locations on field map)							
Narrowly Confined (1-2)	<input checked="" type="checkbox"/> Gorge	Waterfall	upstream	downstream	both	<u>none</u>			
Semi-confined (>2-4)		Ledge	upstream	downstream	both	<u>none</u>			
Narrow (>4-6)		Dam	upstream	downstream	both	<u>none</u>			
Broad (>6-10)		Well	upstream	downstream	both	<u>none</u>			
Very Broad (>10)		Culverts	upstream	downstream	both	<u>none</u>			

2. Stream Channel

2.1 Bankfull Width: 30 ft. 2.2 Max. Bankfull Depth: 8 ft. 2.3 Mean Bankfull Depth: 8 ft.
 2.4 ^{Stream} Floodprone Width: 8 ft. 2.5 Low Bank Height: 8 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous NA 2.11 Riffle/Step Spacing: _____ ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine Coarse 0.1-0.6 in 0.6-2.5 in 2-16 mm 16-64 mm		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: <u>sand</u> Bar: <u>sand</u> circle: inches or millimeters
			25	5	70	<1	<1	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

Rapid Stream Assessment Field Notes

Stream Name: Indian Creek
 Location: 52nd St.
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 7
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: _____ ft.

1 Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep	steep	x-steep	steep
Roads			<u>moderate</u>	gentle	<u>moderate</u>	gentle
Railroads			Continuous w/bank	A / S / <u>N</u>	Continuous w/bank	A / S / <u>N</u>
Improved Paths			Within 1x Wbkt	A / S / N	Within 1x Wbkt	A / S / N
Development			Texture of Exposed Slope		Texture of Exposed Slope	
			till	boulder/cobble	gravel	sand
			<u>clay</u>	bedrock	other	NE

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width: <input type="checkbox"/> Gorge	Location in Reach (record locations on field map)							
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (<u>>2-4</u>)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Well	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2 Stream Channel

2.1 Bankfull Width: 25 ft. 2.2 Max. Bankfull Depth: 7 ft. 2.3 Mean Bankfull Depth: 6 ft.
 2.4 ^{stream} Floodprone Width: 20 ft. 2.5 Low Bank Height: 6 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 100 ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: Bar: circle: inches or millimeters
			Fine 0.1-0.6 in 2-16 mm	Coarse 0.6-2.5 in 16-64 mm					
		<u>5</u>	<u>15</u>	<u>10</u>	<u>70</u>	<u><1</u>	<u><1</u>	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Impounded by beavers u/s

Rapid Stream Assessment Field Notes

Stream Name: Indian Creek
 Location: Sunnyside
US Indian Lake
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 8
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: _____ ft.

1 Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep <u>moderate</u>	steep gentle	x-steep <u>moderate</u>	steep gentle
Roads			Continuous w/bank	A / S / <u>N</u>	Continuous w/bank	A / S / <u>N</u>
Railroads			Within 1x Wbkt	A / S / N	Within 1x Wbkt	A / S / N
Improved Paths			Texture of Exposed Slope		Texture of Exposed Slope	
Development			till boulder/cobble silt clay bedrock	gravel <u>sand</u> other NE	till boulder/cobble <u>gravel</u> silt clay bedrock	sand other NE

1.5 Confinement	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
Valley width / Channel width	Location in Reach (record locations on field map)								
Valley Width: <input type="checkbox"/> Gorge									
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Weir	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2 Stream Channel

2.1 Bankfull Width: 30 ft. 2.2 Max. Bankfull Depth: 8.6 ft. 2.3 Mean Bankfull Depth: 4 ft.
 2.4 ^{stream} Floodprone Width: 15 ft. 2.5 Low Bank Height: 4 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / (partial) / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 100 ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: <u>sand</u> Bar: <u>gravel</u> circle: inches or millimeters
			Fine 0.1-0.6 in 2-16 mm	Coarse 0.6-2.5 in 16-64 mm					
		<u>5</u>	<u>30</u>	<u>15</u>	<u>50</u>	<u><1</u>	<u><1</u>	<u>Y / N</u>	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

Rapid Stream Assessment Field Notes

Stream Name: Indian Creek
 Location: D/S Indian Lake
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 9
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 500 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep <u>moderate</u>	steep gentle	x-steep <u>moderate</u>	steep gentle
Roads			Continuous w/bank <u>A</u> / S / N	Within 1x Wbkt A / S / N	Continuous w/bank <u>A</u> / S / N	Within 1x Wbkt A / S / N
Railroads			Texture of Exposed Slope		Texture of Exposed Slope	
Improved Paths			till boulder/cobble gravel <u>sand</u>	silt clay bedrock other NE	till boulder/cobble gravel <u>sand</u>	silt clay bedrock other NE
Development						

1.5 Confinement	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
<i>Valley width / Channel width</i>	Location in Reach (record locations on field map)								
Valley Width: <input type="checkbox"/> Gorge	Waterfall	upstream	downstream	both					
Narrowly Confined (1-2)	Ledge	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Dam	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Weir	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Culverts	upstream	downstream	both	<u>none</u>				
Very Broad (>10)									

2. Stream Channel

2.1 Bankfull Width: 30 ft. 2.2 Max. Bankfull Depth: 7 ft. 2.3 Mean Bankfull Depth: 4 ft.
 2.4 ^{Stream} Floodprone Width: 20 ft. 2.5 Low Bank Height: 3 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 100 ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine Coarse 0.1-0.6in 0.6-2.5in 2-16 mm 16-64 mm		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: Bar: circle: inches or millimeters
		<u>30</u>	<u>20</u>	<u>30</u>	<u>20</u>	<u><1</u>	<u><1</u>	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

Rapid Stream Assessment Field Notes

Stream Name: Fall Creek
 Location: Geist Dam
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 10
 Date: 4/25/08
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 1000 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep	steep	x-steep	steep
Roads			moderate	<u>gentle</u>	moderate	<u>gentle</u>
Railroads			Continuous w/bank	<u>A</u> / S / N	Continuous w/bank	<u>A</u> / S / N
Improved Paths			Within 1x Wbkf	A / S / N	Within 1x Wbkf	A / S / N
Development			<u>Texture of Exposed Slope</u>		<u>Texture of Exposed Slope</u>	
			till	boulder/cobble	gravel	<u>sand</u>
			silt	clay	bedrock	other NE

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)					Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Valley Width: <input type="checkbox"/> Gorge	Location in Reach (record locations on field map)							
Narrowly Confined (1-2)	Waterfall	upstream	downstream	both	<u>none</u>				
Semi-confined (>2-4)	Ledge	upstream	downstream	both	<u>none</u>				
Narrow (>4-6)	Dam	upstream	downstream	both	<u>none</u>				
Broad (>6-10)	Well	upstream	downstream	both	<u>none</u>				
Very Broad (>10)	Culverts	upstream	downstream	both	<u>none</u>				

2. Stream Channel

2.1 Bankfull Width: 100 ft. 2.2 Max. Bankfull Depth: 6 ft. 2.3 Mean Bankfull Depth: 5 ft.
 2.4 ^{stream} Floodprone Width: 100 ft. 2.5 Low Bank Height: 4 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous NA 2.11 Riffle/Step Spacing: _____ ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel		5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: <u>sand</u> Bar: <u>sand</u> circle: inches or millimeters
			Fine 0.1-0.6in 2-16 mm	Coarse 0.6-2.5in 16-64 mm					
			<u>20</u>	<u>10</u>	<u>70</u>	<u><1</u>	<u><1</u>	<u>Y</u> / N	

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a h c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

No riffles except those at base of dam

Rapid Stream Assessment Field Notes

Stream Name: Fall Creek
 Location: Emerson St
Indpls
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: _____
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 11
 Date: _____
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: _____ ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes / No _____

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes			
	Left	Right	Left Corridor		Right Corridor	
Berms			x-steep	steep	x-steep	steep
Roads			moderate	gentle	moderate	gentle
Railroads			Continuous w/bank	A / S / N	Continuous w/bank	A / S / N
Improved Paths			Within 1x Wbkt	A / S / N	Within 1x Wbkt	A / S / N
Development			Texture of Exposed Slope		Texture of Exposed Slope	
			till	boulder/cobble	gravel	sand
			silt	clay	bedrock	other NE

1.5 Confinement <i>Valley width / Channel width</i>	1.6 Grade Controls (circle one)				Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Location in Reach (record locations on field map)	Waterfall	upstream	downstream				
Valley Width: <input type="checkbox"/> Gorge								
Narrowly Confined (1-2)								
Semi-confined (>2-4)								
Narrow (>4-6)								
Broad (>6-10)								
Very Broad (>10)								

2. Stream Channel

2.1 Bankfull Width: 90 ft. 2.2 Max. Bankfull Depth: 17 ft. 2.3 Mean Bankfull Depth: 5 ft.
 2.4 ^{Stream} Floodprone Width: 90 ft. 2.5 Low Bank Height: 4 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 500 ft.
 2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine 0.1-0.6 in 2-16 mm		Coarse 0.6-2.5 in 16-64 mm	5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on: Bed: gravel Bar: sand circle: inches or millimeters
		10	30	30	30	< 1	< 1	<u>Y</u> / N		

2.14 Stream Type: A G F B E C D 1 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Stream Type

Rapid Stream Assessment Field Notes

Stream Name: Fall Creek
 Location: Meridian Street
Indianapolis
 Observers: GRB
 Organization / Agency: _____
 USGS Map Name(s): _____
 Weather: Sunny 70°F
 Rain Storm within past 7 days: Y / N Flood history known

Segment I.D.: 12
 Date: 4/24/08
 Town: _____
 Elevation: _____ ft.
 Latitude (N/S): _____
 Longitude (E/W): _____
 Drainage Area: _____ sq. mi.
 Segment Length: 600 ft.

1. Valley and River Corridor

1.1 Watershed Zone: _____

1.2 Alluvial Fan: Yes No

1.3 River Corridor Encroachments	Corridor Length		1.4 Adjacent Side Slopes				Total Height (0.0 ft)	Height Above Water Surface (0.0 ft)	Photos taken? Y/N	GPS Y/N
	Left	Right	Left Corridor		Right Corridor					
Berms			<input checked="" type="radio"/> x-steep	steep	<input checked="" type="radio"/> x-steep	steep				
Roads	✓	✓	moderate	gentle	moderate	gentle				
Railroads			Continuous w/bank	A / S / <input checked="" type="radio"/> N	Continuous w/bank	A / S / <input checked="" type="radio"/> N				
Improved Paths	✓	✓	Within 1x Wbkt	A / S / N	Within 1x Wbkt	A / S / N				
Development	✓	✓	Texture of Exposed Slope		Texture of Exposed Slope					
			till	boulder/cobble gravel <input checked="" type="radio"/> sand	till	boulder/cobble gravel <input checked="" type="radio"/> sand				
			silt	clay bedrock other NE	silt	clay bedrock other NE				

1.5 Confinement	1.6 Grade Controls (circle one)				Fill out height fields for grade control with greatest total height				
Valley width / Channel width	Location in Reach (record locations on field map)								
Valley Width: <input type="checkbox"/> Gorge	Waterfall	upstream	downstream	both	<input checked="" type="radio"/> none				
Narrowly Confined <input checked="" type="radio"/> (1-2)	Ledge	upstream	downstream	both	<input checked="" type="radio"/> none				
Semi-confined <input type="radio"/> (>2-4)	Dam	upstream	downstream	both	<input checked="" type="radio"/> none				
Narrow <input type="radio"/> (>4-6)	Weir	upstream	downstream	both	<input checked="" type="radio"/> none				
Broad <input type="radio"/> (>6-10)	Culverts	upstream	downstream	both	<input checked="" type="radio"/> none				
Very Broad <input type="radio"/> (>10)									

2. Stream Channel

2.1 Bankfull Width: 250 ft. 2.2 Max. Bankfull Depth: 10 ft. 2.3 Mean Bankfull Depth: 10 ft.
 2.4 ^{Stream} Floodprone Width: 130 ft. 2.5 Low Bank Height: 2 ft. 2.6 Ratio W/d_{mean}: _____
 2.7 Entrenchment: _____ 2.8 Incision Ratio: _____ 2.9 Sinuosity: _____
 2.10 Riffles/Steps: complete / partial / diagonal / continuous / NA 2.11 Riffle/Step Spacing: 500' ft.

2.12 Bed Substrate Composition (percent):

1 Bedrock	2 Boulder >10 in >256 mm	3 Cobble 2.5 - 10 in 64 - 256 mm	4 Gravel Fine 0.1-0.6 in 2-16 mm		Coarse 0.6-2.5 in 16-64 mm	5 Sand < 0.1 in < 2 mm	% Detritus	Large Woody Debris (# pieces)	Silt or Clay (present)	2.13 Avg. Size of Largest Particles on:
		<input checked="" type="radio"/> 10	20	20	40	< 5	0	<input checked="" type="radio"/> Y / N	Bed: <u>gravel</u> Bar: <u>Sand</u> circle: inches or millimeters	

2.14 Stream Type: A ^{rip rap} G F B E C D I 2 3 4 5 a b c
 Cascade Step-Pool Plane Bed Riffle-Pool Ripple-Dune Braided

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

34
CQHEI Total

Vol ID: []

Site ID: #1

River and Watershed: N 39° 50.426 W 85° 56.070 E L 253

I. Substrate (Bottom Type) Score: 0

a) Size

Mostly Large (Fist Size or Bigger) 14 pt

Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt

Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt

Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt

YES 0 pt
Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

Are Silts and Clays Distributed Throughout Stream? NO 5 pt

YES 0 pt
Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 4

Underwater Tree Roots (Large) 2 pt

Boulders 2 pt

Downed Trees, Logs, Branches 2 pt

Water Plants 2 pt

Undercut Banks 2 pt

Underwater Tree Rootlets (Fine) 2 pt

Backwaters, Oxbows or Side Channels 2 pt

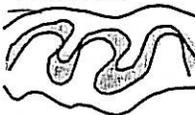
Shallow, Slow Areas for Small Fish 2 pt

Deep Areas (Chest Deep) 2 pt

Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations Score: 8

a) "Curviness" or "Sinuosity" of Channel

2 or More Good Bends 8 pt


1 or 2 Good Bends 6 pt


Mostly Straight Some "Wiggle" 3 pt


Very Straight 0 pt


b) How Natural Is The Site?

Mostly Natural 12 pt

Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt

A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt

Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 13

a) Width of Riparian Forest & Wetland - Mostly:

Wide (Can't Throw A Rock Through/ Across It) 8 pt

Narrow (Can Throw A Rock Through/ Across It) 5 pt

None 0 pt

b) Land Use - Mostly:

Forest/Wetland 5 pt

Shrubs 4 pt

Overgrown Fields 3 pt

Fenced Pasture 2 pt

Park (Grass) 2 pt

Conservation Tillage 2 pt

Suburban 1 pt

Row Crop 1 pt

Open Pasture 0 pt

Urban/Industrial 0 pt

c) Bank Erosion - Typically:

Stable Hard or Well-Vegetated Banks 4 pt

Combination of Stable and Eroding Banks 2 pt

Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

Mostly 3 pt

Partly 2 pt

None 0 pt

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

Chest Deep 8 pt

Knee Deep 4 pt

Waist Deep 6 pt

Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

Very Fast: Hard to Stand in the Current 2 pt

Moderate: Slowly Takes Objects Downstream 1 pt

None 0 pt

Fast: Quickly Takes Objects Downstream 3 pt

Slow: Flow Nearly Absent 1 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 4

a) Riffles/Runs Are:

Knee Deep or Deeper & Fast 8 pt

Ankle Deep or Less & Slow 4 pt

Ankle/Calf Deep & Fast 6 pt

Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

Fist Size or Larger 7 pt

Smaller Than Your Fingernails or Do Not Exist 0 pt

Smaller Than Fist Size, but Larger Than Fingernail 4 pt

#1 PICTURE OF G

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

48
CQHEI Total

Vol ID: []

Site ID: #2

River and Watershed: N 39° 50.667 W 85° 58.507 EL 290 M

I. Substrate (Bottom Type) Score: 0

a) Size

- Mostly Large (Fist Size or Bigger) 14 pt
- Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt
- Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt
- Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

- Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt
- YES 0 pt
- Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

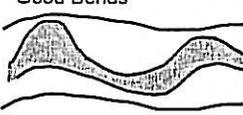
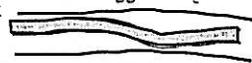
- Are Silts and Clays Distributed Throughout Stream? NO 5 pt
- YES 0 pt
- Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 10

- Underwater Tree Roots (Large) 2 pt
- Boulders 2 pt
- Downed Trees, Logs, Branches 2 pt
- Water Plants 2 pt
- Underwater Tree Rootlets (Fine) 2 pt
- Backwaters, Oxbows or Side Channels 2 pt
- Shallow, Slow Areas for Small Fish 2 pt
- Deep Areas (Chest Deep) 2 pt
- Undercut Banks 2 pt
- Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations Score: 12

a) "Curviness" or "Sinuosity" of Channel

- 2 or More Good Bends 8 pt 
- 1 or 2 Good Bends 6 pt 
- Mostly Straight Some "Wiggle" 3 pt 
- Very Straight 0 pt 

b) How Natural Is The Site?

- Mostly Natural 12 pt
- Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt
- A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt
- Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 13

a) Width of Riparian Forest & Wetland - Mostly:

- Wide (Can't Throw A Rock Through/ Across It) 8 pt
- Narrow (Can Throw A Rock Through/ Across It) 5 pt
- None 0 pt

b) Land Use - Mostly:

- Forest/Wetland 5 pt
- Shrub 4 pt
- Overgrown Fields 3 pt
- Fenced Pasture 2 pt
- Park (Grass) 2 pt
- Conservation Tillage 2 pt
- Suburban 1 pt
- Row Crop 1 pt
- Open Pasture 0 pt
- Urban/Industrial 0 pt

c) Bank Erosion - Typically:

- Stable Hard or Well-Vegetated Banks 4 pt
- Combination of Stable and Eroding Banks 2 pt
- Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

- Mostly 3 pt
- Partly 2 pt
- None 0 pt

V. Depth & Velocity Score: 9

a) Deepest Pool is At Least:

- Chest Deep 8 pt
- Knee Deep 4 pt
- Waist Deep 6 pt
- Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

- Very Fast: Hard to Stand in the Current 2 pt
- Moderate: Slowly Takes Objects Downstream 1 pt
- None 0 pt
- Fast: Quickly Takes Objects Downstream 3 pt
- Slow: Flow Nearly Absent 1 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 4

a) Riffles/Runs Are:

- Knee Deep or Deeper & Fast 8 pt
- Ankle Deep or Less & Slow 4 pt
- Ankle/Calf Deep & Fast 6 pt
- Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

- Fist Size or Larger 7 pt
- Smaller Than Your Fingernails or Do Not Exist 0 pt
- Smaller Than Fist Size, but Larger Than Fingernail 4 pt

#2 PICTURE SHOWS SILT/SAND BAR W/ TRASH & DEBRIS

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

62
CQHEI Total

Vol ID: []

Site ID: # 3

River and Watershed: N 39° 51.358 W 85° 58.204 EL 285.4"

I. Substrate (Bottom Type) Score: 15

a) Size

14 pt Mostly Large (Fist Size or Bigger)

10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)

6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)

0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?

YES 0 pt

Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

NO 5 pt Are Silts and Clays Distributed Throughout Stream?

YES 0 pt

Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: -

2 pt Underwater Tree Roots (Large)

2 pt Boulders

2 pt Downed Trees, Logs, Branches

2 pt Water Plants

2 pt Undercut Banks

2 pt Underwater Tree Rootlets (Fine)

2 pt Backwaters, Oxbows or Side Channels

2 pt Shallow, Slow Areas for Small Fish

2 pt Deep Areas (Chest Deep)

2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 20

a) "Curviness" or "Sinuosity" of Channel

8 pt 2 or More Good Bends

6 pt 1 or 2 Good Bends

3 pt Mostly Straight Some "Wiggle"

0 pt Very Straight

b) How Natural Is The Site?

12 pt Mostly Natural

6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)

9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)

0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 14

a) Width of Riparian Forest & Wetland - Mostly:

8 pt Wide (Can't Throw A Rock Through/ Across It)

5 pt Narrow (Can Throw A Rock Through/ Across It)

0 pt None

b) Land Use - Mostly:

5 pt Forest/Wetland

4 pt Shrubs

3 pt Overgrown Fields

2 pt Fenced Pasture

2 pt Park (Grass)

2 pt Conservation Tillage

1 pt Suburban

1 pt Row Crop

0 pt Open Pasture

0 pt Urban/Industrial

c) Bank Erosion - Typically:

4 pt Stable Hard or Well-Vegetated Banks

2 pt Combination of Stable and Eroding Banks

0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

3 pt Mostly

2 pt Partly

0 pt None

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

8 pt Chest Deep

4 pt Knee Deep

6 pt Waist Deep

0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

2 pt Very Fast: Hard to Stand in the Current

3 pt Fast: Quickly Takes Objects Downstream

1 pt Moderate: Slowly Takes Objects Downstream

0 pt None

1 pt Slow: Flow Nearly Absent

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 8

a) Riffles/Runs Are:

8 pt Knee Deep or Deeper & Fast

4 pt Ankle Deep or Less & Slow

6 pt Ankle/Calf Deep & Fast

0 pt Do Not Exist

b) Riffle/Run Substrates Are:

7 pt Fist Size or Larger

0 pt Smaller Than Your Fingernails or Do Not Exist

4 pt Smaller Than Fist Size, but Larger Than Fingernail

3 PICTURE OF BANKS + TREES OVERHANG + ROOTS 23

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

43
CQHEI Total

Vol ID: []

Site ID: #4

River and Watershed: N 39° 52.879 W 85° 58.837 EL 242.8

I. Substrate (Bottom Type) Score: []

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
- YES 0 pt Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltng"

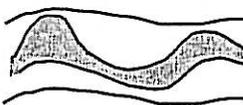
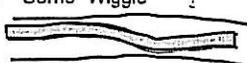
- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
- YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 8

- 2 pt Underwater Tree Roots (Large)
- 2 pt Boulders
- 2 pt Downed Trees, Logs, Branches
- 2 pt Water Plants
- 2 pt Undercut Banks
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Deep Areas (Chest Deep)
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 12

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 18

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 1 pt Moderate: Slowly Takes Objects Downstream
- 0 pt None
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 0

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 4 pt Ankle Deep or Less & Slow
- 6 pt Ankle/Calf Deep & Fast
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail
- 0 pt Smaller Than Your Fingernails or Do Not Exist

#4 PICTURE OF CULVERT ON S. BANK + SMALL WATERCRAFT

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

77
CQHEI Total

Vol ID: []

Site ID: #5

River and Watershed: N 39° 53' 02" W 86° 00' 29" EL 237.9m

I. Substrate (Bottom Type) Score: 19

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
 - YES 0 pt
- Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
 - YES 0 pt
- Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 12

- 2 pt Underwater Tree Roots (Large)
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Boulders
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Downed Trees, Logs, Branches
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Water Plants
- 2 pt Deep Areas (Chest Deep)
- 2 pt Undercut Banks
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 18

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends
- 6 pt 1 or 2 Good Bends
- 3 pt Mostly Straight Some "Wiggle"
- 0 pt Very Straight

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 17

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 11

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 6 pt Waist Deep
- 4 pt Knee Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Moderate: Slowly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent
- 0 pt None

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: []

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 6 pt Ankle/Calf Deep & Fast
- 4 pt Ankle Deep or Less & Slow
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail
- 0 pt Smaller Than Your Fingernails or Do Not Exist

#8 PICTURE UNDER BRIDGE SHOWING 23 GRAVELLY SAND BAR

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

85
CQHEI Total

Vol ID: []

Site ID: #6

River and Watershed: N 39° 53.894 W 85° 59.448 EL 232.8'

I. Substrate (Bottom Type) Score: 14

a) Size

Mostly Large (Fist Size or Bigger) 14 pt

Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt

Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt

Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt

YES 0 pt
Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

Are Silts and Clays Distributed Throughout Stream? NO 5 pt

YES 0 pt
Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 16

Underwater Tree Roots (Large) 2 pt

Boulders 2 pt

Downed Trees, Logs, Branches 2 pt

Water Plants 2 pt

Undercut Banks 2 pt

Underwater Tree Rootlets (Fine) 2 pt

Backwaters, Oxbows or Side Channels 2 pt

Shallow, Slow Areas for Small Fish 2 pt

Deep Areas (Chest Deep) 2 pt

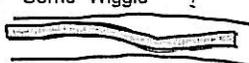
Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations Score: 18

a) "Curviness" or "Sinuosity" of Channel

2 or More Good Bends 8 pt


1 or 2 Good Bends 6 pt


Mostly Straight Some "Wiggle" 3 pt


Very Straight 0 pt


b) How Natural Is The Site?

Mostly Natural 12 pt

Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt

A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt

Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 15

a) Width of Riparian Forest & Wetland - Mostly:

Wide (Can't Throw A Rock Through/ Across It) 8 pt

Narrow (Can Throw A Rock Through/ Across It) 5 pt

None 0 pt

b) Land Use - Mostly:

Forest/Wetland 5 pt

Shrubs 4 pt

Overgrown Fields 3 pt

Fenced Pasture 2 pt

Park (Grass) 2 pt

Conservation Tillage 2 pt

Suburban 1 pt

Row Crop 1 pt

Open Pasture 0 pt

Urban/Industrial 0 pt

c) Bank Erosion - Typically:

Stable Hard or Well-Vegetated Banks 4 pt

Combination of Stable and Eroding Banks 2 pt

Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

Mostly 3 pt

Partly 2 pt

None 0 pt

V. Depth & Velocity Score: 9

a) Deepest Pool is At Least:

Chest Deep 8 pt

Knee Deep 4 pt

Waist Deep 6 pt

Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

Very Fast: Hard to Stand in the Current 2 pt

Fast: Quickly Takes Objects Downstream 3 pt

Moderate: Slowly Takes Objects Downstream 1 pt

Slow: Flow Nearly Absent 1 pt

None 0 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 13

a) Riffles/Runs Are:

Knee Deep or Deeper & Fast 8 pt

Ankle/Calf Deep & Fast 6 pt

Ankle Deep or Less & Slow 4 pt

Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

Fist Size or Larger 7 pt

Smaller Than Fist Size, but Larger Than Fingernail 4 pt

Smaller Than Your Fingernails or Do Not Exist 0 pt

#5 PICTURE SHOWS FALLING TREES & OVER HANG

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

69
CQHEI Total

Vol ID: []

Site ID: # 7

River and Watershed: N 39° 54.140 W 86° 00.662 EL 231.5'

I. Substrate (Bottom Type) Score: 20

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
 - YES 0 pt
- Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltng"

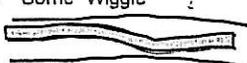
- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
 - YES 0 pt
- Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 8

- 2 pt Underwater Tree Roots (Large)
- 2 pt Boulders
- 2 pt Downed Trees, Logs, Branches
- 2 pt Water Plants
- 2 pt Undercut Banks
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Deep Areas (Chest Deep)
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 18

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 18

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 1 pt Moderate: Slowly Takes Objects Downstream
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent
- 0 pt None

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 0

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 4 pt Ankle Deep or Less & Slow
- 6 pt Ankle/Calf Deep & Fast
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail
- 0 pt Smaller Than Your Fingernails or Do Not Exist

6 PICTURE FROM BRIDGE SHOWS OVERTHANG OF TREES + BANKS

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

51
CQHEI Total

Vol ID: []

Site ID: #8

River and Watershed: N 39° 54.747 W 86.001053 EL 250.8'

I. Substrate (Bottom Type)

Score: 0

a) Size

Mostly Large (Fist Size or Bigger) 14 pt

Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt

Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt

Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt

YES 0 pt
Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

Are Silts and Clays Distributed Throughout Stream? NO 5 pt

YES 0 pt
Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present

Score: 8

Underwater Tree Roots (Large) 2 pt

Boulders 2 pt

Downed Trees, Logs, Branches 2 pt

Water Plants 2 pt

Undercut Banks 2 pt

Underwater Tree Rootlets (Fine) 2 pt

Backwaters, Oxbows or Side Channels 2 pt

Shallow, Slow Areas for Small Fish 2 pt

Deep Areas (Chest Deep) 2 pt

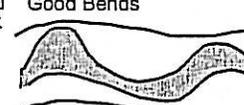
Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations

Score: 20

a) "Curviness" or "Sinuosity" of Channel

2 or More Good Bends 8 pt


1 or 2 Good Bends 6 pt


Mostly Straight Some "Wiggle" 3 pt


Very Straight 0 pt


b) How Natural Is The Site?

Mostly Natural 12 pt

Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt

A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt

Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

IV. Stream Forests & Wetlands (Riparian Area) & Erosion

Score: 18

a) Width of Riparian Forest & Wetland - Mostly:

Wide (Can't Throw A Rock Through/ Across It) 8 pt

Narrow (Can Throw A Rock Through/ Across It) 5 pt

None 0 pt

b) Land Use - Mostly:

Forest/Wetland 5 pt

Shrubs 4 pt

Overgrown Fields 3 pt

Fenced Pasture 2 pt

Park (Grass) 2 pt

Conservation Tillage 2 pt

Suburban 1 pt

Row Crop 1 pt

Open Pasture 0 pt

Urban/Industrial 0 pt

c) Bank Erosion - Typically:

Stable Hard or Well-Vegetated Banks 4 pt

Combination of Stable and Eroding Banks 2 pt

Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

Mostly 3 pt

Partly 2 pt

None 0 pt

V. Depth & Velocity

Score: 5

a) Deepest Pool is At Least:

Chest Deep 8 pt

Knee Deep 4 pt

Waist Deep 6 pt

Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

Very Fast: Hard to Stand in the Current 2 pt

Fast: Quickly Takes Objects Downstream 3 pt

Moderate: Slowly Takes Objects Downstream 1 pt

Slow: Flow Nearly Absent 1 pt

None 0 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken)

Score: 0

a) Riffles/Runs Are:

Knee Deep or Deeper & Fast 8 pt

Ankle/Calf Deep & Fast 6 pt

Ankle Deep or Less & Slow 4 pt

Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

Fist Size or Larger 7 pt

Smaller Than Fist Size, but Larger Than Fingernail 4 pt

Smaller Than Your Fingernails or Do Not Exist 0 pt

#7 picture of UNDERWATER
12" GALV CULVERT 23

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

60
CQHEI Total

Vol ID: []

Site ID: #9

River and Watershed: N39° 55.633 W86° 00.201 EL 239.3m

I. Substrate (Bottom Type) Score: 14

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
- YES 0 pt Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltng"

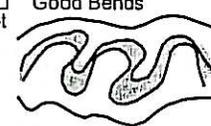
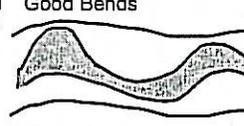
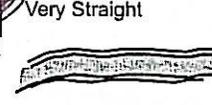
- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
- YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 8

- 2 pt Underwater Tree Roots (Large)
- 2 pt Boulders
- 2 pt Downed Trees, Logs, Branches
- 2 pt Water Plants
- 2 pt Undercut Banks
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Deep Areas (Chest Deep)
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 15

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 17

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 6

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 1 pt Moderate: Slowly Takes Objects Downstream
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent
- 0 pt None

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 0

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 4 pt Ankle Deep or Less & Slow
- 6 pt Ankle/Calif Deep & Fast
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail
- 0 pt Smaller Than Your Fingernails or Do Not Exist

#9 PICTURE FROM UNDER BRIDGE SHOWS BEER CANS & WEST BANK TREES + ROOT

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

60
CQHEI Total

Vol ID: []

Site ID: #10

River and Watershed: N 39° 57.64 W 85° 56.1543 E L 243.6

I. Substrate (Bottom Type)

Score: 14

a) Size

Mostly Large (Fist Size or Bigger) 14 pt

Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt

Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt

Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt

YES 0 pt
Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

Are Silts and Clays Distributed Throughout Stream? NO 5 pt

YES 0 pt
Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present

Score: 10

Underwater Tree Roots (Large) 2 pt

Boulders 2 pt

Downed Trees, Logs, Branches 2 pt

Water Plants 2 pt

Undercut Banks 2 pt

Underwater Tree Rootlets (Fine) 2 pt

Backwaters, Oxbows or Side Channels 2 pt

Shallow, Slow Areas for Small Fish 2 pt

Deep Areas (Chest Deep) 2 pt

Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations

Score: 12

a) "Curviness" or "Sinuosity" of Channel

2 or More Good Bends 8 pt

1 or 2 Good Bends 6 pt

Mostly Straight Some "Wiggle" 3 pt

Very Straight 0 pt

b) How Natural Is The Site?

Mostly Natural 12 pt

Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt

A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt

Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

PARK

IV. Stream Forests & Wetlands (Riparian Area) & Erosion

Score: 11

a) Width of Riparian Forest & Wetland - Mostly:

Wide (Can't Throw A Rock Through/ Across It) 8 pt

Narrow (Can Throw A Rock Through/ Across It) 5 pt

None 0 pt

b) Land Use - Mostly:

Forest/Wetland 5 pt

Shrubs 4 pt

Overgrown Fields 3 pt

Fenced Pasture 2 pt

Park (Grass) 2 pt

Conservation Tillage 2 pt

Suburban 1 pt

Row Crop 1 pt

Open Pasture 0 pt

Urban/Industrial 0 pt

c) Bank Erosion - Typically:

Stable Hard or Well-Vegetated Banks 4 pt

Combination of Stable and Eroding Banks 2 pt

Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

Mostly 3 pt

Partly 2 pt

None 0 pt

V. Depth & Velocity

Score: 8

a) Deepest Pool is At Least:

Chest Deep 8 pt

Knee Deep 4 pt

Waist Deep 6 pt

Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

Very Fast: Hard to Stand in the Current 2 pt

Fast: Quickly Takes Objects Downstream 3 pt

Moderate: Slowly Takes Objects Downstream 1 pt

Slow: Flow Nearly Absent 1 pt

None 0 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken)

Score: 13

a) Riffles/Runs Are:

Knee Deep or Deeper & Fast 8 pt

Ankle/Calf Deep & Fast 6 pt

Ankle Deep or Less & Slow 4 pt

Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

Fist Size or Larger 7 pt

Smaller Than Fist Size, but Larger Than Fingernail 4 pt

Smaller Than Your Fingernails or Do Not Exist 0 pt

#10 PICTURE LOOKING AT RIFFLE UNDER BRIDGE + DOWNED TREES ACROSS CREEK

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

58
CQHEI Total

Vol ID: []

Site ID: # 11

River and Watershed: N 39° 58.626 W 85° 55.144 EL 248.2

I. Substrate (Bottom Type) Score: 0

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
 - YES 0 pt
- Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltling"

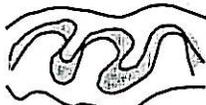
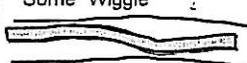
- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
- YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 8

- 2 pt Underwater Tree Roots (Large)
- 2 pt Boulders
- 2 pt Downed Trees, Logs, Branches
- 2 pt Water Plants
- 2 pt Undercut Banks
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Deep Areas (Chest Deep)
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 20

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 12

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 1 pt Moderate: Slowly Takes Objects Downstream
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent
- 0 pt None

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 13

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 4 pt Ankle Deep or Less & Slow
- 6 pt Ankle/Calf Deep & Fast
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 0 pt Smaller Than Your Fingernails or Do Not Exist
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail

#11 PICTURE FROM UNDER BRIDGE SHOWS 23 NARROWING & CURVING OF CREEK

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

20
CQHEI Total

Vol ID: []

Site ID: #12 ALT River and Watershed:

N 40° 00' 00" W 85° 56' 27" E L 239.2

I. Substrate (Bottom Type) Score: 0

a) Size

14 pt Mostly Large (Fist Size or Bigger)

6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)

10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)

0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?

YES 0 pt Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltting"

NO 5 pt Are Silts and Clays Distributed Throughout Stream?

YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 0

2 pt Underwater Tree Roots (Large)

2 pt Boulders

2 pt Downed Trees, Logs, Branches

2 pt Water Plants

2 pt Undercut Banks

2 pt Underwater Tree Rootlets (Fine)

2 pt Backwaters, Oxbows or Side Channels

2 pt Shallow, Slow Areas for Small Fish

2 pt Deep Areas (Chest Deep)

2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 0

a) "Curviness" or "Sinuosity" of Channel

8 pt 2 or More Good Bends

6 pt 1 or 2 Good Bends

3 pt Mostly Straight Some "Wiggle"

0 pt Very Straight

b) How Natural Is The Site?

12 pt Mostly Natural

6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)

9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)

0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 9

a) Width of Riparian Forest & Wetland - Mostly:

8 pt Wide (Can't Throw A Rock Through/ Across It)

5 pt Narrow (Can Throw A Rock Through/ Across It)

0 pt None

b) Land Use - Mostly:

5 pt Forest/Wetland

4 pt Shrubs

3 pt Overgrown Fields

2 pt Fenced Pasture

2 pt Park (Grass)

2 pt Conservation Tillage

1 pt Suburban

1 pt Row Crop

0 pt Open Pasture

0 pt Urban/Industrial

c) Bank Erosion - Typically:

4 pt Stable Hard or Well-Vegetated Banks

2 pt Combination of Stable and Eroding Banks

0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

3 pt Mostly

2 pt Partly

0 pt None

V. Depth & Velocity Score: 5

a) Deepest Pool is At Least:

8 pt Chest Deep

4 pt Knee Deep

6 pt Waist Deep

0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

2 pt Very Fast: Hard to Stand in the Current

1 pt Moderate: Slowly Takes Objects Downstream

0 pt None

3 pt Fast: Quickly Takes Objects Downstream

1 pt Slow: Flow Nearly Absent

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: []

a) Riffles/Runs Are:

8 pt Knee Deep or Deeper & Fast

4 pt Ankle Deep or Less & Slow

6 pt Ankle/Calf Deep & Fast

0 pt Do Not Exist

b) Riffle/Run Substrates Are:

7 pt Fist Size or Larger

0 pt Smaller Than Your Fingernails or Do Not Exist

4 pt Smaller Than Fist Size, but Larger Than Fingernail

#12 PICTURE EAST OF BRIDGE SHOWS AS MUCH AS KNEE DEEP 10' WIDE

#13 PICTURE DRY CREEK BED GRASS W STANDING WOOD

Date: 11-3-07

Citizens Qualitative Habitat Evaluation Index

83
CQHEI Total

Vol ID: []

Site ID: #13

River and Watershed: N39°51.908 W 86°02.803 EL 272.1

I. Substrate (Bottom Type) Score: 14

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
- YES 0 pt Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Silting"

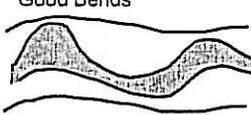
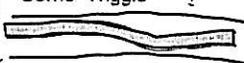
- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
- YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 10

- 2 pt Underwater Tree Roots (Large)
- 2 pt Boulders
- 2 pt Downed Trees, Logs, Branches
- 2 pt Water Plants
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Deep Areas (Chest Deep)
- 2 pt Undercut Banks
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 12

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 19

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 15

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Moderate: Slowly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent
- 0 pt None

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 13

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 6 pt Ankle/Calf Deep & Fast
- 4 pt Ankle Deep or Less & Slow
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 5 pt Smaller Than Your Fingernails or Do Not Exist
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail

#14 PICTURE UNDER 465 BRIDGE LOOKING EAST TO RIFFLE RUN 23

Date: 10/27/2007

Citizens Qualitative Habitat Evaluation Index

86
CQHEI Total

Vol ID: []

Site ID: 14A

River and Watershed: FALL CREEK - DOVA STREAM 56th st. EL. 318 ft. N 39 51.167 W 086 04.968

I. Substrate (Bottom Type) Score: 14

14E
11N
11AM
11EW
11STREAM
11EW

a) Size

- Mostly Large (Fist Size or Bigger) 14 pt
- Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock) 6 pt
- Mostly Medium (Smaller than Fist, but Bigger than Fingernail) 10 pt
- Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky) 0 pt

b) "Smothering"

- Are Fist Size and Larger Pieces Smothered By Sands/Silts? NO 5 pt
- Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects YES 0 pt

c) "Siltling"

- Are Silts and Clays Distributed Throughout Stream? NO 5 pt
- Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two YES 0 pt

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 16

11VIEW
11M
11LE
11RIDGE
11M
11VIEW

- Underwater Tree Roots (Large) 2 pt
- Underwater Tree Rootlets (Fine) 2 pt
- Boulders 2 pt
- Backwaters, Oxbows or Side Channels 2 pt
- Downed Trees, Logs, Branches 2 pt
- Shallow, Slow Areas for Small Fish 2 pt
- Water Plants 2 pt
- Deep Areas (Chest Deep) 2 pt
- Undercut Banks 2 pt
- Shrubs, Small Trees that Hang Close Over the Bank 2 pt

III. Stream Shape and Human Alterations Score: 18

a) "Curviness" or "Sinuosity" of Channel

- 2 or More Good Bends 8 pt
- 1 or 2 Good Bends 6 pt
- Mostly Straight Some "Wiggle" 3 pt
- Very Straight 0 pt

b) How Natural Is The Site?

- Mostly Natural 12 pt
- Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders) 6 pt
- A Few Minor Man-made Changes (e.g., a bridge, some streambank changes) 9 pt
- Heavy, Man-made Changes (e.g., leveed or channelized) 0 pt

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 14

a) Width of Riparian Forest & Wetland - Mostly:

- Wide (Can't Throw A Rock Through/ Across It) 8 pt
- Narrow (Can Throw A Rock Through/ Across It) 5 pt
- None 0 pt

b) Land Use - Mostly:

- Forest/Wetland 5 pt
- Shrubs 4 pt
- Overgrown Fields 3 pt
- Fenced Pasture 2 pt
- Park (Grass) 2 pt
- Conservation Tillage 2 pt
- Suburban 1 pt
- Row Crop 1 pt
- Open Pasture 0 pt
- Urban/Industrial 0 pt

c) Bank Erosion - Typically:

- Stable Hard or Well-Vegetated Banks 4 pt
- Combination of Stable and Eroding Banks 2 pt
- Raw, Collapsing Banks 0 pt

d) How Much of Stream is Shaded?

- Mostly 3 pt
- Partly 2 pt
- None 0 pt

V. Depth & Velocity Score: 13

a) Deepest Pool is At Least:

- Chest Deep 8 pt
- Waist Deep 6 pt
- Knee Deep 4 pt
- Ankle Deep 0 pt

b) Check ALL The Flow Types That You See (Add Points):

- Very Fast: Hard to Stand in the Current 2 pt
- Fast: Quickly Takes Objects Downstream 3 pt
- Moderate: Slowly Takes Objects Downstream 1 pt
- Slow: Flow Nearly Absent 1 pt
- None 0 pt

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 11

a) Riffles/Runs Are:

- Knee Deep or Deeper & Fast 8 pt
- Ankle/Calf Deep & Fast 6 pt
- Ankle Deep or Less & Slow 4 pt
- Do Not Exist 0 pt

b) Riffle/Run Substrates Are:

- Fist Size or Larger 7 pt
- Smaller Than Your Fingernails or Do Not Exist 0 pt
- Smaller Than Fist Size, but Larger Than Fingernail 4 pt

Date: 10-27-07

Citizens Qualitative Habitat Evaluation Index

57
CQHEI Total

Vol ID: []

Site ID: 15

River and Watershed: FALL CREEK N 3951118 E L 22014 W 86.05123

I. Substrate (Bottom Type) Score: 14

a) Size

- 14 pt Mostly Large (Fist Size or Bigger)
- 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
- 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)
- 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

- NO 5 pt Are Fist Size and Larger Pieces Smothered By Sands/Silts?
- YES 0 pt Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltting"

- NO 5 pt Are Silts and Clays Distributed Throughout Stream?
- YES 0 pt Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

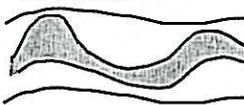
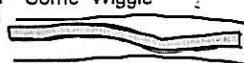
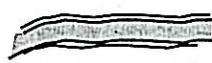
PICTURES
10 #11

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: 12

- 2 pt Underwater Tree Roots (Large)
- 2 pt Underwater Tree Rootlets (Fine)
- 2 pt Boulders
- 2 pt Backwaters, Oxbows or Side Channels
- 2 pt Downed Trees, Logs, Branches
- 2 pt Shallow, Slow Areas for Small Fish
- 2 pt Water Plants
- 2 pt Deep Areas (Chest Deep)
- 2 pt Undercut Banks
- 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: 9

a) "Curviness" or "Sinuosity" of Channel

- 8 pt 2 or More Good Bends 
- 6 pt 1 or 2 Good Bends 
- 3 pt Mostly Straight Some "Wiggle" 
- 0 pt Very Straight 

b) How Natural Is The Site?

- 12 pt Mostly Natural
- 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
- 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)
- 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: 14

a) Width of Riparian Forest & Wetland - Mostly:

- 8 pt Wide (Can't Throw A Rock Through/ Across It)
- 5 pt Narrow (Can Throw A Rock Through/ Across It)
- 0 pt None

b) Land Use - Mostly:

- 5 pt Forest/Wetland
- 4 pt Shrubs
- 3 pt Overgrown Fields
- 2 pt Fenced Pasture
- 2 pt Park (Grass)
- 2 pt Conservation Tillage
- 1 pt Suburban
- 1 pt Row Crop
- 0 pt Open Pasture
- 0 pt Urban/Industrial

c) Bank Erosion - Typically:

- 4 pt Stable Hard or Well-Vegetated Banks
- 2 pt Combination of Stable and Eroding Banks
- 0 pt Raw, Collapsing Banks

d) How Much of Stream is Shaded?

- 3 pt Mostly
- 2 pt Partly
- 0 pt None

V. Depth & Velocity Score: 8

a) Deepest Pool is At Least:

- 8 pt Chest Deep
- 4 pt Knee Deep
- 6 pt Waist Deep
- 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

- 2 pt Very Fast: Hard to Stand in the Current
- 1 pt Moderate: Slowly Takes Objects Downstream
- 0 pt None
- 3 pt Fast: Quickly Takes Objects Downstream
- 1 pt Slow: Flow Nearly Absent

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: 0

a) Riffles/Runs Are:

- 8 pt Knee Deep or Deeper & Fast
- 4 pt Ankle Deep or Less & Slow
- 6 pt Ankle/Calf Deep & Fast
- 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

- 7 pt Fist Size or Larger
- 0 pt Smaller Than Your Fingernails or Do Not Exist
- 4 pt Smaller Than Fist Size, but Larger Than Fingernail

DNA

Date:

Citizens Qualitative Habitat Evaluation Index

07
CQHEI Total

Vol ID:

Site ID: **16**

River and Watershed: **FALL CREEK N 57 30.821 W 86 06.024 EL 222.6**

I. Substrate (Bottom Type) Score: **20**

a) Size

<input type="checkbox"/> 14 pt Mostly Large (Fist Size or Bigger)	<input type="checkbox"/> 6 pt Mostly Small (Smaller Than Fingernail, but Still Coarse, or Bedrock)
<input checked="" type="checkbox"/> 10 pt Mostly Medium (Smaller than Fist, but Bigger than Fingernail)	<input type="checkbox"/> 0 pt Mostly Very Fine (Not Coarse, Sometimes Greasy or Mucky)

b) "Smothering"

Are Fist Size and Larger Pieces Smothered By Sands/Silts?
NO 5 pt

YES 0 pt

Symptoms: Hard to Move Large Pieces, Often Black on Bottom with Few Insects

c) "Siltng"

Are Silts and Clays Distributed Throughout Stream?
NO 5 pt

YES 0 pt

Symptoms: Light Kicking of Bottom Results in Substantial Clouding of Stream for More than a Minute or Two

II. Fish Cover (Hiding Places) - Add 2 Points For Each One Present Score: **14**

<input type="checkbox"/> 2 pt Underwater Tree Roots (Large)	<input checked="" type="checkbox"/> 2 pt Boulders	<input checked="" type="checkbox"/> 2 pt Downed Trees, Logs, Branches	<input checked="" type="checkbox"/> 2 pt Water Plants	<input type="checkbox"/> 2 pt Undercut Banks
<input type="checkbox"/> 2 pt Underwater Tree Rootlets (Fine)	<input checked="" type="checkbox"/> 2 pt Backwaters, Oxbows or Side Channels	<input type="checkbox"/> 2 pt Shallow, Slow Areas for Small Fish	<input type="checkbox"/> 2 pt Deep Areas (Chest Deep)	<input checked="" type="checkbox"/> 2 pt Shrubs, Small Trees that Hang Close Over the Bank

III. Stream Shape and Human Alterations Score: **15**

a) "Curviness" or "Sinuosity" of Channel

<input type="checkbox"/> 8 pt 2 or More Good Bends	<input type="checkbox"/> 6 pt 1 or 2 Good Bends
<input checked="" type="checkbox"/> 3 pt Mostly Straight Some "Wiggle"	<input type="checkbox"/> 0 pt Very Straight

b) How Natural Is The Site?

<input checked="" type="checkbox"/> 12 pt Mostly Natural	<input type="checkbox"/> 6 pt Many Man-made Changes, but still some natural conditions left (e.g., trees, meanders)
<input type="checkbox"/> 9 pt A Few Minor Man-made Changes (e.g., a bridge, some streambank changes)	<input type="checkbox"/> 0 pt Heavy, Man-made Changes (e.g., leveed or channelized)

IV. Stream Forests & Wetlands (Riparian Area) & Erosion Score: **17**

a) Width of Riparian Forest & Wetland - Mostly:

<input checked="" type="checkbox"/> 8 pt Wide (Can't Throw A Rock Through/ Across It)	<input type="checkbox"/> 5 pt Narrow (Can Throw A Rock Through/ Across It)	<input type="checkbox"/> 0 pt None
--	---	---------------------------------------

b) Land Use - Mostly:

<input checked="" type="checkbox"/> 5 pt Forest/Wetland	<input type="checkbox"/> 2 pt Conservation Tillage
<input type="checkbox"/> 4 pt Shrubs	<input type="checkbox"/> 1 pt Suburban
<input type="checkbox"/> 3 pt Overgrown Fields	<input type="checkbox"/> 1 pt Row Crop
<input type="checkbox"/> 2 pt Fenced Pasture	<input type="checkbox"/> 0 pt Open Pasture
<input checked="" type="checkbox"/> 2 pt Park (Grass)	<input type="checkbox"/> 0 pt Urban/ Industrial

c) Bank Erosion - Typically:

<input type="checkbox"/> 4 pt Stable Hard or Well-Vegetated Banks	<input checked="" type="checkbox"/> 2 pt Combination of Stable and Eroding Banks	<input type="checkbox"/> 0 pt Raw, Collapsing Banks
--	---	--

d) How Much of Stream is Shaded?

<input type="checkbox"/> 3 pt Mostly	<input checked="" type="checkbox"/> 2 pt Partly	<input type="checkbox"/> 0 pt None
---	--	---------------------------------------

V. Depth & Velocity Score: **11**

a) Deepest Pool is At Least:

<input type="checkbox"/> 8 pt Chest Deep	<input checked="" type="checkbox"/> 4 pt Knee Deep
<input type="checkbox"/> 6 pt Waist Deep	<input type="checkbox"/> 0 pt Ankle Deep

b) Check ALL The Flow Types That You See (Add Points):

<input checked="" type="checkbox"/> 2 pt Very Fast: Hard to Stand in the Current	<input checked="" type="checkbox"/> 1 pt Moderate: Slowly Takes Objects Downstream	<input checked="" type="checkbox"/> 0 pt None
<input checked="" type="checkbox"/> 3 pt Fast: Quickly Takes Objects Downstream	<input checked="" type="checkbox"/> 1 pt Slow: Flow Nearly Absent	

VI. Riffles/Runs (Areas Where Current is Fast/Turbulent, Surface May Be Broken) Score: **10**

a) Riffles/Runs Are:

<input type="checkbox"/> 8 pt Knee Deep or Deeper & Fast	<input type="checkbox"/> 4 pt Ankle Deep or Less & Slow
<input checked="" type="checkbox"/> 6 pt Ankle/Calf Deep & Fast	<input type="checkbox"/> 0 pt Do Not Exist

b) Riffle/Run Substrates Are:

<input type="checkbox"/> 7 pt Fist Size or Larger	<input type="checkbox"/> 0 pt Smaller Than Your Fingernails or Do Not Exist
<input checked="" type="checkbox"/> 4 pt Smaller Than Fist Size, but Larger Than Fingernail	