

Appendix H - Extra Data Sheets

- **Citizens Qualitative Habitat Evaluation Index**
- **Stream Flow (Discharge) Data Sheet**
- **Stream Site Map**
- **Chemical Monitoring Data Sheet**
- **Biological Monitoring Data Sheet**

Citizens Qualitative Habitat Evaluation Index (CQHEI)



Date: ___/___/___ Volunteer ID: _____ Site ID: _____

Stream Name: _____

CQHEI Total

I. SUBSTRATE (bottom type) Score:

a) Size

- | | |
|---|---|
| <input type="checkbox"/> 14 pt
Mostly Large
(Fist Size or Bigger) | <input type="checkbox"/> 6 pt
Mostly Small (Smaller
Than Fingernail, but
Coarse, or Bedrock) |
| <input type="checkbox"/> 10 pt
Mostly Medium
(Smaller than Fist,
larger 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?

- 5 pt No
- 0 pt Yes

Symptoms:
Hard to move pieces, often
black on bottom.

c) "Siltling" Are Silts and Clays Distributed Throughout Stream?

- 5 pt No
- 0 pt Yes

Symptoms:
Light kicking
results in
substantial
clouding for
more than
a minute.

II. FISH COVER (hiding places) - Add 2 Points For Each One Present Score:

- | | | | | |
|--|---|--|---|---|
| <input type="checkbox"/> 2 pt
Underwater Tree
Roots (Large) | <input type="checkbox"/> 2 pt
Shrubs/Small Trees
Hang Over the Bank | <input type="checkbox"/> 2 pt
Downed Trees, Logs,
or Branches | <input type="checkbox"/> 2 pt
Water Plants | <input type="checkbox"/> 2 pt
Undercut Banks |
| <input type="checkbox"/> 2 pt
Underwater Tree
Rootlets (Small) | <input 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 type="checkbox"/> 2 pt
Boulders |

III. STREAM SHAPE and HUMAN ALTERATIONS Score:

a) "Curviness" or "Sinuosity" of Channel

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

b) How Natural Is The Site?

- | | |
|---|---|
| <input type="checkbox"/> 12 pt
Mostly Natural | <input type="checkbox"/> 6 pt
Many Man-Made Changes, but Some Natural
Conditions left (e.g., trees, meanders) |
| <input type="checkbox"/> 9 pt
Few Minor Man-
Made Changes
(e.g., a bridge) | <input type="checkbox"/> 0 pt
Heavy, Man-made Changes (e.g.,
leveed or channelized) |

IV. STREAM FORESTS & WETLANDS (riparian area) & EROSION Score:

a) Riparian Width Mostly:

- 8 pt
Wide (Can't throw
a rock through it)
- 5 pt
Narrow (can throw
a rock through it)
- 0 pt
None

b) Land Use - Mostly:

- | | |
|--|--|
| <input 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 type="checkbox"/> 2 pt
Park (Grass) | <input type="checkbox"/> 0 pt
Urban/
Industrial |

c) Bank Erosion

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

d) Stream Shading

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

V. DEPTH & VELOCITY Score:

a) Deepest Pool is At Least:

- | | |
|---|---|
| <input type="checkbox"/> 8 pt
Chest Deep | <input type="checkbox"/> 4 pt
Knee Deep |
| <input type="checkbox"/> 6 pt
Waist Deep | <input type="checkbox"/> 0 pt
Do Not Exist |

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

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

VI. RIFFLES/RUNS (areas where current is fast/turbulent, surface may be broken) Score:

a) Riffles/Runs Are:

- | | |
|--|---|
| <input type="checkbox"/> 8 pt
Knee Deep or
Deeper and Fast | <input type="checkbox"/> 4 pt
Ankle Deep or
Less and Slow |
| <input type="checkbox"/> 6 pt
Ankle/Calf Deep
and 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 type="checkbox"/> 4 pt
Smaller Than Fist Size, but
Larger Than Fingernail | |

Hoosier Riverwatch

Stream Flow (Discharge) Data Sheet

Date ___/___/___ Volunteer ID _____ Site ID _____

Stream Name _____

Solving the equation: $\text{FLOW (D)} = W \times Z \times V \times n$

Where:
W = Average Width
Z = Average Depth
V = Average Velocity
n = Coefficient - 0.8 for gravel/rocky bottom streams
 0.9 for muddy or bedrock bottom streams
D = Flow/Discharge

Convert measurements of feet + inches to 10^{ths} of feet.

1 inch = 0.0833 feet

W
River Width
(one measurement at each transect)

Transect	Width (ft)
1	
2	
3	
Average	

Z
River Depth
(three measurement along each transect)

	Transect 1 (ft)	Transect 2 (ft)	Transect 3 (ft)	
1				
2				
3				
Average of Transects				Average of Averages <div style="border: 1px solid black; width: 100px; height: 20px; background-color: #cccccc;"></div>




















V
Surface Velocity = Length/Time
(allow the object to attain velocity before timing)

Transect	Length (ft)	Time (seconds)	Velocity (ft/sec)
1			
2			
3			
Average			

D
Stream Flow or Discharge

	x		x		x		x		n*	=	
W		Z		V							D (cfs)

*Coefficient (0.8 for gravel/rocky bottom streams, 0.9 for muddy or bedrock bottom streams)

	Cobble		Debris/Dam		Rowcrop
	Riffle		Log		Grass
	Slabs/Boulder		Bridge		Pool
	Pipe/Outfall		Overhanging vegetation		
	Rip rap bank		Rootwad		
	Undercut bank		Severely eroded bank		
	Direction of flow		Forest		
	Sample location		Shrub		

Hoosier Riverwatch Chemical Monitoring Data Sheet

Date ____ / ____ / ____ Volunteer ID _____ Site ID _____
 Stream Name _____ Latitude _____ Longitude _____
 Time ____ : ____ AM / PM Time Sampling _____ hrs Air Temp.: _____ °C
 Current Weather: Clear/Sunny Overcast Showers Rain (steady) Storm (heavy)
 Worst Weather (past 48 hours): Clear/Sunny Overcast Showers Rain (steady) Storm (heavy)

	Units	Sample #			Avg.	Q-Value x Weighting = Calculation Factor (Q-value x Wt. Factor)	
		1	2	3			
Temperature							
Water Temp at Site	°C						
Water Temp 1 Mile Upstream							
Water Temp Change: <i>Site Temp - Upstream Temp</i>							0.11
Dissolved Oxygen							
Dissolved Oxygen	mg/L						
DO% Saturation: <i>Determine from chart or table/equation</i>	%						0.18
BOD							
Avg. Dissolved Oxygen: <i>(Calculated Above)</i>	mg/L						
Dissolved Oxygen after 5 days							
BOD <i>Avg DO (original)-DO after 5 days</i>							0.12
pH							
pH							0.12
Nutrients							
Orthophosphate	mg/L						
Total Phosphate <i>(boil in acid)</i>	mg/L						0.11
Nitrate (NO ₃) <i>multiply by 4.4</i>	mg/L						0.10
Nitrite (NO ₂) <i>multiply by 3.3</i>	mg/L						
Turbidity							
Transparency <i>(from tube)</i>	cm						
Turbidity <i>(convert from chart/table)</i>	NTU						0.09
Bacteria							
E.Coli Bacteria	cfu/100						0.17
Fecal Coliforms	mL						

WQI Ratings	
Excellent	90 - 100%
Good	70 - 87%
Medium	50 - 69%
Bad	25-49%
Very Bad	0-24%

Add Weighting Factors for test completed.

Add the calculation column.

TOTALS

Divide Total of Calculation Column by Total Weighting Factor Column

WQI

Use Average DO value for BOD calculation.





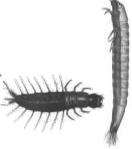

















Remember to convert your reading from the tube to NTUs.

Hoosier Riverwatch Biological Monitoring Data Sheet

Date: ____/____/____ Volunteer ID: _____ Site ID: _____
 Stream Name: _____ Latitude: _____ Longitude: _____
 Time ____:____ AM / PM Time Sampling: _____ hrs Air Temp.: _____ °C
 Current Weather: Clear/Sunny Overcast Showers Rain (steady) Storm (Heavy)
 Worst Weather (past 48 hours): Clear/Sunny Overcast Showers Rain (steady) Storm (Heavy)
 Check Methods Used: Kick Seine Net (3 times) Dip Net (20 jabs or scoops)
 Check Habitats Sampled: Undercut Banks Riffles Leaf Packs Snags/Vegetation Sediment

Pollution Tolerance Index (PTI)

Record the taxa (group) represented in your sampling by either entering the number of organisms you counted or a ✓

<p>Group 1 - Intolerant</p> <p><input type="checkbox"/> Stonefly nymph </p> <p><input type="checkbox"/> Mayfly nymph </p> <p><input type="checkbox"/> Caddisfly larva </p> <p><input type="checkbox"/> Riffle Beetle </p> <p><input type="checkbox"/> Dobsonfly Larva </p> <p><input type="checkbox"/> Right-Handed or Gilled snail </p> <p><input type="checkbox"/> Water Penny </p> <p><input type="checkbox"/> # of TAXA represented</p> <p><input type="checkbox"/> Weighting Factor (x4)</p>	<p>Group 2 - Moderately Intolerant</p> <p><input type="checkbox"/> Damselfly nymph </p> <p><input type="checkbox"/> Dragonfly nymph </p> <p><input type="checkbox"/> Scud </p> <p><input type="checkbox"/> Sowbug </p> <p><input type="checkbox"/> Cranefly larva </p> <p><input type="checkbox"/> Clam/Mussel </p> <p><input type="checkbox"/> Crayfish </p> <p><input type="checkbox"/> # of TAXA represented</p> <p><input type="checkbox"/> Weighting Factor (x3)</p>	<p>Group 3 - Fairly Tolerant</p> <p><input type="checkbox"/> Leech </p> <p><input type="checkbox"/> Midge larva </p> <p><input type="checkbox"/> Planaria/Flatworm </p> <p><input type="checkbox"/> Black fly larva </p> <p><input type="checkbox"/> # of TAXA represented</p> <p><input type="checkbox"/> Weighting Factor (x2)</p>	<p>Groups 4 - Very Tolerant</p> <p><input type="checkbox"/> Aquatic worm </p> <p><input type="checkbox"/> Blood midge larva (red) </p> <p><input type="checkbox"/> Rat-tailed Maggot </p> <p><input type="checkbox"/> Left-Handed or Pouch snail </p> <p><input type="checkbox"/> # of TAXA represented</p> <p><input type="checkbox"/> Weighting Factor (x1)</p>
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Pollution Tolerance Index Rating

(Add the final index values for each group)

PTI Ratings	
Excellent	23 or More
Good	17 - 22
Fair	11 - 16
Poor	10 or Less

Please check other Biological Indicators you observed:

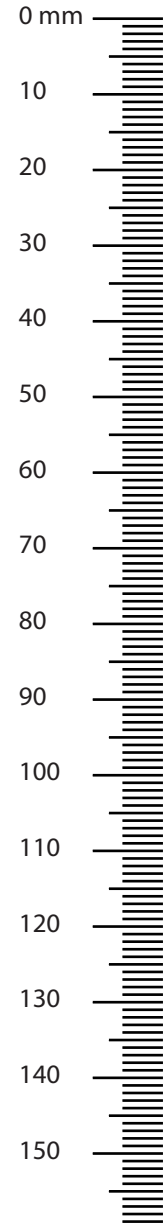
- Native Mussels
 Zebra Mussels
 Rusty Crayfish
 Aquatic Plants

_____ % Algae Cover

_____ Diversity Index

WEIGHTS AND MEASUREMENTS

Metric System	U.S. Customary System
LINEAR MEASURE 1000 millimeters (mm) = 1 meter 100 centimeters (cm) = 1 meter 1000 meters (m) = 1 kilometer (km)	LINEAR MEASURE 12 inches = 1 foot 3 feet = 1 yard
AREA MEASURE 100 sq. millimeters (mm ²) = 1 sq. centimeter 10,000 sq. centimeters (cm ²) = 1 sq. meter 1,000,000 sq. millimeters (mm ²) = 1 sq. meter 100 sq. meters (m ²) = 1 are(a) 100 ares (a) = 1 hectare (ha) 100 hectares (ha) = 1 sq. kilometer (km ²) 1,000,000 sq. meters (m ²) = 1 km ²	AREA MEASURE 144 sq. inches = 1 sq. foot 9 sq. feet = 1 sq. yard 30 1/4 sq. yards = 1 sq. rod 150 sq. rods = 1 acre 640 acres = 1 sq. mile 1 sq. mile = 1 section 36 sections = 1 township
VOLUME MEASURE 1 liter = 0.001 cubic meter (m ³) 1000 milliliters = 1 liter 100 centiliters = 1 liter 1000 liters = 1 kiloliter	LIQUID MEASURE 3 teaspoons (tsp) = 1 Tablespoon (Tbsp) 4 Tbsp = 1/4 cup 5 1/3 Tbsp = 1 pint 16 Tbsp = 1 cup 2 cups = 1 pint 4 cups = 1 quart 2 pints = 1 quart 4 quarts = 1 gallon
WEIGHT 1000 milligrams = 1 gram 100 centigrams = 1 gram 1000 grams = 1 kilogram 1,000 kilograms = 1 metric ton	WEIGHT 16 ounces = 1 pound 2000 pounds = 1 ton



Conversion Table

LINEAR MEASURE			DRY AND LIQUID MEASURE		
To convert	into	Multiply by	To convert	into	Multiply by
Centimeters	Inches	0.394	Pounds	Grams	435.59
	Feet	0.0328		Ounces	16
	Meters	0.01		Kilograms	0.02
	Millimeters	10	Grams	Ounces	0.035
Inches	Centimeters	2.54		Pounds	0.002
	Feet	0.0833		Kilograms	0.001
	Meters	0.0254	Kilograms	Grams	1000
	Yards	0.0278		Ounces	35274
Meters	100	Pounds		2205	
Meters	Feet	3.281	Liters	Cups	4.225
	Inches	39.37		Pints	2.113
	Kilometer	0.001		Gallons	0.264
	Miles	0.0005214	Milliliters	1000	
	Millimeters	1000	Quarts	1.057	
	Yards	1.093	Pints	Liters	0.473
	Kilometers	Feet		3281	Quarts
Meters		1000		Gallons	0.125
Miles		0.621	Quarts	Pints	2
Yards		1093		Liters	0.946
Miles	Feet	5,280	Gallons	25	
	Yards	1,760	Gallons	Pints	8
	Kilometers	1,609		Liters	3.785
Yards	Inches	36	Quarts	4	
	Feet	3	Ounces	Grams	28.35
	Meters	1		Pounds	0.0625
	Miles	0.0005682		Kilograms	0.028