Final Report

Stream Assessment in Mitchell's Grove Nature Preserve

Robert C. Byrne
I.V.C.C.
Oglesby, IL 61348

Project Objectives:

1. To conduct site inventory of the stream macroinvertebrate population through a biodiversity census method.

2. To conduct and analyze inventory of abiotic stream factors including flow characteristics and water chemistry.

Materials and Methods:

1. The materials used for this project include Hach kits containing pH probes, conductivity meter, turbidimeter, DR2000, and thermometers; dip nets, water collecting bottles and biological supplies used for fecal coliform testing.
2. The Mitchell Grove Nature Preserve was used for the sampling. The macroinvertebrates were collected using dip nets and scraping the bottom of the rocks. Up to one hundred macroinvertebrates were sampled and identified to determine the biodiversity of the stream. The chemical tests that were done included nitrates, phosphates, dissolved oxygen, and total dissolved solids using Hach methods. Physical measurements such as temperature, flow rate, total discharge, and turbidity were also performed. Water samples were also taken back to the lab to be tested for fecal coliform and BOD.

Results:

Two sites were studied in the Mitchell Grove Nature Preserve, one on Tomahawk Creek (site #6 see figure 1 and 2) and one on the Little Vermilion River (site #7 see figure 1 and 2). Five faculty and about twenty students were involved in the testing activity. The raw data sheets for each testing are included in the appendix at the end of the report. The summary table of the results (table 1) is included in the body of the report. The weather was fair for each testing date but the 4/27/99 testing was preceded by very heavy

TABLE 1

TOMAHAWK CREEK SITE 6

Date	Site	Time	Water Cond	Weather Cond	Weather 24 hrs.	Water temp C	Air Temp C	Flow ft/sec	Volume cu.ft/sec	pH	NTU	Solids ppm	[N]	Dissolved O2 (ppm)	Satur % O2	PO4 ppm	BOD ppm	Fecal col./100ml	MBI
9/19/98	6	10:50		C	C	22.6	23			8.14	13.6	169	4.41	10	112	0.4	9	1	4.7
3/27/99	6	9:40	C	C	C	5.8	12		36	8.3	4.4	140	8.8	12	95	0.1	9	2	7.14
4/27/99	6	10:45	C	C	S	9	15			8.4	10	140	27	12.5	117	0.9	9	30	9.7
6/4/99	6	9:40	C	C	C	16	24	1.94	87.5	7.84	7.3	151	11	11.5	108	0.1	10	140	6.6
									Average	8.17	8.825	150	12.8	11.5	108	0.375	9.25	43.25	7.035
									StDev	0.245	3.92	13.68698	9.854	1.08012345	9.4163	0.377	0.5	65.8856332	2.062

LITTLE VERMILION RIVER SITE 7

9/19/98	7	9:20	C	C	C	20	22			8.19	10.3	239	4.3	9	98	0.6	8	9	4.71
4/27/99	7	9:00	D	C	S	9	14			8	90	123	12	13.5	117	0.96	7	200	9.46
									Average	8.095	50.15	181	8.15	11.25	107.5	0.78	7.5	104.5	7.085
									StDev	0.134	56.36	82.02439	5.445	3.18198052	13.435	0.255	0.707	135.057395	3.359

Weather Conditions. Weather Conditions past 24 hrs
Clear/sunny, Overcast, Light showers(intermittent),
Rain(steady rain), Storm(heavy rain)

MBI-Macroinvertebrate Biological Index
BOD-Biochemical Oxygen Demand
NTU-Nephelometric Tubidity Units
TNTC-Too Numerous to Count

FIGURE 1

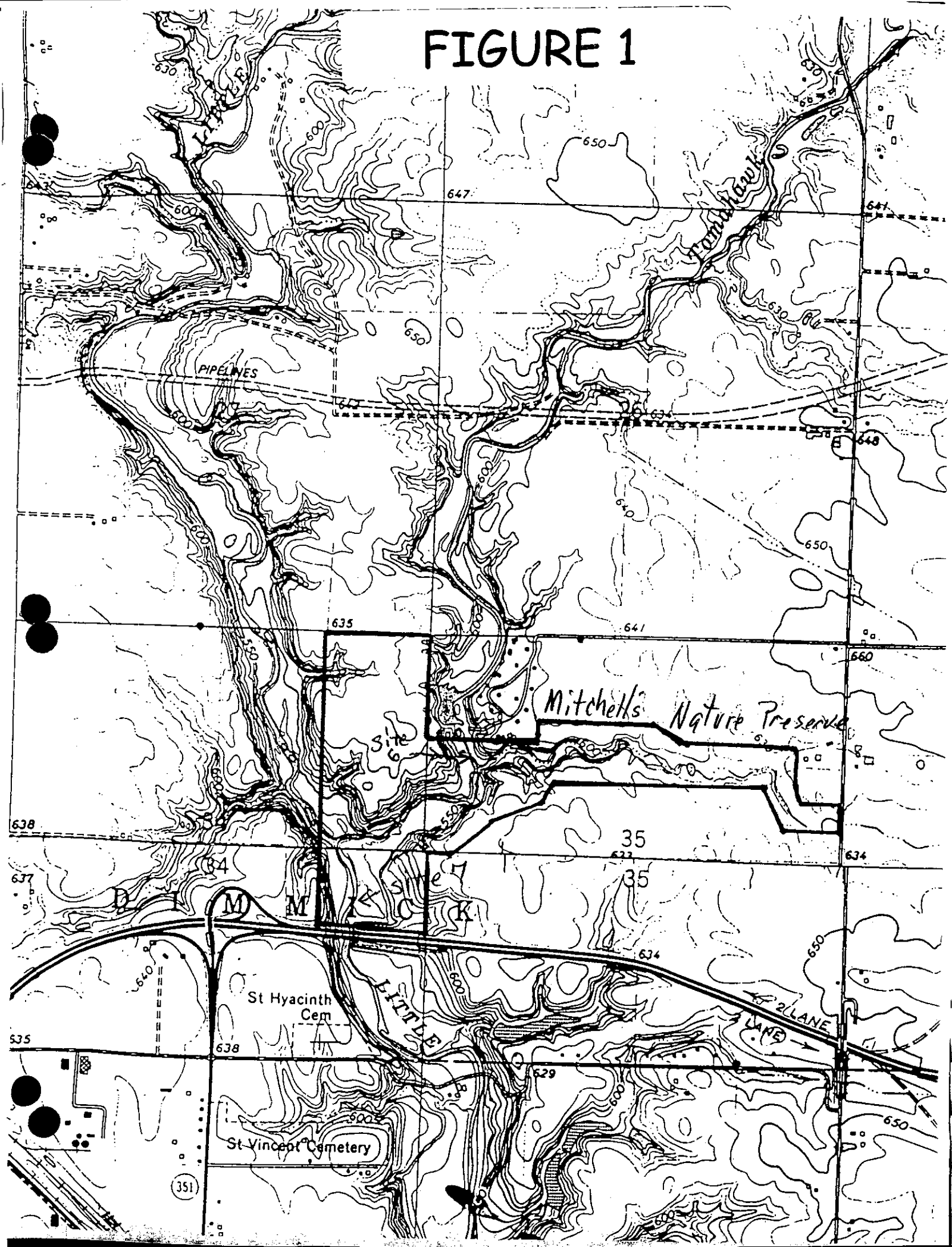
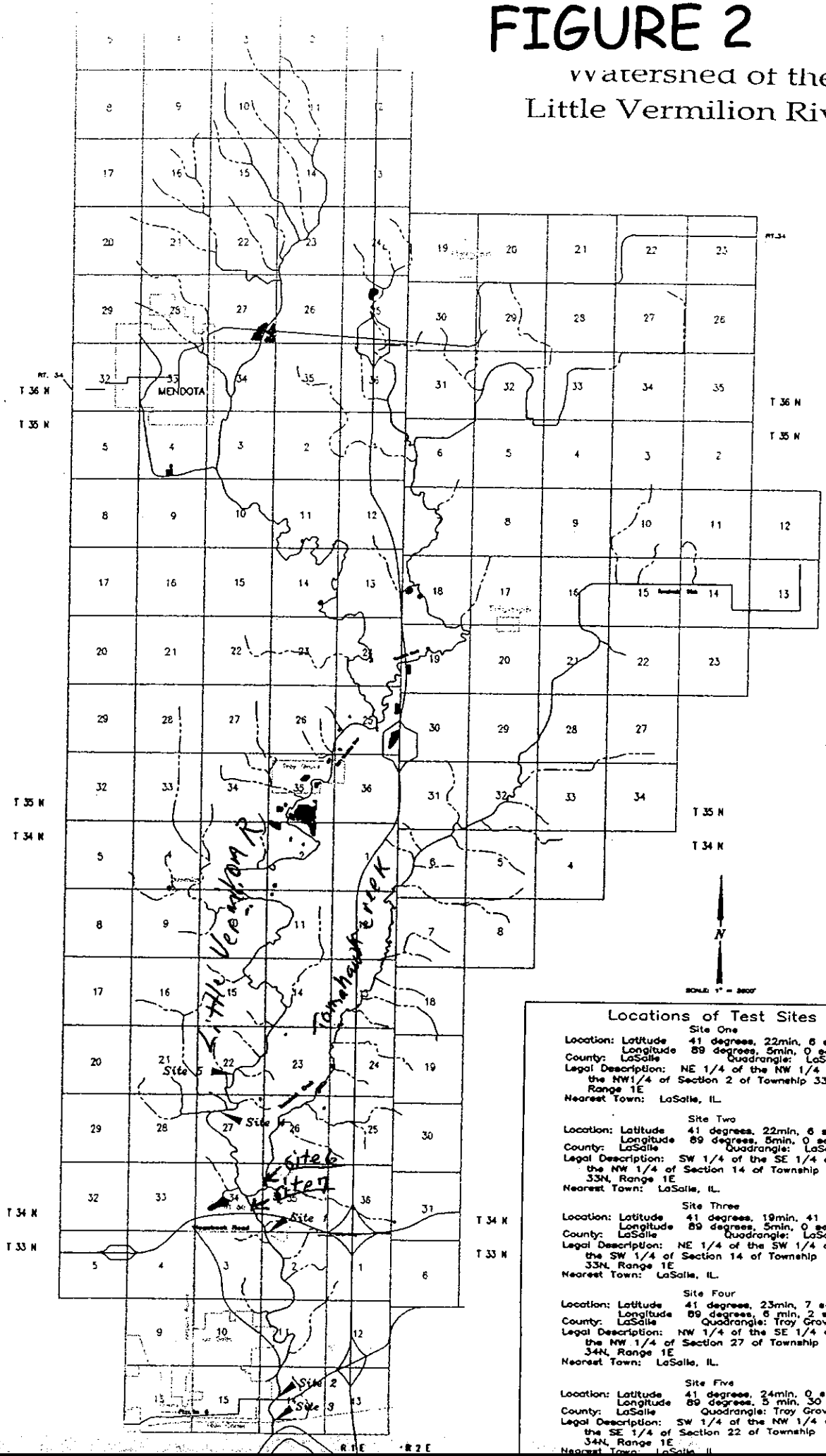

Tomahawk
PIPELINES
Mitchell's Nature Preserve
Site 6
Site 7
D I M M I C K
LITTLE
St Hyacinth Cem
St Vincent Cemetery
2 LANE
LANE
351
34
35
35

FIGURE 2

Watershed of the Little Vermilion River



Locations of Test Sites

Site One

Location: Latitude 41 degrees, 22min, 6 sec
Longitude 89 degrees, 5min, 0 sec
County: LaSalle Quadrangle: LaSalle
Legal Description: NE 1/4 of the NW 1/4 of the NW1/4 of Section 2 of Township 33N, Range 1E
Nearest Town: LaSalle, IL.

Site Two

Location: Latitude 41 degrees, 22min, 6 sec
Longitude 89 degrees, 5min, 0 sec
County: LaSalle Quadrangle: LaSalle
Legal Description: SW 1/4 of the SE 1/4 of the NW 1/4 of Section 14 of Township 33N, Range 1E
Nearest Town: LaSalle, IL.

Site Three

Location: Latitude 41 degrees, 19min, 41 sec
Longitude 89 degrees, 5min, 0 sec
County: LaSalle Quadrangle: LaSalle
Legal Description: NE 1/4 of the SW 1/4 of the SW 1/4 of Section 14 of Township 33N, Range 1E
Nearest Town: LaSalle, IL.

Site Four

Location: Latitude 41 degrees, 23min, 7 sec
Longitude 89 degrees, 6 min, 2 sec
County: LaSalle Quadrangle: Troy Grove
Legal Description: NW 1/4 of the SE 1/4 of the NW 1/4 of Section 27 of Township 34N, Range 1E
Nearest Town: LaSalle, IL.

Site Five

Location: Latitude 41 degrees, 24min, 0 sec
Longitude 89 degrees, 5 min, 30
County: LaSalle Quadrangle: Troy Grove
Legal Description: SW 1/4 of the NW 1/4 of the SE 1/4 of Section 22 of Township 34N, Range 1E
Nearest Town: LaSalle, IL

rains resulting in very high water. The water temperature was the warmest 9/19/98 and quite cold for the March and April testing. The pH, phosphates and dissolved oxygen seemed to be about the same at both sites and were in the good range. The basic pH a little over pH of 8 is consistent with our readings at the other sites and is expected since there is a lot of limestone in the area.

The turbidity of the water varied with conditions. An unexpected result was the large difference between the Tomahawk Creek and the Little Vermilion River site when the turbidity was tested on 4/27/99. The reading of 10 NTU's at site 6, where the reading at site 7 was 90 NTU's. This indicated that the runoff from the fields and the limestone quarry along the Little Vermilion contributed to the very high turbidity with very little contribution from the Tomahawk Creek.

The total dissolved solids seemed to only vary a small amount at the Tomahawk Creek site with flow and temperature while the total dissolved solids was extremely high after the heavy rain at site 7. There is insufficient data at this point to explain this high reading. Further testing under various conditions is needed.

The nitrate-nitrogen was lower in the fall and higher in the spring which can be expected. The fertilizer from the adjacent fields would be a source of high nitrogen in the spring. The April reading at site 6 can't be explained without further testing though. These results are consistent with our nitrogen readings at our other sites.

The fecal coliform readings have been quite variable. There are some pastures near the streams which could be a source of fecal. Normally we have found the higher readings during the warmer months. Readings below 200 fecal colonies are safe for swimming.

The Macroinvertebrate Biological Index (MBI) was similar at both sites. The method we use here is the one used by Ecowatch (Illinois RiverWatch). An index less than 6.0 indicates good water quality, an index 6.1-7.5 fair water quality, an index 7.6-8.9 poor water quality and an index over 9.0 very poor water quality. The September indexes were both well under 6.0 indicating very good water quality. Here there were a lot of caddisflies and mayflies and very few aquatic worms. All of the indexes this spring have indicated water quality varying from fair to very poor. There hasn't been as much diversity this spring along with more species which indicate poor water quality such as worms and left-handed

snails. The same faculty and students have performed the macroinvertebrate study.

Summary:

In conclusion the water quality has been good at both sites with the exception of the April testing where the testing came out with fair water quality at both sites. The lower water quality was due mainly to the heavy rain. Testing will be continued to further develop the site inventory. Pictures and slides are included to help describe the project site and the project activities. A copy of the newspaper articles are also included.

APPENDIX

STUDENT SHEET 3.4 - WATER QUALITY INDEX (WQI)

River/Stream: Tomahawk Creek
River Mile Marker: —
School: TVCC
Location: Latitude: 41 ° 22 min 4 sec
Date: 9/19 Time: 10:00
Longitude: 89 ° 5 min 4 sec
Water Conditions: Clear (low)
County: La Salle Quadrangle: Troy Grove
Weather Conditions: Sunny
Legal Description: NW 1/4 of the SW 1/4 of the SW 1/4.
Previous 24 hrs. Sunny
Section 35 of Township: T 31 N Range: 1 E
Air Temp: 23°C °C
Nearest Town: La Salle
Flow Rate: 0.102 meters/sec
Site Location or Address: #6

Test	Test mean values	Q-Value	Weighting Factor	Total
1. Dissolved Oxygen	DO_{day1} 10 mg/L % Sat 112	95	0.17	16.2 %
2. Fecal Coliform	1 colonies/100mL	97	0.16	15.5
3. pH	8.14 units	75	0.11	8.3
4. BOD	DO_{day1} 10 mg/L minus DO_{day5} 9 mg/L	93	0.11	10.2
5. Temperature Change	$Temp_{point1}$ 22.6°C ΔT = 0 °C $Temp_{point2}$ 22.6 °C	92	0.10	9.2
6. Phosphate	.4 mg/L	65	0.10	6.5
7. Nitrate	19.4 mg/L	40	0.10	4.0
8. Turbidity	13.6 ~~meters~~ NTU feet	70	0.08	5.6
9. Total Solids dissolved	167 mg/L	77	0.07	5.4

Conductivity 348
discharge 0.145 m^3/s

OVERALL WATER QUALITY INDEX 80.9 %

Overall Water Quality Index	Quality of Water
90% - 100%	Excellent
70% - 90%	Good
50% - 70%	Medium
25% - 50%	Bad
0 - 25%	Very Bad

STUDENT SHEET 3.3 - DIVERSITY INDEX

River/Stream: LV #6

School:

Date: 9/19/98 Time:

Water Conditions:

Weather Conditions:

Previous 24 hrs.

Air Temp : °C

Flow Rate: ~~Discharge~~ .102 meters/sec

River Mile Marker:

Location: Latitude: ° min sec

Longitude: ° min sec

County: Quadrangle:

Legal Description: 1/4 of the 1/4 of the 1/4.

Section of Township: Range:

Nearest Town:

Site Location or Address:

TAXON	# of ORGS.	P = # per taxon / Σ org.	ENTER P	Log 10	÷	.301	X	Enter P	INDEX VALUE
hellgram	2	2/100	.02	-1.69					-.11
Sw may fly	24	24/100	.24	-.62					-.49
al may fly	23	23/100	.23	-.64					-.49
cr may fly	15	15/100	.15	-.82					-.41
stone fly	1	1/100	.01	-2.00					-.07
h cad	25	25/100	.25	-.60					-.50
R. beetle	2	2/100	.02	-1.69					-.11
midge	2	2/100	.02	-1.69					-.11
rh snail	6	6/100	.06	-1.22					-.24

discharge .145 m^3/s

Total # of Taxon =

Total # of organ. =

Total Index Values = -2.53

Inverse Sign = +2.53

Diversity index =

Sample Number 1

Sample Number 2

Sample Number 3

Average Diversity Index

Values

less than 1 — Indicates few taxa, some with many individuals, and may indicate pollution.

between 1-3 — May indicate moderatedpolluted water.

exceeding 3 — May indicate relatively clean and unpolluted water.

ILLINOIS RIVERWATCH
BIOLOGICAL SURVEY SHEET
Macroinvertebrate Identification

LV#6 9/19/98

CODE	ORGANISM	N	T_i	T_v
FLW	Flatworm		6.0	
AQW	Aquatic Earthworm		10.0	
LEE	Leech		8.0	
SBG	Sowbug		6.0	
SCD	Scud		4.0	
DGF	Dragonfly		4.5	
DM1	Broadwing Damselfly		3.5	
DM2	Narrowwinged Damselfly		5.5	
HLL	Hellgrammites	2	3.5	7
MF1	Torpedo Mayfly		3.0	
MF2	Swimming Mayfly	24	4.0	96
MF3	Clinging Mayfly	23	3.5	80.5
MF4	Crawling Mayfly	15	5.5	82.5
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly	1	1.5	1.5
CF1	Hydropsychid Caddisfly	25	5.5	137.5
CF2	Non-Hydrospychid Caddisfly		3.5	
RFB	Riffle Beetle	2	5.0	10
WHB	Whirligig Beetle		4.0	
WPB	Water Penny Beetle		4.0	
CRF	Cranefly		4.0	
BIM	Biting Midge		5.0	
BLW	Blood Worm		11.0	
MID	Midge	2	6.0	12
BLF	Black Fly		6.0	
SNF	Snipe Fly		4.0	
OTF	Other Fly		10.0	
LHS	Left-Handed Snail		9.0	
RHS	Right-Handed Snail	6	7.0	42
PLS	Planorbid Snail		6.5	
LIM	Limpet		7.0	
OPS	Operculate Snail		6.0	
	TOTALS	100		469
	TAXA =	N		T_v

MBI = $T_V \div N$ = 4.7

<6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = N = 100

TAXA RICHNESS = TAXA = 9

PERCENT COMPOSTION OF INDICATOR ORGANISMS

ORGANISM	N	÷	N	x 100 =	%C
MAYFLIES (PMF)	62	÷	100	x 100 =	62%
STONEFLIES (PSF)		÷		x 100 =	
CADDISFLIES (PCF)	25	÷	100	x 100 =	25%
BLOODWORMS(PBW)		÷		x 100 =	
AQUATIC WORMS(PAW)	2	÷	100	x 100 =	2%

SUBTOTAL % = 89%

% ALL OTHERS (100 % - SUBTOTAL %) = 11% (PAO)

NOTES (MNT):

STUDENT SHEET 3.4 - WATER QUALITY INDEX (WQI)

River/Stream: Tonawanda
School: JHM
Date: 3/23/99 Time: 9:40
Water Conditions:
Weather Conditions: clear sunny
Previous 24 hrs. 55-60°F
Air Temp : °C

River Mile Marker:
Location: Latitude: 41° 22 min 42 sec
Longitude: 89° 5 min 36 sec
County: LaSalle Quadrangle: La Salle
Legal Description: SW 1/4 of the SE 1/4 of the SE 1/4.
Section 3 of Township: T 34 N Range: R 1 E
Nearest Town: LaSalle

Flow Rate: meters/sec
Site Location or Address: #6

Test	Test mean values	Q-Value	Weighting Factor	Total
12 days 1. Dissolved Oxygen	DO day1 12 mg/L % Sat 95	98	0.17	16.66%
2. Fecal Coliform	2 colonies/100mL	90	0.16	[illegible]
3. pH	8.3 units	73	0.11	8.03
4. BOD	DO day1 12 mg/L minus DO day5 9 mg/L	86	0.11	9.46
5. Temperature Change	Temp site1 5.3 °C ΔT = °C Temp site2 °C	92	0.10	[illegible]
6. Phosphate	1.2 / DR 1 mg/L	46	0.10	4.6
7. Nitrate	15 / DR 8.8 mg/L	50	0.10	5.0
8. Turbidity	4.4 meters feet	80	0.08	6.32
9. Total Solids	140 mg/L	80	0.07	5.6
conductivity	295			

OVERALL WATER QUALITY INDEX 85.17 %

85.17

Overall Water Quality Index	Quality of Water
90% - 100%	Excellent
70% - 90%	Good
50% - 70%	Medium
25% - 50%	Bad
0 - 25%	Very Bad

volume discharge 1.02 m^3/sec

ILLINOIS RIVERWATCH
MACROINVERTEBRATE DATA SHEET
Macroinvertebrate Identification

Tomahawk Creek

CODE	ORGANISM	N	T_i	T_v
[redacted]	Flatworm (21)	21	6.0	126
[redacted]OW	Aquatic Worm	(30)	10.0	300
LEE	Leech		8.0	
SBG	Sowbug		6.0	
SCD	Scud		4.0	
DGF	Dragonfly		4.5	
DM1	Broadwing Damselfly (2)	11	3.5	7.0
DM2	Narrow-winged		5.5	
HLL	Hellgrammites (1)	1	3.5	3.5
MF1	Torpedo Mayfly		3.0	
MF2	Swimming Mayfly		4.0	
MF3	Clinging Mayfly		3.5	
MF4	Crawling Mayfly		5.5	
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly		1.5	
CF[redacted]	Hydropsychid Caddisfly		5.5	
C[redacted]	Non-Hydropsy. Caddisfly		3.5	
R[redacted]	Riffle Beetle		5.0	
WHB	Whirligig Beetle		4.0	
WPB	Water Penny Beetle		4.0	
CRF	Cranefly		4.0	
BIM	Biting Midge		5.0	
BLW	Blood Worm		11.0	
MID	Midge (44)	44	6.0	264
BLF	Black Fly		6.0	
NF	Snipe Fly		4.0	
TF	Other Fly		10.0	
HS	Left-Handed Snail		9.0	
HS	Right-Handed Snail (2)	11	7.0	14.0
S	Planorbid Snail		6.5	
M	Limpet		7.0	
PS	Operculate Snail		6.0	
[redacted]	TOTALS	100		714.5
[redacted]	∑TAXA =	∑N		∑T_v

MBI = $\sum T_v \div \sum N$ = 7.145

≤6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = ∑N = 100

TAXA RICHNESS = ∑TAXA = 6

PERCENT COMPOSITION OF INDICATOR ORGANISMS

ORGANISM	N	÷	∑N	x 100 =	%C
MAYFLIES (MF#)	0	÷	100	x 100 =	0%
STONEFLIES (STF)	0	÷	100	x 100 =	0%
CADDISFLIES (CF#)	0	÷	100	x 100 =	0%
BLOODWORMS (BLW)	0	÷	100	x 100 =	0%
AQUATIC WORMS (AQW)	30	÷	100	x 100 =	30%

SUBTOTAL % = 30%

% ALL OTHERS (100 % - SUBTOTAL %) = 70%

NOTES (MNT):

[illegible]

Revised March 19, 1997, WP7.0, mbdata.doc

Mike Phillips
03/29/99 02:47 PM

To: Bob Byrne/faculty/IVCC@IVCC
cc:
Subject: river numbers

Bob,

Tomahawk at Mitchell Creek
width = 8.3 m
avg. depth = 0.178 m
avg. velocity = 0.694 m/sec
discharge = 1.02 m^3/sec

Little Vermillion at Cabin
width = 8.3 m
avg. depth = 0..365 m
avg. velocity = 0..887 m/sec
discharge = 2.69 m^3/sec

LINOIS RIVERWATCH
ACROINVERTEBRATE DATA SHEET
acroinvertebrate Identification

4/29/

CODE	ORGANISM	N	T_i	T_v
[illegible]	Flatworm	1	6.0	6.0
AQ[illegible]	Aquatic Worm	86	10.0	860
LEE	Leech		8.0	
SBG	Sowbug		6.0	
SCD	Scud		4.0	
DGF	Dragonfly		4.5	
DM1	Broadwing Damselfly		3.5	
DM2	Narrow-winged		5.5	
HLL	Hellgrammites		3.5	
MF1	Torpedo Mayfly		3.0	
MF2	Swimming Mayfly		4.0	
MF3	Clinging Mayfly		3.5	
MF4	Crawling Mayfly		5.5	
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly		1.5	
CF1	Hydropsychid Caddisfly	III	5.5	16.5
[illegible]	Non-Hydropsy. Caddisfly		3.5	
RB	Riffle Beetle		5.0	
WB	Whirligig Beetle		4.0	
PB	Water Penny Beetle		4.0	
CF	Cranefly		4.0	
MB	Biting Midge	II	5.0	10.0
BW	Blood Worm	~~III~~ I	11.0	66.0
MD	Midge		6.0	
BF	Black Fly		6.0	
SF	Snipe Fly		4.0	
OF	Other Fly		10.0	
LS	Left-Handed Snail		9.0	
RS	Right-Handed Snail		7.0	
[illegible]	Planorbid Snail		6.5	
[illegible]	Limpet		7.0	
[illegible]	Operculate Snail	II	6.0	12.0
	TOTALS	100		970.5
	TAXA =	ΣN		ΣT.

MBI = $\sum T_v \div \sum N$ = 9.7

<6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = ΣN = 100

TAXA RICHNESS = ΣTAXA = 6

PERCENT COMPOSITION OF INDICATOR ORGANISMS

ORGANISM	N	÷	ΣN	x 100 =	%C
MAYFLIES (MF#)		÷		x 100 =	0
STONEFLIES (STF)		÷		x 100 =	0
CADDISFLIES (CF#)	3	÷	100	x 100 =	3%
BLOODWORMS (BLW)	6	÷	100	x 100 =	6%
AQUATIC WORMS (AQW)	86	÷	100	x 100 =	86

SUBTOTAL % = 95%

% ALL OTHERS (100 % - SUBTOTAL %) = 5.0%

NOTES (MNT):

Revised March 19, 1997, WP7.0, mbdata.doc

RIVER TESTING 4/24/99

QUALITATIVE

	Lauryl Triptose Broth	Lactose Broth
Cabin		
Full	growth + gas	growth + gas
1/10	growth + gas	growth + gas
1/100	growth, no gas	growth, no gas
Tomahawk		
Full	growth + gas	growth + gas
1/10	growth + gas	growth + gas
1/100	no growth, no gas	no growth, no gas
Sportsmen's Club		
Full	growth + gas	growth + gas
1/10	growth + gas	growth + gas
1/100	growth, no gas	growth, no gas

Quantitative

Cabin	Tomahawk	Sportsmen's Club
Full too numerous to count	Full 30	Full too many to count
1/10 53	1/10 3	1/10 20
1/100 27	1/100 1	1/100 3

STUDENT SHEET 3.3 - DIVERSITY INDEX

River/Stream: NATURE PRESERVE
School: IUCC
Date: 4-24-05 Time: 10:30
Water Conditions:
Weather Conditions:
Previous 24 hrs.
Air Temp : °C
Flow Rate: meters/sec

River Mile Marker:
Location: Latitude: ° min sec
Longitude: ° min sec
County: Quadrangle:
Legal Description: 1/4 of the 1/4 of the 1/4.
Section of Township: Range:
Nearest Town:
Site Location or Address:

TAXON	# of ORGS.	P = # per taxon / Σ org.	ENTER P	Log 10	÷	.301	X	Enter P	INDEX VALUE
flatworm	1	1/100	.01	-2		-.602		.01	-.07
aquatic worm	86	86/100	.86	-.07		-.22		.86	-.19
[illegible]	3	3/100	.03	-1.52		-5.02		.03	-.15
midge	2	2/100	.02	-1.70		-5.64		.02	-.11
bloodworm	6	6/100	.06	-1.22		-4.06		.06	-.24
dragonfly	2	2/100	.02	-1.70		-5.64		.02	-.11

Total # of Taxon =

Total # of organ. =

Total Index Values = .87
Inverse Sign = .87
Diversity index = .87

Sample Number 1 _____

Sample Number 2 _____

Sample Number 3 _____

Average Diversity Index _____

Values

less than 1	Indicates few taxa, some with many individuals, and may indicate pollution.
between 1-3	May indicate moderatedpolluted water.
exceeding 3	May indicate relatively clean and unpolluted water.

Water-Quality Index (WQI)

River/Stream Tomahawk Creek
School IVCC
Date 6/4/99 Time 9:40
Water Conditions Clear
Weather Conditions Partly Sunny
Air temperature 24° °C
Flow rate 0.591 m/s

River Mile Marker —
Location Latitude: 41 ° 22 ' 42 "
Longitude: 89 ° 05 ' 04 "
County La Salle Quadrangle Troy Grove
Legal Description: NW 1/4 of the SW 1/4 of the NW 1/4
Section 35 of Township T 34N Range 1E
Nearest Town La Salle
Site Location or Address #6

Test	Test Results (mean values)	Standard Deviation	Q-Value	Weighting Factor	Total (%)
Dissolved Oxygen	11.5 mg/L ($DO_{day\ 1}$) 108 % Sat		95	0.17	16.2
Fecal Coliform	140 colonies/100 mL		42	0.16	6.7
pH	7.84 units		89	0.11	9.8
BOD	DO_{day1} 11.5 mg/L − DO_{day5} 10.0 mg/L BOD = 1.5 mg/L		96	0.11	10.6
Temperature Change	$Temp_{site\ 1}$ 16 °C $Temp_{site\ 2}$ 16 °C ΔT = 0 °C		93	0.10	9.3
Phosphate	0.10 mg/L		96	0.10	9.6
Nitrate	11.0 mg/L		48	0.10	4.8
Turbidity	7.3 ~~meters or JTU~~/NTU		83	0.08	6.6
Total Solids	151 mg/L		78	0.07	5.5
			OVERALL WATER-QUALITY INDEX		79.1 %

Conductivity 331
Discharge 2.48 m^3/s or 87.5 ft^3/s

Overall Water-Quality Index	Quality of Water
90–100%	Excellent
70–89%	Good
50–69%	Medium
25–49%	Bad
0–24%	Very Bad

© SIU, published by Addison Wesley Longman, Inc.

RIVER TESTING 6/4/99

QUALITATIVE ~ Number of colonies

	Lauryl Triptose Broth	Lactose Broth
Tomahawk		
Full	growth + no gas	growth + gas
1/10	growth + no gas	growth + no gas
1/100	growth, no gas	growth, no gas
Mitchell Creek		
Full	growth + no gas	growth + no gas
1/10	growth + no gas	growth + no gas
1/100	no growth, no gas	growth, no gas

Quantitative

Tomahawk		Mitchell Creek	
Full	too numerous to count (140)	Full	4
1/10	3	1/10	0
1/100	0	1/100	0

Qualitative full in lactose broth and for coliform, which goes along with the quantitative results seen above.

Dissolved Oxygen

Wed June 9 1999

Temp of water 22°C

(# of drops) 10 mg/L

Mr. Byrne's copy

Mr. Byrne ~

Lee Ann wants to know Horger's results

Mike Phillips
06/21/99 04:32 PM

To: Bob Byrne/faculty/IVCC@IVCC
cc:
Subject: river testing - June 1999

Bob,

Total width = 7.8 m or 25.6 ft
Average depth = 0.54 m or 1.76 ft.sec
Average velocity = 0.591 m/sec or 1.94 ft/sec
Discharge = 2.48 cubic meters/sec or 87.5 cubic ft/sec

Mike

LINOIS RIVERWATCH
ACROINVERTEBRATE DATA SHEET
ncroinvertebrate Identification

ODE	ORGANISM	N	T_i	T_v
W	Flatworm		6.0	
[illegible]	Aquatic Worm	~~IIII~~ ~~IIII~~	10.0	280
EE	Leech	I	8.0	8
BG	Sowbug	III	6.0	18
CD	Scud	III	4.0	12
GF	Dragonfly		4.5	
M1	Broadwing Damselfly		3.5	
M2	Narrow-winged		5.5	
LL	Hellgrammites		3.5	
MF1	Torpedo Mayfly ~~IIII~~ III	~~IIII~~ ~~IIII~~	3.0	54
MF2	Swimming Mayfly III	~~IIII~~ ~~IIII~~	4.0	52
MF3	Clinging Mayfly	IIII	3.5	14
MF4	Crawling Mayfly		5.5	
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly	I	1.5	1.5
CF	Hydropsychid Caddisfly		5.5	
CF2	Non-Hydropsy. Caddisfly		3.5	
RB	Riffle Beetle	III	5.0	15
WB	Whirligig Beetle	I	4.0	4
PB	Water Penny Beetle		4.0	
CF	Cranefly		4.0	
M	Biting Midge		5.0	
W	Blood Worm	~~IIII~~	11.0	55
D	Midge	~~IIII~~ ~~IIII~~ I	6.0	66
F	Black Fly		6.0	
	Snipe Fly		4.0	
	Other Fly		10.0	
S	Left-Handed Snail	~~IIII~~ IIII	9.0	81
S	Right-Handed Snail		7.0	
	Planorbid Snail		6.5	
	Limpet		7.0	
	Operculate Snail		6.0	
	TOTALS	100		1605
	TAXA =	ΣN		ΣT.

MBI = $\Sigma T_v \div \Sigma N$ = 6.605

<6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = ΣN = 100

TAXA RICHNESS = ΣTAXA = 13

PERCENT COMPOSITION OF INDICATOR ORGANISMS

ORGANISM	N	÷	ΣN	x 100 =	%C
MAYFLIES (MF#)	35	÷	100	x 100 =	35%
STONEFLIES (STF)	1	÷	100	x 100 =	1
CADDISFLIES (CF#)	0	÷	100	x 100 =	0
BLOODWORMS (BLW)	5	÷	100	x 100 =	5
AQUATIC WORMS (AQW)	28	÷	100	x 100 =	28

SUBTOTAL % = 69

% ALL OTHERS (100 % - SUBTOTAL %) = 31

NOTES (MNT):

STUDENT SHEET 3.4 - WATER QUALITY INDEX (WQI)

River/Stream: Little Vermilion
School: IVCC
Date: 9/19 Time: 9:20
Water Conditions: Clear (low)
Weather Conditions: Sunny
Previous 24 hrs. Sunny
Air Temp: 22 °C

River Mile Marker: —
Location: Latitude: 41° 22 min 26 sec
Longitude: 89° 5 min 36 sec
County: LaSalle Quadrangle: LaSalle
Legal Description: SW 1/4 of the SE 1/4 of the SE 1/4.
Section 34 of Township: T 34 N Range: R 1 E
Nearest Town: La Salle

Flow Rate: 0.603 meters/sec
Site Location or Address: #7

Test	Test mean values	Q-Value	Weighting Factor	Total
1. Dissolved Oxygen	DO_{day1} 9 mg/L % Sat 98	98	0.17	16.7 %
2. Fecal Coliform	9 colonies/100mL	72	0.16	11.5
3. pH	8.19 units	75	0.11	8.3
4. BOD	DO_{day1} 9 mg/L minus DO_{day5} 8 mg/L	93	0.11	10.2
5. Temperature Change	$Temp_{site1}$ 20 °C ΔT = 0 °C $Temp_{site2}$ 20 °C	92	0.10	9.2
6. Phosphate	0.59 mg/L	60	0.10	6.0
7. Nitrate	18.9 mg/L	40	0.10	4.0
8. Turbidity	10.3 ~~meters~~ NTU feet	76	0.08	6.1
9. Total Solids (dissolve)	239 mg/L	68	0.07	4.8

Conductivity 494
discharge 0.796 m^3/s

OVERALL WATER QUALITY INDEX 78.8 %

Overall Water Quality Index	Quality of Water
90% - 100%	Excellent
70% - 90%	Good
50% - 70%	Medium
25% - 50%	Bad
0 - 25%	Very Bad

ILLINOIS RIVERWATCH
MACROINVERTEBRATE DATA SHEET
Macroinvertebrate Identification

LV #7 9/19/98

CODE	ORGANISM	N	T_i	T_v
[redacted]	Flatworm		6.0	
[redacted]	Aquatic Worm		10.0	
LEE	Leech		8.0	
SBG	Sowbug		6.0	
SCD	Scud		4.0	
DGF	Dragonfly		4.5	
DM1	Broadwing Damselfly		3.5	
DM2	Narrow-winged		5.5	
HLL	Hellgrammites	2	3.5	7
MF1	Torpedo Mayfly		3.0	
MF2	Swimming Mayfly		4.0	
MF3	Clinging Mayfly	33	3.5	133
MF4	Crawling Mayfly	13	5.5	71.5
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly		1.5	
CF1	Hydropsychid Caddisfly	44	5.5	242
[redacted]	Non-Hydropsy. Caddisfly		3.5	
[redacted]	Riffle Beetle	1	5.0	5.0
WHB	Whirligig Beetle		4.0	
WPB	Water Penny Beetle		4.0	
CRF	Crane fly		4.0	
BIM	Biting Midge		5.0	
BLW	Blood Worm		11.0	
MID	Midge	2	6.0	12.0
BLF	Black Fly		6.0	
SNF	Snipe Fly		4.0	
OTF	Other Fly		10.0	
LHS	Left-Handed Snail		9.0	
RHS	Right-Handed Snail		7.0	
PLS	Planorbid Snail		6.5	
LIM	Limpet		7.0	
OPS	Operculate Snail		6.0	
[redacted]	TOTALS	100		470.5
[redacted]	ΣTAXA =	ΣN		$ΣT_v$

MBI = $ΣT_v ÷ ΣN$ = 4.705

<6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = ΣN =

TAXA RICHNESS = ΣTAXA =

PERCENT COMPOSITION OF INDICATOR ORGANISMS

ORGANISM	N	÷	ΣN	x 100 =	%C
MAYFLIES (MF#)	51	÷	100	x 100 =	51
STONEFLIES (STF)	0	÷		x 100 =	0
CADDISFLIES (CF#)	44	÷	100	x 100 =	44
BLOODWORMS (BLW)		÷		x 100 =	
AQUATIC WORMS (AQW)	2	÷	100	x 100 =	2

SUBTOTAL % = 97%

% ALL OTHERS (100 % - SUBTOTAL %) = 3%

NOTES (MNT):

Revised March 19, 1997, WP7.0, mbdata.doc

Mike Phillips
10/05/98 02:52 PM

To: Bob Byrne/faculty/IVCC@IVCC
cc:
Subject: river testing

CLUB
width: 5.0 m
avg. depth: 0.317 m
avg. velocity: 0.503m/sec
discharge: 0.796m^3/sec

MITCHELL CREEK
width: 7.0 m
avg. depth: 0.203 m
avg. velocity: 0.102m/sec
discharge: 0.145m^3/sec

Mike

Water Quality Report

Please note: Although it is most unlikely that you will experience any problems responding to this form, certain non-standard browsers will not respond properly. If you experience any difficulties, (or if you are not using a forms-capable browser) you may email your response to this form to: rivers@siue.edu.

This first part of this form provides information describing the location where your water sample was collected. Please insure that all blocks in EITHER section A or section B below are completed before submitting the report. Enter actual water quality test results in the second part of this form.

PART 1 - SITE INFORMATION

School: Illinois Valley Community College	
River: Little Vermilion	Mile Marker:
City: Oglesby	State: IL
Date DDMMMYY: 240499	Time: 9:30 AM

Weather and Stream Conditions

Water Conditions: Very cloudy	Weather Conditions: Sunny	Previous 24 Hours: heavy rain
Celsius Water Temp: 9.0	Celsius Air Temp: 14.0	Flow Rate (m/sec.):

Site Description

Nearest Town: La Salle	
Site Name: # 7 (Sportsman Club)	
Latitude DDMMSS: 412226	Longitude DDMMSS: 890536
County: La Salle	Quadrangle: La Salle
Legal Description: SW quarter of the: SE 1/4 of the: SE 1/4 of Section: 34	
Township: T34N	Range: R1E

Comments:

PART TWO - WATER QUALITY DATA

1. Dissolved Oxygen DO in mg per L: 13.5 DO %sat: 117 DO Q%: 93	***2. Fecal Coliform*** FC colonies per 100mL: 200 FC Q%: 36	***3. pH*** pH units: 8.0 pH Q%: 82
4. Biological Oxygen Demand BOD Day1: 13.5 BOD Day5: 7 BOD Q%: 50	***5. Temperature Change*** Celsius Temp Site1: 8.0 Celsius Temp Site2: 8.0 Temp Change: 0.0 Temp Q%: 93	***6. Phospahte*** Phos mg per L: .96 Phos Q%: 40
7. Nitrate Nit mg per L: 12 Nit Q%: 48	***8. Turbidity*** NTU units: 90 Feet: TURB Q%: 21	***9. Total Solids*** Solids mg per L: 123 Solids Q%: 81

WATER QUALITY SCORES

Overall WQI:

61.6

50%-70% Medium

Send Data Now | Clear Form

WebForms™ 2.5 Unregistered - ©1995,96 Q&D Software Development
http://www.q-d.com/

Rivers Project Homepage | Groundwater Project Homepage | Turtle Tracking Homepage | Zebra Mussel Project Homepage

Curator: *Rivers Project Staff*
Last Updated: *Tue, Aug 25, 1998*

STUDENT SHEET 3.3 - DIVERSITY INDEX

River/Stream: SPORTSMAN CLUB
School: IUCC.
Date: 4-24- Time: 9:30
Water Conditions:
Weather Conditions:
Previous 24 hrs.
Air Temp : °C
Flow Rate: meters/sec

River Mile Marker:
Location: Latitude: ° min sec
Longitude: ° min sec
County: Quadrangle:
Legal Description: 1/4 of the 1/4 of the 1/4.
Section of Township: Range:
Nearest Town:
Site Location or Address: #7

TAXON	# of ORGS.	P = # per taxon / Σ org.	ENTER P	Log 10	÷	.301	X	Enter P	INDEX VALUE
Aquatic Worms	38	38/50	.76	-.12		-.40		.76	-.30
Clinging Mayfly	2	2/50	.04	-1.40		-4.64		.04	-.19
Hydropsychid caddisfly	4	4/50	.08	-1.10		-3.64		.08	-.29
Bloodworm	4	4/50	.08	-1.10		-3.64		.08	-.29
RH snail	2	2/50	.04	-1.40		-4.64		.04	-.19
Operculate Snail	1	1/50	.02	-1.70		-5.64		.02	-.11

Total # of Taxon =

Total # of organ. =

Total Index Values = -1.37
Inverse Sign = 1.37
Diversity index = 1.37

Sample Number 1 _____

Sample Number 2 _____

Sample Number 3 _____

Average Diversity Index _____

Values

less than 1 — Indicates few taxa, some with many individuals, and may indicate pollution.
between 1-3 — May indicate moderatedpolluted water.
exceeding 3 — May indicate relatively clean and unpolluted water.

ILLINOIS RIVERWATCH
MACROINVERTEBRATE DATA SHEET
Macroinvertebrate Identification

4-24-99

CODE	ORGANISM	N	T_i	T_v
FL	Flatworm		6.0	
AQW	Aquatic Worm	38	10.0	380
LEE	Leech		8.0	
SBG	Sowbug		6.0	
SCD	Scud		4.0	
DGF	Dragonfly		4.5	
DM1	Broadwing Damselfly		3.5	
DM2	Narrow-winged		5.5	
HLL	Hellgrammites		3.5	
MF1	Torpedo Mayfly		3.0	
MF2	Swimming Mayfly		4.0	
MF3	Clinging Mayfly	11	3.5	7
MF4	Crawling Mayfly		5.5	
MF5	Burrowing Mayfly		5.0	
MF6	Two-Tailed Mayfly		3.0	
STF	Stonefly		1.5	
CF1	Hydropsychid Caddisfly	IIII	5.5	22
CF2	Non-Hydropsy. Caddisfly		3.5	
RFB	Riffle Beetle		5.0	
WHB	Whirligig Beetle		4.0	
WPB	Water Penny Beetle		4.0	
CRF	Cranefly		4.0	
BIM	Biting Midge		5.0	
BLW	Blood Worm	IIII	11.0	44
MID	Midge		6.0	
BLF	Black Fly		6.0	
SNF	Snipe Fly		4.0	
OTF	Other Fly		10.0	
LHS	Left-Handed Snail		9.0	
RHS	Right-Handed Snail	II	7.0	14
PLS	Planorbid Snail		6.5	
LIM	Limpet		7.0	
OPS	Operculate Snail	I	6.0	10
	TOTALS	50		473
	ΣTAXA =	ΣN		$ΣT_v$

MBI = $ΣT_v ÷ ΣN$ = 9.46

<6.0 = GOOD Water Quality
6.1 - 7.5 = FAIR Water Quality
7.6 - 8.9 = POOR Water Quality
> or = 9.0 = VERY POOR Water Quality

SAMPLE DENSITY = ΣN = 50

TAXA RICHNESS = ΣTAXA = 6

PERCENT COMPOSITION OF INDICATOR ORGANISMS

ORGANISM	N	÷	ΣN	x 100 =	%C
MAYFLIES (MF#)	2	÷	50	x 100 =	1%
STONEFLIES (STF)	0	÷		x 100 =	
CADDISFLIES (CF#)	4	÷	50	x 100 =	8%
BLOODWORMS (BLW)	4	÷	50	x 100 =	8%
AQUATIC WORMS (AQW)	38	÷	50	x 100 =	19%

SUBTOTAL % = 24%

% ALL OTHERS (100 % - SUBTOTAL %) = _____

NOTES (MNT):

Revised March 19, 1997, WP7.0, mbdata.doc

River Testing 3/27/99

Qualitative

Cabin	LT	LB
Full	growth and no gas	growth and gas
1/10	no growth no gas	no growth no gas
1/100	no growth no gas	no growth no gas

Mitchell	LT	LB
Full	growth no gas	growth no gas
1/10	growth no gas	growth no gas
1/100	no growth no gas	no growth no gas

Tomahawk	LT	LB
Full	growth no gas	growth no gas
1/10	growth no gas	no growth no gas
1/100	no growth no gas	no growth no gas

Quantitative

Tomahawk	Cabin	Mitchell
Full 2	Full 16	Full no growth

DRAFT

Byrne -
Lee Ann said these results are ok. they are not that bad.
She also said we can use her stuff for Earth day
Leslie

Water Quality Report

Please note: Although it is most unlikely that you will experience any problems responding to this form, certain non-standard browsers will not respond properly. If you experience any difficulties, (or if you are not using a forms-capable browser) you may email your response to this form to: rivers@siue.edu.

This first part of this form provides information describing the location where your water sample was collected. Please insure that all blocks in EITHER section A or section B below are completed before submitting the report. Enter actual water quality test results in the second part of this form.

PART 1 - SITE INFORMATION

School: Illinois Valley Community College	
River: Tomahawk Creek	Mile Marker:
City: Oglesby	State: IL
Date DDMMMYY: 240499	Time: 10:45

Weather and Stream Conditions		
Water Conditions: Some cloudiness	Weather Conditions: Sunny	Previous 24 Hours: heavy rain
Celsius Water Temp: 9	Celsius Air Temp: 15	Flow Rate (m/sec.):

Site Description	
Nearest Town: La Salle	
Site Name: # 6	
Latitude DDMMSS: 412242	Longitude DDMMSS: 890504
County: LaSalle	Quadrangle: Troy Grove
Description: NW quarter of the: SW 1/4 of the: SW 1/4 of Section: 35	
T34N	Range: 1E

Comments:

"DRAFT"

PART TWO - WATER QUALITY DATA

1. Dissolved Oxygen DO in mg per L: 12.5 DO %sat: 117 DO Q%: 93	***2. Fecal Coliform*** FC colonies per 100mL: 30 FC Q%: 58	***3. pH*** pH units: 8.4 pH Q%: 70
4. Biological Oxygen Demand BOD Day1: 12.5 BOD Day5: 9 BOD Q%: 65	***5. Temperature Change*** Celsius Temp Site1: 9 Celsius Temp Site2: 9 Temp Change: 0 Temp Q%: 93	***6. Phospahte*** Phos mg per L: .90 Phos Q%: 45
7. Nitrate Nit mg per L: 27 Nit Q%: 30	***8. Turbidity*** NTU units: 10 Feet: TURB Q%: 76	***9. Total Solids*** Solids mg per L: 140 Solids Q%: 80

WATER QUALITY SCORES

Overall WQI:

68.5

50%-70% Medium

Send Data Now | Clear Form

WebForms™ 2.5 Unregistered - ©1995,96 Q&D Software Development
http://www.q-d.com/

Curator: *Rivers Project Staff*
Last Updated: *Tue, Aug 25, 1998*

WAL★MART

RIVERS