

LOWER CANNON NEAR RED WING



Lower Cannon River near Highway 61 (LCH-1)

Location:

River mile: 7

U.S.G.S. quad: Welch; 44092-E6

Township: T113N R15W S19

Lat./Long: 44°35'/92°39'30"

Other info:

Type: Small River

Stream Order: 5

Drainage area: 1475 square miles

Riparian: Forest, Old field, Newly developed flood plain with riprap

Instream: Sand and silt with riprap banks

Gradient: 3.33 ft/mi



QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/19/95 River Mile 7 Watershed Number _____
 Location LCH-1 U.S.G.S. quad Welch
 Township T113N R15W Section 19 Lat./Long. 44°35'92°39'30"

57

Total QHEI

1. SUBSTRATE (Check ONLY two substrate TYPES). % Pool/Riffle substrates optional.

<table border="0" style="width: 100%;"> <tr> <th style="text-align: left;">Type</th> <th style="text-align: left;">Pool</th> <th style="text-align: left;">Riffle</th> </tr> <tr> <td><input checked="" type="checkbox"/> Boulder (7)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Cobble (6)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Hardpan (3)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Silt (3)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Muck (2)</td> <td>_____</td> <td>_____</td> </tr> </table>	Type	Pool	Riffle	<input checked="" type="checkbox"/> Boulder (7)	_____	_____	<input type="checkbox"/> Cobble (6)	_____	_____	<input type="checkbox"/> Hardpan (3)	_____	_____	<input checked="" type="checkbox"/> Silt (3)	_____	_____	<input type="checkbox"/> Muck (2)	_____	_____	<table border="0" style="width: 100%;"> <tr> <th style="text-align: left;">Type</th> <th style="text-align: left;">Pool</th> <th style="text-align: left;">Riffle</th> </tr> <tr> <td><input type="checkbox"/> Gravel (5)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sand (4)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Bedrock (3)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Detritus (2)</td> <td>_____</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Sludge (1)</td> <td>_____</td> <td>_____</td> </tr> </table>	Type	Pool	Riffle	<input type="checkbox"/> Gravel (5)	_____	_____	<input type="checkbox"/> Sand (4)	_____	_____	<input type="checkbox"/> Bedrock (3)	_____	_____	<input type="checkbox"/> Detritus (2)	_____	_____	<input type="checkbox"/> Sludge (1)	_____	_____	<p>Quality</p> <p><i>Check all that apply:</i></p> <p><input checked="" type="checkbox"/> Silt covered (-1)</p> <p><input type="checkbox"/> Silt free (1)</p> <p><input type="checkbox"/> Boulders as slabs (1)</p> <p><input checked="" type="checkbox"/> Embedded (-2)</p>
Type	Pool	Riffle																																				
<input checked="" type="checkbox"/> Boulder (7)	_____	_____																																				
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<input type="checkbox"/> Bedrock (3)	_____	_____																																				
<input type="checkbox"/> Detritus (2)	_____	_____																																				
<input type="checkbox"/> Sludge (1)	_____	_____																																				

7

Substrate

Comments New riprap on both shorelines and grasses planted on floodplain.

2. INSTREAM COVER

<p>Type (Check ALL that apply)</p> <p><input type="checkbox"/> Undercut banks (1)</p> <p><input checked="" type="checkbox"/> Overhanging vegetation (1)</p> <p><input type="checkbox"/> Shallows (in slow water) (1)</p> <p><input type="checkbox"/> Logs or woody debris (1)</p>	<p>Amount (Check ONLY one)</p> <p><input type="checkbox"/> Extensive (7)</p> <p><input type="checkbox"/> Moderate (5)</p> <p><input checked="" type="checkbox"/> Sparse (3)</p> <p><input type="checkbox"/> Nearly absent (1)</p>
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7

Cover

Comments _____

3. CHANNEL MORPHOLOGY (Check ONLY one under each category)

<p>Sinuosity</p> <p><input type="checkbox"/> High (4)</p> <p><input type="checkbox"/> Moderate (3)</p> <p><input type="checkbox"/> Low (2)</p> <p><input type="checkbox"/> None (1)</p>	<p>Development</p> <p><input type="checkbox"/> Excellent (4)</p> <p><input type="checkbox"/> Good (3)</p> <p><input checked="" type="checkbox"/> Fair (2)</p> <p><input type="checkbox"/> Poor (1)</p>	<p>Channelization</p> <p><input type="checkbox"/> None (4)</p> <p><input type="checkbox"/> Recovered (3)</p> <p><input type="checkbox"/> Recovering (2)</p> <p><input checked="" type="checkbox"/> Recent or no Recovery (1)</p>	<p>Stability</p> <p><input type="checkbox"/> High (3)</p> <p><input type="checkbox"/> Moderate (2)</p> <p><input checked="" type="checkbox"/> Low (1)</p>	<p>Other</p> <p><input type="checkbox"/> Impound</p> <p><input type="checkbox"/> Islands</p> <p><input checked="" type="checkbox"/> Leveed</p>
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7

Channel

Comments _____

4. RIPARIAN ZONE AND BANK EROSION *River right looking downstream*

(Check single most predominant, on each bank, under each category)

<p>Riparian Width</p> <p>L R</p> <p><input type="checkbox"/> Extensive >100m (3)</p> <p><input type="checkbox"/> Wide 50-100m (4)</p> <p><input checked="" type="checkbox"/> Moderate 10-50m (3)</p> <p><input type="checkbox"/> Narrow 5-10m (2)</p> <p><input type="checkbox"/> Very Narrow 1-5m (1)</p> <p><input type="checkbox"/> None (0)</p>	<p>Flood Plain Quality</p> <p>L R</p> <p><input type="checkbox"/> Open pasture (1)</p> <p><input type="checkbox"/> Fenced pasture (2)</p> <p><input type="checkbox"/> Old field (3)</p> <p><input type="checkbox"/> Rowcrop (1)</p> <p><input checked="" type="checkbox"/> Conservation tillage (2)</p>	<p>L R</p> <p><input checked="" type="checkbox"/> Forest, swamp (3)</p> <p><input type="checkbox"/> Shrub (4)</p> <p><input type="checkbox"/> Residential, Park (2)</p> <p><input type="checkbox"/> Urban</p>	<p>Bank Erosion</p> <p>L R</p> <p><input type="checkbox"/> None (5)</p> <p><input checked="" type="checkbox"/> Little (4)</p> <p><input checked="" type="checkbox"/> Moderate (3)</p> <p><input type="checkbox"/> Heavy (2)</p> <p><input type="checkbox"/> Severe (1)</p>
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10

Riparian

Comments _____

5. POOL/GLIDE AND RIFFLE/RUN QUALITY

<p>Maximum Depth (Check 1)</p> <p><input type="checkbox"/> > 1m (3)</p> <p><input type="checkbox"/> 0.7-1m (2)</p> <p><input type="checkbox"/> 0.4-0.7m (1)</p> <p><input type="checkbox"/> < 0.4m (0)</p> <p><input type="checkbox"/> No Pool</p>	<p>Pool Cover (Check 1)</p> <p><input type="checkbox"/> Extensive (3)</p> <p><input type="checkbox"/> Moderate (2)</p> <p><input checked="" type="checkbox"/> Sparse (1)</p> <p><input type="checkbox"/> Nearly absent (0)</p>	<p>Overall Current Velocity (Check ALL that apply)</p> <p><input type="checkbox"/> Torrential (-1)</p> <p><input checked="" type="checkbox"/> Fast (1)</p> <p><input checked="" type="checkbox"/> Moderate (1)</p> <p><input checked="" type="checkbox"/> Slow (1)</p> <p><input type="checkbox"/> Intermittent (-2)</p> <p><input type="checkbox"/> Eddies (1)</p> <p><input type="checkbox"/> Interstitial (-1)</p>	<p>Morphology (Check 1)</p> <p><input type="checkbox"/> Pool width > riffle width (2)</p> <p><input type="checkbox"/> Pool width = riffle width (1)</p> <p><input checked="" type="checkbox"/> Pool width < riffle width (0)</p>
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7

Pool/
Riffle

<p>Riffle/Run Depth (Check 1)</p> <p><input type="checkbox"/> Generally <10cm (1)</p> <p><input type="checkbox"/> Generally >10cm Max <50 (2)</p> <p><input checked="" type="checkbox"/> Generally >10cm Max >50 (3)</p> <p><input type="checkbox"/> No riffle (0)</p>	<p>Riffle/Run Substrate (Check 1)</p> <p><input type="checkbox"/> Stable (cobble, boulder) (1)</p> <p><input checked="" type="checkbox"/> Unstable (gravel, sand) (0)</p>	<p>Riffle/Run Substrate Quality (Check 1)</p> <p><input checked="" type="checkbox"/> Embedded (0)</p> <p><input type="checkbox"/> Not embedded (1)</p>
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Comments _____

6. GRADIENT

(ft/mi) 3.3

4

Gradient

7. DRAINAGE AREA

(square mile) 1475

15

Drainage Area

QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/19/96 River Mile 7 Watershed Number _____
 Location LCH-1 U.S.G.S. quad Welch
 Township T113N R15W Section 19 Lat./Long. 44°34.52N 92°39.17W

58.5

Total QHEI

1. SUBSTRATE (Check ONLY two substrate TYPES). % Pool/Riffle substrates optional.

Type	Pool	Riffle	Type	Pool	Riffle	Quality
<input checked="" type="checkbox"/> Boulder (7)	_____	_____	<input type="checkbox"/> Gravel (5)	_____	_____	Check all that apply: <input checked="" type="checkbox"/> Silt covered (-1) <input type="checkbox"/> Silt free (1) <input type="checkbox"/> Boulders as slabs (1) <input checked="" type="checkbox"/> Embedded (-2)
<input type="checkbox"/> Cobble (6)	_____	_____	<input type="checkbox"/> Sand (4)	_____	_____	
<input type="checkbox"/> Hardpan (3)	_____	_____	<input type="checkbox"/> Bedrock (3)	_____	_____	
<input checked="" type="checkbox"/> Silt (3)	_____	_____	<input type="checkbox"/> Detritus (2)	_____	_____	
<input type="checkbox"/> Muck (2)	_____	_____	<input type="checkbox"/> Sludge (1)	_____	_____	
Comments _____						

7

Substrate

2. INSTREAM COVER

Type (Check ALL that apply)	Amount (Check ONLY one)
<input type="checkbox"/> Undercut banks (1) <input checked="" type="checkbox"/> Overhanging vegetation (1) <input checked="" type="checkbox"/> Shallows (in slow water) (1) <input checked="" type="checkbox"/> Logs or woody debris (1)	<input type="checkbox"/> Extensive (7) <input checked="" type="checkbox"/> Moderate (5) <input type="checkbox"/> Sparse (3) <input type="checkbox"/> Nearly absent (1)
<input type="checkbox"/> Deep pools (1) <input type="checkbox"/> Oxbows (1) <input checked="" type="checkbox"/> Boulders (1) <input type="checkbox"/> Aquatic macrophytes (1)	
Comments _____	

9

Cover

3. CHANNEL MORPHOLOGY (Check ONLY one under each category)

Sinuosity	Development	Channelization	Stability	Other
<input type="checkbox"/> High (4) <input checked="" type="checkbox"/> Moderate (3) <input type="checkbox"/> Low (2) <input type="checkbox"/> None (1)	<input type="checkbox"/> Excellent (4) <input type="checkbox"/> Good (3) <input checked="" type="checkbox"/> Fair (2) <input type="checkbox"/> Poor (1)	<input type="checkbox"/> None (4) <input type="checkbox"/> Recovered (3) <input type="checkbox"/> Recovering (2) <input checked="" type="checkbox"/> Recent or no Recovery (1)	<input type="checkbox"/> High (3) <input type="checkbox"/> Moderate (2) <input checked="" type="checkbox"/> Low (1)	<input type="checkbox"/> Impound <input type="checkbox"/> Islands <input type="checkbox"/> Leveed
Comments _____				

7

Channel

4. RIPARIAN ZONE AND BANK EROSION *River right looking downstream*

(Check single most predominant, on each bank, under each category)

Riparian Width	Flood Plain Quality	Bank Erosion																																
<table style="width: 100%;"> <tr> <th>L</th> <th>R</th> </tr> <tr> <td><input checked="" type="checkbox"/> Extensive >100m (5)</td> <td><input type="checkbox"/> Forest, swamp (3)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Wide 50-100m (4)</td> <td><input type="checkbox"/> Shrub (4)</td> </tr> <tr> <td><input type="checkbox"/> Moderate 10-50m (3)</td> <td><input type="checkbox"/> Residential, Park (2)</td> </tr> <tr> <td><input type="checkbox"/> Narrow 5-10m (2)</td> <td><input type="checkbox"/> Urban</td> </tr> <tr> <td><input type="checkbox"/> Very Narrow 1-5m(1)</td> <td><input checked="" type="checkbox"/> Conservation tillage (2)</td> </tr> <tr> <td><input type="checkbox"/> None (0)</td> <td></td> </tr> </table>	L	R	<input checked="" type="checkbox"/> Extensive >100m (5)	<input type="checkbox"/> Forest, swamp (3)	<input checked="" type="checkbox"/> Wide 50-100m (4)	<input type="checkbox"/> Shrub (4)	<input type="checkbox"/> Moderate 10-50m (3)	<input type="checkbox"/> Residential, Park (2)	<input type="checkbox"/> Narrow 5-10m (2)	<input type="checkbox"/> Urban	<input type="checkbox"/> Very Narrow 1-5m(1)	<input checked="" type="checkbox"/> Conservation tillage (2)	<input type="checkbox"/> None (0)		<table style="width: 100%;"> <tr> <th>L</th> <th>R</th> </tr> <tr> <td><input type="checkbox"/> Open pasture (1)</td> <td><input type="checkbox"/> Fenced pasture (2)</td> </tr> <tr> <td><input type="checkbox"/> Old field (3)</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Rowcrop (1)</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Conservation tillage (2)</td> <td></td> </tr> </table>	L	R	<input type="checkbox"/> Open pasture (1)	<input type="checkbox"/> Fenced pasture (2)	<input type="checkbox"/> Old field (3)		<input type="checkbox"/> Rowcrop (1)		<input checked="" type="checkbox"/> Conservation tillage (2)		<table style="width: 100%;"> <tr> <th>L</th> <th>R</th> </tr> <tr> <td><input type="checkbox"/> None (5)</td> <td><input checked="" type="checkbox"/> Little (4)</td> </tr> <tr> <td><input type="checkbox"/> Moderate (3)</td> <td><input type="checkbox"/> Heavy (2)</td> </tr> <tr> <td><input type="checkbox"/> Severe (1)</td> <td></td> </tr> </table>	L	R	<input type="checkbox"/> None (5)	<input checked="" type="checkbox"/> Little (4)	<input type="checkbox"/> Moderate (3)	<input type="checkbox"/> Heavy (2)	<input type="checkbox"/> Severe (1)	
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<input type="checkbox"/> Severe (1)																																		
Comments <u>New rip-rap along banks below bridge with grasses planted to hold soil on flood plain</u>																																		

10.5

Riparian

5. POOL/GLIDE AND RIFFLE/RUN QUALITY

Maximum Depth (Check 1)	Pool Cover (Check 1)	Overall Current Velocity (Check ALL that apply)	Morphology (Check 1)		
<input checked="" type="checkbox"/> > 1m (3) <input type="checkbox"/> 0.7-1m (2) <input type="checkbox"/> 0.4-0.7m (1) <input type="checkbox"/> < 0.4m (0) <input type="checkbox"/> No Pool	<input type="checkbox"/> Extensive (3) <input type="checkbox"/> Moderate (2) <input checked="" type="checkbox"/> Sparse (1) <input type="checkbox"/> Nearly absent (0)	<input type="checkbox"/> Torrential (-1) <input type="checkbox"/> Fast (1) <input checked="" type="checkbox"/> Moderate (1) <input checked="" type="checkbox"/> Slow (1)	<input type="checkbox"/> Intermittent (-2) <input type="checkbox"/> Eddies (1) <input type="checkbox"/> Interstitial (-1)		
<table style="width: 100%;"> <tr> <th style="width: 25%;">Morphology (Check 1)</th> </tr> <tr> <td> <input type="checkbox"/> Pool width > riffle width (2) <input type="checkbox"/> Pool width = riffle width (1) <input checked="" type="checkbox"/> Pool width < riffle width (0) </td> </tr> </table>				Morphology (Check 1)	<input type="checkbox"/> Pool width > riffle width (2) <input type="checkbox"/> Pool width = riffle width (1) <input checked="" type="checkbox"/> Pool width < riffle width (0)
Morphology (Check 1)					
<input type="checkbox"/> Pool width > riffle width (2) <input type="checkbox"/> Pool width = riffle width (1) <input checked="" type="checkbox"/> Pool width < riffle width (0)					

6

Pool/
Riffle

Riffle/Run Depth (Check 1)	Riffle/Run Substrate (Check 1)	Riffle/Run Substrate Quality (Check 1)
<input type="checkbox"/> Generally <10cm (1) <input type="checkbox"/> Generally >10cm Max <50 (2) <input type="checkbox"/> Generally >10cm Max >50 (3) <input checked="" type="checkbox"/> No riffle (0)	<input type="checkbox"/> Stable (cobble, boulder) (1) <input checked="" type="checkbox"/> Unstable (gravel, sand) (0)	<input checked="" type="checkbox"/> Embedded (0) <input type="checkbox"/> Not embedded (1)
Comments _____		

6. GRADIENT

(ft/mi) _____ 3.3 _____

4

Gradient

7. DRAINAGE AREA

(square mile) _____ 1475 _____

15

Drainage Area

SITE **LCH-1** Location LOWER CANNON AT HIGHWAY 61

	1994	1995	1996
SUBSTRATE	4	7	7
INSTREAM COVER	7	7	7
CHANNEL MORPHOLOGY	7	7	7
RIPARIAN	9.5	10	10.5
CHANNEL QUALITY	7	7	6
GRADIENT 4 DRAINAGE 15	QHEI 1994 53.5	QHEI 1995 57	QHEI 1996 56.5

EXTENT OF CHANGE IN LOCATION
 No change, however during the study a new bridge was built and the shore line extensively rip-rapped.

RAPID HABITAT BIOASSESSMENT 1995

89

- FISH COVER 6
- MACRO COVER 5
- EMBEDDEDNESS 5
- VELOCITY\DEPTH 7
- CHANNEL 6
- SEDIMENT 6
- RIFFLES 6
- CHANNEL FLOW 13
- BANK EROSION 10
- VEGETATION 10
- GRAZING 10
- RIPARIAN 5

LOWER CANNON RIVER (LCH-1)

U. S. Highway 61 near Red Wing

**Site was under construction in 1994 and 1995; the flood plain was modified, new bridges built, newly seeded grasses on the flood plain, and rip rap added to stabilize the banks.

Riparian: Rip rap and flood plain grasses

Instream: Rip rap, gravel, sand, and silt

Macroinvertebrate Metrics

<u>Metric</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>Average</u>	<u>Overall Impact</u>
QHEI	53.5	57	56.5	56.7	Non Impacted
ICI	28	42	39	36.3	
Richness	11	24	25.5	20.2	Slight
Diversity	1.9	2.7	3.3	2.6	Slight
Equitability	0.56	0.38	0.59	0.51	Slight
Scraper/Filterer Ratio	0.13	0.58	0.71		
Tolerance Range	1-6	1-8	1-8	1-8	

Macroinvertebrate Taxa and Numbers of Individuals

[#] = Tolerance Values (Source is Illinois Environmental Protection Agency)

	<u>June 94</u>	<u>July 94</u>	<u>June 95</u>	<u>July 95</u>	<u>June 96</u>	<u>July 96</u>
			HD's Dry			
Leeches						
Placobdella [8]	-	-	-	-	-	1
Amphipods						
Gammarus [3]	-	-	-	1	-	-
Stoneflies						
Perlesta [3]	98	-	-	1	55	18
Pteronarcys [2]	1	7	-	13	-	4
Acroneuria [1]	-	-	-	2	1	-
Beetles						
Optioservus [4]	-	-	-	1	-	-
Stenelmis [7]	-	-	-	2	1	1
Macronychus [2]	2	-	-	5	3	15
Ancyronyx [2]	1	-	-	-	-	-
Mayflies						
Baetis [4]	-	-	-	2	-	2
Ephemerella [2]	-	-	-	-	4	-
Heptagenia [3]	10	-	-	11	10	76
Stenacron [4]	-	-	-	-	-	3
Stenonema [4]	3	19	-	206	68	268
Isonychia [3]	-	1	-	4	-	25
Pseudocloeon [4]	-	-	-	-	-	23
Tricorythodes [5]	1	2	-	5	7	254
Potamanthus [4]	1	-	-	1	3	-
Caddisflies						
Cheumatopsyche [6]	488	40	-	157	80	214
Hydropsyche [5]	150	36	-	220	80	93
Ceraclea [3]	-	-	-	-	3	-
Psychomyia [2]	-	-	-	-	-	5
Brachycentrus [1]	-	-	-	-	5	5
Hydroptila [2]	-	-	-	-	-	9
True Flies						
Simuliidae [4-6]	-	-	-	3	-	-
Antocha [5]	-	-	-	-	-	10
Hemerodromia [6]	1	-	-	3	-	1
Atherix [4]	4	23	-	132	1	108

LOWER CANNON RIVER (LCH-1) page 2

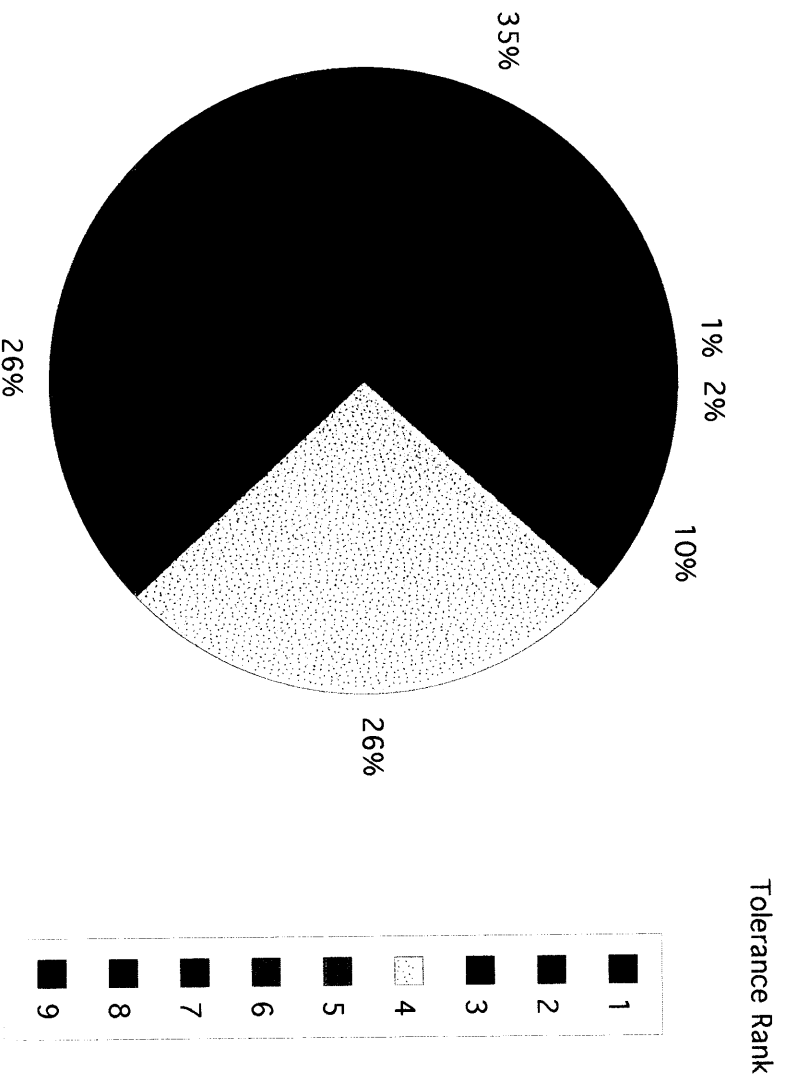
Midges

Cricotopus [8]	-	-	-	-	17	6
Microtendipes [6]	-	-	-	2	2	15
Dicrotendipes [6]	-	-	-	-	-	21
Polypedilum [6]	5	-	-	5	11	27
Eukiefferiella [4]	2	-	-	9	4	3
Tanytarsus [7]	-	-	-	-	-	6
Rheotanytarsus [6]	4	-	-	6	23	30
Thienemanimyia [6]	-	-	-	5	-	42
Phaenopsectra [4]	-	-	-	1	-	-
Cardiocladius [6]	-	-	-	-	2	-
Stenochironomus [3]	-	-	-	-	-	6

Lower Cannon at Highway 61 (LCH-1)

Site	NUMBER OF INSECTS BY TOLERANCE RATING									TOTAL	PERCENT IN TOLERANCE RANK								
	1	2	3	4	5	6	7	8	9		1	2	3	4	5	6	7	8	9
LCH 1994	0	11	109	52	189	538	0	0	0	899	0%	1%	12%	6%	21%	60%	0%	0%	0%
LCH 1995	2	18	17	350	225	181	2	0	0	795	0%	2%	2%	44%	28%	23%	0%	0%	0%
LCH 1996	11	35	193	483	444	468	8	24	0	1666	1%	2%	12%	29%	27%	28%	1%	0%	0%
LCH TOTAL	13	64	319	885	858	1187	10	24	0	3360	0%	2%	9%	26%	26%	35%	0%	1%	0%

Percent Macroinvertebrates by Tolerance Rank



SITE**LOWER CANNON RIVER AT HIGHWAY #61 [LCH]**

DATE

JULY 1994 JULY 1995 JULY 1996

SURFACE WATER

NITRATE NITROGEN	3.67	2.8
AMMONIA NITROGEN	0.032	0.04
KJELDAHL NITROGEN	4.5	5.23
ORTHOPHOSPHATE	0.048	0.039
TOTAL PHOSPHORUS	0.142	0.11

PORE WATER

NITRATE NITROGEN	3.61	2.75
AMMONIA NITROGEN	0.204	0.043
KJELDAHL NITROGEN	5.51	3.45
ORTHOPHOSPHATE	0.171	0.08
TOTAL PHOSPHORUS	0.197	0.129

STREAM LOAD

TURBIDITY		7.0
TOTAL SUSPENDED SOLIDS		50.98
TOTAL VOLATILE SOLIDS		13.71
CONDUCTIVITY	0.606	0.608

OTHER

pH	8.7	8.3
ALKALINITY		260
TEMPERATURE	25.7	20.4

LOWER CANNON RIVER AT HIGHWAY 61

The Cannon River at this location is only seven miles from where it enters the Mississippi River. Much of the area downstream from here is low delta land with multiple stream channels. At this site the Cannon River is a 5th order stream that drains almost 1500 square miles and has a gradient of 3.3 feet per mile. This site has undergone major changes since the beginning of the monitoring program. In 1994, the north bound lane of State Highway 61 was totally reconstructed and a new bridge was put in to replace the old one at the site. In 1995 the south bound lane was reconstructed and the riparian zone in the area of the bridge site was modified. In 1996 construction in the area was completed and all final landscaping and erosion control measures were in place. Both banks in the area of the new bridges now are lined with large limestone boulders. The channel is composed mostly of fine gravel, sand and silt. When the water levels are low the stream runs clean and clear and much of the sediment load is deposited on bars in the channel and on the rip rap boulders that line the channel. A flood plain has been constructed and seeded with grasses for about 50 yards back from the channel on the south side of the stream. The QHEI at this site is the lowest of all of the main stem sites with a score of 57. The low score is related to the silting and construction at the site.

A broad range of macroinvertebrates was found at this site including 3 species of stoneflies, 4 species of beetles, 9 species of mayflies, 6 species of caddisflies, and 15 species of Diptera. The HD set from June of 1995 was dry and no insects were collected from that sample period which will reduce to overall number of insects collected at this site. The distribution of richness remained constant over the sample period, however the density increased each year during the study, reflecting the stabilization of the channel when construction was completed. However, any improvement could also be attributed to the lack of any major storm events as there were in 1994 and 95. Filtering organisms dominate the sample and all indices indicate slight impact with the ICI falling in the non impacted range. Tolerance range was distributed fairly evenly with 35% at 6, 26% at 5, 26% at 4, and 10 % at 3.

The nutrient loading at this site was about the same as it was at all Lower Cannon sample sites, however the phosphorus values were lower than at the other sites but not significantly lower. The TSS and TVS values for this site were higher than at any other Lower Cannon site as well. Overall, the chemistry does not show any values indicating any significant problems.

The siltation at this site is common to all major rivers as they enter the delta region. The richness of the macroinvertebrate population and lack of any significant chemistry all point to this site being relatively unimpacted. As the effects of the construction in the area fade, the riparian zone should improve and the impact of human activities will also be reduced. One of the most notable observations at this site was in June of 1996 when the bridge supports were full of Pteronarcys shells from a recent molt of this stonefly.