

LITTLE CANNON AT HIGHWAY 56



Little Cannon River at Minnesota Highway 56 (LCL-7)

Location:

River mile: 25

U.S.G.S. quad: Kenyon

Township: T110N R18W S9

Lat./Long: 44°20'30"/92°58'30"

Other info.:

Type: Small stream near headwaters

Stream Order: 3

Drainage area: 17

Riparian: Old field (CRP) and residential

Instream: Boulders, cobble, gravel, sand, with dusting of silt in slow current

Gradient: 9.39 ft/mi



QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/15/95 River Mile 25 Watershed Number _____
 Location LCL-7 U.S.G.S. quad Kenyon
 Township T110N R18W Section 9 Lat./Long. 44°20'30" / 92°58'30"

65
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) | _____ | _____ | <i>Check all that apply:</i>
<input type="checkbox"/> Silt covered (-1)
<input type="checkbox"/> Silt free (1)
<input checked="" type="checkbox"/> Boulders as slabs (1)
<input 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) | _____ | _____ | |

11
Substrate

Comments _____

2. INSTREAM COVER

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

9
Cover

Comments Beaver dam 30 yards upstream from site.

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 checked="" type="checkbox"/> None (4)
<input type="checkbox"/> Recovered (3)
<input type="checkbox"/> Recovering (2)
<input type="checkbox"/> Recent or no Recovery (1) | <input type="checkbox"/> High (3)
<input checked="" type="checkbox"/> Moderate (2)
<input type="checkbox"/> Low (1) | <input type="checkbox"/> Impound
<input type="checkbox"/> Islands
<input type="checkbox"/> Leveed |

11
Channel

Comments _____

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 border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>L</th> <th>R</th> </tr> <tr> <td><input type="checkbox"/> Extensive >100m (3)</td> <td><input type="checkbox"/> Open pasture (1)</td> </tr> <tr> <td><input type="checkbox"/> Wide 50-100m (4)</td> <td><input type="checkbox"/> Fenced pasture (2)</td> </tr> <tr> <td><input type="checkbox"/> Moderate 10-50m (3)</td> <td><input checked="" type="checkbox"/> Old field (3)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Narrow 5-10m (2)</td> <td><input type="checkbox"/> Rowcrop (1)</td> </tr> <tr> <td><input type="checkbox"/> Very Narrow 1-5m (1)</td> <td><input type="checkbox"/> Conservation tillage (2)</td> </tr> <tr> <td><input type="checkbox"/> None (0)</td> <td></td> </tr> </table> | L | R | <input type="checkbox"/> Extensive >100m (3) | <input type="checkbox"/> Open pasture (1) | <input type="checkbox"/> Wide 50-100m (4) | <input type="checkbox"/> Fenced pasture (2) | <input type="checkbox"/> Moderate 10-50m (3) | <input checked="" type="checkbox"/> Old field (3) | <input checked="" type="checkbox"/> Narrow 5-10m (2) | <input type="checkbox"/> Rowcrop (1) | <input type="checkbox"/> Very Narrow 1-5m (1) | <input type="checkbox"/> Conservation tillage (2) | <input type="checkbox"/> None (0) | | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>L</th> <th>R</th> </tr> <tr> <td><input type="checkbox"/> Forest, swamp (3)</td> <td><input type="checkbox"/> Shrub (4)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Residential, Park (2)</td> <td><input type="checkbox"/> Urban</td> </tr> </table> | L | R | <input type="checkbox"/> Forest, swamp (3) | <input type="checkbox"/> Shrub (4) | <input checked="" type="checkbox"/> Residential, Park (2) | <input type="checkbox"/> Urban | <table border="1" style="width: 100%; border-collapse: collapse;"> <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) | |
| L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Extensive >100m (3) | <input type="checkbox"/> Open pasture (1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Wide 50-100m (4) | <input type="checkbox"/> Fenced pasture (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Moderate 10-50m (3) | <input checked="" type="checkbox"/> Old field (3) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Narrow 5-10m (2) | <input type="checkbox"/> Rowcrop (1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Very Narrow 1-5m (1) | <input type="checkbox"/> Conservation tillage (2) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> None (0) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L | R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input type="checkbox"/> Forest, swamp (3) | <input type="checkbox"/> Shrub (4) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <input checked="" type="checkbox"/> Residential, Park (2) | <input type="checkbox"/> Urban | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

9
Riparian

Comments _____

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 type="checkbox"/> > 1m (3)
<input type="checkbox"/> 0.7-1m (2)
<input checked="" type="checkbox"/> 0.4-0.7m (1)
<input type="checkbox"/> < 0.4m (0) | <input type="checkbox"/> Extensive (3)
<input checked="" type="checkbox"/> Moderate (2)
<input type="checkbox"/> Sparse (1)
<input type="checkbox"/> Nearly absent (0) | <input type="checkbox"/> Torrential (-1) <input type="checkbox"/> Intermittent (-2)
<input type="checkbox"/> Fast (1) <input type="checkbox"/> Eddies (1)
<input checked="" type="checkbox"/> Moderate (1) <input type="checkbox"/> Interstitial (-1)
<input checked="" type="checkbox"/> Slow (1) | <input checked="" type="checkbox"/> Pool width > riffle width (2)
<input type="checkbox"/> Pool width = riffle width (1)
<input type="checkbox"/> Pool width < riffle width (0) |

9
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 checked="" type="checkbox"/> Generally >10cm Max <50 (2)
<input type="checkbox"/> Generally >10cm Max >50 (3)
<input 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)

9.4

8
Gradient

7. DRAINAGE AREA
(square mile)

17

8
Drainage Area

QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/11/96 River Mile 25 Watershed Number _____
 Location LCL-7 U.S.G.S. quad Kenyon
 Township T110N R18W Section 9 Lat./Long. 44 20.56N 92 58.8W

65

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 type="checkbox"/> Silt covered (-1) <input type="checkbox"/> Silt free (1) <input checked="" type="checkbox"/> Boulders as slabs (1) <input 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 _____						

11

Substrate

2. INSTREAM COVER

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

10

Cover

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

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

10

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 border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>L</th><th>R</th></tr> <tr> <td><input type="checkbox"/> Extensive >100m (5)</td> <td><input type="checkbox"/> Forest, swamp (3)</td> </tr> <tr> <td><input type="checkbox"/> Wide 50-100m (4)</td> <td><input type="checkbox"/> Shrub (4)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Moderate 10-50m (3)</td> <td><input checked="" 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 checked="" type="checkbox"/> Very Narrow 1-5m (1)</td> <td><input type="checkbox"/> Conservation tillage (2)</td> </tr> <tr> <td><input type="checkbox"/> None (0)</td> <td></td> </tr> </table>	L	R	<input type="checkbox"/> Extensive >100m (5)	<input type="checkbox"/> Forest, swamp (3)	<input type="checkbox"/> Wide 50-100m (4)	<input type="checkbox"/> Shrub (4)	<input checked="" type="checkbox"/> Moderate 10-50m (3)	<input checked="" type="checkbox"/> Residential, Park (2)	<input type="checkbox"/> Narrow 5-10m (2)	<input type="checkbox"/> Urban	<input checked="" type="checkbox"/> Very Narrow 1-5m (1)	<input type="checkbox"/> Conservation tillage (2)	<input type="checkbox"/> None (0)		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>L</th><th>R</th></tr> <tr> <td><input type="checkbox"/> Open pasture (1)</td> <td><input type="checkbox"/> Old field (3)</td> </tr> <tr> <td><input type="checkbox"/> Fenced pasture (2)</td> <td><input type="checkbox"/> Rowcrop (1)</td> </tr> <tr> <td><input type="checkbox"/> Rowcrop (1)</td> <td><input type="checkbox"/> Conservation tillage (2)</td> </tr> </table>	L	R	<input type="checkbox"/> Open pasture (1)	<input type="checkbox"/> Old field (3)	<input type="checkbox"/> Fenced pasture (2)	<input type="checkbox"/> Rowcrop (1)	<input type="checkbox"/> Rowcrop (1)	<input type="checkbox"/> Conservation tillage (2)	<table border="1" style="width: 100%; border-collapse: collapse;"> <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 checked="" type="checkbox"/> Little (4)</td> <td><input type="checkbox"/> Moderate (3)</td> </tr> <tr> <td><input type="checkbox"/> Moderate (3)</td> <td><input type="checkbox"/> Heavy (2)</td> </tr> <tr> <td><input type="checkbox"/> Heavy (2)</td> <td><input type="checkbox"/> Severe (1)</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 checked="" type="checkbox"/> Little (4)	<input type="checkbox"/> Moderate (3)	<input type="checkbox"/> Moderate (3)	<input type="checkbox"/> Heavy (2)	<input type="checkbox"/> Heavy (2)	<input type="checkbox"/> Severe (1)	<input type="checkbox"/> Severe (1)	
L	R																																			
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<input type="checkbox"/> Heavy (2)	<input type="checkbox"/> Severe (1)																																			
<input type="checkbox"/> Severe (1)																																				
Comments _____																																				

9

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 type="checkbox"/> > 1m (3)	<input type="checkbox"/> Extensive (3)	<input type="checkbox"/> Torrential (-1)	<input checked="" type="checkbox"/> Pool width > riffle width (2)
<input checked="" type="checkbox"/> 0.7-1m (2)	<input type="checkbox"/> Moderate (2)	<input type="checkbox"/> Fast (1)	<input type="checkbox"/> Pool width = riffle width (1)
<input type="checkbox"/> 0.4-0.7m (1)	<input checked="" type="checkbox"/> Sparse (1)	<input checked="" type="checkbox"/> Moderate (1)	<input type="checkbox"/> Pool width < riffle width (0)
<input type="checkbox"/> < 0.4m (0)	<input type="checkbox"/> Nearly absent (0)	<input checked="" type="checkbox"/> Slow (1)	
<input type="checkbox"/> No Pool			

9

Pool/Riffle

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

6. GRADIENT (ft/mi)

_____ 9.4 _____

8

Gradient

7. DRAINAGE AREA (square mile)

_____ 17 _____

8

Drainage Area

SITE **LCL-7** Location LITTLE CANNON AT HIGHWAY 56

	1994	1995	1996
SUBSTRATE	9	11	11
INSTREAM COVER	6	9	9
CHANNEL MORPHOLOGY	10	11	10
RIPARIAN	9	9	9
CHANNEL QUALITY	7	9	9
GRADIENT 8 DRAINAGE 8	QHEI 1994 57	QHEI 1995 65	QHEI 1996 64

EXTENT OF CHANGE IN LOCATION
 Moved H/D's upstream [out from under bridge]
 approximately 25 meters. No longer in riprap
 from bridge.

RAPID HABITAT BIOASSESSMENT 1995		166
FISH COVER	12	
MACRO COVER	9	
EMBEDDEDNESS	11	
VELOCITY\DEPTH	15	
CHANNEL	15	
SEDIMENT	12	
RIFFLES	8	
CHANNEL FLOW	18	
BANK EROSION	13	
VEGETATION	18	
GRAZING	20	
RIPARIAN	15	

LITTLE CANNON RIVER (LCS-7)

Minnesota Highway #56

Riparian: Residential, old field(CRP)

Instream: Limestone bedrock, sand, silt

Macroinvertebrate Metrics

<u>Metric</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>Average</u>	<u>Overall Impact</u>
QHEI	57	65	64	62	
ICI	19	30	32	27	Moderate
Richness	7.5	15.5	16.5	13.2	Moderate
Diversity	2.6	2.9	3.6	3.0	Slight
Equitability	0.9	0.85	0.67	0.81	Non Impacted
Scraper/Filterer Ratio	1.48	0.28	1.09		
Tolerance Range	2-8	3-8	1-8	3-7	

Macroinvertebrate Taxa and Numbers of Individuals

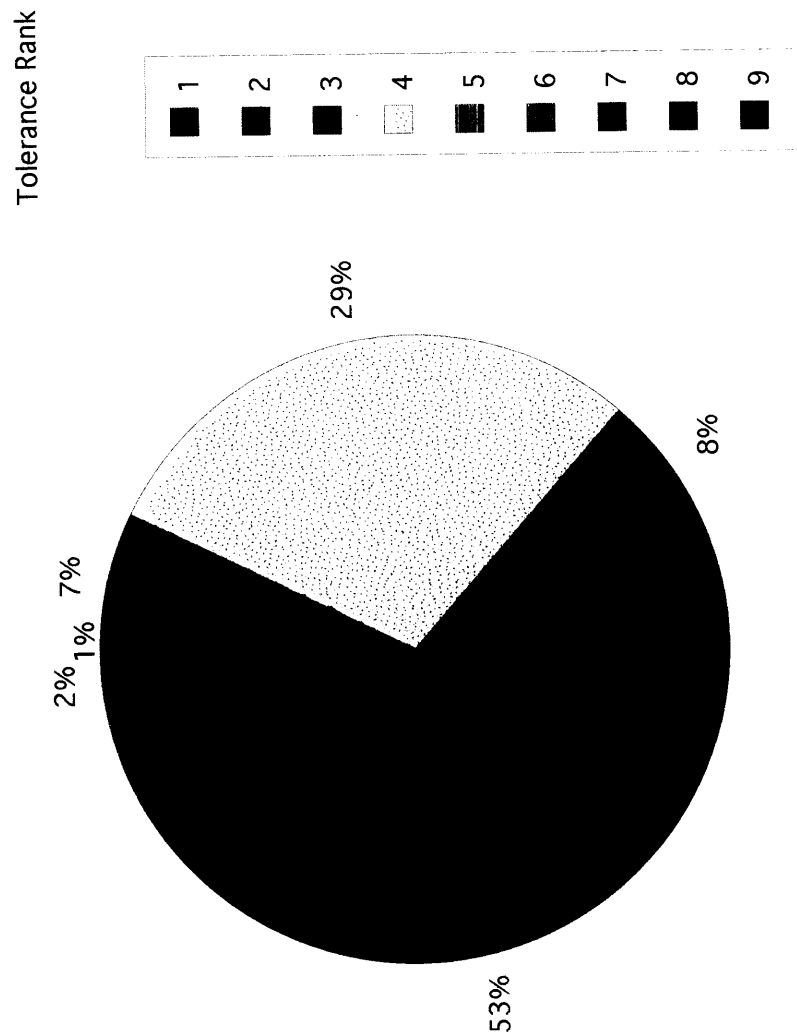
[#] = Tolerance Values (Source is Illinois Environmental Protection Agency)

	<u>June 94</u>	<u>July 94</u>	<u>June 95</u>	<u>July 95</u>	<u>June 96</u>	<u>July 96</u>
Beetles						
Optioservus [4]	-	-	1	2	1	-
Stenelmis [7]	-	-	1	3	11	1
Macronychus [2]	1	-	-	-	-	-
Mayflies						
Baetis [4]	-	-	4	1	22	5
Heptagenia [3]	-	-	19	-	-	1
Stenacron [4]	14	-	-	27	21	18
Stenonema [4]	2	14	-	11	59	4
Isonychia [3]	-	-	5	6	-	15
Caenis [6]	-	1	-	1	2	-
Pseudocloeon [4]	-	-	-	-	6	-
Caddisflies						
Cheumatopsyche [6]	2	-	10	23	4	3
Hydropsyche [5]	-	-	17	52	3	11
Pycnopsyche [3]	2	-	2	3	1	-
Nyctophylax [1]	-	-	-	-	2	-
True Flies						
Simuliidae [4-6]	-	-	-	-	4	-
Antocha [5]	-	-	-	-	-	1
Dicranota [4]	-	-	-	40	11	21
Atherix [4]	-	-	-	3	-	3
Empididae [6]	-	-	-	-	1	-
Midges						
Brillia [?]	-	-	16	-	-	-
Cryptochironomus [8]	1	-	-	-	-	-
Cricotopus [8]	-	-	-	-	-	3
Microtendipes [6]	16	6	27	40	-	42
Polypedilum [6]	3	-	40	-	59	3
Rheotanytarsus [6]	-	1	12	-	-	3
Paratanytarsus [?]	-	-	-	-	-	3
Thienemannimyia [6]	-	7	40	90	23	63
Endochironomus [6]	1	-	-	-	-	-
Stenochironomus [3]	-	-	-	10	-	3
Nyctotanytarsus [?]	2	-	-	-	-	-
Leeches						
Placobdella [8]	-	-	-	4	-	-

Little Cannon at Highway 56 (LCL-7)

Site	NUMBER OF INSECTS BY TOLERANCE RATING									PERCENT IN TOLERANCE RANK									
	1	2	3	4	5	6	7	8	9	TOTAL	1	2	3	4	5	6	7	8	9
LCL 1994	0	1	2	30	0	38	0	1	0	72	0%	1%	3%	42%	0%	53%	0%	1%	0%
LCL 1995	0	0	50	89	69	283	4	4	0	499	0%	0%	10%	18%	14%	57%	1%	1%	0%
LCL 1996	2	0	20	171	15	207	12	3	0	430	0%	0%	5%	40%	3%	48%	3%	1%	0%
LCL TOTAL	2	1	72	290	84	528	16	8	0	1001	0%	0%	7%	29%	8%	53%	2%	1%	0%

Percent Macroinvertebrates by Tolerance Rank



LITTLE CANNON AT HIGHWAY #56 [LCL]

DATE	JULY 1994	JULY 1995	JUNE 1996	JULY 1996
SURFACE WATER				
NITRATE NITROGEN	----	----	9.72	4.6
AMMONIA NITROGEN	----	----	0.025	0.018
KJELDAHL NITROGEN	----	----	11.1	4.92
ORTHOPHOSPHATE	----	----	0.009	0.022
TOTAL PHOSPHORUS	----	----	0.03	0.064
PORE WATER				
NITRATE NITROGEN	----	----	6.29	1.87
AMMONIA NITROGEN	----	----	1.33	1.92
KJELDAHL NITROGEN	----	----	7.85	5.8
ORTHOPHOSPHATE	----	----	0.004	0.009
TOTAL PHOSPHORUS	----	----	0.036	0.088
STREAM LOAD				
TURBIDITY	----	----	18	9
TOTAL SUSPENDED SOLIDS	----	----	66.54	60.03
TOTAL VOLATILE SOLIDS	----	----	16.92	14.29
CONDUCTIVITY	0.621	----	0.636	0.626
OTHER				
pH	8.3	----	8.2	8.4
ALKALINITY	----	----	340	300
TEMPERATURE	17	----	21.9	25

LITTLE CANNON RIVER AT HIGHWAY 56

The Little Cannon River at this location is a very small 3rd order stream that drains only 17 square miles of primarily agricultural land. It has a gradient of 9.4 feet per mile. The substrate at this location contains slabs of limestone with silt and sand overlying it. There was a beaver dam about a fifty yards upstream in 1994 and 95, however it was removed in 1996. When flow is high the water is very cloudy and carries much fine sediment, however when flow is normal, the sediment settles out and the stream runs clean and clear. The QHEI at the site is 65, which is in the mid range for the Little Cannon sites. The 1994 value was 57, but that year the site was located about 40 yards down stream from the present location under the highway bridge. Because it is located in the headwaters, during dry weather the flow rates are very low and the stream at this location does dry up during severe droughts.

The species that predominate at this site are the midges and mayflies. There were no stoneflies found at the site. The number of insects collected in 1994 were low because the artificial samplers were heavily coated with silt. For this reason the sample site was moved upstream. The ratio of scrapers to filterers averages about one. The equitability is high and ranked non impacted for this site indicating low BOD. All other indices showed a steady increase from one year to the next with the ICI and Richness in the moderate impact range and Diversity in the slight impact range. The average tolerance showed 53% at rank 6 and 29% at rank 4, with the range mostly from 3 to 7.

Nitrogen in the water is high at this site compared to all others in the watershed. The surface water nitrate nitrogen was close to 10 mg/l in June of 1996 and decreased in July and in August was 1.16 mg/l. The pore water values showed the same trend. Total Nitrogen showed the same pattern for both pore and surface water. The Ammonia in the pore water was also very high, however surface water was comparable with other streams. Phosphorus levels were low when compared to the other sites. The source of the nitrogen is likely fertilizers that enter the stream with runoff water. Had the phosphorus values been high, it is possible that the source of the nitrogen might be feedlot runoff, however this proved not to be the case. The high pore water ammonia level especially in July may be due to decaying vegetation upstream from this location. Alkalinity is very high as a result of the limestone bedrock substrate. TSS and TVS are also quite high as they are at all other Little Cannon River sites.

The results from this site reflect the land use of the area and the headwaters nature of the stream. Flow can be quite flashy at the site. In the immediate area the landowner has taken the riparian zone out of agricultural production and planted grasses and trees.