

LITTLE CANNON NEAR SOGN



Little Cannon River 1 mile upstream of Sogn (LCS-6)

Location:

River mile: 25

U.S.G.S. quad: Sogn; 44092-D8

Township: T111N R18W S24

Lat./Long: 44°24'/92°56'

Other info.:

Type: Midsize stream in midreach of watershed

Stream Order: 4

Drainage area: 56 square miles

Riparian: Fenced pasture

Instream: Gravel, sand, with silt in slow current and pools

Gradient: 7.42 ft/mi



QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/15/95 River Mile 25 Watershed Number _____
 Location LCS-6 U.S.G.S. quad Sogn
 Township T111NR18W Section 24 Lat./Long. 44°24'92"56'

50.5
Total QHEI

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

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

7
Substrate

Comments Silt bars on inside banks and in pools.

2. INSTREAM COVER

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

5
Cover

Comments _____

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 checked="" type="checkbox"/> Moderate (3)	<input checked="" type="checkbox"/> Good (3)	<input type="checkbox"/> Recovered (3)	<input type="checkbox"/> Moderate (2)	<input checked="" type="checkbox"/> Islands
<input type="checkbox"/> Low (2)	<input type="checkbox"/> Fair (2)	<input type="checkbox"/> Recovering (2)	<input checked="" 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)		

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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
L R	L R	L R
<input type="checkbox"/> Extensive >100m (3)	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Open pasture (1)	<input type="checkbox"/> None (5)
<input type="checkbox"/> Wide 50-100m (4)	<input type="checkbox"/> Fenced pasture (2)	<input type="checkbox"/> Little (4)
<input type="checkbox"/> Moderate 10-50m (3)	<input type="checkbox"/> Old field (3)	<input type="checkbox"/> Moderate (3)
<input type="checkbox"/> Narrow 5-10m (2)	<input type="checkbox"/> Rowcrop (1)	<input checked="" type="checkbox"/> Heavy (2)
<input type="checkbox"/> Very Narrow 1-5m (1)	<input type="checkbox"/> Conservation tillage (2)	<input type="checkbox"/> Severe (1)
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> None (0)		

2.5
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"/> Extensive (3)	<input type="checkbox"/> Torrential (-1)	<input checked="" type="checkbox"/> Pool width > riffle width (2)
<input 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 checked="" type="checkbox"/> 0.4-0.7m (1)	<input 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 checked="" type="checkbox"/> Nearly absent (0)	<input checked="" type="checkbox"/> Slow (1)	
<input type="checkbox"/> No Pool		<input type="checkbox"/> Intermittent (-2)	
		<input type="checkbox"/> Eddies (1)	
		<input type="checkbox"/> Interstitial (-1)	

7
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"/> Stable (cobble, boulder) (1)	<input checked="" type="checkbox"/> Embedded (0)
<input checked="" 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)

7.4

8
Gradient

7. DRAINAGE AREA (square mile)

56

10
Drainage Area

QUALITATIVE HABITAT EVALUATION INDEX (QHEI) SCORING FORM

Date 6/11/96 River Mile 25 Watershed Number _____
 Location LCS-6 U.S.G.S. quad _____ Sogn _____
 Township T111NR18W Section 24 Lat./Long. 44°23.97N 92°55.85W

50

Total QHEI

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

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

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Substrate

Comments _____

2. INSTREAM COVER

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

3

Cover

Comments _____

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 type="checkbox"/> None (4)	<input type="checkbox"/> High (3)	<input type="checkbox"/> Impound
<input checked="" type="checkbox"/> Moderate (3)	<input type="checkbox"/> Good (3)	<input type="checkbox"/> Recovered (3)	<input type="checkbox"/> Moderate (2)	<input checked="" type="checkbox"/> Islands
<input type="checkbox"/> Low (2)	<input checked="" type="checkbox"/> Fair (2)	<input checked="" type="checkbox"/> Recovering (2)	<input checked="" 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)		

8

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

4

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"/> 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 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 checked="" type="checkbox"/> Nearly absent (0)	<input checked="" type="checkbox"/> Slow (1)	
<input type="checkbox"/> No Pool		<input type="checkbox"/> Intermittent (-2)	
		<input type="checkbox"/> Eddies (1)	
		<input type="checkbox"/> Interstitial (-1)	

8

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"/> Stable (cobble, boulder) (1)	<input checked="" type="checkbox"/> Embedded (0)
<input checked="" 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) _____ 7.4 _____

8

Gradient

7. DRAINAGE AREA

(square mile) _____ 56 _____

10

Drainage Area

SITE **LCS-6** Location LITTLE CANNON NEAR SOGN

	1994	1995	1996
SUBSTRATE	9	7	9
INSTREAM COVER	3	5	3
CHANNEL MORPHOLOGY	10	11	8
RIPARIAN	2.5	2.5	4
CHANNEL QUALITY	8	7	8
GRADIENT 8			
DRAINAGE 10			
QHEI 1994	50.5	QHEI 1995	50.5
		QHEI 1996	50

EXTENT OF CHANGE IN LOCATION
 Moved H/D's downstream about 20 meters to a deeper riffle near a small island.

RAPID HABITAT BIOASSESSMENT 1995

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- FISH COVER 6
- MACRO COVER 16
- EMBEDDEDNESS 13
- VELOCITY\DEPTH 18
- CHANNEL 19
- SEDIMENT 8
- RIFFLES 18
- CHANNEL FLOW 16
- BANK EROSION 7
- VEGETATION 6
- GRAZING 8
- RIPARIAN 4

LITTLE CANNON RIVER (LCS-6)

One mile upstream of Sogn

Riparian: Pasture

Instream: Gravel, sand, silt

Macroinvertebrate Metrics

Metric	1994	1995	1996	Average	Overall Impact
QHEI	50.5	50.5	50.0	50.3	
ICI	26	27	30	27.7	Moderate
Richness	7.0	16.0	17.0	13.3	Moderate
Diversity	1.0	3.2	3.1	2.4	Slight
Equitability	0.38	0.53	.68	.53	Slight
Scraper/Filterer Ratio	0.05	0.34	3.46		
Tolerance Range	3-6	2-8	3-8	3-6	

Macroinvertebrate Taxa and Numbers of Individuals

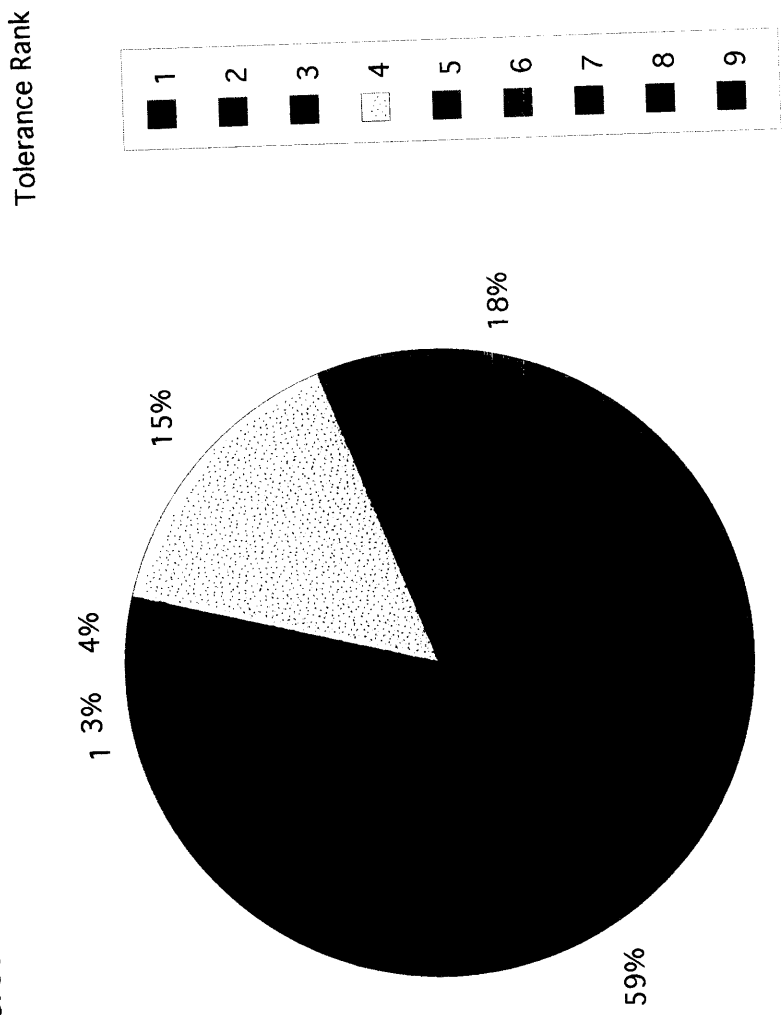
[#] = Tolerance Values (Source is Illinois Environmental Protection Agency)

	June 94	July 94	June 95	July 95	June 96	July 96
Stoneflies						
Perlesta [3]	-	-	1	-	-	-
Beetles						
Dubiraphia [5]	-	-	-	-	-	1
Optioservus [4]	-	-	-	2	3	-
Stenelmis [7]	-	-	-	-	8	1
Macronychus [2]	-	-	2	-	-	-
Helichus [4]	-	-	-	-	1	-
Mayflies						
Baetis [4]	3	6	4	-	81	1
Heptagenia [3]	3	1	28	1	-	5
Stenacron [4]	-	-	5	34	-	24
Stenonema [4]	-	2	3	3	12	-
Isonychia [3]	6	6	-	-	-	-
Caenis [6]	2	-	7	-	6	-
Tricorythodes [5]	-	1	-	-	-	-
Pseudocloeon [4]	-	-	-	-	25	-
Caddisflies						
Cheumatopsyche [6]	2	3	5	3	6	4
Hydropsyche [5]	63	142	76	-	11	5
Pycnopsyche [3]	-	-	-	1	-	-
True Flies						
Antocha [5]	-	-	-	-	1	-
Atherix [4]	-	3	-	9	-	1
Dicranota [4]	-	-	1	-	3	-
Midges						
Brillia [?]	-	-	86	-	-	2
Cryptochironomus [8]	-	-	-	11	-	-
Cricotopus [8]	-	-	17	-	27	-
Microtendipes [6]	-	-	69	44	4	4
Polypedilum [6]	-	-	52	11	4	4
Eukiefferiella [4]	-	-	-	-	7	-
Rheotanytarsus [6]	-	-	360	11	-	13
Paratanytarsus [?]	-	-	17	-	2	-
Thienemannimyia [6]	-	-	120	178	2	35
Stenochironomus [3]	-	-	-	11	-	-
Phaenopsectra [4]	-	-	17	-	-	-
Dicrotendipes [6]	-	-	-	-	-	2
Ababesmyia [6]	-	-	-	-	-	2

Little Cannon Near Sogn (LCS-6)

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
LCS 1994	0	0	16	14	206	5	0	0	0	241	0%	0%	7%	6%	85%	2%	0%	0%	0%
LCS 1995	0	2	42	78	76	860	0	28	0	1086	0%	0%	4%	7%	7%	79%	0%	3%	0%
LCS 1996	0	0	5	158	18	80	9	27	0	297	0%	0%	2%	53%	6%	27%	3%	9%	0%
LCS TOTAL	0	2	63	250	300	945	9	55	0	1624	0%	0%	4%	15%	18%	58%	1%	3%	0%

Percent Macroinvertebrate by Tolerance Rank



LITTLE CANNON ONE MILE SOUTH OF SOGN [LCS]

DATE	JULY 1994	JULY 1995	JUNE 1996	JULY 1996
SURFACE WATER				
NITRATE NITROGEN	----	----	5.65	2.44
AMMONIA NITROGEN	----	----	0.041	0.018
KJELDAHL NITROGEN	----	----	5.74	2.62
ORTHOPHOSPHATE	----	----	0.021	0.023
TOTAL PHOSPHORUS	----	----	0.064	0.06
PORE WATER				
NITRATE NITROGEN	----	----	3.84	1.05
AMMONIA NITROGEN	----	----	0.869	0.951
KJELDAHL NITROGEN	----	----	5.37	2.88
ORTHOPHOSPHATE	----	----	0.005	0.014
TOTAL PHOSPHORUS	----	----	0.038	0.068
STREAM LOAD				
TURBIDITY	----	----	25	6
TOTAL SUSPENDED SOLIDS	----	----	92.51	80.21
TOTAL VOLATILE SOLIDS	----	----	18.24	18.21
CONDUCTIVITY	0.695	0.645	0.662	0.655
OTHER				
pH	8.2	----	8.1	8.3
ALKALINITY	----	----	360	340
TEMPERATURE	18	----	19.8	22.4

LITTLE CANNON AT SOGN

The Little Cannon River empties into the Cannon River at river mile 25 in downtown Cannon Falls. This site is located about 9 miles upstream from the mouth a half mile south of Sogn. The sample site is located in a pasture that is used by cattle during the summer months. The banks show severe signs of erosion and the cattle are contributing to the erosion. The substrate is composed of gravel and sand in the areas where the current is fast, however where the current slows much silt begins to settle out and covers the sand and gravel. The Corps of Engineers modified the channel above the bridge in 1995 by placing limestone rip rap along the outside bank that was being undercut and threatening to wash out the bridge approach on the east bank. Just upstream from this location is an artesian spring that flows all year long at a fairly constant flow. The QHEI at this site is the lowest value of all sites sampled. The low score is primarily due to the lack of instream cover and the erosion of the banks. The flow at the site varies because there is a variety of riffles, runs, and pools.

The dominant species at the sample site were midges and caddisflies. The lack of larger substrates may well influence the species that inhabit this site. Only one stonefly was found at the site over the 3 years of the study. The average tolerance range was quite narrow (3-6), which indicates that this site has been impacted significantly by human activities. Tolerance rank 6 made up 60% of the insects sampled and 92% of the insects collected were of tolerance rank 4 - 6. All of the indices showed increases each year over the 3 years. The scraper to filterer ratio changed significantly in year 3 showing a significant increase in scrapers.

Nutrient values at this site were in the average range compared to the other sites tested. Stream loading however showed to be a greater problem at this site with total suspended solids and volatile solids ranking quite high compared to most of the other sites. The alkalinity also ranked as being one of the highest.

This site is most likely to always carry a larger bed load than most streams because of the steep gradient and the geology of the area. Much of the stream bank erosion could be reduced if efforts were taken to stabilize the banks and cattle were prevented from pasturing along the banks of the stream. Limiting the access of cattle to the stream would also improve the nutrient loading as well.