

# Long Sault Creek Biometrics

A bug & water quality study was conducted in two branches of Long Sault Creek, which are beside an existing and a proposed gravel pit in Lanark Highlands, Ontario

This project was undertaken during October & November, 2023



# Watershed of Long Sault Creek

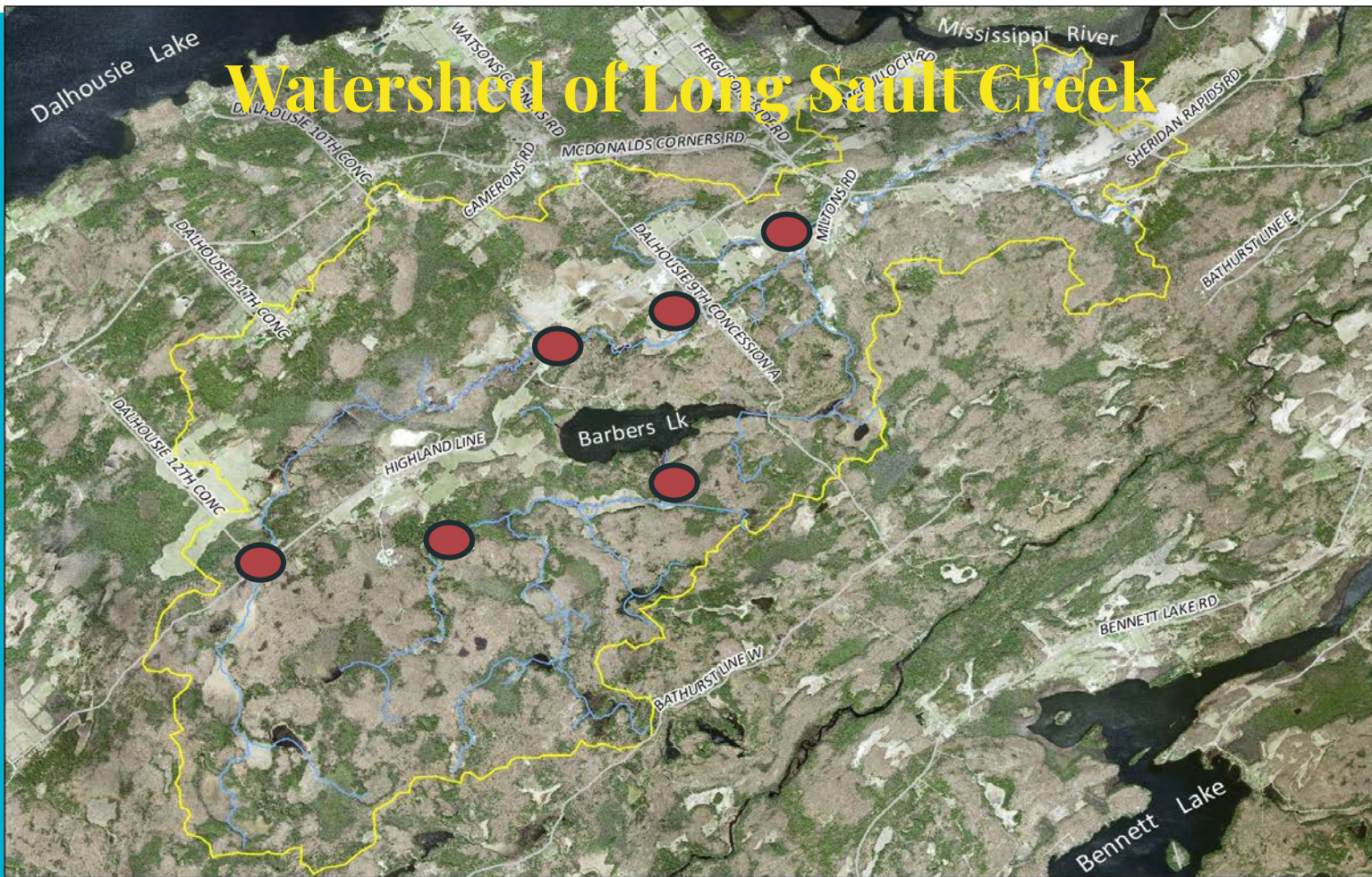
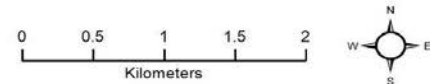


Image courtesy of



Long Sault Creek  
Watershed



# Bug Counting Protocol

- Sites upstream and downstream from existing pit
- Sites upstream and downstream from proposed pit
- Water and air temperature & conductivity were measured
- Character of the streambed was noted
- 3-minute kick and sweep to collect samples in a net
- Each sample was allocated to a bucket, net was rinsed
- Bugs from each sample site were identified using magnifying glasses, preserved in isopropyl alcohol and stored in labelled glass jars



# Pictures of aquatic research team



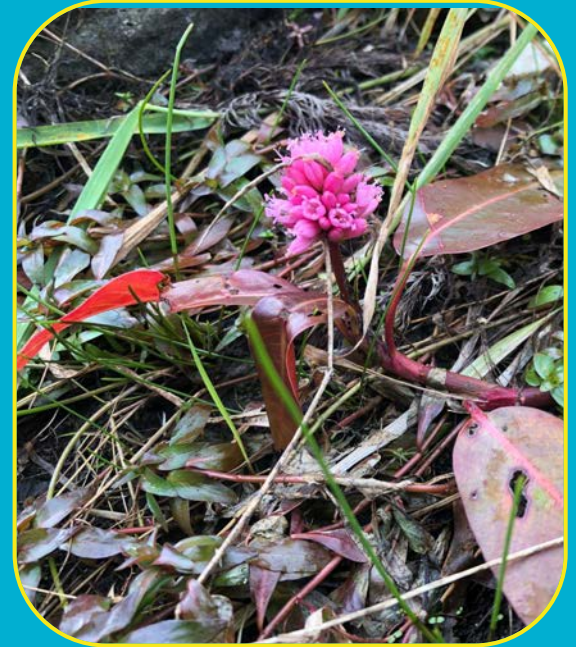
# Long Sault Creek Botanicals



Water Smartweed  
(*Persicaria amphibia*)  
Uncommon native

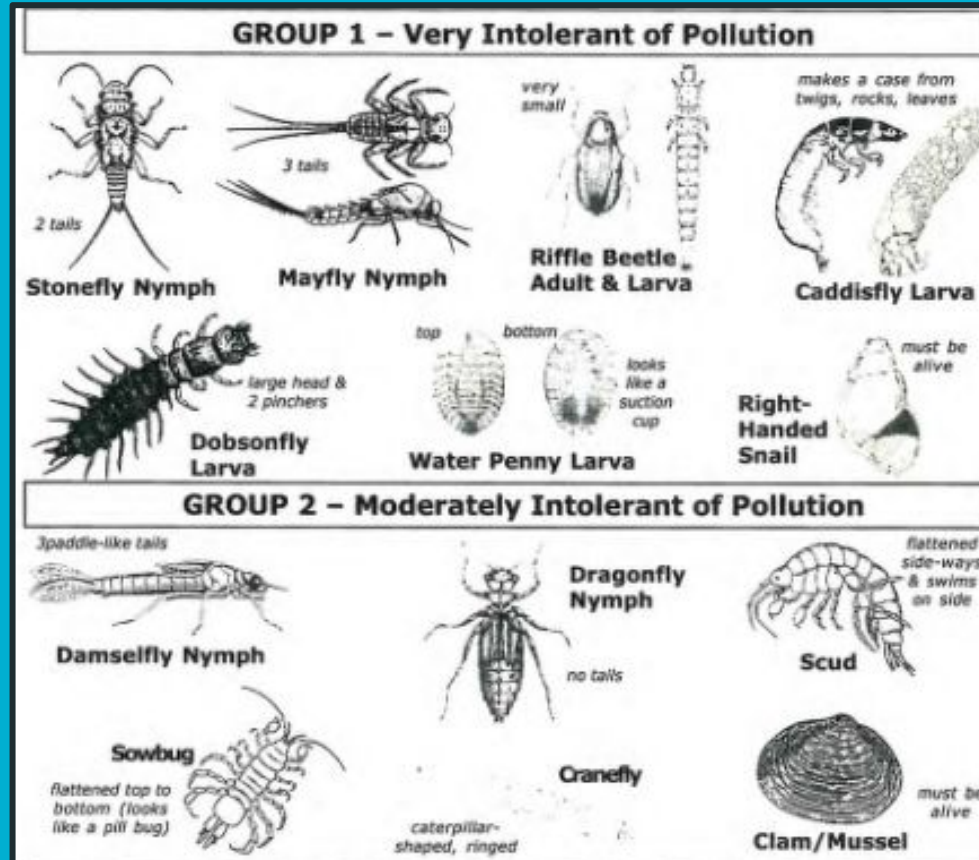


Yellow Dock  
(*Rumex crispus*)  
Common weed



Wild Marjoram  
(*Oreganum vulgare*)  
Common weed

# Identification Key Used in Study



# Species Richness

upstream & downstream from existing pit



	Upstream - Oct 31 /23		Downstream - Nov 16 & 04 /23	
	Riffle	Pond	Riffle	Pond
Very intolerant of pollution	29 (42.0%)	60 (53.0%)	638 (88.3%)	1 (2.6%)
Moderately intolerant	3	3	8	4
Fairly tolerant of pollution		1		
Very tolerant of pollution	18 (26.0%)	10 (8.8%)	20 (2.7%)	5 (13.1%)
Unidentified	19 (27.5%)	39 (34.5%)	56 (7.7%)	28 (73.6%)
Total bugs counted	<b>69</b>	<b>113</b>	<b>722</b>	<b>38</b>

# Species Richness

upstream & downstream from proposed pit



	Upstream - Nov 26 /23		Downstream - Oct 26 /23	
	Riffle	Pond	Riffle	Pond
Very intolerant of pollution	98 (59.3%)	130 (62.8%)	22 (52.3%)	21 (18.4%)
Moderately intolerant	25 (15.1%)	41 (19.8%)	3	23 (20.1%)
Fairly tolerant of pollution				
Very tolerant of pollution	3	7	6 (14.2%)	44 (38.5%)
Unidentified / unrated	39 (23.6%)	29 (14.0%)	11+ small ones	26 (22.8%)
Total bugs counted	<b>165</b>	<b>207</b>	<b>42+ small ones</b>	<b>114</b>



# Species Richness

where the two branches of Long Sault Creek join



<i>November 23, 2023</i>	Riffle	Pond
Very intolerant of pollution	263 (83.7%)	233 (77.6%)
Moderately intolerant	1	10 (3.3%)
Fairly tolerant of pollution		
Very tolerant of pollution	1	14 (4.6%)
Frog		2
Unidentified	49 (15.6%)	41 (13.6%)
Total bugs counted	314	300

# Species diversity within very intolerant group upstream and downstream from existing pit



	Upstream - Oct 31 /23		Downstream - Nov 16 & 04 /23	
	Riffle	Pond	Riffle	Pond
Stonefly Nymph	1		116	1
Mayfly Nymph	24	50	471	
Riffle Beetle	4	5	3	
Caddisfly Larvae			25	
Dobsonfly Larvae			22	
Water Penny Larvae			1	

# Species diversity within very intolerant group upstream and downstream from proposed pit



	Upstream - Nov 26 /23		Downstream - Oct 26 /23	
	Riffle	Pond	Riffle	Pond
Stonefly Nymph	25	1	9	
Mayfly Nymph	53	95	9	17
Riffle Beetle	1	4		
Caddisfly Larvae	18	20		3
Dobsonfly Larvae			1	
Water Penny Larvae	1			1



# Temperatures & Water Chemistry upstream and downstream from proposed pit

	Upstream - Nov 26 /23		Downstream - Oct 26 /23	
	Riffle	Pond	Riffle	Pond
Air temperature (Celsius)	1.5 C	1.5 C	11 C	11.4 C
Water temperature ( C )	2 C	0.8 C	13 C	13 C
Conductivity (uS/cm)	174	164	311-304	310-304
Alkalinity (CaCO3) mg/L	?	?	157	157
Total dissolved solids	?	?	156	156
Ph at 25 Celsius	?	?	8.16	8.16
Uranium RL 0.00005 mg/L	?	?	0.00452	0.00452



# Temperatures & Water Chemistry

## upstream and downstream from existing pit

	Upstream - Oct 31 /23		Downstream - Nov 16 & 04 /23	
	Riffle	Pond	Riffle	Pond
Air temperature (Celsius)	11 C	11 C	2 C	6.7 C
Water temperature ( C )	3.3 C	3.4 C	3.8 C	6.5 C
Conductivity (uS/cm)	102	105	297	266
Alkalinity (CaCO3) mg/L	58	58	144	144
Total dissolved solids	54	54	142	142
Ph at 25 Celsius	106	106	277	277
Lead RL 0.00002 mg/L	0.00007	0.00007	0.0003	?
Uranium RL 0.00005 mg/L	0.00049	0.00049	0.00021	0.00021

# Temperatures & Water Chemistry

where the two branches of Long Sault Creek join

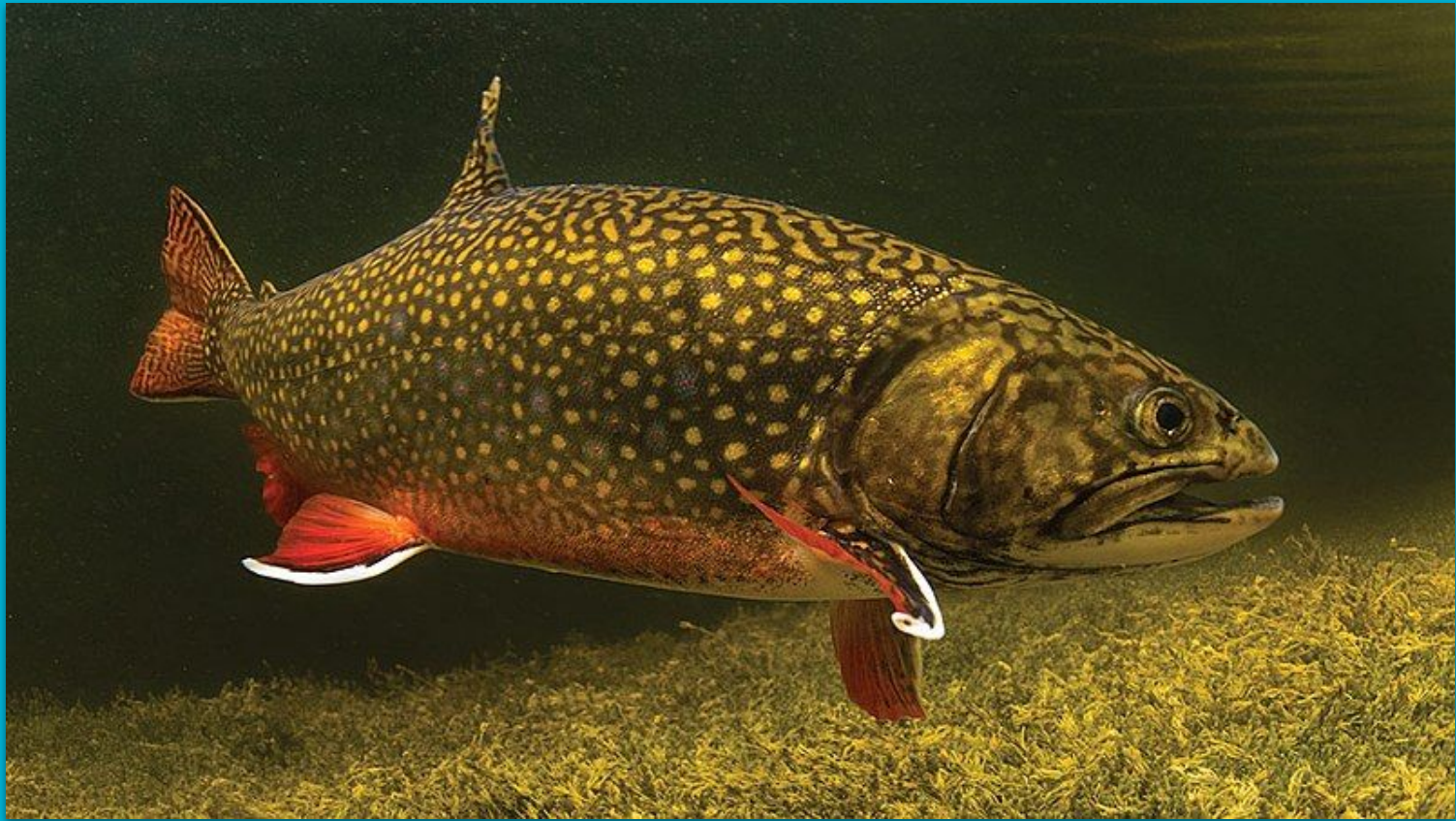


<i>November 23, 2023</i>	Downstream from both sites	
	Riffle	Pond
Air temperature (Celsius)	0 C	0 C
Water temperature ( C )	2 C	2 C
Conductivity (uS/cm)	N/A	N/A
Alkalinity (CaCO3) mg/L	133	133
Total dissolved solids	137	137
Ph at 25 Celsius	268	268
Uranium RL 0.00005 mg/L	0.00067	0.00067

# Conclusions

1. In all sites, the majority of species were very intolerant of pollution
2. In all sites, the most common species were Stonefly and Mayfly Nymphs, with Mayfly Nymphs being the most common
3. Conductivity, a measure of the ability of water to pass an electrical current, at all sites was extremely low (102 - 310  $\mu\text{S}/\text{cm}$ )
4. These results indicate the water is pollution free
5. Lead and Uranium readings were very low





The Long Sault Creek is the only confirmed naturally reproducing population of Brook Trout in the area. There are other cold water streams with Brook Trout in Lanark County.



