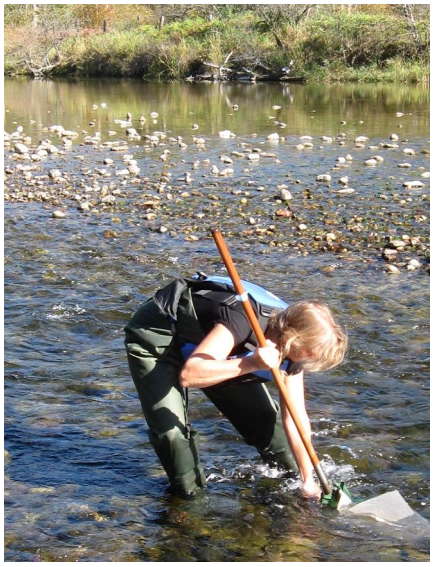
Nixon Island West Channel
Slocan River Benthic Invertebrate Assessment
Fall, 2010



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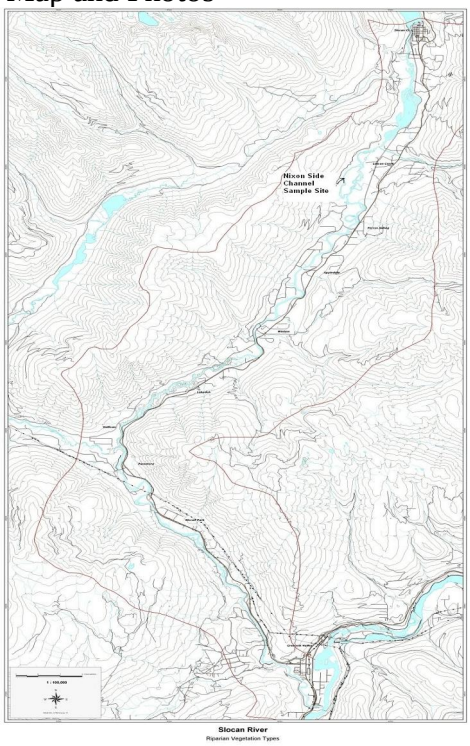
1.0 Introduction

Invertebrates are studied because they are important indicators of biodiversity and productivity of aquatic systems. When collected according to standardised protocol such as described by the Canadian Aquatic Invertebrate network (Environment Canada) they can be used as indicators of stream health. The Slocan River Streamkeepers have been monitoring invertebrates on the main Slocan River and important Tributaries for over 5 years. One of our stations is on the main river approximately 10 kilometers north of the Nixon Island study site

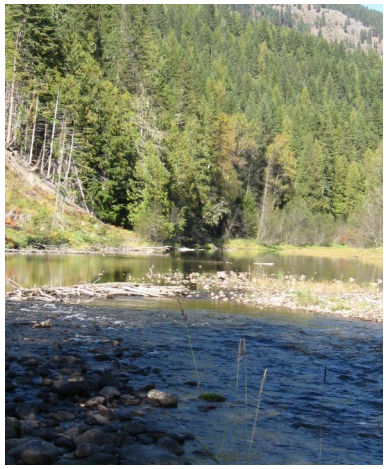
In an effort to better understand fish population dynamics and links between numbers, age class and species of fish in relation to food source, a study of benthic macroinvertebrates, the fish's main food source, was carried out in 2008 and 2010.

In 2008, specimens were collected in the Spring in riffle habitat above a large (fish over-wintering) pool south of Slocan Park. In 2010, specimens were collected in Fall, at a side channel adjacent to an Island below Lemon Creek. This site lies mid-way down a channel with reduced flow and that is a prospective restoration site. The intent is to eventually open the channel to create more habitat. This report summarises methods, and findings for the 2010 collection at the Nixon Island Side Channel

Map and Photos



Collection Site on the Slocan River


View Upstream


Downstream

2.0 Acknowledgements

We are thankful to the Columbia Basin Trust and the following members of the Slocan Community: Peter Corbett, R.P. Biologist, Jennifer Yeow, Microbiologist, Shanoon Bennett, BSc, and Judy Laret. We are grateful to Streamkeepers and their Directors who endorsed this project.

3.0 Methodology

Three samples of invertebrates were collected on October 10, 2010. Two of the samples were collected using a Hess Sampler with diameter of ____ and net mesh size of ____. One sample was collected midstream entirely in the water and the second was collected on a semi-dry location in the middle of the stream. The other sample was collected using a 400µm mesh Kick net and collected according to CABIN protocol. The net was placed downstream of the collector while the collector walked backward, kicking the substrate to disturb it. The collector was timed for 3 minutes and samples from both methods were preserved in 90% isopropanol alcohol.

The Hess sampler was used because it is an area based sampling device. E.g. all organisms within the sample zone are collected. For this reason, a comparison can be made between a sample collected pre-treatment and a sample collected after restoration at the same site.

The second methodology for sample collection was a kick-net. (3 minute), Habitat features and channel measurement data were collected as per Environment Canada's "Invertebrate Biomonitoring Field and Laboratory Manual for running water habitats" prepared in 2001 and revised in 2006. This data will serve as a baseline for future collections.

Velocity was measured using tennis balls and the average of three "floats" was recorded.

Water Chemistry was performed using a Hach Al-38 model Kit. Conductivity and Turbidity were done at Passmore Laboratory Ltd.

Samples from the Hess samples and one of the kick-net collection were sorted to Order only and sized. This work was done locally at Passmore Laboratory. The second collection was sent to Ecoanalysts in Washington for comprehensive identification.

Table 1. Field Data for Invertebrate Collections, October 5, 2010

Site Location **Nixon or Slocan Island West Side Channel**	**Latitude: 49°41'21.40"** **Long: 117°30'53.58"** **Elevation: 529 meters**
Stream Order	5
Habitat Type	Riffle
Habitat sample	Riffle
Canopy Cover	0%
Macrophyte Coverage	0-25%
Riparian Vegetation Dominant Vegetation	Ferns, grasses, shrubs, deciduous trees, coniferous trees Ferns/grasses
Periphyton	(3) Rocks noticeably slippery with patches of thicker green to brown algae
Substrate Predominant 2nd predominant Surrounding	 12.8 – 25.6cm 6.4 – 12.8cm 0.1 - 0.5 cm

Embeddeness	¼ embedded
Bankfull-Width	47.2meters
Wetted Width	35.5 meters
Bankfull-Wetted Depth	140 cm
Air/Water Temperature	19°/15° Centigrade
Oxygen	11.5 mg/l
Alkalinity	41.0mg/l
Acidity	2.3 mg/l
Hardness (CaCO3)	31.2 mg/l
pH	7.5
Turbidity	0.15NTU
Conductivity	82.6 mmhos/cm
Average depth of sample collection	0.45 meters

Table 2. Flow Data

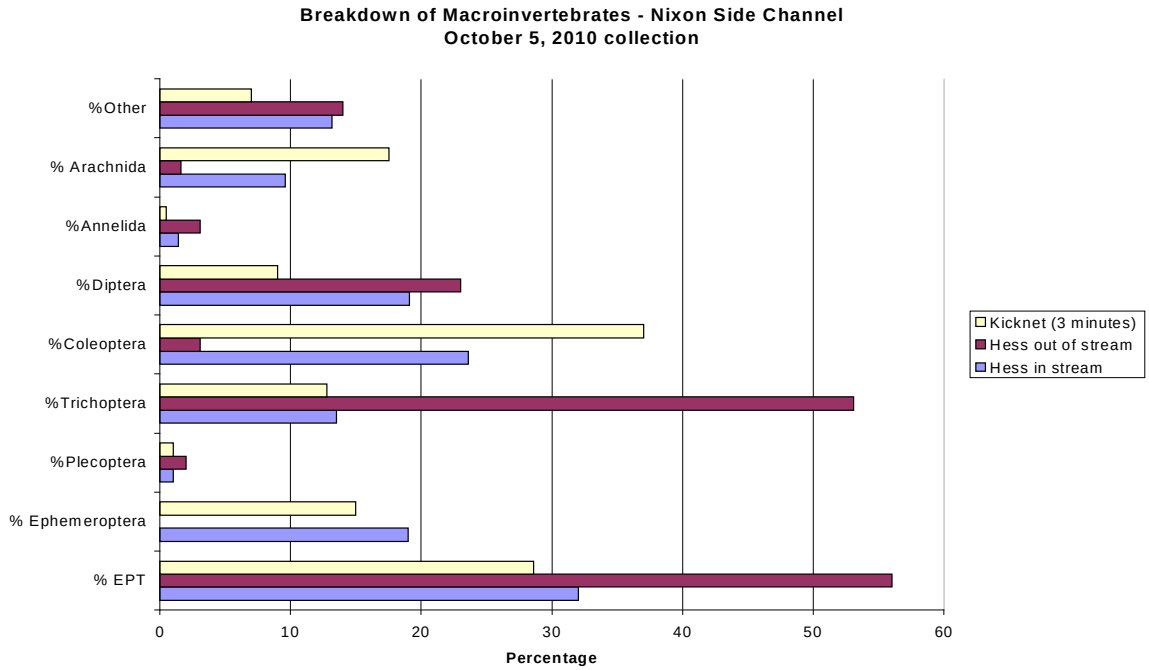
Date of Collection	Distance From Shore	Depth (cm)	Change ∆D = D2-D1 (cm)	Water Velocity
10/01/2010	15.3	24	4	.886
10/01/2010	20.4	45	3	.767
10/01/2010	25.6	63	2	.622
10/01/2010	30.7	50	2	.626

4.0 Results

Regarding abundance, the dominant taxa by Order for the instream Hess sample was Coleoptera. The Hess "out of stream" dominant taxa was Tricoptera. Only 94 organisms were seen in the "out of stream" Hess sample while 355 were seen instream. The instream counts for larger (0.5-1cm) organisms were also higher. As expected, at 1,862 organisms, The kick net sample collection at 3 minutes had 1,862 organisms.

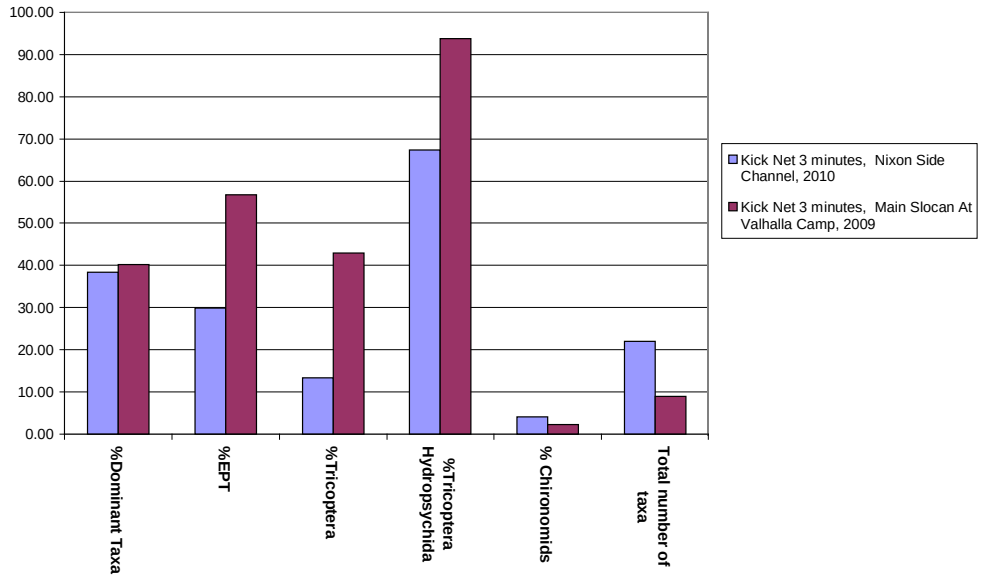
As seen in Chart 1, the Hess "out of stream" sample had higher Diptera and Annelida Taxa than the instream sample. These organisms can be found deeper e.g. burrowing in the substrate. Also, organisms labelled "other" were mostly mollusks and again, likely to be found deeper in the substrate. The "out of stream" had a high percentage of Tricoptera Larvae. This fact gives it a high %EPT, however, no Ephemeroptera (Mayfly) were observed.

Chart 1.



A comparison can be made between the assemblage of organisms found in the 3 minute kicknet collection in the Nixon Side Channel and Main Slocan River at Valhalla Camp in 2009 (the previous year). The Valhalla Camp site is approximately 10 kilometers north of Nixon Island. While the %EPT was slightly lower, the dominance of Hydropsychida family in Tricoptera Order was observed at both sites.

Chart 2



5.0 Conclusions and Recommendations

This study is intended to establish a benchmark of the numbers and types of insects present in an side channel of the Slocan River. As such, the data represents a baseline that can be related to fish numbers, species, size, age class and overall fish health.

6.0 References

1. Patrick McCafferty, Aquatic Entomology The Fisherman's and Ecologist's Illustrated Guide to Insects and Their Relatives
2. Canadian Aquatic Biomonitoring Network: Wadeable Streams Field Manual, 2010
3. Environment Canada Invertebrate Biomonitoring Field and Laboratory Manual for running water habitats, 2009
4. The Slocan River Streamkeepers, Monitoring , Assessment and School Outreach Activities, December, 2009