



The Mussels of Lakelse Lake

BC Parks – PEF 2021

Lakelse Watershed Stewards Society

Prepared By: Summer Schulte and Rachel Sweezey

March 14, 2022



Table of Contents

Table of Contents2

Introduction3

Summary of Project3

 Freshwater Mussels Interpretive Event3

 Interpretive Signage.....4

 Collecting Mussel and Water Samples.....4

Advertising5

Financial Summary6

Conclusion7

Appendix – Receipts8



Introduction

The Lakelse Watershed Stewards Society (LWSS) successfully obtained a grant of \$2,840 from BC Parks (Park Enhancement Fund) to increase awareness on the value of freshwater mussels that reside in Lakelse Lake as indicators of ecosystem health. Funds were used to host an interpretive event, build an interpretive sign, and collect mussel and water samples.

The name Lakelse pays tribute to the mollusks that live throughout Lakelse Lake and Lakelse River. The name comes from the Coast Tsimshian word "LaxGyels" which means "freshwater mussel". Lakelse Lake is one of the few lakes in BC that contains freshwater mussels. Mussels are effective indicators of water quality as they are filter feeders. They have a sensitivity to low dissolved oxygen levels, as well as siltation. Since they are unable to remove themselves from an unhealthy environment, fluctuations in the population can be indicative of environmental stressors.

Over 70 hours were spent coordinating with volunteers, developing ways to advertise and promote the project, designing the interpretive signage and event, and conducting the event and sample collection. The front desk staff at the park's visitor centre played an essential part in the promotion of the event, as they notified campers about the event and encouraged the use of the sign-up sheet. The event was promoted on LWSS social media pages (Facebook/Instagram) and posters were placed at the Terrace Visitor Centre. Due to COVID-19, only 8 participants were permitted at the event. A sign-up sheet was used to ensure that only eight people would attend, which proved effective.

Summary of Project

Freshwater Mussels Interpretive Event

Community outreach and education is an important part of the LWSS initiative. An interpretive event was hosted at Furlong Bay Campground on August 13th, 2021. A booth was set up on the beach and those in attendance were provided with information about the three mussel species that reside in Lakelse Lake. Additional topics discussed include the life cycle of a mussel, the importance of mussels, and the anatomy of a mussel. Presenters then outlined how mussels can be used as indicators for ecosystem health. Informational pamphlets were handed out, and members discussed opportunities to volunteer with the mussel project. Presenters: 2 Participants: 8



Figure 1. Poster used to advertise the mussel event.

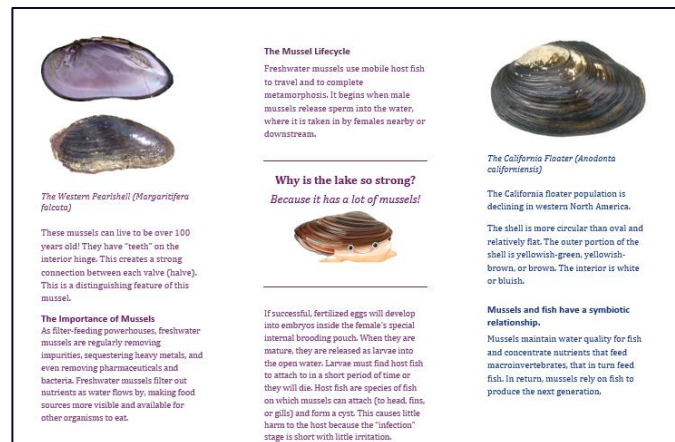


Figure 2. Section of informational pamphlet provided to attendees.

Interpretive Signage

An interpretive sign providing information on the freshwater mussels living in Lakelse Lake will be installed at Furlong Bay Campground once ground conditions have thawed in the spring (2022). This will allow members of the public to learn about the traditional and environmental significance of these mollusks as they visit the lake. The sign has been designed to match the formatting and design of the interpretive signs already in place along the Twin Spruce Trail at Furlong Bay Campground.



Figure 3. Interpretive signage.

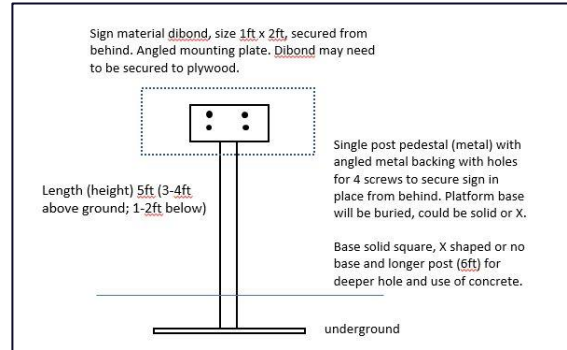


Figure 4. Draft of sign pedestal.

Collecting Mussel and Water Samples

Mussels were collected at sites representing different environments around the lake. The mussels were sent to a laboratory where they were tested for heavy metals. Water samples, taken from the same sites where the mussels were harvested, were also tested for heavy metals. A total of 10 mussel and 12 water samples were submitted to the lab for testing. The lab results are now awaiting final interpretation.

Water quality data was also collected at the selected mussel harvest sites using a YSI ProDSS. The YSI meter has four sensors on it that measure turbidity, pH, conductivity, and optical dissolved oxygen. In the field, data was collected concerning water temperature ($^{\circ}\text{C}$), turbidity (NTU), water depth (meters), pressure (mmHg), dissolved oxygen (% and mg/L), conductivity ($\mu\text{S}/\text{cm}$), and pH.



Figure 5. Collecting water quality readings.



Figure 6. Mussel samples and water samples.



Figure 7. Mussel shell collected during sampling.



Figure 8. Granola bar for size reference.

Advertising

The interpretive event was advertised on the LWSS social media pages (Facebook/Instagram), and posters were given to the Terrace Visitor Centre. The front desk staff at the park’s visitor centre helped to promote the event by notifying campers and encouraging them to sign up.



Figure 9 (above). LWSS Instagram post to advertise mussel event.

Figure 10 (right). Individual pamphlets handed out to campers.



Financial Summary

List of Items Purchased (with Receipts)

<i>Description</i>	<i>Where/Who</i>	<i>BC Parks</i>	<i>Other Cash</i>	<i>In Kind</i>
Lab Results - 10 tissue samples - 12 water samples	Northern Laboratories Ltd., Prince Rupert BC	\$2,709.00		
Supplies (Ziplocs)	Walmart, Terrace BC	\$6.97		
Sign Printing	Silvertip Signs, Terrace BC	\$124.03	\$43.97	
Sign Pedestal	Terrace Steel Works, Terrace BC		\$291.20	
Volunteer Time (sampling)	LWSS Volunteers (9 hours @ \$20) x2 Volunteers			\$360.00
LWI Student Time (Prep, design, interpretive event, sampling)	Lakelse Watershed Initiatives (RDKS) (62 hours @ \$25) 1 Student		\$1,550.00	
LWI Technician Time (Prep, design, interpretive event, sampling)	Lakelse Watershed Initiatives (RDKS) (15 hours @ \$46) 1 Technician		\$690.00	
Photograph Use	(1 photograph @ \$50) iNaturalist			\$50.00
Total		\$2,840.00	\$2,575.17	\$410.00

Remaining Items (Approximate Costs)

<i>Description</i>	<i>Where/Who</i>	<i>Amount</i>	<i>Other Cash</i>	<i>In Kind</i>
Supplies for mounting	Hardware store		\$50.00	
Volunteer Time (Sign installation)	LWSS Volunteers	(5 hours @ \$20) 1 Volunteer		\$100.00
LWI Technician Time (Sign prep, installation)	Lakelse Watershed Initiatives (RDKS)	(20 hours @ \$46) 1 Technician	\$920.00	
Total		Approx.	\$970.00	\$100.00

Total project costs once completed (cash and leveraging): Approx. \$6,895.17


See Appendix I for Receipts

Conclusion

In conclusion, a total of \$6,895.17 was spent on the Mussels of Lakelse Lake project this year. The sampling and community events ran smoothly, and everyone involved in the project was interested to learn about the role the freshwater mussel plays in the Lakelse watershed. The LWSS would like to extend a sincere thank you to BC Parks for partnering with us and the many people involved in this project.

We hope the findings of this project will provide an enriched understanding of Lakelse Lake and perhaps spur further research related to freshwater mussels. The interpretive sign produced from this project will surely enhance the collection of signs already in place on the Twin Spruce Trail and provide visitors with a better understanding of local mussel species and their role as ecosystem indicators. In continuing this project forward, LWSS hopes to create brochures with information about the project and freshwater mussels. These brochures would be made available at our public events, and perhaps the Visitor Center and park kiosks.

Appendix – Receipts

		Invoice		Page 1 of 1																																																										
Invoice To Summer Shulte Westland Resources 2803 Kenney St Terrace, BC V8G 3E6			Invoice No. 2100802		Date 13-Oct-2021																																																									
GST/HST No. 828387662			<table border="1"> <tr> <th>Work Order No.</th> <th>Purchase Order No.</th> <th>Contract No.</th> </tr> <tr> <td>See Below</td> <td></td> <td></td> </tr> </table>		Work Order No.	Purchase Order No.	Contract No.	See Below																																																						
Work Order No.	Purchase Order No.	Contract No.																																																												
See Below																																																														
<table border="1"> <thead> <tr> <th>Description</th> <th>Qty</th> <th>Rate</th> <th>Surcharge</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td colspan="6"> Work Order: N21H125, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake </td> </tr> <tr> <td>Metals, Total, in water - pkg</td> <td>12</td> <td>110.00</td> <td></td> <td>\$1,320.00</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">Subtotal:</td> <td>\$1,320.00</td> </tr> <tr> <td colspan="6"> Work Order: N21H126, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake </td> </tr> <tr> <td>Total Metals in Tissue</td> <td>10</td> <td>126.00</td> <td></td> <td>\$1,260.00</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">Subtotal:</td> <td>\$2,580.00</td> </tr> <tr> <td colspan="4"></td> <td style="text-align: right;">GST @5.0%:</td> <td>\$129.00</td> </tr> <tr> <td colspan="4">Terms: Net 30</td> <td style="text-align: right;">Total:</td> <td>\$ 2,709.00</td> </tr> <tr> <td colspan="4">2% per month charged on invoices over 30 Days</td> <td style="text-align: right;">Balance Due:</td> <td>\$ 2,709.00</td> </tr> </tbody> </table>						Description	Qty	Rate	Surcharge	Amount	Work Order: N21H125, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake						Metals, Total, in water - pkg	12	110.00		\$1,320.00					Subtotal:	\$1,320.00	Work Order: N21H126, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake						Total Metals in Tissue	10	126.00		\$1,260.00					Subtotal:	\$2,580.00					GST @5.0%:	\$129.00	Terms: Net 30				Total:	\$ 2,709.00	2% per month charged on invoices over 30 Days				Balance Due:	\$ 2,709.00
Description	Qty	Rate	Surcharge	Amount																																																										
Work Order: N21H125, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake																																																														
Metals, Total, in water - pkg	12	110.00		\$1,320.00																																																										
				Subtotal:	\$1,320.00																																																									
Work Order: N21H126, Received: 18-Aug-2021, Project: Heavy Metals - Lakelse Lake																																																														
Total Metals in Tissue	10	126.00		\$1,260.00																																																										
				Subtotal:	\$2,580.00																																																									
				GST @5.0%:	\$129.00																																																									
Terms: Net 30				Total:	\$ 2,709.00																																																									
2% per month charged on invoices over 30 Days				Balance Due:	\$ 2,709.00																																																									
Northern Laboratories (2010) Ltd. Address: 530 3rd Ave West Prince Rupert, BC V8J 1L8 Phone: (250) 627-1906 • Fax: (250) 627-8214 • www.norlabsltd.com • info@norlabsltd.com																																																														

Lab Samples – Northern Laboratories (\$2,709.00)



HOW DID WE DO TODAY?

Complete our short customer survey at
SURVEY.WALMART.CA

for a **monthly chance** to

WIN
1 of 3 \$1000 GIFT CARDS

Rules and regulations apply. See contest rules for details.

STORE 5834
4427 HWY-16 WEST
TERRACE, BC
V8G 6L5
250-615-4728

ST# 05834 OP# 009049 TE# 49 TR# 05248
VINYL SUMMER 009357372850 ~~\$15.97 E~~
VEGA PGSCHD 083876610670 ~~\$19.97 J~~
GV RC SESA 068113134221 ~~\$1.47 D~~
ZIPLC FRZ MD 0067 00433 **\$6.97 E**
CHRRITZ CHIP 0066 01368 ~~\$1.97 J~~
GRAPES SSS 08143001000
1.03519018 \$5.45/kg ~~\$5.64 D~~

SUBTOTAL ~~\$51.99~~
GST 5.0000% ~~\$2.24~~
PST 7.0000% ~~\$1.61~~
TOTAL ~~\$55.84~~
000000001234K \$0.05 C
SUBTOTAL ~~\$55.84~~
GST 5.0000% ~~\$2.26~~
PST 7.0000% ~~\$1.61~~
TOTAL ~~\$59.71~~
DEBIT TEND ~~\$59.71~~
CHANGE DUE \$0.00

GST/HST 137466199 RT 0001
GST 1016551356 TQ 0001

TRANSACTION RECORD PURCHASE
65.90

CHEQUING **** * 8609 I 1
RRN # 001001068
AUTH # 558312
TERMINAL ID WMTK009903
00 APPROVED-THANK YOU

INTERAC
AID A0000002771010
TC A13D89D9DDF141BC
*PIN VERIFIED

Tiama CARD.
Ziploc for
Mussel

08/09/21 12:30:2

ITEMS SOLD 7 *Mussel Project*
TC# 8252 0300 0633 2416 6558



THANK YOU FOR SHOPPING WITH US
08/09/21 12:30:33

Ziplocs - Walmart (\$6.97)



INVOICE #190750

2022-02-22

Prepared For:
Westland Resources Ltd./Northwest Timberlands Ltd.
Terrace, B.C.

Prepared By:
Kalen Snipper
Silvertip Signs
105 - 2905 Kenney Street
Terrace, BC V8G 3E8 Canada

Phone:
Alt. Phone:
Email: admin@westlandresources.ca

Phone: 250-835-1723 **Fax:** 250-835-1813
Alt. Phone: 855-820-1723
Email: signs@silvertipinc.ca

Description: #2022158 - Interpretive Sign (Fresh Water Mussels)

Due Date: 2022-03-03

Quantity	Description	Each	Total	Taxable
1	(1) 1' x 2' Digital Print on 12g Aluminum, Interpretive Sign.	150.00	\$150.00	✓
		Subtotal	\$150.00	
		PST	\$10.50	
		GST	\$7.50	
		Total	\$168.00	

Terms: This Estimate is good for 30 days. Sign permits the responsibility of client unless agreed otherwise in writing.

Sign Printing – Silvertip Signs (\$124.03 of \$168.00)