

Summary of Minnow trapping component of the SD 91/UNBC eDNA project

2022 Season

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Photos on cover page, left to right:

Ronan Blattner and Tynan Filan, NVSS working on Clear Creek.

Tynan Filan obtaining water samples, Necoslie River.

Ronan Blattner setting a minnow trap on Tatsutnai Creek (Photo T. Filan)

All other photos on cover page and rest of the document by B Booth

Project Overview

This report summarizes the results of a minnow trapping project that is being conducted under the auspices of the Koh-learning in Our Watersheds program, an experiential nature- and place-based program of integrative learning taking place throughout School District (SD) 91, Nechako Lakes. The goals of this project are threefold: to support and enhance the outdoor learning outcomes of students in SD 91; to provide baseline information related to juvenile fish in streams in the Nechako River Basin (NRB); and because it is also paired with joint UNBC/SD 91 project that is using environmental DNA (eDNA) to examine the distribution of juvenile salmonids in a selected number of streams in the NRB, the results help corroborate eDNA signals that were detected in selected streams.

Sampling Summary

We sampled 11 creeks at 23 different sampling locations¹ in 2022 (Table 1). Sites were sampled from July 12 through to September 28. All sampling, save for one day, was completed by Barry Booth and a crew of high school students from Nechako Valley Secondary School (NVSS) in Vanderhoof. Sampling was conducted by Casey Litton, teacher at NVSS and the NVSS students on Moss, Dog, Ormond, Tatsutnai and Nine Mile Creeks on August 11.

Table 1. Sites sampled in 2022.

Region	Water Body	Number of sites	Number of times creek was sampled ²
Ft. Fraser	Dog Creek	2	3
"	Nine Mile Creek	3	3
"	Ormond Creek	1	3
"	Tatsutnai Creek	1	3
Ft. St. James	Nahounli Creek	4	3
"	Necoslie River	1	1
"	Sowchea Creek	1	1
Vanderhoof	Clear Creek	1	3
"	Knight Creek	1	3
"	Moss Creek	2	3
"	Murray Creek	6	3

Most of the creeks were sampled on a small geographic scale (e.g., 1-2 sites near one another). Murray and Nahounli Creeks were sampled more extensively in 2022 to continue to enhance our understanding of the distribution of fish on these creeks.

¹ Maps of associated with the 2022 season can be found in Appendix 1.

² Please note that not each site on a given creek was sampled the number of times noted in this table.

Results from trapping

Juvenile Chinook - overall

We caught a total of 59 chinook salmon during our trapping efforts. Chinook were caught in 4 of the 11 creeks that we sampled. Chinook caught ranged from 50 to 90 mm in length and weighed between 2 and 8 grams (Table 2). Locations of where chinook were caught on each creek can be found in Appendix 1.

Table 2. Summary of chinook salmon caught during trapping season.

Creek	Site #'s where chinook were caught	Total # caught	Length (mm)		Weight (g)	
			Min	Max	Min	Max
Clear Creek	1	14	60	90	3	8
Moss Creek	1	31	50	80	2	7
Dog Creek	1, 2	10	70	85	4	7
Tatsutnai Creek	1	4	70	80	4	7

Of note is that of the creeks we sampled, we did not catch chinook in Ormond, Nine Mile, or Knight Creeks in 2022, but did so in 2021. This variation in trapping success in terms of presence/absence not detected of juvenile salmon reinforces the need for on-going monitoring.

Juvenile Chinook - selected creeks

Ft Fraser Area

Dog Creek

Over three trapping sessions we caught 10 chinook in a small section (~ 130 m) of Dog creek that extends from just above a set of culverts that cross the of Dog Creek Forest Service Road to the confluence with the Nechako River (Appendix 1). Of note in 2022 were the following observations. First, we captured chinook upstream of the perched culverts (Photo 1) and the small chute / waterfall below the culvert (Photo 2). These were thought to be barriers to upstream movement at lower flows in 2021. Clearly, our results this year have indicated that chinook were able to cross these structures during some point prior to our sampling in 2022. Second, we noted cattle activity on the section of Dog Creek above the Dog Creek FSR (Photo 3), and in fact one trap was disturbed by cattle. This activity resulted in a dramatic increase in turbidity of the lower section of Dog Creek in our August trapping session compared to our June and September trapping sessions.



Photo 1. Perched culverts at Dog Creek FSR.

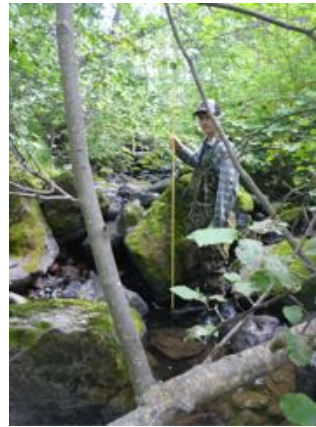


Photo 2. Cascade/chute at upstream end of Reach 1 on Dog Creek.



Photo 3. Sign of cattle accessing Dog Creek above the Dog Creek FSR.

Vanderhoof Area

Moss Creek

Again in 2022 numerous chinook were caught on Moss Creek, although none were located upstream of the newly installed bridge on this creek. Flows were low during the times that we sampled (Photos 4 a, b, c), but there appeared to be sufficient water flowing under the bridge to facilitate the movement of fish between these two sections of the stream in late August. Movement of fish between these two sections was uncertain in late September due to even lower flows (Photo 4c). This situation should be monitored throughout the season to determine if these two sections are cut off from one another and if this may require further attention.



Photo 4a Looking downstream from beneath the bridge on Moss Creek, August 24, 2022. The plunge pool that formed because of the previous culvert can be seen in the background



Photo 4b Looking upstream from beneath the bridge on Moss Creek, August 24, 2022. The yellow star in the background of photos 7 b and 7c is for reference.



Photo 4c Looking upstream from beneath the bridge on Moss Creek, September 26, 2022

Other species caught

Overall, we caught a total of 468 individuals from seven different species (Table 3).

Table 3. Total number of each species caught in minnow traps in each creek during trapping season.

Water Body	Species caught						
	Chinook Salmon	Rainbow Trout	Lake Chub	Northern Pike Minnow	Prickly Sculpin	Redside Shiner	Sucker
Dog Creek	10	6	-	-	-	-	-
Nine Mile Creek	-	11		-	-	-	-
Ormund Creek	-	2	-	5	-	-	-
Tatsutnai Creek	4	6	-	-	-	-	-
Nahounliu Creek	-	4	-	-	4	-	5
Necoslie River	-	-	-	3	1	4	-
Sowchea Creek	-	-	-	-	-	-	-
Clear Creek	14	-		-	-	-	1
Knight Creek	-	-	16	-	-	-	26
Moss Creek	31	26	-	-	-	-	-
Murray Creek	-	21	221	1	-	20	26
Totals	59	76	237	9	5	24	58

Of note was the large number of creeks (7 out of 11) where rainbow trout caught. Sites where rainbow trout were captured is presented in Table 4.

Table 4. Sites where rainbow trout were caught.

Water Body	Sites
Dog Creek	2
Nine Mile Creek	1,2,3
Ormund Creek	1
Tatsutnai Creek	1,2
Nahounliu Creek	2,3
Moss Creek	1,2
Murray Creek	2,5,6

In addition to the widespread occurrence of rainbow trout throughout the study area was the dramatic increase in the numbers of lake chub that we encountered at Site 5 on Murray Creek. In 2022 we caught a total of 66 lake chub at this site whereas in 2021 we caught one and in 2020 we caught zero.

Other observations

Ormond Creek

We noted that a small beaver dam spanning Ormond Creek in the vicinity of where we placed our traps had been constructed between our August and September sampling sessions (Photo 5 & 6). While this beaver dam will not persist on this section of Ormond Creek given width of the creek at this location, and the high flows we have seen in the past, it nonetheless had localized and temporal impacts: water was clearly backing up behind the dam; and a large rainbow trout was seen staging downstream of the dam when we arrived and its upstream movement appeared to be hindered by this small dam (Photos 5 & 6). It was also noted that some attention downstream of the culverts that cross Stella Road may be warranted. We noted that there have been significant alterations to the channel morphology downstream of the culverts. While we did not thoroughly assess the section of Ormond Creek immediately downstream of the culverts for possible fish passage issues, but we feel that this is warranted given the current appearance of the channel (Photos 7-9).



Photo 5. Beaver Dam spanning Ormond Creek.



Photo 6. Close up of dam.

Note water pooling above dam in Photo 5 and large (~ 15 cm) fish that appeared to be a rainbow trout staging at downstream end of dam in the foreground of Photo 6.



Photo 7. Ormond Creek

This photo is looking upstream to the culvert that crosses Stella Road. Note the sediment wedge on the right-hand side of the photo. This deposition is pushing most of the flow of Ormond Creek through the willows on the river right side of the creek (left hand side of this photo).



Photo 8. Ormond Creek through willows.

Although difficult to see in the photo, this is one of the paths Ormond Creek takes through the willows on river right. Of importance to note here is that the creek winds through at least one narrow channel that is somewhat clogged with logs and debris.



Photo 9. Ormond Creek emerging from path through willows

This photo is looking downstream from Photo 7. One can notice the large accumulation of bedload in the foreground. It can also be seen that the flow of the creek reappears down stream

Acknowledgments

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NEWSS
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Special thanks to all the landowners who allowed us to have access to their property.

Appendix 1. Maps associated with the 2022 sampling season

1a. Trapping locations

Figure 1. Ft. Fraser Sites..... 11

Figure 2. Ft. St. James Sites..... 12

Figure 3. Clear Creek..... 13

Figure 4. Knight Creek..... 13

Figure 5. Murray Creek 14

Figure 6. Moss Creek 16

1b. Trapping locations where chinook salmon were caught

Figure 7. Ft. Fraser and Vanderhoof Creeks 16

Figure 1. Ft. Fraser Sites



Ormond Creek



Dog Creek



Tatsutnai Creek



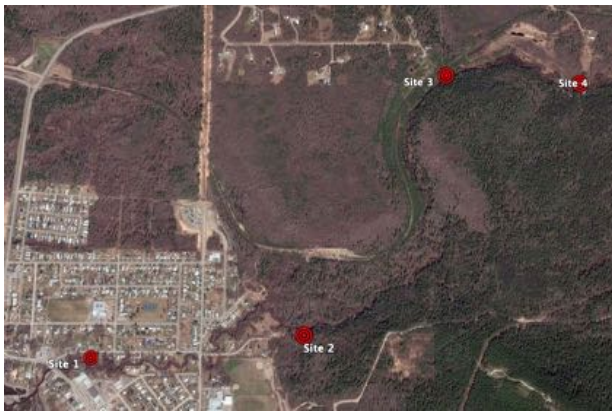
Nine Mile Creek



Figure 2. Ft. St. James sites



Nahounli Creek



Necoslie River



Sowchea Creek



Figure 3. Clear Creek



Figure 4. Knight Creek



Figure 5. Murray Creek



Upper Murray



Mid Murray



Lower Murray



Figure 6. Moss Creek



Figure 7. Sites where chinook salmon were caught

Ft. Fraser Creeks

Tatsutnai Creek



Dog Creek



Vanderhoof Creeks

Clear Creek



Moss Creek



Sites where chinook were caught are circled in yellow