

**Salmon Resue from Towhee Creek Ponds
After Clean up of Abandoned Homeless Camp
April 2024**

Eyes on the Tsolum River Report 2



For the Tsolum River Restoration Society (TRRS)
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June, 2024

Background

Juvenile salmon migrate into the backwaters to escape from the strong currents in the mainstem of the Tsolum River in the fall and winter. In recent years Towhee Creek, an ephemeral tributary in the lower Tsolum River, is one backwater that has been monitored for its fish populations and fish health (Chamberlain 2019, Tripp et al. 2020 and 2021).

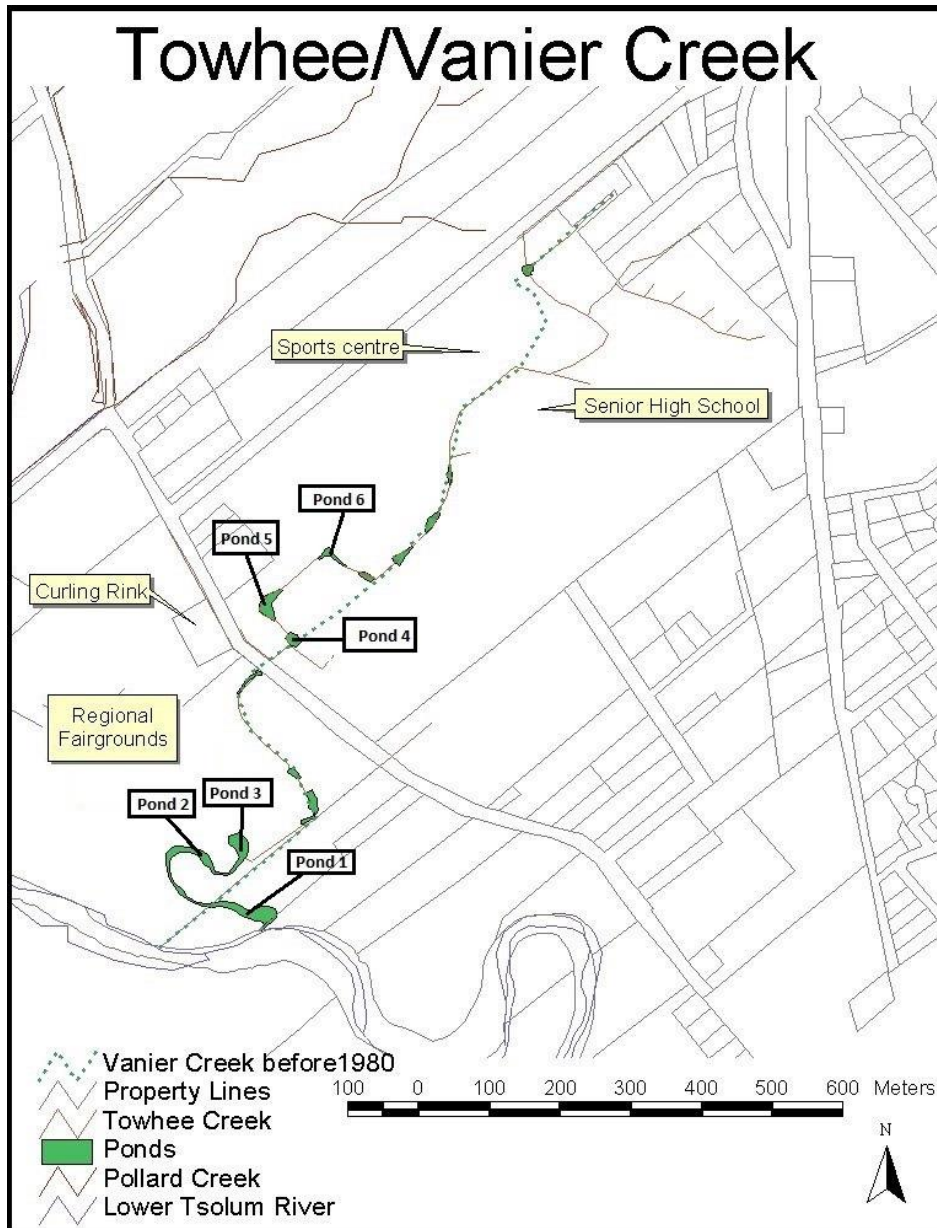


Figure 1. Towhee Creek showing approximate location of ponds

A number of years ago these ponds, ranging from approximately 50 to 500 m² in area, were excavated to increase the amount of fish habitat. As many as 5,000 juvenile coho salmon over

winter in these ponds (Tripp et al 2020). Unfortunately, in recent years fish become stranded in these ponds and perish when water levels decline, water temperatures increase, and dissolved oxygen declines from April to May.

In recent years, spring rains have been insufficient to connect Towhee Creek to the mainstem of Tsolum River, stranding juvenile salmon in stagnant ponds. Since 2020, thousands of juvenile salmon have been rescued from these ponds in May, by junior and high school students, university students, and TRRS volunteers. The fry are trapped, acclimated, and released into the Tsolum River. This occurs during the “smolt window” when the bodies of the one- and two-year-old juvenile Coho salmon are chemically preparing for seawater. Smolting begins when water temperatures are suitable for outmigration.

Current Findings

This year, Environmental Response Teams (ERT) are being formed from Eyes on the Tsolum River Observers to aid the Tsolum River Restoration Society (TRRS) to conduct these rescues more responsibly. Unfortunately, trashing in and around Pond 1 in Towhee Creek increased significantly in 2023. For public health and safety reasons, fish rescues in 2024 were delayed until this garbage was removed. On April 21, 2024, many enthusiastic volunteers did an excellent clean-up around Pond 1.



Before cleanup



After cleanup

On April 24, dissolved oxygen (D.O.) and water temperatures were measured in Ponds 1, 2, and 3. Gee traps and cloverleaf traps were set in late afternoon. Because D.O. was approaching lethal levels in Pond 1, traps there were set with a portion of the trap above the surface so that any stressed fish had access to atmospheric air if they needed to “gill” on the surface.

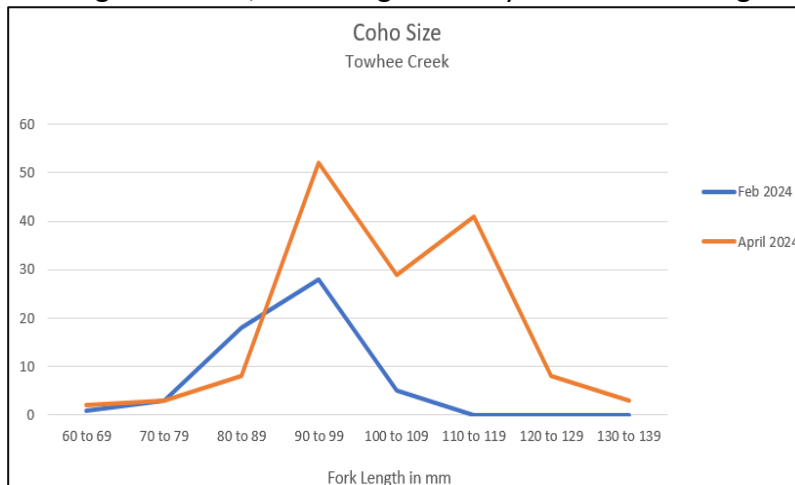
The traps were lifted in the morning of April 25. A total of 109 one- and two- year-old juvenile Coho salmon were trapped from Ponds 1, 2, and 3.

	Pond 1	Pond 2	Pond 3
Total Coho (1,2 years)	87	19	3
Average size (FL, mm)	102.1	98.1	96.7

The majority of fish were trapped from Pond 1.



Comparison with a sample taken in February, 2024, shows that the Coho had grown an average of 1 cm in the intervening ten weeks, indicating that they had been feeding well.



The fish appeared healthy, apart from two dead fish retrieved from Pond 1. These two fish had large cystic lesions. Of the thousands of juvenile salmon trapped in the Towhee Ponds in the past, this is the first observation of a malady like this.



Approximately one hour after being retrieved from the traps and measured, all fish were acclimated and released in the Tsolum River mainstem.



Lessons Learned and Recommendations

As demonstrated over the years, there are juvenile Coho salmon stranded in the ponds of Towhee Creek. Unfortunately, the number of juvenile salmon declined in the past year probably due to Pond 1 becoming a toxic sump, catching organic and inorganic runoff from wastes that built up around the pond. Also, the discovery of two fish mortalities with large cystic lesions, from a relatively small catch of 87 healthy looking fish, is a cause for concern. This should be investigated further in subsequent fish rescues.

Juvenile salmon entering and leaving Towhee Creek during freshets in the mainstem Tsolum swim through Pond 1 to access refugia further upstream. Also, during outmigration to the ocean in early May, one- and two-year-old juvenile Coho salmon slowly drift downstream. This natural behaviour becomes very critical when the fish's body is preparing its chemical change for life in the ocean. This spring in Towhee Creek, salmon were unable to complete this journey and became trapped as flows gradually diminished and went subsurface in Pond 1. As Tripp 2020 mentions, these waterbodies can either be eco-refugia or eco-traps.

However, even with all the stressors in recent years such as dry hot summers and trash build up around Pond 1, juvenile salmon still seek winter refuge in significant numbers in Towhee Creek. And, for the first time in many years, an adult Coho salmon carcass was found partially spawned out between Ponds 1 and 2 (Chamberlain 2024). This shows how resilient our salmon can be. With help, ephemeral backwaters such as Towhee Creek can be restored to be productive and healthy nurseries for juvenile salmon.

With an overall strategic plan to mitigate the anthropogenic stressors inflicted on the Towhee Creek salmon, we could work toward the development of a "show case" of how salmon and people can live in harmony. A start in this direction would be to survey each of the six main ponds for potential restoration, such as silt removal and sufficient riparian setbacks to filter sediment.

Reflections on the Clean Up of Pond 1

As mentioned previously, this salmon rescue would not have been possible without the prior removal of hazardous trash around Pond 1. On April 21, approximately 30 individuals removed the trash around Pond 1. It was truly incredible to watch the transformation of this area as the syringes, wastes, and recyclables were sorted and removed for disposal. The community members, Brett Restemeyer and company, did an excellent job of organising this cleanup. To our knowledge, no tally was made of the trash removed. However, two container bins were filled and some individuals told us they each collected approximately 10 discarded syringes.



One of the bins of trash after the clean up. Sienna Espinoza and Savannah Glennie, North Island College Licensed Practical Nursing Students, who were part of the clean up crew.

We hope that this cleanup, and follow up salmon rescues, will create more awareness of the value of ephemeral backwaters and wetlands. The Federal Fisheries Act, RAPP 2022 (Riparian Area Protection Regulations), calls on local governments to protect these areas. It is interesting to note, in this incidence, a community of individuals organised this cleanup.

According to Farha, L., and K. Schwan (2020) Canadian governments should ensure basic adequacy standards in homeless encampments such as: access to hygiene and sanitation facilities, waste management systems, and rodent and pest prevention. Encampments in riparian flood plains, like Towhee Creek, do not meet these requirements. Encampments situated on floodplains create a constant risk to the associated waterways from untreated wastewater runoff. Farha, L., and K. Schwan 2020 states that the presence of pharmaceutical products in water bodies poses a significant risk to aquatic organisms and human health. They also mention phytoremediation as a potential method to treat pharmaceutical runoff. This form of remediation uses plants and

associated soil microbes to reduce the concentration of contaminants, and therefore emphasizes the need to maintain strong riparian buffers along salmon bearing watersheds.

Acknowledgements

In recent years, Derek Tripp did excellent fisheries work in Towhee Creek and documented the value of Towhee Creek as winter refugia and potential spawning site for Coho salmon.

This salmon rescue was made possible by many volunteers from the local community who removed the trash and hazardous wastes from Towhee Creek Pond 1. Thanks to Brett Restemeyer for initiating the work.

Thanks to Bela and Vitya Hermanek for their enthusiasm and energy in the pouring rain as we trapped and transferred the salmon.

Shortly after the salmon rescues, Wayne White and Stuart Carwithen, from TRRS, and Dominik Piatek, from BC Hydro, met to initiate a restoration plan for the riparian area around Pond 1. We hope that their efforts will meet with success and motivate reclamation work in the other Towhee Ponds.

Lastly, we would like to thank Dr. Connie Haist and Mike Day for reviewing drafts of this report.

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FISHERIES AND OCEANS CANADA – PACIFIC REGION
FINAL DRAFT - FISH HABITAT RESTORATION GUIDELINES:
Emergency Juvenile Salmonid Relocation

Appendix A: Sample Fry Relocation Field Data Form

RELOCATION DATE(S) AND TIME: April 24/2024 11:30 AM		CREW (AND EXPERTISE): Allan Chamberlain Bela & Vitya Heermanek Darren & Kandize Froese Stu Carwithan						
REASON FOR RELOCATION: Lethally low D.O.								
STREAM NAME: TOWHEE CRK		GPS COORDINATES		WATER QUALITY				
SALVAGE LOCATION				Temp °C	mg O ₂	% O ₂	pH	
RELEASE LOCATION				10.5	2.05	18.6		
							Turbidity NTU	
							WATER LEVEL	
							<input type="checkbox"/> Extremely Low <input type="checkbox"/> Below Normal <input type="checkbox"/> Normal	
OBSTRUCTION AND RELEASE LOCATION DESCRIPTIONS: MAIN STEM TSOLUM RIVER ≈ 150m UPSTREAM								
SALMON SPECIES	CHINOOK	CHUM	COHO	PINK	SOCKEYE	EQUIPMENT USED		
OBSERVED ONLY:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Seine net <input checked="" type="checkbox"/> Gee/minnow trap + CL trap <input type="checkbox"/> Dip net <input type="checkbox"/> Other net		
# JUVENILES						(explain in comments)		
RELOCATED BYCATCH (#, species, stage, etc.)	≈ 30 THREE SPINE STICKLE BACK						WEATHER	
TOTAL # FISH RELOCATED	109						OTHER ENVIRONMENTAL OBSERVATIONS: POND 1 TURBID	
COMMENTS: (e.g., general observations, fish health/mortality, estimated average length, trap set time etc.) – PLEASE ATTACH PHOTOGRAPHS								
<p>1 PUMPKINSEED SUNFISH 30 THREE SPINE STICKLE BACK COHO SALMON 1⁺ & 2⁺ - POND 1 87 40-130mm length - POND 2 19 40-113mm - POND 3 3 90-105mm 2 COHO MORTALITIES WITH CYSTIC LESIONS (pg 3 report)</p>								