

Truax Dam Removal Monitoring on the Saugeen River - Fall 2025 Update Report -

In August 2019, the century-old Truax Dam in Walkerton, ON was successfully removed through a collaboration between Bruce Power, the Lake Huron Fishing Club and the Municipality of Brockton, with direction from GSS Engineering Consultants Ltd. The removal addressed safety concerns related to the ageing structure and eliminated a significant barrier to fish migration in the Saugeen River (Figure 1). To assess the impact of the dam removal, scientists from Bruce Power and Biotactic Inc., supported by Golder Associates, designed a Before-After-Control-Impact (BACI) study. Monitoring for this study is conducted year-round and includes electrofishing surveys to measure fish biomass and production, habitat assessments, redd surveys to track fish spawning, and underwater video and radiotelemetry studies to monitor fish movement and passage.

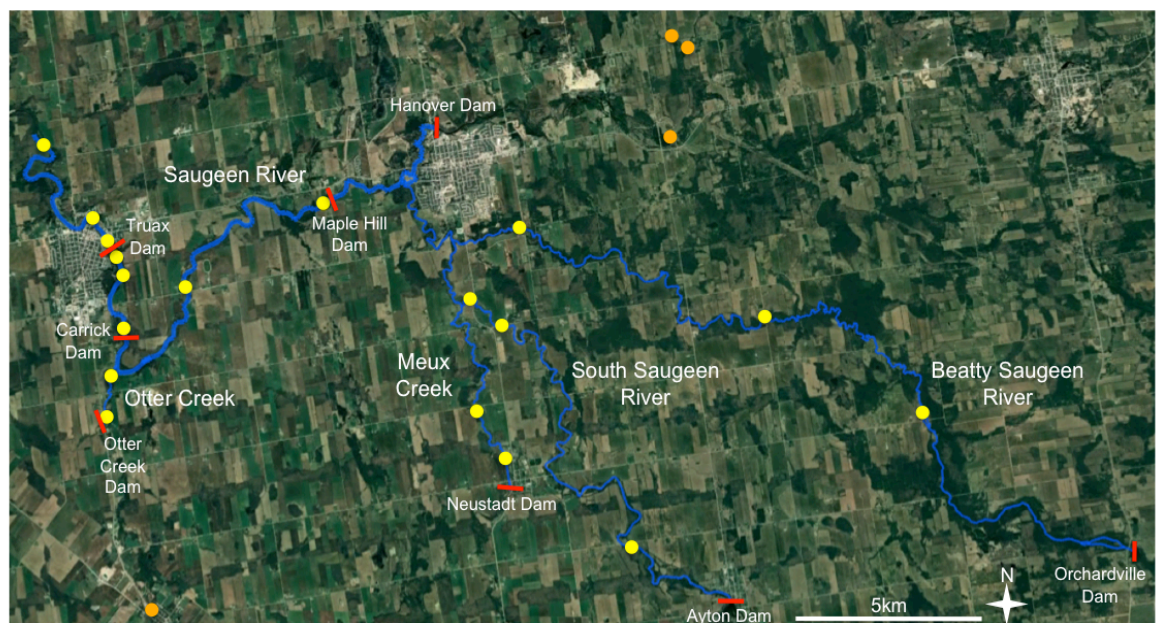
Twenty-two sampling locations, divided into 65 sampling sections, were established throughout the Saugeen River watershed (Figure 2). Baseline data were collected in 2018 and 2019 before the dam was removed. Post-removal monitoring and data collection began in the fall of 2019 and continues to be on-going so that the long-term benefits of the dam removal can be quantified and explored.

Almost immediately after the dam was removed, natural river flow and temperature patterns were restored in the former headpond area, creating new spawning habitat and increasing fish diversity and biomass. With the barrier gone, fish now have easier access to high-quality habitat upstream, leading to increased spawning. The following is a summary of data collected up to the summer of 2025.



Figure 1 – Aerial images of the Truax Dam footprint, Walkerton, ON, before and after removal. The original wooden dam was built in 1852 and later replaced by the concrete structure shown above in 1919. While the dam had a fishway that allowed the passage of some migrating salmonids under specific flow conditions, it posed a significant barrier to fish passage before it was removed to restore river connectivity.

Figure 2 – Twenty-two long-term monitoring sites are located upstream and downstream of the former Truax Dam in the Saugeen River and within Otter and Meux Creeks and the South Saugeen and Beatty Saugeen Rivers. Red bars are locations of dams in the study area. Yellow circles are sites with fish communities that are monitored for potential changes related to the dam removal. Orange circles are control sites with independent fish communities located upstream of Hanover and Otter Creek Dams, which are barriers to upstream movement.



Radiotelemetry – Tracking the Movement of Rainbow Trout Throughout the Saugeen River Watershed

Radiotelemetry uses transmitters and receivers that detect unique signals to track individual fish, allowing researchers to analyze migration patterns and behaviours. Biotactic Inc., experts in fish tracking studies, partnered with Bruce Power to study Rainbow Trout movement in the Saugeen River watershed as they migrate inland from Lake Huron each spring and fall. With support from the Ontario Steelheaders and Lake Huron Fishing Club, 523 fish have been radio-tagged to-date (Figure 3). The most recent tagging event took place in October 2025 and more tagging is planned in spring 2026. Fish are tagged at Denny's Dam, and their movement is tracked using a combination of seven stationary receiver stations, as well as mobile methods such as by airplane, truck and on foot.

Studies conducted from spring 2018 to 2022, and again in fall 2023, involved releasing tagged fish upstream of Denny's Dam to investigate how the removal of the Truax Dam affected fish passage and movement throughout the Saugeen River watershed. The research revealed that removing the dam not only reduced downstream delays and improved passage at the former dam site, but also increased fish travel speeds and passage success at remaining upstream dams. Additionally, fall-run fish were able to overwinter closer to known spawning grounds. This research has been published and is publicly available at biotactic.com/peer-reviewed-scientific-papers.

Figure 3 – Surgical implantation of a radio-tag in an electro-sedated Rainbow Trout, a tagged fish, and the release of fish downstream of Denny's Dam (left to right).



Studies conducted in spring 2023, 2024 and 2025 and fall 2024, instead involved releasing tagged fish downstream of Denny's Dam, and have been focussed on investigating the passage success of fish at the Denny's Dam fishway (Table 1). These studies help to address an important knowledge gap regarding how many fish from the migration run entering the Saugeen River can pass this partial downstream barrier and potentially reach upstream tributaries to spawn. In spring 2023, 12 out of 30 tracked fish approached the fishway, but only 5 of these fish successfully passed upstream, 3 after being trapped by the LHFC. In spring 2024, 11 of 12 tracked fish approached the fishway, with just 4 successfully passing upstream. Most recently in spring 2025, 19 out of 28 tracked fish approached the fishway, with 10 of these fish successfully passing upstream. Total fishway efficiency was 14%, 31% and 33% in spring 2023, 2024 and 2025, respectively. In fall 2024, 17 out of 30 tracked fish approached the fishway, with only 3 successfully re-ascending within the fall/winter monitoring period (November – March), for a fishway efficiency of 10%. Of the fall fish relocated in spring 2025, 15 approached and 8 passed Denny's Dam, equating to a 34% fishway efficiency. For comparison, the total efficiency of the nature-like fishway at the nearby Thornbury Dam on the Beaver River was found to be 53% in the spring, with 53% of tagged fish approaching the dam and, importantly, 100% successfully passing. The current radiotelemetry study in fall 2025, will continue until March 2026 and will provide insight into the variability of fall-run fish passage at Denny's. Future studies will explore the differences in movement patterns of river-resident Rainbow Trout and adfluvial Steelhead, and may also expand to explore the behaviours of other important migratory species such as Chinook or Coho Salmon.

Monitoring period		Spring 2023		Spring 2024		Fall 2024		Spring 2025	
Fish tracking group		New	Prev.	New	Prev.	New	Prev.	New	Prev.
Sample size (n)	(# fish tagged/remaining)	35	128	13	110	30	102	30	88
Sample size (n)	(# relocated)	30	10	12	21	30	4	28	21
Denny's Dam	(# arrived at Denny's)	12	2	11	9	17	1	19	16
	(# passed upstream)	5	0	4	6	3	0	10	9
	(% passage)	42	0	36	67	18	0	53	56
Truax Dam	(# arrived at Truax)	4	1	1	7	1	-	7	5
	(# passed upstream)	3	0	0	2	1	-	6	5
	(% passage)	75	0	0	29	100	-	86	100
Released	# fish	-	1	-	-	6	-	2	-
Harvested	# fish	3	2	-	-	5	-	1	2

Table 1 – Radiotelemetry results collected from studies where fish were released downstream of Denny's Dam. New are newly tagged fish each season, Prev. is the number of all previously tagged fish available to be tracked.

Fish Biomass – Measuring Changes in Fish Production

Bruce Power and Biotactic Inc. are collecting important data on fish communities in the study area. Every summer, fish are sampled using established electrofishing methods at the 22 sampling locations, within the 65 sampling sections (Figures 2 and 4). Each captured fish is identified to species and its length and weight are recorded before it is safely released back into the river. This data, along with information from four annual capture efficiency studies and depletion sampling, is used to calculate the total fish biomass in the community. Changes in fish production are used to help assess the impact of the Truax Dam removal on the Saugeen River watershed and are credited to Bruce Power as an Offset under its *Fisheries Act* Authorization.



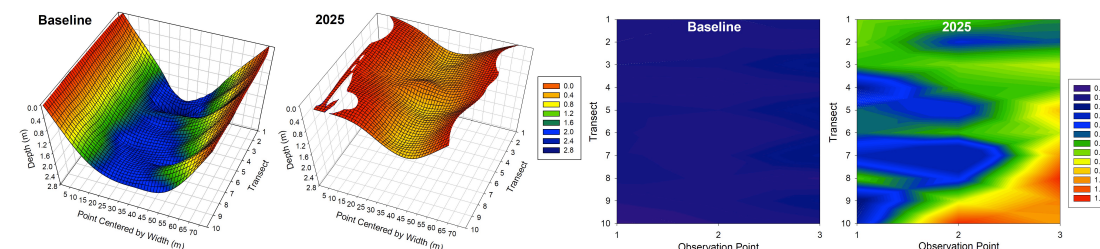
Figure 4 – Multi-pass zig-zag depletion electrofishing within a blocked off section of Otter Creek (left) and examples of species captured during summer biomass electrofishing surveys.

To-date a total of 89,209 fish have been collected: 12,323 in 2018, 8,146 in 2019, 8,713 in 2020 (after the Truax Dam was removed), 9,289 in 2021, 13,321 in 2022, 12,566 in 2023, 11,329 in 2024 and 13,532 in 2025. Additional sampling will be conducted in 2026. Not including control sites, within biomass sampling, only an average of 85 salmonids across 8 sections were captured before the dam was removed (2018 and 2019) in the main-stem, and an average of 480 salmonids across 16 sections were captured in the tributaries (Table 2). After the Traux Dam was removed, this increased to an average (2020 to 2025) of 122 salmonids across 15 sections in the main-stem (max: 256 fish in 2025, 18 sections in 2023), and an average of 783 salmonids across 18 sections in the tributaries (max: 1177 fish in 2024, 21 sections in 2022). Most importantly, the amount of fish biomass and production captured throughout the watershed continues to increase each year. Such increases began immediately after the dam removal in 2020, with a significant increase in fish biomass within sites within the previously impounded dam headpond. Additional significant increases began to be found within the main-stem further upstream in 2021 and downstream in 2022 and within Otter Creek in 2023. Most recently, as of 2024, positive trends continued to also be found in the remaining upstream tributaries. The full analysis of 2025 electrofishing data is currently on-going.

Table 2 – Average total number of all fish and salmonids captured within sampling sites across the Saugeen River watershed, including in Otter (OC) and Meux (MC) Creeks and the South (SS) and Beatty (BS) Saugeen Rivers before (B: 2018 and 2019) and after (A: 2020 to 2025) the Truax Dam was removed. Biomass (g/m^2) is the mean average across sites each year, with Increase showing the comparison of before removal versus in 2025.

		Main-stem Saugeen River				OC	MC	SS	BS
Sites		3	3	2		2	2	3	3
Fish	B	795	615	178		1045	338	797	943
	A	930	749	386		1257	546	1607	1294
	2025	1230	1117	391		1523	800	1944	1384
Salmonids	B	69	14	2		361	21	0	99
	A	49	70	3		619	40	1	123
	2025	110	144	2		621	71	0	184
Biomass	B	1.392	1.080	0.858		2.821	1.602	1.848	1.654
	A	2.589	2.104	1.684		4.585	2.052	2.600	2.271
	2025	3.169	2.530	2.237		4.319	3.603	3.037	2.845
Increase		2.3x	2.3x	2.6x		1.5x	2.2x	1.6x	1.7x

Full or partial habitat assessments are also conducted annually at each site to evaluate the environmental conditions present during sampling and to account for variation in the fish community between years. Given the expected changes in river conditions upstream of the Truax Dam, complete assessments have been performed in the vicinity of the dam footprint (Figure 5). Upstream, wetted width has decreased by an average of 10.7m and water depth by an average of 1.2m, while water velocity



has increased by an average of 0.5m/s post-removal (2020 to 2025).

Figure 5 – Baseline and 2025 wetted width and depth profiles as well as flow profiles of sections immediately upstream of the Truax Dam footprint.

Underwater Video and Spawning Survey

Underwater solar-powered, motion-activated infrared cameras have been installed to monitor fish movement, activity, and condition during key periods in the spring and fall in Otter Creek and at the Maple Hill Dam. Otter Creek was monitored from fall 2018 to spring 2022, with catch-per-unit-effort (CPUE) – the number of unique fish observed per hour – increasing by 1.5 to 6.4 times in the fall, and 1.1 to 2 times in the spring over this period (Figure 6). Monitoring at the Maple Hill Dam continues to be on-going. At the Denil fishway, CPUE has increased by 5.4 to 12.8 times in the fall, and by 0.3 to 2.5 times in the spring (Figure 6). As monitoring is conducted at the same time each season, recent decreases are likely accounted for by shifts in the spawning window, with fish migrating earlier in the season compared to when monitoring first began. The pool-and-weir fishway at the Maple Hill Dam was monitored in spring 2023 and 2025 using a camera installed on land to track fish exiting upstream. As in 2023, several adult Rainbow Trout were observed successfully passing upstream in 2025, with additional fish observed jumping within only the lower pools of the fishway. A compilation video of spring 2025 passage is available at biotactic.com/MHTrailCamSpring2025.mp4.

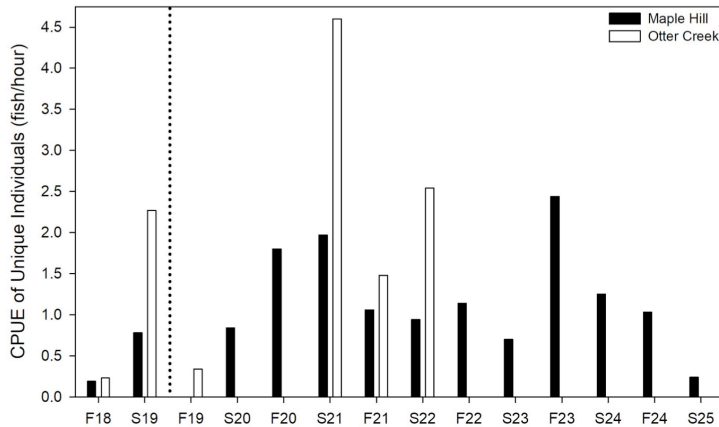


Figure 6 – Results from videographic surveys conducted in Otter Creek and at the Maple Hill Dam Denil fishway during baseline and post-dam removal monitoring (left and right of dotted line) and an example of an



adult Rainbow Trout passing upstream through the Maple Hill Dam pool-and-weir fishway.

Redd count surveys are conducted to measure the number of spawning Rainbow Trout in the spring and Chinook Salmon in the fall. Surveys are performed by scientists from Bruce Power and Biotactic Inc. on foot along Otter and Meux Creeks, and the Beatty Saugeen River and by drone within newly created spawning habitat within the former dam headpond within the Saugeen River. Since the dam removal, the number of Rainbow Trout redds in the Saugeen River and Otter Creek has increased by an average of 4.4 times (range: 2.1 to 9.6), with a maximum of 223 redds and 309 fish observed in Otter Creek and a maximum of 93 and 143, respectively, observed in the Saugeen River in spring 2025 (Figure 7). With respect to Chinook Salmon, the number of redds has risen by an average of 6.5 times (range: 1.6 to 12.6), with a maximum of 73 redds and 165 alive fish observed in Otter Creek and a maximum of 28 and 24, respectively, observed in the Saugeen River in fall 2021. Although not perfectly correlated, the number of redds counted has generally aligned with the number of juveniles captured in these areas during summer biomass sampling. Of note, the timing and duration of the spawning period has changed since 2018. While earlier spring counts started late April/early May and lasted for ~5 weeks, more recent counts have started late March/early April and have lasted ~8 weeks; early fall counts started mid-October and more recently have started late September. This shift could result in larger juveniles and increased biomass during summer electrofishing. Combined long-term monitoring data from radiotelemetry, electrofishing biomass surveys as well as videographic and redd count surveys are providing a comprehensive understanding of the impacts of the Truax Dam removal and the overall benefits to the Saugeen River fishery.

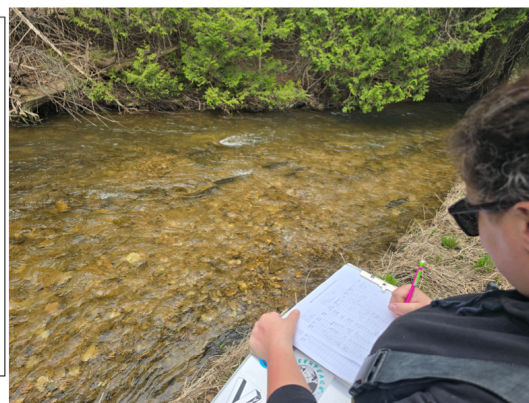
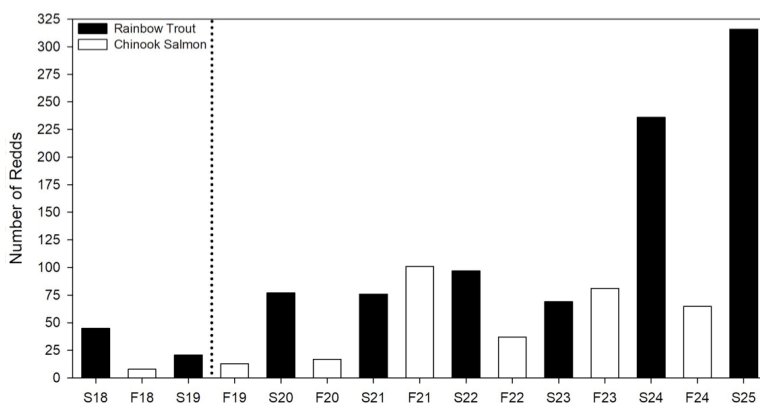


Figure 7 – Results from redd count surveys conducted in the Saugeen River and Otter Creek during baseline and post-dam removal monitoring (left and right of dotted line).