

FishPass Monthly Update



Dear partners and stakeholders:

On behalf of the FishPass team, I am pleased to provide an update from the final quarter of 2023. Happy holidays to you all from the FishPass team. Please distribute the update as you see fit.

Engineering Design / Construction:

- On August 22, 2023, the Michigan Supreme Court denied the plaintiff's application for leave to appeal. The court's decision ends the legal challenge to the city and opens a pathway to re-start FishPass construction. The Great Lakes Fishery Commission (GLFC) is working with the U.S. Army Corps of Engineers (USACE) and FishPass prime contractor, Spence Brothers Construction, to identify an agreeable price that accounts for delays incurred due to the legal cases and re-start construction.

Research/Assessment:

- Reid Swanson, Dr. Daniel Zielinski, and Dr. Andrew Muir (GLFC) completed a report summarizing the results of a trapping operation conducted in spring of 2022, in which a weir normally used for harvesting salmonids during fall migrations was installed and modified to incorporate two large box style traps used to capture and enumerate the longnose and white sucker migrations into the Boardman/Ottaway River. The report titled, *Weir enumeration and capture-mark-recapture estimates of spring spawning-run size for white sucker *Catostomus commersonii* and longnose sucker *Catostomus catostomus* in the Boardman (Ottaway) River*, is free to download [here](#).
- Reid Swanson, Dr. Daniel Zielinski, Dr. Andrew Muir (GLFC), and Dr. Theodore Castro-Santos (U.S. Geological Survey; USGS) complete a report describing the results from fisheries community sampling from 2017-2021 and the concurrent bio-telemetry project aimed at understanding temporal changes in the fish community and movement and space-use of a variety of large-bodied fishes in the lower Boardman/Ottaway River (below Union St. Dam). The report titled, *FishPass baseline assessment of fish community assemblage and migratory patterns in the Boardman River*, is free to download [here](#).
- Dr. David Benoit (GLFC and University of Toronto) and other FishPass researchers published a paper in the Journal of Great Lakes Research describing the first comprehensive data set of sortable attributes associated with fish passage. The integrated database consists of 21 biological attributes that influence the movement and passage of 220 species in the Great Lakes, including native species, established non-native species, and unestablished but potentially invasive fishes. The sortable attributes of the fish community include phenology (i.e., time of movements), morphology (i.e., shape and color), physiology (i.e., swimming

ability or senses), and behavior. This database will help inform the selection of sorting technologies at FishPass. The manuscript, titled *FishPass sortable attribute database: Phenological, morphological, physiological, and behavioral characteristics related to passage and movement of Laurentian Great Lakes fishes*, is free to download here: <https://doi.org/10.1016/j.jglr.2023.08.006>.

- Prathyush Nallamothe, Jonathon Gregory, Jordan Leh, and Dr. Jesse Eickholt (Central Michigan University) and Dr. Daniel Zielinski (GLFC) published a paper in the journal *Fishes* that investigated the leap characteristics of rainbow trout (also known as steelhead) present in the Laurentian Great Lakes. The team collected video of steelhead leaping at the auxiliary spillway of the Union Street Dam in Traverse City, MI in 2022 and 2023, and developed a web application to quantify their launch speed, launch angle, and length of fish. Across 173 total leaps, the mean launch angle was found to be 58-68 degrees and the mean launch speed was equivalent to 8.6 body lengths per second. Steelhead launch angles were also found to be closely aligned with the direction of the water flow. These data were used to validate the FishPass design and establish operational procedures that eliminate the risk of unintentional volitional passage of fish. The manuscript, titled *Semi-automated inquiry of fish launch angle and speed for hazard analysis*, is free to download here: <https://doi.org/10.3390/fishes8100476>.
- June – September 2023 – Staff from the USGS continued work on a two-year study initiated in 2023, *Spatio-temporal drift patterns on larval fish in the Boardman/Ottaway River* [See the [FishPass Supplementary Research Project Summary](#) for a brief description and objectives of the study]. For the year, 836 samples containing 24,973 larvae were collected through the week of 21 August and sampling was concluded due to absence of larvae other than round goby (*Neogobius melanostomus*) and Centrarchidae (sunfishes). Processing of samples (i.e., identify fish to lowest practical taxonomic level) is ongoing at the USGS Great Lakes Science Center.
- 11 July 2023 – Staff from the GLFC and the Grand Traverse Band of Ottawa and Chippewa Indians (GTB) conducted a two-pass electrofishing survey at the Forks long-term monitoring site. As part of this work, the team counted and measured all fish captured and estimated the population size of brook and brown trout (**Table 1**).
- 25 July, 13 September & 7 November 2023 – GLFC and GTB staff completed the second, third, and fourth scheduled quarterly index electrofishing surveys in the lower Boardman/Ottaway River. These surveys are used to understand the seasonal diversity and abundance of species in this section of river. During these surveys GLFC and GTB staff also implant a variety of bio-telemetry tags to facilitate ongoing research on fish movement and presence in the river. Results of the three surveys can be found in **Table 2**.

Table 1. Number of fish captured (n), mean length and weight, adjusted Lincoln-Peterson population estimate and density for brook and brown trout at the Forks long-term monitoring site 11 July 2023.

Species	n	Mean (SD) Total Length (in.)	Mean (SD) Weight (lbs.)	Adjusted Lincoln- Peterson Population Estimate (95% CI)	Acreage	Fish/Acre	Lbs./Acre
brook trout	50	4.3 (0.4)	0.05 (0.01)	99 (61-275)	0.76	130.00	6.30
brown trout	164	6.2 (0.3)	0.17 (0.02)	381 (271-596)	0.76	502.00	82.90
Central mudminnow	1	2.1*					
common shiner	1	3.3*					
longnose dace	7	2.6 (0.3)					
Northern brook lamprey	12	6.2*					
rainbow trout	1	6.7*					
sculpin mixed species	278	2.5 (0.1)					

*Denotes a sample size of one

- September 2023 – Staff from the GLFC, University of Windsor, Cornell University, and USGS retrieved and downloaded acoustic fish telemetry receivers deployed in Boardman Lake and the upper Boardman/Ottaway River (above Union St. Dam). Receivers were deployed as part of the *Energy and Nutrient Dynamics* project [See the [FishPass Supplementary Research Project Summary](#) for a brief description and objectives of the study]. This effort concludes the active tracking of 270-white sucker *Catostomus commersonii* and longnose sucker *Catostomus catostomus* tagged and released in Spring of 2022. Translocated suckers were observed moving as far upstream as the Brown Bridge Quiet Area for the second year in a row.
- October 2023 – The FishPass Advisory Board met in Traverse City to discuss research coordination, data management, commissioning research plans, and progress updates from ongoing research and assessment activities.

Outreach:

- 21 & 22 August 2023 – GLFC staff hosted a symposium, Exploration of the science and innovation supporting selective connectivity at barriers, at the 153rd Annual Meeting of the American Fisheries Society in Grand Rapids, MI. As part of the symposium GLFC staff members and collaborating researchers on the FishPass project shared results from completed and ongoing research associated with FishPass.
- 29 September - Dr. Daniel Zielinski (GLFC) presented an update on the FishPass project to Leadership Grand Traverse on their Natural Resource Day.
- 13 October 2023 – Dr. Daniel Zielinski (GLFC) provided an overview of the science of fish sorting at FishPass to the Department of Civil, Environmental, and Geo-Engineering at the University of Minnesota as part of the Warren Distinguished Lecture Series <<https://www.youtube.com/watch?v=quJRrlNvcs4>>.

Table 2. Average length and number of fish (n) sampled during electrofishing in the lower Boardman/Ottaway River on 25 July 2023, 13 September 2023, and 7 November 2023. Note, Pacific salmon (primarily Chinook *Oncorhynchus tshawytscha* and Coho salmon *Oncorhynchus kisutch*) were not enumerated or measured during the survey on 13 September 2023. Hundreds of Chinook and coho salmon were identified by staff on this survey but not processed because their numbers are monitored by Michigan Dept. of Natural Resources (MDNR) at the Boardman/Ottaway River Salmon Weir.

Species	25-Jul-23		13-Sep-23		7-Nov-23	
	n	Ave. Length (in.)	n	Ave. Length (in.)	n	Ave. Length (in.)
black bullhead	2	9.7	-	-	-	-
brown trout	5	12	3	14.9	12	12.5
Chinook salmon	1	35.2*	-	-	-	-
coho salmon	-	-	-	-	43	23.3
common white sucker	21	12.3	4	13.7	-	-
Northern Pike	1	22.5*	2	26.8	1	24.3*
rainbow trout	6	14	17	11.5	102	18.8
rock bass	9	6.5	-	-	-	-
smallmouth bass	1	14*	1	5.5*	1	14*
walleye	1	17*	1	17.7*	-	-
yellow perch	4	4.8	-	-	-	-

*Denotes a sample size of one

Upcoming:

- February 2024 – The FishPass Advisory Board will be meeting in Traverse City to discuss research coordination, data management, commissioning research plans, and progress updates from ongoing research and assessment activities.

In the News:

- Legal battle over future of FishPass Project (UpNorthLive, 24 April 2023): <https://upnorthlive.com/news/local/legal-battle-over-future-of-fishpass-project>
- ‘Rivers have long memories’: Michigan gets \$5 million for restorations (MLive, 19 May 2023): <https://www.mlive.com/public-interest/2023/05/rivers-have-long-memories-michigan-gets-5-million-for-restorations.html>
- Michigan Supreme Court Won't Hear Building Height, FishPass Appeals (The Ticker, 23 August, 2023): <https://www.traverseticker.com/news/michigan-supreme-court-wont-hear-building-height-fishpass-appeals/>

- Insight into where things stand for Traverse City's FishPass project (UpNorthLive, 26 September 2023): <https://upnorthlive.com/news/local/insight-into-where-things-stand-for-traverse-citys-fishpass-project>
- City Updates: Commission Votes, Fish Survey, Senior Center Tree Project (The Ticker, 02 October 2023): <https://www.traverseticker.com/news/city-updates-commission-votes-fish-survey-senior-center-tree-project/>
- Future of invasive species control top-of-mind at Freshwater Summit (Interlochen Public Radio, 31 October 2023): <https://www.interlochenpublicradio.org/ipr-news/2023-10-31/future-of-invasive-species-control-top-of-mind-at-freshwater-summit>



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