

Assessing the impact of the Brunswick Dam using ecological and interdisciplinary context for future recertification Zellie Lipman, Class of 2026

My project this summer involved the creation of a database about the Brunswick Dam and the Androscoggin River, and field data collection to establish a baseline of how many *Alosa sapidissima* (American shad) attempt to cross the fishway at the Brunswick Hydroelectric Project. The dam license was issued in 1979 and is coming up for its first recertification in 2029. Both aspects of my research contributed toward my goal of providing stakeholders with centrally located and accessible information to facilitate informed, productive decisions in the dam recertification process.

With my research for the database, I created a website where experts in their fields contribute information they have about topics including the history of the Androscoggin River, case studies of dam removals, river ecology, local perspectives, a glossary of technical terms, the design of the fishway, and news. An important finding in this research is that the river quality has greatly improved over the last few decades, and now is a healthy habitat for fish, if only the fish could access it.

Table 1. Results of fish counts through the passage at Brunswick Hydroelectric Project for three anadromous fish species. Counts for 2013-2023 conducted by DMR and Brookfield Renewable Energy Group. Counts denoted with an asterisk (*) denote high outliers, and counts denoted with a dagger mark (†) were contributed by Ed Friedman of Friends of Merrymeeting Bay

Year	<i>Salmo salar</i>	<i>Alosa sapidissima</i>	<i>Alosa pseudoharengus</i>
2013	2	16	69104
2014	3	0	55678
2015	1	53	71887
2016	6	*1096	114874
2017	0	1	49923
2018	1	32	179040
2019	1	63	81025
2020	5	23	67
2021	5	*550	54906
2022	17	*228	139326
2023	8	14	67927
2024		†91	

These fish counts indicate that significantly fewer *S. salar* and *A. sapidissima* cross through the fish passage at the Brunswick Hydroelectric Project than *A. pseudoharengus*. The years in which greater numbers of *A. sapidissima* made it up the fish ladder, denoted by asterisks, correspond with the years that the turbine next to the fishway entrance was taken down for maintenance. We predict that this allowed more *A. sapidissima* to have safe passage through the fishway. Still, those years the greater amount of *A. sapidissima* that safely passed through the fishway is a small fraction of those that attempted passage.

Using ARIS Scope 3000 sonar technology and under the assistance of John Lichter, professor Emeritus of Bowdoin, we counted between 9,000 and 12,000 *A. sapidissima* swimming up the river attempting to cross the fishway in one day in June this summer. Yet, in 2024 so far only 91 *A. sapidissima* have successfully made it through the fish passageway (Table 1). This supports the idea that the Brunswick Dam is negatively impacting *A. sapidissima* runs through the fishway, and indicates that the fishway should be updated to allow for adequate fish passage.

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