

The Effects of Dam Passage on American Eels during Seaward Migration

By Matthew Mensinger

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In a Nutshell...

Every fall, **American eels** embark on one of the longest **migrations** of any fish species as they travel thousands of kilometers from lakes, rivers, and estuaries across eastern North America to spawning grounds in the Sargasso Sea. During this migration event, many individuals are forced to navigate through **impounded waterways** and **hydroelectric** facilities. Understanding the consequences of **dam passage** on migrating eels is critical for managing populations and informing decision making for current and future hydroelectric operations.

American Eels

American eels (*Anguilla rostrata*) have among the most fascinating life histories of any fish species. They begin their lives in the Sargasso Sea before being dispersed by ocean currents to the northern edge of South America through as far north as Newfoundland and Labrador. Classified as facultatively catadromous, eels spend anywhere from 3 to 30 years in freshwater and estuarine systems before metamorphosing into their silver-stage to return to their natal spawning grounds. Understanding how dam passage affects this stage of the eel life cycle is critical in managing population dynamics as their life history allows only one chance to contribute to future generations. Our research aims to understand mortality risks, delays, and phenotypic consequences associated with dams during seaward migration through the Penobscot River. This four-year study will be



With an eel weir on a tributary of the Penobscot River in the background, University of Maine graduate student Matthew Mensinger surgically implants an acoustic tag into an eel, which will allow him to track its seaward migration. Photo by Hadley Courand.

among the most extensive survival analysis of the species in the region.

Eel Procurement and Dam Passage

Our eel weir was erected in 2015 atop the foundation of a historic commercial weir on a

tributary of the Penobscot River. It is operated from sunrise to sunset throughout the fall. We surgically implant acoustic transmitters into silver-stage eels and transport them upstream of multiple dams in the Penobscot River system. An extensive array of acoustic receivers, strategically placed throughout the river, enables us to detect tagged eels after release as they continue their downstream migration. This design allows us to understand mortality risks and delays associated with dam passage while also incorporating morphological differences between individuals into our analysis. Since 2016, we have tagged 300 eels and will continue the study through fall 2019.

Researchers

Matthew Mensinger is a M.S. student at the University of Maine in Wildlife Ecology Program under the advisement of Joseph Zydlewski and

Erik Blomberg. Matthew is interested in understanding how dam passage affect diadromous fish species and also investigating how non-physical barriers can guide fish to safe dam passage. Matthew earned his B.A in Biology from Carleton College in 2016 and joined the Future of Dams team in the fall of 2018.

Collaborators: **Joe Zydlewski** and **Erik Blomberg**

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