MS Thesis
Department of Environmental Science and Policy
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Defense Date and Time: November 20, 2020, 2:00-4:00 PM
Defense Location: Online through Zoom (RSVP to slister1@gmu.edu for session link)
Title: Assessment of Fish Passage Use and Success In Facilitating The Movement of Anadromous Fish Species In Potomac River Tributaries

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ABSTRACT

Diadromous fish are particularly vulnerable to anthropogenic alterations in watersheds, such as road construction and the establishment of flow control areas like dams and weirs. In northern Virginia, two anadromous species of concern, Blueback Herring (*Alosa aestivalis*) and Alewife (*Alosa pseudoharengus*), collectively managed as river herring, rely on well-connected waterways to complete annual spawning runs from the Atlantic Ocean into inland streams. Water passage infrastructure, hereafter fish passages, are installed at road-stream intersections in order to maintain the structural integrity of roads as flow conditions fluctuate, while also supporting continued up- and downstream passage by fishes and other aquatic organisms. Successful fish passages, in regard to river herring, are those that permit upstream movement by the anadromous species as they travel inland to spawn. However, little information is available surrounding which passage characteristics are most important in permitting river herring movement. This study aimed to confirm areas theorized to host river herring spawning runs in Potomac River tributaries throughout northern Virginia, while also identifying passage characteristics that promote river herring presence successful upstream passage. Environmental DNA samples (eDNA) were collected at 18 road crossings, one dam, and three weirs between 2018 and 2019 to determine species presence at each passage. Understanding the variables that correspond with successful fish passage use by anadromous fish species is key to guide future management strategies and plans for the recovery of river herring populations.