

Atlantic sturgeon seasonality and spawning distribution in Minas Basin, inner Bay of Fundy, Canada

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Introduction

Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus* Mitchill, 1815 are long-lived, late-maturing, anadromous fish, vulnerable to human exploitation. Atlantic sturgeon are designated as threatened in Canada (COSEWIC 2011) and endangered or threatened in the U.S.A. (NOAA 2012).

Population-specific behaviour

- Minas Basin, Nova Scotia (Figure 1) hosts a summer feeding aggregation of Atlantic sturgeon originating from populations in both Canada and the U.S.A. (Wirgin et al. 2012; A)
- Population-specific behaviours including timing of arrival into and departure from Minas Basin, school fidelity, and environmental preferences are being investigated for 94+ acoustically-tagged Atlantic sturgeon (Figure 1)

Spawning distribution

- Four rivers draining into Minas Basin, Nova Scotia including the Saint Croix, Kennetcook, Shubenacadie and Stewiacke (Figure 2) are suspected to support Atlantic sturgeon spawning populations
- These rivers are being investigated for evidence of spawning using acoustic telemetry, archival tagging, and egg and larvae sampling

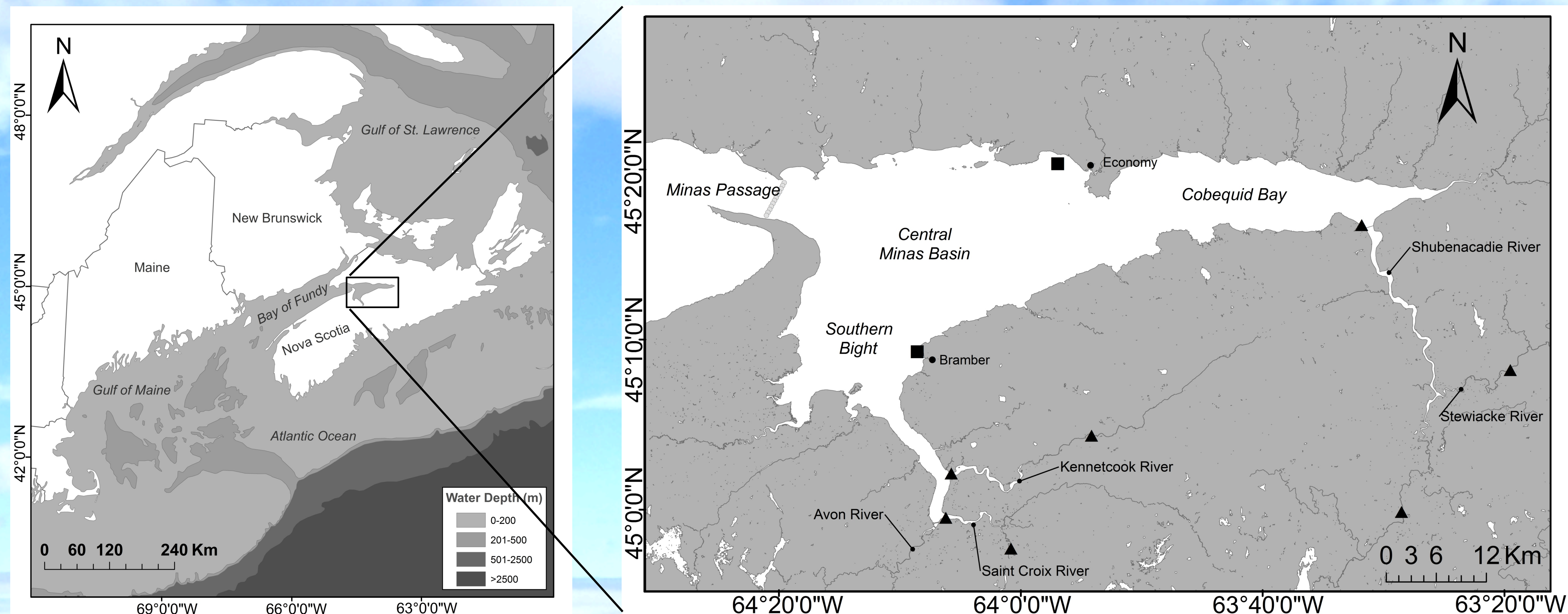


Figure 2. Map of Minas Basin, Nova Scotia showing VR2W receiver deployment locations (triangles). Atlantic sturgeon will be captured by intertidal brush weir (squares) and by directed otter trawl in the Southern Bight of Minas Basin.

Methods

Population-specific behaviour

- Genetic analyses of Atlantic sturgeon tissue samples will occur through collaboration with Dr. Paul Bentzen at Dalhousie University, Dr. Matt Balazik of V.C.U. and Dr. Tim King of U.S.G.S.
- Acoustic telemetry data from 2010-2014 will be analyzed for population-specific behaviours and environmental preferences

Spawning distribution

- VR2W receivers (Vemco Ltd.) were deployed at the mouth and in the freshwater portion of each river (Figure 2)
- Six large potentially spawning Atlantic sturgeon will be tagged with a V16P acoustic transmitter (Vemco Ltd.; B) and a MiniPAT (Wildlife Computers Ltd.; C) to investigate upriver movements

Preliminary Results

- Some acoustically-tagged Atlantic sturgeon seem to move together around Minas Basin, perhaps as river conspecifics
- Knowledge of population-specific behaviours will help to minimize the impact of tidal turbine operations on Atlantic sturgeon travelling through Minas Passage
- Numerous acoustically-tagged Atlantic sturgeon were detected at the mouth of the Shubenacadie, Kennetcook and Saint Croix River in 2012
- Atlantic sturgeon have not yet been detected in the freshwater portions of these rivers however further investigations are necessary

References

- COSEWIC. 2011. COSEWIC assessment and status report on the Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus* in Canada (online). Committee on the Status of Endangered Wildlife in Canada.
- NOAA. 2012. Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) (online). National Oceanic and Atmospheric Administration Fisheries Office of Protected Resources.
- Wirgin, I., Maceda, L., Waldman, J. R., Wehrell, S., Dadswell, M. J. and King, T. 2012. Stock origin of migratory Atlantic sturgeon in the Minas Basin, inner Bay of Fundy, Canada determined by microsatellite and mitochondrial DNA analyses. T. Am. Fish. Soc. 141: 1389-1398.

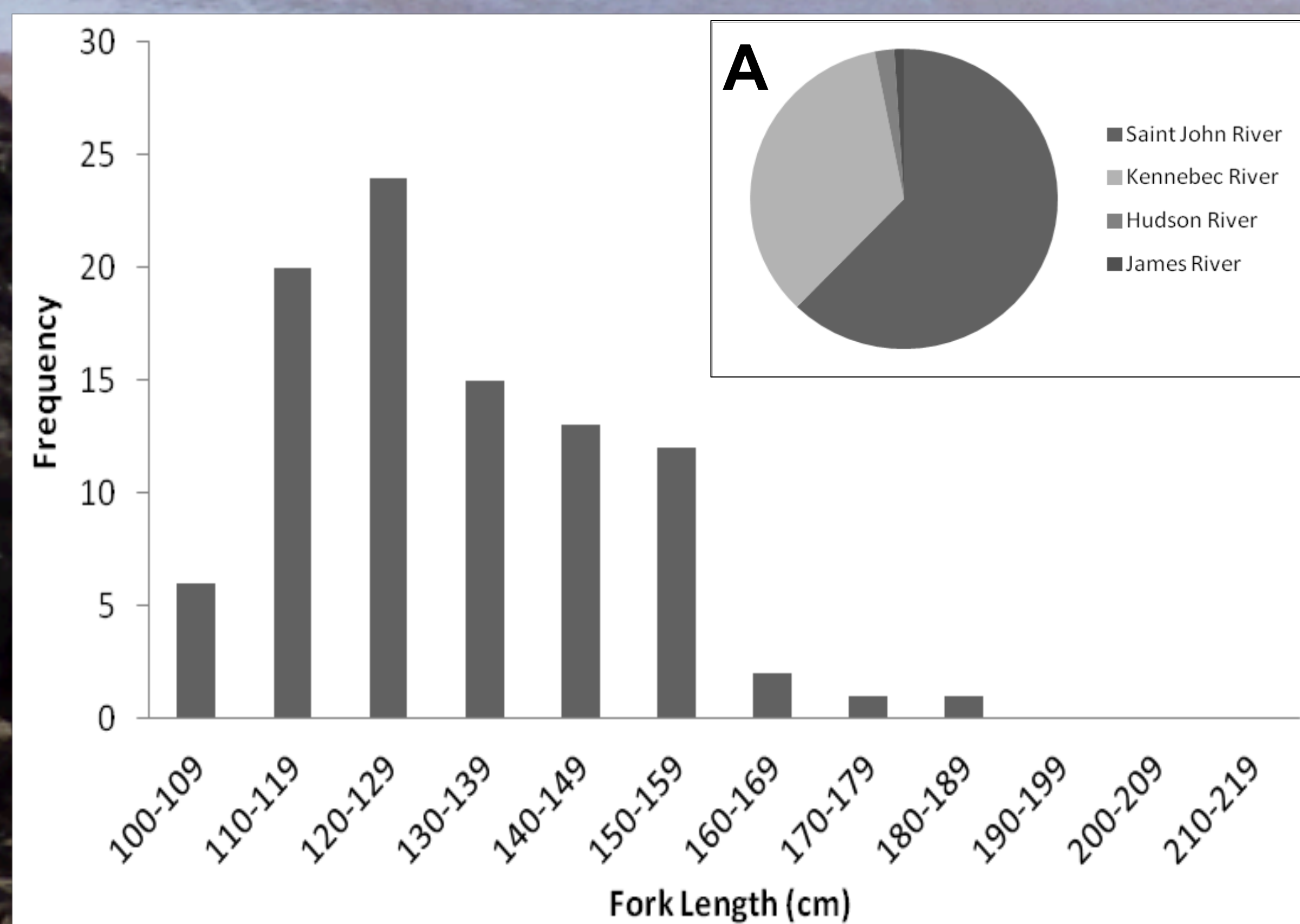


Figure 1. Length-frequency distribution of 94 Atlantic sturgeon tagged with V16 acoustic transmitters (Vemco Ltd.) from 2010 to end of May 2014.

