

Measuring the effects of tagging and transportation on the activity of Atlantic salmon (*Salmo salar*) using acoustic accelerometers

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INTRODUCTION

- Studying the Atlantic salmon population in the Clyburn Brook, Cape Breton Highlands National Park in association with Parks Canada's restoration program
- Observing fine-scale changes in both movement and behavior to aid management practices and ongoing conservation efforts
- Utilizing tri-axial acoustic accelerometers to observe possible changes in activity caused by feeding events, light regime, vehicular transportation, and tag insertion

HYPOTHESES & PREDICTIONS

- Daily activity will change in correlation with feedings and light regime**
 - Average activity will increase during feeding events
- Stress from handling and transportation will increase activity**
 - Overall activity will be increased during transportation, and greatest at time of release
- Individual response to the surgical insertion of tags will cause an initial decrease in activity, followed by a gradual increase**
 - Activity will begin to increase as the time post-surgery increases

METHODS

- Smolts were collected using fyke nets during May and June of 2022 at the fork of the Clyburn and South Clyburn Brook (Fig. 1), and transported to the Aquatron
- In September of 2023, 20 adult salmon were inserted with tri-axial acoustic accelerometers. Maximum surgery time was ~2 minutes, total time from holding to recovery tank was maximum ~10 minutes
- Acoustic and feeding data collected during September and October 2023, and adults released back into the brook October 19, 2023



Figure 2. (a) Master's student Natalie Koopman holding an Atlantic salmon up to the incoming flow of water after undergoing surgery. (b) An Atlantic salmon before prior to surgery and having been placed under anesthesia.

RESULTS & DISCUSSION

- Preliminary data shows an increased level of activity across individuals during transportation (Fig. 3,4).
- Some increased activity at or around feeding events, further analysis is required to determine accurate correlation
- Previous ex situ studies on Atlantic salmon have shown increases in activity in response to variable feeding habits (Behrend et al., 2022; Kolarevic et al., 2016).
- Studies have not documented changes in Atlantic salmon activity as caused by light regime or light intensity but have been observed in other aquatic species (Almazan-Rueda et al., 2004).
- Next step: analyze feeding and transportation data, observe any correlations between light regime and changes in activity

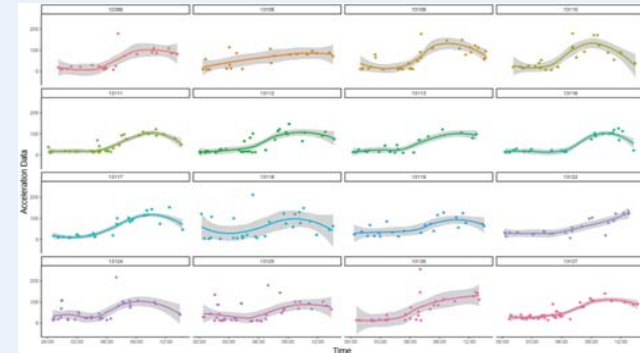


Figure 3. Preliminary acoustic data recorded during transportation to Clyburn Brook

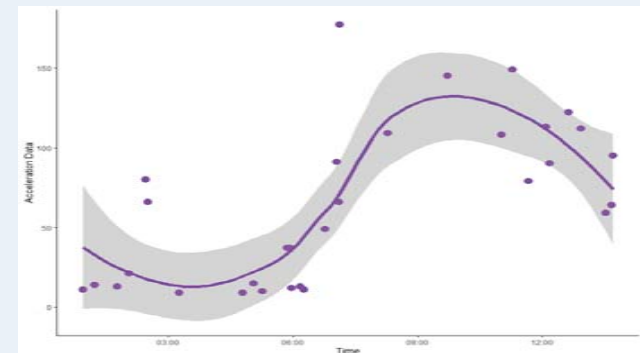


Figure 4. Preliminary acoustic data taken from an individual salmon during transportation

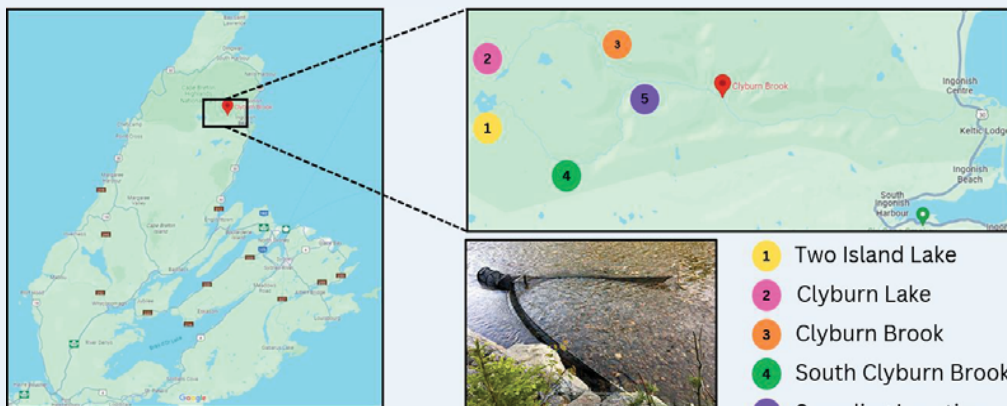


Figure 1. Map of Cape Breton, Nova Scotia and inset of the general location of the Clyburn Brook watershed with an image of the fyke nets used for sample collection (imagery courtesy of Parks Canada)

ACKNOWLEDGEMENTS

Dr. Robert Lennox, John Batt, Sarah Penney, Marin Stubbings, Natalie Koopman, Dr. Glenn Crossin, funding and support from NSERC Alliance and Parks Canada

