

## Vita

Candidate's name: Stephanie Scott Luna

Universities  
Attended: University of New Brunswick (2018)  
Bachelors of Science

University of New Brunswick (2023)  
Masters of Science  
Biology

### Conference Presentations:

Marine block guest lecture on "The use of autofluorescence for detection and diagnosis of the swimbladder nematode (*Anguillicola crassus*) in the American eel, definitive host". - October 2022

ACCESS – BoFEP Conference (Atlantic Canada Coastal & Estuarine Science Society, Bay of Fundy Ecosystem Partnership) - May 2022

Graduate Research Conference (GRC) - May 2022

Coastal Environmental Baseline Program - May 2022

Marine block guest lecture on "*Anguillicola crassus* detection and diagnosis in the definitive host, *Anguilla rostrata*". - November 2021

Graduate Research Conference (GRC) - May 2021

Canadian Conference for Fisheries Research (CCFFR) - February 2021

Marine block guest lecture on "Detection and diagnosis of the swim bladder nematode *Anguillicola crassus* in the American eel, definitive host". - October 2020

Girls STEM Up: DISCOVERY conference Fredericton - November 2019

Marine block guest lecture on *Anguillicola crassus* and its impacts on the American eel, definitive host. - October 2019

## Detection and diagnosis of the invasive swim bladder parasite, *Anguillicola crassus*, in American eels (*Anguilla rostrata*)

UNIVERSITY OF NEW BRUNSWICK  
THESIS DEFENCE AND EXAMINATION

in Partial Fulfillment

of the Requirement for the Degree of  
Master of Science

by

**Stephanie Scott Luna**

in the Department of Biology

U.N.B., Fredericton, N.B.

**Thursday, March 2<sup>nd</sup>, 2023  
2:30 p.m.**

Bailey Hall, Room 146 and via MS TEAMS

Examining Committee

Dr. Mike Duffy

Dr. Tillmann Benfey

Dr. David Lentz

Dr. Shawn MacLellan

Supervisor

Internal Examiner

External Examiner

Chair of Oral Examination

## Abstract

*Anguillicola crassus* is an invasive parasitic nematode that infects the swim bladder of American eels (*Anguilla rostrata*) throughout most of the eel's native range. Declines in eel populations are attributed in part to *A. crassus* infection, with swim bladder damage impairing their survival and migration to the Sargasso Sea, where they reproduce. Hydroelectric dams on inland rivers, such as dams on the Wolastoq | Saint John River (W|SJR), New Brunswick, Canada impede both upstream eel migration and parasite transmission and thus could serve as refugia for stocking and translocation of parasite-free eels to support conservation initiatives. Based on eel life stage (pre-elvers, elvers, yellow) and month/location of eel collection, I assessed *A. crassus* infections in this system, using existing diagnostic tools (light microscopy, PCR, and sequencing) as well as a new diagnostic methodology that I developed

(autofluorescence microscopy). The high prevalence of *A. crassus* infection in elvers and yellow eels precludes their use in parasite-free translocation. However, the absence of infection in early life stage of pre-elvers ingressing to estuarine locations March and April supports their use in conservation initiatives.