Invasive Typha and Frog Call Activity in the Great Lakes

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Abstract

The presence of the invasive hybrid cattail, Typha x glauca, has increased in Great Lakes coastal wetlands, but attempts have been made to control the invasion through the harvesting of Typha biomass. Anurans (frogs and toads) are sensitive to habitat disturbance and fragmentation, and they are likely negatively impacted by invasive plant species that form dense stands like Typha. To quantify the effects of Typha and Typha removal on anurans, I have analyzed audio recordings of anuran calls collected from three habitat zones across four coastal wetlands in northern Michigan. I have analyzed four five-minute segments from each habitat zone during May 2018 for the call activity from different anuran species using bio-acoustic data analysis software (RavenPro).

Methods

Between May 14 and June 31 of 2018, the Sault Tribe Natural Resources Department (STRN) placed three sound recorders to monitor bird and anuran populations in various coastal wetlands across Northern Lake Huron and the St. Marys River: St. Ignace, Munuscong, Sand Island, and Cheboygan. The recorders were placed in habitat zones at each wetland: a native sedge meadow, a treated Typha stand, and an untreated, Typha-dominated wetland. In the treated Typha stand, all vegetation above 40 cm was removed using a wetland tractor during 2016. The sound recorders were located so there was a distance of 400 m or more between each one. Data was collected continuously from these recorders for 30 minutes at the beginning of every hour over the entire seven day period. I analyzed this audio data using bio-acoustic data analysis software (RavenPro), listening to recordings from May 2018 each site at every wetland four times from 10:00 to 10:05 pm. I ranked the call activity of each anuran species on a scale, with a value of “0” meaning that no individuals were audible, “1” meaning that one individual was audible, “2” meaning that multiple individuals were audible but there was not a full chorus, and “3” meaning that there was a full chorus.

Results and Conclusions

The frog species I identified were the green frog (Rana clamitans), the eastern gray treefrog (Hyla versicolor) and Cope’s gray tree frog (Hyla chrysoscelis), which were not differentiated, the northern spring peeper (Pseudobufo criscruicer), the American toad (Anaxyrus americanus), the wood frog (Rana sylvatica), and the northern leopard frog (Rana pipiens). However, habitat zone was not found to affect total call activity (χ²(1) = 1.7215, p = 0.4228).

References


Figure 1. Study sites in Sand Island, Munuscong, St. Ignace, and Cheboygan, MI.

Figure 2-5. Spectrograms of anuran species are (1) green frog, (2) gray treefrog, (3) spring peeper (4) American toad, (5) wood frog, and (6) northern leopard frog.

Acknowledgments

Thank you to my mentors Drew, Shane, and Dr. Ohsowski for their ongoing help with my project. My project was made possible due to funding from the Loyola Undergraduate Research Opportunities Program.