Examining the Efficacy of Bullfrog Removal in Thurston County: Implications for Oregon Spotted Frog Recovery

Sarah Gillenwater, Ryan Munes, Eliza Heery

Introduction

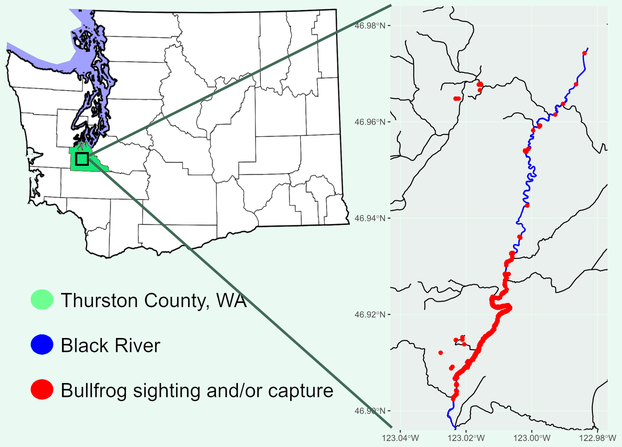

Figure 1: Map of Thurston County, WA and the Black River

American Bullfrog (*Lithobates catesbeianus*). Photo Credit: USFWS

- The Black River Unit of Billy Frank Jr. Nisqually National Wildlife Refuge in Thurston County, WA is a critical habitat for the endangered Oregon Spotted Frog in Washington State.
- .The refuge is also inhabited by the invasive American Bullfrog, a competitor species.
- In 2022, a project began to remove American Bullfrogs from this area.
- Data analyzed over two culling seasons in 2022 and 2023 was collected to determine the efficacy of culling methods and temperature on Catch Per Unit Effort (CPUE).

Methods

Data Collection:

- A small team of technicians spent approximately 5 hours per "hunt" culling American Bullfrogs from June-September in 2022 and July-October in 2023.
- Technicians digitally tagged each capture site and recorded snout-to-vent length (SVL) measurements of each captured American Bullfrog.
- Temperature loggers placed on site recorded water temperature every four hours.

Data Analyzation:

- Catch per unit effort (CPUE) was calculated for 2022 and 2023.
- Air and Water temperatures for 2022 and 2023 were averaged, and compared to CPUE.
- SVL was aggregated for each week of the 2022 and 2023 seasons.

Oregon Spotted Frog Egg Mass Survey at the Black River Unit
Photo Credit: Ryan Munes USFWS

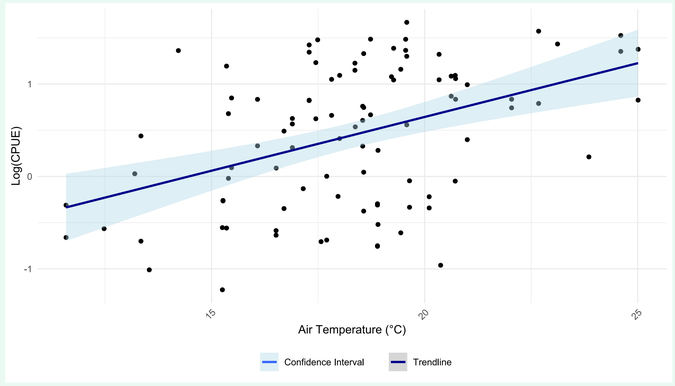

Figure 2: Average Air Temperatures compared to CPUE.

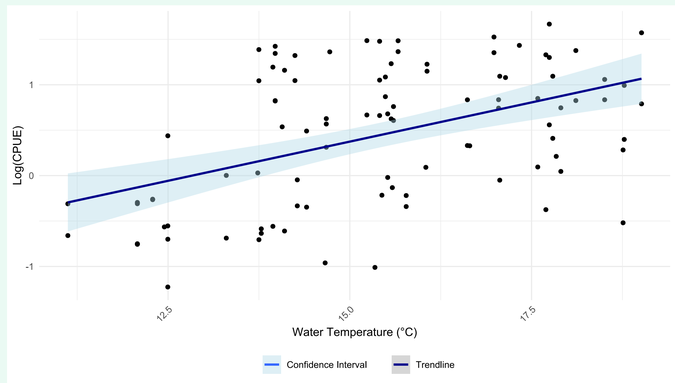

Figure 3: Average Water Temperatures compared to CPUE.

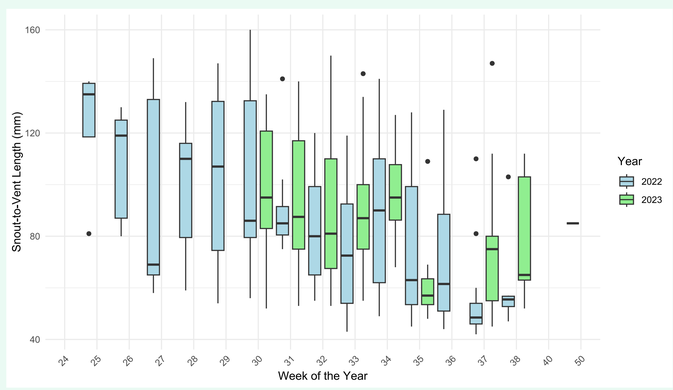

Figure 4: Snout to Vent Length (SVL) comparison by culling season and year.

Discussion

Left: Oregon Spotted Frog(Rana pretiosa). Right: Developing Oregon Spotted Frog Tadpoles Photo Credit: Linnea Gullikson/USFWS

Project Goals:
The aim of this project is to facilitate the functional eradication of American Bullfrogs in the Black River Unit. The removal of this invasive species is key to Oregon Spotted Frog conservation efforts. By removing this competitive and predatory species, Oregon Spotted Frogs could see an increase in larvae survival and expanded breeding territory.

Preliminary Research Findings:

- Positive correlation between CPUE and air/water temperatures suggests that prioritizing removal efforts during warmer average temperatures may result in a higher CPUE.
- SVL reduction during each culling season implies younger American Bullfrogs are being captured, indicating effective removal efforts of mature, breeding-age frogs.
- 2023 CPUE averages show a slight decline from 2022, suggesting the potential effectiveness of continued removal efforts.

Future Plans:
Removal efforts are planned to continue in 2024. Additional data will be collected to strengthen positive correlations over time. Preliminary findings from this project may be used to experiment with achieving higher CPUE rates.

Acknowledgements

[1] American bullfrog | Washington Department of Fish & Wildlife. https://wdfw.wa.gov/species-habitats/invasive/rana-catesbeiana.

[2] Xu F, Li J, Yang W. 2022. Invasive American Bullfrogs Age, Body Size, and Sexual Size Dimorphism Geographical Variation in Northwestern China. Diversity. 14(11):953. doi:10.3390/d14110953.

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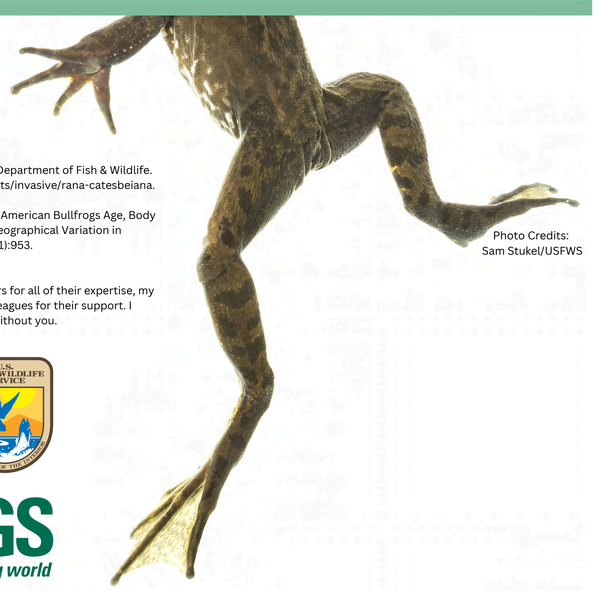

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