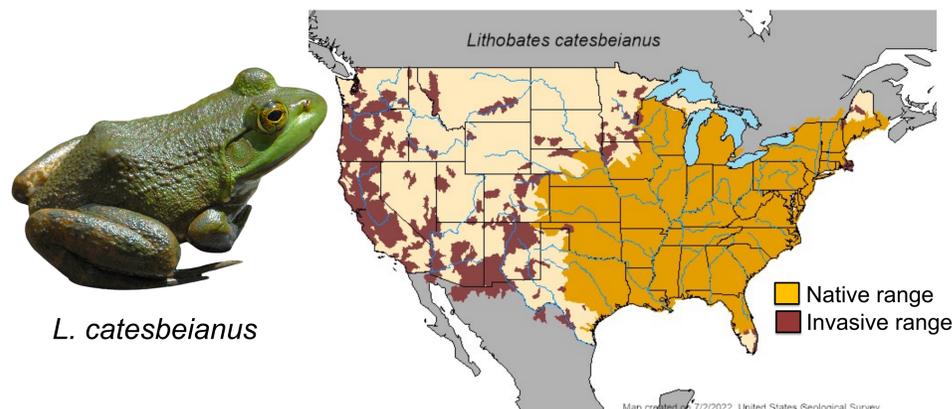


Invasive Bullfrogs in Western Colorado: Dietary Profile and *Batrachochytrium dendrobatidis* status of *Lithobates Catesbeianus* Removed from Local Wetlands

Alexander Burdick, Isabella Barker, Denita Weeks*
Colorado Mesa University, Grand Junction, CO

Background

- American Bullfrogs (*Lithobates catesbeianus*) are invasive in western Colorado where they are a reservoir for the fungal pathogen *Batrachochytrium dendrobatidis* (*Bd*) & prey on native amphibians.
- Impact on native amphibians in McInnis Canyon National Conservation Area (MCNCA) is of concern.
- A citizen science campaign in Grand Junction, CO aimed to remove Bullfrogs from source populations along the Colorado River upstream of MCNCA and catalog the (1) dietary profile and (2) *Bd* status of *L. catesbeianus*.



Methods

- Bullfrogs were collected from Snooks Bottom Open Space and Audubon Nature Preserve in Mesa County, CO by trained volunteers. Each bullfrog was measured (SVL and mass) and swabbed for *Bd*.
- Bd* status was determined through DNA extractions & qPCR at Colorado Mesa University.
- Stomach contents were removed and identified for each frog according to taxonomic order. Photos were taken and to catalog the *L. catesbeianus* diet for each location.

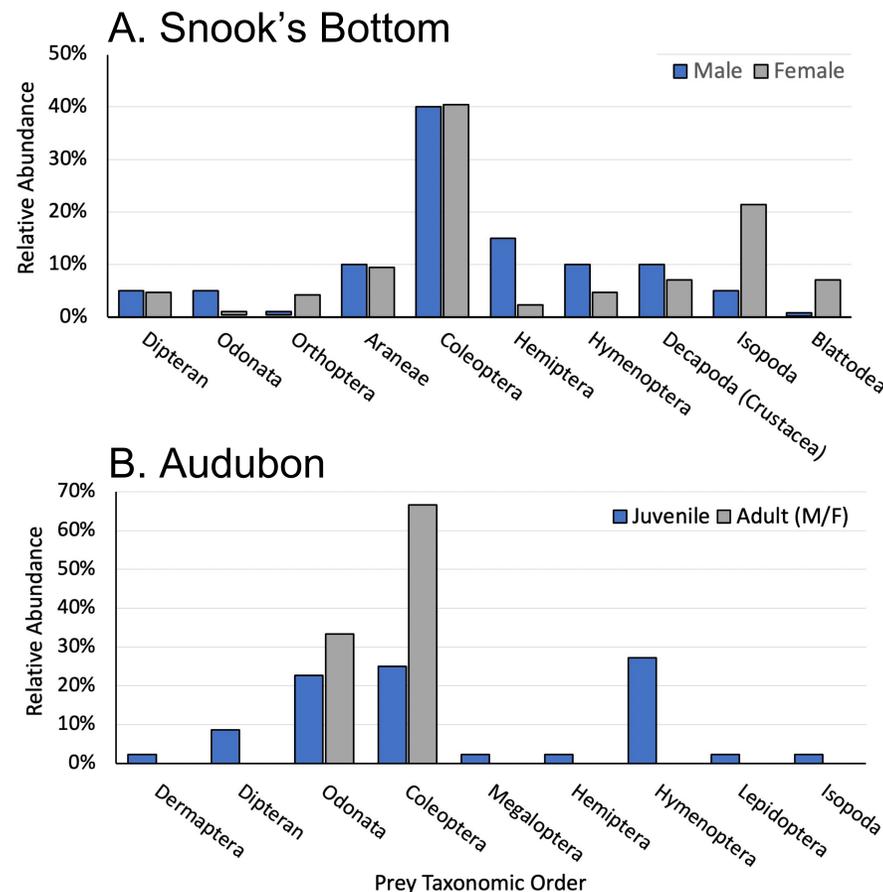


Figure 1A & B: Relative abundance of prey items consumed by Order for (A) Males (n=7) & Females (n=14) at Snooks Bottom Open Space and (B) Juveniles (n=24) vs. Adults (n=3) at Audubon.

Results

- All individuals tested negative for *Bd*.
- Only adults were found at Snooks Bottom and mostly juveniles were captured with few adults at Audubon. See Table 1 for descriptive statistics.
- Frogs with empty stomachs (Snooks:12.5%; Audubon: 33.0%) were excluded from diet analysis.
- A Pianka's Niche Overlap Index was calculated for males and females at Snook's Bottom (0.88).
- Shannon's Diversity Index was calculated for Snooks Bottom (0.81) and Audubon (0.78).

Table 1. Mass and SVL (mean \pm s.e.) of *L. catesbeianus* captured at Audubon and Snooks Bottom. *Audubon did not have enough males to calculate this statistic (n=1) and no juveniles were found at Snooks Bottom.

	Audubon		Snooks Bottom	
	Mass (g)	SVL (mm)	Mass (g)	SVL (mm)
Female	113.5 \pm 4.2	102.0 \pm 5.5	118.0 \pm 3.14	143.2 \pm 11.0
Male	NA*	NA*	123.5 \pm 3.8	156.4 \pm 12.0
Juvenile	62.5 \pm 1.4	20.4 \pm 1.4	NA*	NA*

Discussion

- While all *L. catesbeianus* were *Bd* negative, individuals in these parks and MCNCA were *Bd* positive in 2019 so we will continue to monitor these populations.
- Age class differences found at each location may be due to recruitment. Snooks Bottom is a single pond whereas Audubon is a series of adjacent wetlands. We will include more wetland locations to examine this hypothesis in the future.
- Diet diversity does not differ between locations with Coleoptera as an important prey group at both locations. Males & Females at Snook's have a considerable overlap in dietary niche.
- Native amphibians were not in stomachs of *L. catesbeianus* in this study, but it has been documented in MCNCA. In future studies, we will target *L. catesbeianus* in McInnis Canyon NCA to assess if they are more likely to consume native amphibians due to lack of insect diversity in dry, red-rock canyon habitats.

References



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COLORADO MESA UNIVERSITY



*Corresponding author: dweeks@coloradomesa.edu