

Examination of bog turtle feeding habits in grazed compared to ungrazed wetlands through stable isotope analysis.

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ABSTRACT

Appalachian bogs constitute a distinct ecosystem that shelters the smallest turtle in North America, the bog turtle (*Glyptemys muhlenbergii*). Unfortunately, both the turtle species and its habitat are facing decline. This research aimed to explore the dietary preferences across two sites: one that has been subjected to livestock grazing for about sixty years and another that has remained untouched, both located in western NC. Claw clippings and possible prey species were collected from each location for stable isotope analysis.



Figure 1: Bog turtle at one year old Figure 2: Appalachian bog

INTRO / GOALS / OBJECTIVES

What are stable isotopes?

- Forms of chemical elements with the same number of protons but vary in their neutrons.
- They can be used to trace carbon sources, determine trophic levels, and differentiate diets across various habitats.
- The goal of the study is to examine whether grazing influences the dietary preferences among populations of bog turtles.

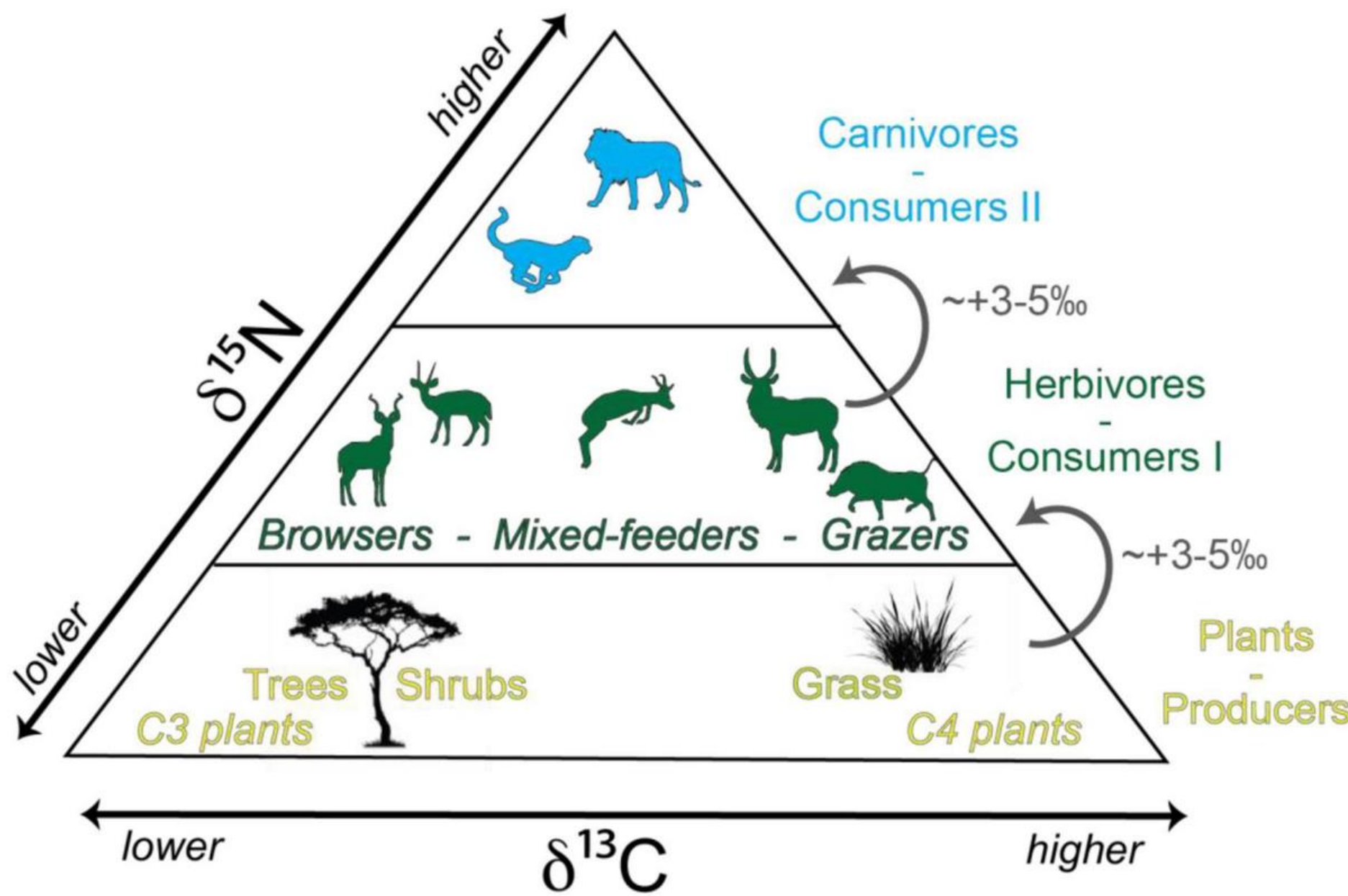


Figure 3: A demonstration of the movement of stable isotopes across trophic levels.

METHODS

- A claw clipping was obtained from 16 turtles at one site and 18 turtles from another site. Each turtle was measured and sexed.
- Potential prey items were collected manually and using nets, informed by existing literature. Samples of plants, arthropods, and various invertebrates from multiple taxonomic groups were gathered across the sites.
- All samples were dried, crushed, and sent to a laboratory for analysis.
- The laboratory will analyze isotopes of Carbon 12 and 13 and Nitrogen 14 and 15, concentrating on C 12/13 and N 14/15 ratios. The prey items will have vary carbon and nitrogen ratios.
- A comparison will be made between the claws and the collected prey items.



Figure 4(above): Assessing and determining the sex of a bog turtle with NC Wildlife



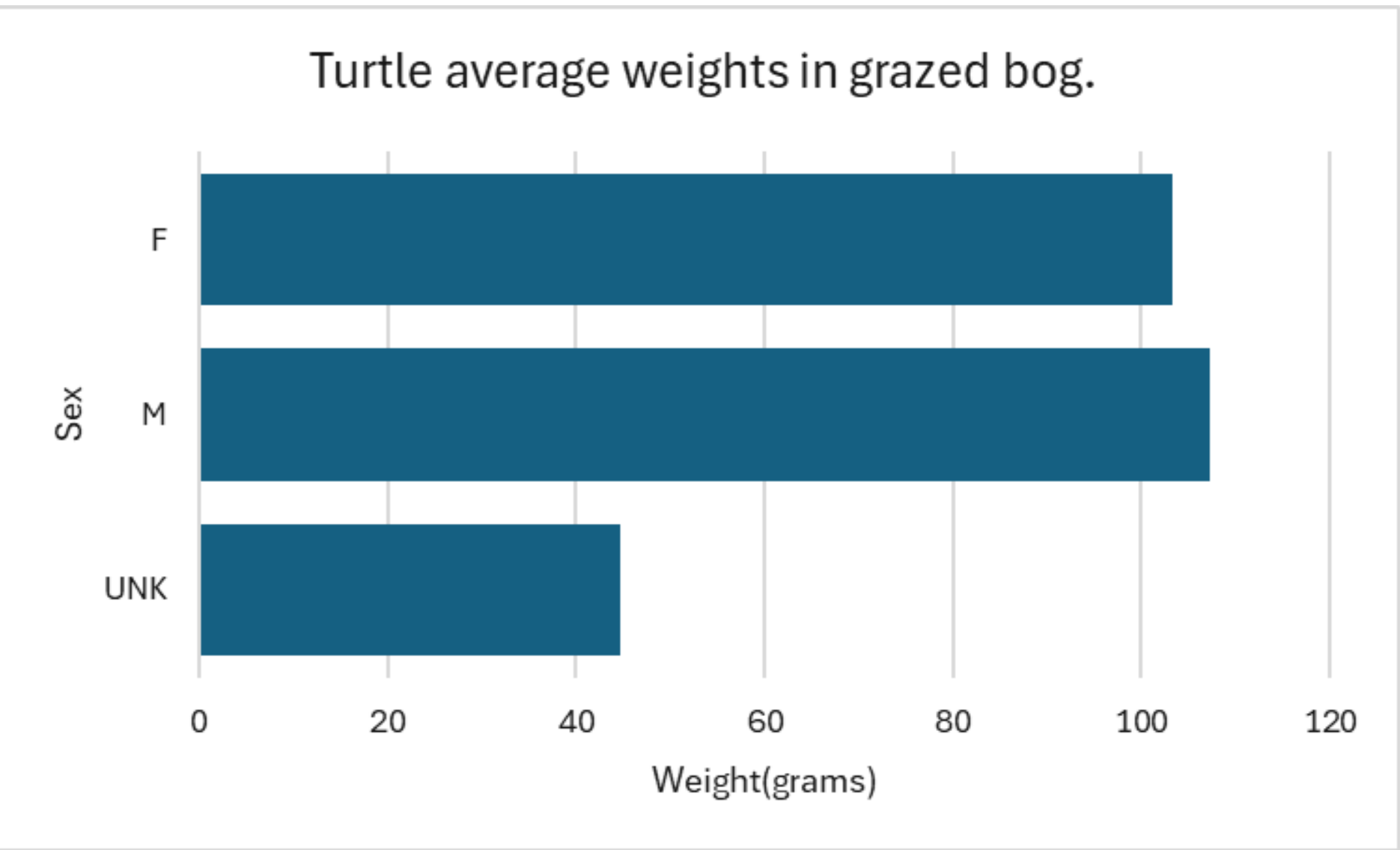
Figure 5 (above): Common Blackberry (*Rubus allegheniensis*) as a potential food source for bog turtles



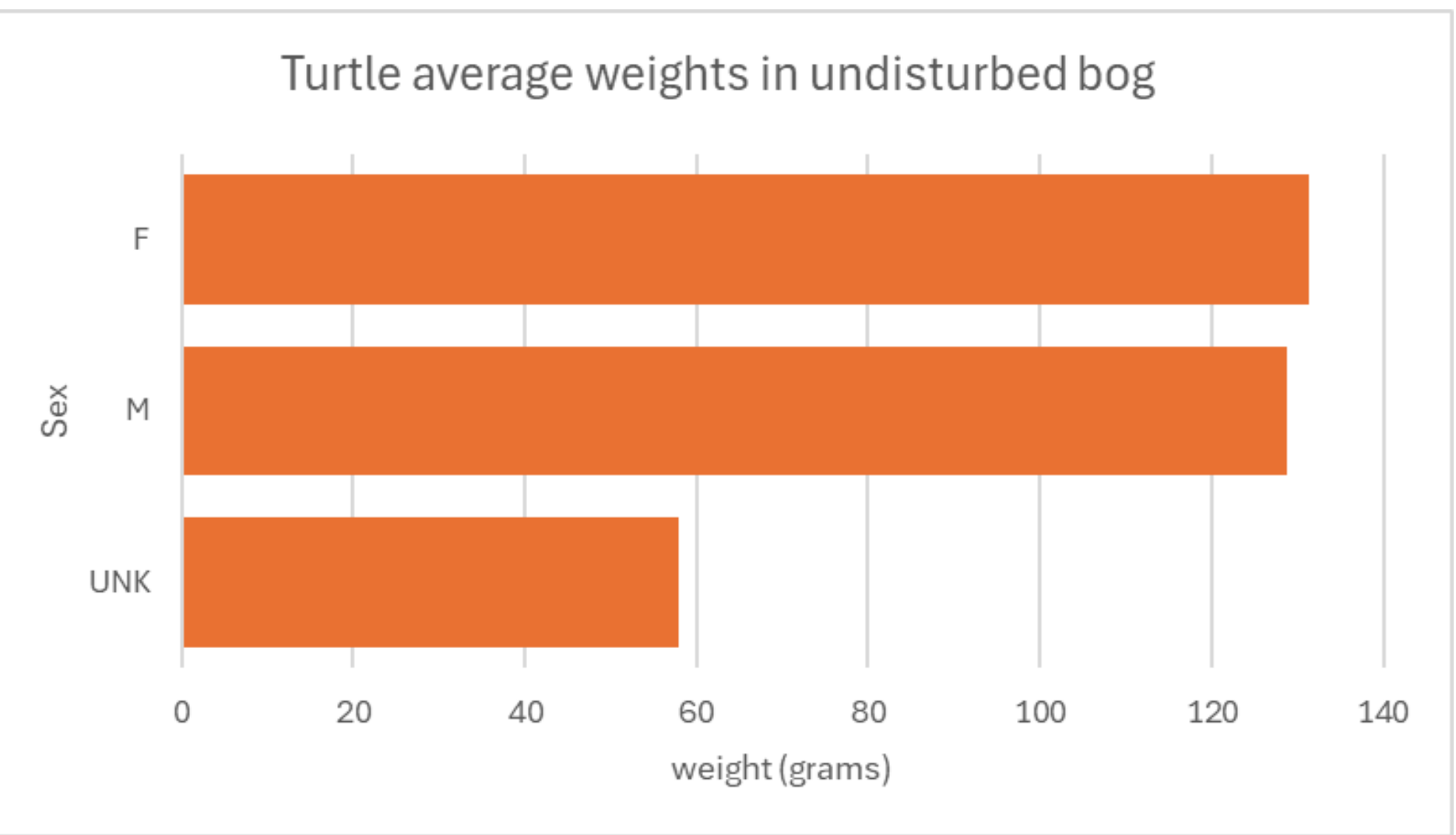
Figure 6: collecting a claw clipping from a front claw

Results

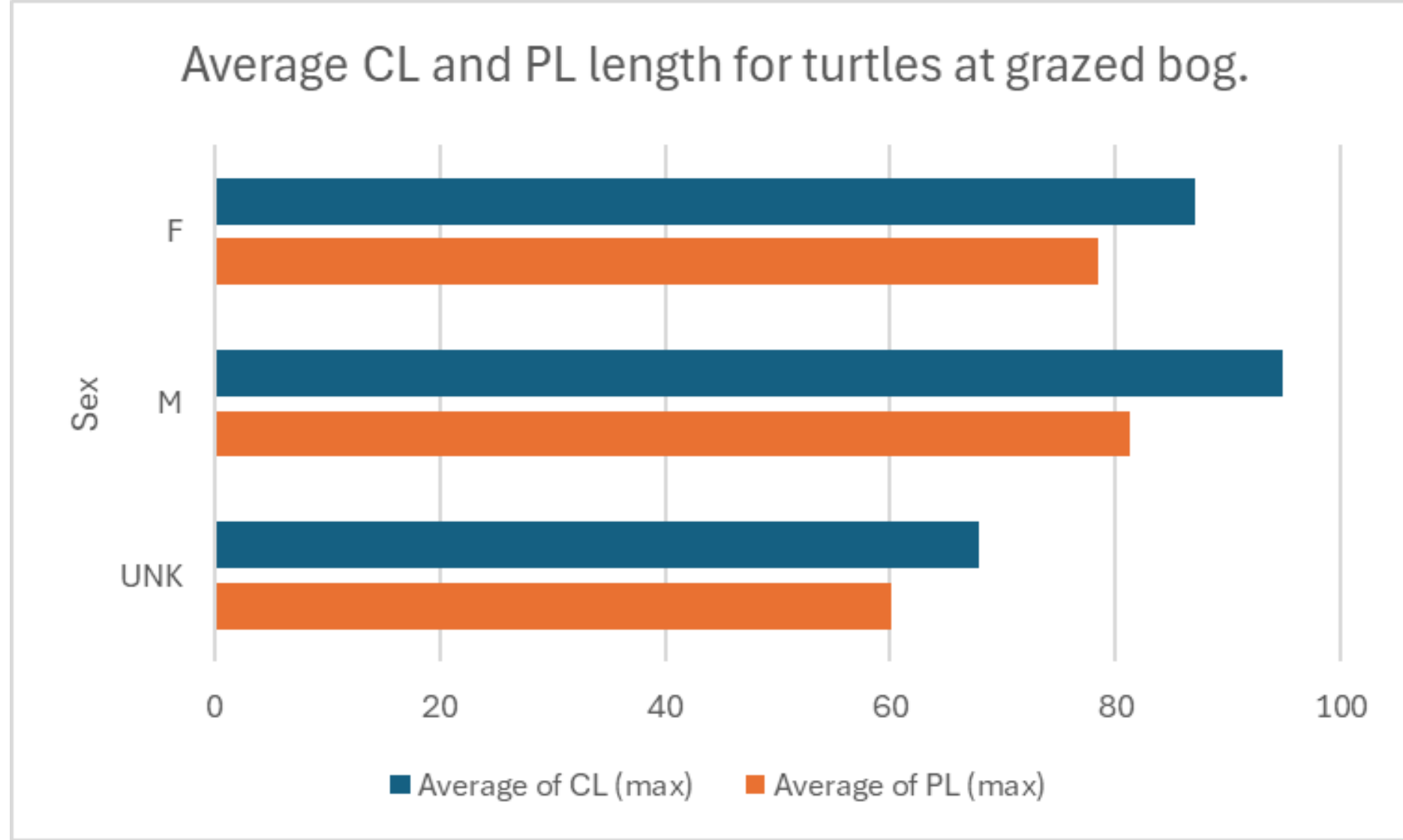
Graph 1



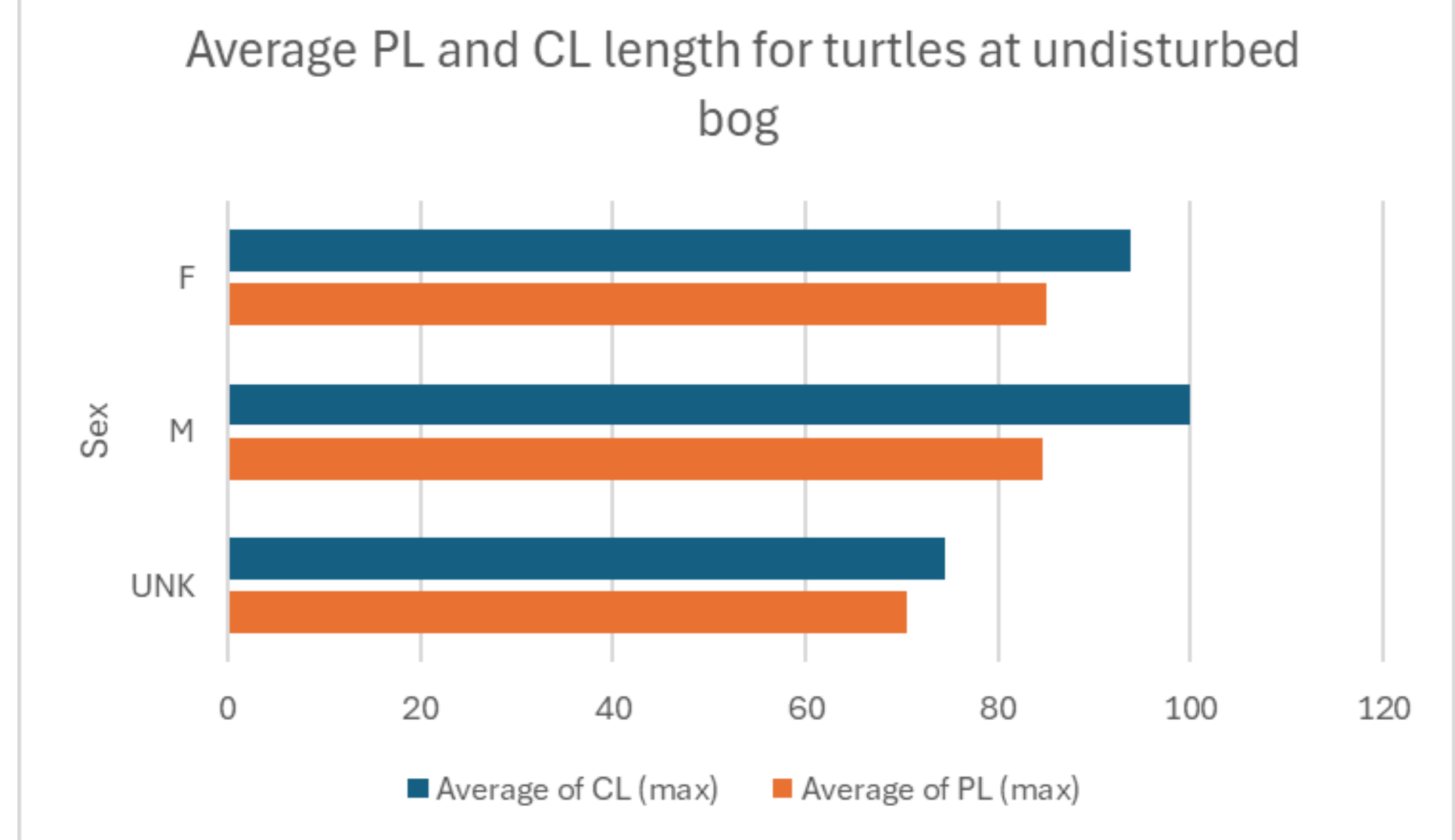
Graph 2 (Below)



Graph 3(Below)



Graph 4(Below)



RESULTS AND RECOMMENDATIONS

The laboratory analysis results will improve our comprehension of bog turtles' dietary preferences and how livestock grazing might affect their feeding behaviors. Future research could broaden the scope by examining vertebrate prey such as tadpoles and exploring regional variations between Northern and Southern populations.



Figure 7: adult bog turtle discovered by Dr. Pechmann

References

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