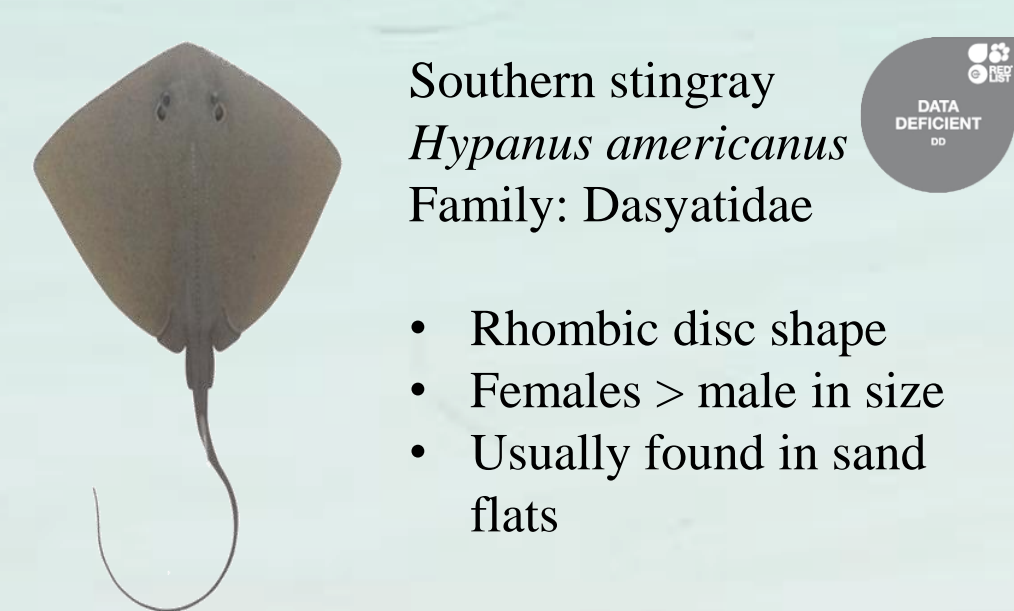


Introduction

Stingrays provide immense benefits towards the ecosystem they inhabit, but still remain data deficient. Stingrays are ecosystem engineers that not only impact their environment biologically, but also physically and chemically. As mesopredators, they biologically impact their environment by acting as regulators between the upper and lower levels of the food chain. As bioturbators¹, benthic² rays feed on infauna that inhabit ocean floor sediments. They physically reshape the ocean floor by stirring up sand, and chemically provide oxygen to deeper sediments that were previously anoxic. This results in new microhabitats for other organisms to live in. Research of these elasmobranchs³ is not only beneficial to reveal more about the species themselves, but also of their ecosystems. In Eleuthera, there are two sympatric species of rays that are able to coexist without outcompeting one another.

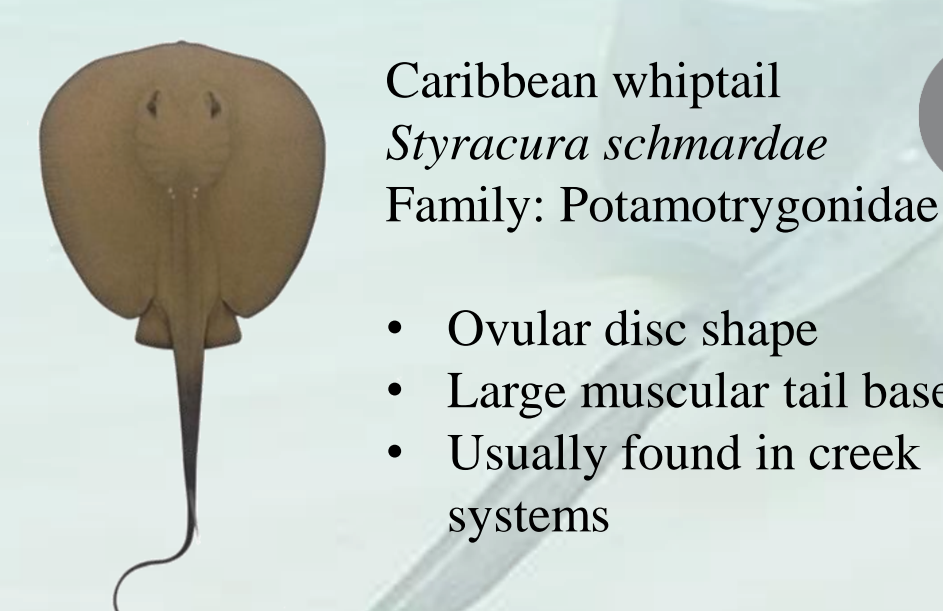
Guiding Question:

Are these species utilizing dietary partitioning to coexist?



Southern stingray
Hypanus americanus
Family: Dasyatidae

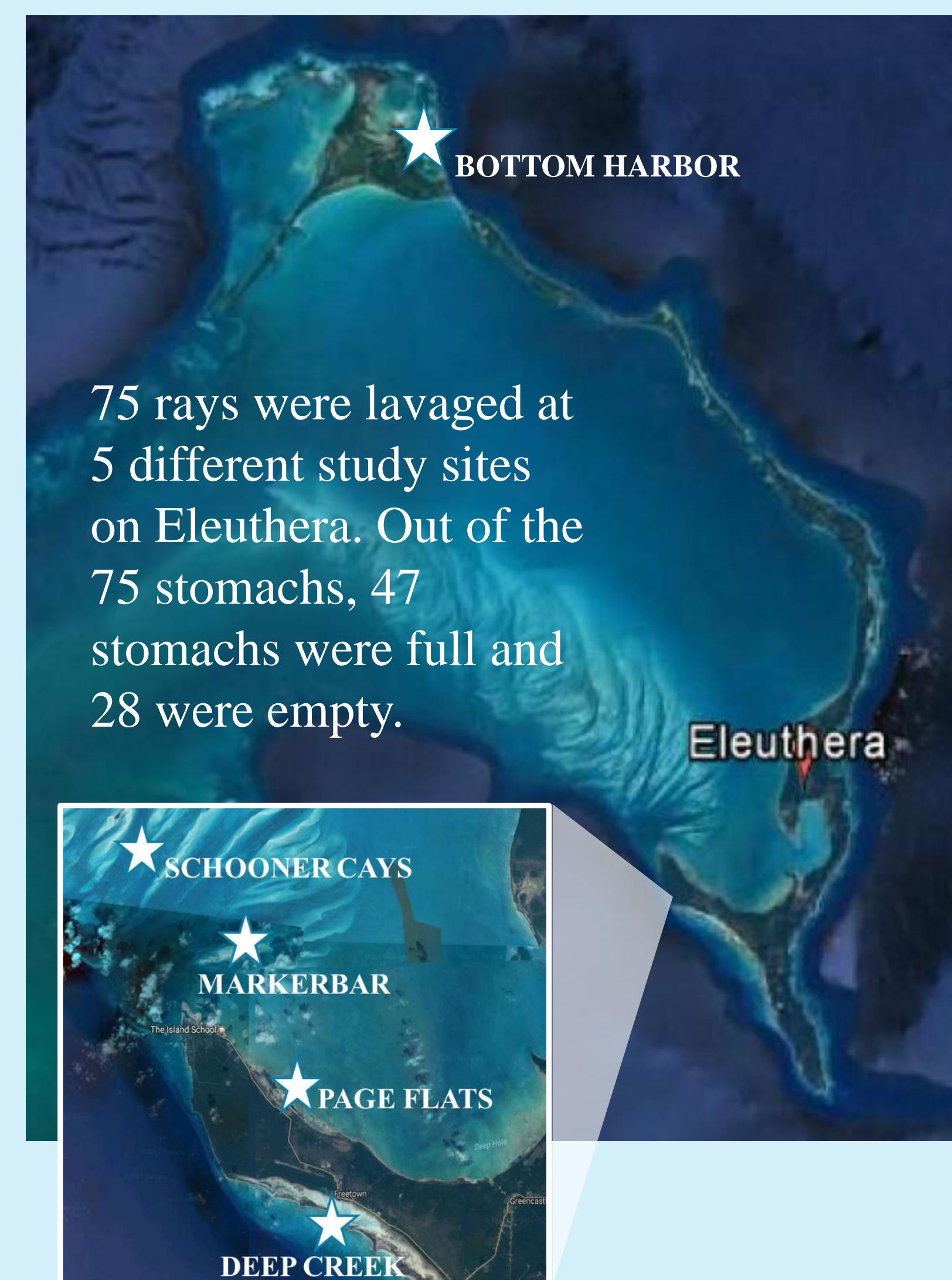
- Rhombic disc shape
- Females > male in size
- Usually found in sand flats



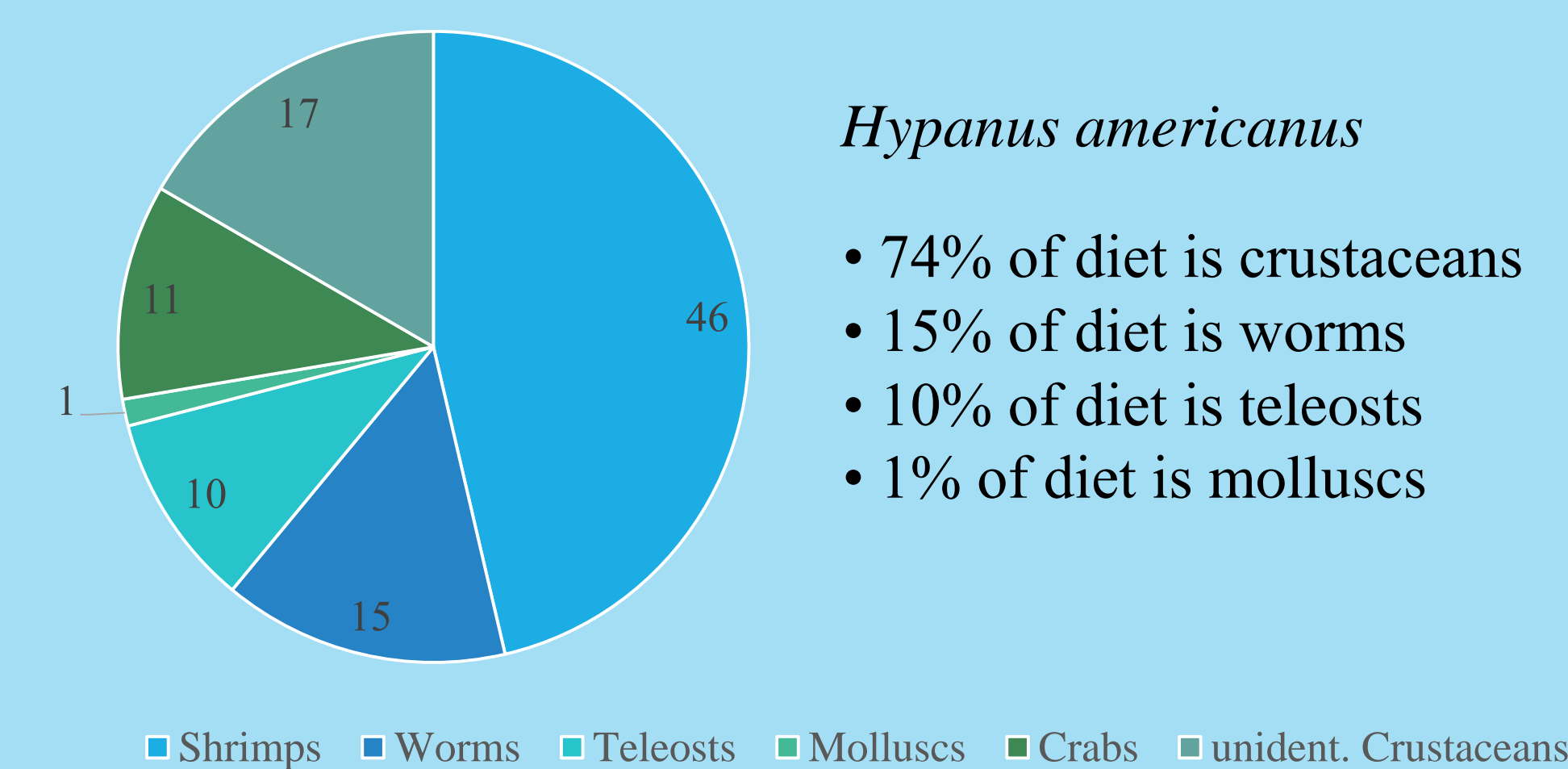
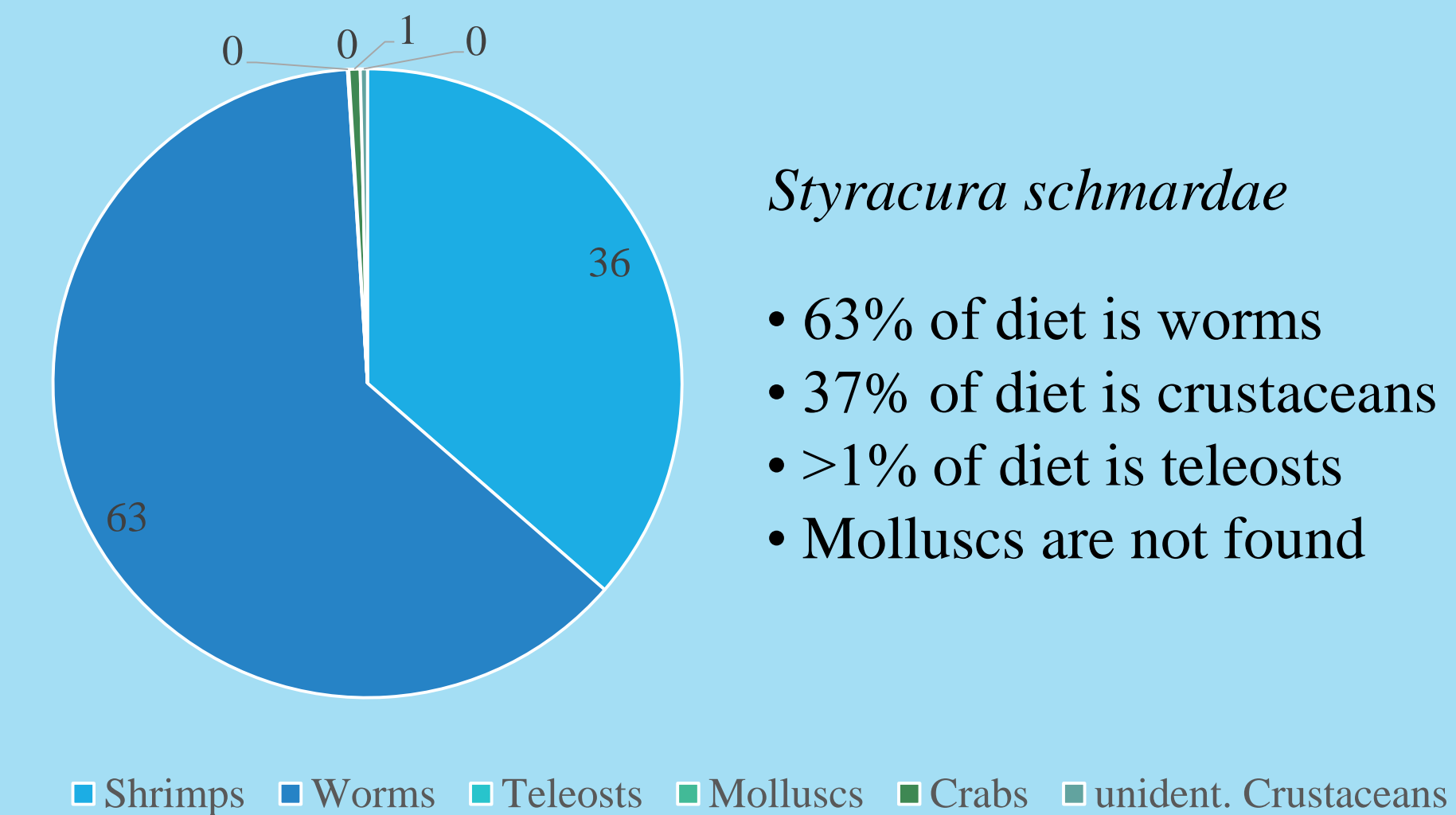
Caribbean whiptail
Styracura schmardae
Family: Potamotrygonidae

- Ovular disc shape
- Large muscular tail base
- Usually found in creek systems

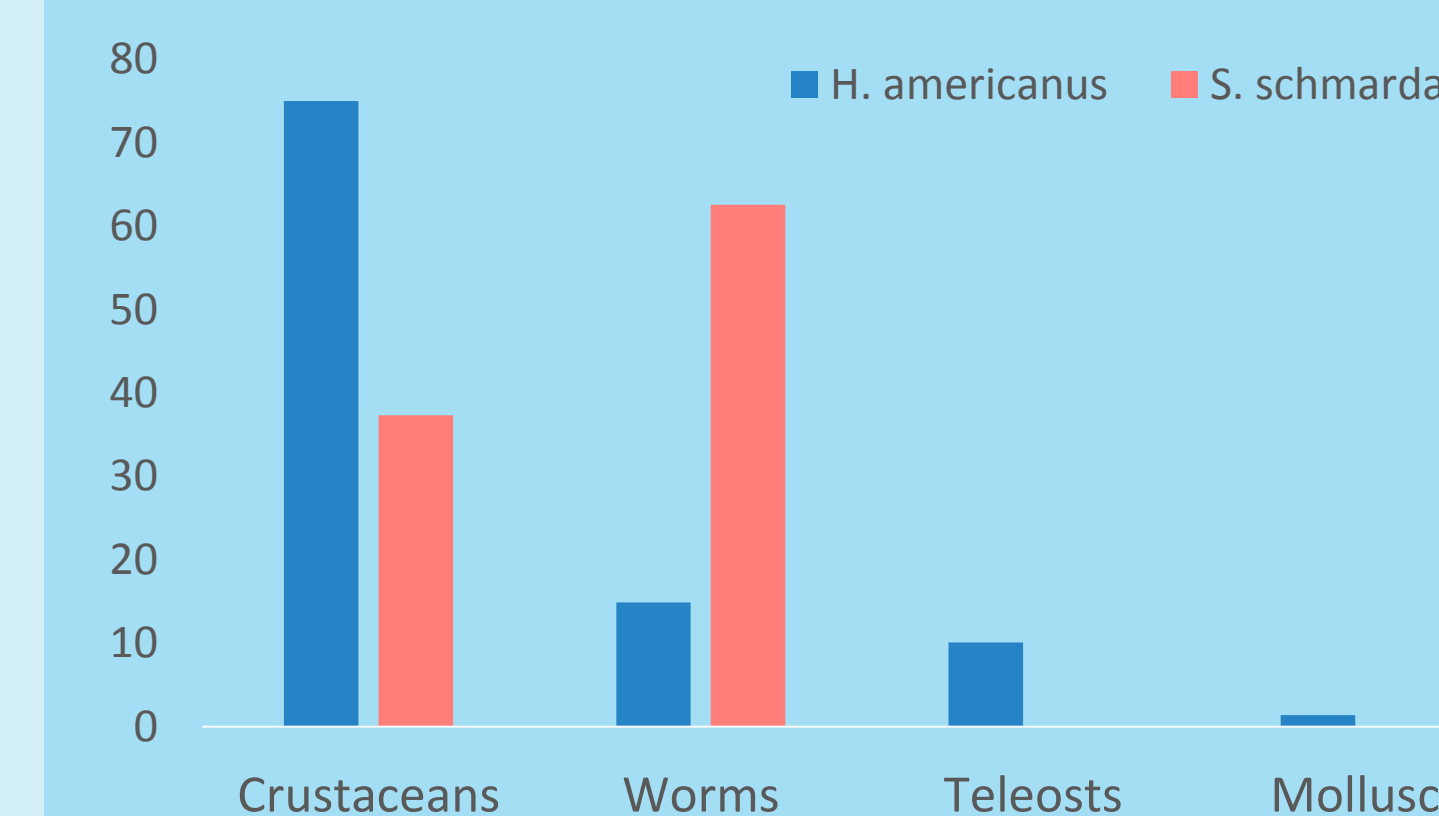
Results



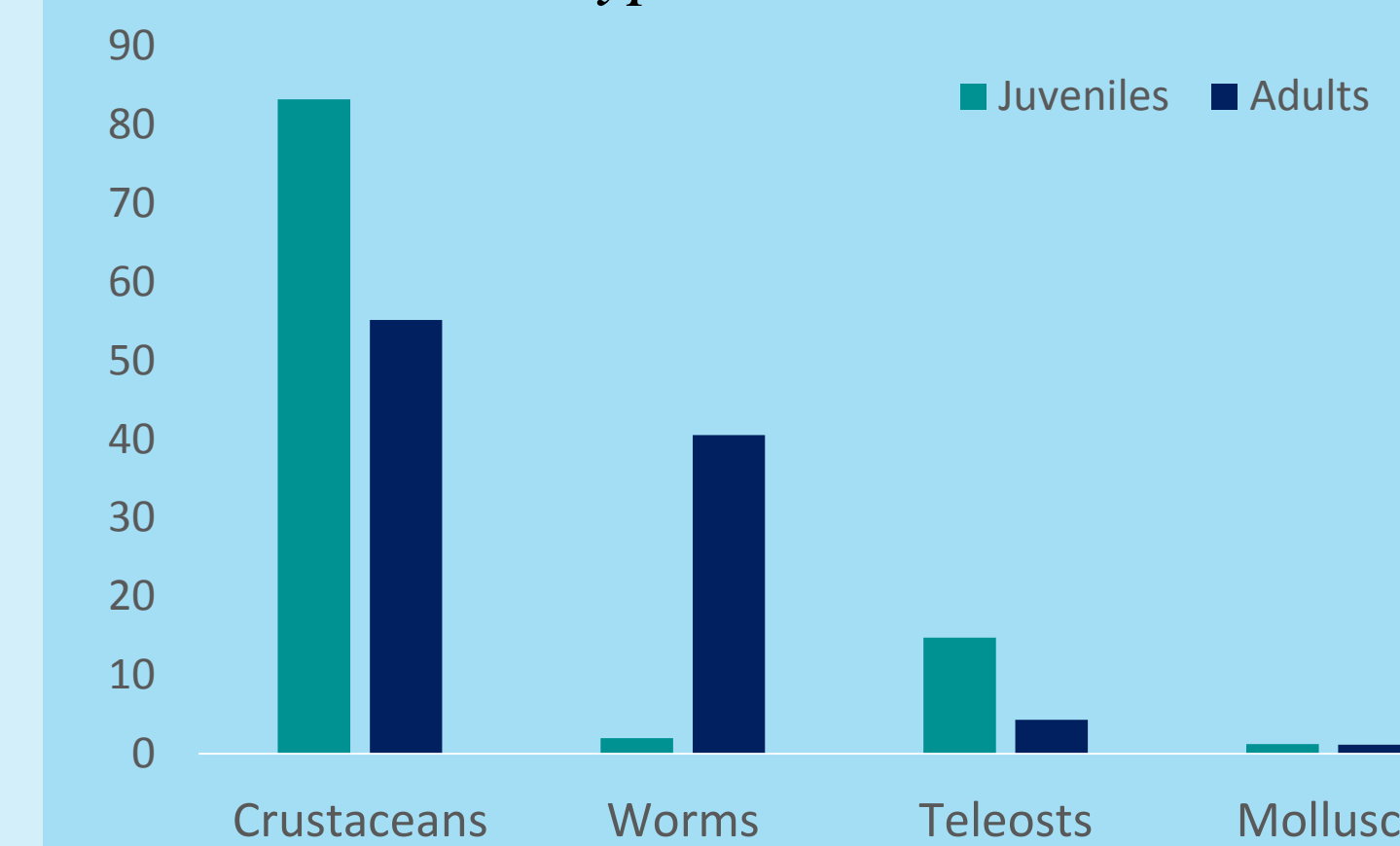
%IRI of prey taxa



Interspecific comparison



Ontogenetic⁴ Differences in Hypanus americanus



Objectives

- Describe dietary contents of species through analysis of stomach contents
- Analyze inter- and intraspecific dietary differences
- Understand stingrays' roles in their ecosystems



Methods

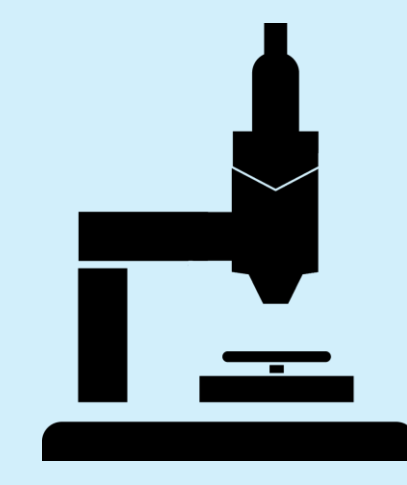
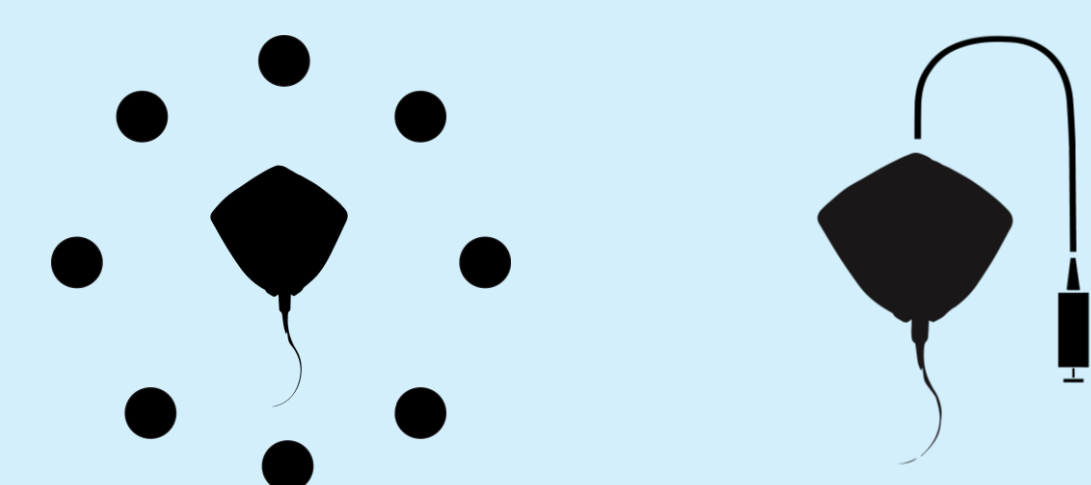
1. CAPTURE
2. GASTRIC LAVAGE
3. LAB WORK
4. CALCULATIONS

Ray is encircled and captured with nets

Stomach contents obtained through stimulated regurgitation

Stomach contents are visually analyzed and identified

Index of Relative Importance is calculated for specific prey taxa

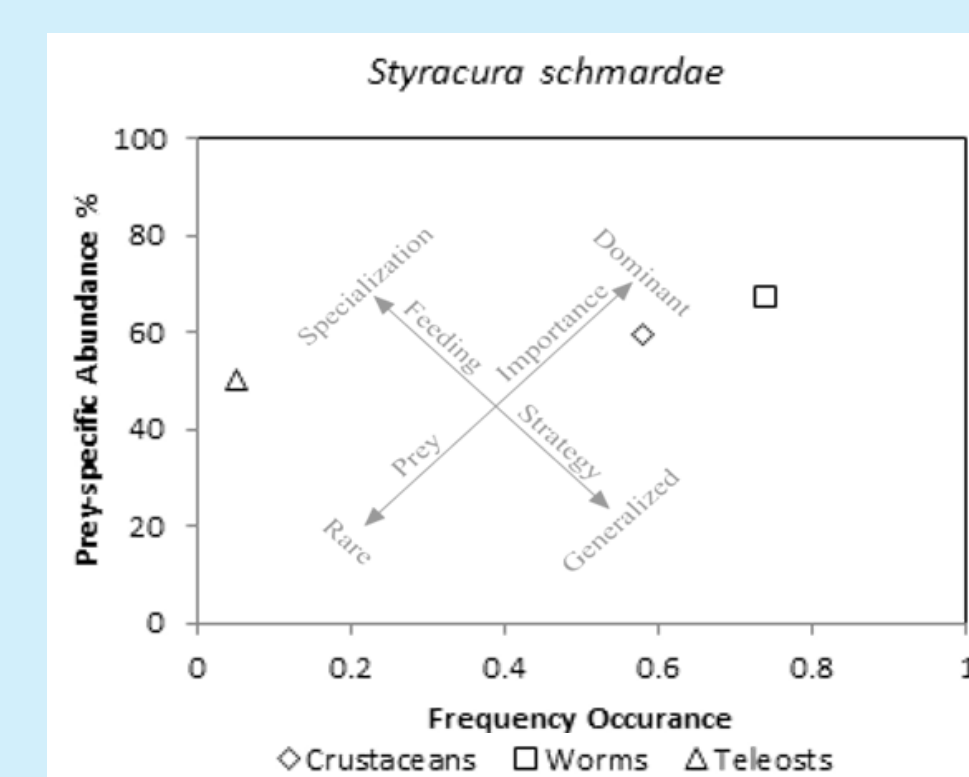
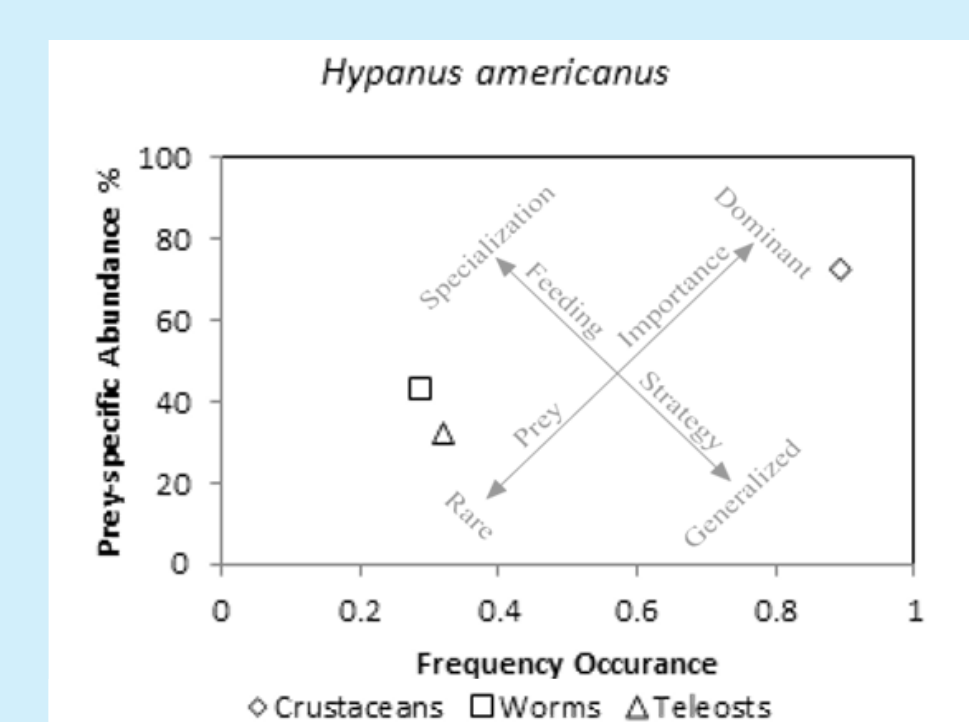


$$IRI = (\%N + \%M) \times \%F_o$$

Pinkas et al. (1971)

Discussion

The analysis shows that the diets of both species are generalized. Southern stingrays have a much more diverse diet than the Caribbean whiptails. Southern stingrays are slightly specialized towards crustaceans and the Caribbean whiptails towards worms. The overall dietary generalization demonstrates an ability to adapt to short-term and long-term prey population changes. Ontogenetic dietary differences were observed in southern stingrays. Thus, dietary behavior differs throughout various life stages in southern stingrays. Furthermore, this study also provides insight to how the observed benthic prey taxa are distributed and prevalent throughout the ecosystem.



Conclusion

Overall, it is concluded that the southern stingray and the Caribbean whiptail utilize dietary partitioning to coexist while avoiding competitive exclusion. By better understanding the trophic⁵ relationships of the two species, this research has significantly decreased data deficiency, and further supported conservation efforts for these species.

Future Studies

Future studies could assess the relationship between size and maturity of *Styracura schmardae*. This would facilitate research to analyze ontogenetic dietary differences within the species.

Scientific Terms

¹ **Bioturbation**: the disturbance of sedimentary deposits by living organisms

² **Benthic**: the flora and fauna found on the bottom, or in the bottom sediments, of a sea, lake, or other body of water

³ **Elasmobranch**: a cartilaginous fish of a group that comprises the sharks, rays, and skates

⁴ **Ontogenetic**: the development of an individual organism or anatomical or behavioral feature from the earliest stage to maturity

⁵ **Trophic level**: an organism's position in the food chain

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