PREY SELECTION BY THE LITTLE BLUE HERON (*EGRETTA CAERULEA*) IN GREAT WHITE HERON NATIONAL WILDLIFE REFUGE

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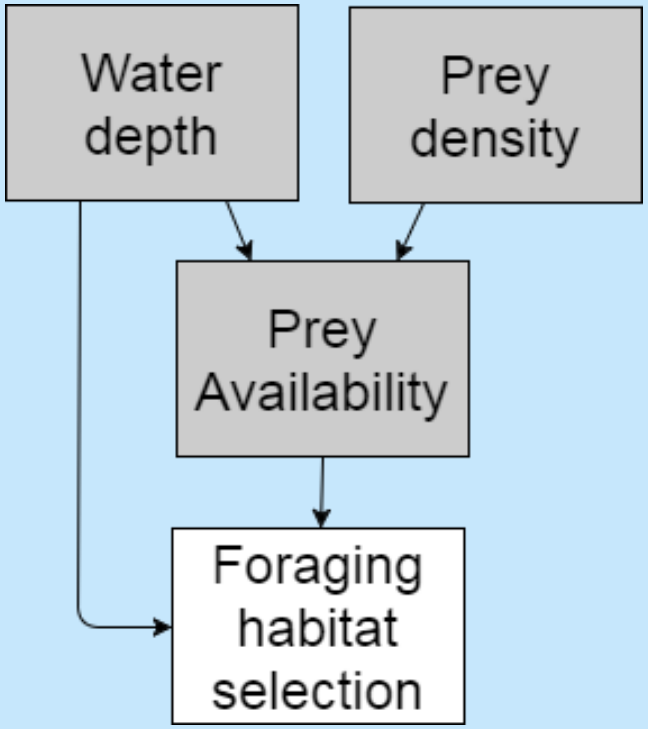
Human Induced Rapid Environmental Change (HIREC) (Sih et al. 2011)

- HIREC and coastal systems
- Management response

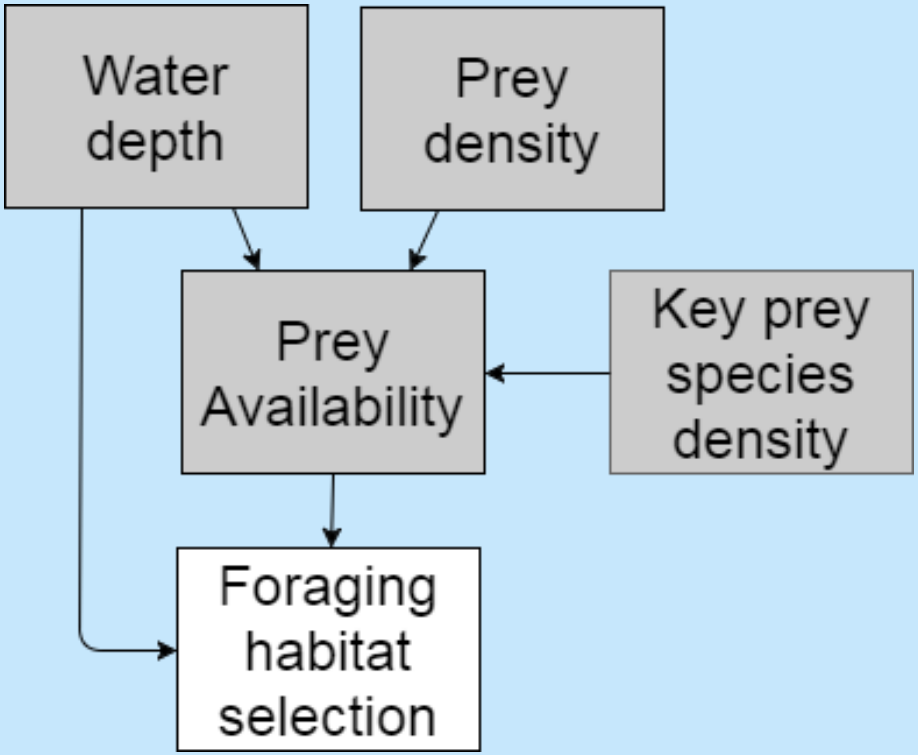
Habitat suitability models for wading birds

- CERP restoration success metric
- Understanding habitat requirements

Factors Influencing Foraging Habitat Selection

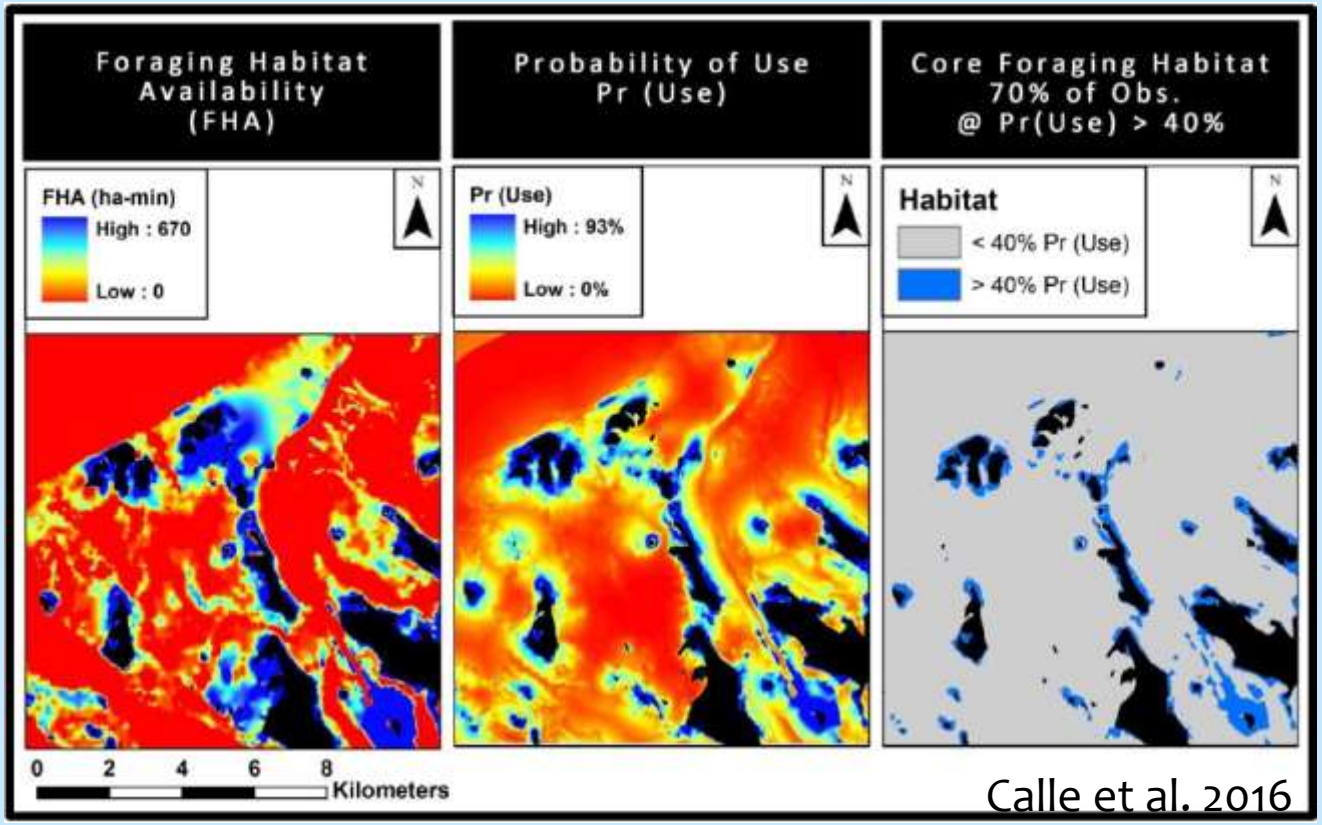


Factors Influencing Foraging Habitat Selection



Little Blue Heron Habitat Suitability Model

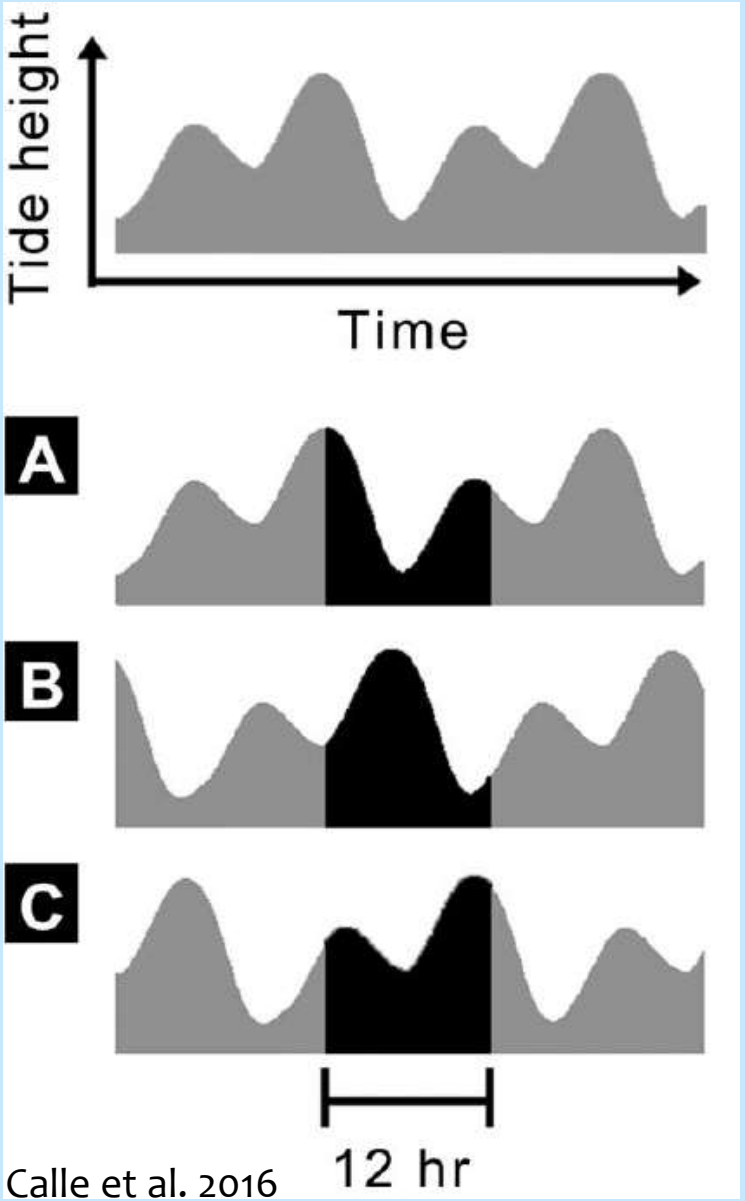
- Physical parameters
- Landscape scale



Calle et al. 2016

Why Little Blue Herons (LBHE)?

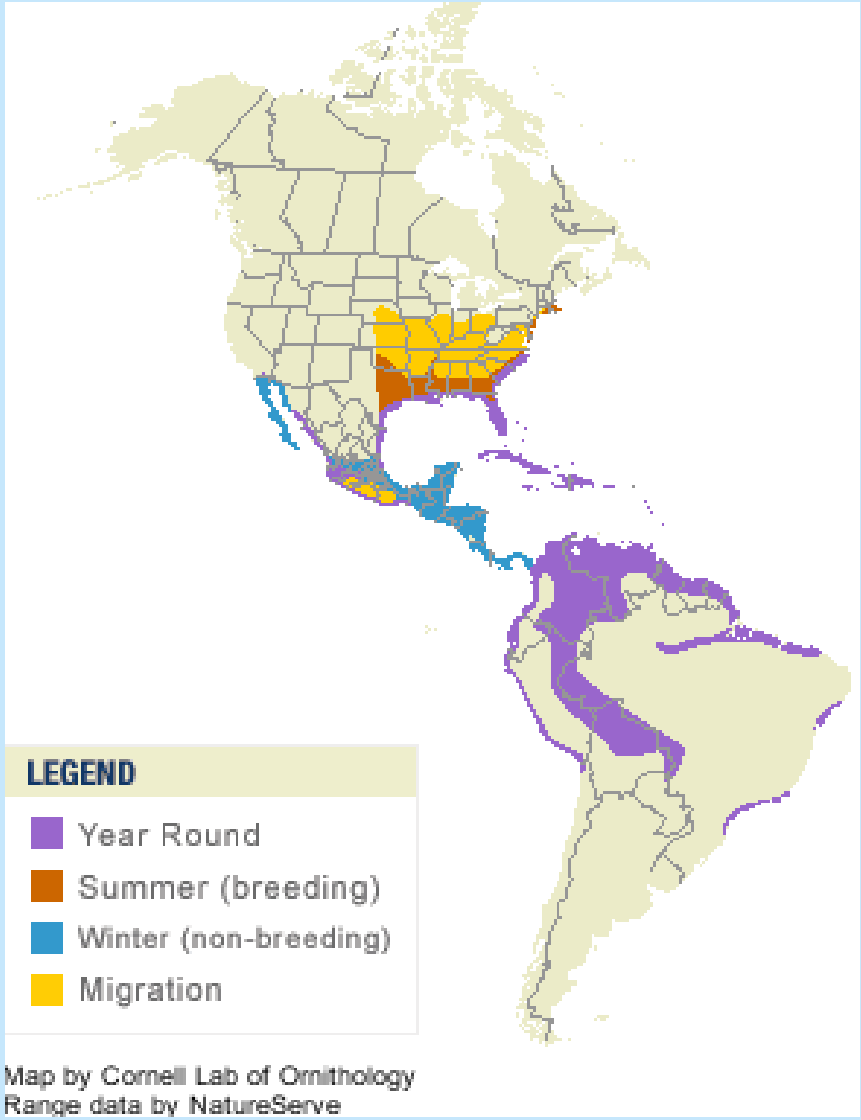
- Restrictive foraging requirements
  - Diurnal foragers
  - Leg length constraint
- Species of concern



Calle et al. 2016

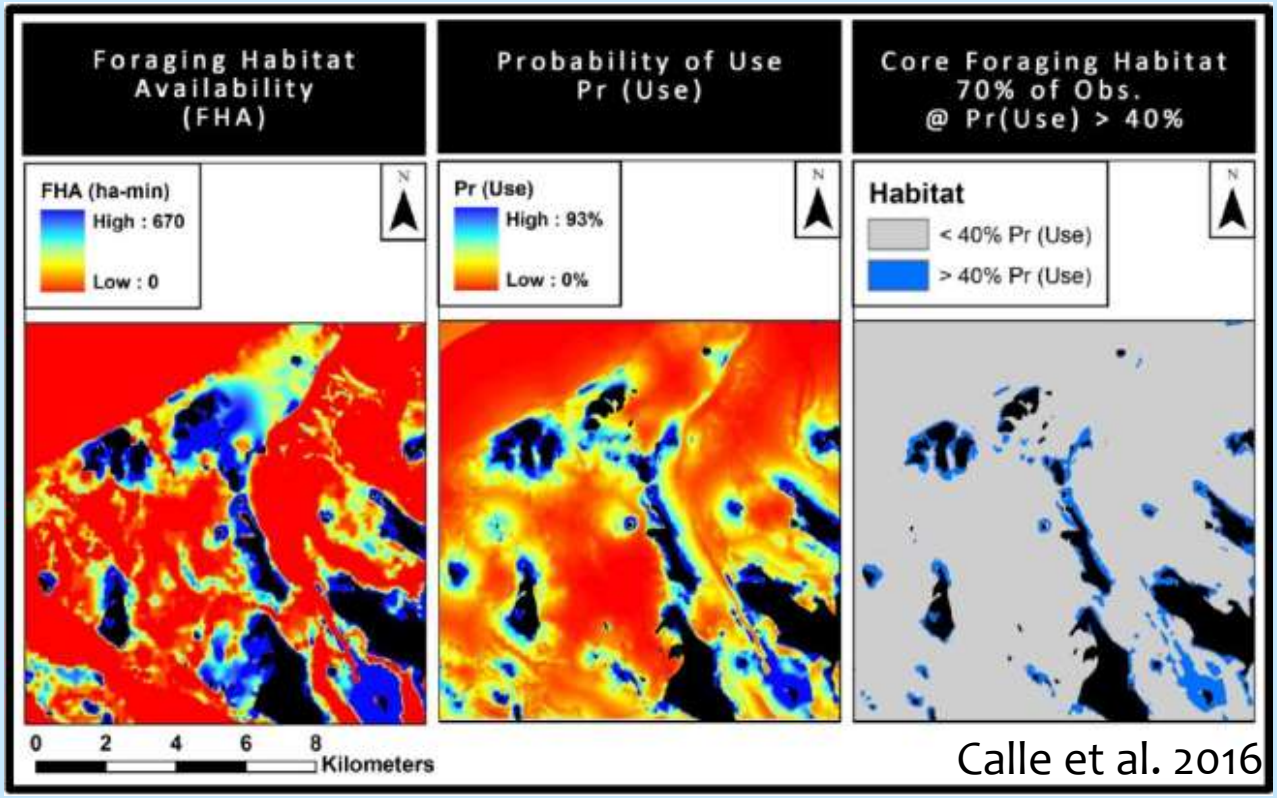
Why Little Blue Herons (LBHE)?

- Restrictive foraging requirements
- Species of concern
- Wide Distribution



Little Blue Heron Habitat Suitability Model

- Physical parameters
- Landscape scale
- Lacks prey assessment



Calle et al. 2016

Improve Habitat Suitability Model

- Prey assessment
- Diet assessment

Diet Composition Affects Wading Bird Productivity

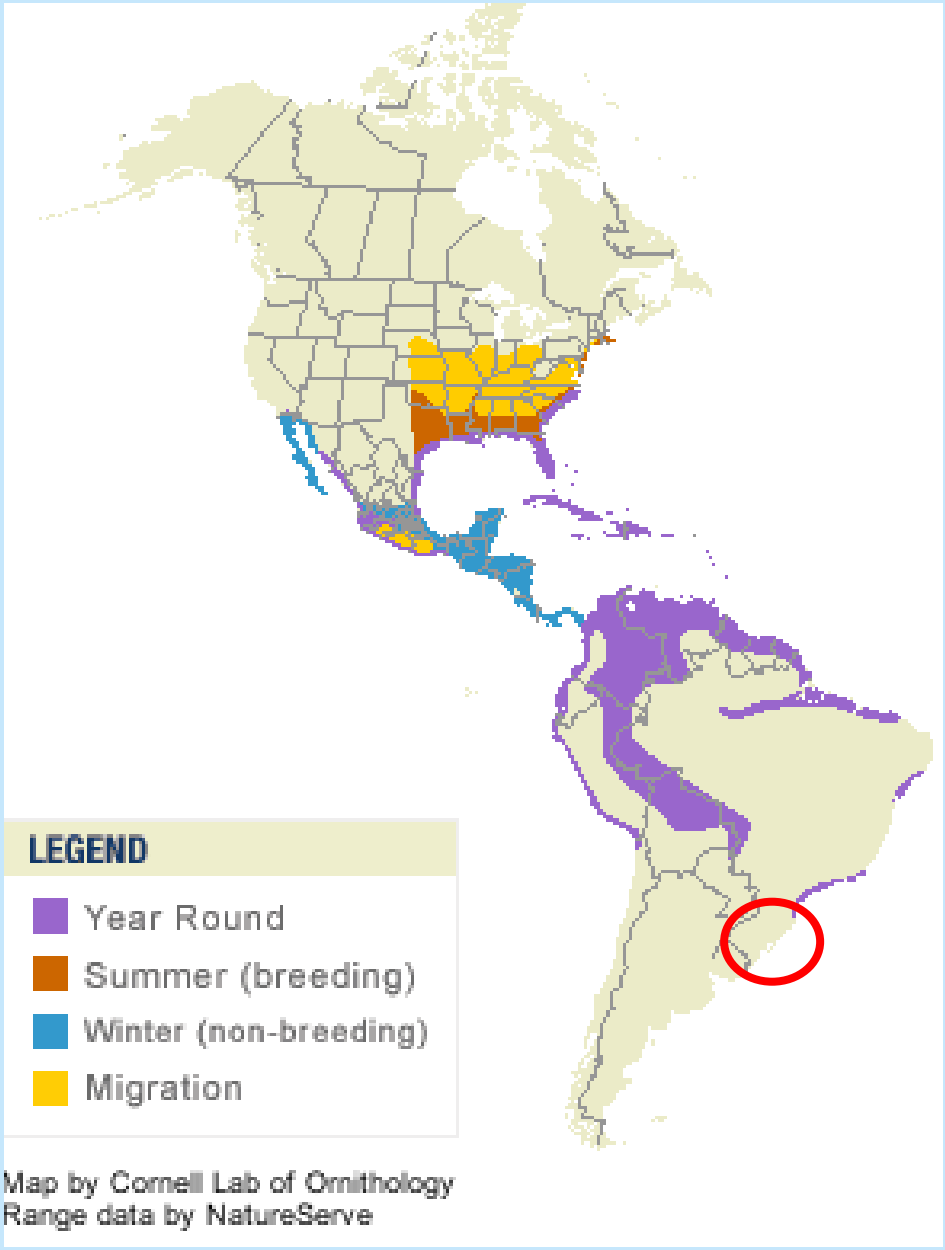
Prey Item	Colony 73 (2008)	Lox West (2008)	New Colony 4 (2009)
Crayfish	60	65	55
Small fishes	0.6	22	14
Sunfish	0.2	2	6
Shrimp	0	0.2	1
Aquatic insects	2	3	3
Terrestrial insects	22	4	6
Vertebrates	0.2	0	1
Garbage	15	4	14
Mean total kcal (SE)	6.56 (0.97)	4.89 (1.26)	6.41 (0.43)
n	54	33	144

Boyle 2014

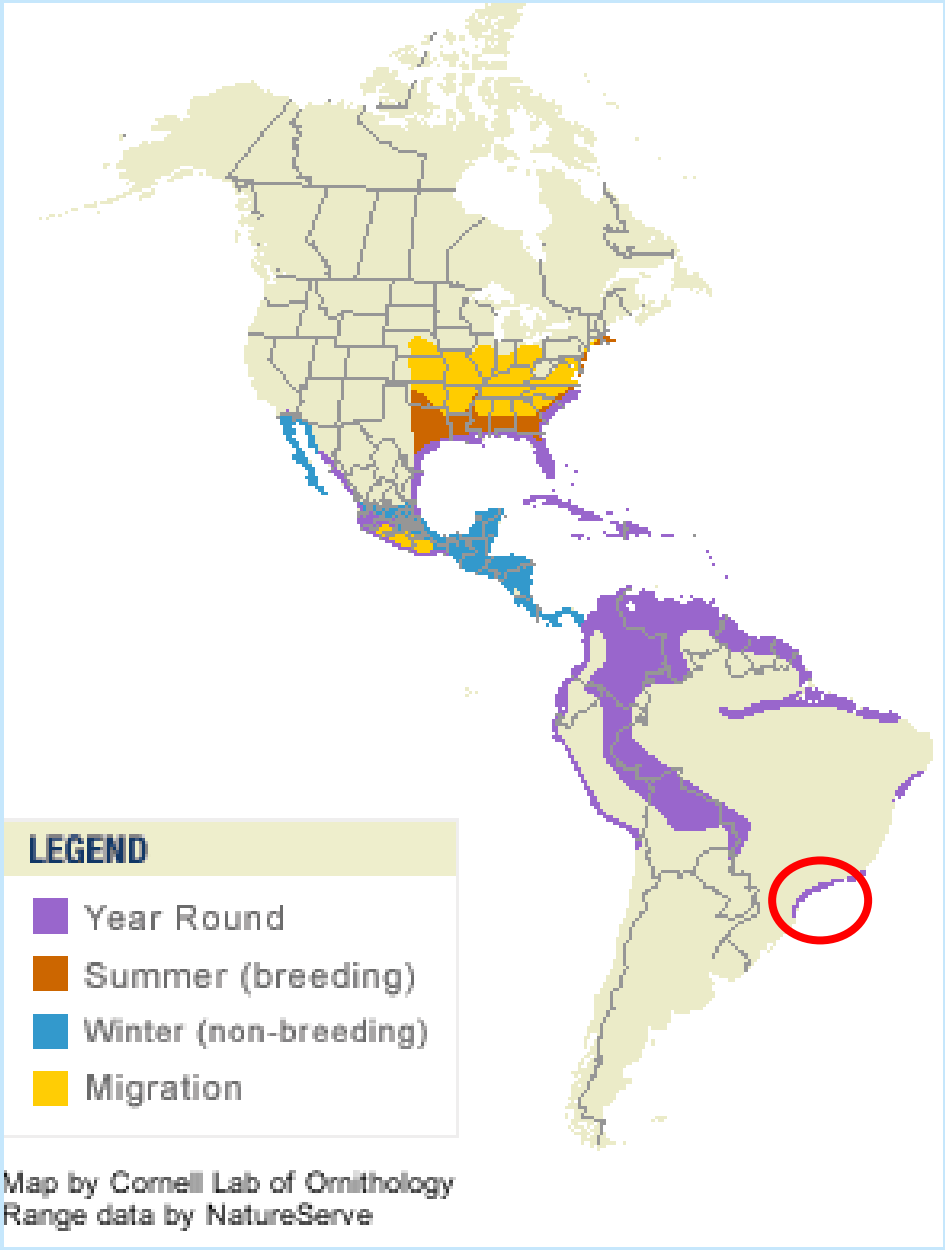
Varying nutritional values of prey

Little Blue Heron Diet Composition

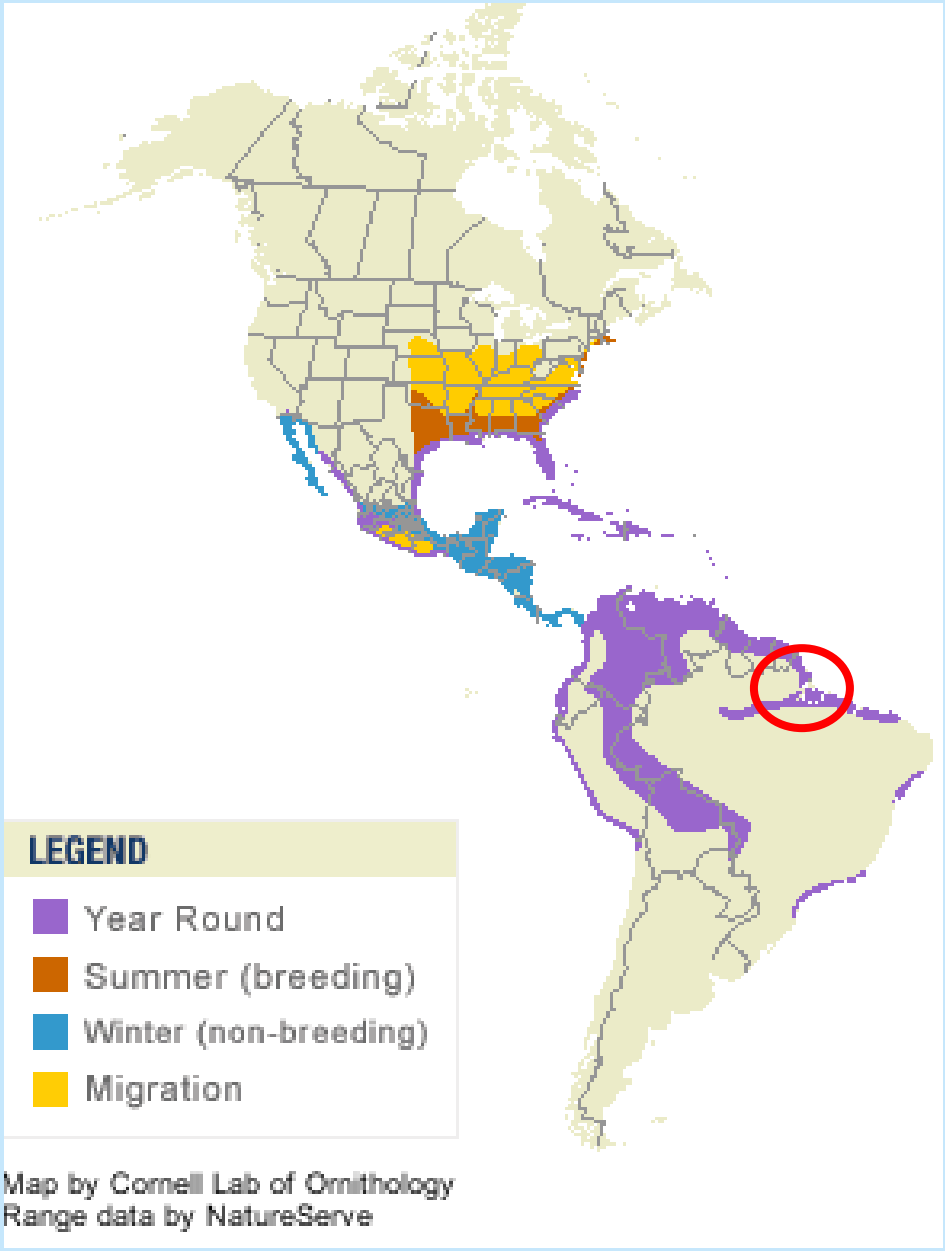
- Generalists
- Diet shift spatially & temporally



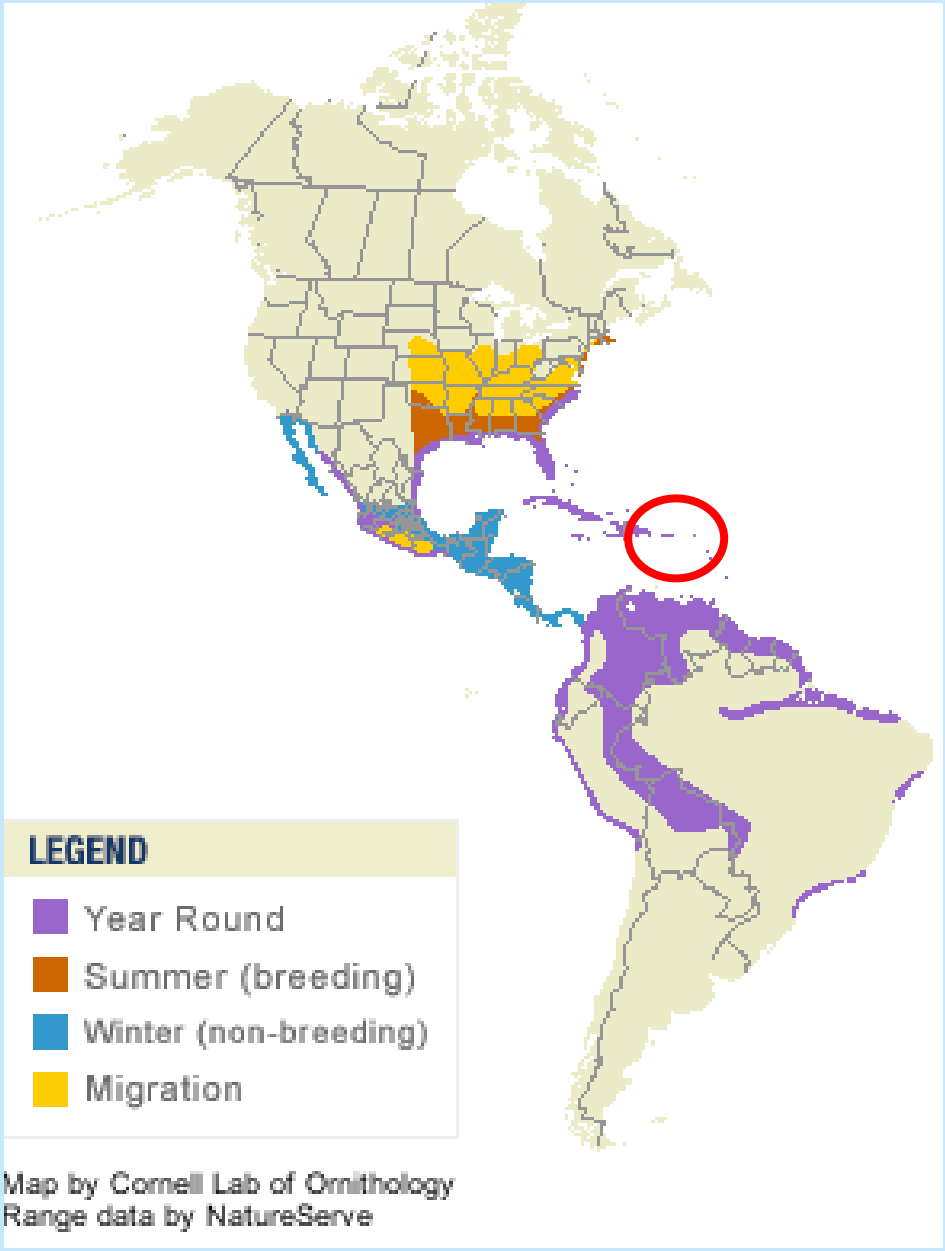
- Coastal Brazil
- 78% Blue crabs



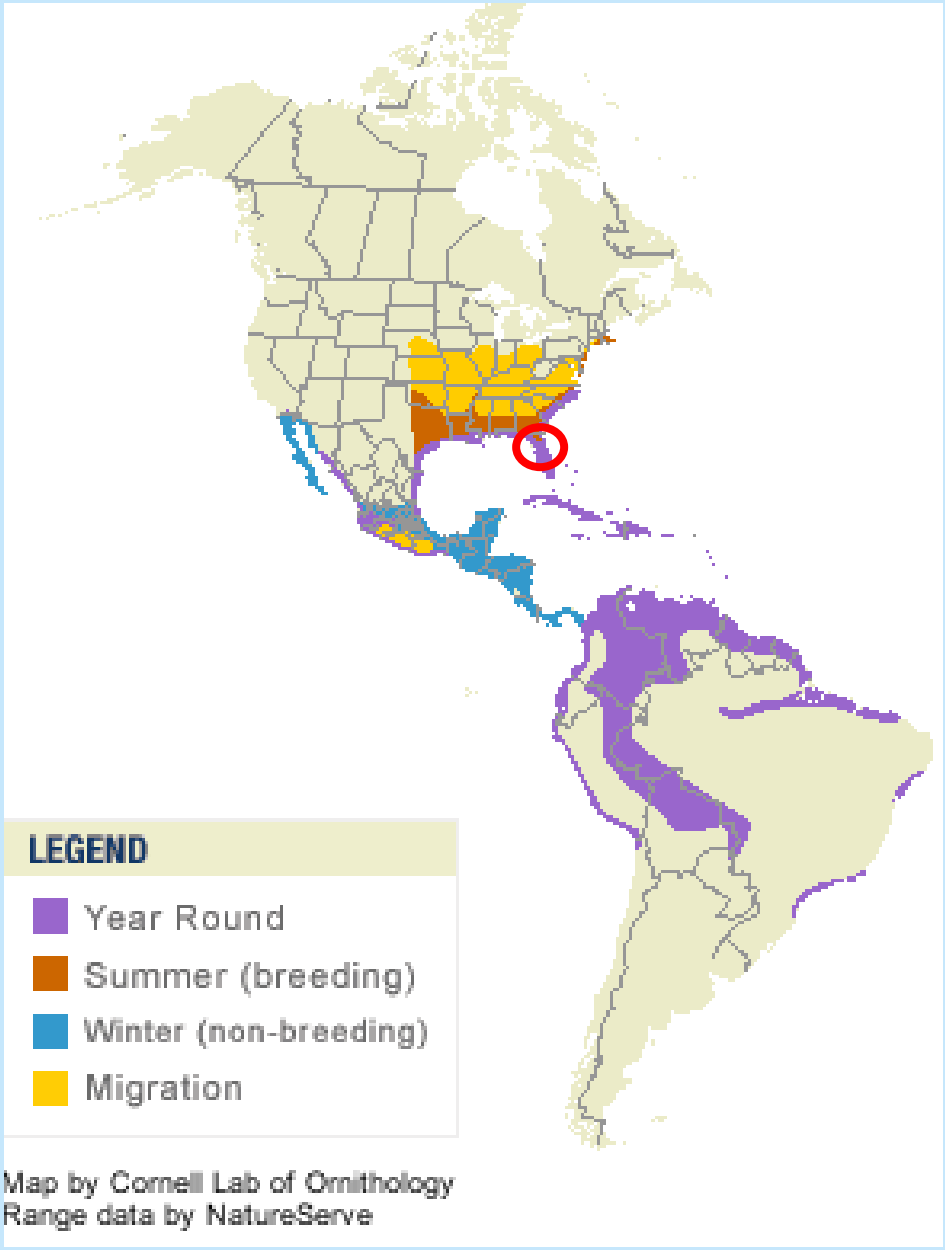
- Coastal Brazil
- 80% crabs
  - 65% Mangrove Tree Crabs & *M. rubripes*



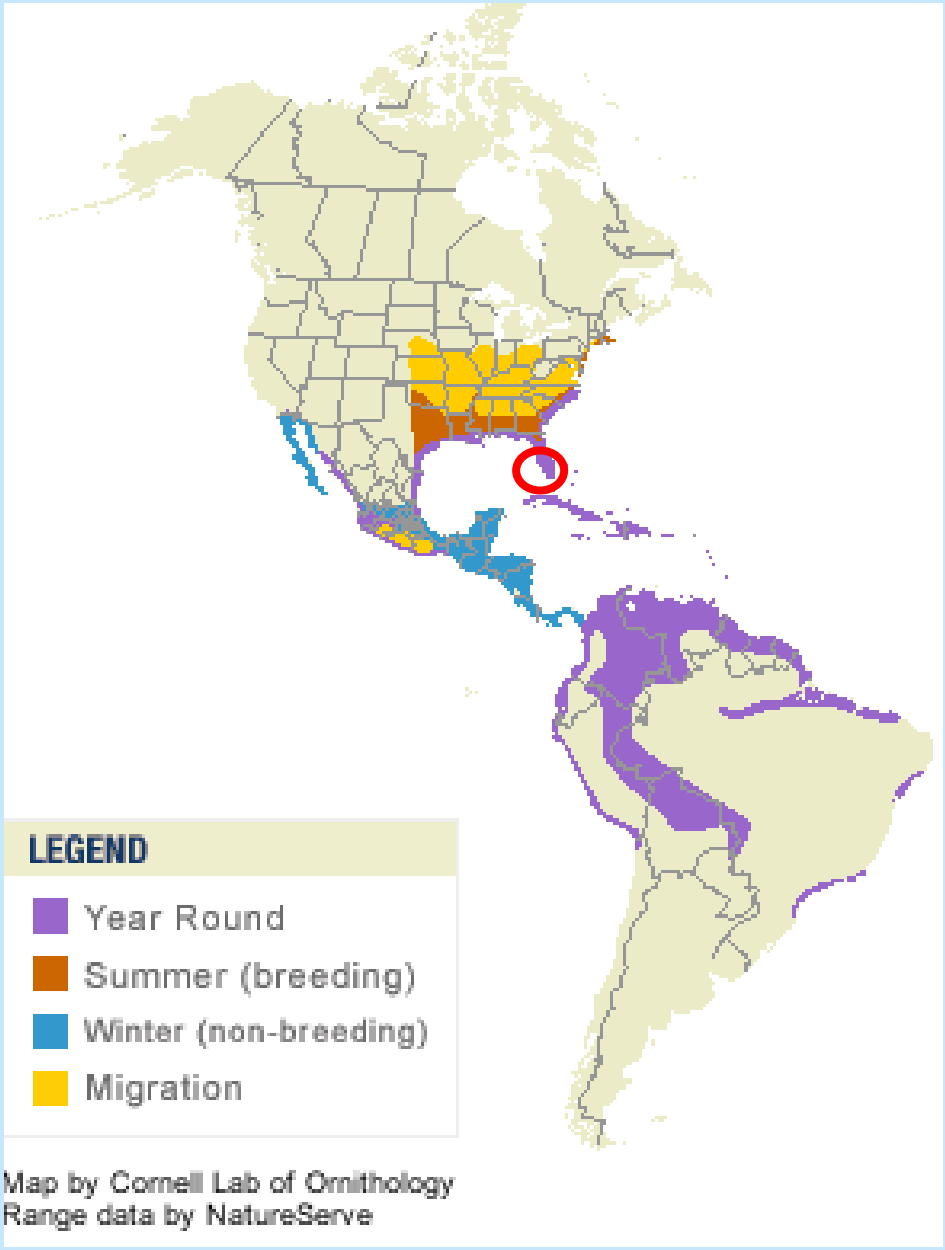
- Coastal Brazil
- Killifish & shrimp



- Puerto Rico
- Only fiddler crabs



- Tampa Bay
- Blue crabs, polychaetes, isopods

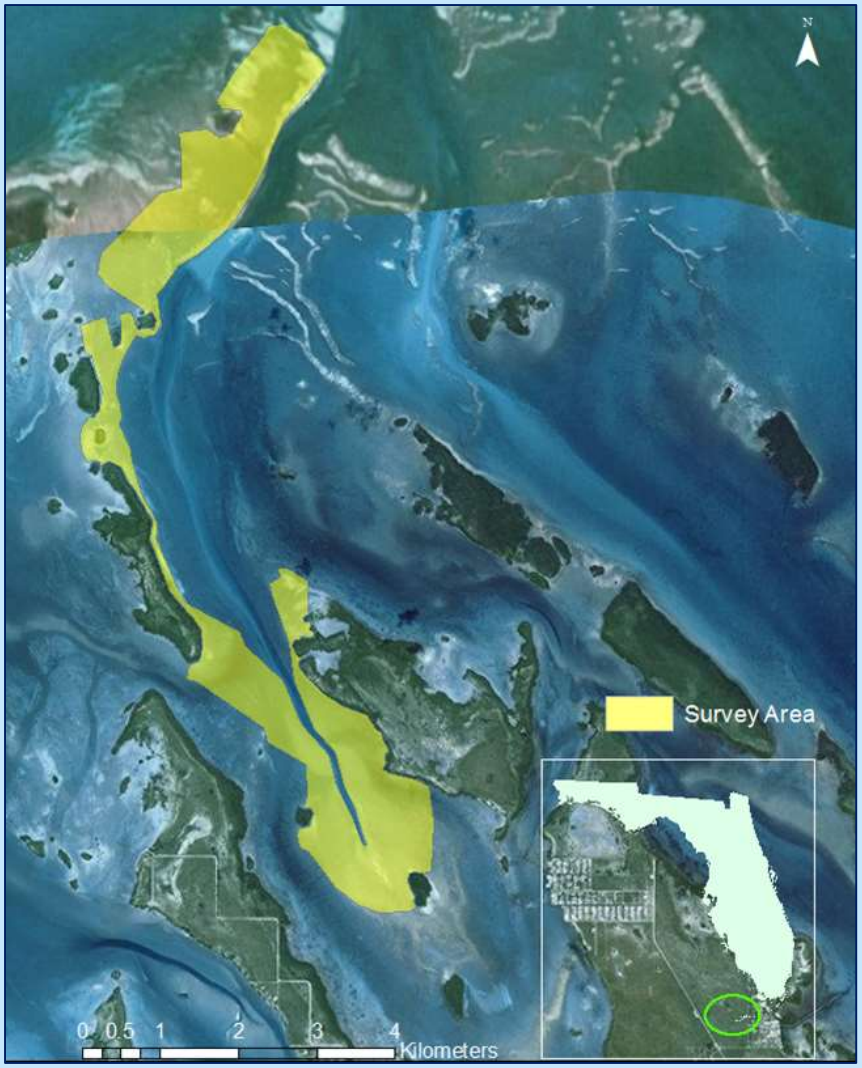


- Florida Keys
- Unknown

Great White Heron National Wildlife Refuge

Foraging Distribution Survey

- 2016 breeding period
- Biweekly
- Recorded locations & abundance



Determining Prey Availability

Sampled prey communities with 1 m^2 throw trap

Diet Analysis

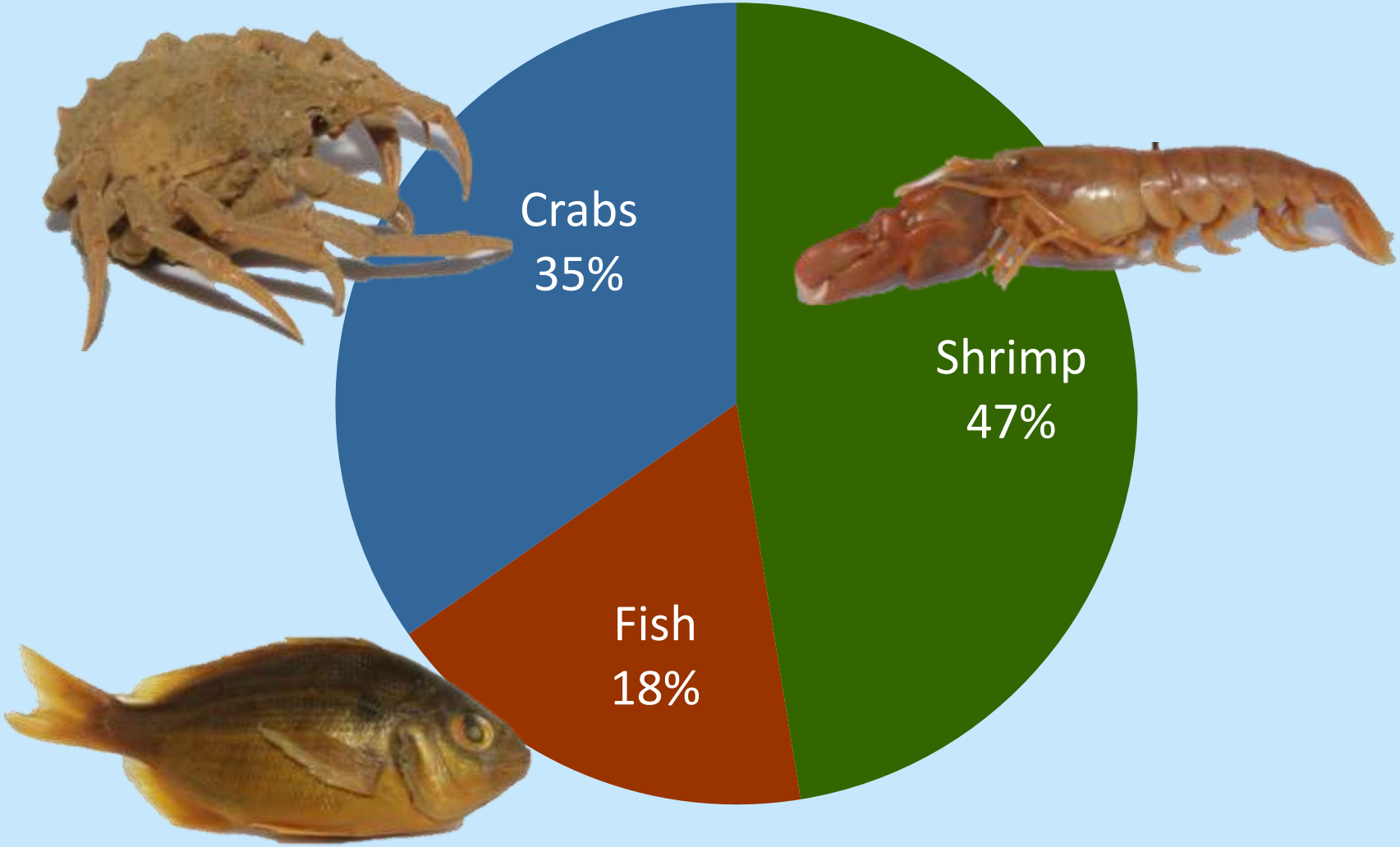
- 53 samples from 26 nests
- Chicks aged 1 to 4 weeks

Results

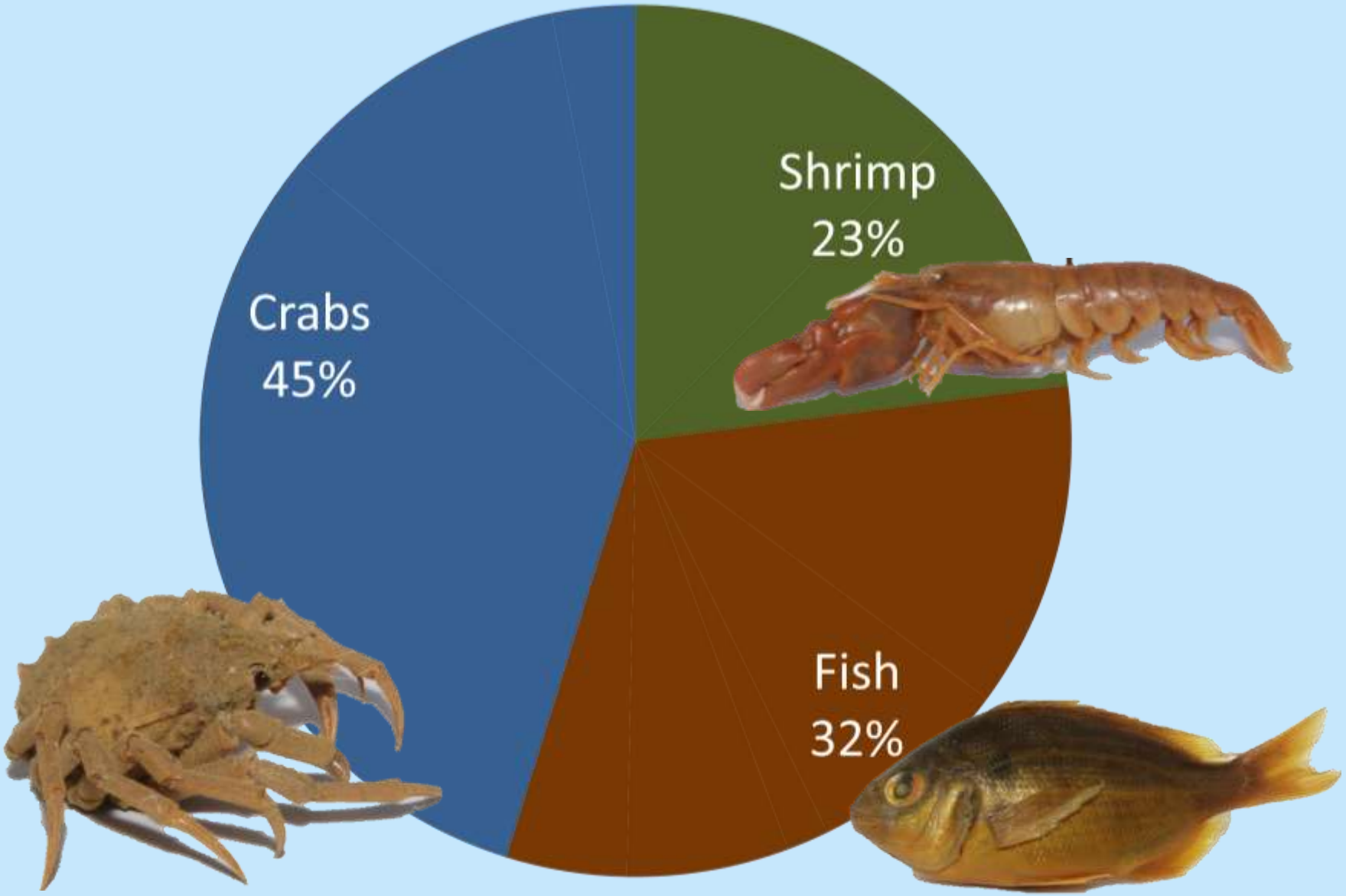
- Available prey abundance & biomass
- Prey biomass in colony boluses & occurrence in nests

Prey Species

Available Prey Abundance



Available Prey Biomass



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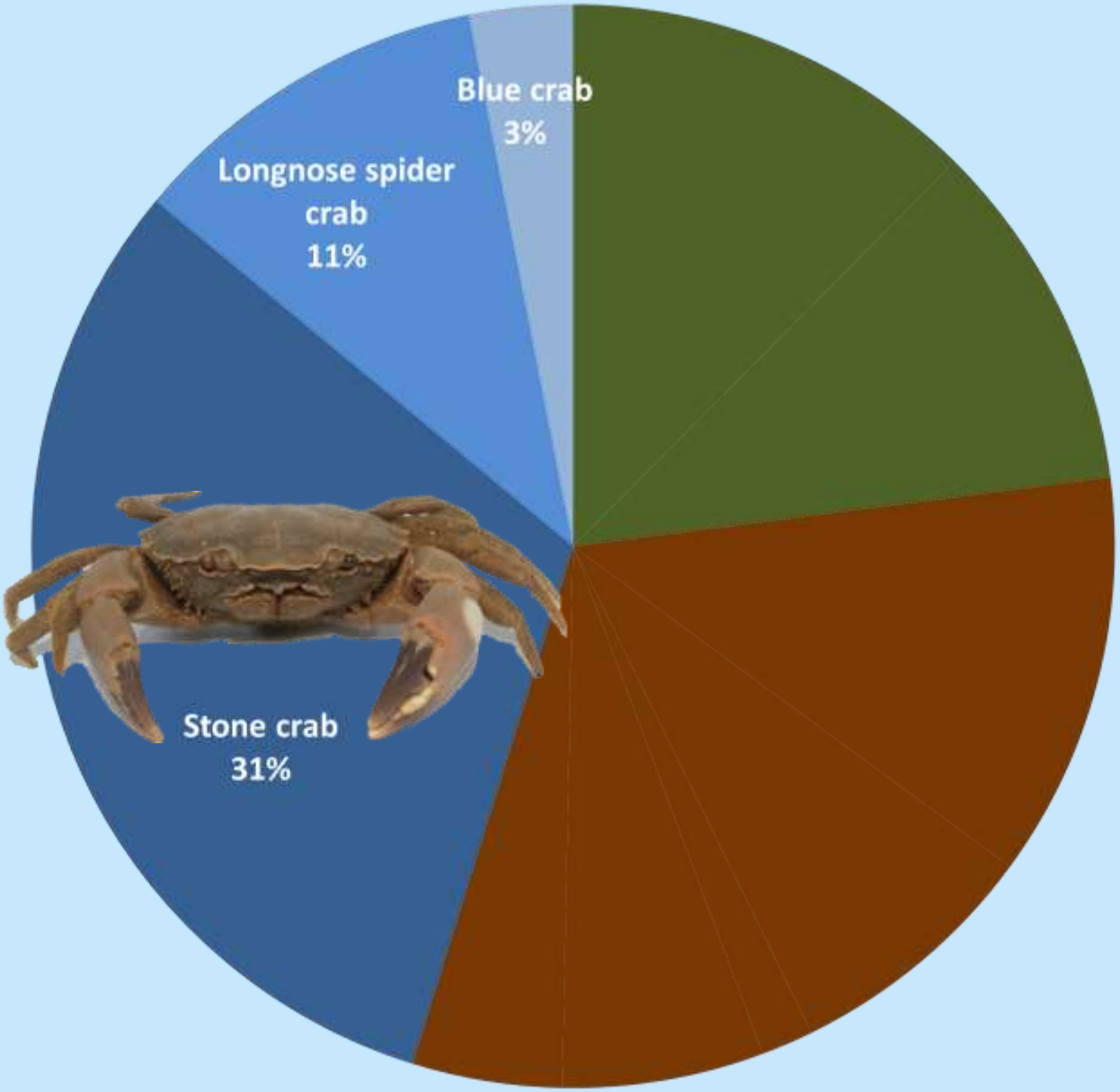
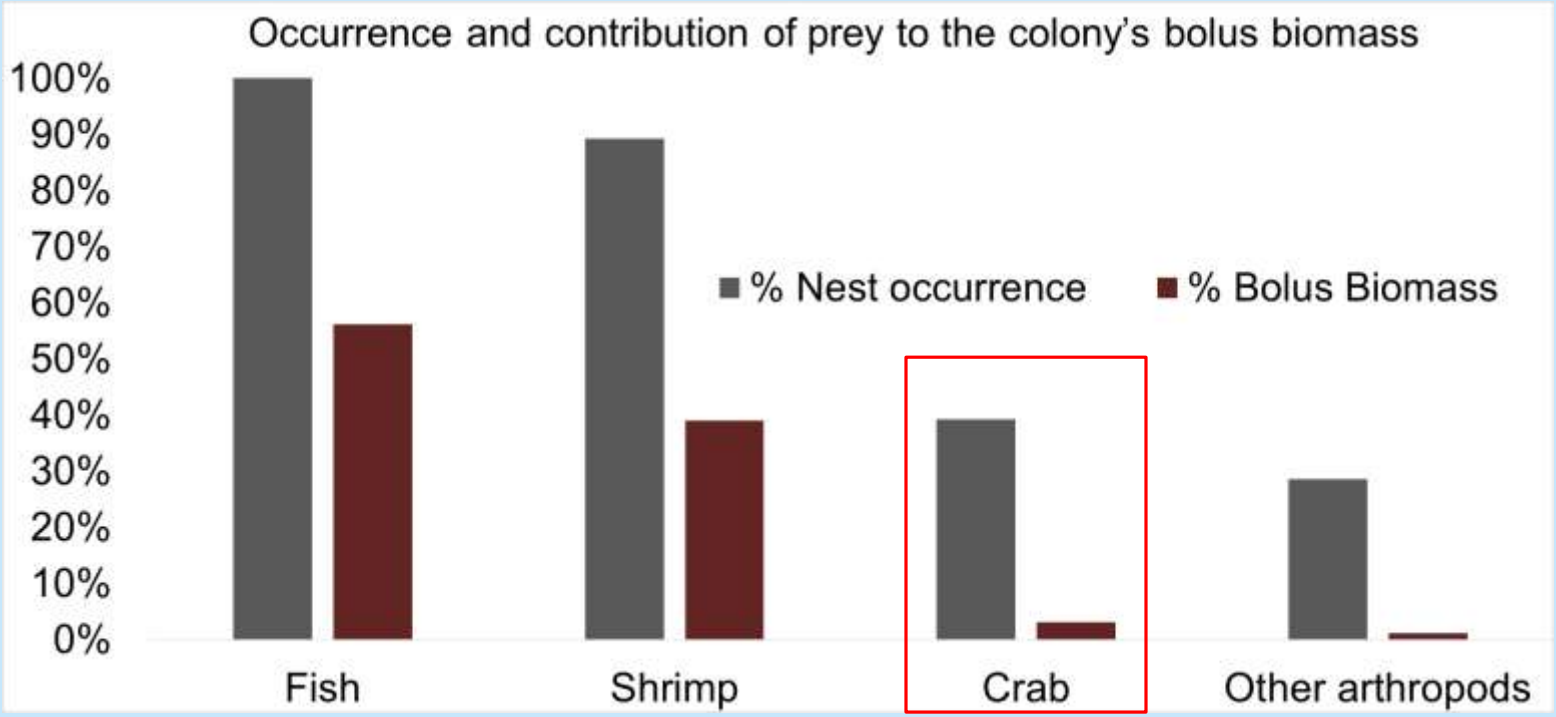
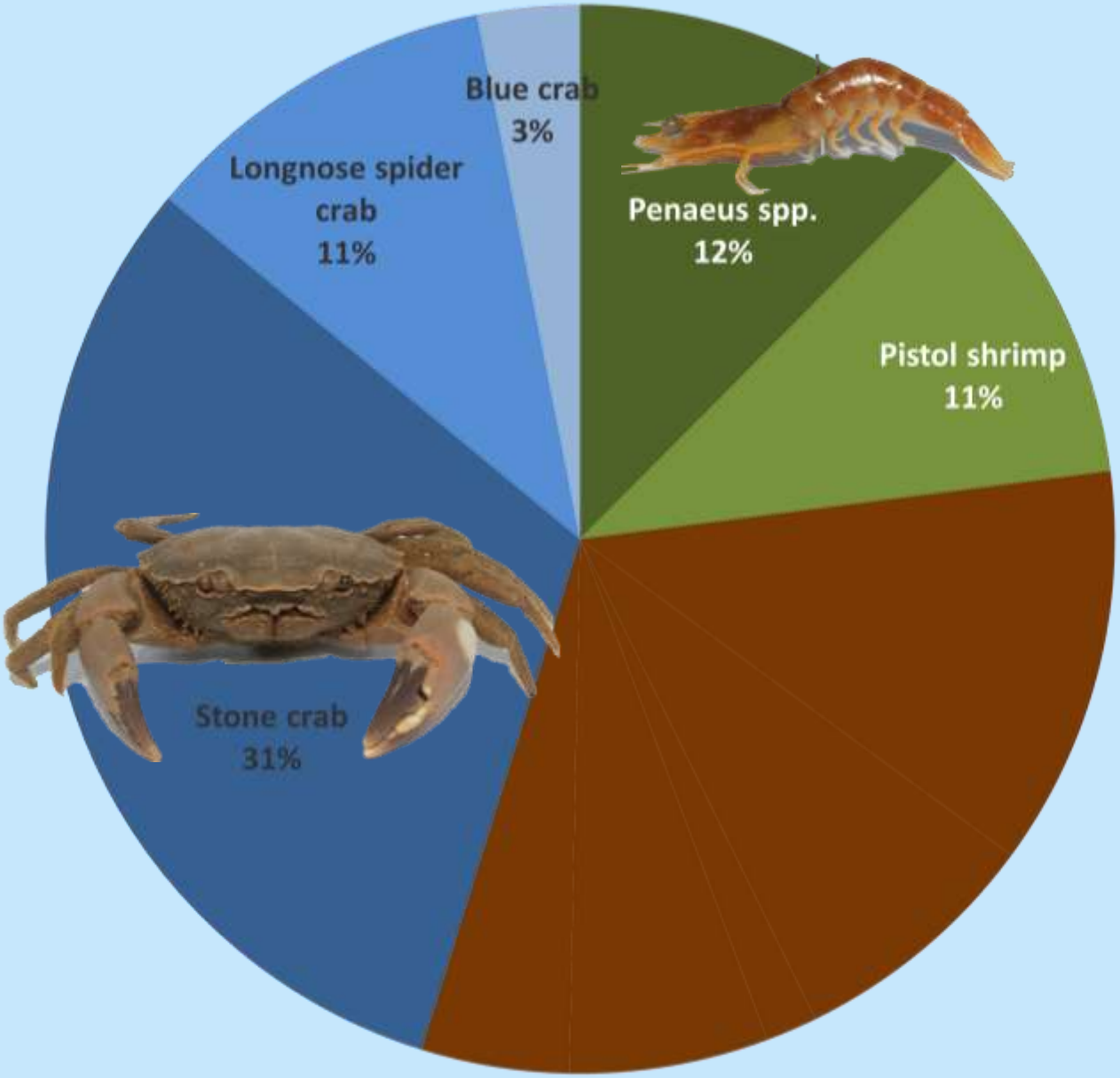


Crabs

- 35% available prey abundance
- 45% available prey biomass
- <1% fully aquatic crabs, 15% of nests
- 3% semi-terrestrial crabs, 38% of nests

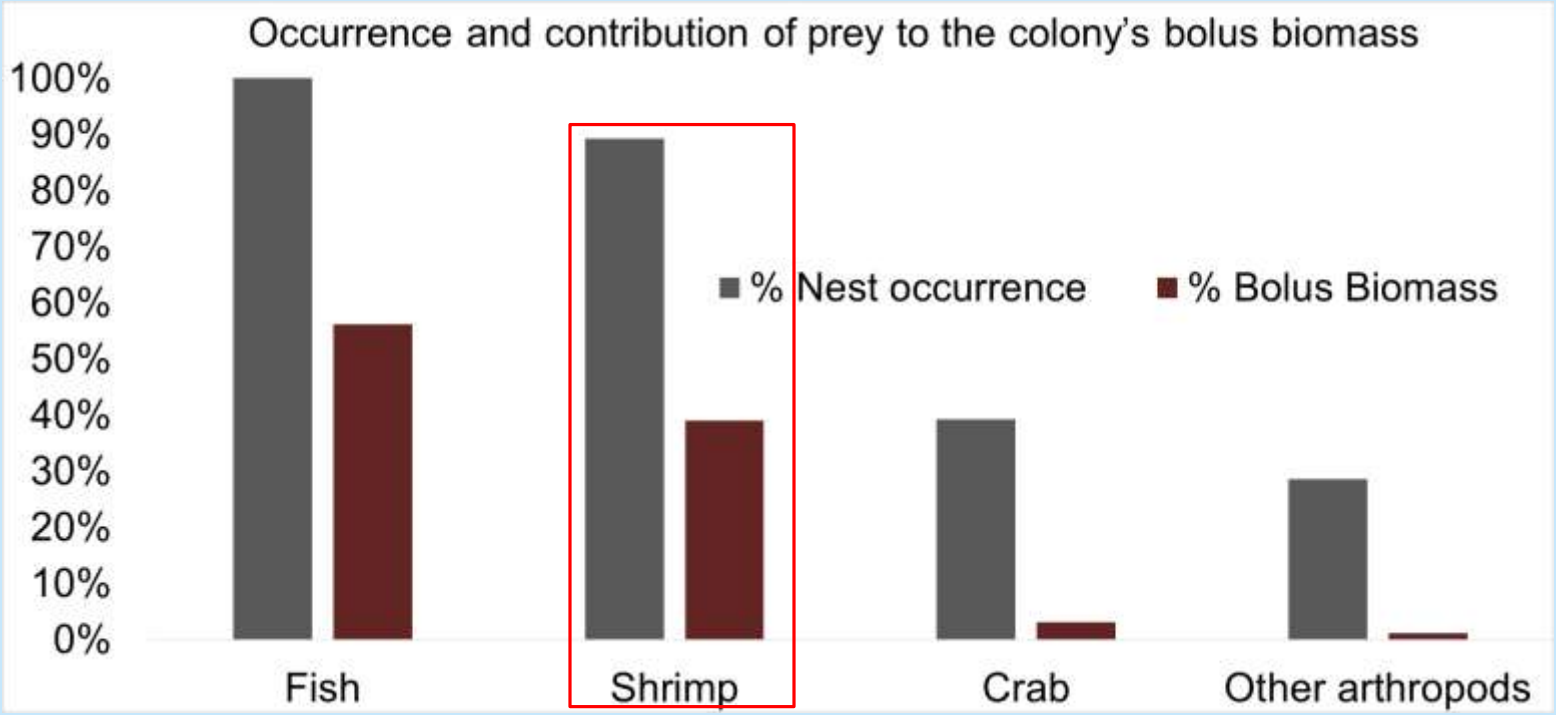


Available Prey Biomass

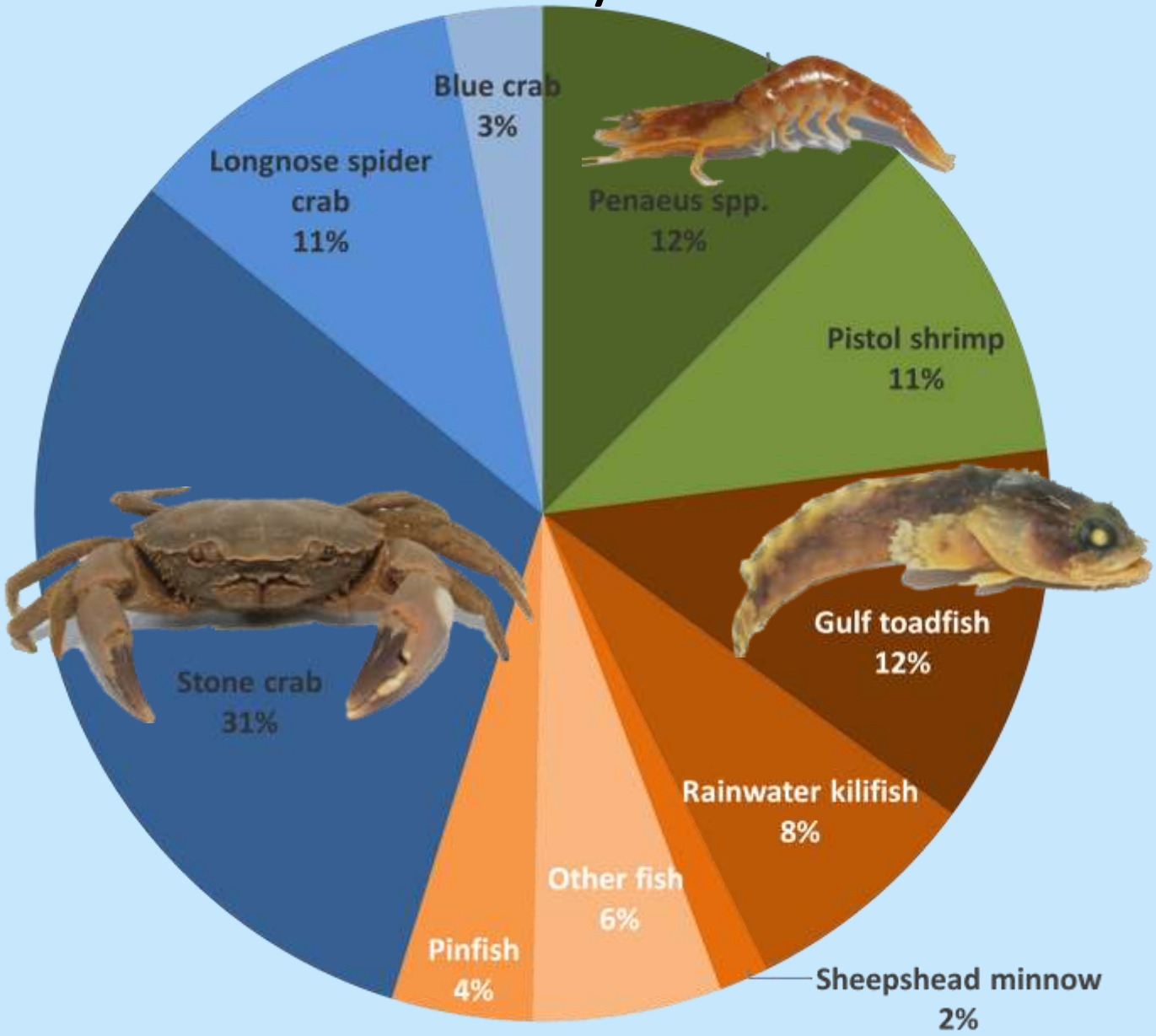


Shrimp

- 47% available prey abundance
- 23% available prey biomass
- 39% bolus biomass
- 89% of nests

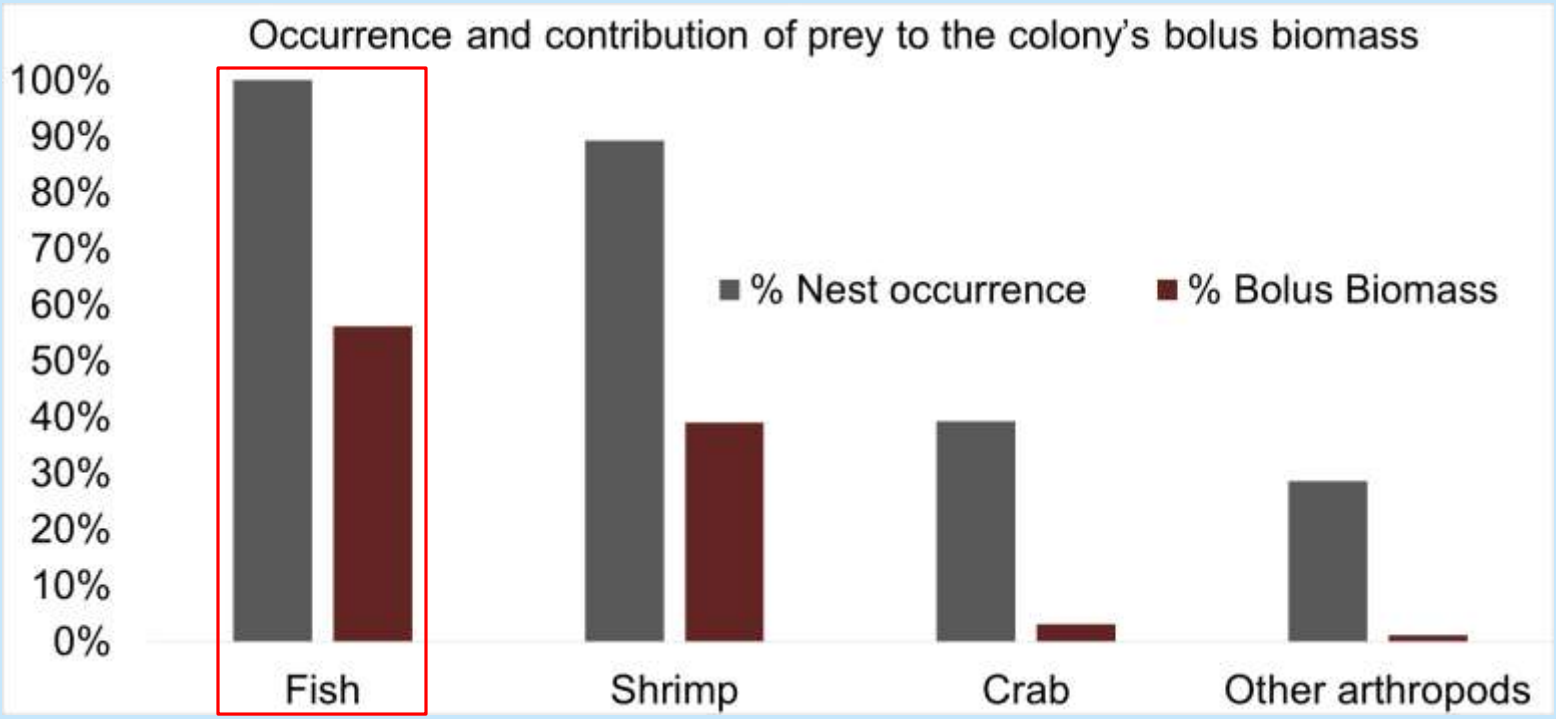


Available Prey Biomass



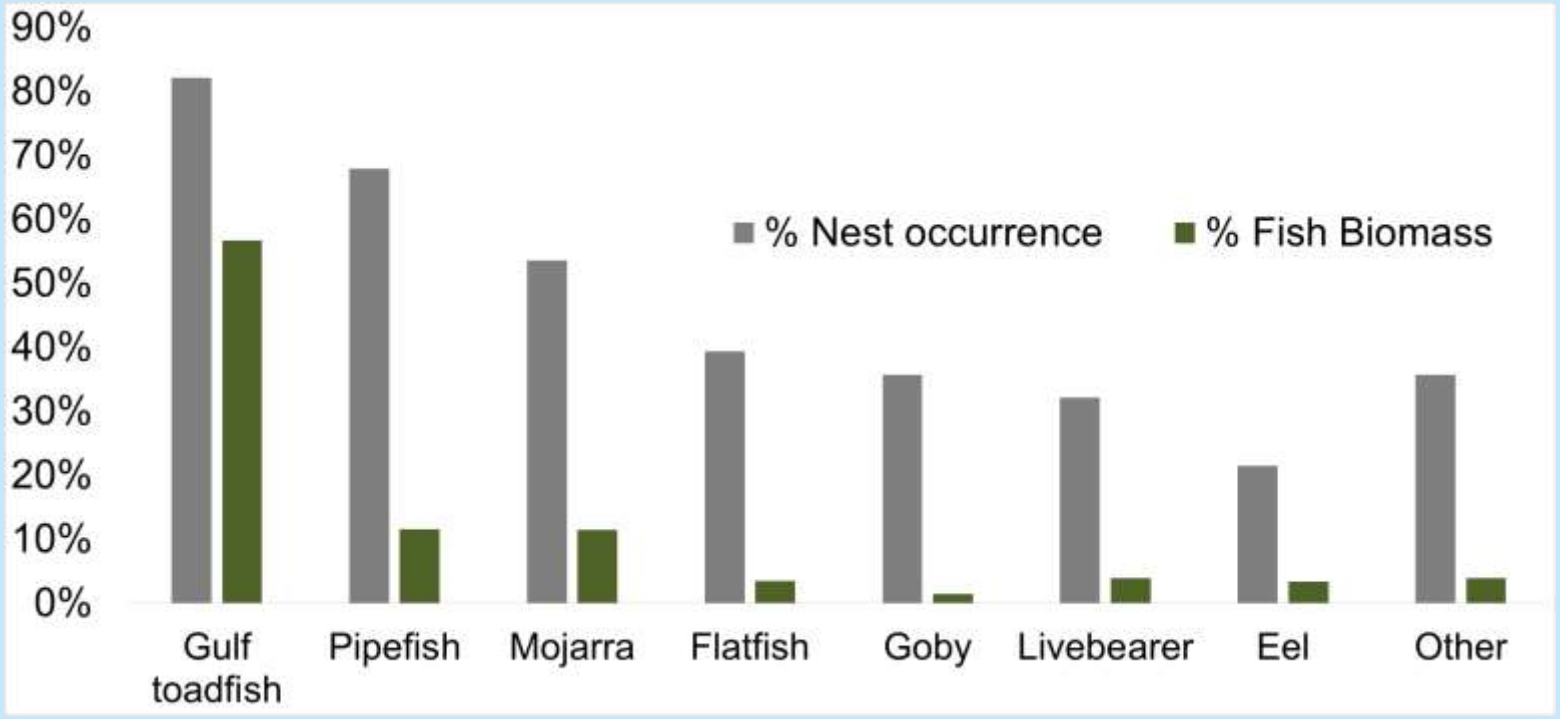
Fish

- 18% available prey abundance
- 32% available prey biomass
- 56% bolus biomass
- 100% of nests

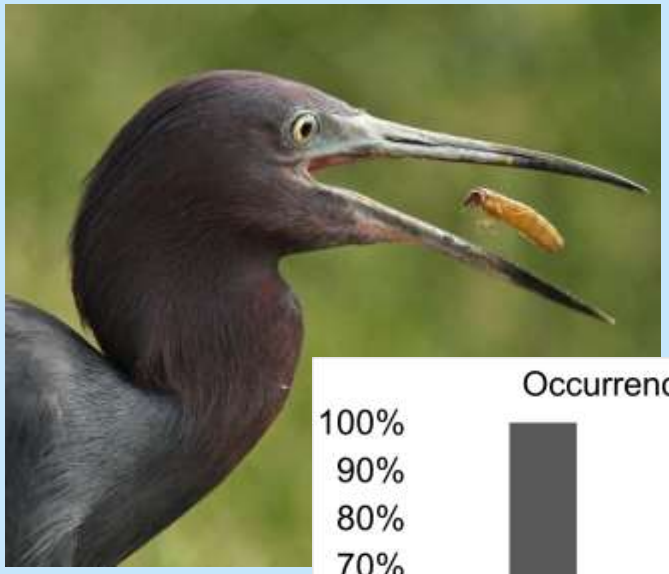


Gulf Toadfish in Bolus

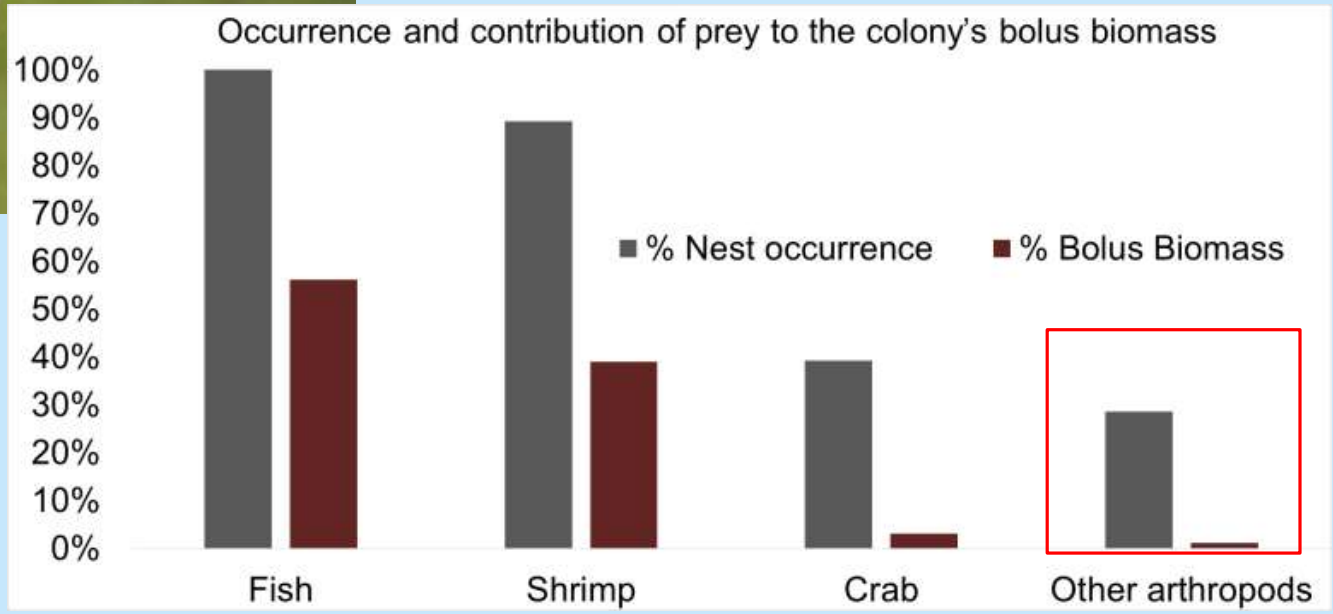
- Occurred in 57% of boluses
- 38% of total bolus biomass
- 57% of the fish bolus biomass



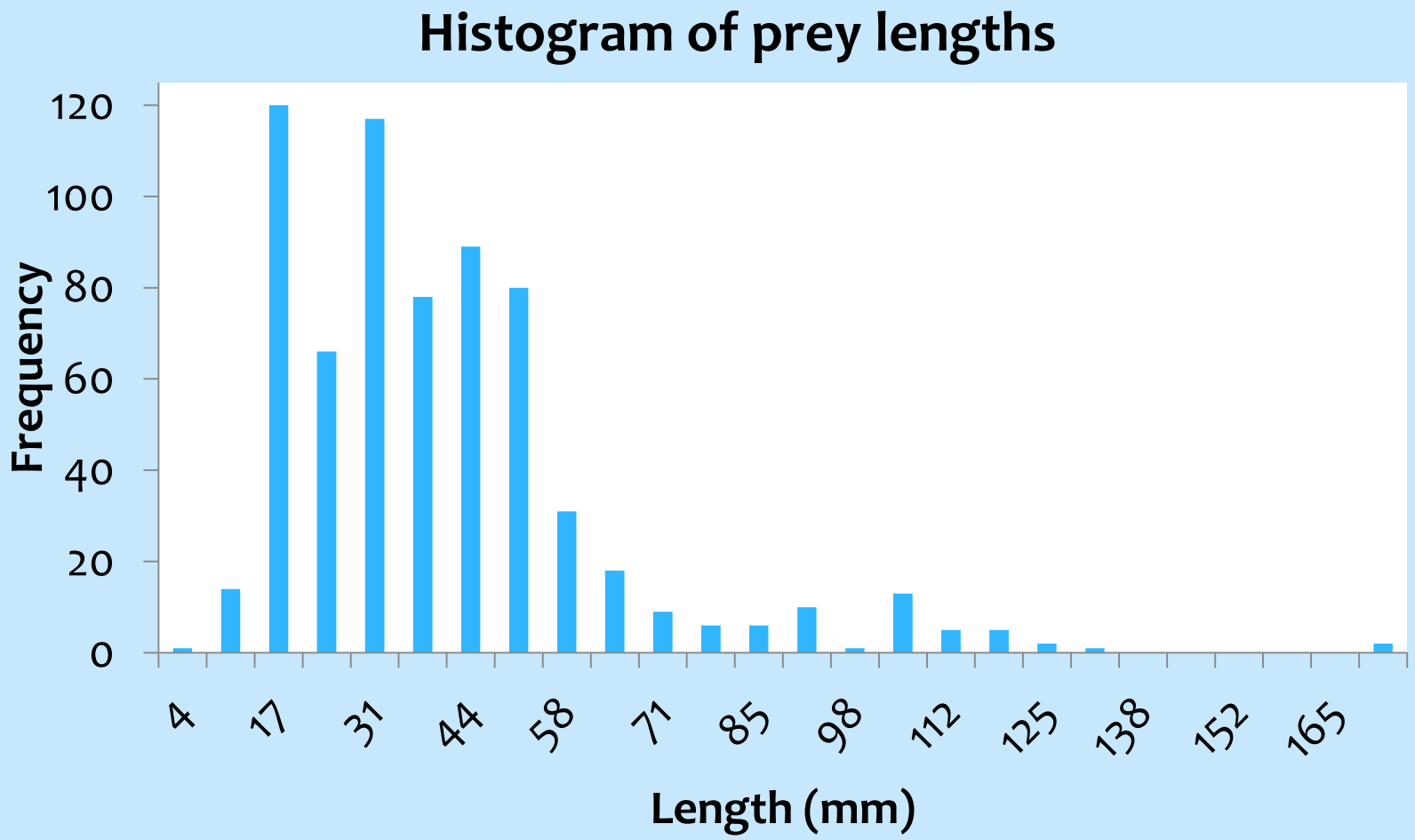
Other Arthropods



- Spiders & insects
- 4% abundance, 1% biomass
- 29% of nests



Prey Characteristics



Conclusions

- 77% of nestling diet is shrimp and Gulf Toadfish
- Highly selective for Gulf toadfish, moderately selective for shrimp, weak selection for crabs
- Consumed terrestrial prey
- Regional differences in prey selection
- LBHE prey range from 4 mm-172 mm

Future work

- Revisit nest colony & locate other colonies
- Prey sampling
- Foraging distribution surveys

Future work

- Assess influence of key prey species in habitat selection
- Predict changes to Little Blue Heron foraging habitat

Acknowledgments

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FLORIDA ATLANTIC UNIVERSITY

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