



ENHANCE ★ PROTECT CONSERVE

Predation on Juvenile Blue Crabs by Red Drum (preliminary findings)

GSMFC TCC Blue Crab Subcommittee Meeting

March 15, 2022

Purpose and Need

- Foraging habits of Red Drum have not been formally evaluated since the 1980's. Since that time, the population has rebounded in response to management measures.
- Decapod crustaceans are a known primary food source for sciaenids.
- The project provides current seasonal and spatial foraging habits of Red Drum.

Overview

- Funded through a MS Tidelands Trust Fund (FY15-M200-08) and NOAA fishery resource disaster funding – 2011 Bonnet Carré opening
- 483 stomachs analyzed
- Specimens collected opportunistically from 2015-2018 from volunteer recreational anglers, charters and ongoing FID sampling programs
- Specimen length range: 199mm (7.83”) to 1126mm (44.33”) TL

Month	Samples per Month	Season	Samples per Season
January	33	Winter	110
February	27		
March	50		
April	27	Spring	103
May	46		
June	30		
July	77	Summer	171
August	54		
September	40		
October	24	Fall	99
November	44		
December	31		

Methods

- Lengths and weights (if available) of each Red Drum were recorded
- Stomach contents separated and identified to lowest possible taxonomic classification, weighed, and volume determined



Data Analysis

- Prey item composition was analyzed by prey item species (or lowest possible taxa) and by general prey item groups – fish, shrimp, crabs
- Results were analyzed using the composite measure of percent index of relative importance (%IRI) which considers three well-known single-index approaches – percent number (%N), percent weight (%W) and percent occurrence (%O).

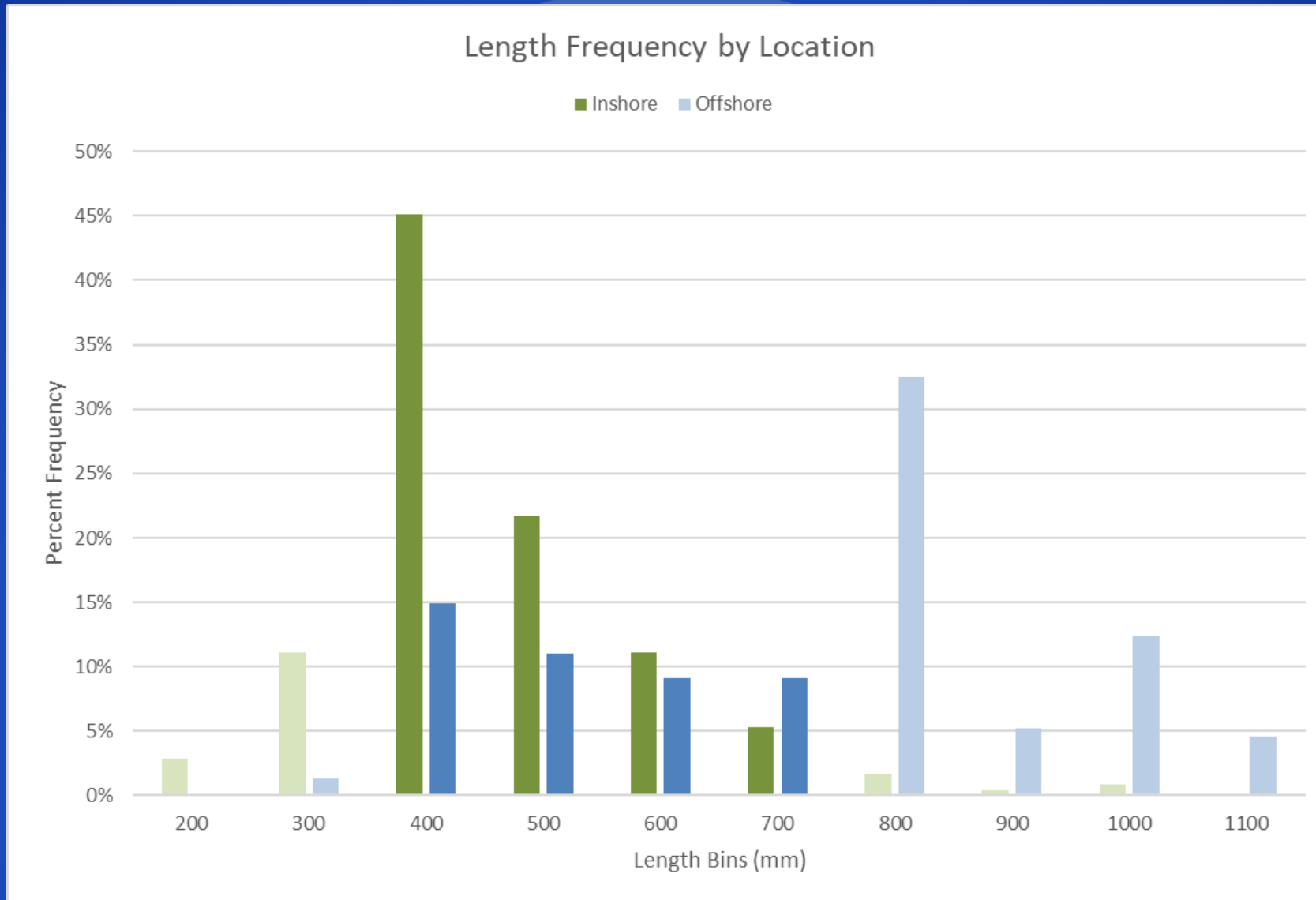
**Index of relative
importance (IRI)**

$$\text{IRI} = \%O(\%W + \%N)$$

%IRI

$$\%IRI = 100 * \text{IRI} / \Sigma \text{IRI}$$

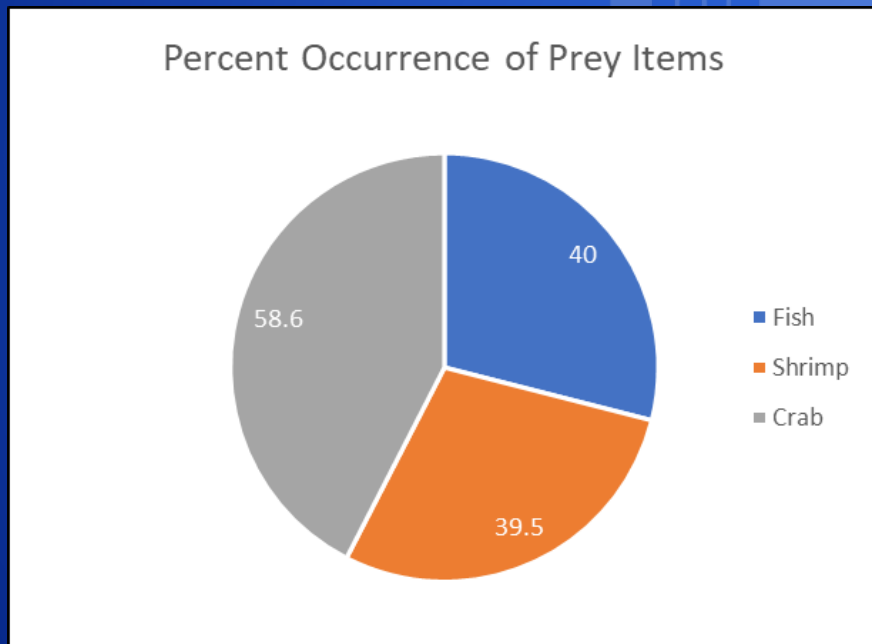
Red Drum Lengths



*Note- Darkened bars indicate the length bins which include fish within the MS Red Drum slot size (457 – 762mm)

Preliminary Findings

- 77% of the 483 stomachs contained identifiable prey items
 - Fishes (47.5% IRI) and crabs (38.7% IRI)
- Based on %O across all stomachs the primary prey item group is crabs (58.6%) followed by fishes (40.0%) and shrimp (39.5%)

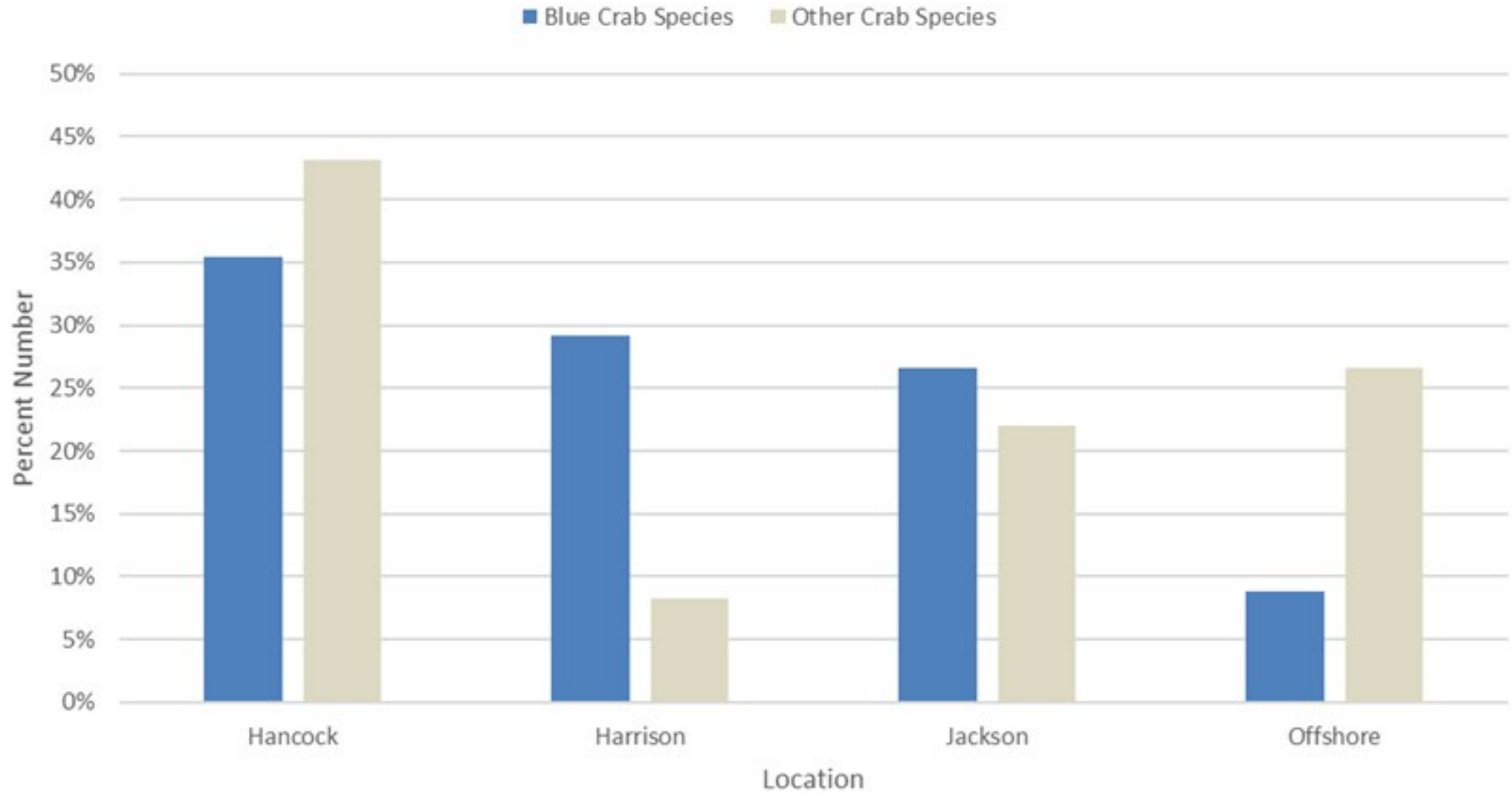


Prey Item	%O	%N	%W	%IRI
Fish	40	31.3	76.8	47.5
Shrimp	39.5	27.4	4.4	13.8
Crab	58.6	41.4	18.8	38.7

Additional Findings

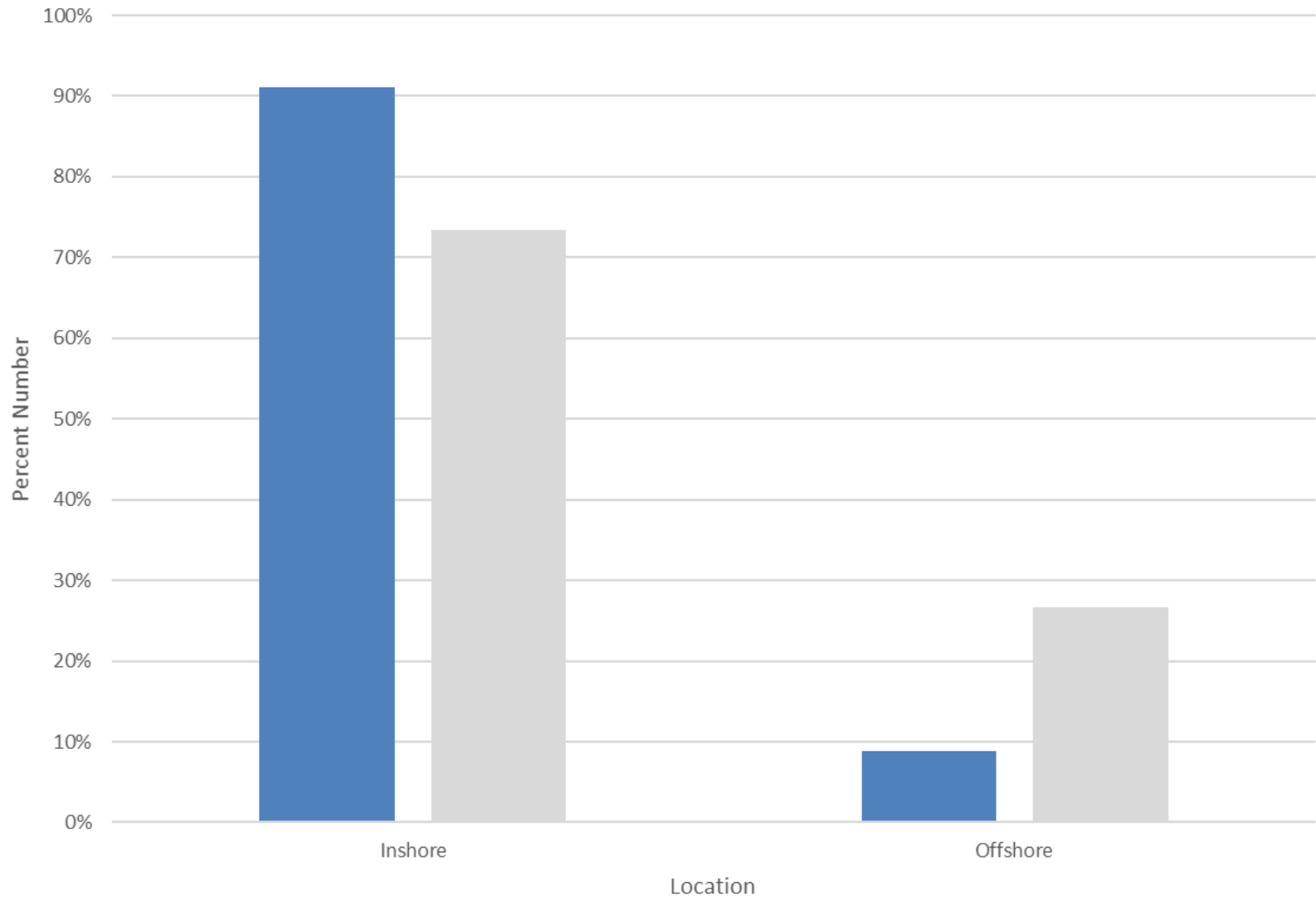
- Red Drum were binned by capture location – inshore (Hancock Co., Harrison Co. & Jackson Co.) and offshore
- Local specificity was limited by availability of capture location data
- Prey item selection was relatively consistent across three counties (inshore captures).
- Fish caught in offshore waters contained a more diverse assortment of stomach contents likely due to the diversity of available prey items.
- In all locations, Penaeid shrimp and *Callinectes* spp. were the most abundant prey items.
- There was a very high frequency of unidentified fish since they are more rapidly digested than crustaceans.

Percent Number of Blue Crabs by Location

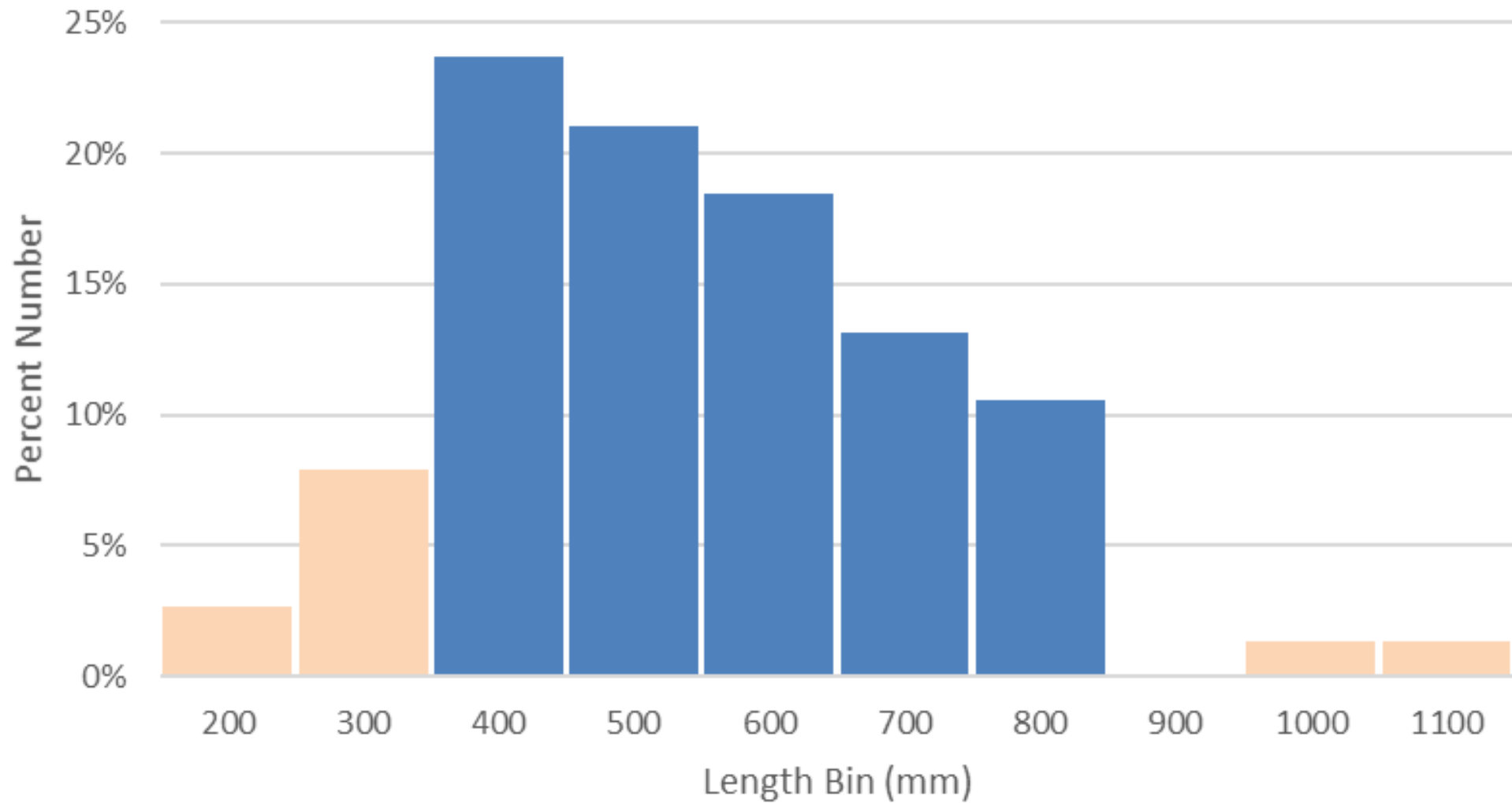


Percent Number of Crab Species by Location

■ Callinectes spp ■ Other Crab Species

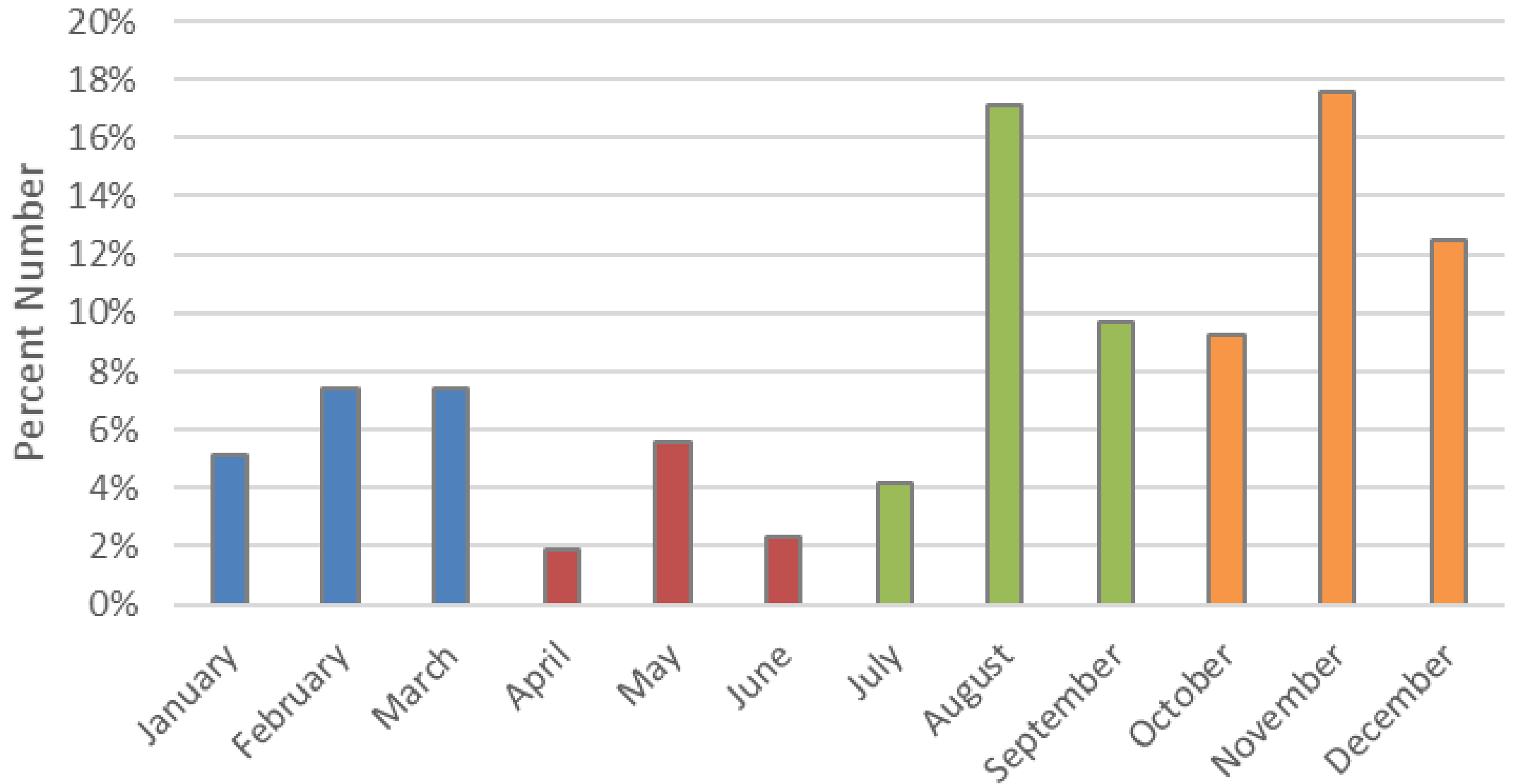


Percent Number of Blue Crabs by Red Drum Length



*Note- Dark blue bars indicate the length bins which include fish within the MS Red Drum slot size (457 – 762mm)

Percent Number of Blue Crabs By Month



Discussion

- How can these results inform management?
- Results confirm that foraging habits do shift with fish migration
- Size does matter... based on the life history of Red Drum and blue crabs and the common denominator of habitat utilization how can changes in management of predator species effect abundance of prey item species?
- ... and if management changes were made, could we project predator and prey abundance?