

# Species Specific Effort Estimation

Presentation to: GMFMC Shrimp AP

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# Rationale/Assumptions

- Use fishery independent SEAMAP data to determine species distributions in space and time at finest possible scale
- Pair with fishery dependent ELB data to statistically apportion targeted effort
- Species specific effort sums to the total effort (NOT comparable with previous estimates where effort does not sum to the total)

## Assumptions:

- There have been no systematic shifts in relative habitat use patterns among the Penaeid species across the duration of the SEAMAP survey (generally supported by the data; allows aggregation over years to better estimate sparse cells)
- Only three Penaeids (brown, pink, white) and royal reds are being explicitly targeted

# Proportion trip ticket reported landings, 2014-2022

COMMON NAME	TAIL WEIGHT (lbs.)	PERCENT
SHRIMP, NORTHERN BROWN	312,886,616	52.2
SHRIMP, NORTHERN WHITE	258,837,465	43.2
SHRIMP, NORTHERN PINK	23,841,794	4.0
SHRIMP, ROYAL RED	1,040,249	0.2
SHRIMP, ATLANTIC SEABOB	939,506	0.2
SHRIMPS, PENAEOID	887,021	0.1
SHRIMPS, ROCK	865,118	0.1
SHRIMP, ROCK	498,231	0.1
SHRIMP, ROUGHNECK	Conf.	0



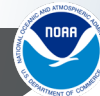
# Process

1. Penaeid ELB effort isolated from royal red (>100 fm)
2. All Penaeid effort in stat zones 1-7 (W. FL) defined as pink
3. All Penaeid effort in stat zones 8-21 (Northern Gulf) and deeper than 30 fm defined as brown
4. Penaeid effort in stat zones 8-21 and shallower than 30 fm proportioned according to relative weights of brown/pink/white in SEAMAP data (1987-2022) by:
  - Season\*
  - Stat zone\*\*
  - Depth zone (0-10 fm, 10-30 fm, 30+ fm)\*\*\*
  - Time of day (D/N based on sunrise/sunset)

\*SEAMAP survey only occurs in summer and fall, therefore summer and fall proportions are averaged within stratum cells and used as winter proportions

\*\*Stat zones 8-10 and 11-12 are combined due to limited data

\*\*\*SEAMAP survey has 5 fm minimum depth



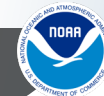
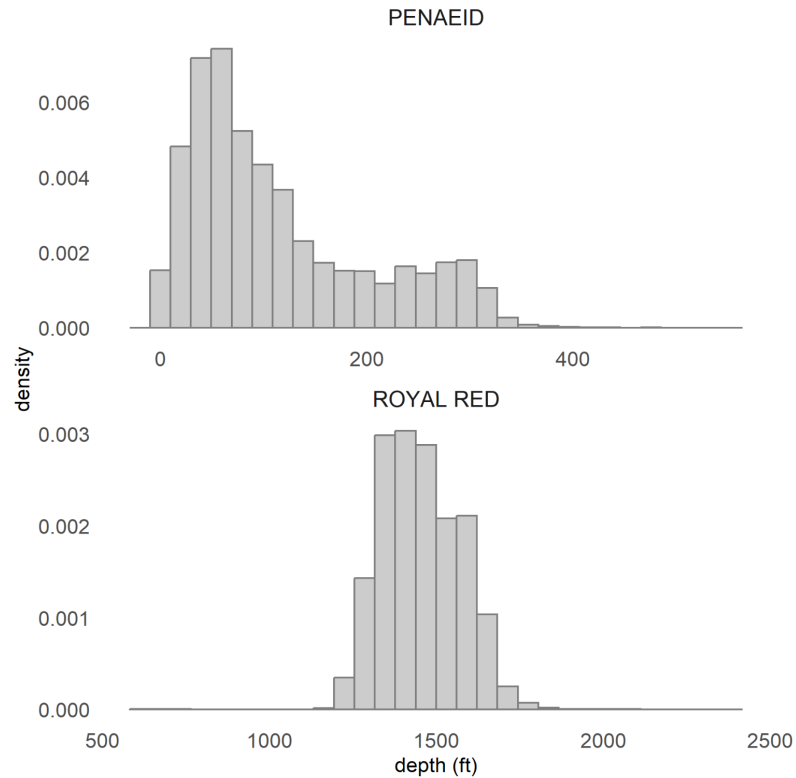
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# Why SEAMAP over trip ticket?

- Trip tickets are not reported at sufficient spatial and temporal resolution to capture variables that are important to predicting species distribution
  - Single stat zone reported for trips spanning many (e.g., 30+) days and multiple stat zones
  - No depth information
  - No time of day information
- Species not always reported as completely and accurately on trip tickets (e.g., sometimes mixed species trips are reported as single species)
- SEAMAP runs 30 minute tows, allowing relative species abundances to be derived at a much finer scale

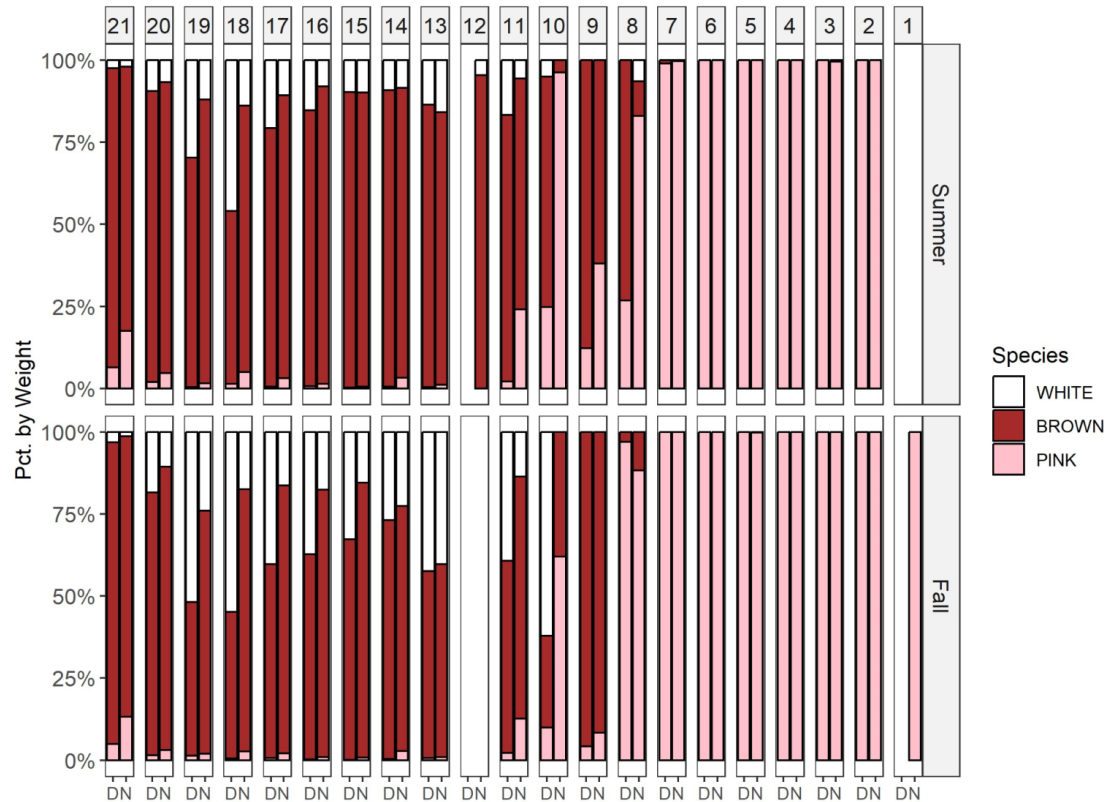


# 1. Isolation of royal red effort

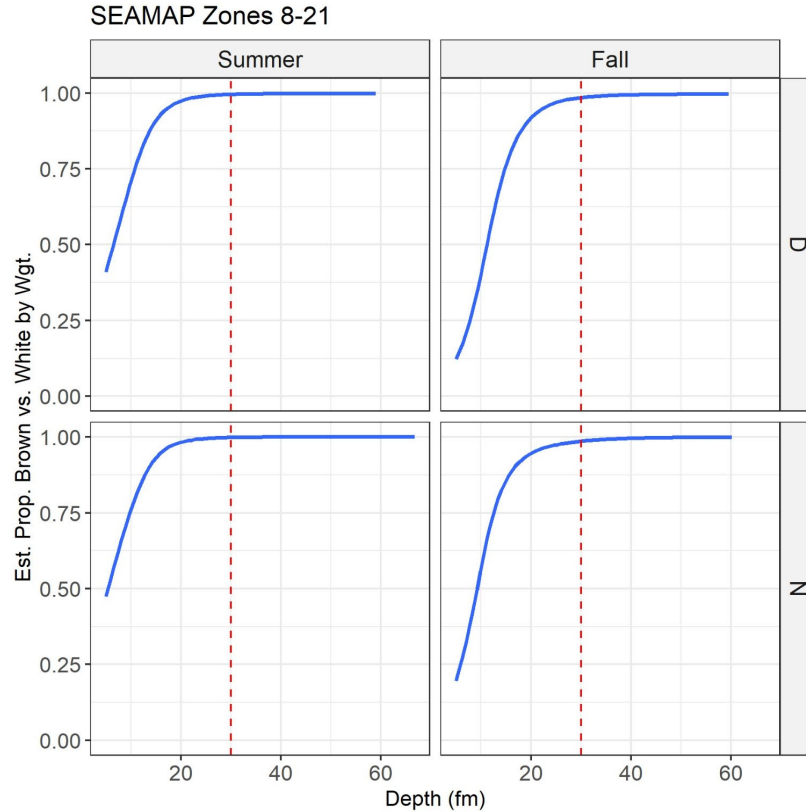


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## 2. Isolation in pink shrimp effort in zones 1-7

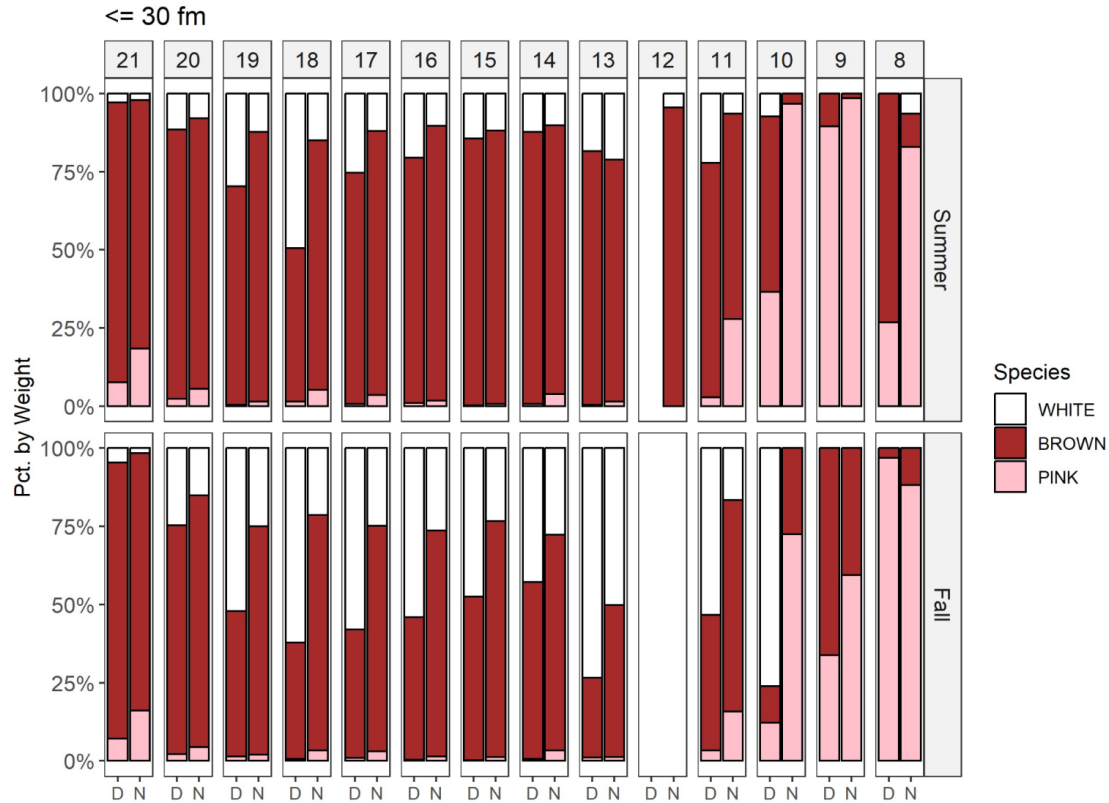


### 3. Isolation of brown shrimp effort in stat zones 8-21, >30 fm

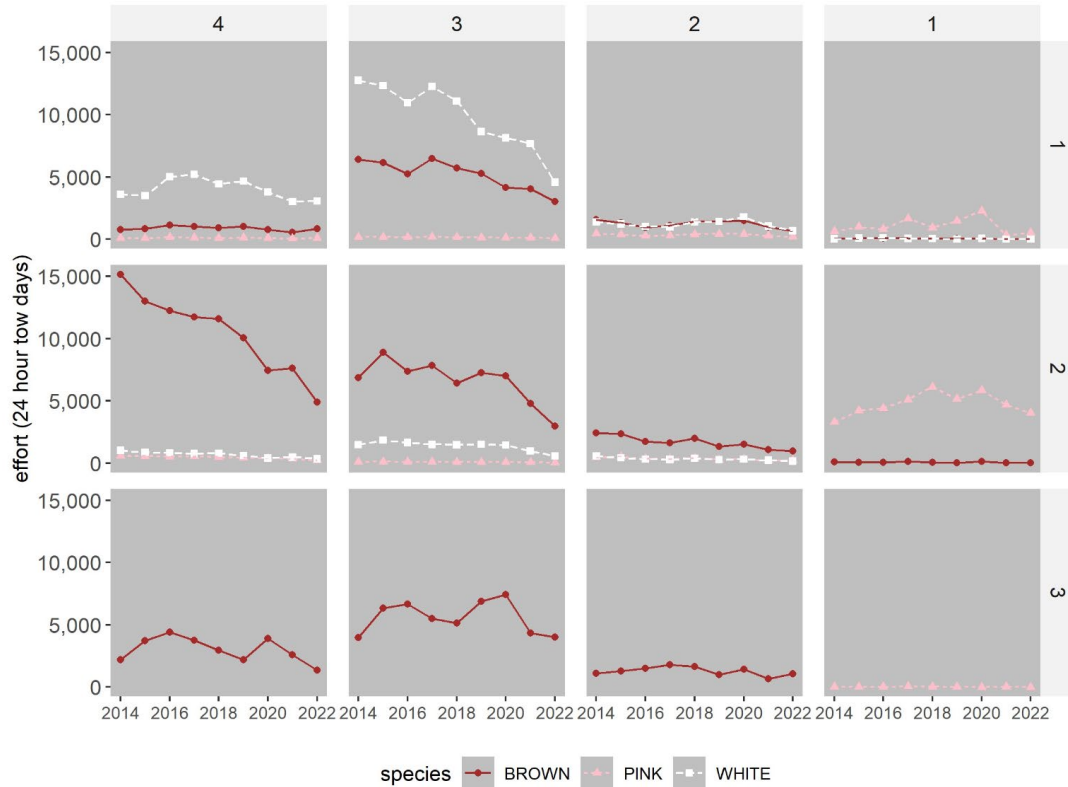




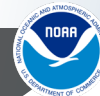
# 4. Proportioning of effort by stratum in stat zones 8-21, <=30 fm



# Time series of estimates, 2014-2022



Effort estimates grouped by:  
 historical area (horizontal axis) 1 = stat zones 1-9, 2 = 10-12, 3 = 13-17, 4 = 18-21  
 depth zone (vertical axis) 1 = 0-10 fm, 2 = 10-30 fm, 3 = 30+ fm



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# Use in assessment models

Determined at SEDAR 87 Data Workshop that species specific estimates are not necessary for assessment models

- SEFSC currently not pursuing additional work related to species specific estimates, e.g. how to obtain comparable estimates pre-2014



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# Acknowledgements

- Gulf of Mexico Shrimp Fishing Industry
- Gulf of Mexico Fishery Management Council, SSC and Shrimp AP
- Gulf of Mexico Commercial Shrimp Fishermen
- Internal SEFSC Shrimp Bycatch and Effort Workgroup



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