



# *Stock Assessment of Striped Mullet, 2018*



*DEPARTMENT OF ENVIRONMENTAL QUALITY*

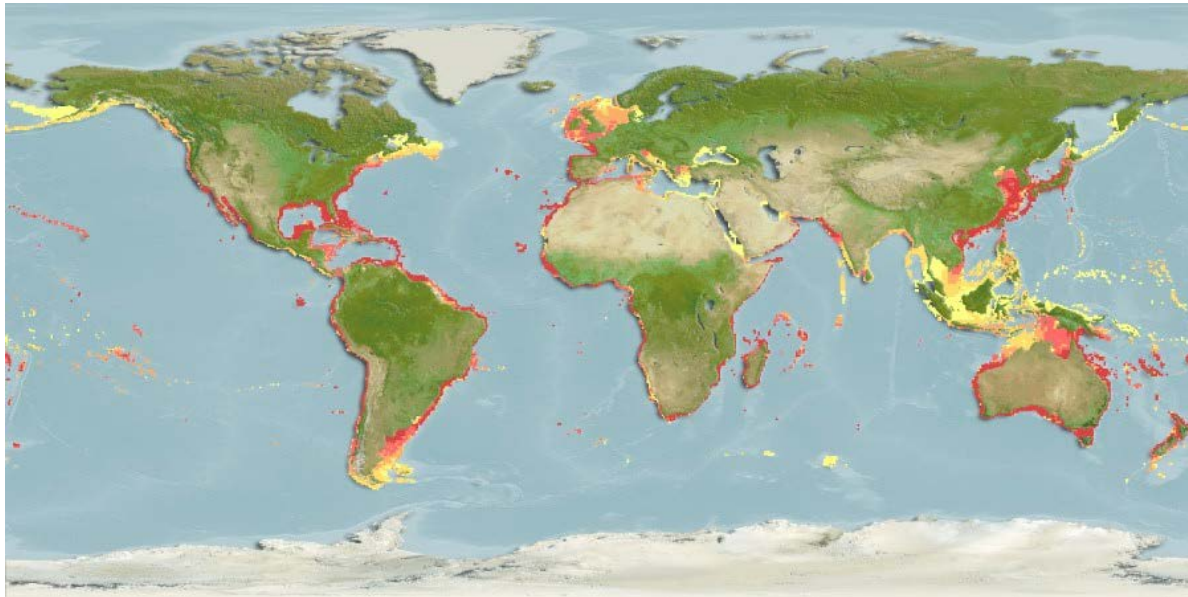
Marine Fisheries

N.C. Marine Fisheries Commission | Laura M. Lee | Aug. 16, 2018



# *Life History*

- Found in marine, brackish, and freshwater
- Max age in North Carolina is 14 years
- Spawning takes place offshore

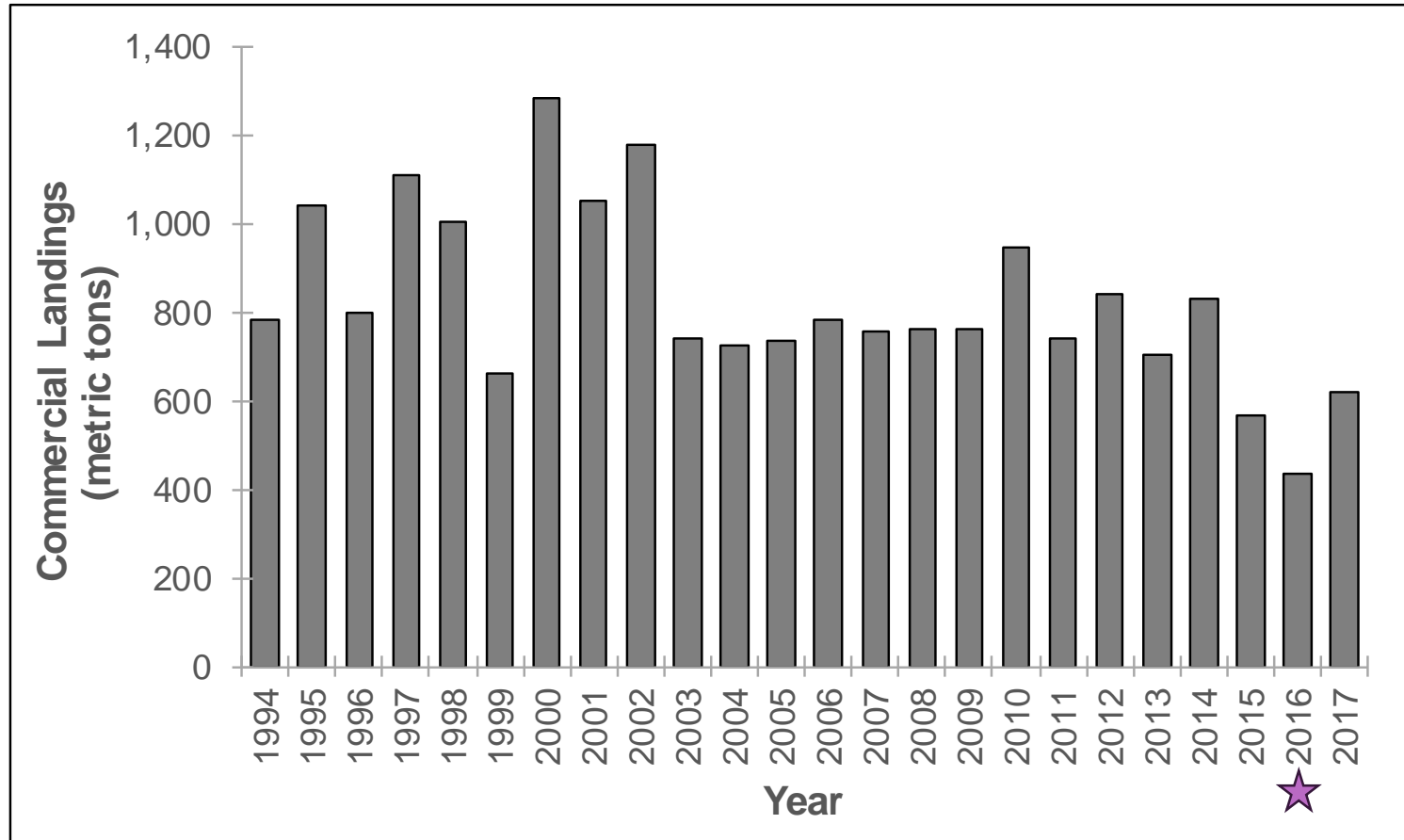


# *What is a Model?*

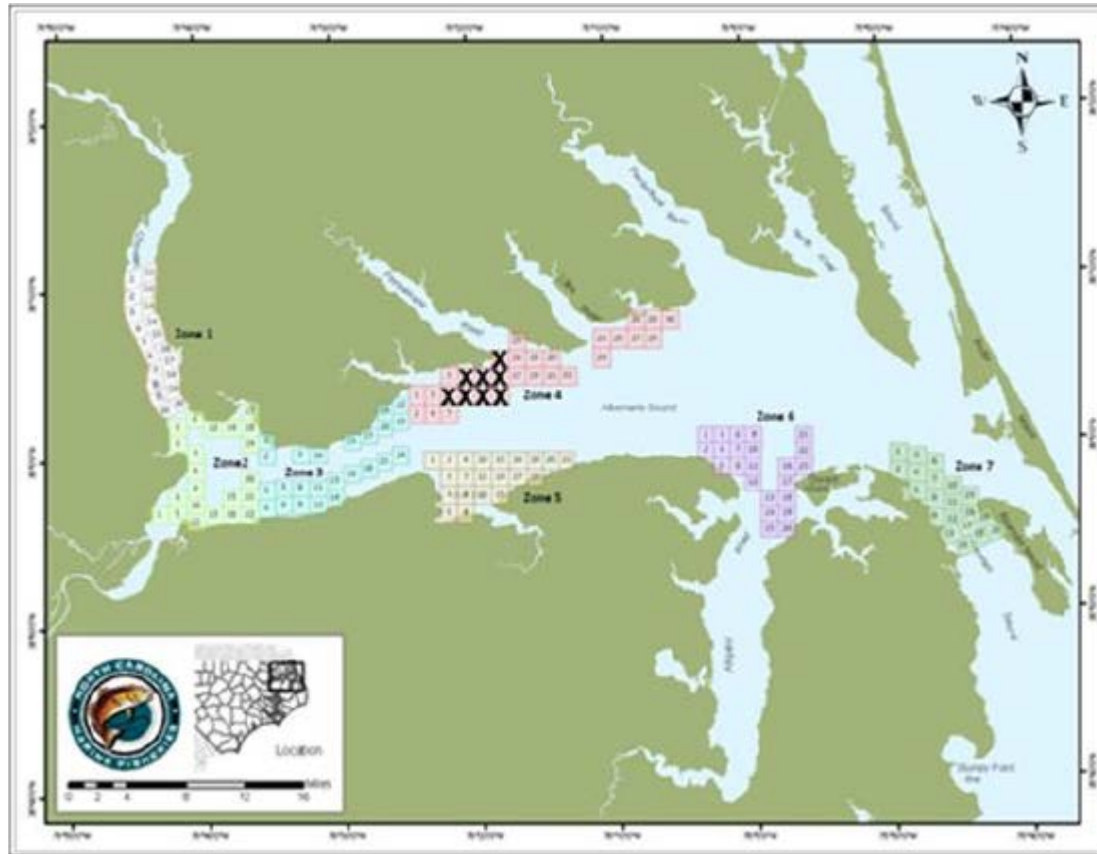
- A simple representation of a complex process
- Assessment model data needs
  - Catch—the amount of fish removed from a stock by fishing (landings plus discards)
  - Abundance—relative index of the number or weight of fish in a stock
  - Biology—provides information on growth, maturity, and natural mortality
- Data types
  - Fisheries-dependent
  - Fisheries-independent



# Commercial Landings



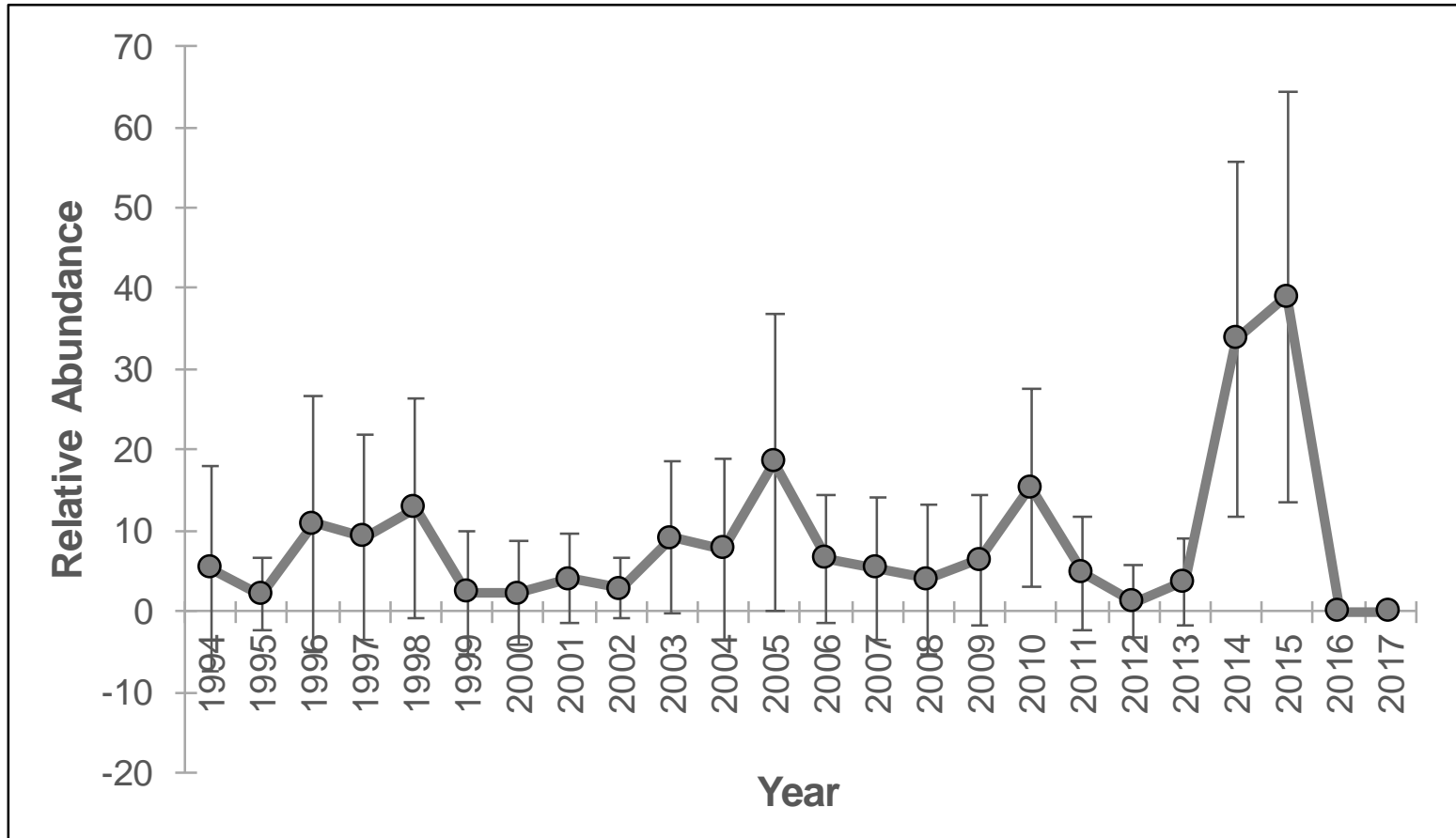
# *Striped Bass Independent Gill-Net Survey*



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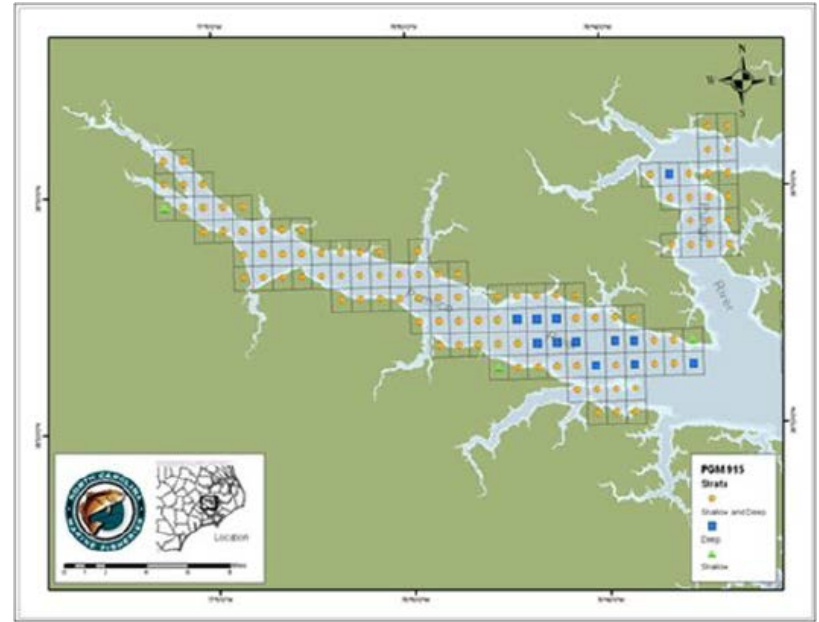
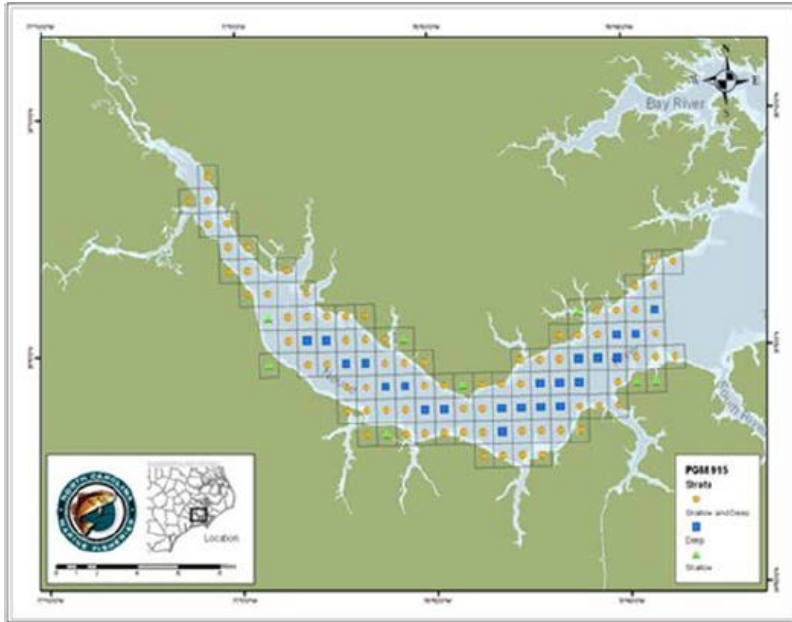
# *Striped Bass Independent Gill-Net Survey November-February*



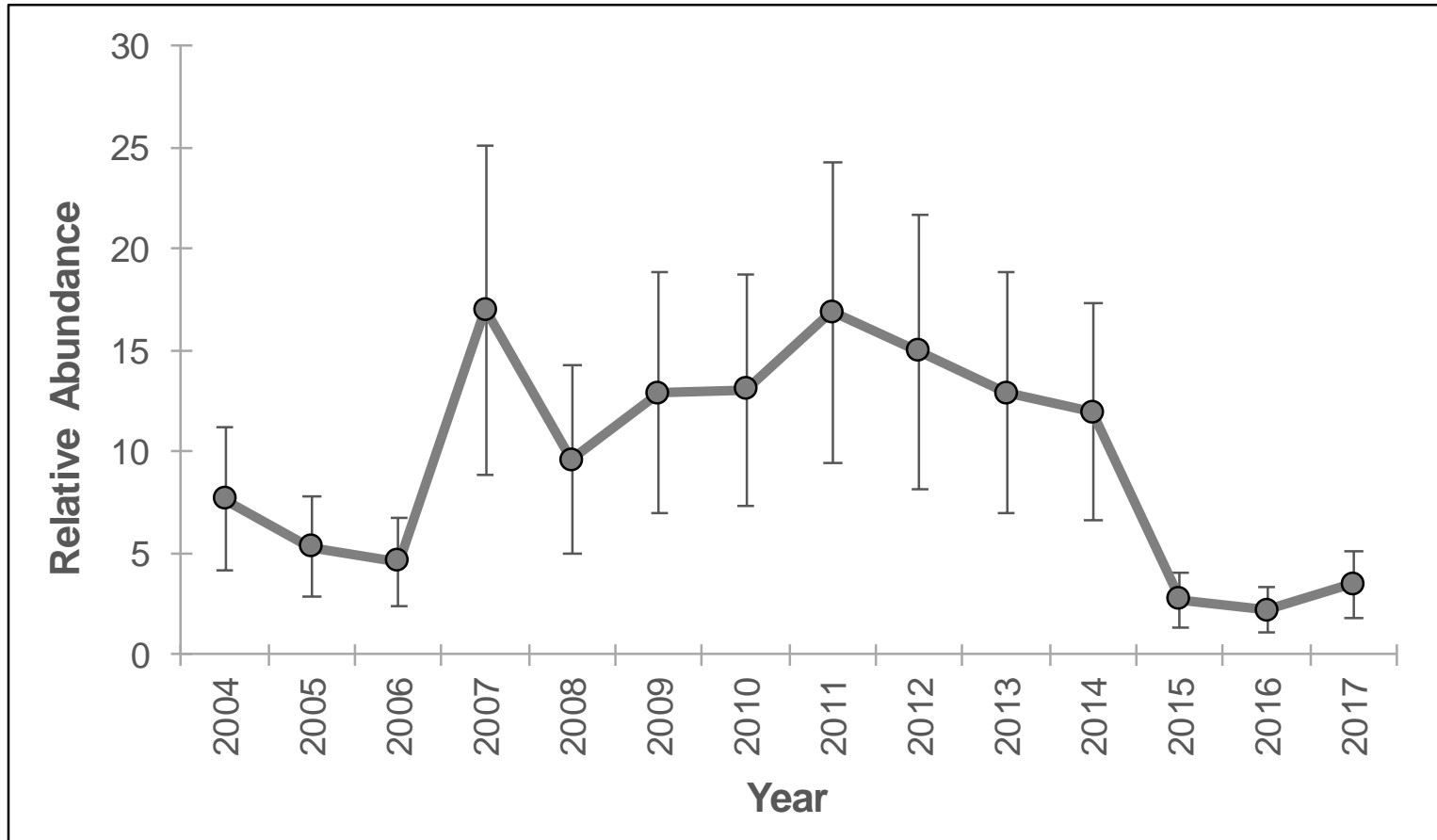
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# *Fisheries-Independent Gill-Net Survey*



# *Fisheries-Independent Gill-Net Survey October-November*

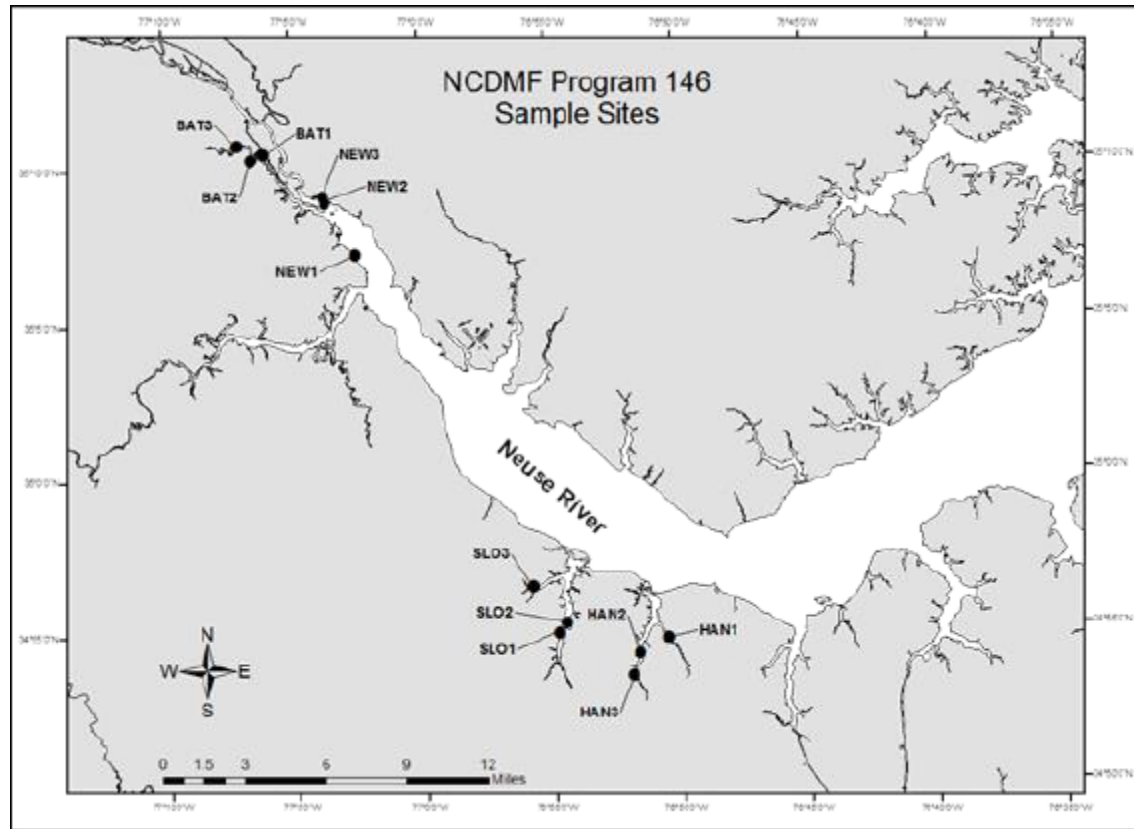


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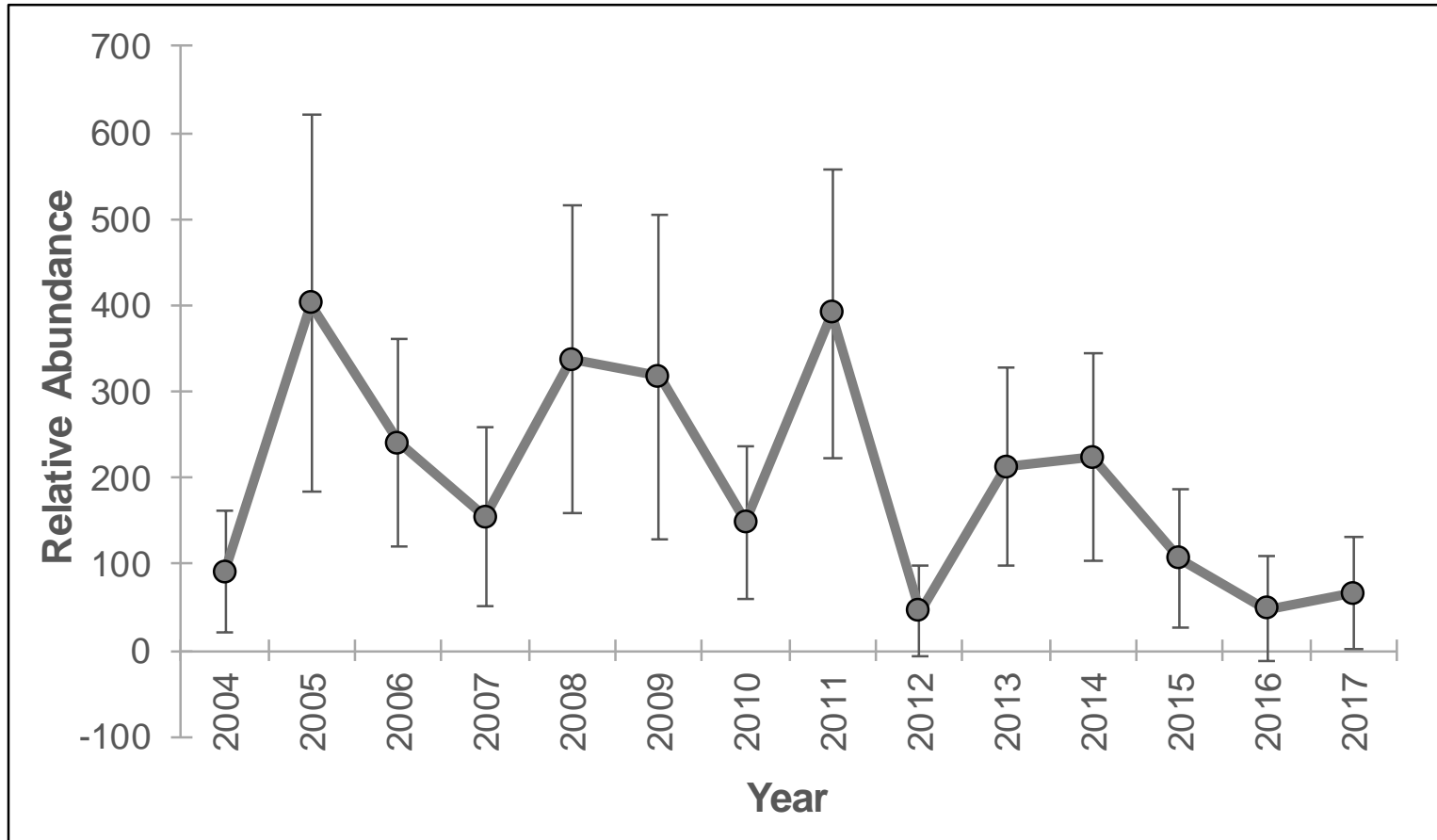
# *Striped Mullet Electrofishing Survey*



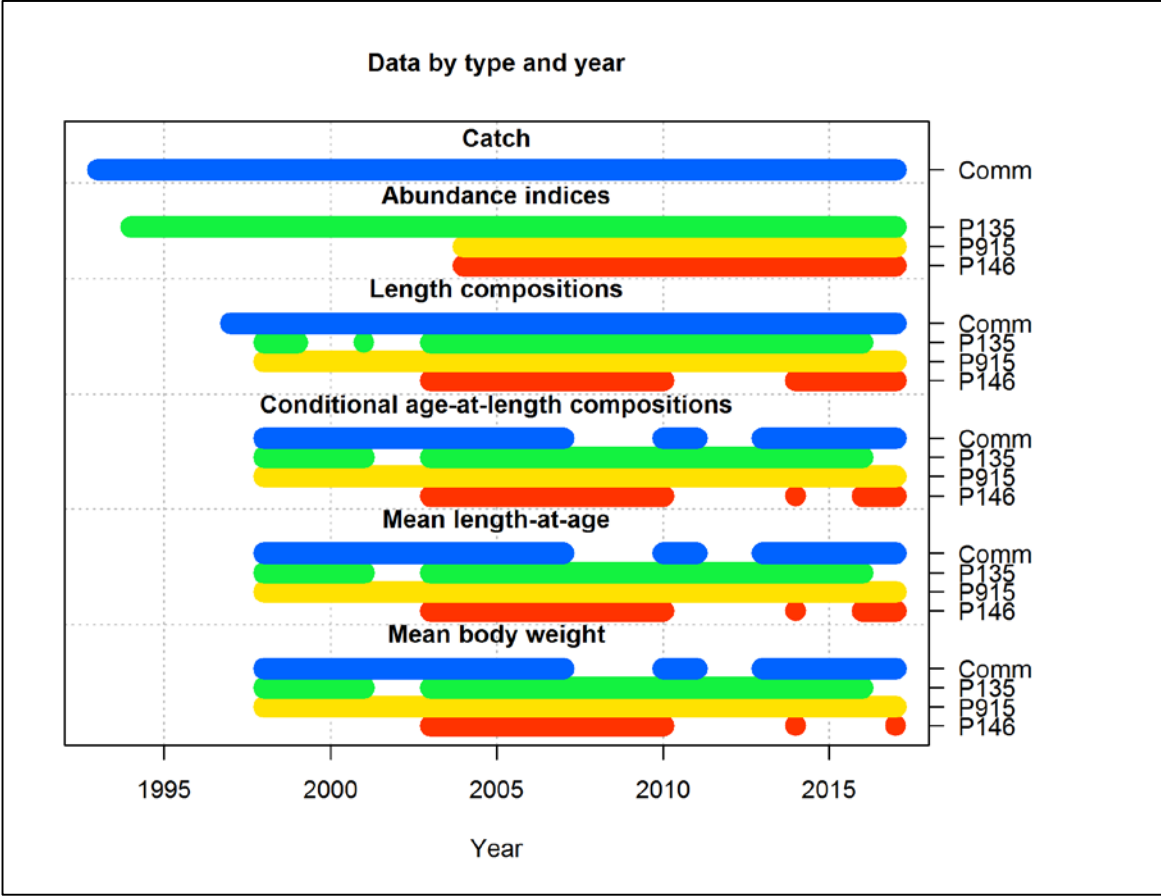
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# *Striped Mullet Electrofishing Survey January-April*



# Data Summary

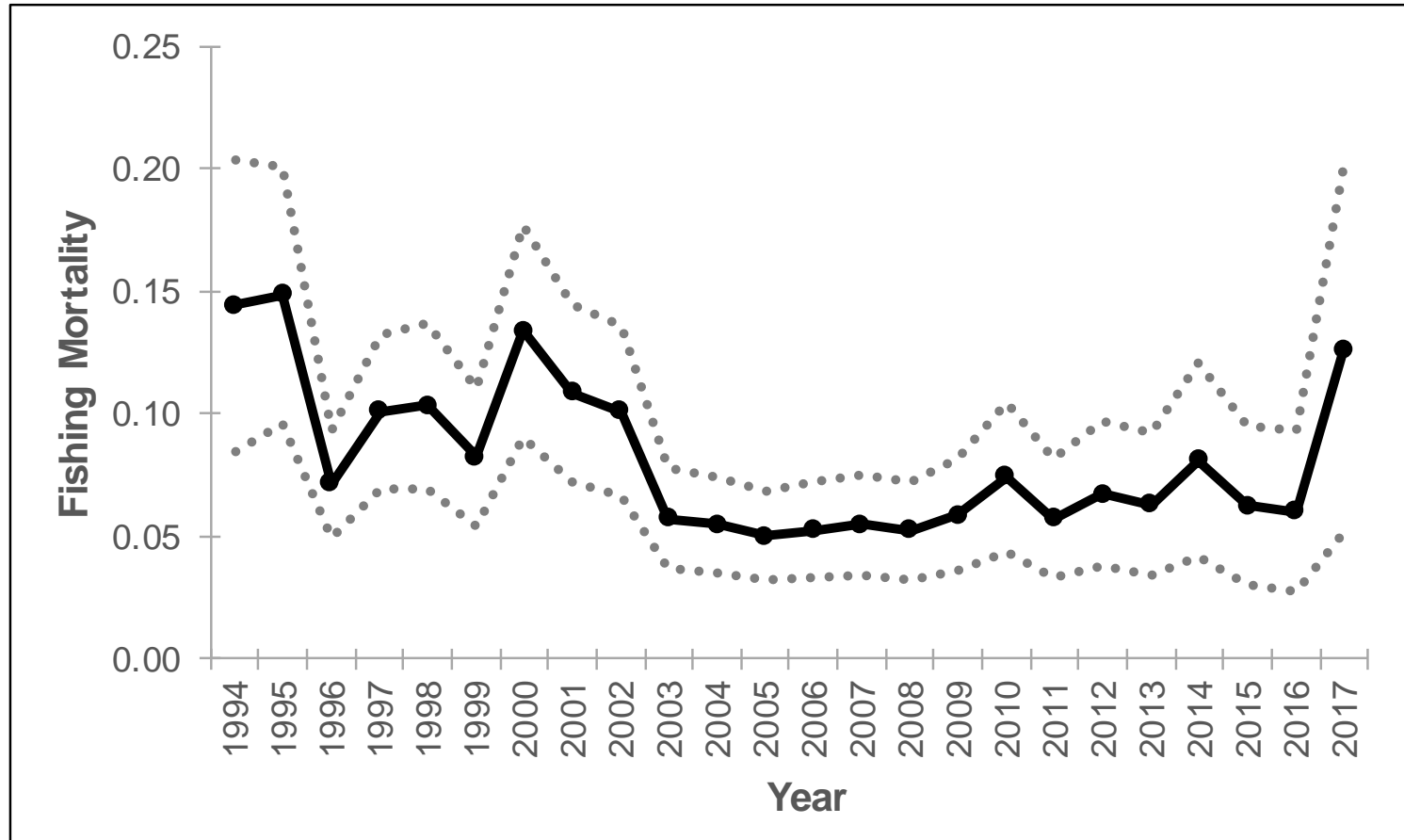


# *Model Structure*

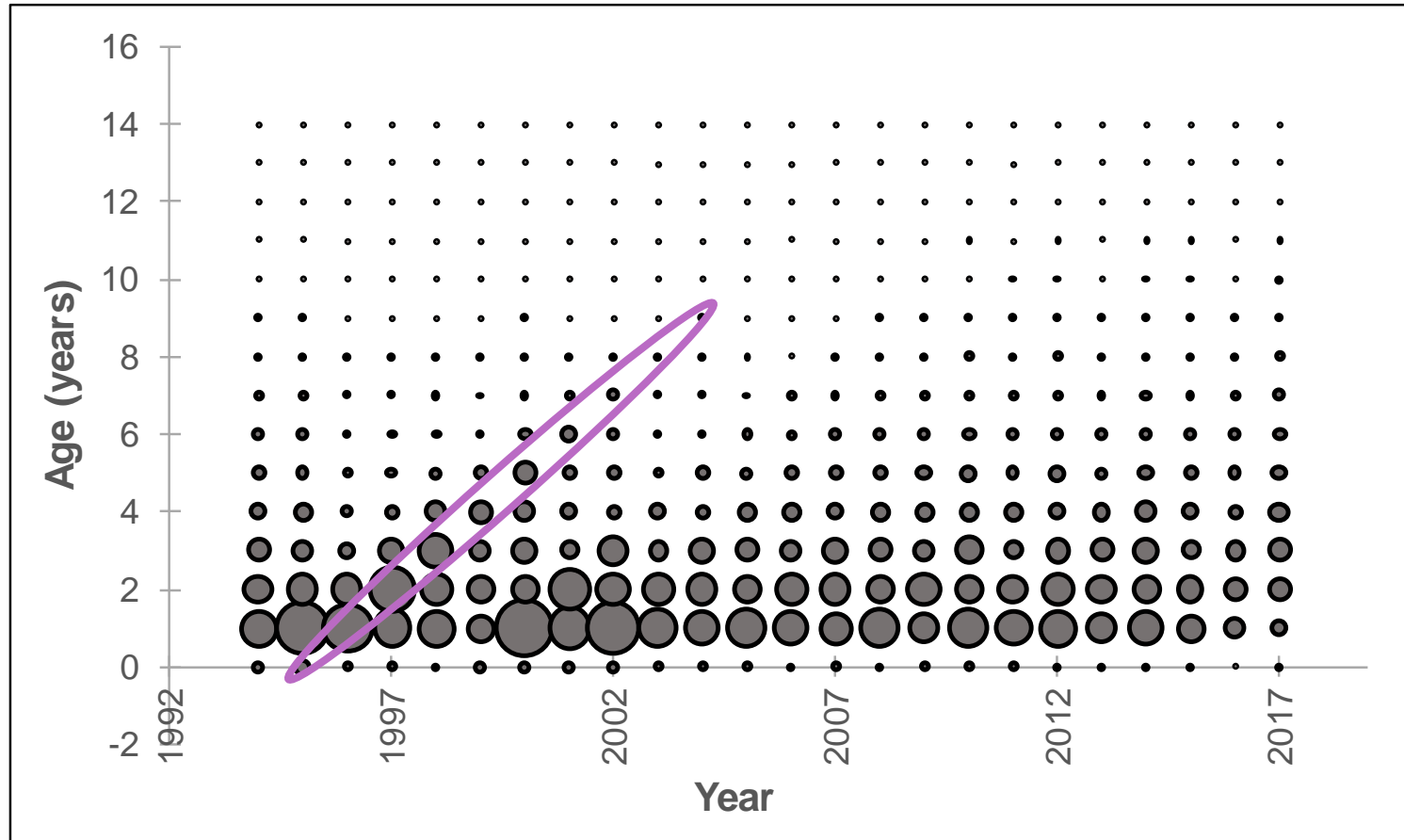
- Unit stock: North Carolina
- Calendar year: 1994 through 2017
- Birth date: January 1
- Gender: Two sexes
- Age range: Age-7 plus group (max age of 14)
- Natural mortality: Age-specific



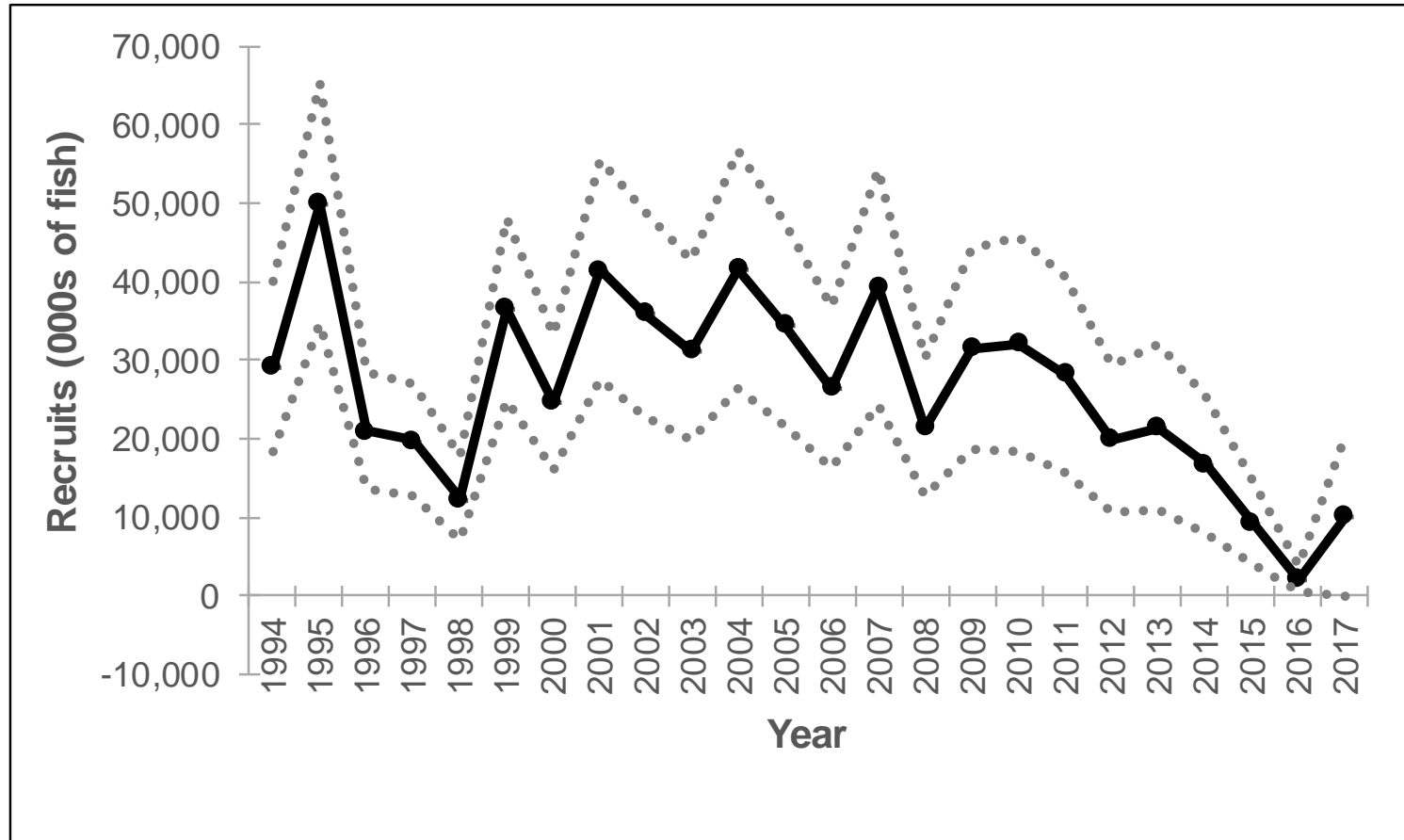
# Results—Fishing Mortality



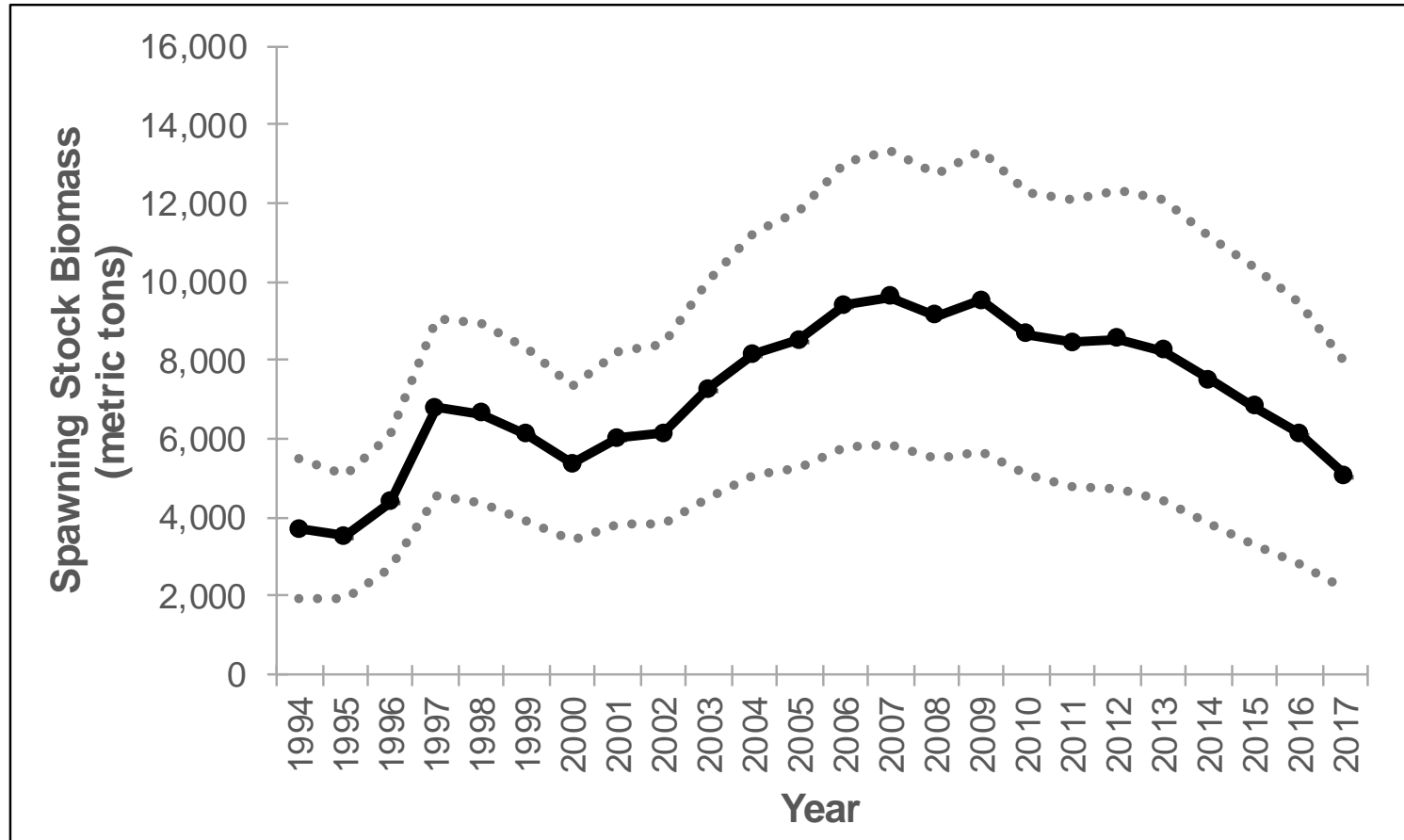
# Results—Predicted Catch at Age



# Results—Recruitment

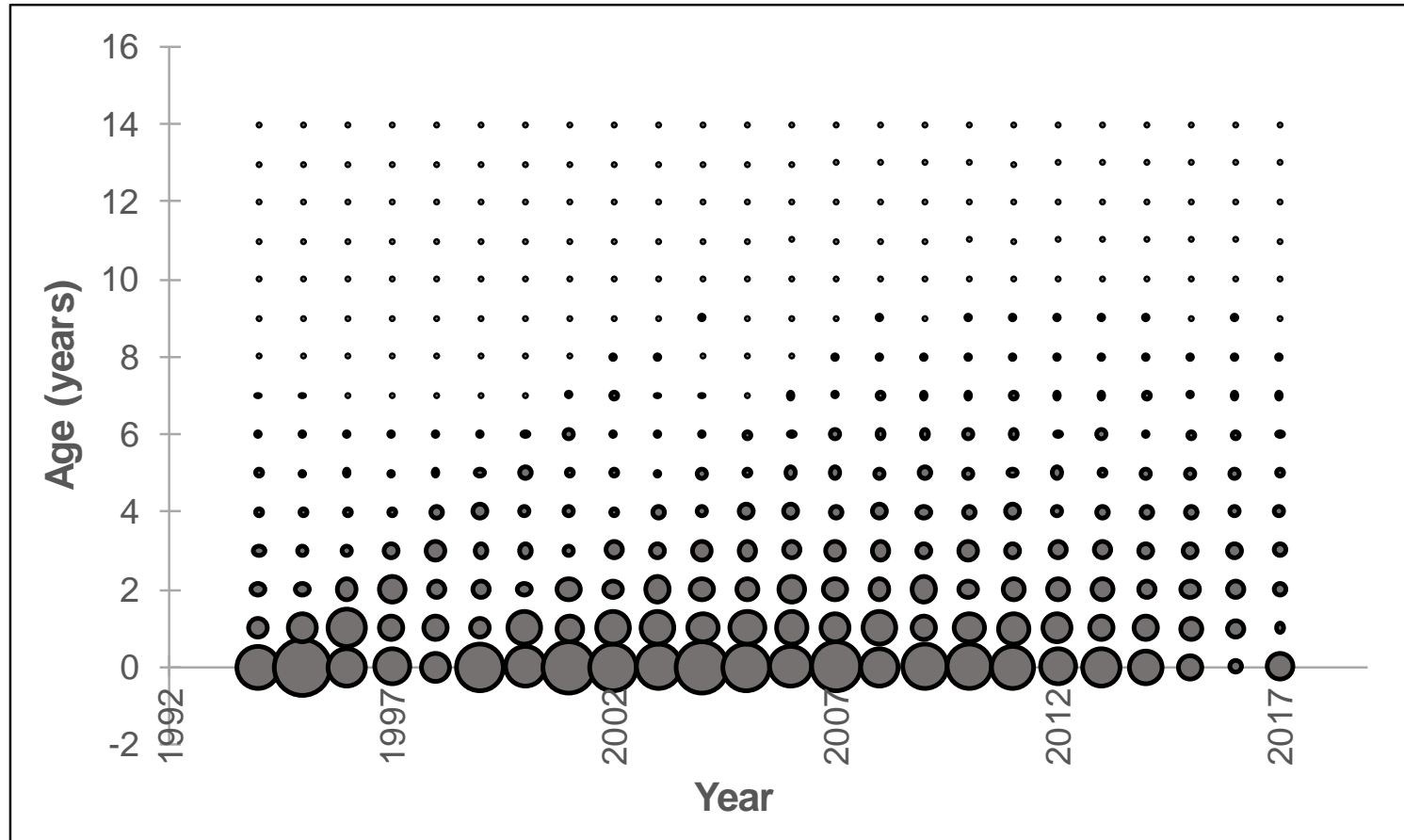


# Results—Female Spawning Stock Biomass





# Results—Predicted Numbers at Age



# *Reference Points*

- Fishing mortality ( $F$ )
  - Target:  $F_{35\%}$
  - Threshold:  $F_{25\%}$
- Spawning stock biomass
  - Poor stock-recruit relationship
  - Lack of juvenile index
  - Biomass-based reference points considered unreliable

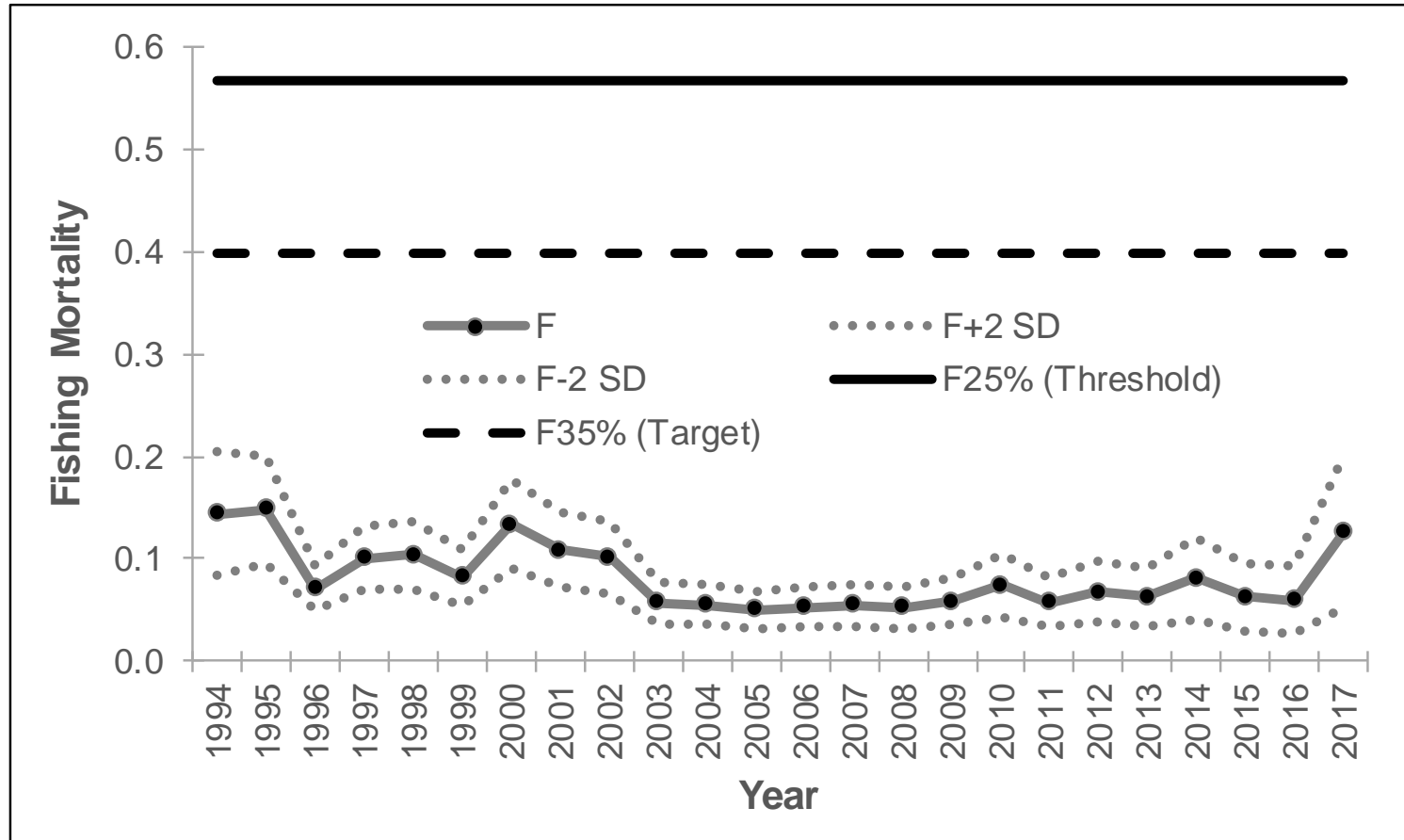


## *Determining Stock Status*

- If current fishing mortality ( $F_{2017}$ ) is greater than the threshold ( $F_{25\%}$ ), then **overfishing** is occurring
- Cannot determine overfished status



# Stock Status—Fishing Mortality



## *Stock Status—Fishing Mortality*

- $F_{2017} = 0.13$
- $F_{35\%} = 0.40$  (target)
- $F_{25\%} = 0.57$  (threshold)
- $F_{2017} < F_{25\%}$  overfishing is not occurring



## *Summary*

- Overfishing not occurring
- Overfished status could not be determined
- Recent abundance indices among the lowest on record
- Poor model fits to survey indices, average body weights, and length frequencies along with lack of contrast in observed data suggests model results may provide limited guidance
- Model results robust to various sensitivity analyses



# Questions?



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