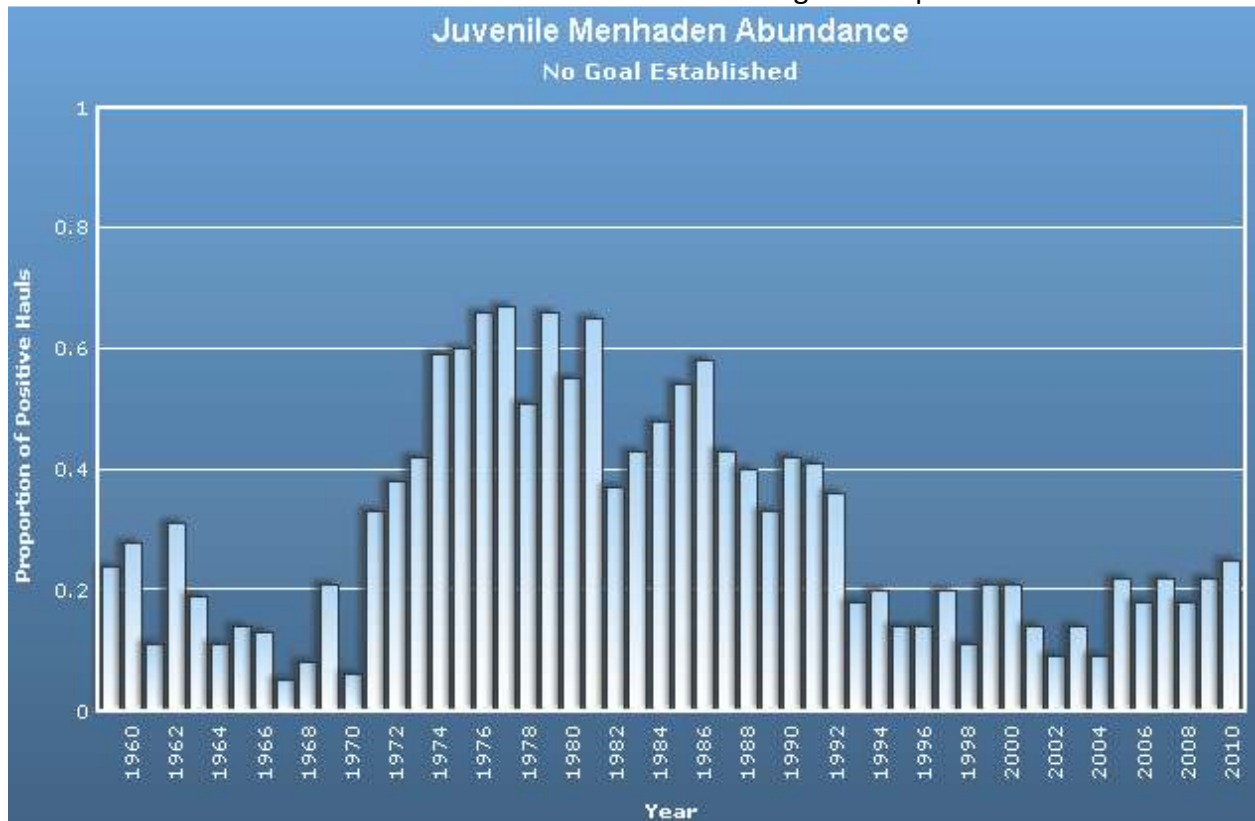


## Chesapeake Bay Program – Fisheries GIT Indicators - Menhaden

**Background:** We told the Chesapeake Bay Program we were going to update our public information indicators for striped bass and menhaden by November 21<sup>st</sup>. The below options are our proposed striped bass and menhaden indicators for Executive Committee review. For these indicators we would like to show something that represents both the current management strategies as well as some sort of Bay health/abundance component that would relate to the Chesapeake Bay. If you have any other options of ideas for available data please let us know.

### **Current Menhaden Indicator:**

- [http://www.chesapeakebay.net/indicators/indicator/juvenile\\_menhaden\\_abundance\\_maryland](http://www.chesapeakebay.net/indicators/indicator/juvenile_menhaden_abundance_maryland)
- Researchers in Maryland measure juvenile [menhaden](#) abundance by casting nets and recording the percentage of hauls with menhaden present. These are called “positive hauls.” The 2010 data show that menhaden were caught in 25 percent of the hauls



**Goal:** None

## Menhaden Options:

### 1. ASMFC Coastal Fishing Mortality & Bay Specific Landings

#### a. Graph A: Fishing Mortality

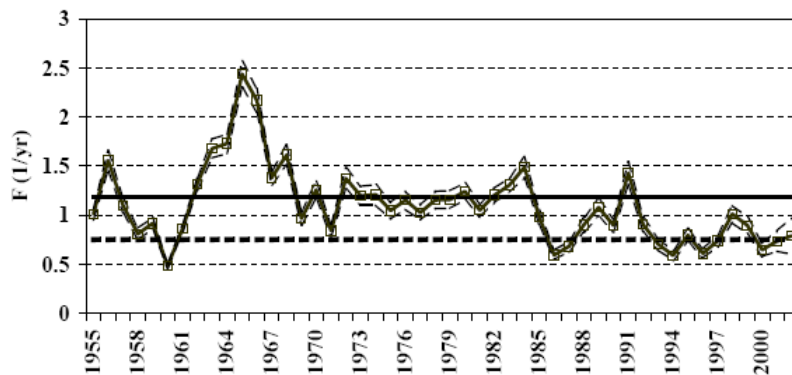
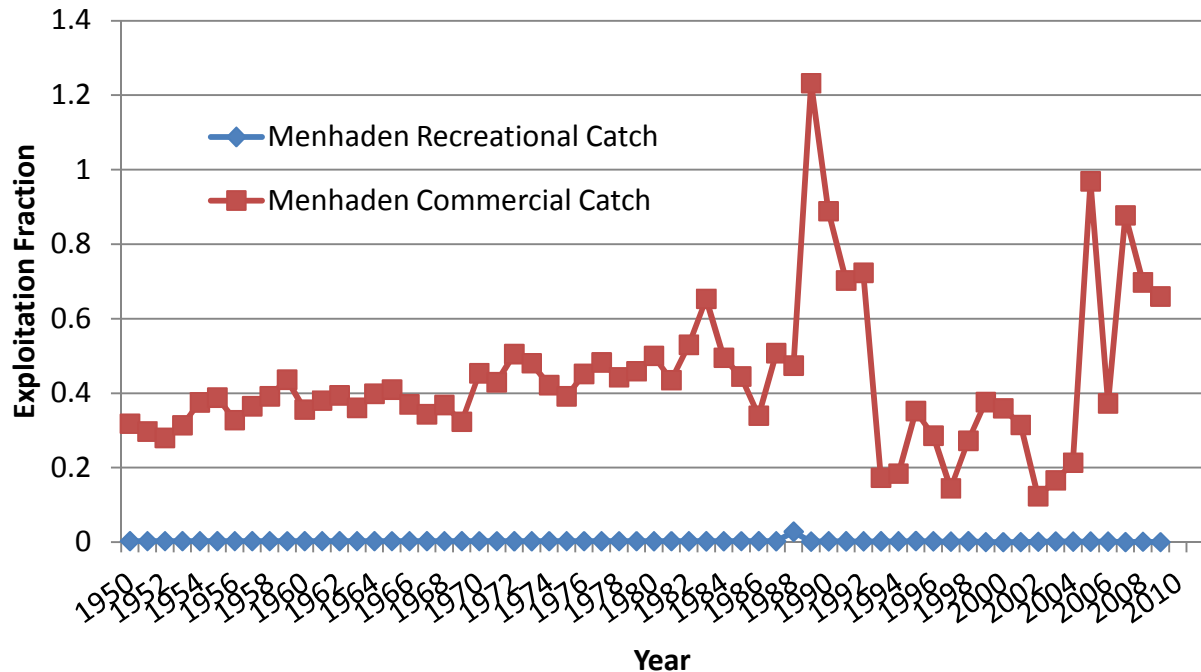


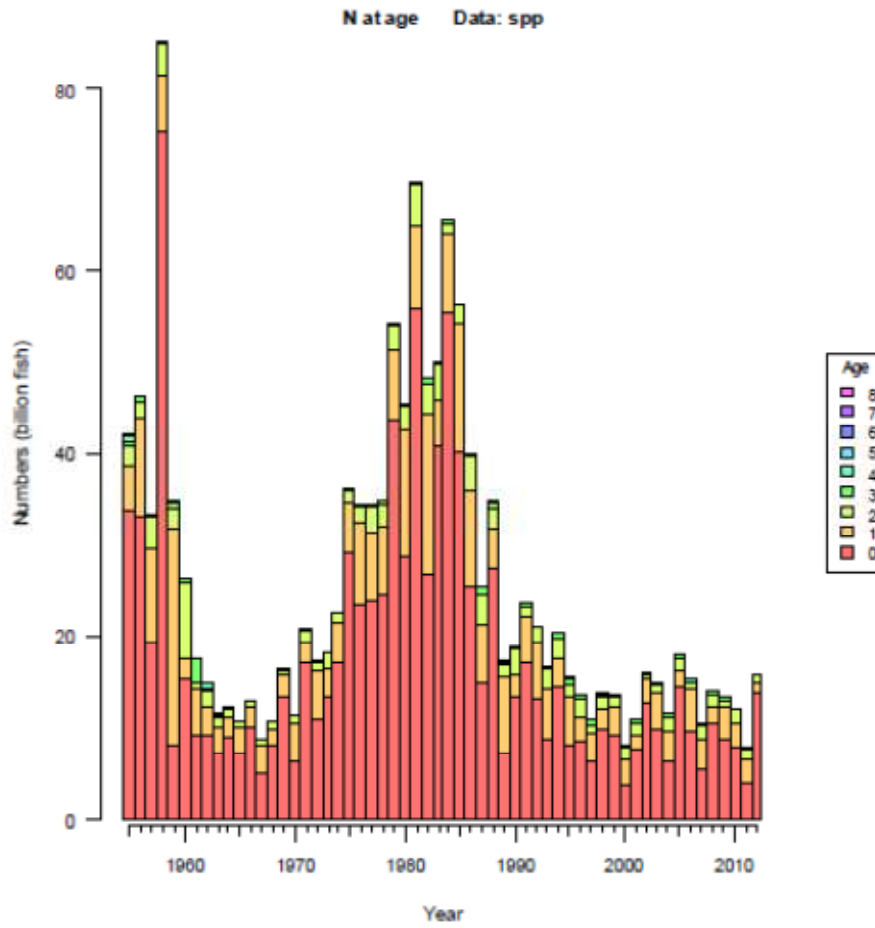
Figure 1. Atlantic menhaden fishing mortality rate,  $F$  (ages 2+) plus/minus 2 standard errors. Horizontal lines represent target (dashed) and threshold (solid).

#### b. Graph B: Bay Specific Landings (Commercial and Recreational)



2. ASMFC Population Estimates (w/ age structure) & Bay Landings  
a. Graph A: Population Estimates from BAM model.

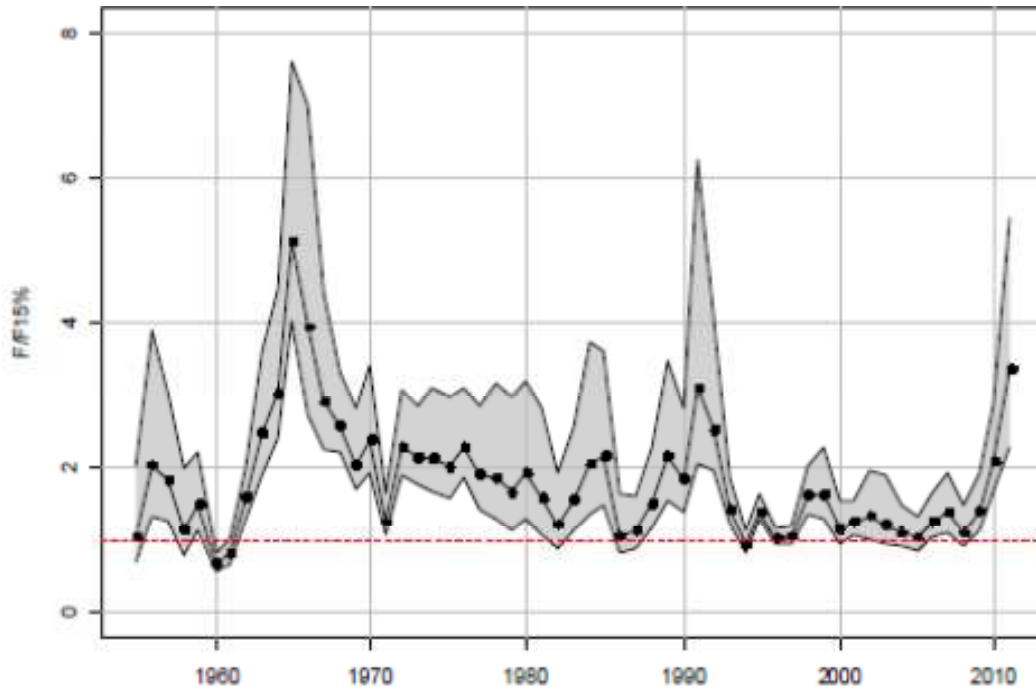
Figure 31. Estimated numbers at age of Atlantic menhaden (billions) at the start of the fishing year from the base BAM model.



b. Graph B: Same as Option 1, Graph A

3. ASMFC Estimated Fishing Mortality vs. Management Threshold & Bas Specific Landings
  - a. Graph 1: Estimated Fishing Mortality vs. Management Threshold

**Figure 56. Estimates of the total full fishing mortality rate relative to the F15% benchmark (fishing limit value) from the base BAM model (connected points) using benchmarks calculated over 1955-2011. Shaded area represents the 90% confidence interval of the bootstrap runs.**



- b. Graph B: Same as Option 1, Graph B.

4. ASMFC Fishing Mortality & Bay Specific Landings

- a. Graph A: Coastal Fishing Mortality (same as Option 3, Graph A, but without confidence interval)

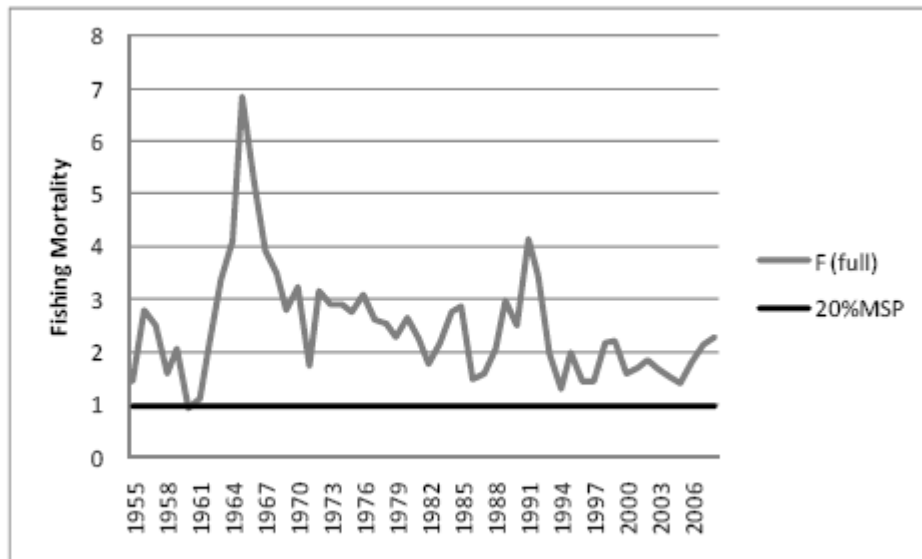


Figure 3. Atlantic Menhaden fishing mortality rates from 1955-2008.

- b. Graph B: Same as Option 1, Graph B.