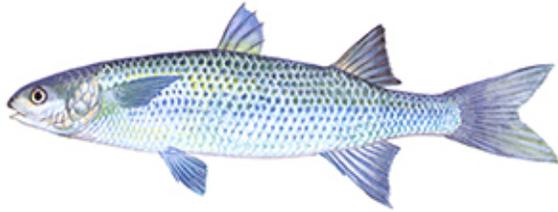


STRIPED MULLET, *Mugil cephalus*



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Life History

Striped mullet are found in a wide range of depths and habitats, but primarily inhabit freshwater to estuarine environments until a spawning migration into the ocean occurs during the fall. Striped mullet serve as an ecological link between some of the smallest aquatic organisms and the highest-level predators in the marine food chain. Striped mullet feed on microorganisms such as bacteria and single-celled algae found on aquatic plants, in mud, silt, and sand and in decaying plant material. In turn, striped mullet are prey to top predators such as birds, fish, sharks and porpoises. Striped mullet are highly fecund (upwards of 4 million eggs for a large female) and spawn in large aggregations near inlets to offshore areas. Spawning individuals have been reported from September to March; however, peak spawning activity occurs from October to early December.

Fisheries

Since 2007, striped mullet commercial landings have ranged from a low of 964,348 pounds in 2016 to a high of 2 million pounds in 2000 (Figure 1). Landings have fluctuated little over this period except for large decreases in 2015 and then again in 2016.

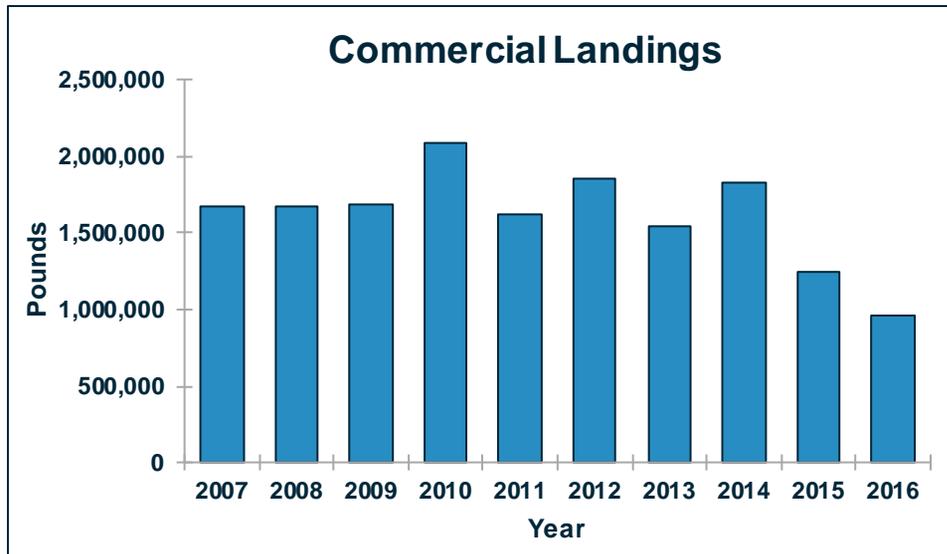


Figure 1. Annual commercial landings of striped mullet in North Carolina, 2007-2016.

The Marine Recreational Information Program is primarily designed to sample anglers who use rod and reel as the mode of capture. Since most striped mullet are caught with cast nets for bait, recreational harvest data are imprecise. Misidentification between striped mullet and white mullet is also common. Bait mullet are usually released by anglers before observation by creel clerks, and, therefore, cannot be identified to the species level. However, based on estimates from a mail survey conducted by the North Carolina Division of Marine Fisheries, 227,674 mullet (striped and white combined) were harvested by recreational fishermen in 2016, just below the 2011 to 2016 average of 261,182 (Figure 2).

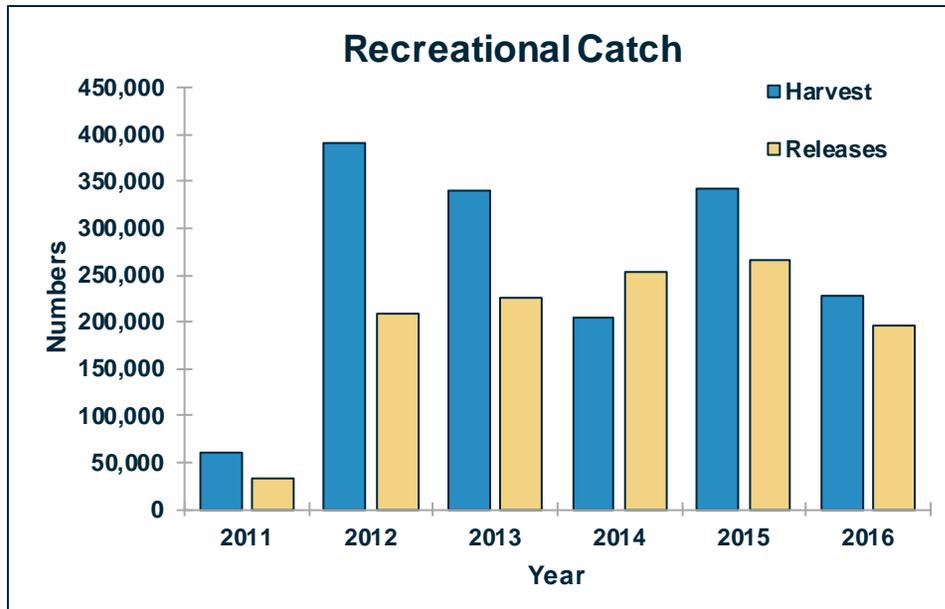


Figure 2. Annual recreational catch of mullet (striped and white) in North Carolina, 2011-2016. Data from 2011 only includes November and December.

Management

The North Carolina Marine Fisheries Commission adopted a Striped Mullet Fishery Management Plan in April 2006. The plan classified the stock as viable and established minimum and maximum landings thresholds of 1.3 million pounds and 3.1 million pounds, respectively. If landings fall below the minimum threshold, the North Carolina Division of Marine Fisheries would initiate further analysis of the data to determine if the decrease in landings is attributed to stock decline or decreased fishing effort. If landings exceed 3.1 million pounds, the division would initiate analysis to determine if harvest is sustainable and assess what factors are driving the increase in harvest. The plan also established a daily possession limit of 200 mullets (white and striped in aggregate) per person in the recreational fishery. Amendment 1 was completed in November 2015 and removed a Newport River gill net attendance requirement, addressed user group conflicts, and updated the management framework for the North Carolina striped

mullet stock. Amendment 1 updated the minimum and maximum commercial landings triggers to 1.13 and 2.76 million pounds, respectively, that would warrant a closer examination of data.

Stock Status Overview

A population assessment of the North Carolina striped mullet stock was conducted using the Stock Synthesis model, which incorporated data from commercial fisheries and three fishery-independent surveys (data collected by scientists) from 1994 to 2011. Spawning stock biomass (total weight of mature females in the stock) increased from 2003 through 2007, but has since declined. Recruitment (the number of fish that survive to the juvenile stage) has also declined in recent years, though a slight increase was observed in 2011. Fishing mortality has increased in recent years, but fishing mortality in 2011 was below both the fishing mortality target and threshold. Based on these results, the stock is not undergoing overfishing (rate at which striped mullet are removed from the population). A poor relationship between spawning stock biomass and juvenile abundance prevented a determination of whether the stock is overfished (population size status). Striped mullet commercial landings in 2016 fell below the minimum landings threshold set by Amendment 1. This, in combination with declining trends in independent indices, results in the status of the stock being classified as concern.

Division staff conduct sampling of adult striped mullet through the Striped Mullet Electrofishing Survey and the Independent Gill Net Survey. To provide the most relevant index from the division's Striped Mullet Electrofishing Survey, data were limited to those collected during January through April, when striped mullet were most abundant in the Neuse River. A sample represents all the fish collected over a 500 meter transect. Striped mullet catch-per-unit-effort has been generally stable since 2007 but declined significantly in 2015 and 2016 (Figure 3). To provide the most relevant index from the Independent Gill Net Survey, data were limited to samples from shallow river areas during October and November, where and when most striped mullet occurred. Striped mullet catch-per-unit-effort was generally stable between 2007 and 2013 before spiking in 2014 and then declining to time series lows in 2015 and 2016 (Figure 4). It should be noted that Hurricane Matthew hit North Carolina in October 2016, which may have influenced the striped mullet catch-per-unit-effort from this survey.

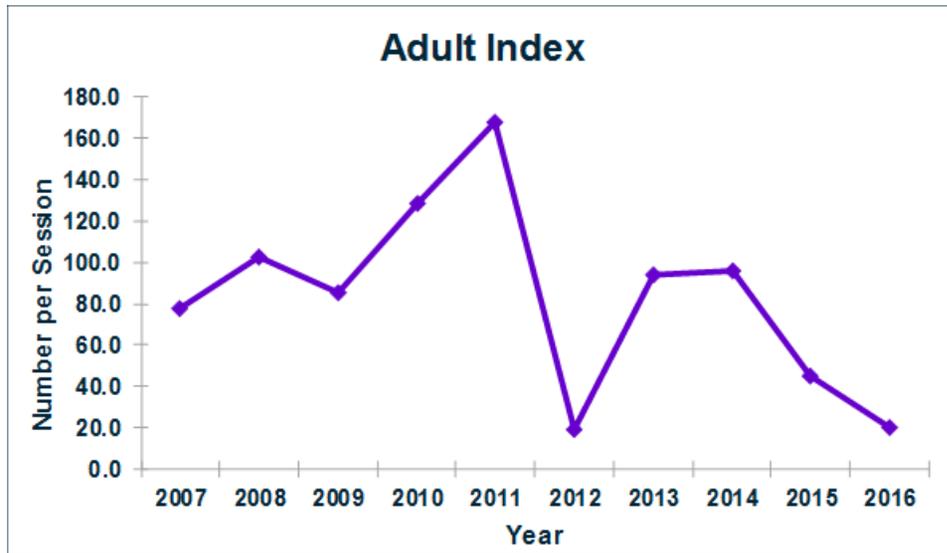


Figure 2. Annual index of relative adult abundance of striped mullet in the Striped Mullet Electrofishing Survey, 2007-2016.

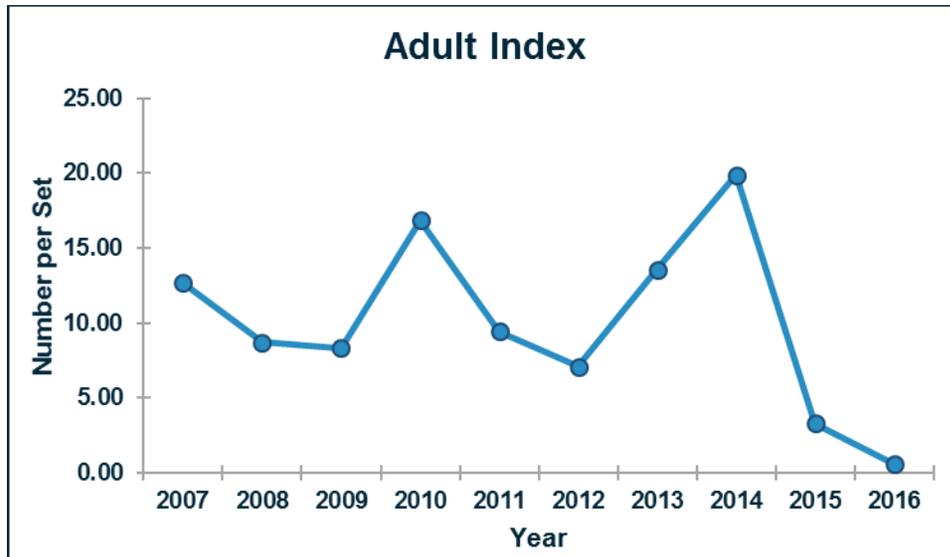


Figure 3. Annual index of relative adult abundance of striped mullet in the Independent Gill-Net Survey, 2007-2016.

Research Needs

Research needs include the collection of life history information regarding maturity, age, growth, identification of spawning locations, and larval and juvenile movements; continued improvements in estimating recreational bait harvests; collection of length and age compositions and catch-per-unit-effort of commercial, recreational, and recreational-commercial gear fisheries, as well as from all relevant fishery-independent surveys; and creating and validating a juvenile abundance index.



Links

Management Agencies

[North Carolina Division of Marine Fisheries](#)

Fishery Management Plans, Amendments, Revisions, & Supplements

[North Carolina Fishery Management Plan](#)

Contacts

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