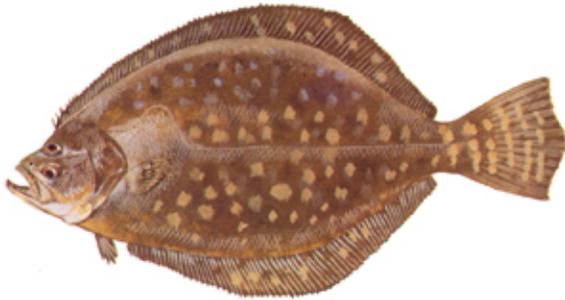


SOUTHERN FLOUNDER, *Paralichthys lethostigma*



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Life History

Southern flounder (*Paralichthys lethostigma*) are a bottom dwelling species found in the Atlantic Ocean and estuaries from northern Mexico to Virginia. This species supports important commercial and recreational fisheries along the U.S. South Atlantic and Gulf coasts and are particularly important to fisheries in North Carolina. The biological unit stock for southern flounder inhabiting North Carolina waters may include other southern states based on evidence from tagging and genetic studies, as well as differences in aging structures, which indicate mixing of southern flounder from North Carolina to Florida. Evidence also suggests some adult southern flounder may return to the estuaries after spawning in the ocean, while others may remain in the ocean. Tagged fish are typically recaptured south of tagging locations and often in other states once in the ocean. Limited data from South Carolina and Georgia tagging programs suggest a low probability of adult movement from South Carolina or Georgia to North Carolina waters.

Data collected from fall fisheries by the North Carolina Division of Marine Fisheries suggests that with the onset of maturity, fish of both sexes migrate out of inlets to ocean waters in the fall. Southern flounder can produce approximately 3 million eggs per female in multiple spawning events in a season, and spawning is thought to take place between November and April. Larval southern flounder pass through inlets within 30 to 45 days of hatching and settle throughout the sounds and rivers in the winter and early spring. Nearly half of female flounder are thought to be

mature by ages 1 and 2 (at approximately 16 inches). Fish collected in the ocean tend to be larger and older fish with females attaining larger sizes. The largest southern flounder observed in North Carolina was a 33 inch total length female and a 20 inch male. The maximum observed age was 9 for a female and 9 for a male; southern flounder captured in North Carolina represent the oldest ages observed throughout the species range.

Juvenile and adult southern flounder are bottom dwelling and typically feed by camouflaging themselves and ambushing their prey with a quick upward lunge. Southern flounder diets switch to fish when they are between 3 inches and 4 inches long. Adult southern flounder feed almost exclusively on other fish, but will consume shrimp as well.

Fisheries

Records of commercial landings go back to the early 1960s and are among the highest of any finfish species in North Carolina. In 2013 it was the most commercially valuable finfish in the state. Gill nets, pound nets and gigs are the dominant commercial gears used to capture southern flounder (Figure 1). The pound net fishery in North Carolina was historically (pre-1990s) the predominate fishery for catching southern flounder. However, landings from the gill net fishery began to rise in the late 1980s and early 1990s, surpassing pound net landings from 1994 to 2013. Since 2014, pound net landings have again surpassed gill net landings. Total commercial landings have averaged 1.8 million pounds over the past 10 years.

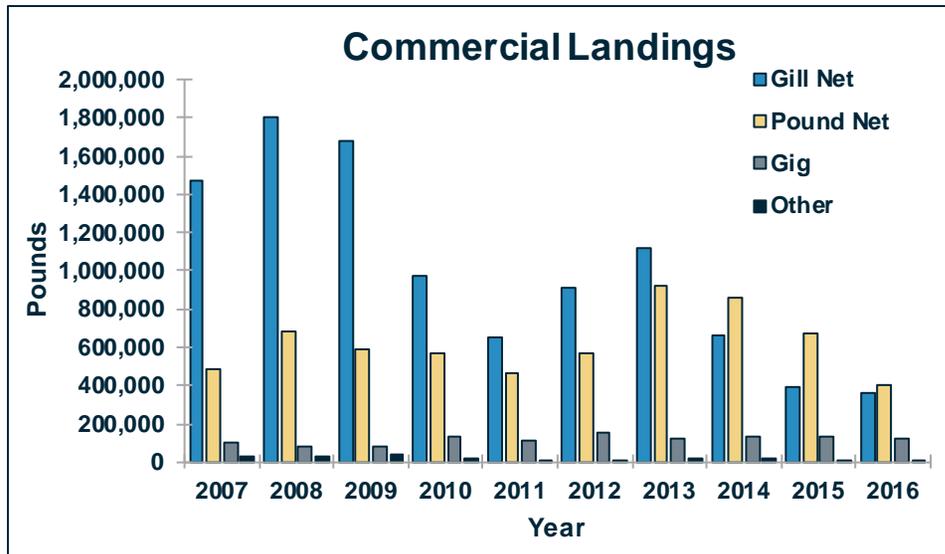


Figure 1. Annual commercial landings of southern flounder in North Carolina by gear, 2007-2016.

Southern flounder are harvested recreationally in North Carolina by hook and line, gig, and the recreational use of commercial gears such as gill nets, trawls, pots and seines (Figure 2). Flounder are among the most commonly targeted finfish species by recreational fishermen and the recreational fishery has a significant economic impact in North Carolina. Flounder are caught year-round throughout the estuaries, inlets and nearshore ocean waters of the state with the majority of the harvest occurring in the summer and fall. Most of the recreational harvest occurs inshore; however, the ocean harvest on or near reefs is an important component of the fishery, especially for hook and line harvest. Average recreational catch of southern flounder for the past 10 years is 152,389 fish with an average of 828,299 fish being released.

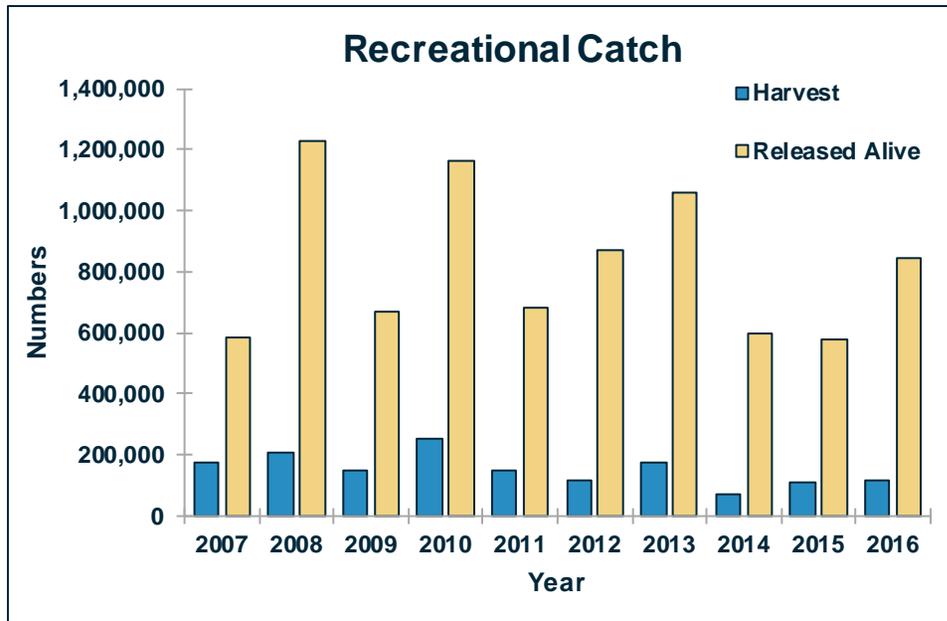


Figure 2. Annual recreational catch of southern flounder in North Carolina, 2007-2016.

Management

The division is responsible for the management of estuarine and marine resources occurring in all state coastal fishing waters extending to 3 miles offshore. The management unit includes southern flounder and its fisheries in North Carolina's coastal fishing waters. The commercial fishery has been managed through the use of size limits, gear restrictions, area closures, reporting requirements, mandatory scientific observer coverage and seasonal closures. The recreational fishery is managed through a combination of size limits, bag limits and seasons in both the inland and ocean fisheries.

A Southern Flounder Fishery Management Plan was developed by the division in February 2005. Amendment 1 to the plan was adopted in February 2013. Supplement A to Amendment 1, which is intended to reduce catch from the

southern flounder fishery by up to 60 percent, was approved by the North Carolina Marine Fisheries Commission at its November 2015 business meeting. Approved management measures implemented Jan. 1, 2016 include an increase of the minimum size limit to 15 inches total length, an increase in minimum mesh size to 6 inch stretched mesh for the harvest of flounder and an increase in mesh size for the escape panels in flounder pound nets to 5 $\frac{3}{4}$ inches stretched mesh. Additional management measures were approved, but not enacted due to an injunction through the North Carolina court system. These additional management measures not implemented include a closure of the recreational harvest from Oct. 15 through Dec. 31, a closure of the commercial gig fishery once the pound net quota was met and a 38 percent reduction to the flounder pound net fishery based on the average of the 2011 to 2014 landings.

Stock Status Overview

The division's 2014 stock assessment of southern flounder in North Carolina waters was not approved for management due to mixing of the stock on a regional scale (the U.S. South Atlantic). However, data inputs in the stock assessment were considered valid for management. The status of southern flounder in North Carolina continues to be defined as concern based on the declining coastwide trends in juvenile and adult abundance and the high percentage of immature fish in the harvest. A regional stock assessment that includes partners from North Carolina, South Carolina, Georgia and Florida is underway and scheduled to be completed in the fall of 2017. Several of division's independent sampling programs collect biological data on southern flounder and were included as indices of abundance in recent stock assessments. The primary surveys that collect length data for southern flounder include: Estuarine Trawl Survey, Pamlico Sound Survey, Striped Bass Independent Gill Net Survey and the Pamlico Sound Independent Gill Net Survey.

Data collected by the Pamlico Sound Independent Gill Net Survey were used for an index of general (juvenile and adult) abundance in recent stock assessments. The abundance index peaked in 2010 and the low point was in 2016 for the time-series analyzed (2003 to 2016) and has a decreasing trend (Figure 3). Data collected by the Albemarle Sound Independent Gill-Net Survey were used for an index of general (juvenile and adult) abundance in recent stock assessments. The abundance index peaked in 1992 and the low points were in 2011 and 2016 for the time-series analyzed (1991 to 2016; Figure 4). Data collected by the Estuarine Trawl Survey and the Pamlico Sound Survey were used to produce southern flounder juvenile abundance indices from 1991 to 2016. The index for the Estuarine Trawl Survey peaked in 1996 and the low point was in 2016 for the time-series analyzed (1991 to 2016) and shows a variable trend (Figure 5). The juvenile index for the Pamlico Sound Survey peaked in 1996 and the low point was in 1998 for the time-series analyzed (1991 to 2016; Figure 5).

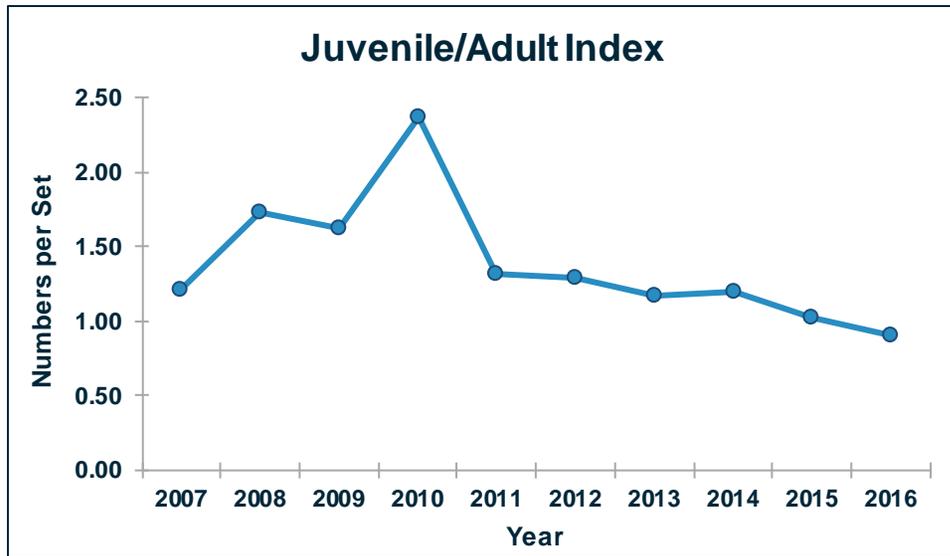


Figure 3. Annual index of relative juvenile/adult abundance of southern flounder in the N. C. Division of Marine Fisheries Pamlico Sound Independent Gill Net Survey, 2007-2016.

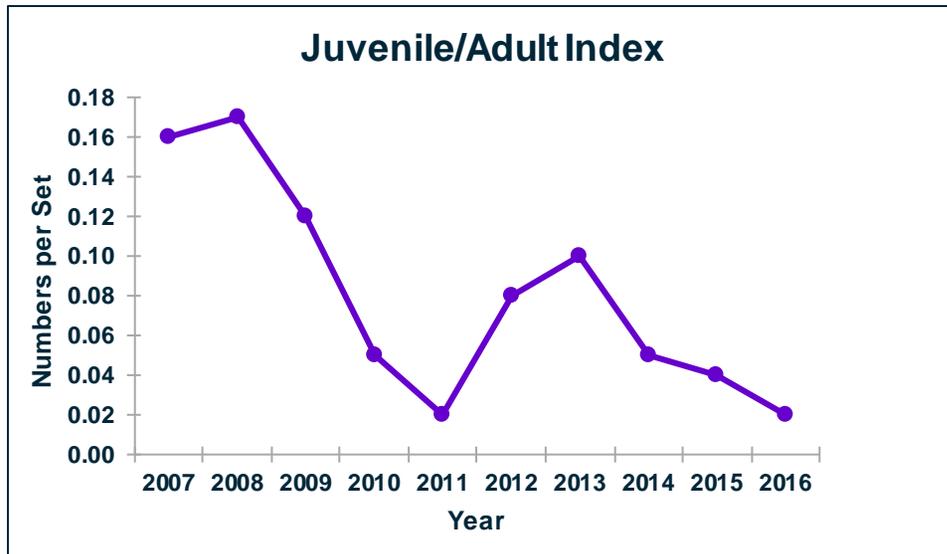


Figure 4. Annual indices of relative juvenile/adult abundance of southern flounder in the N. C. Division of Marine Fisheries Albemarle Sound Independent Gill Net Survey, 2007-2016.

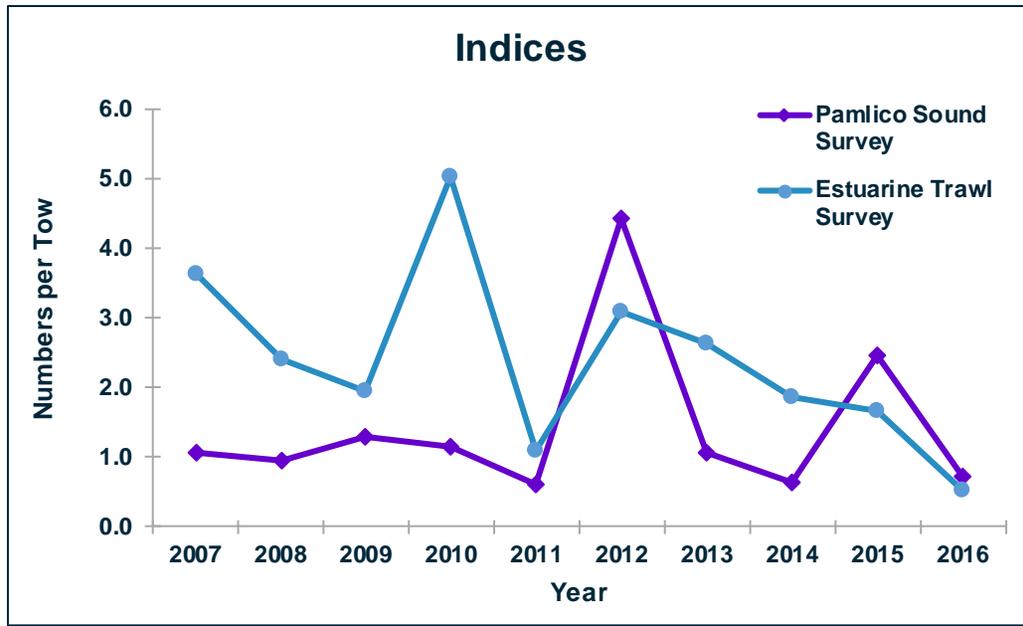


Figure 5. Annual indices of relative juvenile abundance of southern flounder in the N. C. Division of Marine Fisheries Pamlico Sound Survey and the Estuarine Trawl Surveys, 2007-2016.

Research Needs

Research needs include determining discard and discard mortality estimates for commercial pound net and recreational and commercial gig fisheries, migration patterns and rates, species composition of recreationally released flounder and fishery-independent ocean surveys; expanding age data collection from the fisheries; validating mail survey estimates of recreational gigging using dockside surveys; expanding inshore independent gill net surveys; and conducting a regional stock assessment.

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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