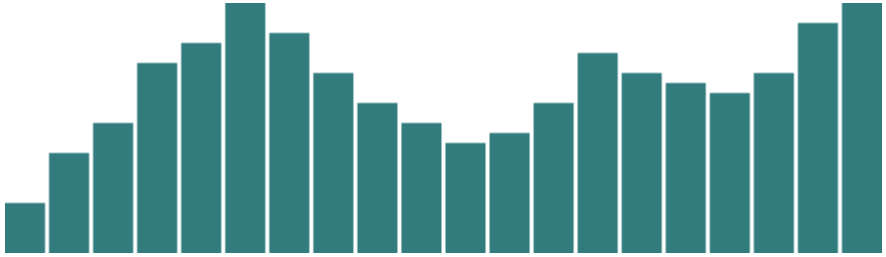
2018 Stock Overview

Presented to: Marine Fisheries Commission

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

| Lee Paramore | August 15-16, 2018



STOCK OVERVIEW

- Report issued annually and released in July
- Includes data available through prior year
- Each report provides stock information on:
  - Life History
  - Fisheries and catch/harvest trends
  - Management summary
  - Assessment results and trends in indices
  - Research needs

User-Friendly Changes to Annual Stock Overview Report

Report maintains changes from last year:

- State-managed stocks separated from stocks cooperatively managed federal and interstate management plans
  - ➢14 state-managed stocks
  - ➢23 federal and interstate managed stocks

- Redesigned web pages better illustrate trends in catch and surveys for each species. Helpful links were also provided to help viewers find more information.

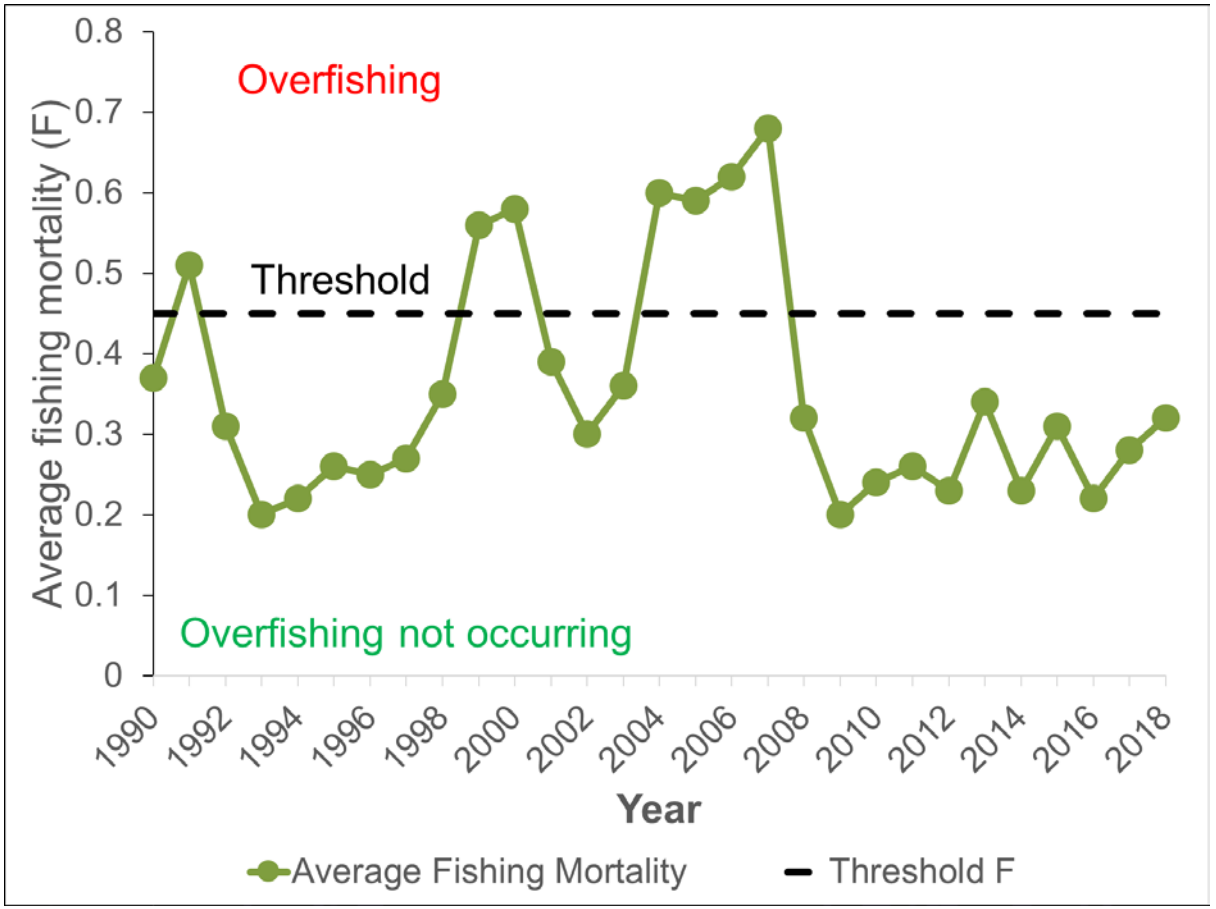
User-Friendly Changes to Annual Stock Overview Report

New changes for 2018:

- Stock determinations based on terminology directly related to peer reviewed assessment
  - ➢ Terminology for “stock status” categories dropped: viable, recovering, depleted, concern, and unknown
  - ➢ Stock assignments now consistent with overfishing and overfished terminology used in peer reviewed stock assessments
  - ➢ Stocks with no assessment still provide pertinent trends in catch and surveys

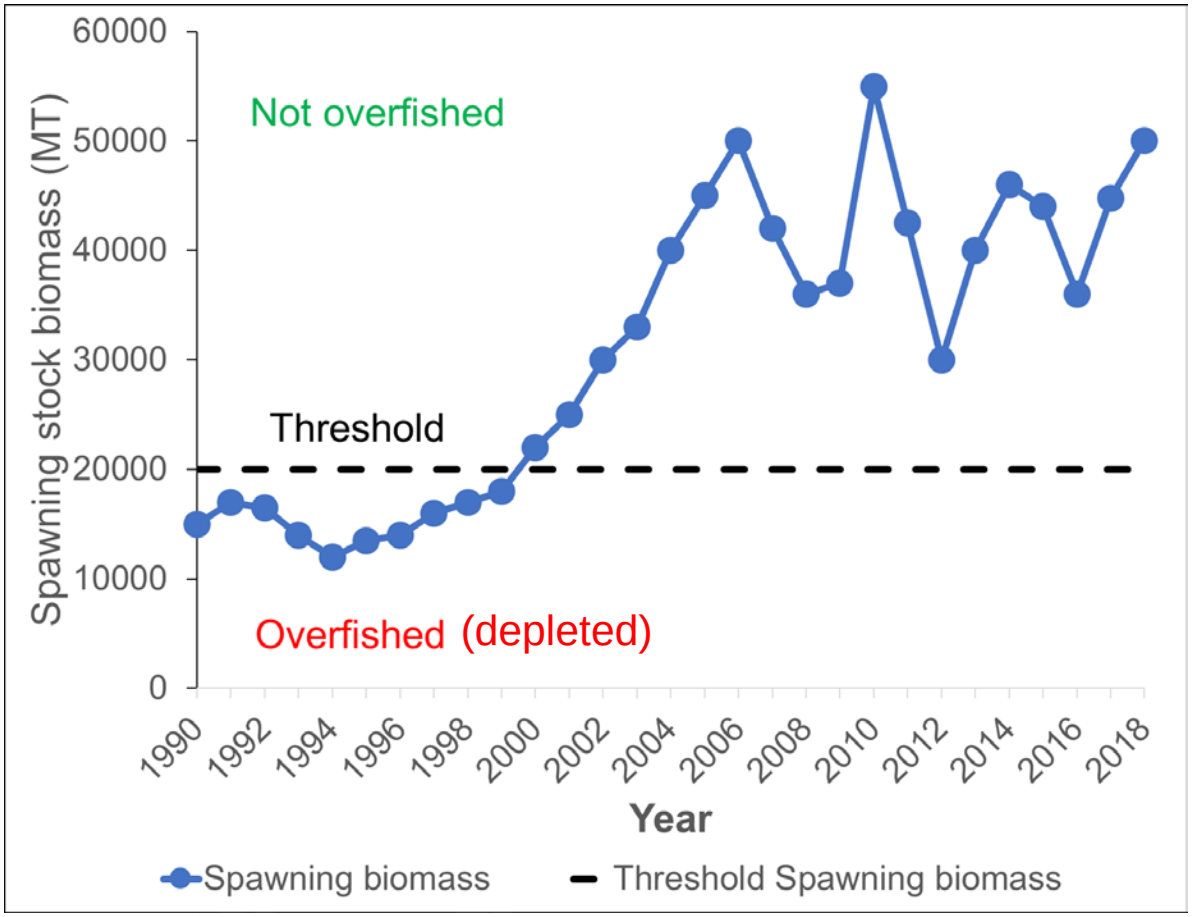
Stock Determination based on Overfishing and Overfished (Depleted)

Overfishing occurs when the rate of removals due to fishing mortality is too high (i.e. it is above the overfishing threshold).



Stock Determination based on Overfishing and Overfished (Depleted)

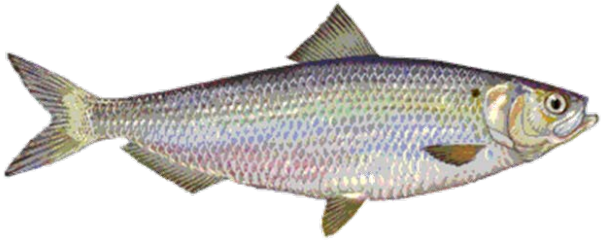
Overfished occurs when the size of the adult population is too small increasing the risk of recruitment failure.



Highlights of the 2018 Stock Overview Report

Blue Crab

- 2018 assessment passed peer review
- Overfished and overfishing occurring
- Amendment 3 to Fisheries Management Plan under development



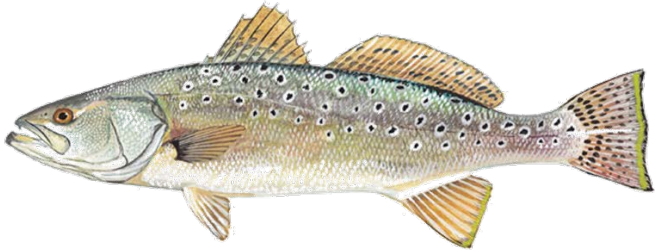
River Herring

- Closed to fishing (moratorium)
- 2017 stock assessment update shows stock remains depleted
- Plan last approved 2015

Highlights of the 2018 Stock Overview Report

Red Drum

- 2017 assessment passed peer review
- Management targets being met
- No overfishing
- Overfished status unknown
- Plan reviewed in 2017



Spotted Seatrout

- 2014 assessment not overfished with no overfishing
- Susceptible to cold stun events
- Next review begins in 2019

Highlights of the 2018 Stock Overview Report

Southern Flounder

- 2018 assessment peer review passed contingent on 2016 and 2017 data being added to model
- Overfished and overfishing occurring
- Assessment currently being updated with additional years (2016 and 2017)
- Plan review underway

Highlights of the 2018 Stock Overview Report

Striped Bass
Albemarle/Roanoke

- 2016 assessment not overfished with no overfishing
- Currently being assessed, plan review underway

Central Southern (Tar/Pamlico, Neuse and Cape Fear rivers)

- Fisheries supported primarily by hatchery reared fish
- Very limited natural reproduction
- Currently being assessed, plan review underway

Highlights of the 2018 Stock Overview Report

In some situations stock assessments are not available for a stock. This is typically due to a lack of data or unaddressed research needs.

Kingfish

Sheepshead

Eastern Oyster

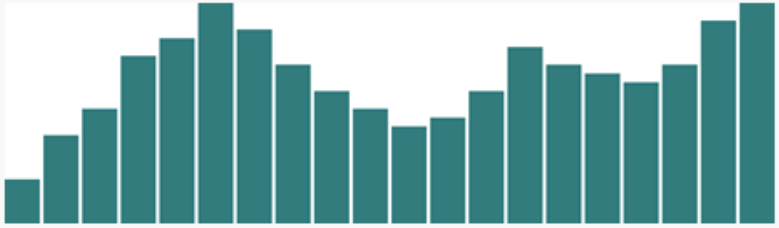
Hard Clam

Highlights of the 2018 Stock Overview Report

- Two stocks managed by North Carolina are annual crops.
- Annual crops are not assessed due to short life-span.

Bay Scallop

Shrimp
(Brown, Pink, White)

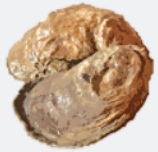


Stock Overview

The North Carolina Division of Marine Fisheries Stock Overview is issued annually and reviews available information to determine the overall condition of North Carolina's state-managed species. The information in each year is based on fisheries data available in the prior year. The 2018 Stock Overview, covering data through 2017, was prepared just as the NOAA Fisheries released revised Marine Recreational Information Program catch estimates as part of its recent transition from the former Coastal Household Telephone Survey to the new, mail-based Fishing Effort Survey. Results from NOAA Fisheries data queries will be different until these new NOAA Fisheries estimates are incorporated next year in the 2019 Stock Overview.

The phrase "stock status" is traditionally used to describe the current condition of the stock relative to established reference points. These reference points are often defined in terms of a threshold fishing mortality and threshold stock size. When a stock is above the fishing mortality threshold, overfishing is said to be occurring. When a stock is below the stock size threshold, it is said to be overfished or, sometimes, the term depleted is used if fishing mortality is not the reason for low stock size. Assignment of stock status based on this definition requires a stock assessment that provides both the values of the thresholds and the current estimates of fishing mortality and stock size to compare to those thresholds. Stock assessments are the primary tools used by managers to assist in determining the status of stocks and developing appropriate management measures for their long-term viability. Stock status in the Stock Overview beginning with 2018 is only assigned based on overfishing and overfished/depleted status.

2018 NORTH CAROLINA DIVISION OF MARINE FISHERIES STOCK OVERVIEW - STATE MANAGED SPECIES (July 2018, based on 2017 Data)

Species	Comments
Bay Scallop (Closed to fishing) 	Bay scallops are a short lived species that are managed as an annual crop. They are sensitive to environmental change and may experience high levels of predation, which can impact annual abundance. As a result, a stock assessment is not an effective tool for management. Sampling showed low numbers in all areas, and harvest was not allowed in 2017 because abundance levels did not meet the thresholds to open the season. Amendment 2 to the Bay Scallop Fishery Management Plan was approved in February 2015.
Blue Crab 	Results of the 2018 benchmark stock assessment indicate the blue crab stock is overfished (stock size is too small) and overfishing (excessive fishing mortality) is occurring. This recent assessment passed peer review and the model was accepted for use in management. Development of Amendment 3 to the Blue Crab Fishery Management Plan is underway in conjunction with an advisory committee.
Eastern Oyster 	A stock assessment could not be conducted due to limited data; therefore, population size and the rate of removals from the population are not known. Commercial landings from public bottom have been variable, and landings from private bottom in the past few years have increased significantly due to more interest in aquaculture. Work is underway with N.C. State University and the Nature Conservancy to develop methodologies to determine stock status. Amendment 4 to the Oyster Fishery Management Plan was approved in February 2017.
+Estuarine Striped Bass: Albemarle Sound/Roanoke River Management Area 	The 2016 Albemarle/Roanoke striped bass stock assessment update indicates overfishing (excessive fishing mortality) is not occurring and the stock is not overfished (stock size is adequate). Although the stock is not overfished, the abundance of mature females in the population has declined steadily since the peak in 2003. While very large, the estimate of abundance in the final year of the assessment (2014) is the most uncertain and should be viewed with caution. The estimate will likely decrease as additional years of data are added to the model. The fishery management plan review for estuarine striped bass is currently underway and results from a benchmark stock assessment utilizing
Kingfishes 	A stock assessment is not available due to lack of migration data, so an annual trend analysis with management triggers is used to monitor the stock. Though one management trigger was activated in 2017, no action is required because two triggers must be activated for two consecutive years to warrant further evaluation and possible management change. The Kingfish Fishery Management Plan Information Update was approved in December 2015.
+Red Drum 	The regional benchmark stock assessment (North Carolina and all states north), conducted by the Atlantic States Marine Fisheries Commission in 2017, indicates that overfishing (excessive fishing mortality) is not occurring and that management targets continue to be met. The size of the fish stock (overfished status), however, continues to be unknown due to limited data available for the adult population. The Red Drum Fishery Management Plan Update was approved in August 2017.
+River Herring (Closed to fishing) 	An Atlantic coastwide stock assessment update for river herring was completed in August 2017, with data through 2015, by the Atlantic States Marine Fisheries Commission. The North Carolina portion of the coastwide stock assessment is for the Albemarle Sound blueback herring stock only, due to the long-term data available for this area. River herring in other parts of the state are currently listed as unknown by the Atlantic States Marine Fisheries Commission due to the lack of data for these systems. The stock assessment update found that the North Carolina stock in the Albemarle Sound was not experiencing overfishing (excessive fishing mortality) due to the harvest moratorium, but the stock remains overfished (stock size is too small). The factors leading to this recommendation of stock status remain largely unchanged since the 2012 stock assessment, despite fishing pressure that is negligible. The spawning stock biomass remains 12 percent of the amount necessary to replace itself in the complete absence of fishing. Amendment 2 to the River Herring Fishery Management Plan was approved in February 2015.
Sheepshead 	No stock assessment is currently available for sheepshead. Landings trends and other biological data prompted the Marine Fisheries Commission to implement new harvest restrictions in June 2015. The division continues to monitor landings and collect data on the stock. In 2017, the commercial landings were below the 10 year average; however, recreational landings were above the 10 year average.

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RED DRUM, *Sciaenops ocellatus*

Life History

Red drum (*Sciaenops ocellatus*) are estuarine dependent members of the drum family that includes Atlantic croaker, spot, black drum, weakfish and spotted seatrout. Ranging from Florida to Massachusetts along the Atlantic coast, red drum are most abundant from Virginia to Florida. Red drum, also called channel bass, are common throughout the coastal waters of North Carolina and was adopted in 1971 as the state's saltwater fish (N.C. General Statute 145-6). Large red drum (up to 90 pounds) inhabit the coastal waters throughout the year, are often observed in the surf during the spring and fall seasons and commonly found in the Pamlico Sound during the summer months. Spawning takes place in the fall around coastal inlets and in Pamlico Sound. Larval and juvenile red drum use various shallow estuarine habitats in coastal sounds and rivers during the first few years of life. Upon maturity (age 4 and around 32 inches in length), red drum move out of the estuaries to join the adult spawning stock in the ocean. Red drum are a long-lived species commonly reaching ages in excess of 40 years. The oldest red drum recorded was taken in North Carolina and was 62 years old. Red drum are opportunistic feeders and diet can shift with changes in age and habitat. Various types of small crabs and shrimp make up a large portion of juvenile red drum diets. While crabs and shrimp continue to make up a portion of the adult diet, adults also frequently eat various fish species.

NORTH CAROLINA MARINE FISHERIES

Stock Overview

- Assessment: Yes
- Terminal Year of Last Assessment: 2013
  - Overfishing: No
  - Overfished: Unknown

Red drum in North Carolina are currently not experiencing overfishing and management targets continue to be met based on the results of the 2017 Atlantic States Marine Fisheries Commission stock assessment. Under the stock assessment, the stock unit for red drum along the Atlantic coast is divided into a northern and southern stock. North Carolina and states north represent the northern stock. For the northern stock, the static spawning potential ratio was at or above target levels. Static spawning potential ratio is a measure of the reproductive potential of a fished stock compared to the reproductive potential that would be produced in an unfished stock. Management measures have effectively controlled fishing mortality to a level sufficient to meet management targets. The management target is to maintain the static spawning potential ratio at 40 percent of an unfished stock. It is critical to note that reaching the target is only the first step in maintaining this fishery. For the red drum stock to be considered healthy and viable, the management target must be maintained continuously over time. Increases in the harvest rates (relaxation of current regulations) should only be allowed if those increases are not anticipated to lower the static spawning potential ratio below the management target.

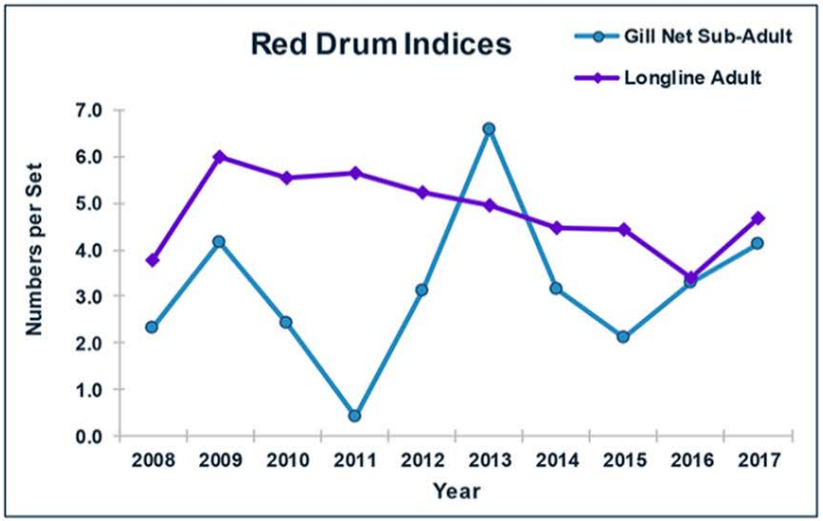

Figure 5. Annual indices of relative sub-adult and adult abundance of red drum in the Division Pamlico Sound Independent Gill Net Survey and Longline Survey, 2008-2017.

QUESTIONS?