

*Atlantic States Marine Fisheries Commission*

**PUBLIC INFORMATION DOCUMENT  
FOR AN INTERSTATE FISHERY MANAGEMENT PLAN  
FOR BLACK DRUM**



*ASMFC Vision Statement:*

*Healthy, self-sustaining populations for all Atlantic Coast fish species or successful restoration well in progress by the year 2015.*

**February 2012**

**The Atlantic States Marine Fisheries Commission seeks your comment  
on an Interstate Fishery Management Plan for Black Drum**

The public is encouraged to submit comments regarding this document during the public comment period. Comments will be accepted until **5:00 PM (EST) on July 20, 2012**. Regardless of when they were sent, comments received after that time will not be included in the official record. The South Atlantic State-Federal Fisheries Management Board will consider the public comment received on this document when developing the first draft of the Interstate Fishery Management Plan.

You may submit public comment in one or more of the following ways:

1. Attend public hearings held in your state or jurisdiction.
2. Refer comments to your state's members on the South Atlantic State-Federal Fisheries Management Board or South Atlantic Species Advisory Panel, if applicable.
3. Mail, fax, or email written comments to the following address:

Danielle Chesky  
1050 North Highland St., Suite 200 A-N  
Arlington, VA 22201  
Fax: (703) 842-0741  
[dchesky@asmfc.org](mailto:dchesky@asmfc.org) (subject line: Black Drum)

If you have any questions please call Danielle Chesky at (703) 842-0740.

## TABLE OF CONTENTS

<b>YOUR COMMENTS ARE INVITED .....</b>	<b>1</b>
<b>WHY IS THE ASMFC PROPOSING THIS ACTION? .....</b>	<b>1</b>
<b>WHAT IS THE PROCESS FOR DEVELOPING AN INTERSTATE FISHERY MANAGEMENT PLAN?.....</b>	<b>1</b>
<b>WHAT IS THE PURPOSE OF THIS DOCUMENT? .....</b>	<b>3</b>
<b>WHAT GENERAL ISSUES WILL BE ADDRESSED? .....</b>	<b>3</b>
<b>ISSUE 1: CONSISTENT COASTWIDE MANAGEMENT OF A MIGRATORY STOCK .....</b>	<b>3</b>
<b>ISSUE 2: ESTABLISH A FRAMEWORK TO QUICKLY IMPLEMENT MANAGEMENT MEASURES, IF NECESSARY FOR THE CONSERVATION OF THE STOCK.....</b>	<b>4</b>
<b>ISSUE 3: CONFRONT ISSUES THE FISHERY MAY FACE NOW AND IN THE FUTURE .....</b>	<b>6</b>
<b>BACKGROUND INFORMATION ON BLACK DRUM AND CURRENT MANAGEMENT .....</b>	<b>7</b>
<b>WHAT ISSUES DO WE WANT YOUR INPUT ON? .....</b>	<b>9</b>
<b>REFERENCES.....</b>	<b>10</b>
<b>TABLES.....</b>	<b>11</b>
<b>FIGURES .....</b>	<b>13</b>

***YOUR  
COMMENTS  
ARE INVITED***

The Atlantic States Marine Fisheries Commission (Commission) is developing an interstate fishery management plan for black drum. Management authority for this species within internal waters and from zero to three nautical miles offshore currently lies with the coastal states. This plan would act to coordinate state management throughout the management unit through the Commission.

This is your opportunity to inform the Commission about changes observed in the fisheries, actions you feel should or should not be taken in terms of management, regulation, enforcement, research, and any other concerns you have about the resources or the fisheries, as well as the reasons for your concerns.

***WHY IS THE  
ASMFC  
PROPOSING  
THIS ACTION?***

In November 2009, the Commission's Interstate Fishery Management Program Policy Board (Policy Board) tasked staff with assessing the feasibility of developing a stock assessment and coastwide fishery management plan. Members of the Policy Board raised concerns that the fishery targets juveniles and have greatly expanded in recent years. Staff reported back at the February 2010 meeting, briefly summarizing that the data may be sufficient for a stock assessment, although significant deficiencies likely existed. The Policy Board formed a Black Drum Working Group and tasked the group with developing an in-depth data review on black drum as well as recommendations on the feasibility of conducting a coastwide stock assessment in anticipation of a potential interstate fishery management plan. The working group reported to the Policy Board in August 2011, with recommendations on the status of the data, feasibility of a stock assessment, and management recommendations. The Policy Board accepted the working group's recommendations and voted to initiate an interstate fishery management plan (FMP) for black drum and tasked the South Atlantic State-Federal Fisheries Management Board (Management Board) with developing and implementing the FMP. At its November 2011 meeting, the Management Board voted to initiate the FMP and a stock assessment concurrently.

***WHAT IS THE  
PROCESS FOR  
DEVELOPING  
AN  
INTERSTATE  
FISHERY  
MANAGEMENT  
PLAN?***

The publication of this document and announcement of the Commission's intent to develop an interstate FMP for black drum is the first step of the FMP development process. Following the initial phase of information gathering and public comment, the Commission will evaluate potential management alternatives and the impacts of those alternatives. The Commission will then develop a Draft FMP, incorporating the identified management alternatives, for public review. Following that review and public comment, the Commission will specify the management measures to be included in the FMP, as well as a timeline for implementation. The proposed timeline for completion of the FMP is as follows:

August 2009	Policy Board forms Working Group	
February 2010	Policy Board receives first report and further tasks Working Group	
August 2011	Policy Board receives second report and initiates FMP	
November 2011	Management Board initiates FMP	
February 2012	Management Board reviews PID for public comment	
Spring/Summer 2012	Public comment on PID	← Current step
Summer/Fall 2012	Management Board reviews public comment and initiates Draft FMP	
Fall 2012	Management Board reviews and approves Draft FMP for public comment	
Winter 2012/2013	Public comment on Draft FMP	
Spring/Summer 2013	Management Board reviews and approves FMP	

**WHAT IS THE PURPOSE OF THIS DOCUMENT?**

The purpose of this document is to inform the public of the Commission’s intent to gather information concerning the black drum fisheries and to provide an opportunity for the public to identify major issues and alternatives relative to the management of this species. Input received at the start of the FMP development process can have a major influence in the outcome of the FMP. This document is intended to draw out observations and suggestions from fishermen, the public, and other interested parties, as well as any supporting documentation and additional data sources.

To facilitate public input, this document provides a broad overview of the issues already identified for consideration in the FMP; background information on the black drum population, fishery, and management; and a series of questions for the public to consider about the management of the species. In general, the overarching question on which the ASMFC is seeking public comment is: **“How would you like the black drum fishery to look in the future?”**

**WHAT GENERAL ISSUES WILL BE ADDRESSED?**

Reasons for developing an interstate FMP for black drum:

1. To provide for consistent coastwide management for the migratory black drum population;
2. To provide a framework to implement management measures for black drum, should it be necessary for the conservation of the stock; and
3. To confront issues that may face the fishery now or in the future.

**ISSUE 1: CONSISTENT COASTWIDE MANAGEMENT OF A MIGRATORY STOCK**

Background: Black drum are currently managed on a state-by-state basis. Within its primary harvest range (New Jersey to Florida), some states have not implemented management measures while other states have implemented size limits, creel limits, and total quotas. The minimum size requirements in effect range from 10” to 16”, though some states are currently considering a 32” minimum size. Maximum sizes range from 24” to 26”, and creel limits range from 1 to 15 per person/day and 500 to 10,000 pound commercial trip limits. The working group expressed concern that, although the stock has generally appeared healthy throughout the past, increased fishing pressure, due to more restrictive regulations on other species, may negatively impact the stock.

Past tagging efforts have shown black drum to be migratory. Music and Pafford (1984) found that most black drum tagged in Georgia did not move far from the area of release. However, in Georgia 13% of all returned fish had moved more than 100 km, reaching as far south as West Palm Beach, Florida (619 km), and as far north as Murrells Inlet, North Carolina (437 km) (Table 1). Further, migration is not necessarily related to size, as the two black drum that had travelled the farthest from their release sites in Georgia were less than 350 mm TL. Within the South Carolina Marine Game Fish Tagging Program, the majority (99.6%) of recaptures were caught within 1-2 miles of the initial tagging location (WG Report 2011). Nine specimens were recaptured out of state from 9 to 381 miles from the initial tagging location for these fish. Seven of these specimens were recaptured in North Carolina and two were recaptured in Florida. Additional tagging efforts within Virginia and Maryland showed similar

trends of a majority of recaptures occurring nearby with some far-traveling migrants (Table 2, Table 3).

Statement of the Problem: Lack of consistent coastwide regulations may negatively impact the black drum population as fishing pressures shifts from other stocks.

Objective: Develop coastwide management measures for black drum to provide consistent protection for the stock along the coast.

Considerations:

- What is the status of the fishery?
- What precautionary measures may be necessary for continued conservation of the stock until the stock status is known?
- Are there regional differences in the fishery and/or in the black drum stock that need to be considered when implementing management measures?
- What are the recent trends in the recreational and commercial fisheries, in terms of landings and effort (see Figure 1 and Figure 2)?
- How accurate are the recreational data due to how the fishery is conducted?
  - If accuracy of the data is an issue, how can it be improved?

***ISSUE 2:  
ESTABLISH A  
FRAMEWORK  
TO QUICKLY  
IMPLEMENT  
MANAGEMENT  
MEASURES, IF  
NECESSARY  
FOR THE  
CONSERVATION  
OF THE STOCK***

Background: The Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) was enacted for the purpose of supporting and encouraging the development, implementation, and enforcement of effective interstate conservation and management of Atlantic coastal fishery resources. Enforcement of state compliance with mandatory plan provisions is carried out by the Secretary of Commerce, who, upon recommendation by the Commission, has the authority to declare a moratorium in a state's fishery if that state has not implemented and enforced the plan as required and if doing so is necessary for the conservation of the fishery in question. Under the ACFCMA, the Commission is responsible for:

- Preparing and adopting coastal FMPs to provide for the conservation of coastal fishery resources,
- Specifying the requirements necessary for states to be in compliance with the plan and identifying each state that is required to implement and enforce the plan,
- Reviewing, at least annually, each state's implementation and enforcement of the plan to determine whether each state is effectively implementing and enforcing the plan within established timeframes, and
- Notifying the Secretaries of Commerce and the Interior if it determines that a state is not in compliance with the plan.

Additionally in 1995, the Commission adopted an Interstate Fisheries Management Program (ISFMP) Charter to establish standards and procedures for the preparation and required elements of coastal fishery management plans (ASMFC 2009). Such elements include compliance requirements, criteria for

designating a state as *de minimis* and related exemptions, procedures for conservation equivalency, if applicable, and adaptive management measures.

Statement of the Problem: Black drum populations are not subject to any of the protections or benefits gained from an interstate fishery management plan. Fishing effort has increased on the stock since the 1980s and is expected to continue to increase due to restrictions on other fisheries. The framework of an FMP affords managers tools to react quickly to changes in the population and the fishery and provide protection across the range of the migratory stock.

Objective: Develop an interstate FMP for black drum that is consistent with ACFCMA and the ISFMP Charter's standards and procedures, providing states with a management framework.

Considerations:

1. Recommended versus mandatory management measures: All to none of the new measures selected by the Management Board could be recommended or mandatory measures. These possibly include:
  - Size limits
  - Creel limits
  - Trip limits
  - Closed seasons/areas
  - Monitoring requirements
  - Biomass or fishing level targets and thresholds
  - Annual, seasonal, or area-specific quotas
  - Methods to limit entry into the fishery
  - Management or assessment triggers
2. *De minimis* criteria: A state may be granted *de minimis* status (exempting it from certain, specified requirements) if, under existing conditions of the stock and scope of the fishery, conservation and enforcement actions taken by the state would be expected to contribute insignificantly to a required coastwide conservation program (ASMFC 2003). Other Commission FMPs use a *de minimis* range from 0.1% to 2% landings limit compared to coastwide total landings (or commercial and recreational landings separately or jointly).
3. Overfishing definition: An overfishing definition is a standard element within the Commission's FMPs. Assessment results are compared to the overfishing biological reference point(s) to determine stock status. Black drum has yet to undergo a stock assessment, which is projected to occur concurrently during the development of the interstate FMP.
4. Adaptive management measures: Adaptive management provides the flexibility to implement management changes through the addendum process. Addendums, in contrast to amendments, are defined within the FMP and can be an efficient way to institute management measures, while still providing public input opportunities, in response to changes in the fishery or stock population. Measures subject to the addendum process can be defined within the FMP. Contrasting the two methods, an



amendment generally takes 12-18 months to complete, whereas an addendum takes 6-12 months.

**ISSUE 3:  
CONFRONT  
ISSUES THE  
FISHERY MAY  
FACE NOW AND  
IN THE FUTURE**

Background: Currently, the black drum fishery has not been assessed, but no indices or warning signs have materialized to indicate that the stock is in jeopardy. Although the catch-per-unit-effort calculated from the Maryland Charter Boat fleet indicates a downward trend (Figure 3), most other indices, including Delaware's bottom trawl surveys (Figure 4), North Carolina's gill net survey (Figure 5), the trammel surveys in South Carolina (Figure 6) and Georgia (Figure 7), and Florida's young-of-year and post-young-of-year survey (Figure 8) relay little to no trend. Although most surveys do not suggest an unhealthy population level, the Black Drum Working Group noted their concerns that the targeted size range of the fishery tends to be on immature juveniles. Black drum have been shown to begin maturing at 450-499 mm total length (TL) for males, with 50% of them reaching maturity at about 590 mm (age 4 or 5) (Murphy and Taylor 1989). Females begin maturing at 450-550 mm TL, with 50% reaching maturity at 650-699 mm (age 5 or 6). As depicted in length frequency charts of the recreational and commercial harvests (Figure 9 - Figure 14), the majority of fish caught have yet to reach maturity and spawn for the first time. Coupled with the migratory nature of the stock (Music and Pafford 1984, Table 1 - Table 3) and that the actions or lack of action by one state may impact the fishery of another state, coastwide management could be a viable option for ensuring the ability to react to future changes.

Statement of the Problem: Although the stock is not currently considered to be depleted or in trouble, there is currently no framework or forum for states to confront issues relating to the migratory black drum population and/or their black drum fisheries.

Objective: Develop an interstate FMP to provide a framework for addressing issues that may arise in the fishery, both in the near- and long-term.

Considerations:

- What issues face the fishery now?
- What issues has the fishery faced in the past? Have these issues involved interactions with the fishery of another state?
- What potential issues could arise in the fishery in the near-term?
- What potential issues could arise in the fishery in the long-term?
- What tools should be included in the FMP for managers to address these issues? Should these all be included under adaptive management, which would require an addendum (6-12 month process), or should some of these tools require an amendment (18-24 month process)?

**BACKGROUND  
INFORMATION  
ON BLACK  
DRUM AND  
CURRENT  
MANAGEMENT**

*Description of the Resource:* Black drum range from the Gulf of Maine to Argentina, spanning the entire Commission jurisdiction (Figure 15). Atlantic coast black drum conduct an age-specific inshore migration, northward in the spring and southward in the fall (Jones and Wells 2001). Some genetic work has suggested clinal variation in the Gulf of Mexico (Gold and Richardson 1998), but little other differentiation has been shown (Gold and Richardson 1991). Further, tagging work has suggested migration of some parts of the stock over long distances (Music and Pafford 1984, Table 1 - Table 3).

Black drum are the largest members within the family Sciaenidae, reaching over 46" and 120 lbs. The species is long-lived, reaching up to 60 years of age (Murphy et al. 1998). Black drum are known to spawn during the winter and early spring, with females maturing at 4-6 years and produce on average 32 millions eggs each year (Fitzhugh et al. 1993).

*Description of the Fisheries:* Recreational harvest of black drum has increased along the Atlantic coast in the last decade. In 2009-2010, harvest was down from the time series peak observed in 2008 (Figure 1). Although New Jersey, Delaware, Virginia, Georgia, and Florida have experienced apparent increases in black drum harvested by anglers, the majority of the recent coastwide increase in harvest comes from North Carolina; increased harvest in South Carolina also occurred until harvest restrictions were enacted in 2007. Florida and North Carolina fisheries comprise the majority of black drum harvested along the Atlantic Coast.

Coastwide commercial landings of black drum reported by NMFS averaged approximately 368,000 lbs in the 1950s and 60s, then declined to an average of approximately 211,000 lbs in the 1970s and 80s (Figure 2). Since 1990, landings have slowly increased to an average of approximately 270,000 lbs. Since 2000, the majority of black drum harvested coastwide are landed in North Carolina and Virginia. A smaller portion of the coastwide black drum harvest is landed in Delaware, Florida, New Jersey, and Maryland. Landings reported from South Carolina are generally low and indicative of reported bycatch rather than a targeted fishery. Georgia, New York, Connecticut, Rhode Island, and Maine occasionally report small amounts of black drum landings as well; however, the magnitude of these landings is so small that the total annual state landings records are confidential. In recent years, gill nets and pound nets have been the primary gear used coastwide.

*Description of Stock Status:* To date, a coastwide stock assessment has not been performed for black drum. Two regional stock assessments have been completed in the past for black drum on the Atlantic Coast. An assessment of black drum in Florida indicated that the static spawning potential ratio was at least 26%–36% under fishing mortalities estimated for the mid to late 1980s. This observation suggests that the black drum stock in Florida could sustain the level of fishing occurring during the early 1990s (Murphy and Muller 1995). In 2001, yield-per-recruit and catch curve analyses were conducted for black drum that suggested

fishing mortality in the Chesapeake Bay was below  $F_{MSY}$  and would likely stay below  $F_{MSY}$ , unless fishing on animals 5 years in age or greater in other areas along the coast increased (Jones and Wells 2001).  $F_{MSY}$  is defined as the level of fishing that can sustain the stock level to provide the maximum yearly yield to the fishery.

Further, recent survey indices, in general, do not indicate any consistent trends (Figure 3 - Figure 8).

*Description of Management:* Black drum is managed by state fisheries agencies from New Jersey to Florida. All states in this range currently have some level of regulations for black drum except for North Carolina (Table 4). The minimum size requirements in effect range from 10" to 16", and New Jersey is currently proposing to raise the minimum size to 32". Maximum sizes range from 24" to 26", and creel limits range from 1 to 15 per person/day and 500 to 10,000 pound commercial trip limits.

Catch is tracked by states and the federal government for the commercial fishery and through the Marine Recreational Information Program (MRIP) for the recreational fishery. One concern with MRIP estimates of weight and length is that black drum angling in some states (e.g., Delaware) is conducted during the evenings and nighttime; if these times of day are not adequately sampled, dockside intercept samples may not be representative of the population. Also, black drum seasons in some states (e.g., Maryland and Virginia) are of short duration, so the number of angler intercepts during these periods may not be adequate to characterize these pulse fisheries.

**WHAT ISSUES  
DO WE WANT  
YOUR INPUT  
ON?**

A series of questions is provided to help facilitate the public comment process. Please also provide any general comments on the black drum population or management.

- What is your perception of the health of the black drum population, and what trends and/or issues do you see in the fishery?
- What should be the objectives for the black drum management program?
- Should there be biological reference points, such as fishing mortality and biomass targets and thresholds, for black drum?
- Should managers be prompted to revise the management program when a target is met (more conservative) or not until a threshold is met (less conservative)?
- What should be the management measures for the black drum commercial and recreational fisheries? For example, should there be minimum size limits, maximum size limits, creel limits, trip limits, quotas, bycatch limits, closed seasons, closed areas, permit requirements, and/or limited entry into the fishery?
- Should fishery regulations be implemented coast-wide or state-by-state?
- Should any or all of the fishery regulations be mandatory for states to adopt? If a state delays implementation, what should be the penalty?
- What recommendations should be made for federal regulations?
- Should *de minimis* criteria be defined and adopted that would exempt some states from specific management requirements because the states' landings are insignificant to the coastwide total? Below what level of harvest should a state's harvest be considered insignificant?
- Should states be permitted to submit proposals for alternative management that achieves the same conservation goals as the required management program (e.g., a less restrictive bag limit given a more restrictive minimum size limit)?
- What adaptive management measures should be included in order to use the more efficient addendum process?
- Should the FMP include monitoring measures (such as research surveys and biological sampling from the fisheries) for black drum? Should state adoption of monitoring measures be recommended or mandatory? If a state delays implementation, what should be the penalty?
- What habitat issues are present for black drum? How should these issues be addressed or evaluated further?

## ***References***

- ASMFC. 2009. Interstate Fisheries Management Program Charter. Washington (DC): ASMFC. 27 p.
- Fitzhugh, G., B. Thompson, and G. Snider, III. 1993. Ovarian development, fecundity, and spawning frequency of black drum *Pogonias cromis* in Louisiana. *Fishery Bulletin*, 91: 244-253.
- Gold, J. and L. Richardson. 1991. Genetic studies in marine fishes, IV. An analysis of population structure in the red drum (*Sciaenops ocellatus*) using mitochondrial DNA. *Fisheries Research*, 12: 213-241.
- Gold, J. and Richardson, L. 1998. Mitochondrial DNA diversification and population structure in fishes from the Gulf of Mexico and Western Atlantic. *Journal of Heredity*, 89: 404-414.
- Jones, C.M. and B.K. Wells. 2001. Yield-per-recruit analysis for black drum, *Pogonias cromis*, along the East Coast of the United States and management strategies for Chesapeake Bay. *Fishery Bulletin* 99:328-337.
- Murphy, M.D. and Muller, R.G. 1995. A stock assessment of black drum *Pogonias cromis* in Florida. Florida Marine Research Institute, In-house Report Series IHR 1995-005.
- Murphy, M.D. and R.G. Taylor. 1989. Reproduction and growth of black drum, *Pogonias cromis*, in northeast Florida. *Northeast Gulf Science* 10(2):127-137.
- Murphy, M.D., D.H. Adams, D.M. Tremain, and B.L. Winner. 1998. Direct validation of ages determined for adult black drum, *Pogonias cromis*, in east-central Florida, with notes on black drum migration. *Fishery Bulletin* 96:382-387.

**Tables**

**Table 1.** Number tagged, number and percent recaptured, days at large and distance traveled for black drum in 50 mm length groups. Taken from Music and Pafford (1984).

Length Group	Number tagged	Number recaptured	Percent returned	<u>Days At Large</u>		<u>Distance Traveled (km)</u>	
				Avg	Max	Avg	Max
101 - 150	1	0	0.0				
151 - 200	37	5	13.5	226	359	4.8	24
201 - 250	165	28	17.0	173	529	29.3	445
251 - 300	66	27	40.9	126	424	18.2	165
301 - 350	62	26	41.9	100	321	77.5	619
351 - 400	17	5	29.4	138	455	88.4	217
401 - 450	4	1	25.0	331	331	0.0	0
Total	352	92	26.1	141	529	41.2	619

**Table 2.** Number of tagged and recaptured black drum (2007-2009) and cumulative recapture rates in the Virginia Game Fish Tagging Program.

State	Number of Returns	Percent of Returns
Virginia	145	79.2%
Maryland	36	19.7%
North Carolina	1	0.5%
Delaware Bay	1	0.5%

**Table 3.** Number and percent of tag returns by state from the Maryland black drum tagging survey.

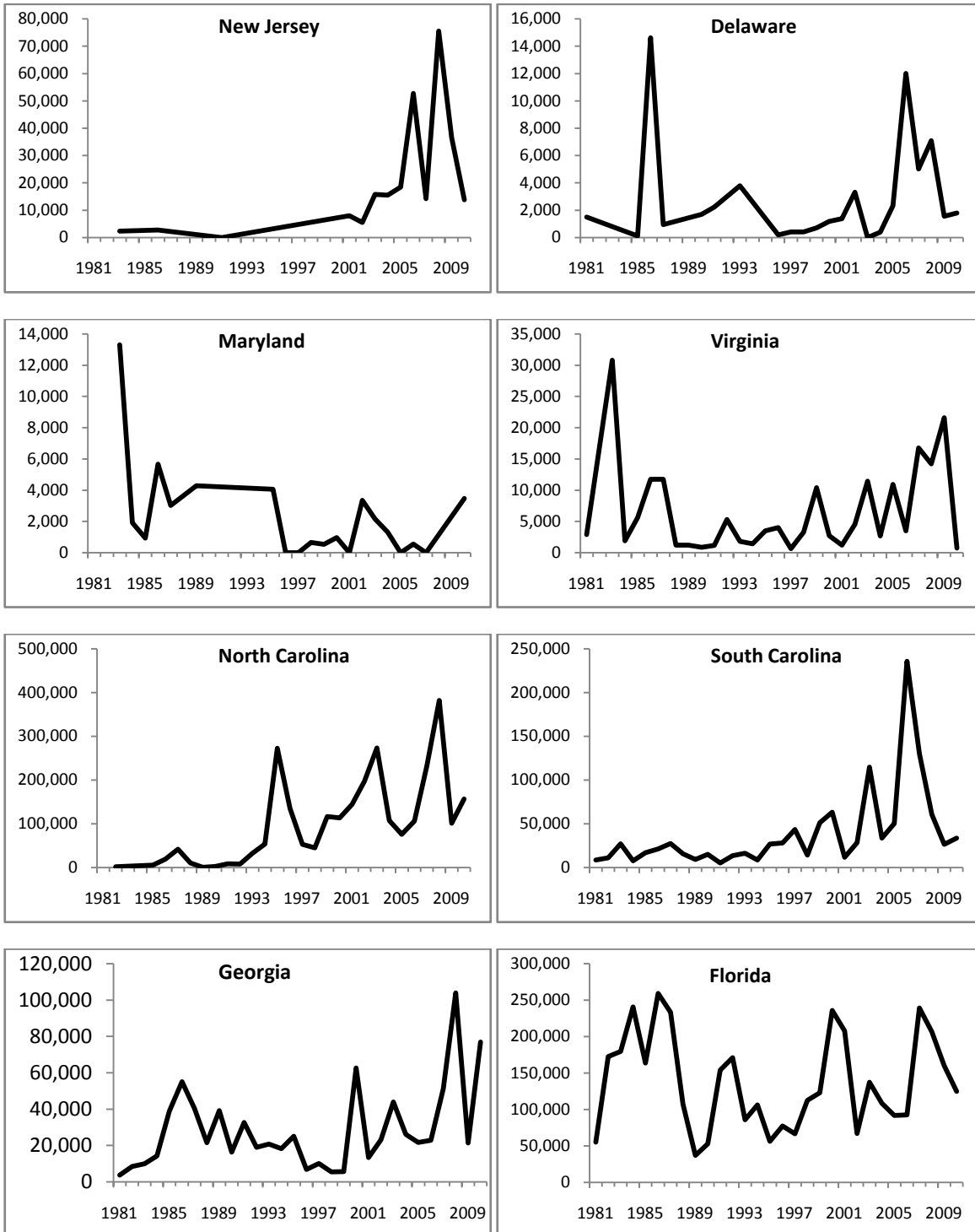
State	Number of Returns	Percent of Returns
Maryland	45	83.3%
Florida	5	11.1%
Virginia	2	3.7%
New Jersey	1	1.9%

**Table 4.** Current state regulations for black drum.

State	Recreational		Commercial			Notes
	Size limit	Bag limit	Size limit	Trip Limit	Annual Quota	
ME->NY	-	-	-	-	-	
NJ	16" min	3/person/day	16" min	10,000 lbs	65,000 lbs	
NJ Proposed	32" min	2/person/day	32" min	5,000 lbs	50,000 lbs	
DE	16" min	3/person/day	16" min	10,000 lbs	65,000 lbs	
MD	16" min	1/person/day 6/vessel (Bay)	16" min		1,500 lbs Atlantic Coast	Ches Bay closed to commercial harvest
VA	16" min	1/person/day	16" min	1/person/day*	120,000 lbs	*without Black Drum Harvesting and Selling permit
NC	-	-	-	-	-	
SC	14" min 27" max	5/person/day	14" min 27" max	5/person/day		Commercial fishery primarily bycatch
GA	10" min	15/person/day	10" min	15/person/day		
FL	14" min 24" max	5/person/day	14" min 24" max	500 lbs/day		One fish >24" allowed for recreational fishers

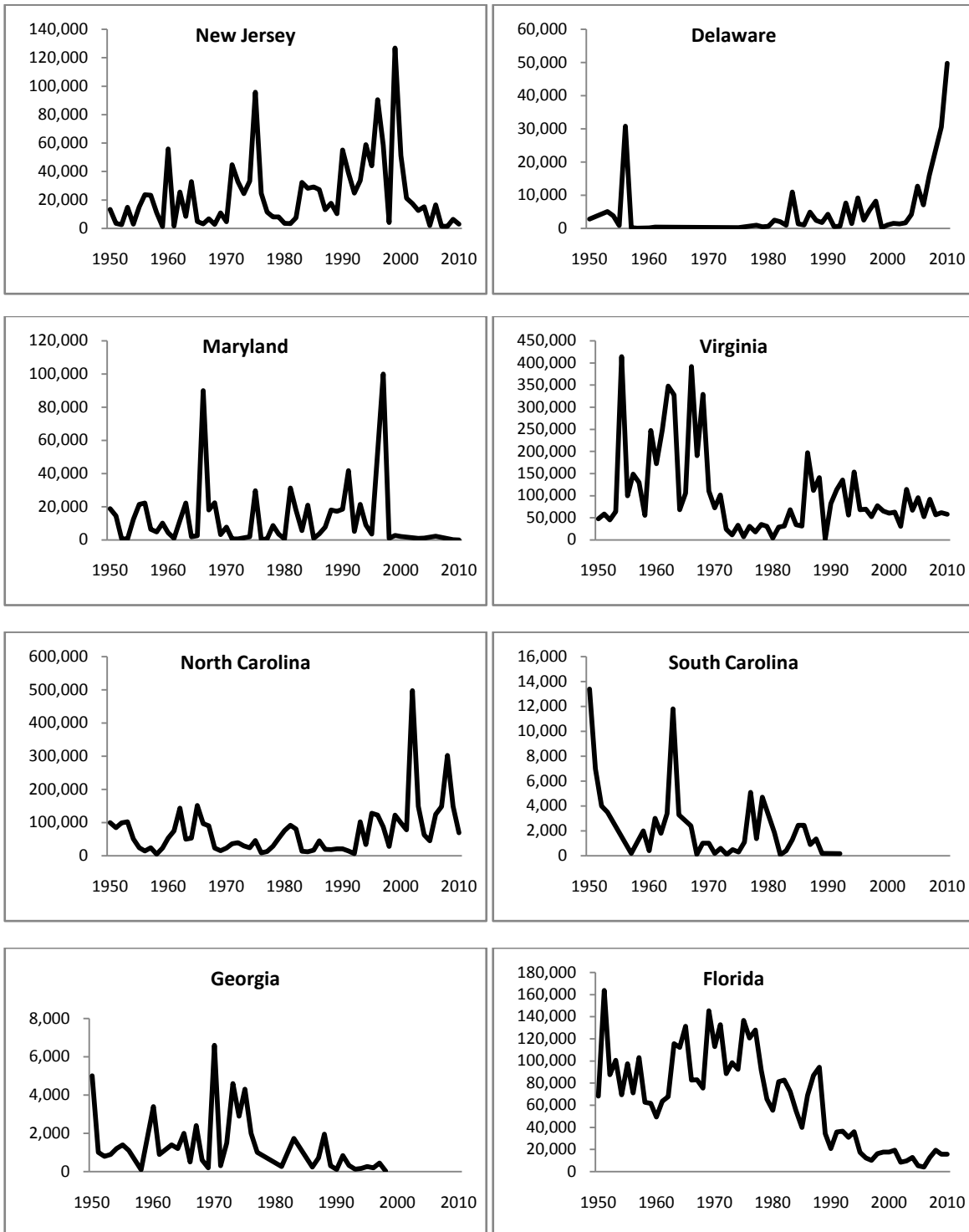
**Figures**

**Figure 1.** State trends in estimated recreational harvest (Type A + B1; in numbers) of black drum from 1981-2010 (MRIP, June 2011). Note differences in scale.

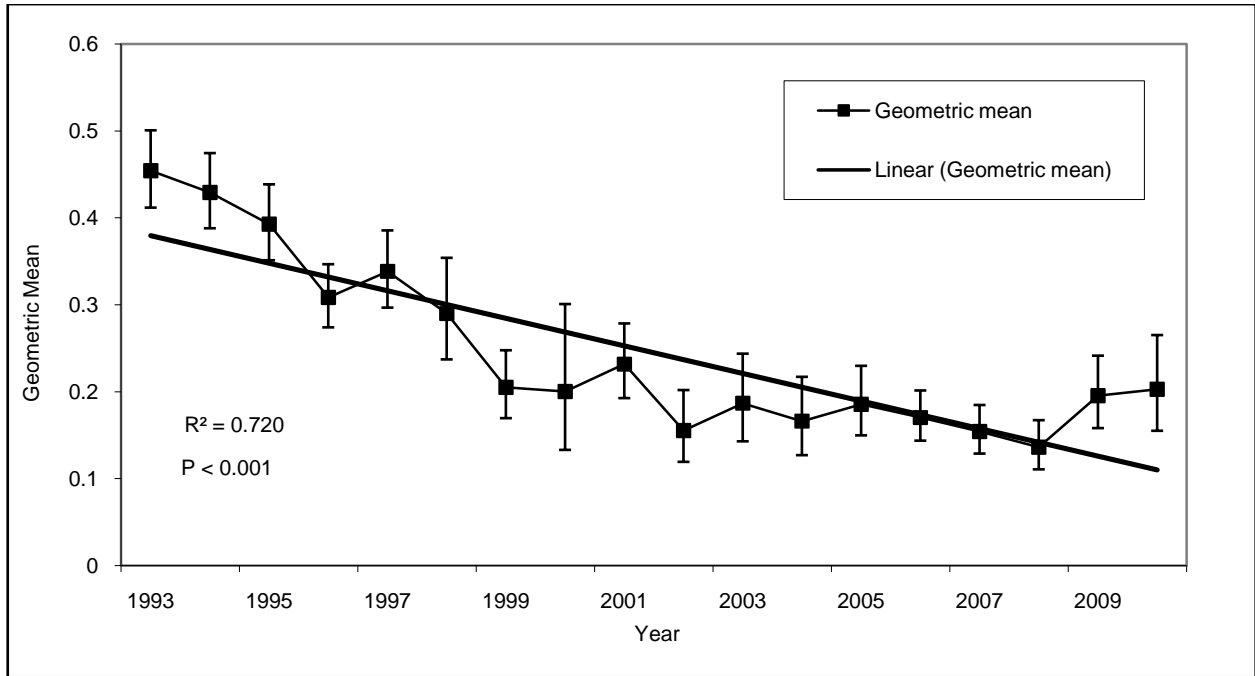




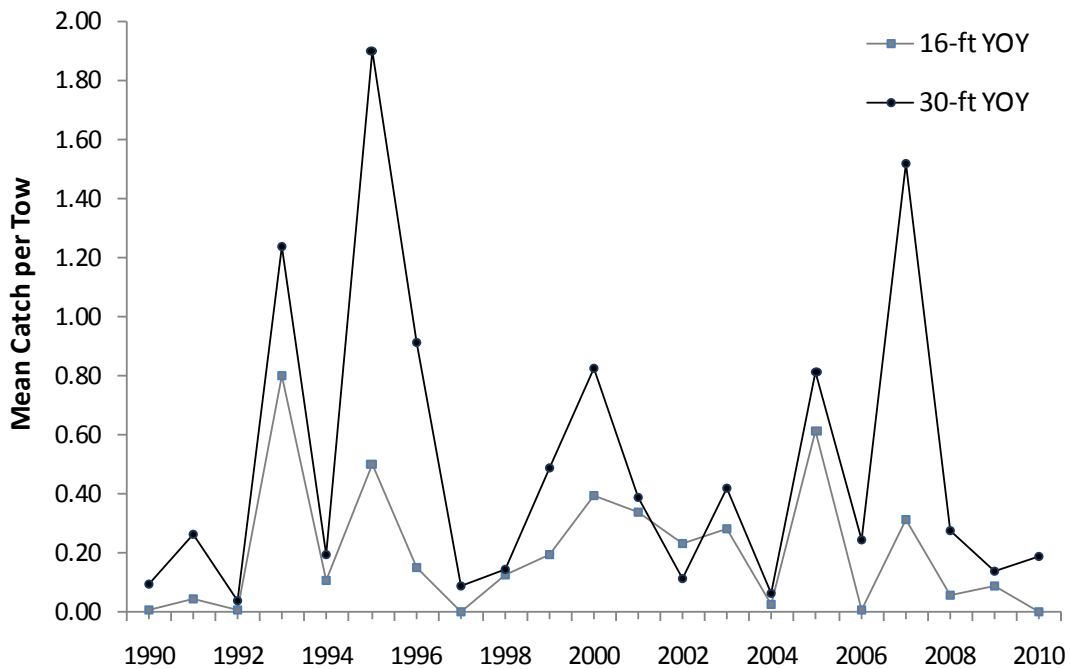
**Figure 2.** State trends in commercial harvest (in pounds) of black drum from 1950-2010 (NMFS Statistics). Note that South Carolina and Georgia landings are not graphed beginning in 1993 and 1999, respectively; South Carolina designated black drum as a game fish and Georgia landings are confidential. Additionally, Maryland prohibited a Chesapeake Bay commercial fishery since 1998. Note differences in scale.



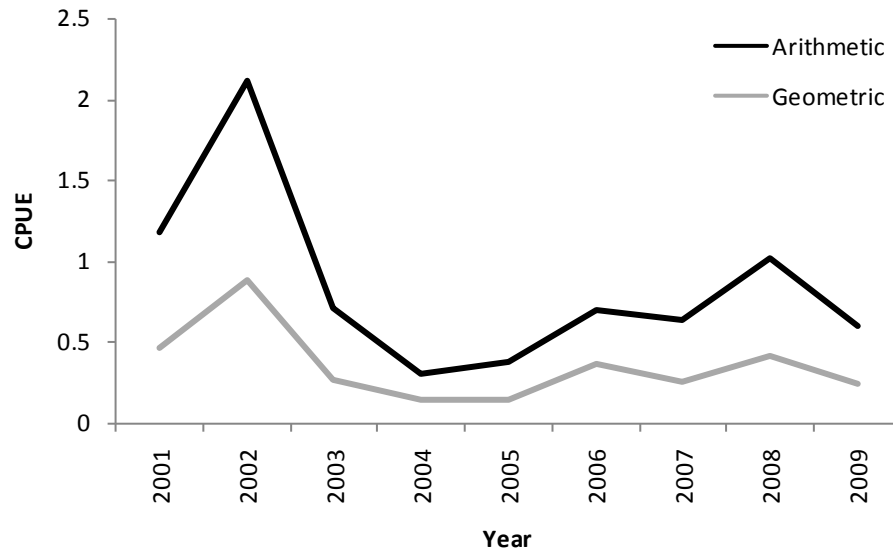
**Figure 3.** Maryland charter boat black drum harvest per angler CPUE (number of fish caught per day and only days on which black drum were caught), 1993-2010.



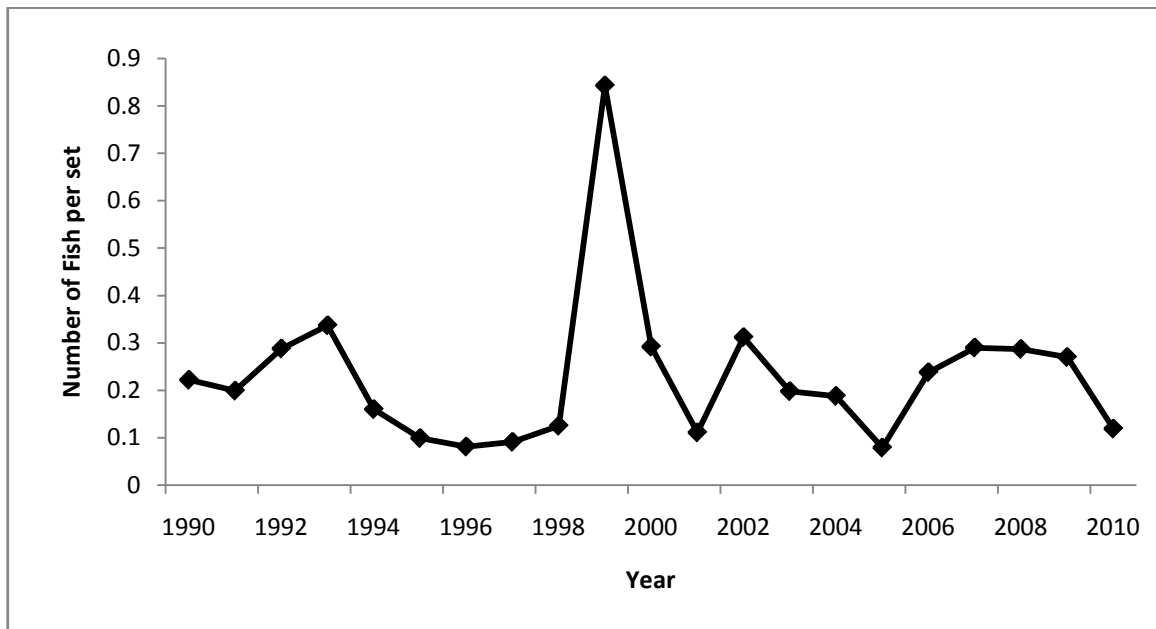
**Figure 4.** Mean catch per tow of juvenile black drum in the 16- and 30-foot Delaware bottom trawl surveys, 1990-2010.



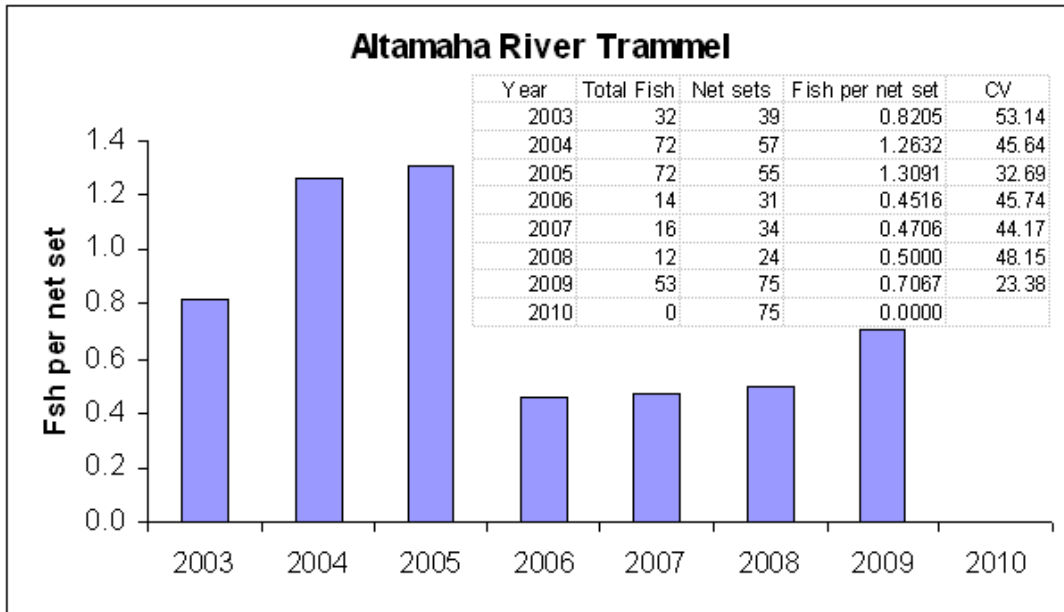
**Figure 5.** Annual arithmetic and geometric abundance indices for black drum from Program 915 (NC Independent Gill Net Survey). CPUE is number of individuals in a 12 hour gill net set.



**Figure 6.** Mean annual CPUE (black drum per 10-minute set) of black drum for SCDNR trammel survey.

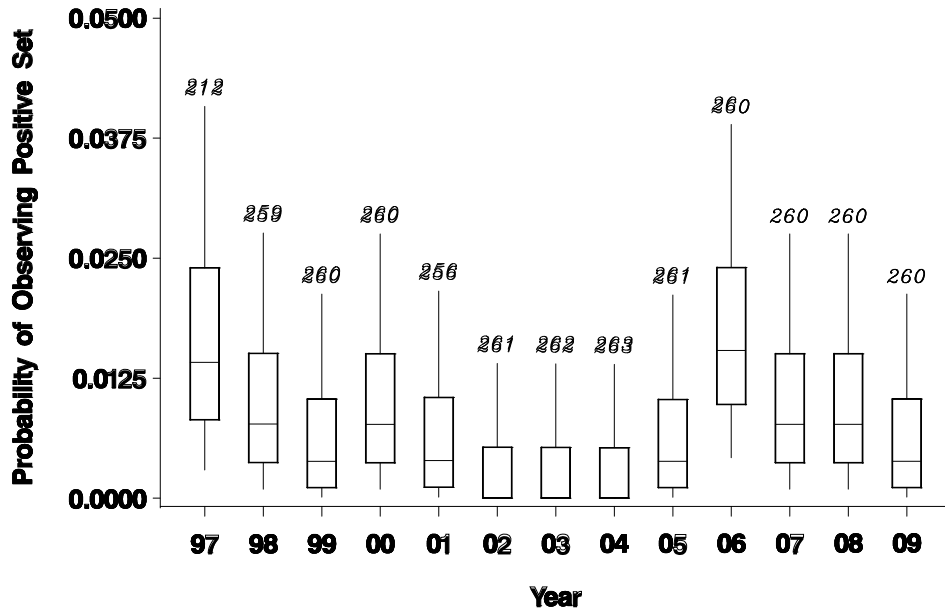


**Figure 7.** CPUE of black drum in the GA DNR Altamaha River trammel net survey.

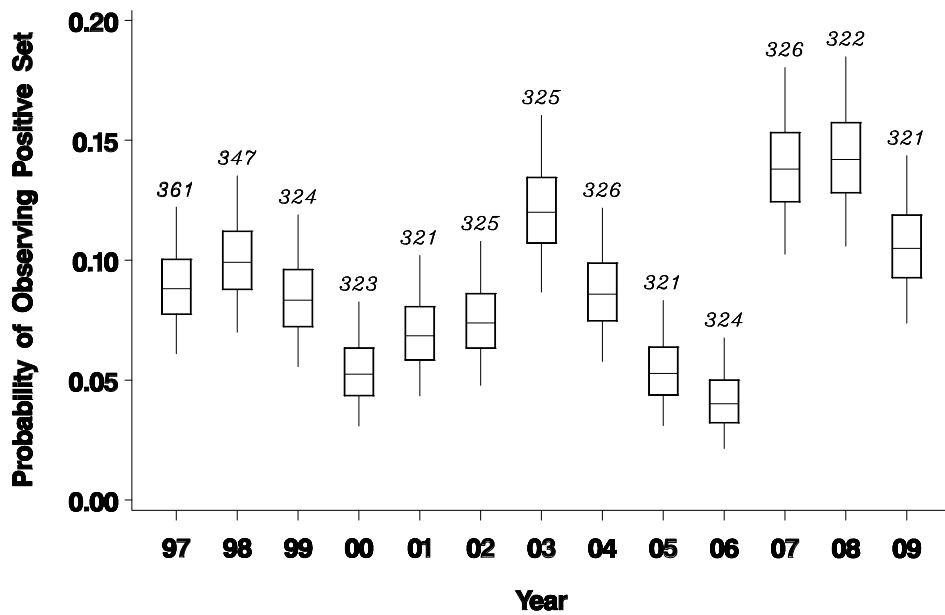


**Figure 8.** Proportion of fishery-independent-monitoring sets that captured black drum from 1997-2009. (a) Young-of-the-year; (b) Post-YOY.

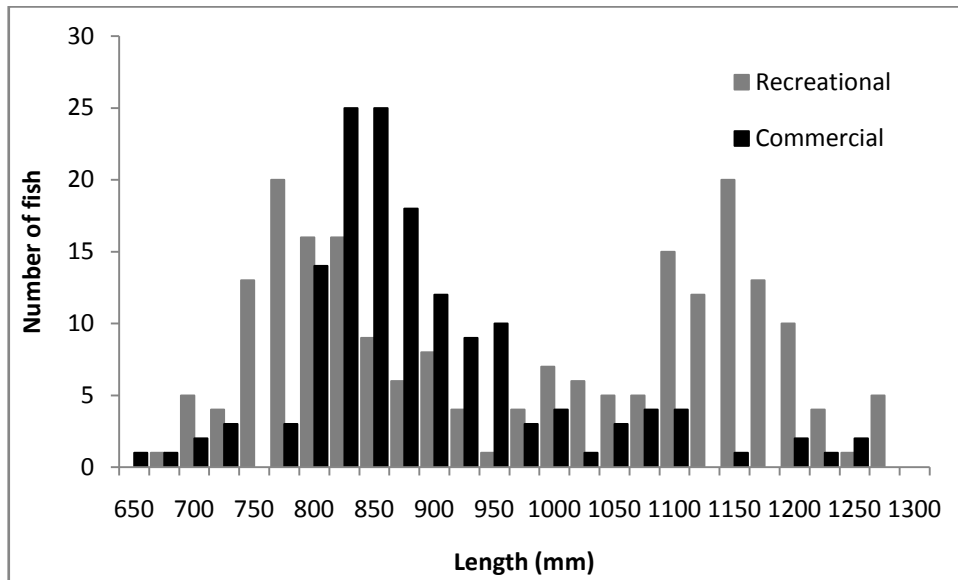
a. Atlantic coast YOY



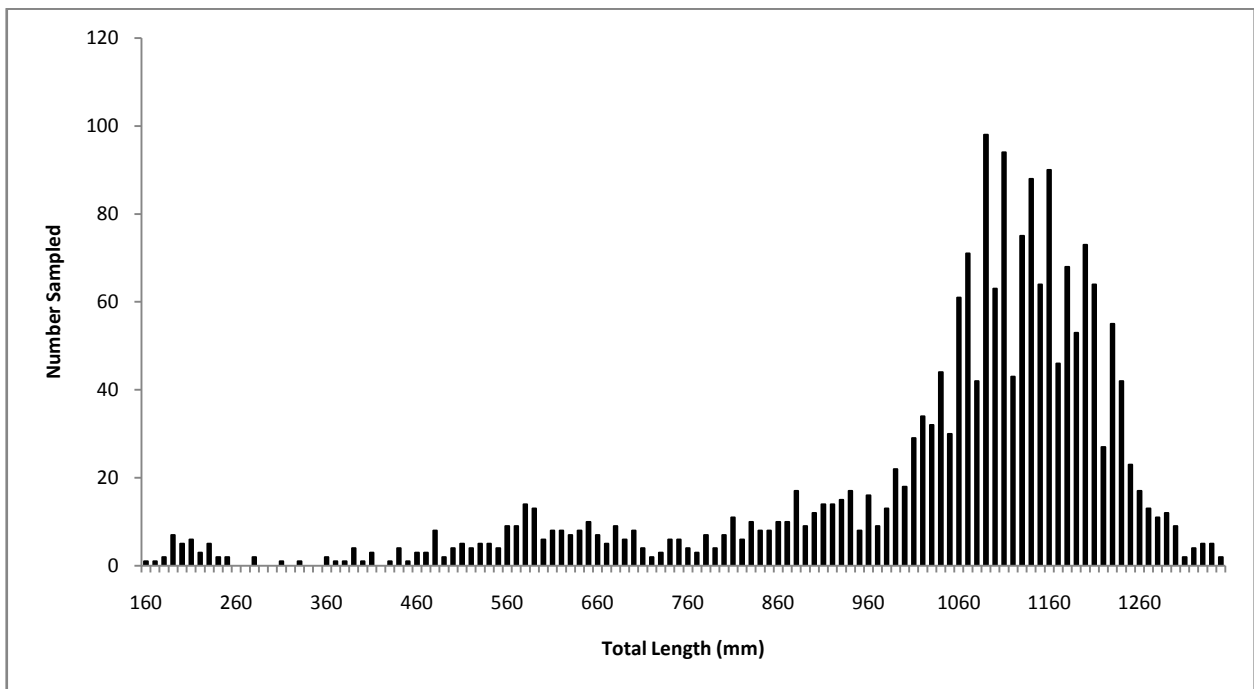
b. Atlantic coast post-YOY



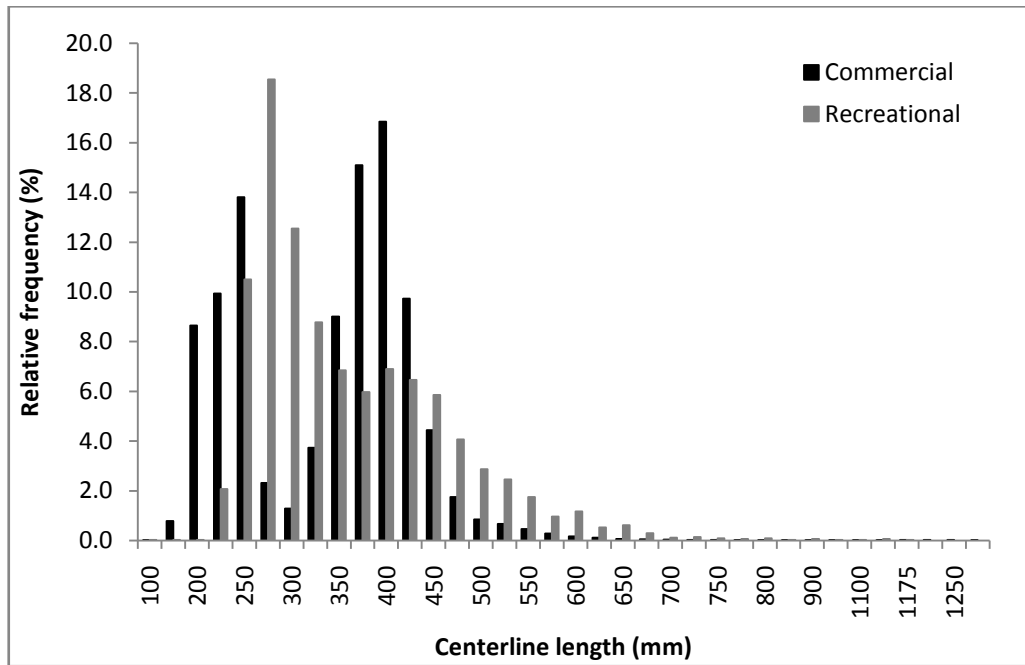
**Figure 9.** Length distribution of recreational and commercial black drum harvest in Delaware, 2009-2010.



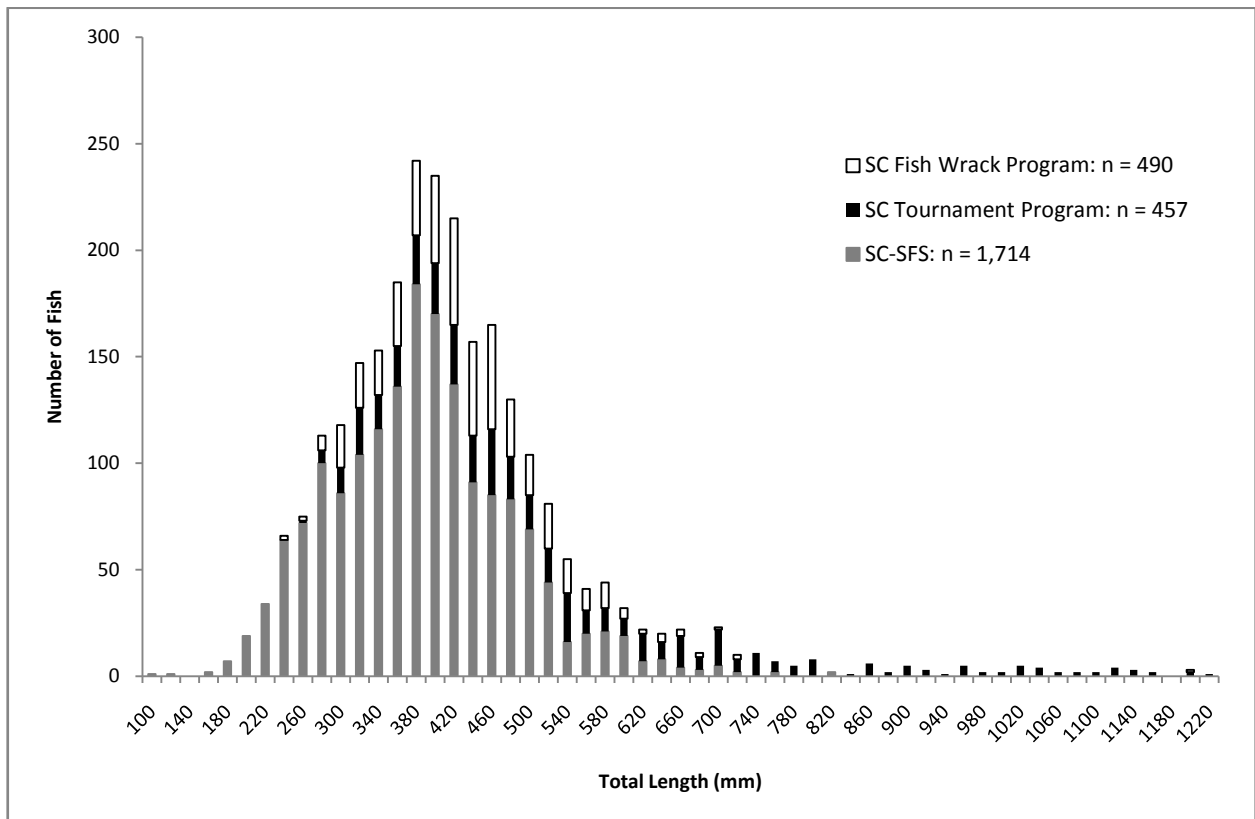
**Figure 10.** Total length distribution of black drum sampled in the VMRC Biological Sampling Program, 1998-2010.



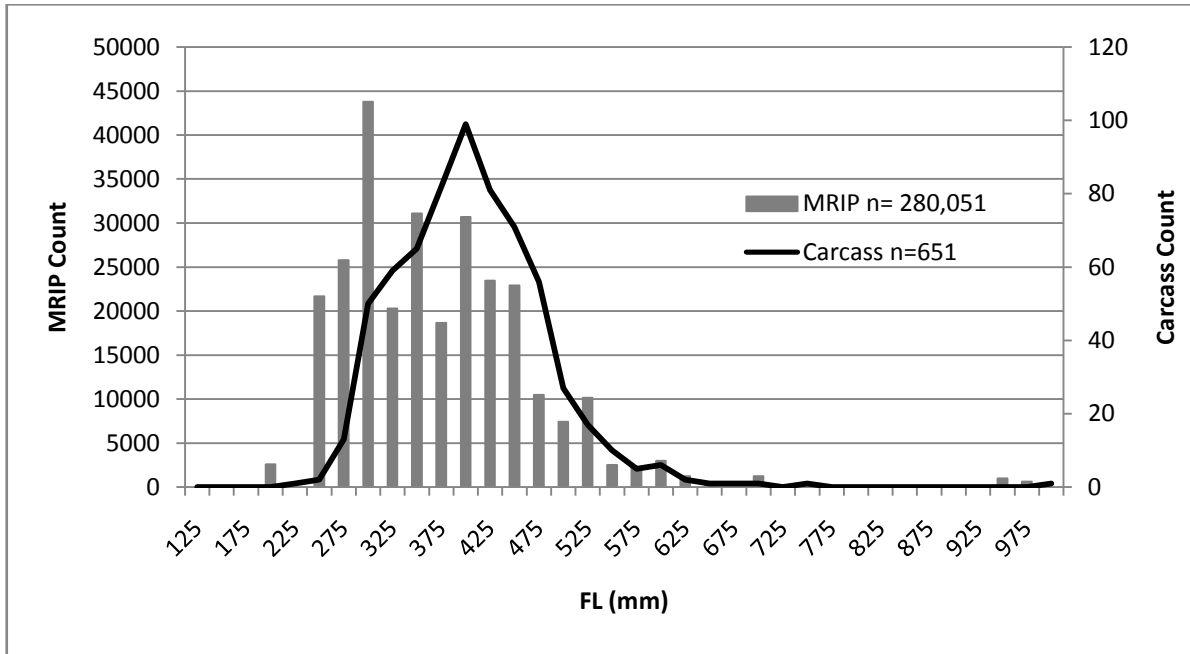
**Figure 11.** Length frequency distribution for black drum in North Carolina for the recreational (1982-2010) and commercial (1990-2009) fisheries.



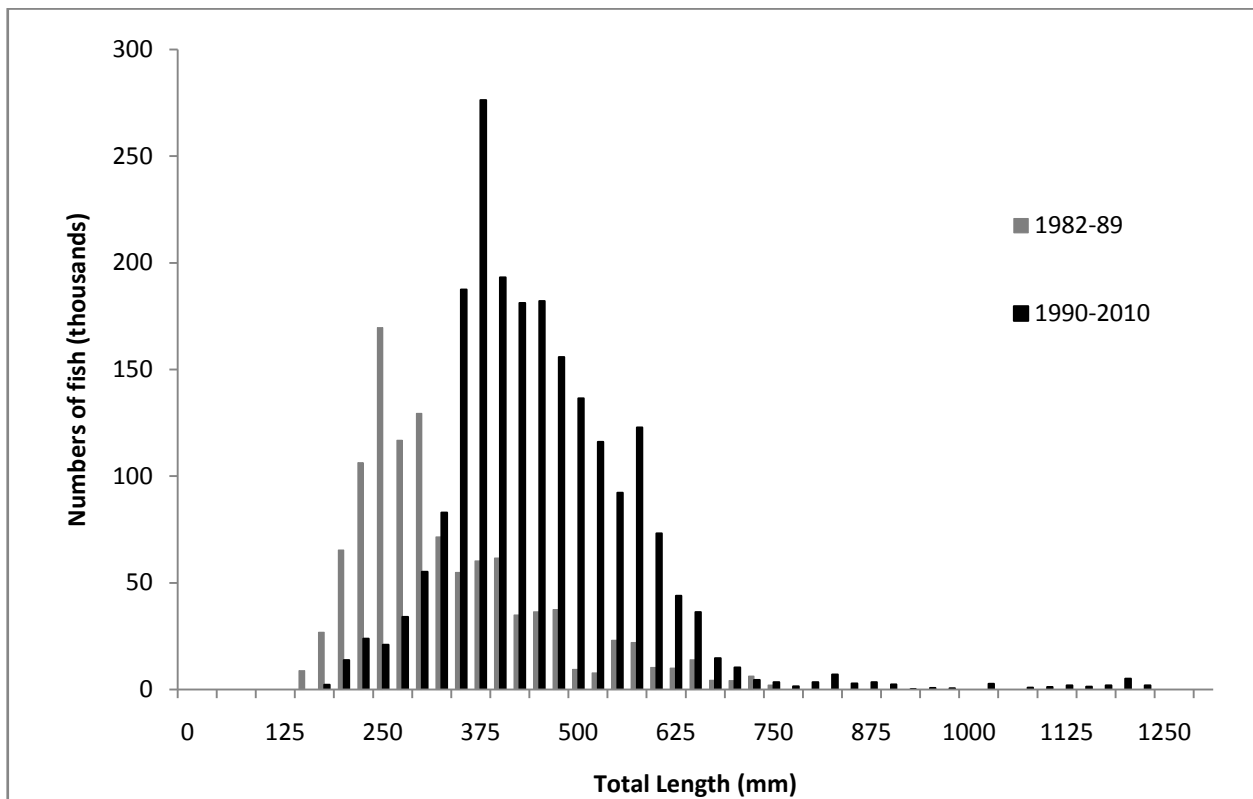
**Figure 12.** Fishery dependent length frequency distribution for black drum in South Carolina by data source, 1986-2010.



**Figure 13.** Length distribution of black drum in the Georgia MRFSS survey, 2005 to 2010 and angler carcass donations.



**Figure 14.** Estimated length frequencies for the total seen catch (Type A) of black drum during the periods 1982-1989 (gray) and 1990-2009 (black) from the Atlantic coast of Florida.





**Figure 15.** Spatial distribution of black drum catches in the NEAMAP survey.

