

# ATLANTIC STATES MARINE FISHERIES COMMISSION

## REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR WEAKFISH  
*(Cynoscion regalis)*

2012 FISHING YEAR



Prepared by the Plan Review Team

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## **I. Status of the Fishery Management Plan**

The Atlantic States Marine Fisheries Commission (Commission) adopted its first Fishery Management Plan (FMP) for Weakfish in 1985. Amendment 1 to the FMP (1992) unsuccessfully aimed to improve the status of weakfish. Amendment 2 (1995) resulted in some improvement to the stock, but several signs indicated that further improvement was necessary. Thus, Amendment 3 (1996) was implemented to increase the sustainability of the fishery. Addendum I to Amendment 3 was approved in 2000 in order to extend the management program until the next amendment was implemented.

Amendment 4 was approved in 2002. The goal of Amendment 4 is to utilize interstate management so that Atlantic coastal weakfish recover to healthy levels that will maintain commercial and recreational harvest consistent with a self-sustaining spawning stock and to provide for restoration and maintenance of essential habitat (ASMFC 2002). The management objectives are to:

- 1) establish and maintain an overfishing definition that includes target and threshold fishing mortality rates and a threshold spawning stock biomass to prevent overfishing and maintain a sustainable weakfish population;
- 2) restore the weakfish age and size structure to that necessary for the restoration of the fishery;
- 3) return weakfish to their previous geographic range;
- 4) achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit, including states' waters and the federal EEZ;
- 5) promote cooperative interstate research, monitoring, and law enforcement necessary to support management of weakfish;
- 6) promote identification and conservation of habitat essential for the long term stability in the population of weakfish; and
- 7) establish standards and procedures for both the implementation of Amendment 4 and for determination of states' compliance with provisions of the management plan.

Amendment 4 established target and threshold fishing mortality rates and a threshold spawning stock biomass level to determine overfishing and overfished stock status. The amendment requires states to implement recreational and commercial management measures to achieve annual fishing mortality targets. Some management measures are specified (e.g., minimum size limit, minimum mesh size, bycatch limit), while the amendment provides the states flexibility in implementing other regulations (e.g., trip limits, area or season closures). States may request implementation of alternative management plans with conservationally equivalent measures. States deemed to have insignificant landings were exempt from the recreational and commercial requirements, with the exception of the bycatch reduction device requirements.

The Commission adopted Addendum I to Amendment 4 (2005) to replace the biological sampling program in section 3.0 of Amendment 4. In response to a significant decline in stock abundance and increasing total mortality since 1999, the Commission approved Addendum II to Amendment 4 (2007) to reduce the recreational creel limit and commercial bycatch limit, and set landings levels that when met will trigger a re-evaluation of management measures. Addendum III to Amendment 4 (2007) altered the bycatch reduction device certification requirements in Section 4.2.8 of Amendment 4 for consistency with the South Atlantic Fishery Management Council's Shrimp FMP. The Commission approved Addendum IV to Amendment 4 in 2009 to

respond to the results of the 2009 benchmark stock assessment (additional information is provided in Section VI. Status of Management Measures and Issues).

Weakfish are managed under this plan as a single stock throughout their coastal range. All Atlantic coast states from Massachusetts through Florida and the Potomac River Fisheries Commission have a declared interest in weakfish. See Table 1 for a summary of state-by-state regulations in 2012.

## **II. Status of the Stock (see also Appendix A)**

The weakfish stock is depleted and overfishing is not occurring (NEFSC 2009a, NEFSC 2009b). In general, weakfish biomass has declined to an all time low, total mortality is currently high, and non-fishing mortality has increased in recent years. While overfishing has not occurred in recent years, harvest was reduced by an estimated 60% in Addendum IV to reduce additional mortality from fishing and poise the stock for a quicker recovery should natural mortality decline.

Between 1982 and 1990, age 1+ weakfish biomass<sup>1</sup> declined drastically from 113.1 million pounds to 17.6 million pounds (Figure 1). Overfishing was the main cause of this decline, with fishing mortality (F) accounting for about 60-90% of total mortality (fishing plus natural mortality) during the period. Fishing mortality<sup>2</sup> peaked at 1.01 in 1989, but with the implementation of management measures in the early to mid-1990s, F declined to 0.24 in 1995 and biomass responded favorably by increasing to a peak of 62.1 million pounds in 1996 (Figure 1). While F remained relatively stable (between 0.26 and 0.58) after that time, the stock began another drastic decline in 2001 to the time-series low of 10.8 million pounds in 2008. However, the contribution of fishing mortality to total mortality was substantially reduced during this period; from 2004-2007 only 10-20% of total mortality is attributed to fishing mortality. Conversely, natural mortality has risen substantially since 1995 (Figure 1), and factors such as predation, competition, and changes in the environment are thus believed to be having a stronger influence on recent weakfish stock dynamics than fishing mortality. Bycatch and under-reported catches would have to be much greater than those estimated, growing from about 3-4 times the estimates in 1996 to 15-20 times in the most recent years, to account for the biomass decline. Thus far, there is no evidence available of an Atlantic coast fishery capable of generating additional unreported weakfish discards of this magnitude.

Currently, the stock's spawning potential is considered to be at only 4% of an unfished stock, well below the 20% spawning potential threshold and 30% spawning potential target adopted in Addendum IV. Trends in F indicate a stable and modest fishing mortality. Thus, while the stock biomass is depleted, overfishing is not occurring.

## **III. Status of the Fishery**

At 539,318 pounds, the total coastwide landings of weakfish in 2012 are a drastic increase from the lowest-on-record landings from 2011 (160,542 lbs). Total landings are still well below the ten-year (2002-2011) average of 2.0 million pounds. The commercial fishery (273,606)

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<sup>1</sup> Biomass estimates are for January 1 stock size. All mortality rates are also based on January 1 stock size.

<sup>2</sup> F estimates are based on age 1+ biomass and are therefore affected by partial recruitment and can not be comparable to the F target and threshold in Amendment 4 which are for fully recruited ages only.

accounted for 51% of the total 2012 landings, and the recreational fishery (265,712 lbs) for 49% (Table 2).

### *Commercial Fishery*

Commercial data are cooperatively collected and compiled by the National Marine Fisheries Service (NMFS) and state fishery agencies from state mandated trip-tickets, landing weigh-out reports from seafood dealers, federal logbooks, shipboard and portside interviews, and biological sampling of catches. Landings from the NMFS Fisheries Statistics Division are used within this report unless a state reports alternative values in its compliance report to the Commission, in which case these values are used (see notes for Table 3).

Between 1982 and 2012, coastwide commercial weakfish landings have ranged from the high of 21.1 million pounds in 1986 to the low of 133,085 pounds in 2011 (Table 3). Since 1988, the overall trend is declining except for during the period of 1990-1998 when landings hovered between 6.1 and 9.1 million pounds (Figure 2). Landings in 2012 were 273,606 pounds.

North Carolina (33 %) and New York (22 %) landed the largest shares of the 2012 coastwide commercial weakfish landings (Figure 3). Some states (FL, GA, PRFC, DE, CT, RI, MA) reported increases in landings since 2011, but that is only because recent landings are very low, so in comparison the increased landings are not significant (Table 3).

The dominant commercial gears in 2012 were gill nets (about 35% of the total commercial landings, respectively; NMFS 2012). There has been a shift in the dominant source of landings from trawls in the 1950s-1980s to gill nets in the 1990s-present. The majority of commercial landings tend to occur in the fall and winter months, presumably as the fish congregate to migrate to over-wintering grounds in the South Atlantic (Hogarth et al. 1995).

### *Recreational Fishery*

Recreational catch statistics are collected by the NMFS. Effort data are collected through telephone interviews. Catch expansions are based on angler interviews and biological sampling conducted by trained interviewers stationed at fishing access sites. All recreational data in this report are from the NMFS Fisheries Statistics Division queried from the Marine Recreational Information Program (MRIP; 2012), except as noted in section VI of this report for Florida's estimates.

Since 1982, coastwide recreational landings have ranged from the high of 11.4 million pounds in 1983 to the low of 27,436 pounds in 2011 (Table 4). Landings averaged 7.8 million pounds from 1982-1988, before falling to 2.1 million pounds in 1989. Annual recreational landings generally fluctuated between one and four million pounds from 1990 to 2002, before dropping below one million pounds in 2003 (Figure 2). Landings have averaged 307 thousand pounds (or 238 thousand fish) the last five years (Table 5), and are estimated at 265,712 pounds (216,474 fish) in 2012. The number of fish released alive by anglers remained above 1 million fish from 1992 to 2008, peaked at over 5 million in 1996, decreased to 1.2 million fish in 2012 (Table 6, Figure 4).

New Jersey anglers have consistently harvested the most weakfish by pounds along the coast. In the 1980s and 1990s, anglers in Delaware, Maryland, and Virginia often took the next largest shares of the recreational total amount. In the 2000s, New Jersey anglers led in the harvest, whereas anglers in Virginia and North Carolina tended to take the second and third largest

amounts (Tables 4 and 5). However, from 2009-2011, North Carolina anglers landed the largest share while South Carolina and Virginia had the next largest shares of the recreational harvest. This trend appears to have ended though, as New Jersey harvested the most fish (by pounds) in 2012. More specifically, New Jersey had 59% of the of the coastwide harvest, followed by North Carolina anglers with 17% (by pounds; Figure 5).

The recreational fishery catches weakfish using live or cut bait, jigging, trolling, and chumming. The majority of recreationally harvested weakfish are caught in state waters (85.5% in 2012 by pounds). In 2011, nearly all recreationally harvested fish were caught from private or rental boats (43%) or from shore (53%).

#### **IV. Status of Assessment Advice**

An assessment was completed in 2009 by the Weakfish Stock Assessment Subcommittee (NEFSC 2009a, NEFSC 2009b) and peer reviewed by the 48<sup>th</sup> Stock Assessment Review Committee (Sullivan et al. 2009) at the 48<sup>th</sup> Northeast Regional Stock Assessment Workshop (SAW). The assessment includes fishery data and survey indices through 2007.

As recommended by previous review panels, an age-structured VPA was used to evaluate trends in population parameters. This model provided reasonable estimates of fishing mortality and biomass from 1981-2001 with estimates converging regardless of the terminal year of the model; however, estimates from 2002 onward were subject to excessive bias when adding additional years of data, making them unusable for analysis. An alternative approach using an index-based model (where relative values are estimated from harvest and survey data and then scaled to absolute values based on results from the early, more stable part of the VPA time series) was developed. Two surplus production models were also included in the assessment because these could include additional sources of mortality, such as predation, competition, and environmental factors. The peer review panel endorsed using, on an interim basis, the index-based model for estimating biomass and fishing mortality, weakfish relative spawning stock biomass projections, and a biomass threshold approximating 20% of unfished SSB. The review panel recommended that the SAS develop additional methods to analyze the stocks in the next assessment.

#### **V. Status of Research and Monitoring**

##### *Fishery-Independent Data*

Young-of-year indices of relative abundance are provided by Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, and Florida. Connecticut, New Jersey, Delaware, North Carolina, Georgia, and Florida provide age-0+ or 1+ indices of relative abundance. The Northeast Fisheries Science Survey Groundfish Trawl Survey also produces an age-structured index for the Mid-Atlantic coast, while the Southeast Area Monitoring and Assessment Program (SEAMAP) survey produces another for the South Atlantic Coast. The Northeast Area Monitoring and Assessment Program (NEAMAP) began spring and fall surveys between Martha's Vineyard and Cape Hatteras in the fall of 2007, and will provide an index in the future. The Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP), which began in 2002, collects data on relative abundance, length, weight, age, sex, and trophic interactions in the Bay. See Table 9 for the indices provided in the 2012 compliance reports.

### *Fishery-Dependent Data*

The coastal states and the NMFS collect data on commercial and recreational landings. Addendum I to Amendment 4 requires the collection of otoliths and lengths to characterize the catch; the number of samples required is based on the magnitude of each state's fisheries. Each spring, the states are required to submit biological sampling plans, and each fall, through the compliance reports, the states are required to provide the actual sampling levels completed. See Section VII for more information.

## **VI. Status of Management Measures and Issues**

### *Fishery Management Plan*

Addendum IV to Amendment 4 was approved in November 2009, and was implemented in May 2010. In response to the 2009 stock assessment results, the addendum implements more appropriate biological reference points in response to recent stock dynamics and reduces harvest while attempting to minimize unnecessary bycatch waste, thus poising the stock for recovery should natural mortality decrease. Addendum IV requires all states in the management unit (including those that are *de minimis*) to implement a recreational creel limit no greater than 1 fish, commercial trip and bycatch limits no greater than 100 pounds, and a finfish trawl fishery allowance for up to 100 undersized fish. The addendum adopted percentage based biological reference points with an overfished/depleted threshold of 20% SSB and a target of 30% SSB. The biological sampling requirements under Addendum I are unchanged, and all regulations previously enacted to protect weakfish and reduce bycatch are to remain effective.

No additional amendments or addenda are under development.

### *Florida Management Area and Landings Data*

In November 2009, the Management Board approved a proposal from Florida to reduce the state's weakfish management area to a small area in northeast Florida where pure weakfish are known to occur based on genetics data. The revision is intended to address the misidentification of weakfish, sand seatrout, and their hybrids, and the consequential law enforcement issue. Inside the newly established weakfish management area (St. Mary's River only), any fish that resembles weakfish will be considered weakfish for enforcement purposes, both for commercial and recreational limits. Outside the weakfish management area, all fish that resemble weakfish will be considered sand seatrout.

As a result of the approved proposal, the commercial and recreational landings data provided in Florida's 2012 compliance report represent the best estimate of pure weakfish landings in the state. Commercial landings data from Florida's trip ticket program and recreational landings from the NMFS's Marine Recreational Fisheries Statistics Survey include only weakfish landed in Nassau and Duval counties, as revised on the basis of the genome proportions within the *Cynoscion*-complex found in the counties (48% weakfish in Nassau County and 17% in Duval County). The landings tables and figures in this report use the landings as reported by Florida.

### *De Minimis Status*

Amendment 4 permits states to request *de minimis* status if, for the last two years, their combined average commercial and recreational landings (by weight) constitute less than 1% of the

coastwide commercial and recreational landings for the same two year period. The *de minimis* threshold for 2012, calculated with 2011 and 2012 harvest data, is 4,040 pounds.

Four states requested *de minimis* status in their 2012 compliance reports: Florida, Georgia, Connecticut, and Massachusetts. Each of these states has had a previous *de minimis* request approved and qualify for *de minimis* status (Florida 0.17%, Georgia 0.41, Connecticut 0.37%, and Massachusetts 0.09%). If any *de minimis* state were to lose its designation as such, the state would be required to implement the regulatory and monitoring requirements from which it was previously exempt.

#### *Addendum II Management Triggers*

In 2010, the recreational and commercial management measures in Addendum IV replaced those in Addendum II. However, the Plan Review Team will continue to include an evaluation of the two management triggers as they provide perspective on the magnitude of fishery landings (but hitting a trigger will not require Board reconsideration of the management measures).

Addendum II established two management triggers that would require the Board to consider modifying management measures if reached. First, commercial management measures are to be re-evaluated if coastwide commercial landings exceed 80% of the mean commercial landings from 2000-2004, or 2.99 million pounds. Second, commercial and recreational management measures are to be re-evaluated if any single state's landings exceed its five-year mean by more than 25% in any single year.

The 2012 coastwide commercial landings are 273,606 pounds, thus the first trigger has not been exceeded. The second trigger was met in six states because their landings increased by more than 25% in any single year, however, this drastic increase is due to extremely low landings in previous years and is not cause for concern (Table 7).

## **VII. Implementation of FMP Compliance Requirements for 2012**

Mandatory compliance elements for 2012 were provided by Amendment 4 and its three addenda.

#### *Regulatory Requirements*

The management program includes regulatory requirements for non *de minimis* states as follows:

- Recreational management measures including maximum creel limits and minimum size limits (see Addendum II to Amendment 4)
- Commercial management measures including minimum size limits, minimum mesh size limits, trip limits, bycatch limits, closed seasons and areas, and bycatch reduction device requirements (see Section 4.2 of Amendment 4, and Addendum II)

The PRT finds all states to have implemented the plan's compliance requirements.

See Table 1 for a summary of state commercial and recreational regulations in 2012.

#### *Monitoring Requirements*

Addendum I implemented monitoring requirements for non *de minimis* states as follows:

- Maintenance of at least the 2005 level of recreational sampling of individual lengths through the Marine Recreational Fisheries Statistics Survey;



- Collection of six individual fish lengths for each metric ton of weakfish landed commercially;
- Collection of three individual fish ages for each metric ton of total weakfish landed, with a maximum of 1000 ages annually per state.

Table 8 provides the otolith and length collection requirements for 2011. These are based on the best available 2011 landings data provided to the Commission by the NMFS and the states. Table 8 also provides the number of otoliths and lengths collected by the states in 2012.

## **VIII. Recommendations of the Plan Review Team**

### **Management Recommendations**

- That the Board consider the *de minimis* requests from Massachusetts, Connecticut, Georgia, and Florida.
- That the Technical Committee and Stock Assessment Subcommittee explore alternative assessment methods for the next benchmark stock assessment and continue to compile the input data for the interim assessment model should an update assessment be requested prior to the next benchmark assessment.

### **Research Recommendations**

#### **Fishery-Dependent Priorities**

##### ***High***

- Increase observer coverage to identify the magnitude of discards for all commercial gear types from both directed and non-directed fisheries.<sup>1</sup>

##### ***Moderate***

- Continue studies on temperature, size, and depth specific recreational hook and release mortality rates, particularly catches from warm, deep waters. Investigate methods to increase survival of released fish.
- Continue studies on mesh size selectivity, particularly trawl fisheries.<sup>2</sup>

##### ***Low***

- Determine the onshore versus offshore components of the weakfish fishery.
- Collect catch and effort data including size and age composition of the catch, determine stock mortality throughout the range, and define gear characteristics. In particular, increase length frequency sampling in fisheries from Maryland and further north.
- Develop latitudinal, seasonal, and gear specific age length keys coast wide. Increase sample sizes for gear specific keys.

#### **Modeling / Quantitative Priorities**

##### ***High***

- Evaluate predation of weakfish with a more advanced multispecies model (e.g., the ASMFC MSVPA or Ecosim) to validate estimates calculated by production models with predation-competition extensions.

- Develop a bioenergetics model that encompasses a broader range of ages than Hartman and Brandt (1995) and use it to evaluate diet and growth data.
- Analyze the spawner-recruit relationship and examine the effects of the relationship between adult stock size and environmental factors on year class strength.
- Quantify trawl bycatch. Refine estimates of discard mortality based on factors such as distance from shore and other geographical differences for all sizes including below minimum size.

### **Life History, Biological, and Habitat Priorities**

#### ***High***

- Develop a coast wide tagging program to identify stocks and determine migration, stock mixing, and characteristics of stocks in over wintering grounds. Determine the relationship between migratory aspects and the observed trend in weight at age.<sup>3</sup>
- Monitor weakfish diets over a broad regional and spatial scale.

#### ***Moderate***

- Identify and delineate weakfish spawning habitat locations and environmental preferences to quantify spawning habitat.
- Compile data on larval and juvenile distribution from existing databases to obtain preliminary indications of spawning and nursery habitat location and extant.
- Examine geographical and temporal differences in growth rate (length and weight at age).

#### ***Low***

- Determine the impact of power plants and other water intakes on larval, post larval, and juvenile weakfish mortality in spawning and nursery areas. Calculate the resulting impact on adult stock size.<sup>4</sup>

### **Management, Law Enforcement, and Socioeconomic Priorities**

#### ***Moderate***

- Assemble socioeconomic data as it becomes available from ACCSP.

#### ***Low***

- Define restrictions necessary for implementation of projects in spawning and over wintering areas and develop policies on limiting development projects seasonally or spatially.

## **XI. References**

- Atlantic States Marine Fisheries Commission (ASMFC). 2002. Amendment 4 to the Interstate Fishery management Plan for Weakfish. Washington (DC): ASMFC Fishery Management Report No. 29. 84 p.
- Hogarth WT, Meyer T, Perra P, Shaefer RH. 1995. Final environmental impact statement and draft regulatory impact review for a regulatory amendment for the Atlantic Coast weakfish fishery in the Exclusive Economic Zone (EEZ). Silver Spring (MD): US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Fisheries Conservation and Management, Recreational and Interjurisdictional Fisheries Division. 84 p.

- National Marine Fisheries Service (NMFS). 2009. Personal communication with the Fisheries Statistics Division. See: <http://www.st.nmfs.gov/st1/>
- Northeast Fisheries Science Center (NEFSC). 2009a. 48th Northeast Regional Stock Assessment Workshop (48th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-10; 50 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/nefsc/saw/>
- Northeast Fisheries Science Center. 2009b. 48th Northeast Regional Stock Assessment Workshop (48th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-15; 834 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/nefsc/saw/>
- Sullivan PJ, Bell M, Gibson J, Kupschus S. 2009. Summary Report of the 48<sup>th</sup> Northeast Regional Stock Assessment Review Committee (SARC 48). Report prepared for the Northeast Regional Stock Assessment Workshop. 39 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://www.nefsc.noaa.gov/nefsc/saw/>

## X. Tables

**Table 1. Summary of state regulations for weakfish in 2012.**

State	Commercial	Recreational	Implementation Date
MA	16", open 1/1-12/31, 100 lb possession limit.	16", 1 fish	June 2010
RI	16"; open 6/1-6/30 & 8/7-11/8, 100 lb possession limit. Trawl: codend mesh size $\geq$ 4.5" diamond or 4.0" square. 100 lb bycatch limit & 50% bycatch rule (except hook and line: 0 lb bycatch).	16", 1 fish	April 28, 2010
CT	16"; open 1/1-12/31, 100 lb possession limit.	16", 1 fish	April 25, 2010
NY	16" (12" dressed & 10" filleted); Hook and line open 4/1-6/24 & 8/28-11/15; 0 lb bycatch limit. All other gears open 4/1-6/24 and 8/28-11/15; 100 lb bycatch limit.	16" (12" dressed, 10" fillet), 1 fish	By May 1, 2010
NJ	Gill net: 13"; open 1/1-5/20 & 9/3-10/19 & 10/27-12/31, 100 lb possession limit; mesh $\geq$ 3.25" stretched except 2.75 - 3.25" allowed within 2nm for permitted fishermen doing monthly reporting. Otter trawl: 13"; open 1/1-7/31 & 10/13-12/31, 100 lb possession limit; mesh $\geq$ 3.75" diamond or 3.375 square. Pound net: 13"; open 1/1-6/6 & 7/1-12/31, 100 lb possession limit. 100 lb bycatch limit & 50% rule. Hook & line: 13", 1 fish, open 1/1-12/31.	13", 1 fish	March 25, 2010
DE	Gill net: 12"; only nets with stretch mesh $\geq$ 3.125" allowed in water 4/1-6/30, none permitted weekends and legal holidays 5/10-9/30, 100 lb possession limit. Drift gill net: open 1/1-12/31 except 34 specified days of gear out of water in May and June. Anchor gill net: open 1/1-5/9 and 10/1-12/31, otherwise gear out of water. Hook & line: 13"; 100 lb possession limit 4 days/week during 5/1-10/31, 1 fish creel limit all other times.	13", 1 fish	April 11, 2010
MD	12". Ocean all gears: 100 lb bycatch limit & 50% rule. Chesapeake Bay hook & line: open 8/1-11/30, 50 lb possession limit, 0 lb bycatch. Chesapeake Bay all other gears: 50 lb bycatch limit & 50% rule. Gillnet: mesh $\geq$ 3.0" stretched. Trawl: mesh $\geq$ 3.375" square or 3.75" diamond.	13", 1 fish	June 28, 2010
PRFC	12"; open 7/28-12/31, 50 lb possession limit; 50 lb bycatch limit & 50% rule for certified pound nets with approved cull panels, and 0 lb bycatch for all other gears. Pound net: limited entry.	12", 1 fish	January 1, 2010
VA	Gill net: 12"; open 3/16-5/13 & 10/21-12/30, 100 lb possession limit. Pound net: no minimum size; limited entry; open 4/1-4/30 & 5/23-9/12 unless exempted by license forfeit, 100 lb possession limit. Haul seine: no minimum size; open 4/16-6/10 & 8/21-9/24, 100 lb possession limit. Out of state trawl: 12" except <del>300</del> 100 undersized fish allowed; open 4/1-9/25, 100 lb possession limit; codend mesh $\geq$ 3.0". Hook & line: 12"; open 1/1-12/31, 100 lb possession limit. 100 lb bycatch limit (per vessel), 50% rule.	12", 1 fish	May 1, 2010

NC	12", except 10" for long haul seines & pound nets in internal waters 4/1-11/15; open 1/1-12/31, 1,000 lb possession limit, and 10% rule. Gill net: mesh $\geq$ 2.875" stretch. Flynet: gear requirements & area closure south of Cape Hatteras. Gill nets and flynets that do not meet mesh requirements have 100 lb bycatch limit & 10% rule. Long haul seine: culling panel requirement south of Bluff Shoal & 100 lb bycatch limit & 50% rule. BRDs in shrimp trawls. Hook & line: 1 fish.	12", 1 fish	August 20, 2010
SC	12", 1 fish. BRDs in shrimp trawls.	12", 1 fish	July 1, 2010
GA	13", 1 fish. BRDs in shrimp trawls.	13", 1 fish	June 3, 2010
FL	12", 100 lb possession limit. BRDs in shrimp trawls.	12", 1 fish	July 27, 2010

**Table 2. Comparison of commercial and recreational Atlantic coast weakfish landings from 1982 to 2012** (see Tables 3 and 4 for source information and state-specific landings).

<b>Year</b>	<b>Recreational Landings (lbs)</b>	<b>Commercial Landings (lbs)</b>	<b>Total Landings (lbs)</b>	<b>% Comm</b>
1982	8,285,323	19,493,321	27,778,644	70%
1983	11,391,635	17,485,501	28,877,136	61%
1984	6,655,261	19,652,279	26,307,540	75%
1985	5,467,698	16,833,896	22,301,594	75%
1986	10,043,641	21,097,068	31,140,709	68%
1987	6,705,462	16,947,925	23,653,387	72%
1988	6,244,994	20,431,283	26,676,277	77%
1989	2,069,062	14,018,067	16,087,129	87%
1990	1,293,187	9,087,481	10,380,668	88%
1991	2,051,533	8,381,774	10,433,307	80%
1992	1,349,200	7,332,282	8,681,482	84%
1993	995,410	6,689,118	7,684,528	87%
1994	1,650,411	6,120,441	7,770,852	79%
1995	1,813,279	7,060,567	8,873,846	80%
1996	2,908,627	7,216,860	10,125,487	71%
1997	3,628,760	7,237,666	10,866,426	67%
1998	4,026,244	8,400,173	12,426,417	68%
1999	3,047,216	6,863,765	9,910,981	69%
2000	4,046,525	5,345,618	9,392,143	57%
2001	2,684,146	5,007,329	7,691,475	65%
2002	2,135,034	4,770,229	6,905,263	69%
2003	843,357	1,983,239	2,826,596	70%
2004	891,399	1,540,456	2,431,855	63%
2005	1,490,205	1,250,239	2,740,444	46%
2006	848,282	1,104,031	1,952,313	57%
2007	562,613	897,531	1,460,144	61%
2008	665,943	470,630	1,136,573	41%
2009	171,675	364,553	536,228	68%
2010	71,991	199,780	271,771	74%
2011	27,436	133,085	160,521	83%
2012	265,712	273,606	539,318	51%

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**Table 3. Commercial landings (pounds) of weakfish by state, 1982-2012** (Source: NMFS 2013, except as noted below table).

Year	FL	GA	SC	NC	VA	PRFC	MD	DE	NJ	NY	CT	RI	MA	Total
1982	176,203	596	443	12,052,232	1,856,920	307,230	249,297	1,294,500	2,073,500	1,257,100	25,600	176,800	22,900	19,493,321
1983	117,720	2,749		10,233,734	2,483,777	119,394	390,227	901,800	2,172,700	850,000	42,800	163,700	6,900	17,485,501
1984	923	862		12,990,726	2,022,123	90,166	325,279	782,400	2,751,600	484,500	31,300	167,600	4,800	19,652,279
1985	7,747	82		9,821,188	2,014,376	72,666	316,320	990,817	3,030,100	386,200	28,200	163,100	3,100	16,833,896
1986	9,162	75		14,309,372	1,886,254	116,197	337,064	723,444	3,208,600	359,900	13,700	127,600	5,700	21,097,068
1987	11,719	189		11,508,389	1,722,441	265,942	328,510	577,735	2,094,100	329,100	29,500	78,600	1,700	16,947,925
1988	13,283			15,091,878	1,383,218	96,765	832,636	530,603	2,332,800	124,500	2,400	19,400	3,800	20,431,283
1989	21,376		113	10,115,747	1,001,324	28,653	731,313	543,741	1,458,500	103,500	2,300	9,600	1,900	14,018,067
1990	17,433	33		5,802,159	1,192,321	18,510	416,130	625,006	968,318	19,924	1,281	24,646	1,720	9,087,481
1991	21,344			5,308,574	1,047,106	13,798	153,632	503,289	1,174,181	111,629	21,300	25,009	1,912	8,381,774
1992	24,655			4,862,551	532,482	19,961	384,999	362,042	940,695	168,087	3,500	30,277	3,033	7,332,282
1993	19,580			4,309,249	1,049,946	37,828	141,926	195,216	834,446	88,379	1,477	9,991	1,080	6,689,118
1994	27,835			3,489,929	1,264,263	28,958	223,288	262,263	695,280	99,470	11,000	18,155		6,120,441
1995	5,609			4,113,260	1,448,372	38,138	64,829	291,010	867,262	172,431	6,431	52,690	535	7,060,567
1996	387			3,977,633	1,487,069	99,493	97,068	317,317	822,041	365,307	6,937	43,522	86	7,216,860
1997	875			3,561,060	1,521,517	35,239	144,659	558,910	1,036,470	336,752	10,958	31,171	55	7,237,666
1998	952			3,354,008	1,796,487	81,744	221,048	552,947	1,804,618	496,403	14,482	77,074	410	8,400,173
1999	779			2,617,580	1,610,484	68,749	192,750	441,176	1,291,319	489,935	22,172	126,271	2,550	6,863,765
2000	448			1,869,042	1,311,298	68,574	145,918	328,269	1,071,428	352,832	7,920	189,362	527	5,345,618
2001	1,201			1,960,324	1,124,707	44,219	153,865	190,093	837,550	578,797	6,774	109,568	231	5,007,329
2002	394			1,828,150	1,129,158	57,818	79,734	164,064	863,088	513,977	10,223	122,781	842	4,770,229
2003	288			848,822	454,841	5,273	31,215	91,195	340,269	144,416	3,059	63,337	524	1,983,239
2004	192			685,463	325,832	1,986	50,519	48,905	204,587	178,414	6,206	38,284	68	1,540,456
2005	553			421,779	361,874	1,004	30,983	70,788	205,692	109,861	6,118	41,587		1,250,239
2006	337			363,078	261,619	689	32,417	34,429	206,450	152,867	7,012	45,133		1,104,031
2007	888			175,579	406,392	20	18,060	24,570	162,656	86,656	1,910	20,800		897,531
2008	996			170,469	171,153	74	5,815	11,185	55,949	44,275	1,012	9,702		470,630
2009	453			156,145	61,089	17	5,340	2,976	28,891	102,861	495	6,286		364,553
2010	73			106,319	57,326	80	2,148	2,339	12,053	13,105	899	5,380	58	199,780
2011	608	45		65,897	26,014	45	423	1,100	13,324	17,143	2,105	5,766	636	133,106
2012	1,998	0	0	91,382	45,790	98	1,227	29,367	19,291	61,206	4,723	17,908	616	273,606

**Notes:** FL: state-reported landings 1984-present (NMFS-reported landings limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex in those counties' waters). NC: state-reported landings 1994-present. VA: NMFS-reported landings minus the PRFC-reported harvest landed in VA 1982-1992; state reported landings 1993-present (exclude Potomac River harvest). PRFC: agency-reported landings 1982-present (fish caught in Potomac River and landed in MD and VA). MD: state-reported landings 1982-present (exclude Potomac River harvest). DE: state-reported landings 1985-present. NJ: state-reported landings 2005-present. CT: state-reported landings 1995-present. RI: SAFIS landings 2005-present.

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**Table 4. Recreational landings (pounds) of weakfish by state, from 1982 to 2012 (NMFS 2013, except as noted below table).**

Year	FL	GA	SC	NC	VA	PRFC	MD	DE	NJ	NY	CT	RI	MA	Total
1982	48,137		14,786	276,047	2,994,879		2,127,679	1,330,769	613,223	725,194		154,609		8,285,323
1983	9,190	12,165	4,515	338,100	738,671		1,215,376	2,205,140	6,080,018	164,227	12,976	588,805	22,452	#####
1984	9,719		5,150	189,031	850,169		254,962	1,279,594	3,987,542	51,464	11,358		16,272	6,655,261
1985	578	3,422	105,151	184,485	508,980		898,313	1,102,095	1,876,608	638,913	17,269	131,884		5,467,698
1986	2,661	12,621	44,185	417,470	2,032,394		2,406,643	1,598,932	3,184,095	242,217	61,281	41,142		#####
1987	1,205	9,491	23,781	710,002	647,692		831,615	1,072,198	3,353,362	51,830	4,286			6,705,462
1988	2,349		1,841	359,606	1,677,694		1,679,702	1,664,477	833,198	26,127				6,244,994
1989	2,933	8,175	5,963	139,979	424,463		344,658	521,648	575,110	46,133				2,069,062
1990	1,466	961	11,186	63,420	256,690		388,662	207,131	358,457	4,317		897		1,293,187
1991	2,142	5,597	25,210	99,824	280,075		278,176	427,778	896,800	35,931				2,051,533
1992	1,350	1,014	40,459	27,363	206,710		121,403	232,204	677,811	19,824	908	20,154		1,349,200
1993	2,899	12,791	6,929	78,982	89,992		173,952	291,627	312,839	18,889	6,510			995,410
1994	3,934	783	25,163	149,159	142,265		300,831	319,491	706,206	2,579				1,650,411
1995	1,146	21,283	22,875	72,412	211,494		141,511	419,527	898,564	24,467				1,813,279
1996	454	5,060	4,980	79,317	194,485		185,074	690,121	1,730,055	19,081				2,908,627
1997	1,734	34,356	1,728	165,032	463,652		188,339	734,800	1,817,034	220,718	1,367			3,628,760
1998	508	690	11,288	192,210	839,245		377,820	616,422	1,910,868	63,298	9,808		4,087	4,026,244
1999	2,245	1,614	4,383	161,291	399,588		544,474	484,157	1,374,169	63,058	6,371	5,866		3,047,216
2000	2,943	3,503	6,312	87,926	496,205		696,662	635,339	1,916,093	164,525	35,095	1,922		4,046,525
2001	1,323	2,983		158,423	373,206		567,625	172,969	1,251,150	151,584	4,883			2,684,146
2002	1,576	683	50,141	82,747	295,397		174,064	243,156	1,213,557	58,627	11,285	3,801		2,135,034
2003	580	1,327	4,306	161,474	215,522		24,698	57,866	333,690	37,106	3,536	2,379	873	843,357
2004	948	11,153	118,352	273,683	102,629		43,576	6,726	315,101	19,231				891,399
2005	2,719	7,659	94,205	157,977	20,439		8,814	39,438	1,149,891	606		8,457		1,490,205
2006	2,075	3,305	8,014	139,392	51,749		575	19,292	571,589	13,766		38,525		848,282
2007	2,706	3,847	46,103	125,459	55,580		19,434	4,204	297,138	8,142				562,613
2008	961	5,853	21,296	139,368	39,293		2,194	4,054	338,913	114,011				665,943
2009	1,945	4,797	10,375	103,230	21,548		1,506	9,868	18,406					171,675
2010	474	2,829	10,379	49,903	3,267		1,810	46	1,989	1,294				71,991
2011	253	430	3,089	17,621	3,267		134	21	2,449	172		0	0	27,436
2012	556	3,625	12,244	46,081	20,952		6,192	4,442	156,495	15,125			0	265,712

**Notes:** FL: state-reported landings 1983-present (NMFS-reported estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters).



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**Table 5. Recreational landings (numbers) of weakfish by state, from 1982 to 2012 (NMFS 2013, except as noted below table).**

Year	FL	GA	SC	NC	VA	MD	DE	NJ	NY	CT	RI	MA	Total
1982			17,342	200,045	715,892	440,146	217,821	104,066	88,234	11,769	18,614		1,813,929
1983	16,716	17,209	6,807	387,871	354,846	595,286	1,009,899	2,857,093	36,934	6,363	74,608	2,732	5,366,364
1984	26,564		7,836	489,468	782,848	104,057	593,107	1,026,043	20,133	1,561		2,237	3,053,854
1985	2,356	4,811	61,788	217,671	505,223	305,799	365,693	812,839	89,538	2,874	17,092		2,385,684
1986	8,084	18,130	78,315	611,363	2,418,046	1,947,394	914,489	2,500,622	34,582	7,315	4,595		8,542,935
1987	4,185	10,802	18,841	624,160	1,015,413	824,883	638,342	1,666,619	7,447	777			4,811,469
1988	5,106		1,834	438,148	2,297,053	1,163,766	974,712	642,032	13,215				5,535,866
1989	7,534	8,245	6,810	190,193	357,864	226,505	254,170	303,289	6,436				1,361,046
1990	4,071	2,273	8,027	91,300	286,458	370,528	179,837	216,385	3,057		407		1,162,343
1991	6,575	4,954	19,616	140,826	351,947	221,242	366,464	545,665	28,072	18,695			1,704,056
1992	5,814	1,751	23,501	35,490	265,645	137,260	100,561	311,659	5,282	434	9,624		897,021
1993	7,414	14,752	7,360	106,737	108,392	238,768	235,312	203,915	12,610	2,460			937,720
1994	11,856	718	46,858	177,965	169,740	332,846	300,211	591,571	1,872				1,633,637
1995	4,173	22,437	29,897	62,475	226,682	88,695	406,730	671,850	22,310		1,568		1,536,817
1996	2,878	5,413	5,695	90,704	193,861	183,408	633,920	1,104,251	16,320				2,236,450
1997	10,891	44,202	2,039	184,954	557,809	162,900	647,529	1,028,334	112,986	517	1,415		2,753,576
1998	2,617	718	15,838	191,181	463,525	290,051	455,603	920,558	21,392	2,183		618	2,364,284
1999	5,532	1,679	3,941	127,163	229,209	340,096	224,307	583,883	18,347	1,606	2,296		1,538,059
2000	8,827	4,181	5,585	71,247	286,752	475,348	311,553	760,279	42,406	7,342	712		1,974,232
2001	4,083	3,316		158,605	175,872	302,719	72,451	736,069	28,126	715	2,301		1,484,257
2002	3,955	852	90,245	90,170	178,110	100,467	121,884	492,876	24,962	1,796	1,420		1,106,737
2003	2,331	1,573	4,162	153,753	86,112	41,048	20,124	151,101	9,234	443	298	109	470,288
2004	4,510	9,815	153,589	237,395	103,181	29,645	6,967	183,649	7,596				736,347
2005	3,546	5,764	129,575	163,265	30,346	22,164	19,031	1,053,005	359		1,009		1,428,064
2006	6,709	3,501	7,123	153,696	58,814	470	11,158	417,527	9,123		3,297		671,418
2007	1,910	4,712	71,230	114,332	44,624	10,316	4,182	209,310	7,120				467,736
2008	2,170	5,909	25,794	137,564	29,016	2,590	4,212	269,858	30,543				507,656
2009	2,313	8,664	10,952	81,643	18,090	2,314	5,431	10,688					140,095
2010	528	3,113	9,672	50,932	5,325	2,833	83	3,302	2,682				78,470
2011	1,097	973	4,107	13,464	4,374	237	27	3,003	111				27,393
2012	799	4,603	13,593	40,299	21,791	11,401	4,603	114,330	5,055			0	216,474

**Notes:** FL: state-reported landings 1983-present (NMFS-reported estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters).

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**Table 6. Recreational releases (numbers) of weakfish by state, from 1982 to 2012 (NMFS 2013, except as noted below table).**

Year	FL	GA	SC	NC	VA	MD	DE	NJ	NY	CT	RI	MA	Total
1982				44,134	126,514	2,139	12,712	1,695					187,194
1983	1,141	173		10,560	45,565	15,642	8,912	155,116	15,870				252,979
1984	357		1,561	17,381	202,791	8,934	1,163	4,464			5,214		241,865
1985	426	152	3,279	2,138	82,071	12,114	2,085	246,284					348,549
1986	1,219		2,873	354,095	692,462	327,841	9,637	895,044	4,556				2,287,727
1987	773	89		71,659	233,441	299,172	46,064	182,019	1,266				834,483
1988	34	4,196		109,489	484,782	155,255	59,980	5,144		634			819,514
1989	0		1,019	34,074	52,191	53,148	13,924	22,841	1,980				179,177
1990	143			20,669	198,948	142,055	41,765	32,863	570				437,013
1991	1,556			11,457	361,768	40,349	65,685	238,646	33,046	2,108			754,615
1992	2,121	362	4,598	27,052	244,817	71,040	61,886	249,846	8,362		98		670,182
1993	2,041	840	267	52,468	245,211	225,510	255,968	281,450	20,995				1,084,750
1994	1,862	21,588		147,616	652,571	583,059	560,999	1,051,931	45,537	1,013			3,066,176
1995	2,006	572		154,008	939,970	178,937	1,088,353	1,613,831	81,236		98		4,059,011
1996	1,303	307		188,263	814,573	492,402	1,567,046	1,859,049	84,990		780		5,008,713
1997	6,596		2,938	209,122	1,404,092	323,653	897,625	975,280	90,549	1,213	163		3,911,231
1998	1,721	1,468	329	131,537	1,244,949	461,518	613,544	778,180	29,836	360	1,921		3,265,363
1999	2,818		13,616	149,377	818,959	753,266	372,479	551,283	35,459		8,436		2,705,693
2000	5,551	12,895	15,869	346,212	935,594	1,209,290	465,496	1,605,024	68,531	1,285	931		4,666,678
2001	2,541	13,537		886,943	633,443	737,240	227,214	1,064,609	69,123		358		3,635,008
2002	2,113	9,540	1,019	336,709	888,337	286,182	101,282	350,810	62,803		1,932		2,040,727
2003	1,556	21,212	1,966	153,563	504,129	180,827	39,314	631,438	7,286	1,233			1,542,524
2004	1,114	12,249	107,177	240,298	528,200	132,087	79,238	607,393	40,254	5,470	248		1,753,728
2005	1,539	29,623	56,663	241,674	266,879	55,270	110,717	1,279,930	193,556				2,235,851
2006	1,578	6,149	21,917	295,415	456,270	57,394	120,930	1,231,102	11,732				2,202,487
2007	961	19,890	90,224	148,938	172,068	106,308	18,811	581,435	200,574		1,574		1,340,783
2008	1,460	13,229	105,401	127,333	314,118	30,260	61,364	1,254,625	26,851				1,934,641
2009	2,028	12,438	40,292	125,649	69,274	6,700	5,243	82,282	6,038				349,944
2010	489	11,483	25,559	250,369	142,502	104,421	17,329	78,053	3,107			1,542	634,854
2011	522	14,576	5,165	109,483	288,304	18,500	6,568	99,964	55,172				598,254
2012	799	37,247	50,026	165,891	102,245	24,898	84,856	731,563	11,454			0	1,208,979

**Notes:** FL: state-reported landings 1983-present (NMFS-reported estimates limited to Nassau and Duval Counties and adjusted on the basis of the genome proportions of weakfish within the Cynoscion-complex found in those counties' waters).

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**Table 7. Evaluation of the Coastwide Management Trigger** (Section 3.3.1 of Addendum II to Amendment 4): percent change of each state's 2012 total landings to its five-year (2007-2011) mean total landings

	FL	GA	SC	NC	VA	PRFC	MD	DE	NJ	NY	CT	RI	MA
2007-2011	1,871	3,560	18,248	221,998	168,986	47	11,373	12,073	186,354	77,532	1,284	9,587	139
2012	2,554	3,625	12,244	137,463	66,742	98	7,419	33,809	175,786	76,331	4,723	17,908	616
% change	36%	2%	-33%	-38%	-61%	108%	-35%	180%	-6%	-2%	268%	87%	344%

**Table 8. Biological sampling of weakfish in 2012, Massachusetts-Florida** (Sampling requirements are based on Addendum I to Amendment 4 and 2011 landings data; values highlighted with red bold font do not meet sampling requirements).

	Samples Required		Samples Completed		Fisheries Sampled
	Otoliths	Lengths	Otoliths	Lengths	
MA*	0	0	0	0	NA
RI	8	16	12	16	commercial
CT*	3	6	152	797	NA
NY	24	47	268	267	commercial (GN, TR, PN, H&L)
NJ	22	36	154	202	commercial (GN), additional samples available from TR survey
DE	2	2	696	153	MRFSS
MD	1	1	121	144	commercial (PN, TR)
PRFC	0	0	0	0	NA
VA	40	84	320	1,462	commercial (GN, PN, HS, TR); additional otoliths available from TR survey
NC	114	179	501	2,274	commercial (HS, GN, TR, PN, BS), otolith count includes samples from rec also
SC	4	0	28	28	recreational
GA*	0	0	0	0	recreational
FL*	1	36	0	0	commercial

\* *de minimis* in 2012; not required to conduct sampling; sample numbers provided to show from what states were exempt  
 NA=not applicable, GN= gill net, TR=trawl, PN=pound net, H&L=hook and line, HS=haul seine, BS=beach seine

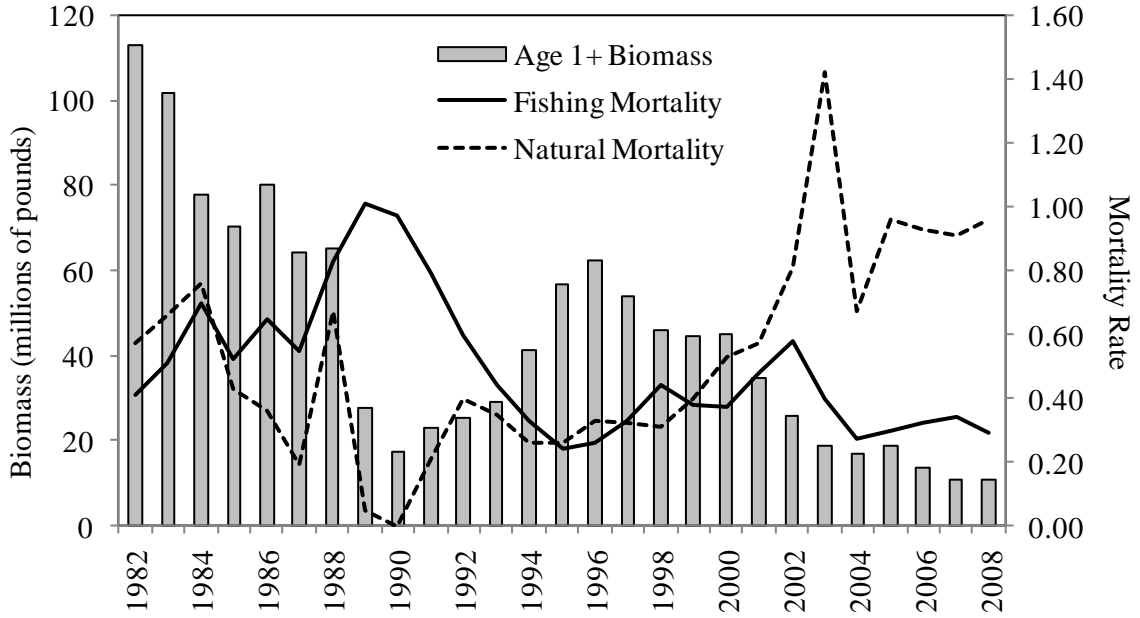
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**Table 9. Indices of relative weakfish abundance from 1980 to 2011 (reported in the 2012 state compliance reports).**

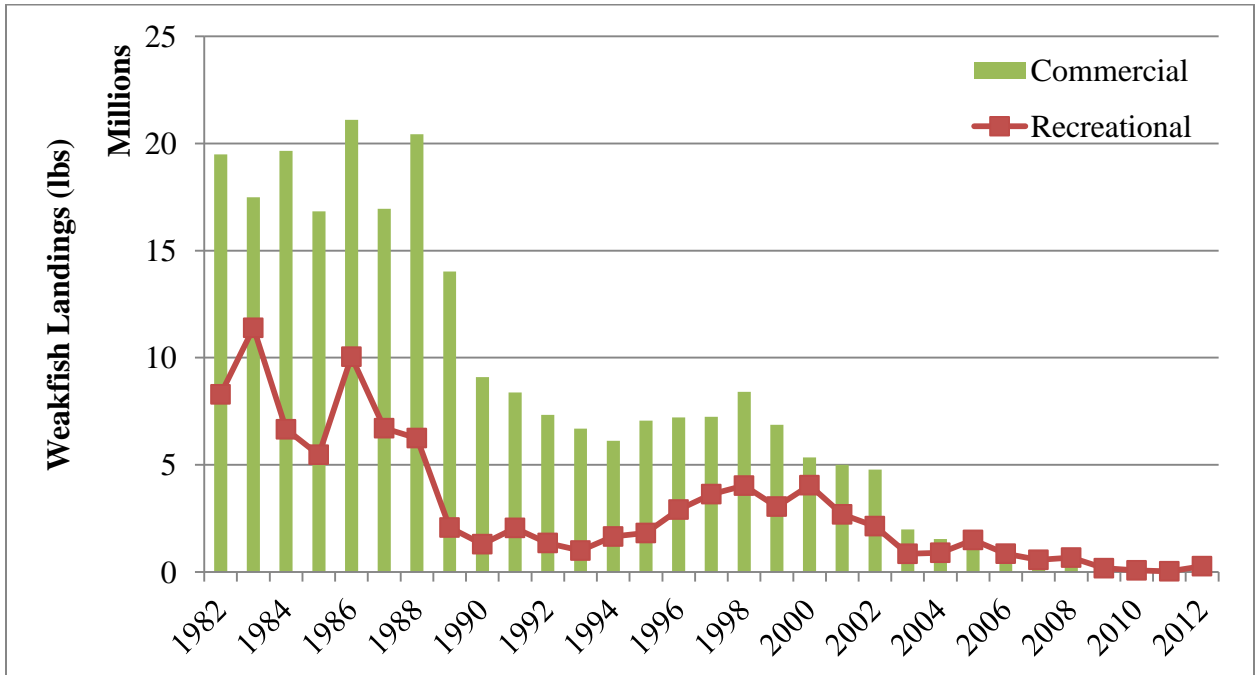
Yr	RI Tr	CT Tr	CT Tr	NY Tr	NJ Tr	NJ Tr	DE Tr	DE Tr	DE Tr	MD Tr	MD Tr	VA Tr	NC Tr	NC Gn	GA Tr	FL Tr	FL Tr
	Coast	LIS	LIS	Coast	DE Bay	Ocean	DE Bay	Inland	DE Bay	ChesBay	Coast	ChesBay	Pamlico	Pamlico	Coast	Jax	IR&Jax
	YOY	YOY	1+	YOY	YOY	1+	YOY	YOY	1+	YOY	YOY	YOY	YOY	1+	0+	YOY	1+
	#/tow	GM#/tow	GM#/tow	AM#/tow	GM#/tow	GM#/tow	GM#/tow	GM#/tow	#/nm	GM#/tow	GM#/ha	GM#/tow	#/tow	#/set	#/obs hr	med/tow	med/tow
1980	17.1633	*	*	*	*	*	4.15	*	*	*	*	*	*	*	*	*	*
1981	36.4416	*	*	*	*	*	5.98	*	*	*	*	*	*	*	*	*	*
1982	19.5507	*	*	*	*	*	11.49	*	*	*	*	*	*	*	*	*	*
1983	3.13235	*	*	*	*	*	4.47	*	*	*	*	*	*	*	*	*	*
1984	5.03226	1	0.55	*	*	*	6.67	*	*	*	*	*	*	*	*	*	*
1985	19.1774	6.19	0.24	*	*	*	9.25	*	*	*	*	*	*	*	*	*	*
1986	2	13.17	0.24	*	*	*	12.79	1.14	*	*	*	*	*	*	*	*	*
1987	1.31373	0.63	0.11	1.5	*	*	5.82	1.26	*	*	*	12.14	*	*	*	*	*
1988	10.8571	2.9	0.06	0.2	*	*	4.73	0.81	*	*	8.13	101.5	*	*	*	*	*
1989	1.16667	8.69	0.02	6.9	*	2.23	11.11	2.2	*	0.44262	0.87025	11.74	14.2	*	*	*	*
1990	25.5333	5.56	0.08	2.3	*	1.01	8.73	2.95	*	0.9505	1.72023	4.46	50.2	*	*	*	*
1991	25.4103	11.95	0.31	56.5	2.2	1.01	20.07	5.87	31.43	0.78479	1.89331	3.16	36.96	*	*	*	*
1992	14.5143	3.03	0.18	23.4	1.01	1.4	14.72	2.51	23.83	3.23863	1.81496	6.78	42.71	*	*	*	*
1993	7.5	4.08	0.12	4.4	1.01	0.89	14.79	0.63	80.1	1.59272	0.91273	5.81	8.7	*	*	*	*
1994	15.1667	11.19	0.06	70.9	1.4	5.43	11.47	1.47	206.5	2.33092	1.83884	2.51	68.06	*	*	*	*
1995	0.2619	5.21	0.7	4.7	0.89	6.2	13.49	4.24	150	5.95141	4.44469	5.95	38.21	*	*	*	*
1996	124.667	15.23	0.56	220.4	5.43	3.95	12.13	1.18	233.8	6.39549	3.18307	7.26	72.07	*	*	*	*
1997	88.8333	12.38	0.89	82.4	6.2	3.48	15.4	2.07	110.4	4.28432	3.05986	6.81	32.79	*	*	*	*
1998	13.5122	5.02	0.28	4.8	3.95	0.59	11.35	1.35	102.07	5.8682	2.79961	7.6	70.44	*	*	*	*
1999	3.68293	30.93	0.39	40.5	3.48	1.05	13.51	1.99	92.56	3.25744	2.76387	6.78	99.9	*	*	*	*
2000	9.375	63.31	0.3	167.1	0.59	2.36	14.14	1.64	179.12	6.53832	2.33775	8.35	62.99	*	*	*	*
2001	19.3333	40.09	0.52	113.7	15.03	0.68	7.56	1.53	80.7	8.10129	2.55858	5.09	30.3	1.42	*	1.31	0.07
2002	8.4	41.35	0.16	145.2	19.7	1.59	5.96	1.31	144.98	3.91977	0.61066	6.93	22	1.4	*	2.45	0.03
2003	198	49.41	0.07	69.8	3.11	0.08	10.44	2.44	65.78	4.89255	5.64104	9.23	23.93	1.22	105.44	6.63	0.03
2004	1.88095	58.98	0.21	43.9	8.48	1.79	8.39	3.32	48.88	1.62152	3.39291	6.66	28.75	1.32	94.42	6.55	0.08
2005	128.925	25.86	0.12	226.5	20.6	0.46	16.82	3.84	29	3.54587	4.98447	5.69	28.76	1.24	32.08	3.71	0.09
2006	0.35714	1.05	0.29	55.1	12.24	0.19	5.35	1.6	106.31	2.41125	1.50213	6.34	39.09	0.92	79.96	1.53	0.07
2007	36.0976	63.93	0.06	92.12	25.53	0.83	13.7	2.98	43.16	1.6	2.32	5.35	56.8	0.43	159.64	1.22	0.02
2008	0.54762	9.07	0.08	51.5	7.86	0.35	6.74	1.02	45.94	0.79	0.23	5.77	50.3	0.49	75.55	4.43	0.04
2009	7.29	6.48	0.3	13.3	7.29	0.33	8.56	5.91	35.83	1.42	1.33	6.18	58.89	0.31	104.76	4.66	0.08
2010	7.95	-	-	15.3	10.51	0.69	11.98	3.49	43.57	1.68	2.16	14.11	32.45	0.48	128.48	1	0.07
2011	70.63	11.64	0.68	34.5	15.8	22.32	7.89	3.3	89.22	2.04	1.9	5.23	33.69	0.36	104.2	0.89	0.03
2012	122.3	21.96	0.73	9.4	1.26	0.23	7.55	3.44	106.43	0.46	0.46	3.02	40.66	0.92	91.64	2.86	0.04

**X. Figures**

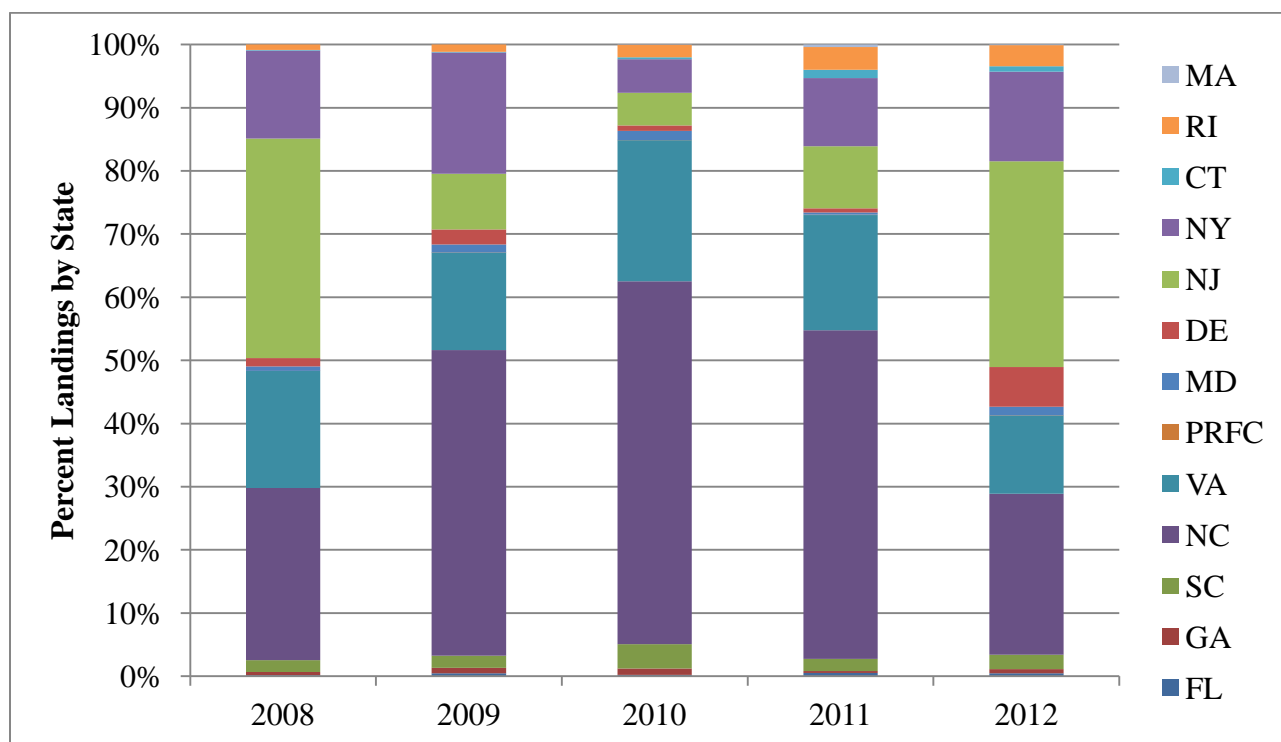
**Figure 1. Estimated weakfish age 1+ biomass, fishing mortality, and natural mortality from 1982 to 2008 (NMFS 2009a, NMFS 2009b).**



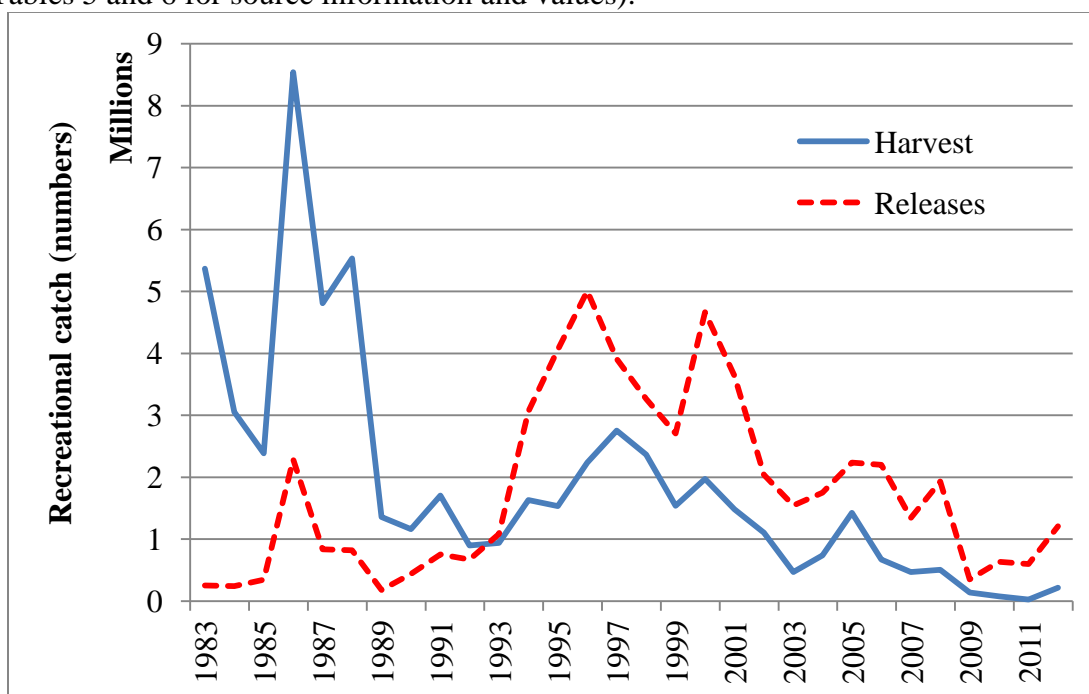
**Figure 2. Commercial and recreational weakfish harvest (pounds), from 1982 to 2012 (see Tables 3 and 4 for source information and values).**



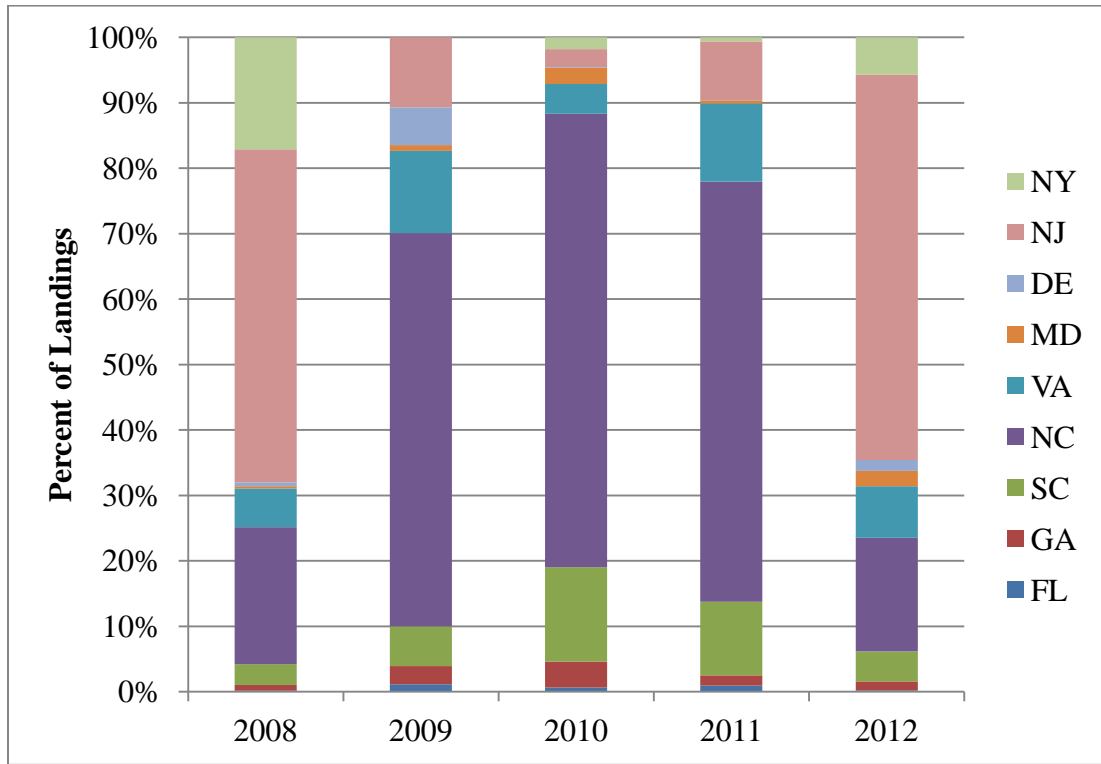
**Figure 3. Percent commercial weakfish landings (pounds) by state, from 2007 to 2012.**



**Figure 4. Recreational weakfish harvest and releases (number of fish), from 1982 to 2012** (see Tables 5 and 6 for source information and values).



**Figure 5. Recreational weakfish landings (pounds) by state, from 2007 to 2012 (See Table 4 for source information and values).**



## APPENDIX A

### 2013 Weakfish Status Update

#### *Summary*

Non-age structured indicators of weakfish status were updated through 2012. This included exploitable biomass indices, length quality indices for DE and NJ, relative F, relative exploitation and juvenile indices. A run was made with a biomass dynamic model to estimate biomass, F, and M.

Weakfish biomass indices remain very low - slightly better than 2010-2011 but still among the lowest measured. Landings and estimated discards rose from 123 MT in 2011 to 311 MT in 2012. Fishing mortality in 2012 rose from a very low point in 2011, but is still among the lowest measured. The stock is exhibiting little response to substantial reductions in F. Length quality indices indicated that very few weakfish were reaching harvestable size; these length quality indices were similar to those observed during 1966-1969. A run of a biomass dynamic model with a predation/competition loss term indicated that M is still extremely high (1.08 in 2012) when compared to F (0.13).

#### *Estimation of biomass indices, fishing losses, relative F, and juvenile indices.*

Biomass indices were formulated as outlined in the 2009 peer-reviewed assessment (see section C10, TOR 6 in the assessment; (available

<http://www.nefsc.noaa.gov/publications/crd/crd0915/weakfish.pdf>), with some exceptions.

Biomass indices (MRIP mid-Atlantic catch per trip and, DE and NJ trawl indices) were standardized to their respective 1990-2012 means (years in common for all three time-series; Table 1). This approach was recommended by the peer-review panel in 2009. The MRFSS-based estimates of Mid-Atlantic private/rental recreational CPUE (includes releases and harvest) were replaced with MRIP-based estimates. Indices outside this time-period (1981-1989 for MRIP and 1989 for NJ) were also standardized to these means (Table 1).

With the addition of 2012 biomass indices, it does not look like recovery has started. Biomass appears to have stabilized at a low level. DE and MRIP indices rose slightly in 2012 (Table 1;



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Figure 1). There was a substantial rise in the NJ index during 2011, but it returned back to a low level in 2012 (Table 1; Figure 1).

Recreational and commercial harvest and discard losses were estimated using conventions of the assessment with one exception. Commercial discard losses were estimated by extending a time trend in discard estimates as a percent of commercial harvest during 2002-2007 through 2010 (Table 2). Using this trend, discard estimates increased steadily from 18% of commercial harvest in 2002 to 40% in 2010 (i.e., commercial discards more than doubled as a proportion of catch; Table 2). Commercial discard losses in 2011-2012 were arbitrarily frozen at the 2010 level (40% of harvest) so that they would not go up indefinitely. Ratio-based estimates of commercial discards that used all years combined rather than annual estimates (latter were variable and imprecise) were used in the 2009 assessment; however, continuing with this approach would not reflect putative changes in bycatch due to recent restrictions.

Fishing losses rose from 123 MT in 2011 to 311 MT in 2012, the first rise in estimated losses since 1998 (Figure 2). During the recovery of the stock in response to Amendments 2 and 3, losses rose to 6,500 MT (1998) and declined afterwards. An abrupt decline occurred between 2002 and 2003, from 3,700 MT to 1,600 MT (Figure 2).

Relative F indicated that F had fallen to a very low level in 2011 – the lowest of the time-series (Figure 3). Relative exploitation in 2012 suggests that F may rise, but would still be among the lowest levels estimated (Figure 3).

Juvenile indices were updated through 2012. A series of poor year-classes during 2008-2012 were indicated by the grand means of annual standardized juvenile indices (Figure 5). An index for NY was not available for 2012.

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Table 1. Observed (Obs) biomass indices, biomass indices standardized (Standard) to 1990-2011 mean, estimated fishing losses, relative fishing mortality (F), and relative exploitation (U).

Year	Obs NJ	Obs DE	Obs MRIP index	Standard Mean NJ	Standard Mean DE	Standard Mean MRIP	Standard Mean Indices	Mt Fishing Killed	Relative F	Relative U
1981			0.92			10.56	10.56	20,193	2,558	1913
1982			0.45			5.24	5.24	13,408	2,483	2561
1983			0.48			5.56	5.56	13,849	3,107	2489
1984			0.29			3.35	3.35	13,010	4,215	3882
1985			0.25			2.82	2.82	10,720	3,123	3799
1986			0.35			4.04	4.04	14,863	3,953	3676
1987			0.30			3.48	3.48	11,311	3,404	3253
1988			0.28			3.17	3.17	12,690	5,581	4006
1989	0.12		0.12	1.41		1.35	1.38	7,865	7,815	5701
1990	0.08	1.15	0.07	1.00	0.12	0.78	0.63	5,165	7,525	8158
1991	0.08	2.63	0.09	0.95	0.27	1.00	0.74	5,206	6,140	7039
1992	0.12	3.80	0.09	1.47	0.39	1.01	0.96	4,320	4,715	4518
1993	0.07	11.31	0.05	0.86	1.15	0.62	0.88	4,011	3,546	4578
1994	0.12	14.84	0.10	1.48	1.51	1.17	1.39	4,659	2,876	3361
1995	0.14	23.93	0.13	1.63	2.43	1.50	1.85	4,839	2,115	2610
1996	0.14	42.56	0.19	1.70	4.32	2.15	2.72	5,536	2,284	2034
1997	0.19	20.04	0.18	2.25	2.04	2.09	2.13	5,910	2,879	2780
1998	0.10	21.44	0.23	1.14	2.18	2.62	1.98	6,468	3,815	3268
1999	0.08	12.66	0.18	0.93	1.29	2.02	1.41	5,347	3,239	3787
2000	0.13	20.68	0.18	1.54	2.10	2.03	1.89	4,956	3,112	2622
2001	0.10	13.58	0.11	1.26	1.38	1.25	1.30	4,698	3,779	3627
2002	0.07	14.43	0.11	0.84	1.47	1.27	1.19	3,662	4,702	3074
2003	0.02	4.65	0.04	0.19	0.47	0.44	0.37	1,563	3,528	4263
2004	0.06	4.30	0.03	0.73	0.44	0.39	0.52	1,348	2,452	2595
2005	0.06	2.91	0.07	0.69	0.30	0.75	0.58	1,401	2,589	2414
2006	0.03	5.20	0.06	0.34	0.53	0.64	0.50	1,257	2,737	2504
2007	0.06	1.86	0.03	0.74	0.19	0.32	0.42	945	2,531	2268
2008	0.04	1.04	0.04	0.45	0.11	0.43	0.33	615	2,612	1862
2009	0.03	0.33	0.00	0.34	0.03	0.05	0.14	336	1,743	2392
2010	0.05	0.76	0.01	0.58	0.08	0.08	0.25	177	451	724
2011	0.12	0.91	0.01	1.45	0.09	0.08	0.54	123	293	227
2012	0.04	1.38	0.03	0.46	0.14	0.29	0.30	311		1050
Mean 1990- 2012	0.08	9.84	0.09							

2013 WEAKFISH FMP REVIEW

Figure 1. Weakfish biomass indices, 1981-2012. Indices have been standardized to their respective means during a common time period.

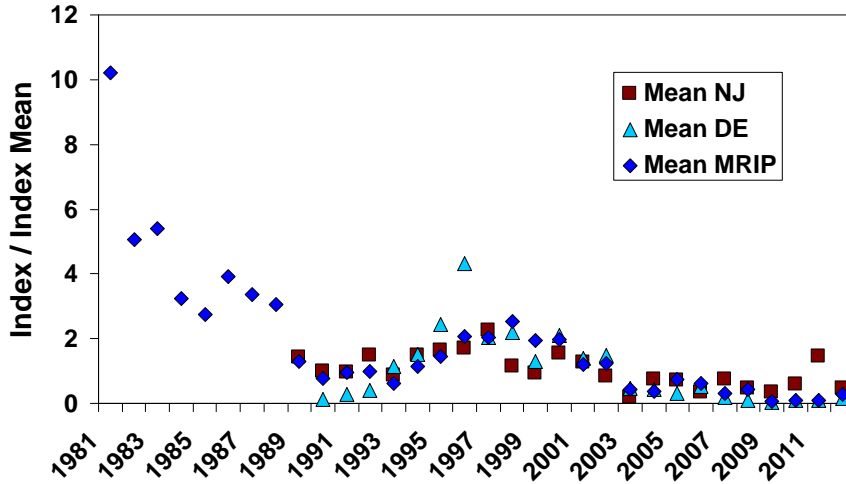


Figure 2. Total fishing losses (harvest and discards). Commercial discards for 2007-2012 estimated from 2001-2007 trend and were a constant 40% after 2010.

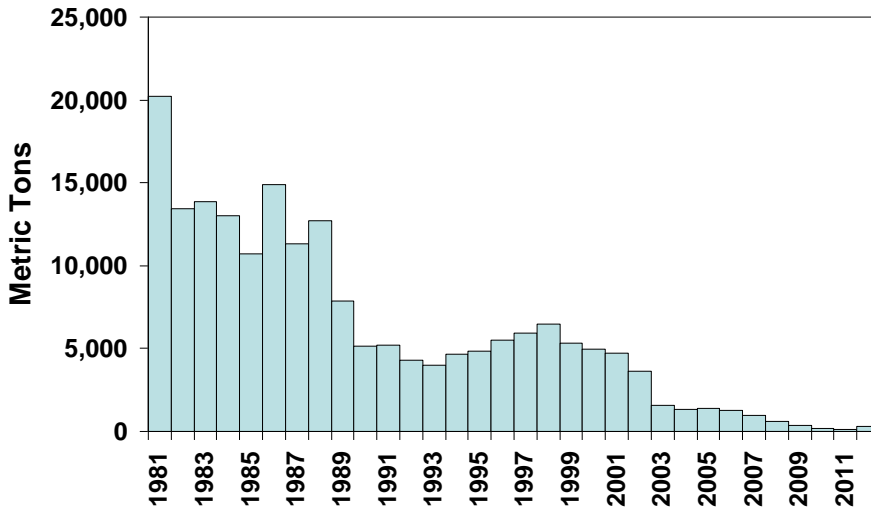


Figure 3. Relative F (fishing losses / 2 yr mean of indices) and relative exploitation (U; fishing losses / mean of indices).

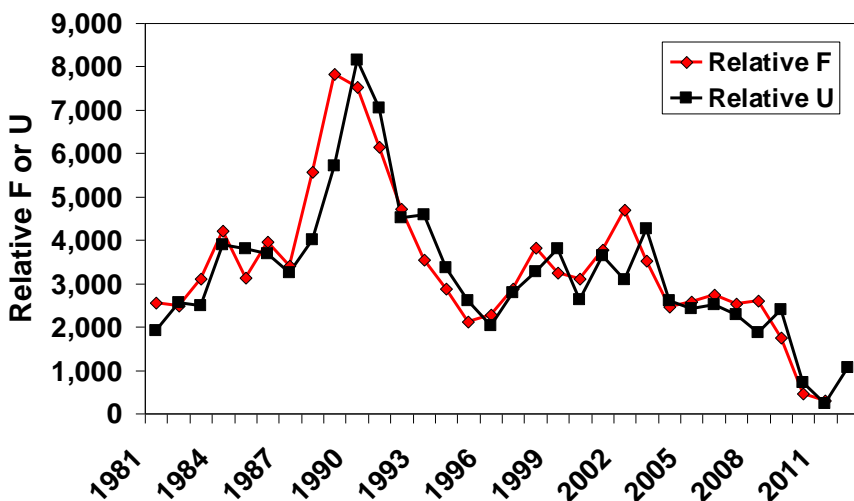
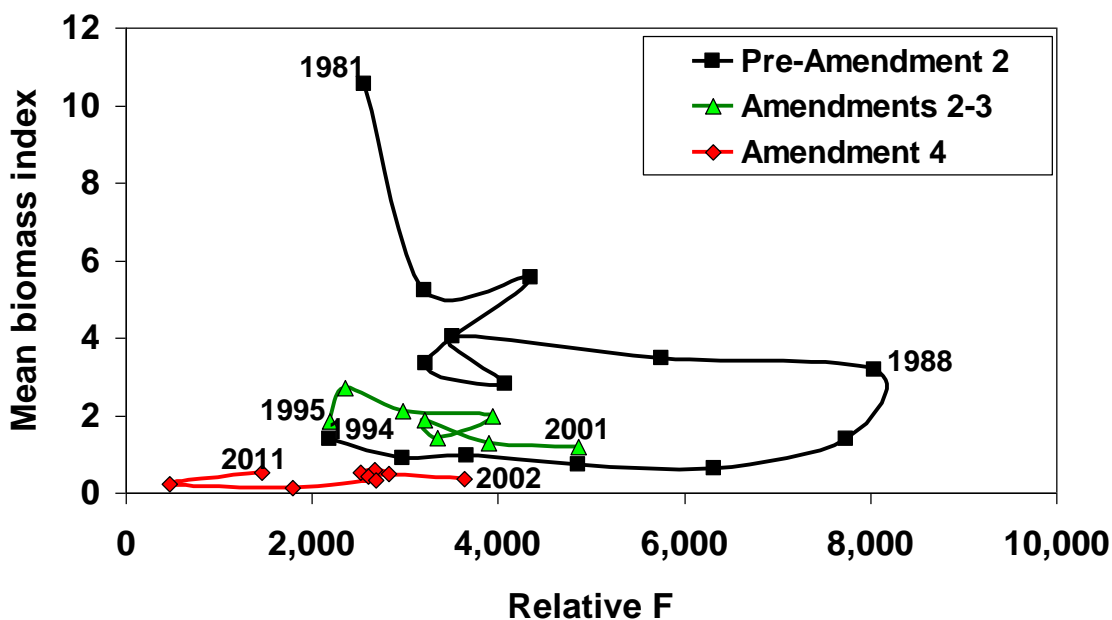
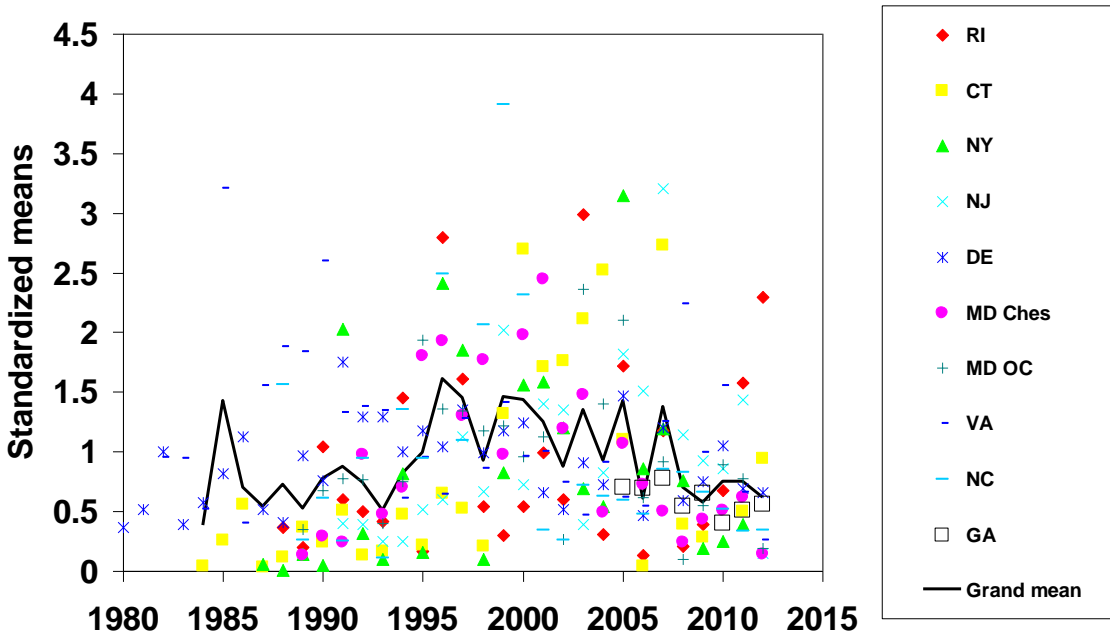


Figure 4. Response of biomass (mean of indices) to F (relative F) over major management periods



**Figure 5. Juvenile indices standardized to their 1991-2012 means. Trend indicated by unweighted grand mean.**



**Figure 6. Delaware and New Jersey trawl survey length quality indices (Quality+ PSD)**

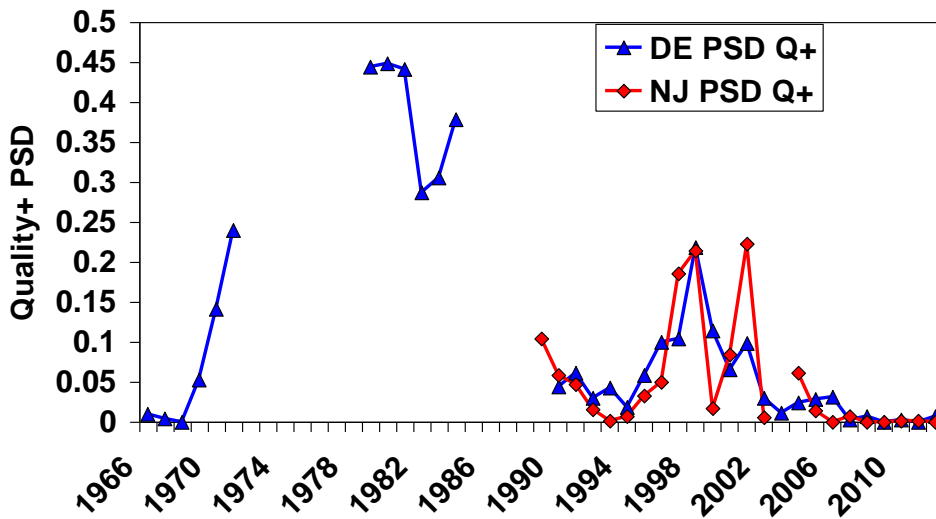


Figure 7. Estimated F and M on weakfish during 1981-2012 .

