

ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR WEAKFISH
(Cynoscion regalis)

2016 FISHING YEAR



Prepared by the Plan Review Team

Approved by the Weakfish Management
Board February 2018

Tables of Contents

I.	Status of the Fishery Management Plan	1
II.	Status of the Stock.....	2
III.	Status of the Fishery.....	2
IV.	Status of Assessment Advice	4
V.	Status of Research and Monitoring.....	5
VI.	Status of Management Measures and Issues	5
VII.	Implementation of FMP Compliance Requirements for 2016.....	7
VIII.	Recommendations of the Plan Review Team	8
IX.	References	9
X.	Tables.....	12
XI.	Figures	12

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, approved in 2002, strives to establish two goals. One is the utilization of 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. The second goal is to provide for restoration and maintenance of essential habitat (ASMFC 2002). The management objectives are to:

- 1) establish and maintain an overfishing definition which includes target and threshold fishing mortality rates and a threshold spawning stock biomass in order to prevent overfishing and to 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 weakfish population; 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, as do FWS and NMFS; Maine, New Hampshire, Pennsylvania, and the District of Columbia do not. See Table 1 for a summary of state-by-state regulations in 2015.

II. Status of the Stock

According to the last stock assessment, completed in 2016, the weakfish stock is depleted and overfishing is not occurring (ASMFC 2016). 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 1986 and 1993, spawning stock biomass (SSB) declined drastically from 48.5 million pounds (the time series maximum) to 16.0 million pounds (Figure 1). Overfishing was the main cause of this decline, with fishing mortality (F) accounting for about 90% of total mortality (fishing plus natural mortality) during the period (Figure 1). With the implementation of management measures in the early to mid-1990s, F declined to 0.60 in 1996 and biomass responded favorably by increasing to a peak of 38.1 million pounds in 1997 (Figure 1). Despite low and declining harvests since the early 2000s, SSB continued to decline, reaching a time-series low of 4.2 million pounds in 2009. However, the contribution of fishing mortality to total mortality was substantially reduced during this period; from 2001-2010, 60-75% of total mortality is attributed to fishing mortality. After the 2009 stock assessment (48th SAW), harvest quotas were reduced, further reducing the contribution of fishing mortality to less than 25% of total mortality from 2011-2014. SSB increased slightly at the end of the assessment time series, but further monitoring is necessary to determine whether this increase is sustainable. Conversely, natural mortality has risen substantially since the mid-1990s (Figure 1). Annual natural mortality estimates did not exceed 0.17 from 1982-1997 but had an average of 0.93 from 2007-2014. Factors such as predation, competition, and changes in the environment are believed to be having a stronger influence on recent weakfish stock dynamics than fishing mortality.

III. Status of the Fishery

At 247,416 pounds in 2016, the total coastwide landings of weakfish have declined in every year since 2012 (512,589 lbs) and are below the most recent ten-year (2007-2016) average of 542,736 pounds. The commercial fishery (171,039 lbs) accounted for 69% of the total 2016 landings, and the recreational fishery (76,377 lbs) for 31% (Table 2).

Commercial Fishery

Commercial data are cooperatively collected and compiled by the Atlantic Coastal Cooperative Statistics Program (ACCSP) 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. In this report, commercial landings from 2015 and earlier are from ACCSP and landings from 2016 are from state compliance reports, unless otherwise stated (see notes for Table 3).

Between 1982 and 2016, coastwide commercial weakfish landings have ranged from the high of 21.1 million pounds in 1986 to the low of 132,261 pounds in 2011 (Figure 2). Commercial landings have generally declined throughout the time series. Landings in 2016 were the third-lowest on record at 171,039 pounds, but did increase from 142,609 pounds in 2015. North Carolina (47%) and Virginia (23%) landed the largest shares of the 2016 coastwide commercial weakfish landings (Table 3).

The dominant commercial gears were gill nets (about 63% of commercial landings). 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. Recreational data from 2015 and earlier in this report are from the NMFS Fisheries Statistics Division queried from the Marine Recreational Information Program (MRIP; 2017), except as noted in Section VI of this report for Florida's estimates. Some states also monitor and report recreational landings through their own sampling and estimation efforts. Recreational landings for 2016 are calculated from landings reported in state compliance reports.

Since 1982, coastwide recreational landings have ranged from the high of 11.4 million pounds in 1983 to the low of 27,081 pounds in 2011 (Figure 2). Landings averaged 7.8 million pounds from 1982-1988, before falling to between one and four million pounds from 1990-2002. In 2003, recreational landings dropped below one million pounds (Figure 2). Landings have averaged 153 thousand pounds from 2012-2016, and are estimated at 76,377 pounds (66,151 fish) in 2016 (Tables 4 and 5), the third-lowest year for recreational landings by both number and weight on record. The number of fish released alive by anglers remained above 1 million fish from 1992 to 2008, peaked at over 5 million in 1996, and decreased to 363,669 fish in 2013 (Figure 3). In 2016, 975 thousand fish were released (Table 6). In 2010, all states implemented a one fish bag limit, which impacted landings and discards from that point on.

New Jersey anglers consistently harvested the most weakfish by pounds along the coast until 2009. 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. Between 2012 and 2013, New Jersey again recreationally harvested the most weakfish, in pounds; however, in 2014-2016 North Carolina was the largest recreational harvester. North Carolina harvested 34,860 pounds (45.6% of recreational harvest) of weakfish in 2016.

The size of fish sampled to provide the MRIP weight estimates has historically varied in a latitudinal fashion, with larger fish caught in the north and smaller fish caught in the south. The mean weight per fish sampled throughout the recreational time series (1982-2016) is less than 1.5 pounds for all states from Florida through Maryland and over 1.5 pounds for all states north of Maryland. In 2016, the mean weights for fish caught in New Jersey, Delaware, North Carolina, and South Carolina (1.88, 1.79, 1.04, and 1.36 lbs, respectively) were greater than each state's time series mean (1.74, 1.57, 0.99, and 0.99 lbs, respectively), and the mean weights for fish caught in Massachusetts, Connecticut, New York, Maryland, Virginia, Georgia, and the east coast of Florida (3.41, 2.65, 0.17, 0.63, 1.06, 0.72, and 0.52 lbs, respectively) were less than each state's time series mean (6.01, 4.94, 3.31, 1.23, 1.10, 0.87, and 1.02 lbs, respectively).

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 (98.6% in 2016 by pounds). In 2016, nearly all recreationally harvested fish were caught on private or rental boats (65.5%) or from shore (26.9%).

IV. Status of Assessment Advice

The 2016 assessment was completed by the ASMFC Weakfish Stock Assessment Subcommittee (SAS) (ASMFC 2016) and peer reviewed by the ASMFC Weakfish Stock Assessment Review Panel (ASMFC 2016). The assessment includes fishery data and survey indices through 2014.

As a result of this assessment, the Weakfish TC recommends new Z and SSB reference points along with a two-stage control rule for evaluating weakfish stock status and management response.

Under conditions of time-varying natural mortality, there is no long-term stable equilibrium population size, so an SSB target is not informative for management. The Weakfish TC recommends an SSB threshold of $SSB_{30\%} = 6,880$ MT that is equivalent to 30% of the projected SSB under average natural mortality and no fishing. When SSB is below that threshold, the stock is considered depleted.

SSB in 2014 was 2,548 MT, below the SSB threshold, indicating the stock is depleted (Table 9.2.1, Figure 9.2.1). SSB has been below the threshold for the last 13 years.

The TC recommends the use of total mortality benchmarks to prevent an increase in fishing pressure when F is low but M is high. When Z is below the Z target, F reference points can be used to assess overfishing status.

Z in 2014 was 1.11, above the Z target, but below the Z threshold, indicating total mortality is still high but within acceptable limits (Table 9.2.1, Figure 9.2.2). Z was above the threshold from 2002-2013.

V. Status of Research and Monitoring

Fishery-Independent Data

Young-of-year indices of relative abundance are provided by Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Florida. Massachusetts, Connecticut, New Jersey, Delaware, North Carolina, Georgia, and Florida provide age- 0+ or 1+ indices of relative abundance. The Northeast Fisheries Science Center 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 index 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 provided an Age 1+ index which is included in the 2016 assessment. Stomach content analysis was also done to assess food habit changes and investigate the possible decrease in preferred food availability as a driver of natural mortality, however results were inconclusive. 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 7 for the indices provided in the 2016 compliance reports. While the most recent years of data are shown, full data sets for each survey are available upon request to the state or Commission.

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. 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. Results of the 2016 assessment support continued use of these reference points. 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, silver 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 2016 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 the 2016 fishing year, calculated with 2015 and 2016 harvest data, is 2,608 pounds.

Four states requested *de minimis* status in their 2016 compliance reports: Massachusetts, Connecticut, Georgia, and Florida. Massachusetts, Georgia, and Florida qualify for *de minimis* status (Massachusetts 0.38%, Georgia 0.27%, Florida 0.41%). Connecticut's 2015-2016 average landings are 1.48% of the coastwide total, exceeding the *de minimis* threshold by 0.48%.

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 2016 coastwide commercial landings are 171,039 pounds, thus the first trigger has not been exceeded. The second trigger was met in Connecticut because their total estimated landings in 2016 (5,958 lbs) were 38% greater than their average total landings from 2012-2016 (4,330 lbs). While landings of this level are not out of the range of the historical time series for Connecticut, landings greater than 5,000 lbs have only occurred in one other year since 2007. Due to the low level of landings in Connecticut with respect to the rest of the coast, the PRT does not find the 2016 harvest to be a cause for concern (Table 8).

VII. Implementation of FMP Compliance Requirements for 2016

Mandatory compliance elements for 2015 were provided by Amendment 4 and its four addenda.

Regulatory Requirements

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

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

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 2015.

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 [Samples may come from commercial and/or recreational fishery as long as they come from the same general area (inshore versus offshore) that those fisheries are prosecuted in.].

Table 9 provides the otolith and length collection requirements for 2015. These are based on the best available 2015 landings data provided to the Commission by the ACCSP, NMFS, and the states. Table 9 also provides the number of otoliths and lengths collected by the states in 2016. All states except Rhode Island and New York met the biological sampling requirements in 2016, as reported in state compliance reports. Rhode Island specifically stated in their compliance report that they had difficulty attaining weakfish samples. They collected an

adequate number of lengths but collected 6 ages less than their required 9 ages. New York collected an adequate number of ages but collected 5 lengths less than their required 66 lengths. Although these states did not meet their sampling requirements, the PRT recognizes the difficulty in acquiring weakfish samples and has no reason to believe that these states did not make a good faith effort to fulfill the requirements of the FMP.

VIII. Recommendations of the Plan Review Team

Management Recommendations

- That the Board approve the *de minimis* requests from Massachusetts, Connecticut, Georgia, and Florida.
- That the Board consider for management the use of biological reference points from the 2016 stock assessment.
- That the Board consider updating management triggers established in Addendum II to Amendment 4.
- That the Board clarify the use of fishery-independent samples in fulfilling biological sampling requirements as set forth in Addendum I to Amendment 4.

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.¹

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.²
- Improve methods to estimate commercial 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.

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.

¹ Some Mid-Atlantic trawl fleet observer coverage has been implemented under ACCSP funding.

² Gillnet selectivity has been investigated by Swihart et al (2000). Some gear selectivity information in Amendment 3 to the ASMFC Weakfish FMP. Information can also be obtained from the North Carolina Pamlico Sound Independent Gill Net Survey.

Modeling / Quantitative Priorities

High

- Evaluate predation of weakfish with a more advanced multispecies model (e.g., the ASMFC MSVPA or Ecopath with Ecosim); consider an expanded suite of predators (e.g., marine mammals) and include weakfish as predator and prey.
- 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.

Life History, Biological, and Habitat Priorities

High

- Develop a coastwide 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.³
- Estimate weakfish mortality through independent approaches (e.g., alternative models, tagging) to corroborate trends in mortality from the assessment model.
- Determine the impact of scientific monitoring surveys on juvenile weakfish mortality. Calculate the resulting impact on adult stock size.
- Monitor weakfish diets over a broad regional and spatial scale, with emphasis on new studies within estuaries.
- Continue to investigate the geographical extent of weakfish hybridization.

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 indications of spawning and nursery habitat location and extent.
- Examine geographical and temporal differences in growth rate (length and weight at age).
- 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.⁴
- Monitor predation on weakfish from bird, fish, and marine mammal species.

Management, Law Enforcement, and Socioeconomic Priorities

Moderate

- Assemble socioeconomic data as it becomes available from ACCSP.

³ A university led weakfish tagging study has been ongoing in North Carolina and Delaware since 2014. The objective of the study is to evaluate movement and stock mixing of weakfish along the U.S. east coast and to estimate seasonal and annual rates of fishing and natural mortality. The study is slated to be completed in late 2017 with results available to the weakfish TC in early 2018.

⁴ Data are available for power plants in the Delaware Bay area and North Carolina. Also see Heimbuch et al. 2007. Assessing coastwide effects of power plant entrainment and impingement on fish populations: Atlantic menhaden example. *North American Journal of Fisheries Management*. 27: 569-577.

Low

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

IX. References

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X. Tables

Table 1. Summary of state regulations for weakfish in 2016.

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. Other times of year: 100 pound bycatch limit with at least an equal poundage of other species as weakfish. Trawl codend mesh size ≥ 4.5 " diamond or 4.0" square.	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 ≥ 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 ≥ 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 ≥ 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 8/1-9/30, 50 lb possession limit, 0 lb bycatch. Chesapeake Bay all other gears: 50 lb bycatch limit & 50% rule. Gillnet: mesh ≥ 3.0 " stretched. Trawl: mesh ≥ 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

Table 1 (continued). Summary of state regulations for weakfish in 2016.

State	Commercial	Recreational	Implementation Date
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 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 for all gears during closed seasons.	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, 100 lbs trip limit. Gill net: mesh \geq 2.875" stretch. Gill nets and flynets that do not meet mesh requirements can only take weakfish as bycatch provided the weight of weakfish doesn't exceed 50% of catch up to 100lbs, 100lb limit in shrimp or crab trawl.	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 2000 to 2016 (see Tables 3 and 4 for source information and state-specific landings).

Year	Recreational Landings (lbs)	Commercial Landings (lbs)	Total Landings (lbs)	% Com
2000	4,046,525	5,062,705	9,109,230	56%
2001	2,684,146	4,802,221	7,486,367	64%
2002	2,135,037	4,594,956	6,729,993	68%
2003	843,359	1,999,040	2,842,399	70%
2004	887,312	1,538,517	2,425,829	63%
2005	1,407,490	1,264,102	2,671,592	47%
2006	1,129,741	1,075,964	2,205,705	49%
2007	690,552	900,958	1,591,510	57%
2008	594,000	456,793	1,050,793	43%
2009	169,823	372,985	542,808	69%
2010	75,421	202,626	278,047	73%
2011	27,081	132,261	159,342	83%
2012	265,824	246,765	512,589	48%
2013	165,366	343,959	509,325	68%
2014	77,231	192,009	269,240	71%
2015	123,678	142,609	266,287	54%
2016	76,377	171,039	247,416	69%

Table 3. Commercial landings (pounds) of weakfish by state, 2000-2016 (Source: ACCSP for 2015 and earlier and state compliance reports for 2016, except as noted below). Starred values are confidential.

Year	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
2000	527	189,362	7,920	352,832	1,071,428	*	200,299	68,574	1,302,271	1,869,044			448	5,062,705
2001	231	109,568	6,774	578,797	837,550	*	181,188	44,219	1,082,369	1,960,324		*	1,201	4,802,221
2002	842	122,781	10,223	513,977	863,088	*	108,318	57,818	1,089,323	1,828,150	42		394	4,594,956
2003	519	63,337	*	144,416	340,269	*	46,427	5,273	455,094	848,822		*	288	1,999,040
2004	59	34,209	6,206	150,046	204,585	51,276	55,100	1,986	349,395	685,463	*	*	192	1,538,517
2005	2,840	41,558	6,118	90,238	208,232	70,669	35,527	1,004	385,584	421,779		*	553	1,264,102
2006	*	47,474	7,012	152,922	*	34,434	51,081	689	187,849	363,078		*	337	1,075,964
2007	*	20,586	1,910	86,723	164,506	24,579	22,284	20	403,873	175,589			888	900,958
2008	73	9,703	1,024	42,621	57,013	11,186	6,364	74	165,223	162,516		*	996	456,793
2009	*	6,286	506	101,561	30,196	*	5,230	17	65,589	163,146			453	372,985
2010	58	5,400	960	13,102	12,053	*	2,930	80	61,651	106,319			73	202,626
2011	615	5,766	2,105	17,136	13,324	*	646	45	26,119	65,897		*	608	132,261
2012	616	17,908	4,723	63,119	19,291	*	2,078	98	45,551	91,383			1,999	246,765
2013	3,400	31,826	5,960	108,656	14,829	*	3,404	24	54,607	120,188		*	1,065	343,959
2014	918	15,583	3,343	33,303	8,415	*	2,126	10	22,508	105,246			557	192,009
2015	473	6,327	1,666	24,238	9,655	*	1,394	3	17,882	80,230			741	142,609
2016	882	12,022	2,838	30,308	*	5,303	603	0	38,823	79,640	0	0	621	171,039

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.

Table 4. Recreational landings (pounds) of weakfish by state, 2000-2016 (Source: MRIP, except as noted below).

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2000		1,923	35,096	164,524	1,916,092	635,339	696,662	496,204	87,926	6,312	3,504	2,943	4,046,525
2001			4,884	151,584	1,251,151	172,969	567,625	373,206	158,423		2,982	1,322	2,684,146
2002		3,800	11,286	58,626	1,213,558	243,157	174,065	295,397	82,746	50,141	684	1,577	2,135,037
2003	874	2,379	3,537	37,106	333,690	57,867	24,698	215,522	161,474	4,305	1,327	580	843,359
2004		0	0	50,624	284,420	3,915	21,617	221,283	244,023	54,364	6,129	937	887,312
2005		12,340		532	1,093,492	36,627	29,404	30,924	142,140	52,315	8,151	1,565	1,407,490
2006		69,501		64,091	789,330	21,070	719	35,888	143,525	1,512	2,585	1,520	1,129,741
2007		0		3,900	433,567	3,360	13,727	98,981	111,754	13,345	3,472	8,446	690,552
2008				57,980	365,125	4,071	1,968	29,500	114,192	15,314	4,653	1,197	594,000
2009				0	24,069	10,634	3,425	20,923	89,652	14,502	4,666	1,952	169,823
2010	0			6,981	3,541	57	3,161	1,664	38,721	18,177	2,664	455	75,421
2011				172	2,449	21	134	2,635	17,621	3,089	430	530	27,081
2012				15,125	156,495	4,442	6,192	20,952	46,081	12,244	3,625	668	265,824
2013		1,825		28,611	77,848	9,697	3,501	1,692	34,731	5,572	952	937	165,366
2014			0	5,016	17,311	3,531	2,144	5,902	25,957	12,905	3,703	762	77,231
2015				1,713	21,990	141	1,695	6,124	50,903	40,626	384	102	123,678
2016	610	0	3,120	335	13,347	757	635	12,128	34,860	8,931	1,001	653	76,377

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.

Table 5. Recreational landings (numbers) of weakfish by state, 2000-2016 (Source: MRIP, except as noted below).

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2000		712	7,342	42,406	760,279	311,553	475,348	286,752	71,247	5,585	4,181	3,276	1,968,681
2001		2,301	715	28,126	736,069	72,451	302,719	175,872	158,605		3,316	1,542	1,481,716
2002		1,420	1,796	24,962	492,876	121,884	100,467	178,110	90,170	90,245	852	1,842	1,104,624
2003	109	298	443	9,234	151,101	20,124	41,048	86,112	153,753	4,162	1,573	774	468,731
2004		0	0	10,634	228,536	4,499	15,832	158,111	211,787	97,019	5,040	1,114	732,572
2005		1,473		315	1,008,393	19,533	32,243	44,088	151,597	76,299	6,634	1,539	1,342,114
2006		5,948		9,759	489,440	10,457	754	43,081	151,502	2,086	2,433	1,578	717,038
2007		0		3,602	229,755	3,782	6,980	87,470	94,398	19,891	3,884	961	450,723
2008				40,027	298,076	4,032	2,000	27,929	108,389	22,930	4,807	1,470	509,660
2009				0	11,928	5,995	4,169	15,523	68,553	15,699	8,450	2,028	132,345
2010	0			3,423	2,261	88	4,784	4,303	41,598	11,599	2,840	589	71,485
2011				111	3,003	27	237	4,374	13,464	4,107	973	471	26,767
2012				5,055	114,330	4,246	11,401	21,791	40,299	13,593	4,603	988	216,306
2013		331		7,003	30,697	7,518	1,807	2,171	33,851	5,711	1,080	2,086	92,255
2014			0	644	6,520	3,295	1,062	9,084	26,308	11,065	3,423	905	62,306
2015				620	30,273	74	3,093	4,122	39,842	29,215	492	143	107,874
2016	179	0	1,179	1,987	7,116	422	1,013	11,448	33,585	6,582	1,389	1,251	66,151

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).

Table 6. Recreational releases (numbers) of weakfish by state, 2000-2016 (Source: MRIP, except as noted below).

Year	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL	Total
2000		931	1,285	68,531	1,605,024	465,496	1,209,290	935,594	346,212	15,869	12,895	5,551	4,666,678
2001		358	0	69,123	1,064,609	227,214	737,240	633,443	886,943		13,537	2,541	3,635,008
2002		1,932	0	62,803	350,810	101,282	286,182	888,337	336,709	1,019	9,540	2,113	2,040,727
2003	0	0	1,233	7,286	631,438	39,314	180,827	504,129	153,563	1,966	21,212	2,556	1,543,524
2004		187	12,331	38,306	534,836	72,556	231,092	544,776	242,135	71,556	10,953	3,395	1,762,123
2005		0		76,318	1,372,057	104,955	60,721	355,792	206,481	29,595	38,010	2,007	2,245,936
2006		0		17,120	1,335,489	95,802	47,107	556,763	302,429	15,572	5,858	5,132	2,381,272
2007		1,784		108,709	612,698	23,113	63,515	229,453	122,717	27,867	20,197	949	1,211,002
2008				25,450	1,435,551	61,470	37,219	427,616	113,886	131,346	14,171	711	2,247,420
2009				3,179	79,023	4,431	8,185	84,700	165,992	26,989	9,776	285	382,560
2010	931			3,073	102,787	12,682	162,733	177,395	200,274	54,203	8,331	38	722,447
2011				55,172	99,964	6,568	18,500	288,304	109,483	5,165	14,576	520	598,252
2012				11,454	731,563	84,856	24,898	102,245	165,891	50,026	37,247	0	1,208,180
2013		14,520		6,010	93,877	22,443	9,852	78,951	109,006	7,602	8,362	561	351,184
2014			315	239	79,756	22,730	4,819	109,115	281,226	54,139	1,772	614	554,725
2015				3,893	246,280	16,109	117,606	125,238	505,666	76,940	11,193	0	1,102,925
2016	1,140	0	1,615	2,108	136,187	26,153	81,011	271,867	423,482	28,643	2,848	0	975,054

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).

Table 7. Indices of relative weakfish abundance from 2000 to 2016.

Year	MA Tr BB & VS YOY	MA Tr BB & VS 1+	RI Tr Coast YOY	CT Tr LIS YOY	CT Tr LIS 1+	NY Tr Coast YOY	NJ Tr DE Bay YOY	NJ Tr Ocean 1+	DE Tr DE Bay YOY	DE Tr Inland YOY	DE Tr DE Bay 1+
	mean#/ tow	mean#/ tow	mean #/ tow	GM#/ tow	GM#/ tow	AM#/ tow	GM#/ tow	GM#/ tow	GM#/ tow	GM#/ tow	#/ nm
2000	*	*	9.38	63.31	0.30	167.10	0.59	2.36	14.14	1.64	179.12
2001	*	*	19.33	40.09	0.52	113.70	15.03	0.68	7.56	1.53	80.70
2002	*	*	8.40	41.35	0.16	145.20	19.70	1.59	5.96	1.31	144.98
2003	*	*	198.00	49.41	0.07	69.80	3.11	0.08	10.44	2.44	65.78
2004	*	*	1.88	58.98	0.21	43.90	8.48	1.79	8.39	3.32	48.88
2005	*	*	128.93	25.86	0.12	226.50	20.60	0.46	16.82	3.84	29.00
2006	*	*	0.36	1.05	0.29	55.10	12.24	0.19	5.35	1.60	106.31
2007	*	*	36.10	63.93	0.06	92.12	25.53	0.83	13.70	2.98	43.16
2008	*	*	0.55	9.07	0.08	51.50	7.86	0.35	6.74	1.02	45.94
2009	*	*	7.29	6.48	0.30	13.30	7.29	0.33	8.56	5.91	35.83
2010	*	*	7.95	-	-	15.30	10.51	0.69	11.98	3.49	43.57
2011	*	*	70.63	11.64	0.68	34.50	15.80	22.32	7.89	3.30	89.22
2012	*	*	122.30	21.96	0.73	9.40	1.26	0.23	7.55	3.44	106.43
2013	*	*	13.20	7.01	0.52	22.60	15.55	0.39	13.49	4.47	71.78
2014	*	*	1.27	41.53	0.08	97.70	4.87	0.98	13.67	4.71	38.01
2015	0.21	*	46.47	30.91	0.46	56.00	2.27	1.44	10.22	3.88	76.46
2016	23.00	0.29	4.14	5.87	0.81	57.60	2.34	1.34	7.47	3.00	154.40

Table 7 (continued). Indices of relative weakfish abundance from 2000 to 2016.

Year	MD Tr ChesBay YOY	MD Tr Coast YOY	VA Tr ChesBay YOY	NC Tr Pamlico YOY	NC Tr Pamlico YOY	NC Gn Pamlico 1+	SC Tr Inshore YOY	SC SEAMAP Summer 0+/1+	SC SEAMAP Fall 0+/1+	GA Tr Coast 0+	FL Tr Jax YOY	FL Tr IR & Jax 1+
	GM#/ tow	GM#/ ha	GM#/ tow	#/ tow	#/ tow	#/ set	#/ tow	#/ tow	#/ tow	#/ obs hr	med/ tow	med/ tow
2000	6.54	2.34	8.35	62.99	*	*	*	20.30	5.10	*	*	*
2001	8.10	2.56	5.09	30.30	*	1.42	*	19.20	5.40	*	0.79	0.23
2002	3.92	0.61	6.93	22.00	*	1.40	*	16.20	2.80	*	1.45	0.52
2003	4.89	5.64	9.23	23.93	*	1.22	*	14.20	3.90	105.44	4.35	0.34
2004	1.62	3.39	6.66	28.75	*	1.32	*	3.10	3.40	94.42	4.04	0.19
2005	3.55	4.98	5.69	28.76	*	1.24	*	1.80	9.40	32.08	1.83	0.73
2006	2.41	1.50	6.34	39.09	*	0.92	*	4.10	3.10	79.96	1.78	0.44
2007	1.60	2.32	5.35	56.80	*	0.43	*	11.40	18.40	159.64	1.68	0.46
2008	0.79	0.23	5.77	50.30	*	0.49	*	11.30	17.70	75.55	1.66	0.39
2009	1.42	1.33	6.18	58.89	*	0.31	*	15.30	11.90	104.76	2.12	1.17
2010	1.68	2.16	14.11	32.45	*	0.48	*	14.80	14.60	128.48	0.74	0.70
2011	2.04	1.90	5.23	33.69	*	0.36	*	74.10	13.90	104.20	0.74	0.52
2012	0.46	0.46	3.02	40.66	*	0.92	*	18.80	9.80	91.64	1.79	0.65
2013	2.15	1.02	9.41	58.53	*	0.69	*	25.50	0.20	131.52	0.69	0.12
2014	2.95	1.28	3.77	32.83	*	0.50	*	12.00	7.60	64.16	0.62	0.19
2015	2.23	0.88	3.77	43.30	*		19.30	18.20	257.80	3.61	1.08	0.03
2016	0.71	1.69	1.44	43.00	34.50	0.04	22.60	14.50	24.30	3.75	0.69	0.21

Table 8. Evaluation of the Coastwide Management Trigger (Section 3.3.1 of Addendum II to Amendment 4): percent change of each state’s 2016 total landings (lbs) to its five-year (2012-2016) mean total landings.

	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL
2012-2016	1,380	17,098	4,330	62,085	67,836	4,774	4,754	27	45,234	133,844	16,056	1,933	1,621
2016	1,492	12,022	5,958	30,643	13,347	6,060	1,238	0	50,951	114,500	8,931	1,001	1,274
% change	8%	-30%	38%	-51%	-80%	27%	-74%	-100%	13%	-14%	-44%	-48%	-21%

Table 9. Biological sampling of weakfish in 2016, Massachusetts-Florida (Sampling requirements are based on Addendum I to Amendment 4 and 2016 landings data and are reported in state compliance reports; values highlighted with red bold font do not meet sampling requirements).

	Samples Required		Samples Completed		Fisheries Sampled
	Ages	Lengths	Ages	Lengths	
MA*			0		NA
RI	9	17	3	232	commercial, RIDFW Trawl Survey
CT*			0	0	NA
NY	35	66	61	61	commercial (GN, TR, PN, H&L)
NJ	43	26	76	80	NJ Ocean Trawl Survey/ research surveys
DE	2	4	48	49	commercial (GN)
MD	4	4	63	64	commercial (PN)
PRFC	0	0	0	0	NA
VA	33	49	284	284	commercial (GN, PN, HS)
NC	178	218	570	2,664	commercial (SN, GN, PN, HS, TR, H&L), recreational
SC	55	0	174	379	fishery independent, recreational
GA*			0	0	NA
FL*			0	0	NA

* *de minimis* in 2016; 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, SN=sink net

XI. Figures

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

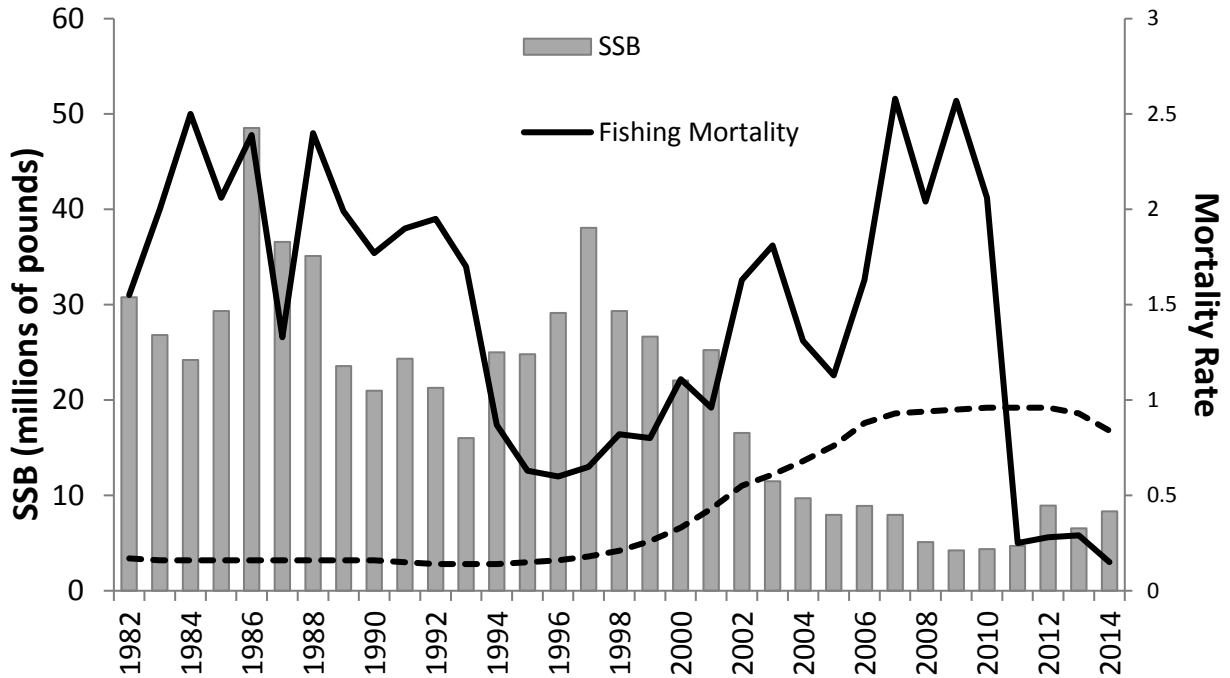


Figure 2. Commercial and recreational weakfish harvest (pounds), from 1982 to 2016 (see Tables 3 and 4 for source information and values).

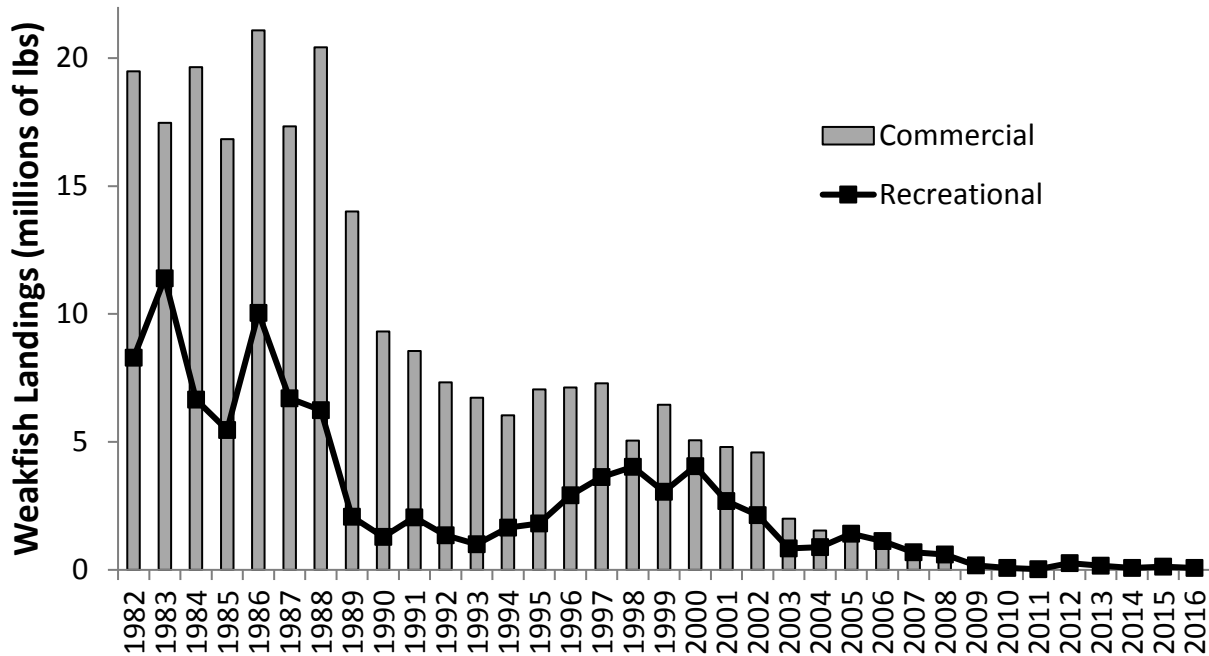


Figure 3. Recreational weakfish harvest and releases (number of fish), from 1982 to 2016 (see Tables 5 and 6 for source information and values).

