

Atlantic States Marine Fisheries Commission

**ADDENDUM IV TO AMENDMENT 4 TO THE
WEAKFISH FISHERY MANAGEMENT PLAN**



ASMFC Vision Statement:

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

November 2009

Acknowledgements

This addendum was prepared by the Commission's Weakfish Plan Development Team. Development of the document benefited greatly from the input of the Weakfish Technical Committee and Stock Assessment Subcommittee, and members of the Weakfish Advisory Panel. The Weakfish Management Board approved Addendum IV on November 3, 2009.

Table of Contents

1.0	Introduction.....	1
2.0	Management Program.....	1
2.1	Statement of the Problem.....	1
2.2	Background.....	1
2.2.1	Management Status.....	2
2.2.2	Stock Status.....	3
2.2.3	Fishery Status.....	5
2.2.3.1	Commercial Fishery.....	5
2.2.3.2	Recreational Fishery.....	6
2.3	Management Measures.....	6
2.3.1	Biological Reference Points.....	6
2.3.2	Recreational Fisheries.....	7
2.3.3	Commercial Fisheries.....	7
3.0	Compliance Schedule.....	8
4.0	Recommendation for Federal Waters.....	9
5.0	References.....	9
6.0	Figures.....	10
7.0	Tables.....	15

1.0 Introduction

The Atlantic States Marine Fisheries Commission (ASMFC) has coordinated interstate management of weakfish (*Cynoscion regalis*) from 0-3 miles offshore since 1985. The management unit includes the U.S. East Coast weakfish population from Massachusetts through Florida. Weakfish is currently managed under Amendment 4 to the Interstate Fishery Management Plan (FMP), implemented in 2003, and its three addenda implemented in 2006 (Addendum I) and 2007 (Addenda II and III). Management authority in the exclusive economic zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries.

The purpose of this addendum is to respond to the results of the most recent weakfish stock assessment. The addendum revises the biological reference points and implements new or revised regulations to reduce the level of fishery removals.

2.0 Management Program

2.1 Statement of the Problem

The weakfish stock is in a depleted state. Estimated (mid-year) weakfish spawning stock biomass declined to 3% of that of an unfished stock by 2007, well below the 20% threshold level in Amendment 4. This decline reflects a sustained rise in natural mortality (deaths from natural causes such as being eaten and starvation) after 1999 to two to four times the level of fishing mortality (deaths from fishing). Fishing mortality rates, estimated with limited assumptions about natural mortality, have been modest and stable during the same time period. Current removals, combined with high natural mortality rates, risk reducing the spawning stock to a level where poor year-classes become typical.

In addition, the biological reference points in Amendment 4 require revision. The reference point estimates are based on an assessment covering 1981-2000 and an assumption that the stock is in equilibrium (constant growth rates and natural mortality). They are not compatible with the current assessment, in part because natural mortality is not constant but has increased in recent years. The review panel for the 2009 weakfish stock assessment recommended developing new reference points for future management.

2.2 Background

In August 2009, the Weakfish Management Board was provided with results of the 2009 peer-reviewed stock assessment (NEFSC 2009a, NEFSC 2009b). The assessment indicated that weakfish abundance has declined markedly, total mortality is high, non-fishing (natural) mortality has recently increased, and the stock is currently in a depleted state. The review panel agreed with the assessment's findings, concluding that the current level of fishery removals further exacerbates the decline in abundance (Sullivan et al. 2009). Consequently, the Management Board initiated the development of this addendum to consider options ranging from significantly reduced harvest to eliminating harvest (moratorium) in order to decrease fishing mortality. Management options were proposed that would poise the stock for recovery when natural mortality decreases. However, the Management Board has little ability to influence natural mortality that has been the dominant factor leading to the recent stock decline (NEFSC

2009a). Additional details on the stock assessment, as well as the current management and fishery status, are included below.

2.2.1 Management Status

Weakfish are currently managed under Amendment 4, plus its three addenda. Amendment 4 was implemented in 2003 in order to revise the biological reference points and the recreational reference period (on which creel and size limits were based) in order to sustain sufficient spawning stock biomass and expand the age structure and geographic range of the population. The reference points include a fishing mortality (F) threshold of $F_{20\%} = 0.5$ (on which overfishing status is based), an F target of $F_{30\%} = 0.31$, and a spawning stock biomass (SSB) threshold of $SSB_{20\%} = 31.8$ million pounds (on which overfished status is based). States were required to maintain their current commercial regulations, those implemented in response to Amendment 3, which required a 32% reduction in fishing mortality from the early 1990s; however, the bycatch limit was increased from 150 pounds to 300 pounds. Recreational size and creel limit options, based on reducing harvest from the revised reference period (1981-1985), included a 12" minimum with a 7 fish creel, a 13" minimum with an 8 fish creel, a 14" minimum with a 9 fish creel, and a 15" or greater minimum with a 10 fish creel.

Amendment 4 was developed based on a 2002 assessment that indicated weakfish in 2000 were at a high level of biomass, were subject to a low level of fishing mortality, and the stock's size and age structure were expanding, results that were reflective of the fisheries. Despite uncertainty in the results due to a retrospective pattern in the virtual population analysis (underestimating the most recent year's F and overestimating the most recent year's SSB), these results indicated that the weakfish fishery had met many of the goals it set to achieve in the previous plan amendment. The increasingly restrictive management during the mid-1990s appeared to be putting weakfish on the path to recovery having reduced fishing mortality from the high levels present in the late 1980s and early 1990s.

With the addition of three more years of data in 2004, preliminary runs of the virtual population analysis (VPA), a traditional single-species assessment model, continued to estimate a weakfish population at all time highs. Concurrently, commercial and recreational weakfish landings along the Atlantic coast were plummeting to all time lows. The Weakfish Stock Assessment Subcommittee (SAS) recognized the need to investigate this disparity in the ongoing benchmark assessment, and did so by considering factors other than fishing in its evaluations. The results of alternative analyses pointed to a decline in weakfish abundance and surplus production during a period of low fishing mortality. These analyses suggested that an increase in natural mortality was responsible for the decline, with such factors as increased predation or competition and decreased prey availability as possible underlying causes. The SAS determined that the weakfish stock was depleted and overfishing was not occurring. The findings of the stock assessment, however, were not supported by an independent peer review panel. The Management Board accepted several findings from the assessment, although no specific parameter estimates, for management use in 2006: 1) the stock was declining; 2) total mortality was increasing; 3) there was little evidence of overfishing; 4) something other than fishing mortality was causing the decline in the stock; and 5) there was a strong chance that regulating the fishery would not, in itself, reverse stock decline.

Based on these conclusions, the Management Board adopted Addendum II to Amendment 4 in 2007 to control expansion of the fishery in the event that stock status improved after a decline in natural mortality. The addendum required all states, except those that are *de minimis* (i.e., have insignificant landings), to reduce their recreational creel limit to six fish and their commercial bycatch limit to 150 pounds. See Table 1 for a description of state regulations in 2008.

Two management triggers were also adopted in Addendum II that would necessitate management intervention when met. The Management Board would need to re-evaluate the commercial management measures when coastwide commercial landings equaled or exceeded 2.99 million pounds (80% of the mean commercial landings from 2000-2004), and re-evaluate commercial and recreational management measures when any single state's landings exceeded its five-year mean by more than 25% in any single year. Meanwhile, another benchmark stock assessment, with data through 2007, was initiated in order to produce improved scientific advice for management use (see Section 2.2.2 Stock Status).

The other two addenda to Amendment 4 address biological sampling and bycatch reduction device certification. Addendum I revised the biological sampling plan in Amendment 4 to respond to decreased availability of fish to sample, and Addendum III revised the language on certification of bycatch reduction devices to achieve consistency with federal regulations.

2.2.2 Stock Status

An assessment was completed in 2009 by the Weakfish SAS (NEFSC 2009a, NEFSC 2009b) and peer reviewed by the 48th Stock Assessment Review Committee (Sullivan et al. 2009) at the 48th Northeast Regional Stock Assessment Workshop (SAW). The assessment includes fishery data and survey indices through 2007. The results of the assessment indicate that weakfish abundance has declined markedly, total mortality is high, non-fishing mortality has increased, and the stock is currently in a depleted state. The weakfish stock is depleted at an all-time low of 10.8 million pounds (4,899 metric tons)¹. At this stock size, recent fishery removals (landings and dead discards combined) represent a significant proportion of the remaining biomass. While the decline in the stock primarily results from a change in the natural mortality of weakfish in recent years, it is further exacerbated by continued removals by the commercial and recreational fisheries. Natural mortality has risen substantially since 1995, with factors such as predation, competition, and changes in the environment having a stronger influence on recent weakfish stock dynamics than fishing mortality. Given current high natural mortality levels, stock projections indicate that the stock is unlikely to recover rapidly, even under a harvest moratorium (Figure 1).

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

¹ All biomass estimates included in this document are for January 1 stock size. The 2009 stock assessment presents mid-year estimates, which the Technical Committee found to be misleading when compared to annual estimates of fishery removals, i.e., removals are compared to biomass that has already had a half-year of removals. To address this issue, the Technical Committee developed and approved on September 16, 2009, a methodology to produce January 1 estimates of stock size and mortality from the approved stock assessment model (Crecco 2009).

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, 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.

According to the index-based modeling, weakfish age 1+ biomass was 10.8 million pounds in 2008. Between 1982 and 1990, age 1+ biomass declined drastically from 113.1 million pounds to 17.6 million pounds (Figure 2). Overfishing was the main cause of this decline, accounting for about 60-90% of total mortality (fishing plus natural mortality). Implementation of management measures in the early to mid-1990s resulted in an increase in age 1+ biomass to a peak of 62.1 million pounds in 1996. After a slight decline through 2000, the stock began another drastic decline to the current time-series low. 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 (Figure 3). These estimates of age 1+ biomass are roughly comparable to spawning stock biomass due to the biology of weakfish (most fish are mature at age one). The 2008 estimate of age 1+ biomass is below the Amendment 4 SSB threshold.

Despite the decline in age 1+ biomass, young-of-year relative abundance appears to have remained in a productive pattern; however, 2006 was one of the lowest years on record and 2008 was low relative to the pattern of recruitment since 1996 (Figure 4). While inter-annual variability is common in juvenile indices, fluctuations in the recent time series appear more pronounced than in earlier years. Conflicting trends in age-0 indices and age 1+ biomass suggest the emergence of a demographic bottleneck (strong young-of-year indices do not translate into high biomass).

Fishing mortality estimated using the index-based approach scaled to the converged portion of the VPA biomass peaked in 1989 at 1.01 before dropping rapidly to 0.24 in 1995 (Figure 3)². Since that time the biomass-weighted F has varied between 0.26 and 0.58. Values presented are for ages 1+ and therefore are affected by partial recruitment of younger ages, while previous assessments provided estimates for fully recruited ages. These estimates cannot be compared to the existing F reference points, but can be evaluated based on the trend in F across the time series.

The failure of recovery since the late 1990s cannot be attributed to high fishing mortality alone unless bycatch and under-reported catches were much greater than those estimated, growing from about 3-4 times the estimates in 1996 to 15-20 times in the most recent years. Thus far,

² All fishing and natural mortality estimates included in this document are based on January 1 stock size. The 2009 stock assessment presents mortality estimates based on mid-year stock size, which the Technical Committee adjusted to be January 1 estimates following the peer review of the stock assessment (Crecco 2009).

there is no evidence available of an Atlantic coast fishery capable of generating additional unreported weakfish discards of this magnitude.

The resulting stock status determination for weakfish is that the stock is depleted, and overfishing is not occurring.

2.2.3 Fishery Status

At 1.1 million pounds, the total coastwide landings of weakfish in 2008 are the lowest on record (Figure 5). The 23% decline in total landings from 2007 to 2008 continued the steady decline observed since 1998, when 12.4 million pounds were harvested. This recent decline in harvest was not due to increasing regulations. The 1998 harvest is still less than half of that observed in the 1980s (1982-89 average of 27.5 million pound). Total landings declined from 25.4 million pounds in 1988 to 7.7 million pounds in 1993 due to overfishing. With the implementation of Amendment 2 in 1994 and Amendment 3 in 1996, some recovery to the stock did occur and landings increased through 1998.

The general pattern of harvest is related to the seasonal migration of weakfish. In the winter, most landings occur in the south due to the overwintering aggregation off the North Carolina coast and the more temperate waters further south. In spring, weakfish migrate back to spawning areas, primarily estuaries in North Carolina and the Mid-Atlantic states. Fishing occurs on the migrating fish along the coast and then concentrates on estuaries for the remainder of spring and summer, from Pamlico Sound in North Carolina through Peconic Bay on eastern Long Island, New York. From spring to mid-summer, some larger fish arrive in southern New England, including Rhode Island and Connecticut. With fall, weakfish leave estuaries and begin their fall migration south to the overwintering grounds and are targeted as they move down the coast.

2.2.3.1 Commercial Fishery

Between 1982 and 2008, coastwide commercial weakfish landings have ranged from the high of 21.1 million pounds in 1986 to the low of 0.47 million pounds in 2008 (Figure 6). Since 1988, the overall trend is one of decline, except during 1994-1998 when landings increased by about two million pounds.

Three states - New Jersey, Virginia, and North Carolina - have consistently accounted for 70 to 90% of the coastwide commercial harvest since 1950 (NEFSC 2009b). In 2008, the proportion of landings from these states individually was approximately 12%, 36%, and 36%, respectively. Figure 7 presents commercial landings by state from 2006 to 2008.

From the mid-1950s to the early 1980s landings from the trawl fishery generally accounted for 50 to 70% of commercial landings. Beginning in the early 1980s, harvest from trawlers began a gradual decline, and recently account for approximately 20% of total harvest. Conversely, between 1979 and 1987, landings from gillnets increased from around 10% of annual harvest to 45% of annual harvest, and have remained relatively stable since that time. Over the entire time period, pound nets and haul seines have each averaged between 10 and 20% of total harvest annually, despite declining trends (NEFSC 2009b).

Discarding of weakfish by commercial fishermen is known to occur, and discard mortality is assumed to be 100% for purposes of stock assessment (NEFSC 2009b). Most discarding occurs in conjunction with two gears (trawls and gillnets) and a limited number of target species. Estimated commercial discards have ranged from 383,000 to 2.5 million pounds (Figure 6). Prior to 1994, it is assumed that discards occurred for non-regulatory reasons because few regulations were in place to limit the fishery. Since 1994, both regulatory and non-regulatory discarding has occurred. Regardless, estimated removals as a result of commercial discarding appear to be minor relative to harvest, even in recent years as harvest has decreased (NEFSC 2009b).

2.2.3.2 Recreational Fishery

Since 1982, coastwide recreational landings have ranged from the high of 11.5 million pounds in 1983 to the low of 0.67 million pounds in 2008 (Figure 6). Landings averaged 7.9 million pounds from 1982-1988, before declining to 1.0 million pounds by 1993. Landings increased slowly through 2000, when 4.1 million pounds were harvested, but then declined again to the time series low in 2008.

The recreational fishery currently takes place predominantly in state waters (97% in 2008) from private or rental boats (92% in 2008) (NMFS Fisheries Statistics Division 2009). During 1981-1988, when large weakfish were more common, harvest in state waters accounted for 67-87%.

Harvest has been dominated by the six states between New York and North Carolina. New Jersey landed the greatest proportion of weakfish in most years, averaging 35% of coastwide harvest across the time series (NEFSC 2009b). Virginia produced greater than 20% of coastwide landings from 1981 to 1992 but has since declined. Since 1995, several states have each had periods of substantial landings, with Delaware contributing 20-30% of total harvest for 1995-1998, Maryland accounting for approximately 25% from 1999 to 2001, and North Carolina averaging 22.5% from 2003 to 2007. See Figure 8 for recreational landings by state from 2006 to 2008.

Recreational discard mortality is assumed to be 10% of all discarded fish for purposes of stock assessment based on catch-and-release studies (NEFSC 2009b). From 1982-2007, annual recreational dead discard estimates ranged between 6,000 and 167,000 pounds (Figure 6). Dead discards averaged 65,000 pounds from 2002 to 2007, about 5% of the average total recreational removals during that period.

2.3 Management Measures

2.3.1 Biological Reference Points

The following measure modifies Amendment 4, Section 2.5 Definition of Overfishing.

Addendum IV removes the existing F target and threshold and replaces the existing SSB threshold with percentage-based SSB reference points. The SSB target and threshold are SSB30% and SSB20%, respectively. These reference points represent a level of SSB that is either 30% or 20% of an unfished stock, and reflect the stock's spawning potential. To determine stock status, estimates of spawning stock biomass are divided by estimates of unfished spawning stock biomass, multiplied by 100 to be in the form of a percent, and then compared to the 30%

target and 20% threshold. Figure 9 illustrates this approach. A spawning stock biomass reduced to less than 20% of an unfished stock equals an overfished or depleted stock (overfished when fishing mortality is the primary cause of the biomass decline, and depleted when causes other than fishing mortality have resulted in the biomass decline). Under this definition, weakfish are currently considered depleted. As a consequence of this modification to the management plan, the F target and threshold triggers in Amendment 4, Section 2.1 Stock Rebuilding Program are no longer applicable; however, the spawning stock biomass threshold trigger remains relevant and in effect.

Rationale: Absolute values of spawning stock biomass and fishing mortality used as biological reference points in Amendment 4 are now inappropriate for weakfish management because of assessment changes and the weight of evidence that undermines underlying assumptions of unchanging natural mortality and growth needed to calculate them. However, the target and limit percentages of unfished spawning stock sizes can still be used to evaluate the status of the stock since methods employed in the current assessment provide estimates of current biomass and unfished biomass. Use of percentages, rather than absolute values, should allow for the same evaluation of spawning stock status if assessment techniques change, minimizing the need for addenda to compensate for differences in assessment results.

2.3.2 Recreational Fisheries

The following measure modifies Amendment 4, Section 4.1 Recreational Fisheries Management Measures. The measure also replaces the recreational management program in Addendum II to Amendment 4.

All states in the management unit (including those that are *de minimis*) may continue recreational fishing at current size limits, but are required to reduce the creel limit to one fish.

Rationale: Current fishery removals contribute to the high rate of total mortality responsible for the stock decline. The approved regulations will maintain a low level of exploitation and increase the likelihood of stock rebuilding in the future should natural mortality decrease substantially. Based on recreational harvest data from 2006 to 2008, a coastwide harvest reduction of at least 54% is expected from the prescribed management measure (Table 2). The one fish creel limit is meant to allow for a small harvest of weakfish while fishing for other species, thus reducing unnecessary waste. A coastwide creel limit ameliorates the problem of having to use state level data subject to higher inaccuracy and imprecision to develop state-specific creel and size limit combinations. The coastwide creel limit is also the most straightforward and will be more enforceable. The Weakfish Plan Development Team and Technical Committee also strongly recommend that conservation equivalency proposals to increase the creel limit via an increase in minimum size or seasonal closure not be allowed because, under the existing depleted stock condition, data for individual state analysis are inadequate to properly evaluate such proposals.

2.3.3 Commercial Fisheries

The following measures modify Amendment 4, Section 4.2 Commercial Fisheries Management Measures. The measures also replaces the commercial management program in Addendum II to Amendment 4.

All states in the management unit (including those that are *de minimis*) must implement a 100 pound landings limit, per vessel, per day or trip (whichever is the longer period of time) for directed fisheries, with all other regulations maintained, in order to continue commercial fishing.

Additionally, all states in the management unit (including those that are *de minimis*) must make the following revisions to existing management measures:

- Reduce the bycatch limit to 100 pounds, per vessel, per day or trip (whichever is the longer period of time) for all non-directed fisheries (those harvesting weakfish during closed seasons, from closed areas, or not meeting gear restrictions; this includes the southern penaeid shrimp fishery). Only the poundage allowance in Section 4.2.1 Bycatch is revised; all other requirements for landing weakfish as bycatch remain in effect (e.g., there must be at least an equal poundage of other species as weakfish on board the vessel, the commercial hook and line fishery is not permitted a bycatch allowance).
- Reduce the finfish trawl fishery's allowance for undersized fish (less than 12 inches total length) to 100 fish. This revises Section 4.2.2 Minimum Fish Size. The prohibition on selling any of the undersized fish remains in effect.

States are required to maintain all other existing management measures previously adopted to protect weakfish stocks and reduce bycatch. The monitoring requirements contained in Addendum I to Amendment 4 also remain unchanged.

Rationale: Current fishery removals contribute to the high rate of total mortality responsible for the stock decline. The approved regulations will maintain a low level of exploitation and increase the likelihood of stock rebuilding in the future should natural mortality decrease substantially. Based on commercial harvest data from 2005 to 2008, a coastwide harvest reduction of at least 60% is expected from the prescribed management measures (Table 3). The 100 pound landing limit is meant to discourage directed fishing and reduce weakfish harvest without creating a large amount of discards. A harvest moratorium (with or without a bycatch allowance) could have nullified season, area, and gear-out-of-water restrictions previously enacted to reduce fishing mortality in response to management requirements. These restrictions were responsible for stock rebuilding into the late 1990s until increasing natural mortality overwhelmed their effect. Under Amendment 4, there was a 300 pound bycatch limit and 300 undersized fish allowance for the finfish trawl fishery, thus the revision to 100 undersized fish to correspond to the 100 pound bycatch limit.

3.0 Compliance Schedule

States must implement Addendum IV according to the following schedule:

January 1, 2010: States must submit programs to implement Addendum IV for approval by the Weakfish Management Board

May 1, 2010: All states must implement Addendum IV through their approved management programs. States may begin implementing management programs prior to this deadline if approved by the Management Board.

4.0 Recommendation for Federal Waters

The weakfish resource has been depleted to an all time low level. The Atlantic States Marine Fisheries Commission believes that additional fishery restrictions are necessary to prevent further depletion of the resource.

The management of weakfish in the exclusive economic zone (EEZ) is the responsibility of the Secretary of Commerce through the National Marine Fisheries Service (NMFS). The Atlantic States Marine Fisheries Commission recommends that the federal government promulgate all necessary regulations to implement complementary measures to those approved in this addendum.

5.0 References

Crecco V. 2009. Estimates of Weakfish Exploitation Rates (u) and Biomass Estimates (mt) at the Beginning of each Year, 1981-2008. Old Lyme (CT): Connecticut Marine Fisheries Division. Report to the ASMFC Weakfish Technical Committee. 6 p.

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<http://www.nefsc.noaa.gov/nefsc/saw/>

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Sullivan PJ, Bell M, Gibson J, Kupschus S. 2009. Summary Report of the 48th 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/>

6.0 Figures

Figure 1. Projection of total spawning stock biomass (TSSB) through 2020 which simulates status quo management and a harvest moratorium ($F=0$) beginning in 2009. The projection is based on an $M=0.25$ from 1981-1998, followed by a rise to 0.65 thereafter. All values, including SSB20% have been scaled, thus they are indicative of relative trends in biomass and not absolute biomass. SSB20% was estimated assuming an $M=0.25$. Projections were conducted based on results of the Steele-Henderson model described in NMFS 2009b, Section C9.0.

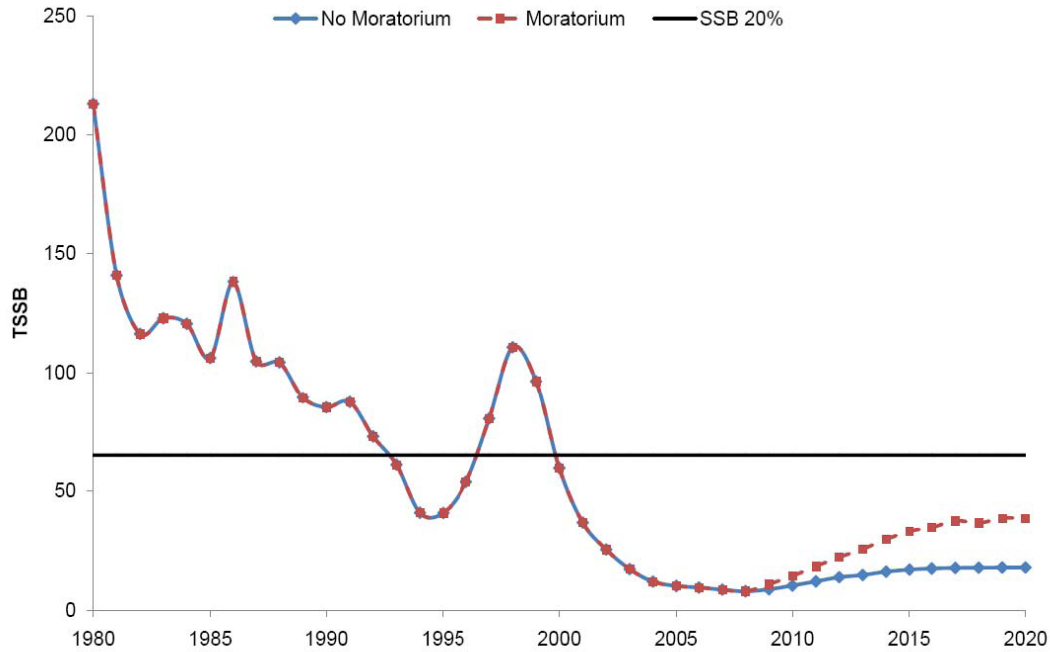


Figure 2. Estimated January 1, age 1+ weakfish biomass (NMFS 2009b), compared to the Amendment 4 SSB threshold. Age 1+ biomass and SSB are roughly comparable.

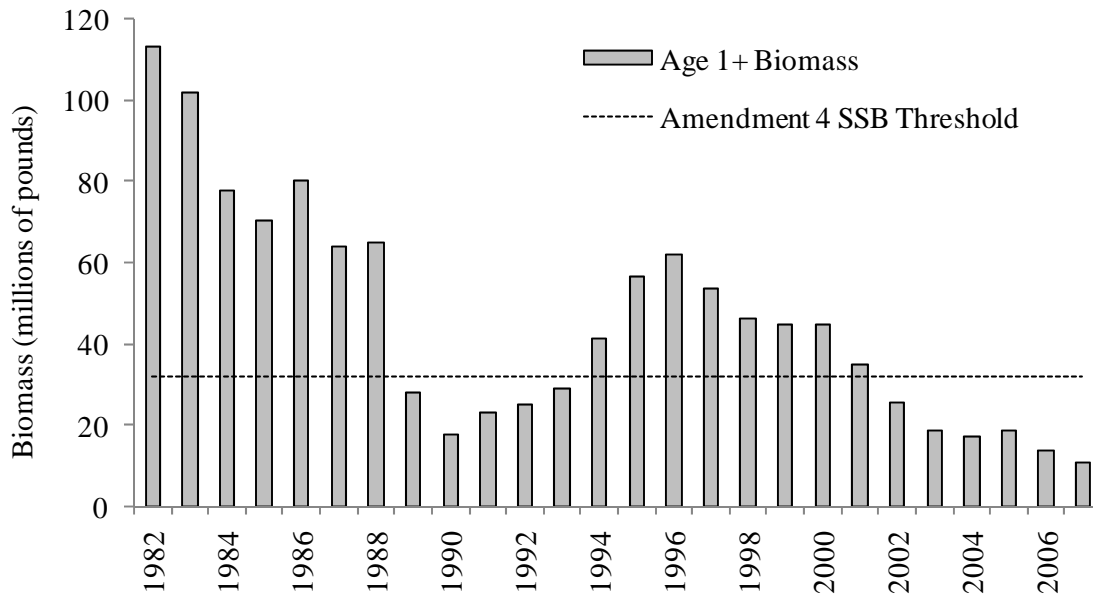


Figure 3. Estimated instantaneous rates of fishing and natural mortality based on changes in biomass over the time series (NMFS 2009b).

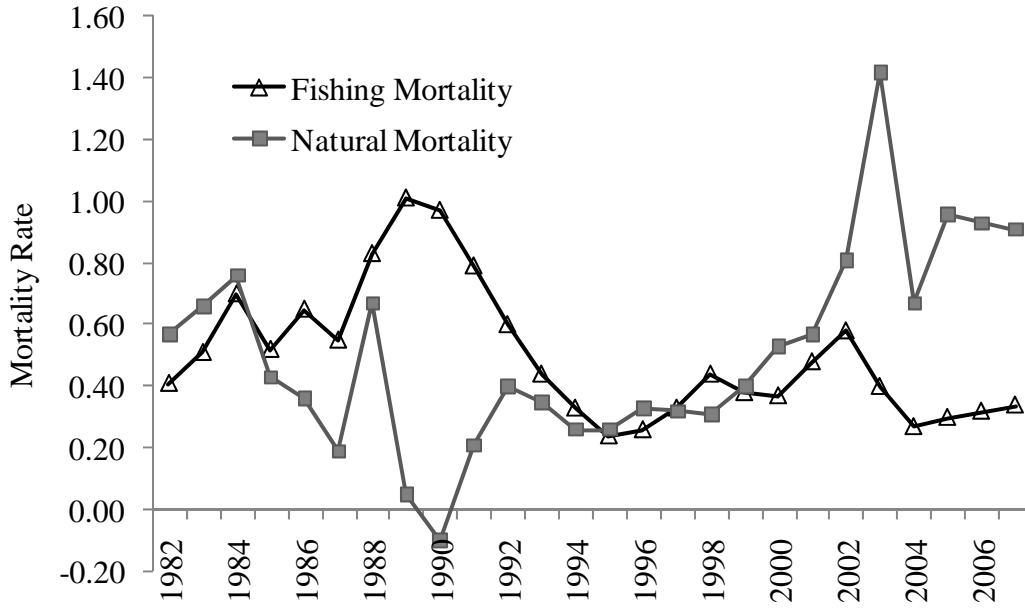


Figure 4. Age-0 weakfish indices of relative abundance (2009 State Compliance Reports). Indices are standardized into the same units. The solid line represents the mean of the indices; 2008 Rhode Island value missing from mean.

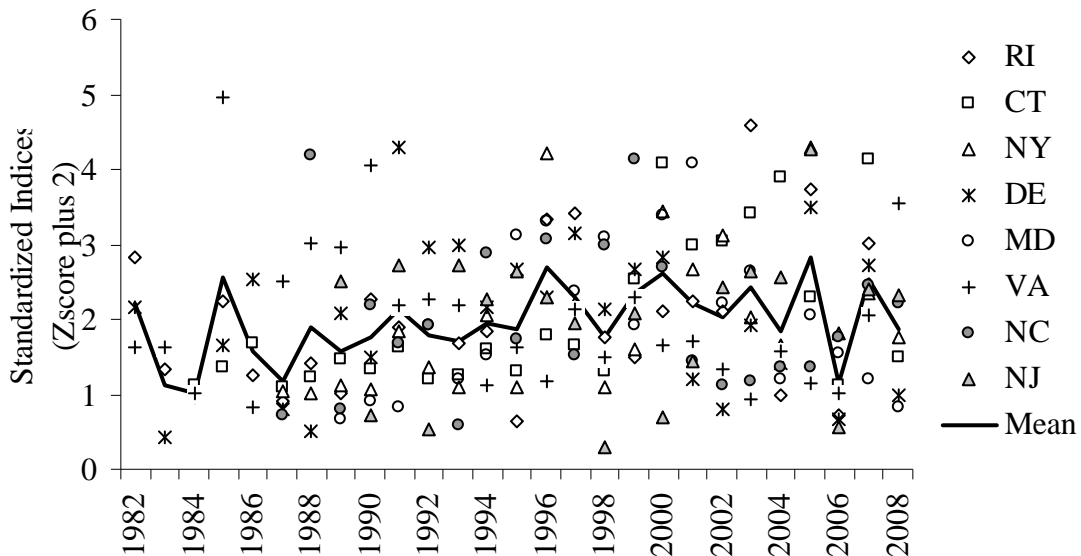


Figure 5. Total (recreational and commercial) weakfish harvest and dead discards from Massachusetts through the east coast of Florida, 1982-2008 (2009 State Compliance Reports, NOAA Fisheries Statistics Divisions 2009, NMFS 2009b). Note that an estimate of 2008 dead discards was not available for inclusion.

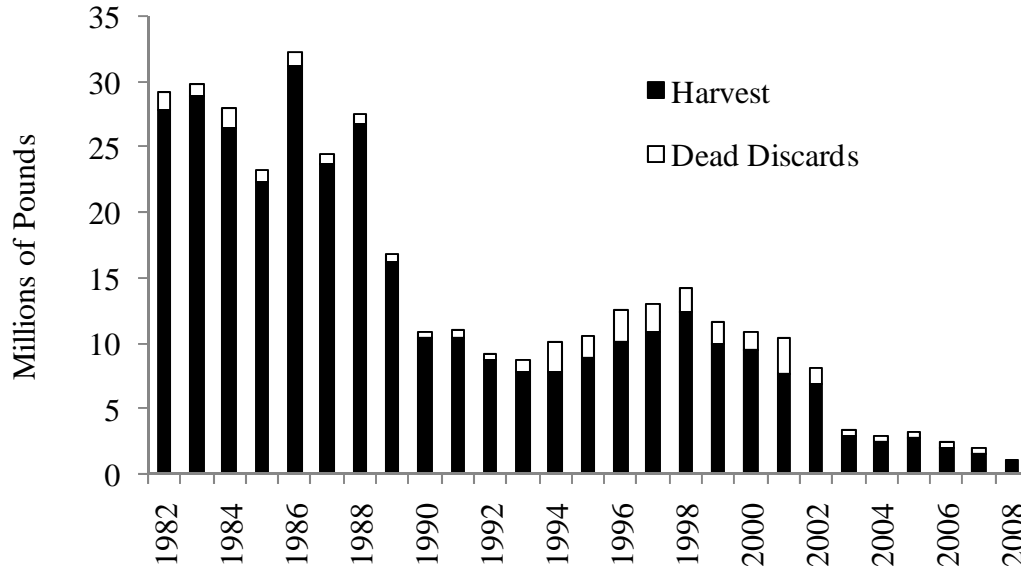


Figure 6. Fishery removals by sector and loss attributed to natural mortality (2009 State Compliance Reports, NOAA Fisheries Statistics Division 2009; NMFS 2009b).

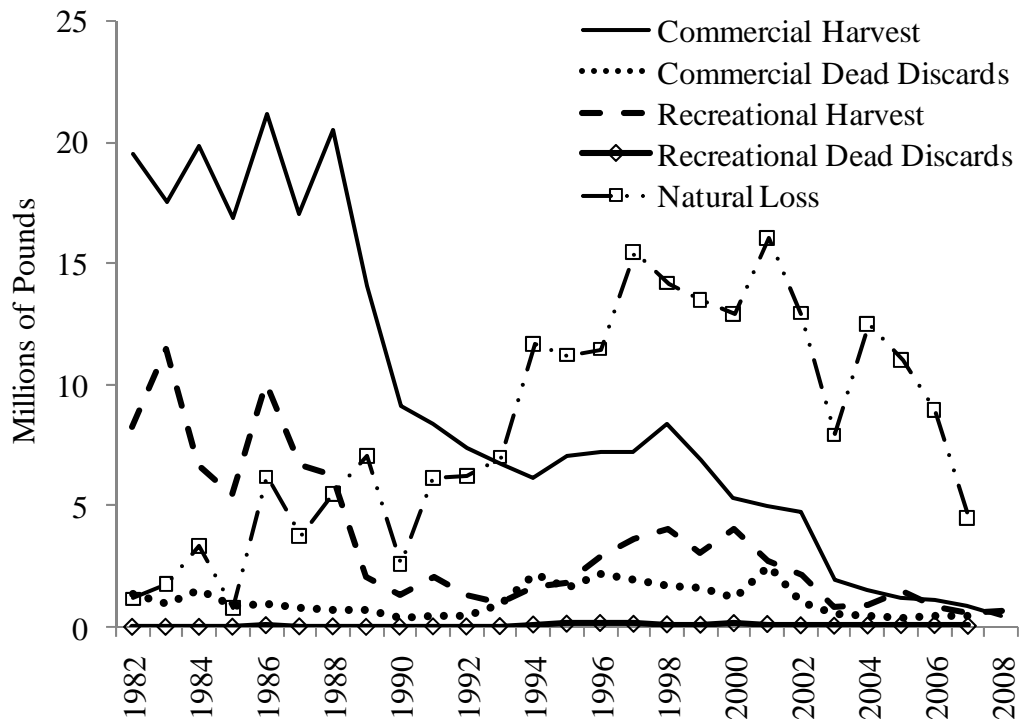


Figure 7. Commercial landings by state, 2006-2008 (2009 State Compliance Reports).

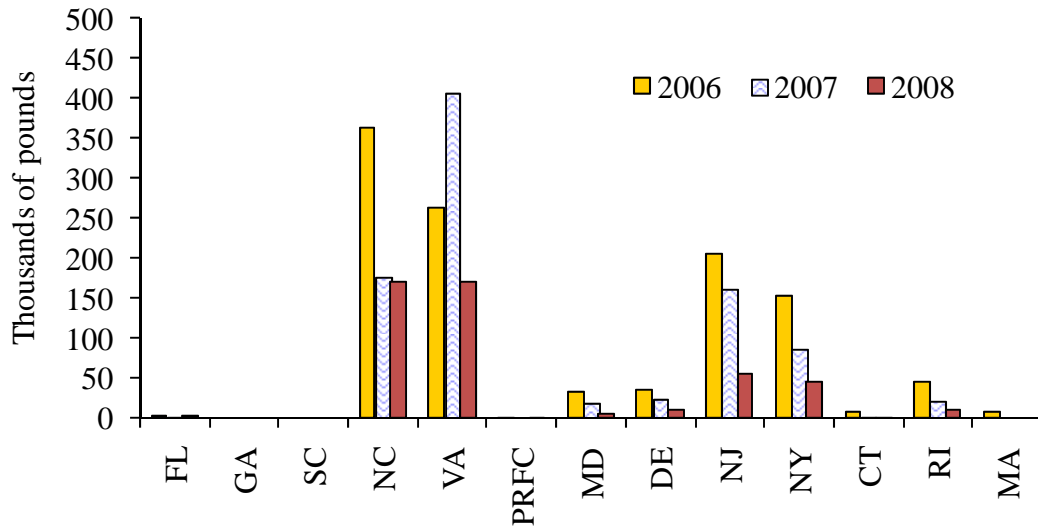


Figure 8. Recreational landings, by state, 2006-2008 (NMFS Fisheries Statistics Division 2009).

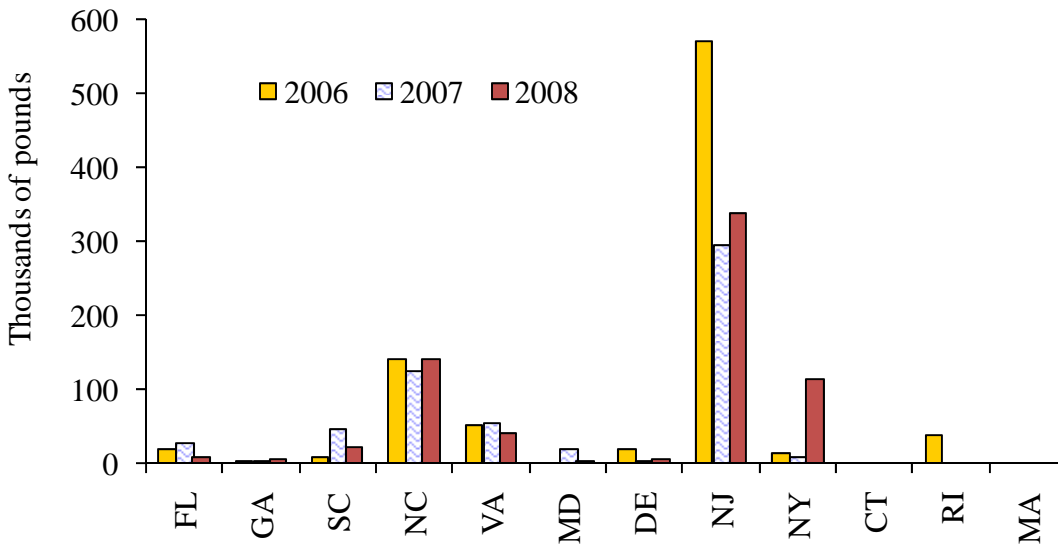
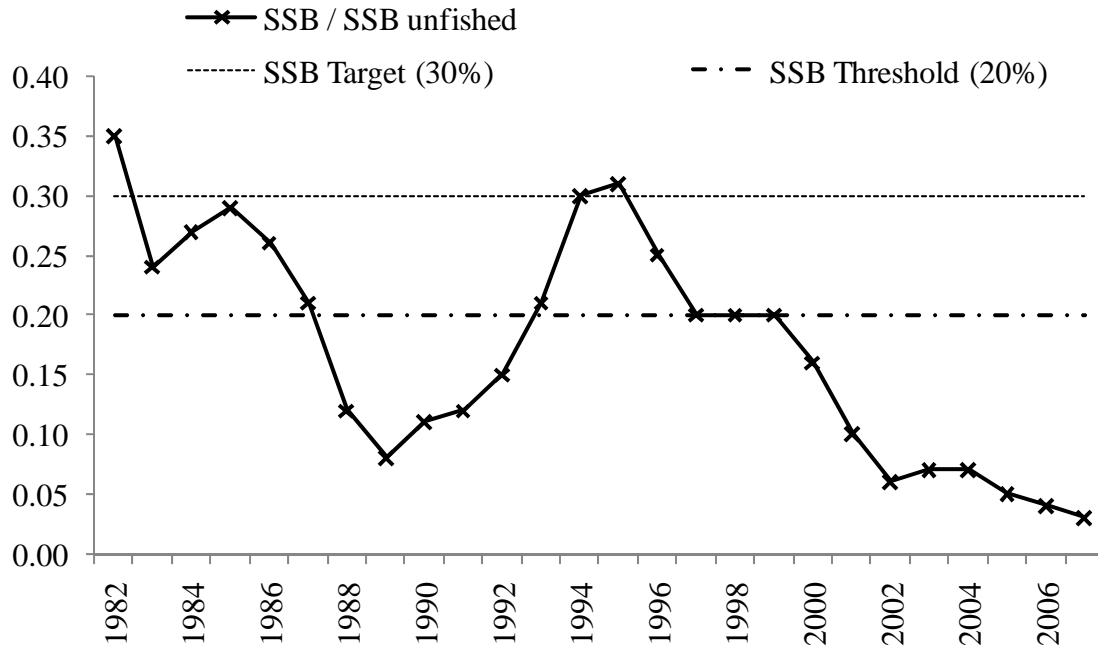


Figure 9. Changes in weakfish percent spawning potential ([spawner biomass (mid-year) / unfished biomass] * 100) during 1982-2007 (NMFS 2009b). Estimates are compared to the SSB20% threshold and SSB30% target.



7.0 Tables

Table 1. State weakfish regulations in 2008

State	Commercial	Recreational
MA	16"; open 1/1 – 12/31.	16", 6 fish
RI	16"; open 6/1 - 6/30 & 8/7 - 11/8; 150 lb bycatch limit. Directed trawl: codend mesh size \geq 4.5" diamond or 4.0" square.	16", 6 fish
CT	16"; open 1/1 – 12/31.	16", 6 fish
NY	16" (10" fillet, 12" dressed). Hook & 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; 150 lb bycatch limit.	16" (10" fillet, 12" dressed), 6 fish
NJ	Gill net: 13"; open 1/1-5/20 & 9/3-10/19 & 10/27-12/31; 150 lb bycatch limit; mesh \geq 3.25" stretched except 2.75 - 3.25" stretched allowed within 2nm for permitted fishermen doing monthly reporting. Trawl: open 1/1-7/31 @ 13" & 10/13-12/31 @ 12"; mesh \geq 3.75" diamond or 3.375 square; 150 lb bycatch limit. Pound net: 13"; open 1/1-6/6 & 7/1-12/31; 150 lb bycatch limit. Hook & line: open 1/1-12/31, 13", 6 fish.	13", 6 fish
DE	Gill net: 12"; open 4/1-9/30 except 34 specified days; mesh \geq 3.125". Hook & line: 13"; unlimited possession 4 days/week, 6 fish creel limit 3 days/week. All gears 0 lb bycatch limit.	13", 6 fish
MD	All gears: 12"; 150 lb bycatch limit. Gillnet mesh \geq 3.0" stretched. Trawl mesh \geq 3.375" square or 3.75" diamond. Ocean trawl open 10/17-12/29 except Saturday & Sunday. All other gears in ocean open 3/26-4/25 & 9/3-11/14 except Sunday. All gears in Chesapeake Bay open 8/5-9/30.	13", 6 fish
PRFC	12"; open 7/28-12/31. 150 lb bycatch limit for certified pound nets with approved cull panels and 0 lb bycatch for all other gears.	12", 6 fish
VA	Gill net: 12"; open 3/16-5/13 & 10/21-12/30. Pound net: no minimum size; open 4/1-4/31 & 5/23-9/12 unless exempted by license forfeit. Haul seine: no minimum size; open 4/16-6/10 & 8/21-9/24. Out of state trawl: 12" except 300 undersized fish allowed; open 4/1-9/25; codend mesh \geq 3.0". All gears: 150 lb bycatch limit, 50% rule, 12" minimum.	12", 6 fish
NC	All gears 12", except long haul seines and pound nets in internal waters 4/1-11/15, 10". No closed seasons. Gill net: mesh \geq 2.875" stretch. Flynets: gear requirements and closure south of Cape Hatteras. 150 lb bycatch limit, 50% rule. BRDs in shrimp trawls.	12", 6 fish
SC	12", 10 fish. BRDs in shrimp trawls.	12", 10 fish
GA	13", 6 fish. BRDs in shrimp trawls.	13", 6 fish
FL	12". Gill and entangling nets prohibited in state waters. Other nets restricted to 500 ft ² in state waters and vessels restricted to two nets and people not on vessel to one net. BRDs in shrimp trawls.	12", 4 fish

Table 2. Estimated percent reduction in recreational harvest at a one fish creel limit based on MRFSS data for 2006-2008. Empty cells reflect a size limit below that currently in place. Color codes: < 50% savings = black; 50-74.9% savings = blue; 75 - 89.9% savings = orange; >= 90% savings = red.

One Fish Creel Limit

	Minimum size						
	12"	13"	14"	15"	16"	17"	18"
MA	-	-	-	-	0	0	0
RI	-	-	-	-	49	49	49
CT	-	-	-	-	0	0	0
NY	-	-	-	-	25	25	25
NJ	-	63	74	82	87	89	93
DE	-	11	22	59	70	88	88
MD	-	23	70	78	86	86	86
VA	41	51	58	61	78	81	91
NC	53	67	81	89	95	98	98
SC	33	63	70	93	100	100	100
GA	-	13	48	82	99	99	100
FL	52	63	74	86	92	96	96
Coast*	54	59	70	78	84	87	89

* Coastwide savings are a weighted average based on each state's percent of coastwide landings. These are likely underestimates because they include MA to NY which have limited data.

Table 3. Estimated commercial harvest reduction from implementing a 100 pound trip limit year round, based on NMFS data for 2005-2008*

	100 lb Trip Limit
Average Landings	216,640
Average Savings	333,914
Percent Reduction	61

* Note that the estimates are likely underestimated because of the assumption that all trips land the limit.