

**FISHERY MANAGEMENT PLAN REVIEW  
FOR THE 2005 WEAKFISH (*Cynoscion regalis*) FISHERY**

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## **2005 FISHERY MANAGEMENT PLAN REVIEW FOR WEAKFISH (*Cynoscion regalis*)**

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

The Atlantic States Marine Fisheries Commission (ASMFC) approved Amendment 4 to the Weakfish Fishery Management Plan in November 2002. The amendment was initially implemented in 2003. This review is of activities of the 2005 fishery and is the third under Amendment 4.

The ASMFC adopted its first Fishery Management Plan for Weakfish in 1985. Amendment 1 to the FMP was implemented in March 1992, Amendment 2 in April 1995, and Amendment 3 in October 1996. Weakfish are currently managed under the guidelines contained in Amendment 4, which was implemented July 2003, and completely replaced all previous amendments. The Commission adopted Addendum I to Amendment 4 in 2005 to replace the biological sampling program in section 3.0 of Amendment 4. Addendum I was first implemented for the 2006 fishing year (see section VI for more information on Addendum I).

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

- 1) to 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) to restore the weakfish age and size structure to that necessary for the restoration of the fishery;
- 3) to return weakfish to their previous geographic range;
- 4) to achieve compatible and equitable management measures among jurisdictions throughout the fishery management unit, including states' waters and the federal EEZ;
- 5) to promote cooperative interstate research, monitoring and law enforcement necessary to support management of weakfish;
- 6) to promote identification and conservation of habitat essential for the long term stability in the population of weakfish; and
- 7) to 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 defines overfishing through the use of target and threshold fishing mortality rates, and a threshold spawning stock biomass (Table 1). In order to achieve annual fishing mortality targets, recreational harvest of weakfish is constrained by a combination of size limits and possession limits, and commercial harvest by size limits, gear restrictions, and possibly season and/or area closures. After approval, states may implement alternative management plans with conservation equivalency.

**Table 1. Amendment 4 Control Rule**

|                  | <b>FISHING MORTALITY RATE</b> | <b>FEMALE SPAWNING STOCK BIOMASS</b> |
|------------------|-------------------------------|--------------------------------------|
| <b>TARGET</b>    | $F_{30\%} = F = 0.31$         | X                                    |
| <b>THRESHOLD</b> | $F_{20\%} = F = 0.50$         | $SSB_{20\%} = 31.8$ million pounds   |

Weakfish are managed under this plan as a single stock throughout their coastal range. All coastal states from Massachusetts through Florida and the Potomac River Fisheries Commission have a declared interest in weakfish. Responsibility for the FMP is assigned to the Weakfish Management Board, Plan Review Team, Technical Committee, Stock Assessment Subcommittee, and Advisory Panel.

## **II. Status of the Stock**

A weakfish stock assessment of data through 1998 was conducted in 1999 and reviewed by the Stock Assessment Review Committee for peer review at the 30<sup>th</sup> Northeast Regional Stock Assessment Workshop (NMFS 2000). This report indicated that weakfish were “at a high level of abundance and subject to low fishing mortality rates.” This assessment was updated in 2002 with data through 2000.

The 2002 update (Kahn 2002) also indicated that weakfish were at a high level of abundance and fishing mortality was low, suggesting that the management measures put in place in Amendment 3 had resulted in positive trends for the weakfish population. However, it was also noted that the absolute magnitude of impact should be viewed with caution given the uncertainty of the fishing mortality and spawning stock biomass estimates for the most recent year of the assessment (which is often the case with final year estimates).

While these traditional single species assessments were generating high stock size estimates, the recreational and commercial landings of weakfish along the Atlantic coast plummeted to all-time lows between 1999 and 2003 (Figure 1). This dichotomy of assessment results and fishery performance lead the Weakfish Technical Committee to consider less traditional assessment techniques in their most recent stock assessment covering the period of 1982-2003, which was conducted in 2004-2006 (ASMFC 2006).

Results from the alternative approaches revealed that a large rise in natural mortality that started in the mid-1990s largely caused weakfish biomass and size structure to decline greatly by 2003 (Figure 2, Figure 3). These declines could not be attributed to a slight rise in fishing mortality, which had fallen to moderate levels by 1994 due to conservative management measures. The rapid decline in biomass starting in the late 1990s is reminiscent of rapid transitions between extended periods of high or low commercial landings dating back to the late 1920s. In theory, these rapid changes could reflect an underlying environmental driver whose effect has been accelerated by high fishing or predation rates.

For the recent stock assessment, the Technical Committee developed and tested specific hypotheses to evaluate candidate predator/competitors (striped bass, summer flounder, bluefish,

spiny dogfish and Atlantic croaker), forage species (Atlantic menhaden, bay anchovy, and spot), environmental factors (water temperature and North Atlantic Oscillation index), high bycatch losses, and overfishing. Insufficient forage, especially Atlantic menhaden, and increased predation by striped bass have emerged as leading hypotheses that support rising natural mortality as cause for stock decline (Figure 4), but contributions by other species or factors may not have been completely detected or tested. While this result does not provide much leverage for recovery by managing the fishery alone, projections did indicate that cuts in fishing mortality are needed for timely recovery if natural mortality declines.

While this assessment was not upheld by an external peer review panel, the Board has accepted for management use five conclusions from the report: 1) the stock is declining; 2) total mortality is increasing; 3) there is not much evidence of overfishing; 4) something other than fishing mortality is causing the decline in the stock; and 5) there is a strong chance that regulating the fishery will not, in itself, reverse stock decline. Due to the difficulty with this last stock assessment and pending management measures, the Technical Committee has been tasked with developing more qualitative techniques for tracking management progress in 2007.

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

The majority of commercially and recreationally caught weakfish are landed from state waters. The dominant commercial gears used include gill nets, pound nets, haul seines, and trawls. The majority of commercial landings occur in the fall and winter months, presumably as the fish congregate to migrate. The recreational fishery catches weakfish using live or cut bait, jigging, trolling, and chumming. Recreational harvests typically peak in the warmer months (May through October) when effort tends to be greatest.

Typically recreational landings are recorded in numbers and commercial landings are recorded in pounds. However, Tables 2 and 4 use recreational landings in pounds to compare the landings of the fisheries. Both commercial and recreational landings fell consistently from 2000 to 2004, reaching all-time lows. In 2005, commercial landings continued to decrease, while recreational landings increased 84% from 2004.

#### *Commercial Fishery --*

The NMFS compiles commercial weakfish landings. The data are cooperatively collected by the 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. The NMFS data were not available for 2005 at the time of this report, thus the 2005 landings rely on preliminary data from annual state compliance reports. Massachusetts had no preliminary data to report and no estimate is included in the total.

The commercial weakfish fishery occurs during the fall and winter as the species migrates from estuaries to over-wintering grounds in the South Atlantic (Hogarth et al. 1995). Weakfish are taken primarily by trawls, pound nets, gill nets, and haul seines. Weakfish landings were dominated by the trawl fishery from the 1950's through the mid -1980's, when gill net landings began to account for the majority of the landings. Gill net landings in the latter half of the 1990's were about double that of the trawl fishery.

From 2000 to 2003, there was an increasing trend of the commercial fishery accounting for a higher percentage of the total catch (Table 1). However, this trend appears to have stopped in 2004. In 2005, commercial landings contributed less than 50% of the total landings for the first time in the time series (1982-present). Coastwide commercial weakfish landings have ranged from a time series high of 21.2 million pounds in 1986 to a low of 1.3 million pounds in 2005 (Table 3).

North Carolina, Virginia, and New Jersey have dominated commercial weakfish landings since 1950 (Table 3). North Carolina has annually landed the most weakfish since 1982 and Virginia has consistently landed the second most since 1993. North Carolina has accounted for over half of all the weakfish commercially landed since 1982.

#### *Recreational Fishery --*

Recreational catch statistics are collected by the NMFS in the Marine Recreational Fisheries Statistics Survey (MRFSS). Effort data is collected through telephone interviews. Catch expansions are based on angler interviews and biological sampling conducted by trained interviewers stationed at fishing access sites.

Recreational landings hit a time series high of 11.7 million pounds in 1983 (Table 4). Landings were relatively high from 1983-1988, but abruptly fell in 1989. Annual recreational landings fluctuated between 1.1 million and 4.1 million pounds from 1993 to 2002, but fell to approximately 864,000 pounds in 2003. The lowest recreational landings on record occurred in 2004 (860,065 pounds). Recreational landings rebounded to over 1.5 million pounds in 2005, with New Jersey taking over 1.1 million pounds (~72% of recreationally landed weakfish). North Carolina is a distant second at 157,018 pounds (~10% of recreationally landed weakfish). The number of fish released alive by anglers has remained above 1 million fish since 1993, peaking at over 5 million in 1996, and decreasing to ~1.8 million fish in 2005 (Table 5).

Recreational landings from the EEZ account for only about 13% of the total coastwide recreational landings by pounds since 1982. From 1995 to 2005, recreational harvest in the EEZ has contributed less than 5.3% to each year's recreational landings, and only 1.8% in 2005. Since 1982, over half of the total recreational harvest in pounds has come from inshore saltwater and brackish water bodies such as bays, estuaries, and sounds. In 2005, these areas contributed 73.6% of the recreational landings.

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

##### *Fishery-Independent Surveys/Studies--*

Young-of-the-year indices of relative abundance are produced by Rhode Island, New York, Delaware, Maryland (2 different indices), Virginia, North Carolina and Florida. North Carolina also produces an age-1 index, while Connecticut, New Jersey and Delaware produce age-structured indices of relative abundance from research trawl surveys. The National Marine Fisheries Service also produces an age-structured index for the Mid-Atlantic coast, while SEAMAP produces one for the South Atlantic Coast.

### *Biological Sampling--*

The Marine Recreational Fisheries Statistics Survey collects data on recreational landings. North Carolina, Virginia, Maryland, and Delaware regularly collect biological data from commercial landings, including age data. Rhode Island, New York, New Jersey, Georgia, and Florida also contributed some otolith ages and/or lengths in 2005.

Biological sampling of commercial landings is an important component of catch-at-age analysis, used to assess the status of weakfish stocks. Section 3.0 of Amendment 4 requires biological sampling from states based on landings. In 2005, most states sampled adequately when compared to their landings.

With the implementation of Addendum I to Amendment 4 in 2005, sampling requirements for states will be determined differently for the 2006 fishing year. States with significant commercial and/or recreational landings will need to develop sampling programs to fulfill their requirements and help insure accurate assessments. Because of recent research suggesting that there are many separate weakfish stocks, assuming the catch composition of northern areas is equivalent to that of southern areas is highly questionable and weakens confidence in assessment results.

## **V. Research Needs for Weakfish**

### **Biological**

#### High Priority

- 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, particularly in fisheries from Maryland and further north.
- Develop latitudinal / seasonal / gear specific age length keys for the Atlantic coast. Increase sample sizes to consider gear specific keys.
- Derive estimates of discard mortality rates and the magnitude of discards for all commercial gear types from both directed and non-directed fisheries. In particular, quantify trawl bycatch, refine estimates of mortality for below minimum size fish, and focus on factors such as distance from shore and geographical differences.
- Update the scale – otolith comparison for weakfish.
- Identify stocks and determine coastal movements and the extent of stock mixing, including characterization of stocks in over-wintering grounds. (e.g. tagging)
- Biological studies should be conducted to better understand migratory aspects and how this relates to observed trends in weight at age.

#### Medium Priority

- Define reproductive biology of weakfish, including size at sexual maturity, maturity schedules, fecundity, and spawning periodicity. Continue research on female spawning patterns: what is the seasonal and geographical extent of "batch" spawning; do females exhibit spawning site fidelity?

- Conduct hydrophonic studies to delineate weakfish spawning habitat locations and environmental preferences (temperature, depth, substrate, etc.) and enable quantification of spawning habitat.
- Compile existing data on larval and juvenile distribution from existing databases in order to obtain preliminary indications of spawning and nursery habitat location and extent.
- Continue studies on mesh-size selectivity; up-to-date (1995) information is available only for North Carolina's gill net fishery. Mesh-size selectivity studies for trawl fisheries are particularly sparse.

#### Low Priority

- Continue studies on recreational hook-and-release mortality rates, including factors such as depth, warmer water temperatures, and fish size in the analysis. Studies are needed in deep and warm water conditions. Further consideration of release mortality in both the recreational and commercial fisheries is needed, and methods investigated to improve survival among released fish.
- Document the impact of power plants and other water intakes on larval, post larval and juvenile weakfish mortality in spawning and nursery areas, and calculate the resultant impact to adult sock size.
- Define restrictions necessary for implementation of projects in spawning and over-wintering areas and develop policies on limiting development projects seasonally or spatially.
- Develop a coastwide tagging database.
- Develop a spawner recruit relationship and examine the relationships between parental stock size and environmental factors on year-class strength.

#### **Social**

- Assemble socio-demographic-economic data as it becomes available from ACCSP.

#### **Economic**

- Assemble socio-demographic-economic data as it becomes available from ACCSP.
- Detailed information on production activities (e.g., fishing effort and labor used by gear, vessel characteristics, areas fished, etc.) and costs and earnings for the harvesting and processing sectors.
- Information on retail sales and demand for weakfish in order to estimate the demand and economic benefits of at-home and away-from home consumption of weakfish.
- Development of bio-economic models that link the underlying population dynamics to the economic aspects of the commercial and recreational fisheries.
- Distribution of weakfish to the various markets and across states.
- Information on the margins of various stages of processing and marketing also need to be obtained; this information is necessary to construct mathematical models that can be used to estimate the economic impacts of management and regulation.
- A directed data collection program for weakfish including the same variables presently collected by NMFS in support of MRFSS and by the economic add-on. Data collected includes information on travel distance, mode of angling, expenditures, area fished, catch on previous trips, and other information.

- Development of commercial decision-making or behavioral models to explain how fishers might respond to various regulations.
- Estimation and assessment of consumer (net economic benefits to consumers) and producer (net economic benefits or profits to producers) surplus; the sum of consumer and producer surplus is a measure of the net economic value to society of a good or service.
- Development of input/output models for all states having commercial weakfish activity, or alternatively, full-blown economic impact models, which might consist of input/output models or General Equilibrium models.
- Determination of the economic value derived from recreational angling including the economic value of a catch and release fishery

### **Habitat**

- Conduct hydrophonic studies to delineate weakfish spawning habitat locations and environmental preferences (temperature, depth, substrate, etc.) and enable quantification of spawning habitat.
- Compile existing data on larval and juvenile distribution from existing databases in order to obtain preliminary indications of spawning and nursery habitat location and extent.
- Document the impact of power plants and other water intakes on larval, post larval and juvenile weakfish mortality in spawning and nursery areas, and calculate the resulting impacts on adult stock size.
- Define restrictions necessary for implementation of projects in spawning and overwintering areas and develop policies on limiting development projects seasonally or spatially.

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

Under Amendment 3, each state was required to implement harvest reduction strategies designed to recover weakfish over a 5-year period. Restoration of historic age and size structure, represented currently by the average percentage of fish numbers at each age from 1979 to 1994, was also a plan goal. According to the 26th SAW, the projected fishing mortality for 1996 was achieved and according to the 2000 stock assessment, fishing mortality was below the Amendment 3 target of 0.50. The 2002 update of the stock assessment estimated that the fishing mortality was below the Amendment 4 target of 0.31 and spawning stock biomass (SSB) above the threshold of 31.8 million pounds. However, the most recent stock assessment with data through 2003 shows the SSB threshold may have been triggered.

The intent of Amendment 4 is to establish a control rule to accurately categorize the status of the stock by considering both fishing mortality and spawning stock biomass, simultaneously. The control rule (Table 1) provides managers with several factors to use when evaluating the status of the stock. Because of changing conditions in the fishery, the fishing mortality and SSB percentages should be used when evaluating biological reference points (i.e.  $F_{30\%}$  should be used, not necessarily 0.31).

Amendment 4 maintained the current commercial fishery management measures. However, a new recreational reference period (1981-1985), revised reference points (Table 1), and a



changing weakfish population led to adjustments in the recreational management measures to reduce high creel limits in some states where the limits were no longer appropriate.

Since the implementation of Amendment 4, weakfish biomass and landings have decreased to low levels. While some states are having difficulty obtaining the required data, the sampling levels required in Section 3.0 have been inadequate to run robust coastwide stock assessments. As a result, the Board approved Addendum I to Amendment 4 in 2005, which consists of a biological sampling program to replace Section 3.0 of Amendment 4. The provisions of Addendum I set the biological sampling requirements for states for the 2006 fishing year.

During the development of Addendum I, the Management Board was considering both a biological sampling program and management options to reduce fishing mortality by 0% (status quo), 25%, 50%, 75% or 100% (moratorium). The former was approved in Addendum I, while action on the latter was postponed until the weakfish stock assessment was peer reviewed. The outcome of the peer review further delayed development of what would become Draft Addendum II. After the Weakfish Technical Committee provided a report on the 2005 fishery and its response to the peer review panel, the Board initiated the development of a Supplement to Draft Addendum II to better describe the changes to state regulations that a mandated 25% reduction in fishing mortality would require. The Management Board is expected to act on Draft Addendum II at their October 2006 meeting.

## **VII. Current State-by-State Implementation per Compliance Requirements**

New Jersey is out of compliance with Amendment 4 to the Weakfish Fishery Management Plan for failing to collect the required number of biological samples in 2005. All other states and jurisdictions are in compliance with Amendment 4 in 2005. The states of Connecticut, South Carolina, Georgia, and Florida requested *de minimis* status for 2005 as defined in Amendment 4. South Carolina and Florida did not qualify; however, the Management Board granted these states a one-year grace period before review of their status. Massachusetts qualified for *de minimis* status but did not request it.

## **VII. Status of Assessment Advice**

Besides virtual population analyses, the Weakfish Stock Assessment Subcommittee has been exploring other approaches for future assessments including using a separable virtual population analysis and relative exploitation. The most recent weakfish stock assessment used a relative exploitation model due to the inconsistency between VPA results and recent landings trends. The Technical Committee will develop additional qualitative techniques for tracking management progress in the future, as tasked by the Board in 2006. The Plan Review Team supports the continued exploration of these additional approaches for the assessment for weakfish.

## **VIII. Recommendations**

The Plan Review Team recommends that:

- All states continue the commercial and recreational measures, monitoring requirements, and recommendations of Amendment 4. Particular attention should be given to achieving the biological sampling requirements that Addendum I to Amendment 4 will require, starting in 2006.

## **IX. References**

Atlantic States Marine Fisheries Commission. 2006. Weakfish Stock Assessment Report for Peer Review. Unpublished.

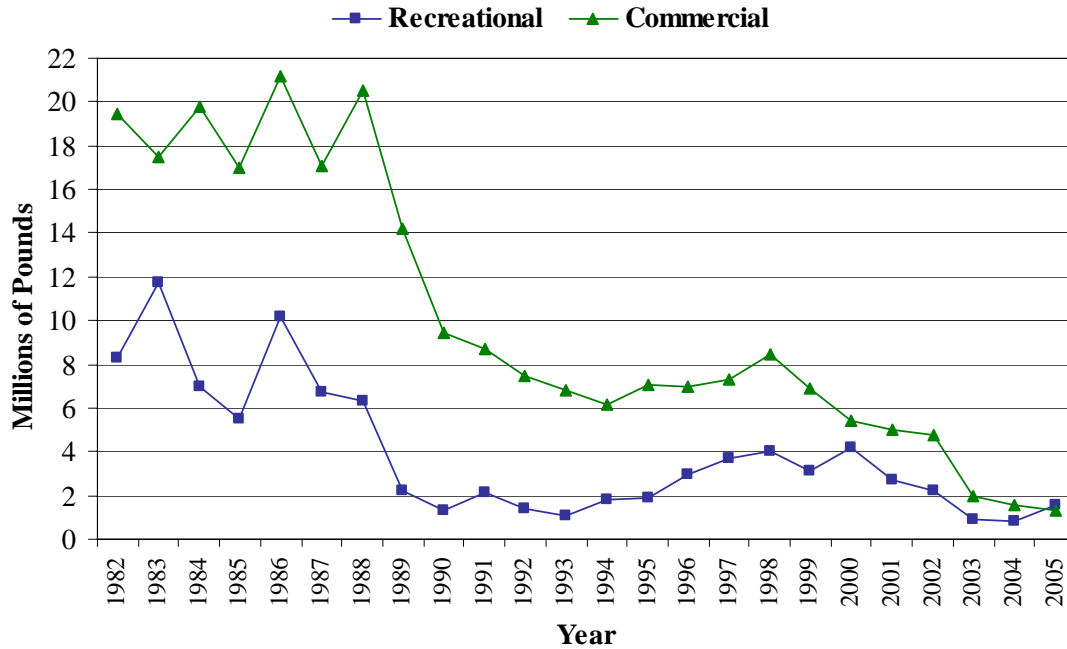
Hogarth, W. T., T. Meyer, P. Perra and R. H. Shaefer. 1995. Final environmental impact statement and draft regulatory impact review for a regulatory amendment for the Atlantic Coast weakfish fishery in the Exclusive Economic Zone (EEZ). U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Fisheries Conservation and Management, Recreational and Interjurisdictional Fisheries Division, Silver Spring, MD. 84 pp.

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NMFS, Northeast Fishery Science Center. 2000. Report of the 30<sup>th</sup> Northeast Regional Stock Assessment Workshop (30<sup>th</sup> SAW): Stock Assessment Review Committee (SARC) consensus summary of assessments. Northeast Fish. Sci. Cent. Ref. Doc. 900-03, Woods Hole, MA.

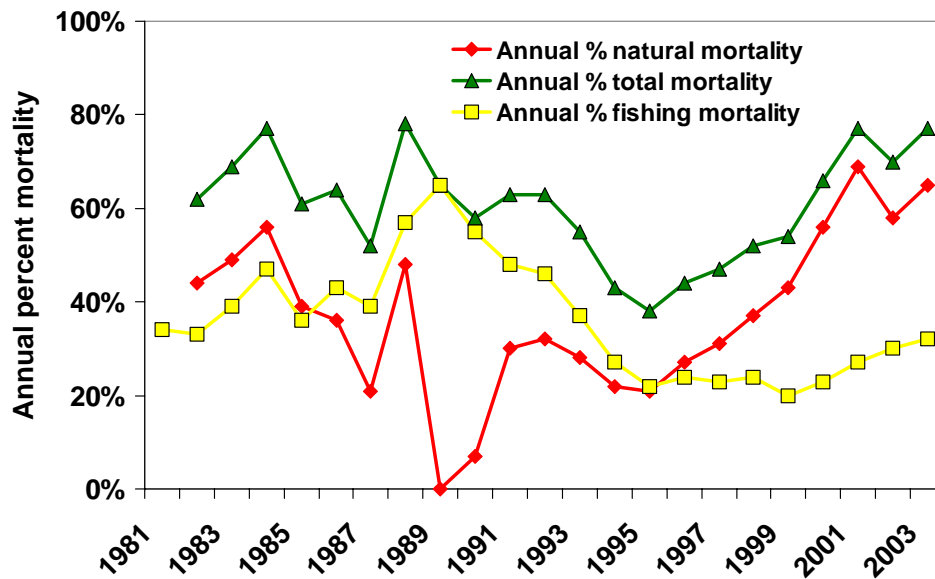
**Figure 1. Annual coastwide weakfish landings (1982-2005).**

Commercial landings for 2005 are considered preliminary; Massachusetts landings are not included; Georgia landings are confidential but no more than 100 lbs; this maximum value was used in the calculation.

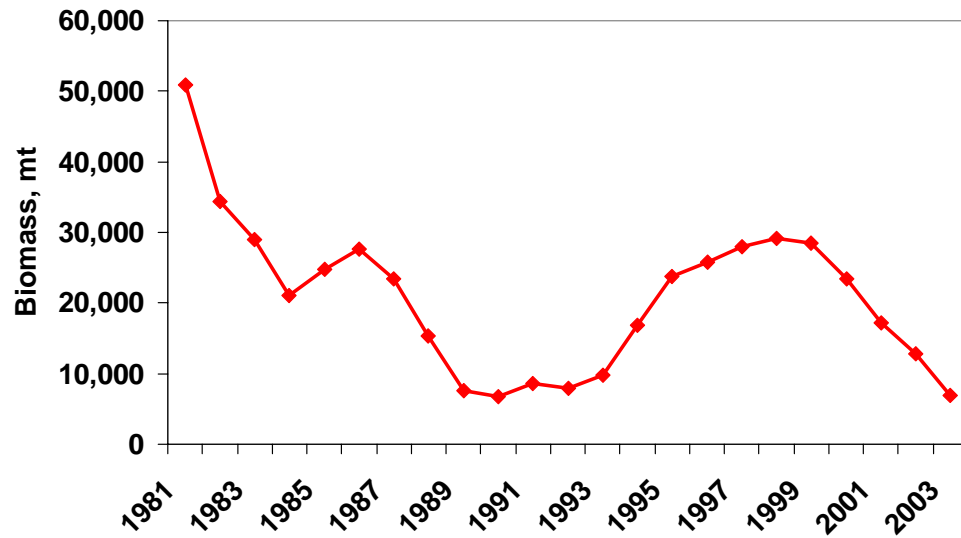


**Figure 2. Coastwide weakfish annual total, natural, and fishing mortality percentages**

Rates were translated into annual percentages, thus fishing and natural mortality are not additive. (Weakfish Technical Committee, 2006)

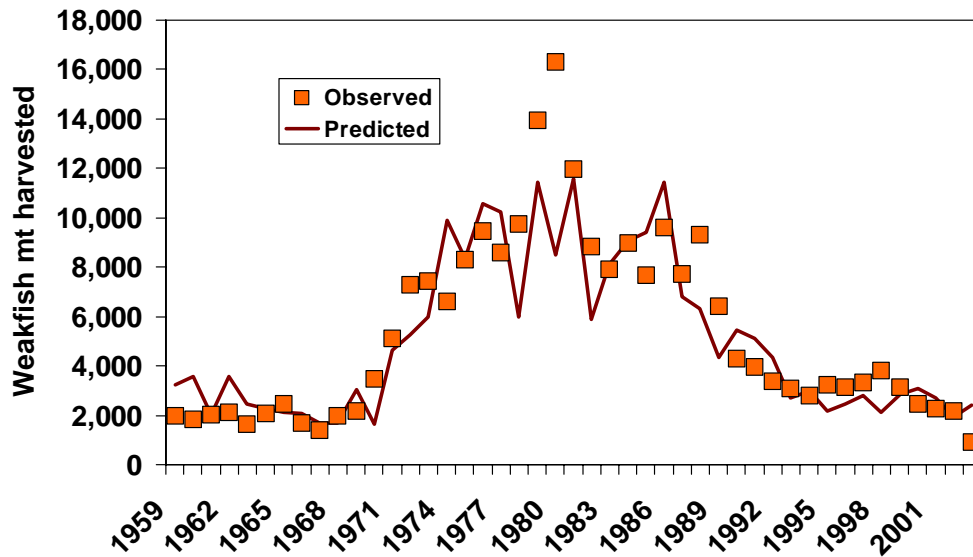


**Figure 3. Estimated coastwide weakfish biomass**  
(Weakfish technical committee, 2006)



**Figure 4. Food web hypothesis**

Weakfish commercial landings are predicted by indices for large bass and menhaden juveniles (multiple regression; both terms significant; menhaden partial  $r^2 = +0.73$ ; bass partial  $r^2 = -0.03$ ).  
(Weakfish Technical Committee, 2006)



**Table 2. Comparison of Atlantic coast commercial and recreational weakfish landings**

| <b>Year</b> | <b>Recreational Landings (pounds)</b> | <b>Commercial Landings (pounds)</b> | <b>Total Pounds</b> | <b>% Total as Commercial</b> |
|-------------|---------------------------------------|-------------------------------------|---------------------|------------------------------|
| 1982        | 8,285,323                             | 19,478,274                          | 27,763,597          | 70%                          |
| 1983        | 11,730,620                            | 17,475,003                          | 29,205,623          | 60%                          |
| 1984        | 7,013,779                             | 19,773,587                          | 26,787,366          | 74%                          |
| 1985        | 5,489,027                             | 16,953,357                          | 22,442,384          | 76%                          |
| 1986        | 10,141,785                            | 21,187,973                          | 31,329,758          | 68%                          |
| 1987        | 6,749,894                             | 17,072,159                          | 23,822,053          | 72%                          |
| 1988        | 6,331,649                             | 20,526,402                          | 26,858,051          | 76%                          |
| 1989        | 2,177,234                             | 14,162,178                          | 16,339,412          | 87%                          |
| 1990        | 1,347,259                             | 9,438,190                           | 10,785,449          | 88%                          |
| 1991        | 2,130,564                             | 8,692,760                           | 10,823,324          | 80%                          |
| 1992        | 1,398,977                             | 7,453,788                           | 8,852,765           | 84%                          |
| 1993        | 1,102,338                             | 6,853,579                           | 7,955,917           | 86%                          |
| 1994        | 1,795,515                             | 6,190,522                           | 7,986,037           | 78%                          |
| 1995        | 1,855,546                             | 7,098,658                           | 8,954,204           | 79%                          |
| 1996        | 2,925,391                             | 6,940,038                           | 9,865,429           | 70%                          |
| 1997        | 3,692,716                             | 7,297,783                           | 10,990,499          | 66%                          |
| 1998        | 4,044,973                             | 8,419,604                           | 12,464,577          | 68%                          |
| 1999        | 3,143,428                             | 6,905,158                           | 10,048,586          | 69%                          |
| 2000        | 4,154,793                             | 5,400,529                           | 9,555,322           | 57%                          |
| 2001        | 2,722,629                             | 4,999,539                           | 7,722,168           | 65%                          |
| 2002        | 2,192,603                             | 4,772,978                           | 6,965,581           | 69%                          |
| 2003        | 864,960                               | 2,001,271                           | 2,866,231           | 70%                          |
| 2004        | 860,086                               | 1,523,919                           | 2,384,005           | 64%                          |
| 2005        | 1,584,547                             | 1,315,859                           | 2,900,406           | 45%                          |

\*Commercial landings for 2005 are preliminary. Massachusetts landings are not included in the coastwide total. One hundred pounds was included for Georgia's commercial landings; the state reported "confidential but no more than 100 lbs."

**Table 3. Atlantic coast commercial landings (pounds weakfish) by state, 1982 - 2005**

| Year             | E. FL   | GA    | SC  | NC         | VA        | MD      | DE        | NJ        | NY        | CT     | RI      | MA            | Total      |
|------------------|---------|-------|-----|------------|-----------|---------|-----------|-----------|-----------|--------|---------|---------------|------------|
| 1982             | 176,203 | 596   | 443 | 12,052,232 | 2,149,200 | 249,200 | 1,294,500 | 2,073,500 | 1,257,100 | 25,600 | 176,800 | 22,900        | 19,478,274 |
| 1983             | 117,720 | 2,749 |     | 10,233,734 | 2,592,900 | 390,000 | 901,800   | 2,172,700 | 850,000   | 42,800 | 163,700 | 6,900         | 17,475,003 |
| 1984             | 125,799 | 862   |     | 12,990,726 | 2,109,000 | 325,000 | 782,400   | 2,751,600 | 484,500   | 31,300 | 167,600 | 4,800         | 19,773,587 |
| 1985             | 132,291 | 82    |     | 9,821,188  | 2,082,186 | 316,110 | 990,800   | 3,030,100 | 386,200   | 28,200 | 163,100 | 3,100         | 16,953,357 |
| 1986             | 108,726 | 75    |     | 14,309,372 | 1,994,100 | 336,700 | 723,500   | 3,208,600 | 359,900   | 13,700 | 127,600 | 5,700         | 21,187,973 |
| 1987             | 123,081 | 189   |     | 11,508,389 | 1,962,800 | 366,900 | 577,800   | 2,094,100 | 329,100   | 29,500 | 78,600  | 1,700         | 17,072,159 |
| 1988             | 115,124 |       |     | 15,091,878 | 1,473,200 | 832,600 | 530,700   | 2,332,800 | 124,500   | 2,400  | 19,400  | 3,800         | 20,526,402 |
| 1989             | 171,318 |       | 113 | 10,115,747 | 1,025,200 | 743,800 | 530,200   | 1,458,500 | 103,500   | 2,300  | 9,600   | 1,900         | 14,162,178 |
| 1990             | 137,188 | 33    |     | 5,802,159  | 1,207,560 | 662,361 | 613,000   | 968,318   | 19,924    | 1,281  | 24,646  | 1,720         | 9,438,190  |
| 1991             | 164,925 |       |     | 5,308,574  | 1,059,679 | 328,251 | 497,300   | 1,174,181 | 111,629   | 21,300 | 25,009  | 1,912         | 8,692,760  |
| 1992             | 147,858 |       |     | 4,862,551  | 549,961   | 385,426 | 362,400   | 940,695   | 168,087   | 3,500  | 30,277  | 3,033         | 7,453,788  |
| 1993             | 144,347 |       |     | 4,309,249  | 1,088,047 | 181,863 | 194,700   | 834,446   | 88,379    | 1,477  | 9,991   | 1,080         | 6,853,579  |
| 1994             | 179,582 |       |     | 3,490,004  | 1,294,224 | 140,907 | 261,900   | 695,280   | 99,470    | 11,000 | 18,155  |               | 6,190,522  |
| 1995             | 50,310  |       |     | 4,113,317  | 1,485,065 | 69,417  | 281,200   | 867,262   | 172,431   | 6,431  | 52,690  | 535           | 7,098,658  |
| 1996             | 4,493   |       |     | 3,977,671  | 1,587,186 | 132,795 |           | 822,041   | 365,307   | 6,937  | 43,522  | 86            | 6,940,038  |
| 1997             | 11,720  |       |     | 3,561,124  | 1,557,980 | 192,634 | 558,919   | 1,036,470 | 336,752   | 10,958 | 31,171  | 55            | 7,297,783  |
| 1998             | 11,518  |       |     | 3,354,060  | 1,863,928 | 244,467 | 552,644   | 1,804,618 | 496,403   | 14,482 | 77,074  | 410           | 8,419,604  |
| 1999             | 17,486  |       |     | 2,617,623  | 1,674,052 | 223,455 | 440,295   | 1,291,319 | 489,935   | 22,172 | 126,271 | 2,550         | 6,905,158  |
| 2000             | 9,430   |       |     | 1,869,073  | 1,362,829 | 208,315 | 328,813   | 1,071,428 | 352,832   | 7,920  | 189,362 | 527           | 5,400,529  |
| 2001             | 10,821  |       |     | 1,960,380  | 1,121,961 | 185,815 | 187,642   | 837,550   | 578,797   | 6,774  | 109,568 | 231           | 4,999,539  |
| 2002             | 5,746   |       |     | 1,828,052  | 1,144,068 | 111,391 | 172,810   | 863,088   | 513,977   | 10,223 | 122,781 | 842           | 4,772,978  |
| 2003             | 2,549   |       |     | 848,847    | 459,385   | 47,409  | 91,476    | 340,269   | 144,416   | 3,059  | 63,337  | 524           | 2,001,271  |
| 2004             | 2,578   |       | 4   | 685,429    | 357,100   | 49,519  | 51,230    | 204,587   | 178,414   | 6,206  | 38,307  | 68            | 1,573,442  |
| 2005<br>(prelim) | 1,652   | < 100 |     | 421,469    | 338,574   | 30,983  | 70,788    | 205,692   | 198,342   | 5,907  | 41,348  | Not available | 1,117,517* |

\* 2005 total includes 1,004 pounds reported by the Potomac River Fisheries Commission, and the maximum of 100 lbs from Georgia.

Source: NMFS Fisheries Statistics Division 2005; State Reports 2006 (preliminary)

**Table 4. Atlantic coast recreational landings (pounds of A +B1 weakfish) by state, 1982 - 2005**

| Year | E. Fl   | GA     | SC       | NC      | VA        | 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 | 348,175 | 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 | 11,730,620 |
| 1984 | 368,237 |        | 5,150    | 189,031 | 850,169   | 254,962   | 1,279,594 | 3,987,542 | 51,464  | 11,358 |         | 16,272 | 7,013,779  |
| 1985 | 21,907  | 3,422  | 105,151  | 184,485 | 508,980   | 898,313   | 1,102,095 | 1,876,608 | 638,913 | 17,269 | 131,884 |        | 5,489,027  |
| 1986 | 100,805 | 12,621 | 44,185   | 417,470 | 2,032,394 | 2,406,643 | 1,598,932 | 3,184,095 | 242,217 | 61,281 | 41,142  |        | 10,141,785 |
| 1987 | 45,637  | 9,491  | 23,781   | 710,002 | 647,692   | 831,615   | 1,072,198 | 3,353,362 | 51,830  | 4,286  |         |        | 6,749,894  |
| 1988 | 89,004  |        | 1,841    | 359,606 | 1,677,694 | 1,679,702 | 1,664,477 | 833,198   | 26,127  |        |         |        | 6,331,649  |
| 1989 | 111,105 | 8,175  | 5,963    | 139,979 | 424,463   | 344,658   | 521,648   | 575,110   | 46,133  |        |         |        | 2,177,234  |
| 1990 | 55,538  | 961    | 11,186   | 63,420  | 256,690   | 388,662   | 207,131   | 358,457   | 4,317   |        | 897     |        | 1,347,259  |
| 1991 | 81,173  | 5,597  | 25,210   | 99,824  | 280,075   | 278,176   | 427,778   | 896,800   | 35,931  |        |         |        | 2,130,564  |
| 1992 | 51,127  | 1,014  | 40,459   | 27,363  | 206,710   | 121,403   | 232,204   | 677,811   | 19,824  | 908    | 20,154  |        | 1,398,977  |
| 1993 | 109,827 | 12,791 | 6,929    | 78,982  | 89,992    | 173,952   | 291,627   | 312,839   | 18,889  | 6,510  |         |        | 1,102,338  |
| 1994 | 149,038 | 783    | 25,163   | 149,159 | 142,265   | 300,831   | 319,491   | 706,206   | 2,579   |        |         |        | 1,795,515  |
| 1995 | 43,413  | 21,283 | 22,875   | 72,412  | 211,494   | 141,511   | 419,527   | 898,564   | 24,467  |        |         |        | 1,855,546  |
| 1996 | 17,218  | 5,060  | 4,980    | 79,317  | 194,485   | 185,074   | 690,121   | 1,730,055 | 19,081  |        |         |        | 2,925,391  |
| 1997 | 65,690  | 34,356 | 1,728    | 165,032 | 463,652   | 188,339   | 734,800   | 1,817,034 | 220,718 | 1,367  |         |        | 3,692,716  |
| 1998 | 19,237  | 690    | 11,288   | 192,210 | 839,245   | 377,820   | 616,422   | 1,910,868 | 63,298  | 9,808  |         | 4,087  | 4,044,973  |
| 1999 | 98,457  | 1,614  | 4,383    | 161,291 | 399,588   | 544,474   | 484,157   | 1,374,169 | 63,058  | 6,371  | 5,866   |        | 3,143,428  |
| 2000 | 111,211 | 3,503  | 6,312    | 87,926  | 496,205   | 696,662   | 635,339   | 1,916,093 | 164,525 | 35,095 | 1,922   |        | 4,154,793  |
| 2001 | 39,806  | 2,983  |          | 158,423 | 373,206   | 567,625   | 172,969   | 1,251,150 | 151,584 | 4,883  |         |        | 2,722,629  |
| 2002 | 59,145  | 683    | 50,141   | 82,747  | 295,397   | 174,064   | 243,156   | 1,213,557 | 58,627  | 11,285 | 3,801   |        | 2,192,603  |
| 2003 | 22,183  | 1,327  | 4,306    | 161,474 | 215,522   | 24,698    | 57,866    | 333,690   | 37,106  | 3,536  | 2,379   | 873    | 864,960    |
| 2004 | 36,246  | 11,305 | *119,428 | 267,625 | 102,051   | 34,229    | 6,742     | 263,465   | 18,995  |        |         |        | 860,086    |
| 2005 | 99,729* | 7,456  | 90,428   | 157,018 | 20,556    | 17,474    | 37,714    | 1,145,157 | 602     |        | 8,413   |        | 1,584,547  |

\* States disagree with these numbers. South Carolina believes this number to be greatly higher than the actual harvest due to high sampling error by MRFSS. Florida reports a recreational harvest of 23,379 pounds. The state believes the MRFSS number to be incorrect due to misidentification of sand seatrout and hybrids of weakfish-sand seatrout as weakfish.

Source: NMFS Fisheries Statistics Division 2006

**Table 5. Atlantic coast recreational releases (number of B2 weakfish) by state, 1982 – 2005**

| Year | E. FL   | GA     | SC      | NC      | VA        | MD        | DE        | NJ        | NY      | CT    | RI    | MA | Total     |
|------|---------|--------|---------|---------|-----------|-----------|-----------|-----------|---------|-------|-------|----|-----------|
| 1982 | 3,387   |        |         | 44,134  | 126,514   | 2,139     | 12,712    | 1,695     |         |       |       |    | 190,581   |
| 1983 | 21,481  | 173    |         | 10,560  | 45,565    | 15,642    | 8,912     | 155,116   | 15,870  |       |       |    | 273,319   |
| 1984 | 6,719   |        | 1,561   | 17,381  | 202,791   | 8,934     | 1,163     | 4,464     |         |       | 5,214 |    | 248,227   |
| 1985 | 8,032   | 152    | 3,279   | 2,138   | 82,071    | 12,114    | 2,085     | 246,284   |         |       |       |    | 356,155   |
| 1986 | 22,955  |        | 2,873   | 354,095 | 692,462   | 327,841   | 9,637     | 895,044   | 4,556   |       |       |    | 2,309,463 |
| 1987 | 14,563  | 89     |         | 71,659  | 233,441   | 299,172   | 46,064    | 182,019   | 1,266   |       |       |    | 848,273   |
| 1988 | 636     | 4,196  |         | 109,489 | 484,782   | 155,255   | 59,980    | 5,144     |         | 634   |       |    | 820,116   |
| 1989 |         |        | 1,019   | 34,074  | 52,191    | 53,148    | 13,924    | 22,841    | 1,980   |       |       |    | 179,177   |
| 1990 | 2,684   |        |         | 20,669  | 198,948   | 142,055   | 41,765    | 32,863    | 570     |       |       |    | 439,554   |
| 1991 | 35,731  |        |         | 11,457  | 361,768   | 40,349    | 65,685    | 238,646   | 33,046  | 2,108 |       |    | 788,790   |
| 1992 | 39,597  | 362    | 4,598   | 27,052  | 244,817   | 71,040    | 61,886    | 249,846   | 8,362   |       | 98    |    | 707,658   |
| 1993 | 56,575  | 840    | 267     | 52,468  | 245,211   | 225,510   | 255,968   | 281,450   | 20,995  |       |       |    | 1,139,284 |
| 1994 | 38,141  | 21,588 |         | 147,616 | 652,571   | 583,059   | 560,999   | 1,051,931 | 45,537  | 1,013 |       |    | 3,102,455 |
| 1995 | 51,338  | 572    |         | 154,008 | 939,970   | 178,937   | 1,088,353 | 1,613,831 | 81,236  |       | 98    |    | 4,108,343 |
| 1996 | 29,558  | 307    |         | 188,263 | 814,573   | 492,402   | 1,567,046 | 1,859,049 | 84,990  |       | 780   |    | 5,036,968 |
| 1997 | 112,075 |        | 2,938   | 209,122 | 1,404,092 | 323,653   | 897,625   | 975,280   | 90,549  | 1,213 | 163   |    | 4,016,710 |
| 1998 | 47,407  | 1,468  | 329     | 131,537 | 1,244,949 | 461,518   | 613,544   | 778,180   | 29,836  | 360   | 1,921 |    | 3,311,049 |
| 1999 | 123,561 |        | 13,616  | 149,377 | 818,959   | 753,266   | 372,479   | 551,283   | 35,459  |       | 8,436 |    | 2,826,436 |
| 2000 | 209,749 | 12,895 | 15,869  | 346,212 | 935,594   | 1,209,290 | 465,496   | 1,605,024 | 68,531  | 1,285 | 931   |    | 4,870,876 |
| 2001 | 76,485  | 13,537 |         | 886,943 | 633,443   | 737,240   | 227,214   | 1,064,609 | 69,123  |       | 358   |    | 3,708,952 |
| 2002 | 79,262  | 9,540  | 1,019   | 336,709 | 888,337   | 286,182   | 101,282   | 350,810   | 62,803  |       | 1,932 |    | 2,117,876 |
| 2003 | 59,517  | 21,212 | 1,966   | 153,563 | 504,129   | 180,827   | 39,314    | 631,438   | 7,286   | 1,233 |       |    | 1,600,485 |
| 2004 | 132,804 | 12,102 | 108,415 | 239,474 | 522,859   | 127,979   | 76,427    | 565,695   | 40,636  | 5,609 | 264   |    | 1,832,264 |
| 2005 | 109,527 | 29,896 | 54,891  | 235,349 | 263,433   | 56,299    | 111,290   | 1,288,121 | 193,705 |       |       |    | 2,342,511 |

Source: NMFS Fisheries Statistics Division 2006