

# MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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Executive Director

## Black Sea Bass Recommendation Summary

Materials provided in this tab include the Black Sea Bass Monitoring Committee Recommendations for annual catch targets (ACTs) and other commercial fishery management measures, a memo from Jessica Coakley to Chris Moore, the Black Sea Bass Update, and projection output files. The Scientific and Statistical Committee (SSC) recommendations for acceptable biological catch (ABC) is the last item contained within briefing book tab 3 (summer flounder).

A summary of the values associated with the SSC and Monitoring Committee recommendations are given here. The SSC recommended an ABC that is less than the OFL to address scientific uncertainty. The Black Sea Bass Monitoring Committee recommended a commercial ACT that is set equal to the commercial ACL and a recreational ACT that is less than the recreational ACL that addresses management uncertainty relative to projected discards. Please see the SSC and Monitoring Committee reports for additional details.

| Black Sea Bass          |                   |                     |
|-------------------------|-------------------|---------------------|
| <b>OFL</b>              | 7.83 mil lb       |                     |
| <b>ABC</b>              | 4.50 mil lb       |                     |
|                         | <b>Commercial</b> | <b>Recreational</b> |
| <b>ACLs</b>             | 1.98 mil lb       | 2.52 mil lb         |
| <b>ACTs</b>             | 1.98 mil lb       | 1.59 mil lb         |
| <b>Landings levels*</b> | 1.76 mil lb       | 1.16 mil lb         |

\*After RSA is deducted, these levels would become the harvest limit and commercial quota.

July 29, 2011

### **Black Sea Bass Monitoring Committee Recommendations**

**Attendees:** John Maniscalco (NY-DEC), Jason McNamee (RI-DFW), Mark Terceiro (NEFSC), Tom Baum (NJ-DEP), Greg Wojcik (CT-DEEP), Chris Batsavage (NC-DMF), Rob O'Reilly (VMRC), Rich Wong (DNREC), Steve Doctor (MD-DNR), Mike Ruccio (NERO), Jessica Coakley (Council Staff), Jeff Kaelin (Lund's Fisheries), Lee Anderson (Council vice-chair), Toni Kerns (ASMFC)

**Discussion:** The Black Sea Bass Monitoring Committee was presented with the SSC's overfishing limit (OFL) and acceptable biological catch (ABC) recommendations. The OFL and ABC recommended for 2012 are 7.83 million lb and 4.50 million lb, respectively. The Monitoring Committee discussed the need to do more work to characterize management uncertainty and how annual catch targets (ACTs) should be derived, including the examination of performance standards for all components of the catch, such as uncertainty in harvest estimates, non-compliance harvest, and effort.

#### **Consensus Recommendation:**

##### ***Annual Catch Targets and Basis for Derivation***

- The Black Sea Bass Monitoring Committee recommended the recreational ACT be reduced from the recreational ACL by 0.92 million lb, to address underestimation of projected discards for 2012 (recreational ACT < recreational ACL). The recommended recreational ACT is 1.59 million lb. The Commercial ACT recommended is 1.98 million lb and no reduction from the commercial ACL was recommended (commercial ACT = commercial ACL). This results in a recreational landings level of 1.16 million lb and commercial landings level of 1.76 million lb. After RSA is deducted, these landings levels are the recreational harvest limit (RHL) and commercial quota.

##### ***Relevant Sources of Management Uncertainty***

- Past sector-specific landings and catch performance can be used as a basis for quantifying management uncertainty (implementation error), and as an indicator of the future ability to achieve 2012 ACTs.

- The Monitoring Committee considered 2009 and 2010 catch information as the basis for setting ACTs. In 2009 the measures in the fishery were very different than 2010, with a recreational fishery closure in 2009. 2010 is the most recent year for which the comparisons of catch limits and observed catches could be made. 2010 was also the basis for which measures in 2011 were set and is the more appropriate year for consideration.

|                      | <b>2009 Limits<br/>(million lb)</b> | <b>2009 Correspondings<br/>Catch, Landings, or<br/>Discards (million lb)</b> | <b>% overage<br/>(+)/underage(-)</b> |
|----------------------|-------------------------------------|--|--------------------------------------|
| <b>ABC</b>           | 2.56                                | 4.60   | 80                                   |
| <b>comm quota</b>    | 1.13                                | 1.18   | 5                                    |
| <b>comm discards</b> | 0.06                                | 0.25   | 291                                  |
| <b>RHL</b>           | 1.17                                | 2.31   | 97                                   |
| <b>rec discards</b>  | 0.20                                | 0.86   | 336                                  |
| <b>comm TAC</b>      | 1.19                                | 1.43   | 20                                   |
| <b>rec TAC</b>       | 1.37                                | 3.17   | 131                                  |
|                      | <b>2010 Limits<br/>(million lb)</b> | <b>2010 Correspondings<br/>Catch, Landings, or<br/>Discards (million lb)</b> | <b>% overage<br/>(+)/underage(-)</b> |
| <b>ABC</b>           | 4.50                                | 6.50   | 44                                   |
| <b>comm quota</b>    | 1.81                                | 1.68   | -8                                   |
| <b>comm discards</b> | 0.20                                | 0.29   | 49                                   |
| <b>RHL</b>           | 1.89                                | 2.98   | 58                                   |
| <b>rec discards</b>  | 0.60                                | 1.56   | 158                                  |
| <b>comm TAC</b>      | 2.01                                | 1.97   | -2                                   |
| <b>rec TAC</b>       | 2.49                                | 4.54   | 82                                   |

- The 58 percent overage of the RHL (recreational landings) is expected to be mitigated to some degree by the recreational fishing measures put in place in 2011. The success of the measures will be depend on fishing effort, fish availability, MRIP intercept sampling support, and any other factors that will be similar in 2011 as in 2010. In the fisheries for summer flounder and scup, very restrictive measures have been successful in constraining the landings to the RHL in the past (e.g., for summer flounder in 2009-2010; for scup in 2005-2006). In contrast to the scup and summer flounder fisheries, the Monitoring Committee lacks the performance history information for the black sea bass fishery to quantify the effectiveness of the 2011 measures at constraining landings, and so the Committee is unable to recommend a reduction from the recreational ACL based on landings performance.

- Recreational discards have been increasing and observed discards exceeded the projected discards in 2010 by 2.6 times. There are no direct measures controlling recreational discards. The Monitoring Committee expects that recreational discards may continue to increase in 2011 given the management measures in place. The Monitoring Committee recommends that the recreational ACL be reduced by 0.94 million lbs to address discard performance, when deriving a recreational ACT. This is based on the underestimation of projected discards in 2010 relative to what was actual observed (1.56 million lb - 0.60 million lb).

- The commercial fishery landings and discards performance has been in line with expectations and the Monitoring Committee recommends that an adjustment to address management uncertainty is not necessary (commercial ACL = commercial ACT). Given the small magnitude of the discard estimates (0.29 million lb), the Committee does not recommend an adjustment at this time.

- Additional constraint on the recreational fishery has the potential to increase discarding (and discard losses), depending on the rates of discarding in the directed or non-directed components of the black sea bass recreational fishery. Managers should consider measures which will reduce discard so they are a smaller component of total catch.

- An adjustment for recreational catch or commercial discard estimate precision was not applied.

### ***Other Management Measures***

- The Monitoring Committee did not recommend changes to other commercial fishery management measures, such as gear regulations (net mesh and pot/trap requirements) or the minimum fish size, for 2012.

- The Monitoring Committee recommends up to 3% for RSA in 2012.

### ***Research Recommendations***

- The Monitoring Committee recommends additional work is needed to characterize the recreational discard mortality rates (i.e., presently 25%).

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Christopher M. Moore, Ph.D.  
Executive Director

## MEMORANDUM

**DATE:** June 27, 2011

**TO:** Chris Moore, Executive Director

**FROM:** Jessica Coakley, Staff *JMC*

**SUBJECT:** Black Sea Bass Management Measures for 2012

### Executive Summary

The black sea bass stock is not overfished and overfishing is not occurring, based on the most recent update (2012 Projection Update). The 2010 stock is at 111% of the spawning stock biomass at maximum sustainable yield ( $SSB_{MSY}$ ). The staff recommendation for acceptable biological catch (ABC) is 4.50 million lb (2,041 mt) for 2012. This is the same ABC that was recommended by the Council's Scientific and Statistical Committee (SSC) in 2010 and 2011. The Omnibus Annual Catch Limit and Accountability Measures Amendment proposed rule has filed (76 FR 35578, June 17, 2011) and National Marine Fisheries Service (NMFS) has indicated their intention to implement the Council preferred alternatives for black sea bass. Based on the process proposed in the Omnibus Amendment, staff recommend a commercial ACL and recreational ACL of 1.98 million lb (900 mt) and 2.52 million lb (1,141 mt), respectively. Staff also recommend a commercial annual catch target (ACT) of 1.79 million lb (810 mt), for 2012, a commercial quota of 1.59 million lb (721 mt), a recreational ACT of 1.86 million lb (844 mt), and a recreational harvest limit of 1.36 million lb (617 mt) for 2012. Staff do not recommend any change to the current minimum fish size (11 inch-TL) or gear requirements (4.5 inch mesh with 500/100 lb trigger; current pot/trap vent requirements). In addition, staff recommend up to 3% of the total allowable landings (TAL) be made available to the Research Set-Aside Program (RSA).

### Introduction

The MSA requires each Council's SSC to provide, among other things, ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In addition, the FMP established Monitoring Committees which develop recommendations for management measures designed to achieve the recommended catch limits. The SSC will recommend an ABC for black sea bass that addresses scientific uncertainty and the Monitoring Committee (MC) will focus on recommending measures to address management uncertainty (ACTs). Based on the SSC and MC recommendations, the Council will make a recommendation to the NMFS Northeast Regional Administrator. Because the FMP is cooperatively

managed with the Atlantic States Marine Fisheries Commission, the Commission's Summer Flounder, Scup, and Black Sea Bass Board will meet jointly with the Council to recommend black sea bass management measures for 2012. In this memorandum, information is presented to assist the SSC and MC in developing recommendations for the Council and Board to consider for the 2012 fishery for black sea bass.

### **Catch and Landings**

Catch and landings from 1968 to 2010 are provided in the "Black sea bass 2012 projection update" (Table 1). In 2010, recreational landings were 2.98 million lb (1,351 mt) and recreational catch (i.e., landings plus dead discards) were 4.54 million lb (2,058 mt). Commercial landings in 2010 were 1.68 million lb (760 mt) and commercial catch were 1.98 million lb (892 mt). Combined commercial and recreational catch in 2010 is 6.50 million lb (2,950 mt). The 2011 commercial landings as of the week ending June 4, 2011, indicate that 44% of the coastwide commercial quota has been landed (Table 2).

### **Regulatory Review**

Last year (July 2010), the SSC met to recommend an ABC for black sea bass for fishing year 2011. The overfishing limit (OFL) for 2011 was derived directly from the stock assessment based on an  $F_{MSY}$  proxy of  $F_{40\%} = 0.42$ , and the OFL was specified as 7.64 million lb (3,465 mt) for 2011 (derived as the 50th percentile of yield at  $F_{40\%} = 0.42$ ). The SSC was concerned about the high uncertainty in the OFL that was not well characterized in the assessment. The SSC recommended an ABC of 4.5 million lb (2,041 mt) in 2011 (Table 1). This recommendation was based on catch history rather than on fishing mortality (F), and was the same ABC recommended for 2010. This constant catch level was based on the catch level in 2008 because of concerns raised by the MC regarding the impact of conservation measures in 2009. At the July 2010 meeting, the SSC considered black sea bass to be a level 4 assessment (based on control rules in the proposed Omnibus Amendment), and considered the following to be the most significant sources of uncertainty: atypical life history strategy (protogynous hermaphrodite); strong annual retrospective pattern in biomass evident for the last 3 years; uncertainty in stock status because of the lack of uncertainty estimation for the biological reference points (proxy used for FMSY) and model output; assessment assumes a completely mixed stock, while tagging analyses suggest otherwise; uncertainty exists with respect to M (because of the unusual life history strategy the current assumption of a constant M in the model for both sexes may not adequately capture the dynamics in M); no uncertainty characterization for the OFL; and concern about the application of trawl calibration coefficients (ALBATROSS IV vs BIGELOW) that are being used for the first year, and their influence on the selectivity pattern and results of the assessment.

Based on the 2011 ABC recommendations, discards were subtracted to derive the TAL, which was then allocated 49% to the commercial quota and 51% to the recreational harvest limit. After deducting research set-aside, the 2011 commercial quota was 1.71 million lb (776 mt) and the recreational harvest limit was 1.78 million lb (808 mt; Table 1). Management measures in the commercial fishery other than quotas and harvest limits (i.e., minimum fish size, gear requirements, etc.) have remained constant since 2006.

**Table 1. Summary of black sea bass management measures and landings, 1996-2011, and 2012 staff proposed.**

| <u>Management measures</u>         | <u>1996</u>        | <u>1997</u>        | <u>1998</u>        | <u>1999</u>        | <u>2000</u>        | <u>2001</u>        | <u>2002</u>        | <u>2003</u>        |                            |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------------------|
| TAL (m lb)                         | -                  | -                  | 6.173              | 6.173              | 6.173              | 6.173              | 6.800              | 6.800              |                            |
| Com. quota-initial (m lb)          | -                  | -                  | 3.025              | 3.025              | 3.025              | 3.025              | 3.332              | 3.332              |                            |
| Com. quota-adjusted (m lb)         | -                  | -                  | -                  | -                  | 2.631              | 2.642              | 3.132              | 3.012              |                            |
| Commercial landings                | 3.360              | 2.614              | 2.563              | 2.898              | 2.664              | 2.857              | 3.464              | 3.000              |                            |
| Rec. harvest limit-initial (m lb)  | -                  | -                  | 3.148              | 3.148              | 3.148              | 3.148              | 3.468              | 3.468              |                            |
| Rec. harvest limit-adjusted (m lb) | -                  | -                  | -                  | -                  | -                  | -                  | 3.434              | 3.434              |                            |
| Recreational landings              | 3.988              | 4.259              | 1.144              | 1.644              | 3.978              | 3.407              | 4.372              | 3.304              |                            |
| Com. fish size (in)                | 9                  | 9                  | 10                 | 10                 | 10                 | 10                 | 11                 | 11                 |                            |
| Min. mesh size (in, diamond)       | 4.0                | 4.0                | 4.0                | 4.0                | 4.0                | 4.0                | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   |                            |
| Threshold (lb)                     | 100                | 100                | 1,000              | 1,000              | 1,000              | 1,000              | 500/100            | 500/100            |                            |
| Vent size (in)                     | 1 1/8              | 1 1/8              | 1 1/8              | 1 1/8              | 1 1/8              | 1 1/8              | 1 3/8 <sup>b</sup> | 1 3/8 <sup>b</sup> |                            |
| <u>Management measures</u>         | <u>2004</u>        | <u>2005</u>        | <u>2006</u>        | <u>2007</u>        | <u>2008</u>        | <u>2009</u>        | <u>2010</u>        | <u>2011</u>        | <u>2012 staff proposed</u> |
| ABC (m lb)                         | NA                 | NA                 | NA                 | NA                 | NA                 | NA                 | 4.500              | 4.500              | 4.500                      |
| TAC (m lb)                         | NA                 | NA                 | NA                 | NA                 | NA                 | 2.300              | 4.500              | 4.500              | 4.500                      |
| TAL (m lb)                         | 8.000              | 8.200              | 8.000              | 5.000              | 4.220              | 2.300              | 3.700              | 3.600              | -                          |
| Com. quota-initial (m lb)          | 3.920              | 4.018              | 3.920              | 2.450              | 2.068              | 1.127              | 1.813              | 1.764              | 1.590                      |
| Com. quota-adjusted (m lb)         | 3.768              | 3.950              | 3.832              | 2.377              | 2.026              | 1.093              | 1.759              | 1.711              | -                          |
| Commercial landings                | 3.081              | 2.845              | 2.802              | 2.240              | 1.883              | 1.182              | 1.676              | -                  | -                          |
| Rec. harvest limit-initial (m lb)  | 4.08               | 4.182              | 4.080              | 2.550              | 2.152              | 1.173              | 1.887              | 1.836              | 1.360                      |
| Rec. harvest limit-adjusted (m lb) | 4.01               | 4.13               | 3.989              | 2.474              | 2.108              | 1.138              | 1.830              | 1.781              | -                          |
| Recreational landings              | 1.680              | 1.878              | 1.979              | 2.229              | 1.571              | 2.313              | 2.979              | -                  | -                          |
| Com. fish size (in)                | 11                 | 11                 | 11                 | 11                 | 11                 | 11                 | 11                 | 11                 | 11                         |
| Min. mesh size (in, diamond)       | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>   | 4.5 <sup>a</sup>           |
| Threshold (lb)                     | 500/100            | 500/100            | 500/100            | 500/100            | 500/100            | 500/100            | 500/100            | 500/100            | 500/100                    |
| Vent size (in)                     | 1 3/8 <sup>b</sup> | 1 3/8 <sup>b</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup> | 1 3/8 <sup>c</sup>         |

<sup>a</sup>Large trawls are required to possess a minimum of 75 meshes of 4.5 inches diamond mesh in the codend, or for nets with codends less than 75 meshes, the entire net must have a minimum mesh size of 4.5 inches throughout. <sup>b</sup>Vent sizes - 2 3/8 inch circular, 2 inch square, 1 3/8 x 5 3/4 inch rectangular. <sup>c</sup>Vent sizes - 2 1/2 inch circular, 2 inch square, 1 3/8 x 5 3/4 inch rectangular with two vents required in the parlor portion of the trap (effective Jan. 2007).

**Table 2. The 2011 black sea bass quotas and the amount of black sea bass landed by commercial fishermen, in lb, in each state.**

| State         | Commercial                            |  |                      | Research                             |
|---------------|---------------------------------------|--|----------------------|--------------------------------------|
|               | Cumulative Landings (lb) <sup>a</sup> | 2011 Quotas ASMFC by State (lb) <sup>b</sup> | Percent of Quota (%) | Set-Aside Landings (lb) <sup>a</sup> |
| ME            | 0                                     | 8,555  | 0                    | 0                                    |
| NH            | 0                                     | 8,555  | 0                    | 0                                    |
| MA            | 84,095                                | 222,440                                      | 38                   | 42                                   |
| RI            | 79,909                                | 188,219                                      | 42                   | 1,395                                |
| CT            | 7,610                                 | 17,111                                       | 44                   | 0                                    |
| NY            | 14,095                                | 119,776                                      | 12                   | 2,786                                |
| NJ            | 150,796                               | 342,216                                      | 44                   | 0                                    |
| DE            | 10,897                                | 85,554                                       | 13                   | 0                                    |
| MD            | 103,041                               | 188,219                                      | 55                   | 0                                    |
| VA            | 209,419                               | 342,216                                      | 61                   | 0                                    |
| NC            | 97,097                                | 188,219                                      | 52                   | 0                                    |
| Other         | 0                                     | 0  | 0                    | 0                                    |
| <b>Totals</b> | <b>756,959</b>                        | <b>1,711,080</b>                             | <b>44</b>            | <b>4,223</b>                         |

<sup>a</sup>Cumulative landings as of week ending June 4, 2011. Source: NMFS Weekly Quota Report.

<sup>b</sup>Less research set-aside, overages, and/or state transfers. Source: Toni Kerns (ASMFC, pers. comm. June 17, 2011).

### **Biological Reference Points**

The 2008 Data Poor Stock Working Group (DPSWG) Peer Review Panel biological reference points for black sea bass include a fishing mortality threshold of  $F_{MSY} = F_{40\%}$  (as  $F_{MSY}$  proxy) = 0.42 and  $SSB_{MSY} = SSB_{40\%}$  (as  $SSB_{MSY}$  proxy) = 27.6 million lb (12,537 mt). The minimum stock size threshold, one-half  $SSB_{MSY}$ , is estimated to be 13.8 million lb (6,269 mt).

### **Stock Status and Projections**

The most recent benchmark assessment on black sea bass was peer-reviewed and accepted in December 2008 by the DPSWG Peer Review Panel. Documentation associated with this assessment and previous stock assessments, such as reports on stock status, including annual assessment and reference point update reports, Stock Assessment Workshop (SAW) reports, and Stock Assessment Review Committee (SARC) panelist reports, are available online at the NEFSC website: <http://www.nefsc.noaa.gov/saw/>.

Based on the June 2011 update, the stock is not overfished and overfishing is not occurring, relative to the DPSWG biological reference points. Fishing mortality ( $F_{MULT}$ ) in 2010 is  $F = 0.41$ , an increase from  $F = 0.32$  in 2009. This point estimate of  $F$  in 2010 is very close to the fishing mortality threshold of  $F = 0.42$ . Estimates for 2010 total biomass remain above  $B_{MSY}$ .  $SSB$  in 2010 is 30.7 million lb (13,926 mt), which is 111% of  $SSB_{MSY}$ . Recruitment estimated by the model was relatively constant through the



time series with the exception of the 1999 and 2001 year classes. These cohorts appeared to be the driving force behind the increase in biomass and SSB. The estimated average recruitment (age one) in 2010 (2009 cohort) was 26.8 million fish.

**Basis for 2012 ABC Recommendation**

Although multi-year management measures can be specified through this FMP, staff do not think it appropriate to set measures for multiple years at this time given the scheduled December, 2011 Stock Assessment Workshop (SAW) for black sea bass. Therefore, staff recommend measures be specified for one year, 2012.

The recommended OFL for 2012 of 7.83 million lb (3,551 mt) is defined by the fishing mortality threshold of  $F=0.42$ . It is clear that recommendations for ABC, which would equal the OFL, would not account for any scientific uncertainty associated with estimation of OFL and the assessment of the black sea bass stock. The DPSWG Panel noted despite acceptance of the assessment model there was *“considerable uncertainty with respect to stock status.”* In addition, the Panel recommended that, *“management should proceed with caution until the implications of recent rapid changes from high to low index values observed in the survey, but not in model estimates of time series, are more adequately understood.”* The review Panel also, *“recommends the SSC recognize and allow for the sizeable uncertainty in stock status when establishing catch limits.”* Last year, the SSC classified the black sea bass assessment as level 4, and applied a constant catch approach to setting ABC. Given the significant sources of uncertainty in the assessment of black sea bass described last year by the SSC and its classification as a level 4 assessment, the large difference between the observed and predicted survey index values, and the increase in F in 2010 as indicated by this year's update, staff recommend an ABC of 4.50 million lb (2,041 mt) for 2012 which is the same ABC applied to this fishery in 2010 and 2011 (Table 3).

**Other Management Measures**

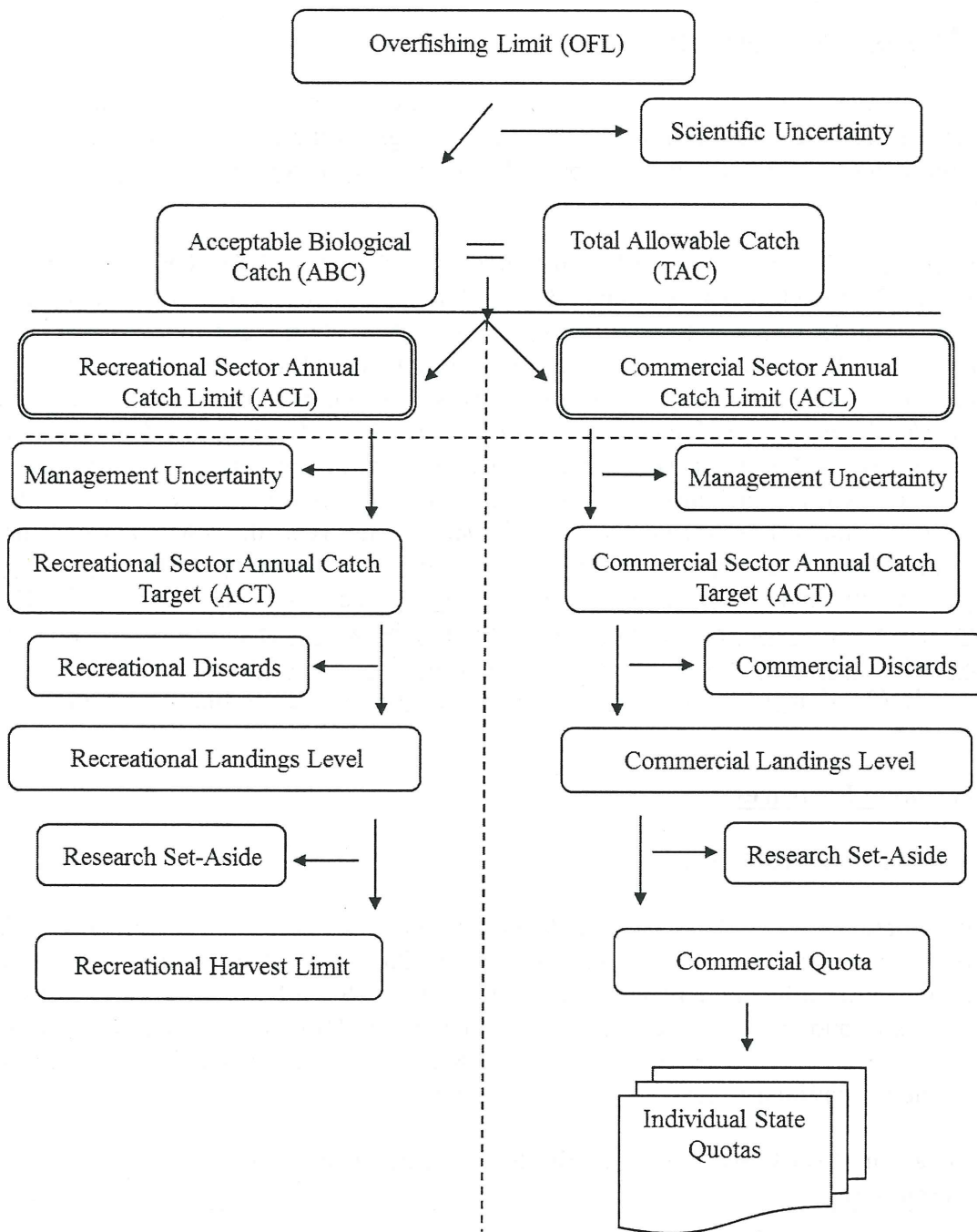
***Recreational and Commercial ACLs***

In the Omnibus Amendment,  $ABC=TAC$  and the sum of the commercial and recreational ACL equals the ABC (Figure 1; Table 4)). An ABC of 4.50 million lb (2,041 mt) is comprised of both landings and discards. Based on the allocation percentages in the FMP, 49% of the landings are allocated to the commercial fishery, and 51% to the recreational (Table 3). Discards are apportioned based on the contribution from each fishing sector using the 2008-2009 average ratios; 76% of dead discards are attributable to the recreational fishery, 24% to the commercial.

**Table 3. Allocation of the black sea bass ABC to the commercial and recreational ACLs for 2012 (Staff recommended).**

|                  | Catch<br>(Landings + Discards) | Landings Portion       | Discards Portion     |
|------------------|--------------------------------|------------------------|----------------------|
| ABC              | 4.50 mil lb (2,041 mt)         | 3.60 mil lb (1,633 mt) | 0.90 mil lb (408 mt) |
| Recreational ACL | 2.52 mil lb (1,141 mt)         | 1.84 mil lb (833 mt)   | 0.68 mil lb (308 mt) |
| Commercial ACL   | 1.98 mil lb (900 mt)           | 1.76 mil lb (800 mt)   | 0.22 mil lb (100 mt) |

## Black Sea Bass Flowchart



**Figure 1. Black sea bass flowchart.**

**Table 4. Omnibus Amendment terminology and relationship to previous FMP terms.**

| Previous Term                     | New Term                                   | Definition  | Use in Omnibus                                    |
|-----------------------------------|--|---|---|
| Overfishing Limit (OFL)           | Unchanged                                  | The OFL is an estimate of the catch level above which overfishing is occurring. The amount of catch that corresponds to the estimate of MFMT applied to a stock and is expressed in terms of numbers or weight of fish. | OFL = catch level calculated by MFMT              |
| Acceptable Biological Catch (ABC) | Unchanged                                  | The level of a stock's annual catch that accounts for the scientific uncertainty in the estimate of OFL. May not exceed OFL.  | ABC is established by SSC                         |
| Fishery                           | Sector                                     | Distinct user group to which separate management strategies and separate catch quotas apply. For black sea bass, there are recreational and commercial sectors.   | Recreational Sector,<br>Commercial Sector         |
| Total Allowable Catch (TAC)       | Sum of Sector Annual Catch Limit (ACL)     | The level of annual catch of a stock that serves as the basis for invoking AMs. The sum of the sector ACLs may not exceed ABC. For black sea bass $\Sigma$ sector ACLs is set equal to ABC.                             | TAC =<br>$\Sigma$ sector ACLs =<br>ABC            |
|                                   | Sector Annual Catch Target (ACT)           | An amount of annual catch of a stock by sector that is the management target of the fishery, including discards, and accounts for management uncertainty in controlling the actual catch at or below ACL.               | Recreational ACT,<br>Commercial ACT               |
| Total Allowable Landings (TAL)    | Sector Total Allowable Landings (TAL)      | Annual amount of total landings permitted by sector after removing estimated discards. For black sea bass $\Sigma$ sector TALs is equal to TAL.   | Sector TAL =<br>sector ACT –<br>sector discards   |
| Research Set-Aside (RSA)          | Unchanged                                  | Amount of Total Allowable Landings (TAL) up to 3 percent that may be set aside to fund research activities  | TAL – X% (up to 3%) = RHL and<br>Commercial Quota |
| Recreational Harvest Limit (RHL)  | Unchanged                                  | Annual management target for the recreational sector after removing research set-aside.   | RHL =<br>Recreational Sector TAL- RSA             |
| Commercial Quota                  | Unchanged                                  | Annual management target for the commercial sector after removing research set-aside.   | Commercial Quota =<br>Commercial Sector TAL-RSA   |
| Optimum Yield (OY)                | Unchanged                                  | The long-term average amount of desired yield from a stock or fishery. OY cannot exceed MSY.  | OY  |
| $\frac{1}{2} B_{MSY}$ Proxy       | Minimum Stock Size Threshold (MSST)        | Level of stock biomass below which the stock is considered to be overfished.  | MSST = $\frac{1}{2} B_{MSY}$<br>Proxy             |
| $F_{40\%} = F_{MSY}$ Proxy        | Maximum Fishing Mortality Threshold (MFMT) | The level of fishing mortality (F), on an annual basis, above which overfishing is occurring.   | MFMT = $F_{40\%} =$<br>$F_{MSY}$ Proxy            |

### *Considerations for ACTs*

As described in the Omnibus Amendment, the Black Sea Bass Monitoring Committee will be responsible for recommending ACTs for the Council to consider. The relationship between the recreational and commercial ACTs, and other catch components (current and proposed) are given in Figure 1 and Table 4. The Monitoring Committee may provide other recommendations relevant to setting catch limits consistent with the Magnuson-Stevens Act (MSA). The Monitoring Committee can consider all relevant sources of management uncertainty in the black sea bass fishery and provide the technical basis, including any formulaic control rules, for any reduction in catch when recommending an ACT. The ACTs, technical basis, and sources of management uncertainty would be described and provided to the Council.

Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about the catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or bycatch) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels).

Staff recommend the Monitoring Committee consider past sector-specific landings performance as a basis for quantifying management uncertainty (i.e., implementation error) and as an indicator of the future ability to achieve catch targets when developing the 2012 commercial and recreational ACT recommendations (Table 5). The Monitoring Committee should also consider the potential imprecision/variability in expected observed recreational and commercial catch to ensure the sector-specific ACLs are not exceeded. Staff recommend a 10% reduction in catch from the commercial ACL to address potential imprecision in observed catch estimates relative to the catch target for 2012. This would result in a commercial ACT of 1.79 million lb (810 mt) for 2012. For the recreational fishery, staff recommend a 26% reduction in catch from the recreational ACL to address both potential imprecision in observed catch (10%) and past performance (16%) of the recreational fishery relative to harvest limits. This results in a recreational ACT of 1.86 million lb (844 mt).

**Table 5. Black sea bass commercial and recreational fishery performance relative to quotas and harvest limits, 2006-2010.**

| Year             | Commercial Landings (mil lb) | Commercial Quota (mil lb) | Percent Overage(+)/ Underage(-) | Recreational Landings (mil lb) | Recreational Harvest Limit (mil lb) | Percent Overage(+)/ Underage(-) |
|------------------|------------------------------|---------------------------|---------------------------------|--------------------------------|-------------------------------------|---------------------------------|
| 2006             | 2.802                        | 2.832                     | -1%                             | 1.979                          | 3.989                               | -50%                            |
| 2007             | 2.240                        | 2.377                     | -2%                             | 2.229                          | 2.474                               | -10%                            |
| 2008             | 1.883                        | 2.206                     | -15%                            | 1.571                          | 2.108                               | -25%                            |
| 2009             | 1.182                        | 1.093                     | +8%                             | 2.313                          | 1.138                               | +103%                           |
| 2010             | 1.676                        | 1.759                     | -5%                             | 2.979                          | 1.830                               | +63%                            |
| <b>5-yr Avg.</b> | -                            | -                         | -3%                             | -                              | -                                   | +16%                            |

### *Commercial Quotas and Recreational Harvest Limit*

The landings-based allocations (i.e., 49% commercial, 51% recreational) were maintained in the

derivation of the sector-specific ACLs and ACTs, such that the sum of the sector-specific TALs (commercial or recreational landings levels) will be equal to overall TAL (Table 3). Based on the staff recommended ACTs given above, the commercial quota is 1.59 million lb (721 mt) and the recreational harvest limit is 1.36 million lb (617 mt). The ASMFC allocates the commercial quota to each state based on the allocation percentages given in Table 6.

**Table 6. The Commission state-by-state commercial allocation percentages.**

| State         | Allocation (percent) |
|---------------|----------------------|
| ME            | 0.5                  |
| NH            | 0.5                  |
| MA            | 13.0                 |
| RI            | 11.0                 |
| CT            | 1.0                  |
| NY            | 7.0                  |
| NJ            | 20.0                 |
| DE            | 5.0                  |
| MD            | 11.0                 |
| VA            | 20.0                 |
| NC            | 11.0                 |
| <b>Totals</b> | <b>100</b>           |

Specific management measures that will be used to achieve the harvest limit for the recreational fishery in 2012 will not be determined until after the first four waves of 2011 recreational landings are reviewed. These data should be available in October 2011. The Monitoring Committee will meet in November 2011 to review these landings data and make recommendations regarding changes in the recreational possession limit, minimum size, or season. Given the performance of the recreational fishery relative to the recreational harvest limit in the last two years, management measures (i.e., minimum size, possession limits, and seasons) should be implemented that are designed to achieve the recreational ACT, while preventing the recreational ACL from being exceeded.

***Gear Regulations and Minimum Fish Size - Commercial Fishery***

Amendment 9 established minimum fish size for black sea bass in federal and state waters. The Council and Commission increased the size limit to an 11 inch-TL in 2002 (Table 1). Staff recommend that the size limit remain at 11 inch-TL for 2011. Amendment 9 also established gear regulations that became effective on December 16, 1996. The Council and Commission recommended a change in the mesh size for 2002. Current regulations state that large trawl nets are required to possess a minimum of 75 meshes of 4.5 inch diamond mesh in the codend, or the entire net must have a minimum mesh size of 4.5 inch throughout. The threshold level used to trigger the minimum mesh requirement size is 500 lb from January through March and 100 lb from April through December. Staff recommend no change in these regulations for 2012.

The Council and Commission adopted modifications to the circle vent size in black sea bass pots/traps based on the findings of a Council and Commission sponsored workshop. Effective January 1, 2007 the minimum circle vent size requirements for black sea bass pots/traps were increased from 2 <sup>3</sup>/<sub>8</sub> inch to 2

$\frac{1}{2}$  inch. The requirements of  $1 \frac{3}{8}$  inch x  $5 \frac{3}{4}$  inch for rectangular vents and 2 inch for square vents remained unchanged. In addition, 2 vents are now required in the parlor portion of the pot/trap. Staff recommend no change in these regulations in 2012.

***Research Set-Aside***

Staff recommend up to 3% of the TAL be made available for the Research Set-Aside Program in 2012.

## **Black sea bass 2012 projection update**

Projections for 2012 quota were based on an update of the 2010 assessment models. The previous assessment update through 2009 used a model averaging approach among a suite of 10 models whereas the present update/projection involves only a single model, equivalent to the average 2009 model. The update required estimating 2010 parameters, fixing values for 2011, then projecting through 2012 and 2013. Population numbers in the SCALE model are estimated as of January 1, therefore it is necessary to estimate 2013 abundance to evaluate the impact of 2012 fishing mortality.

### SCALE Model Input

Input to the SCALE model update included NEFSC spring and winter offshore indices of abundance. The spring series of stratified ln re-transformed mean number per tow included 1968 to 2011 while the comparable indices from the winter survey were 1992 to 2007. Juvenile indices in the spring and winter surveys were computed as the sum of re-transformed indices at length for fish less than or equal to 14 cm. Mean lengths at age were predicted from an average growth curve among available studies and length-weight equation parameters were from fitted length weight data collected on NMFS surveys. Total catch was commercial landings since 1968, recreational landings since 1981 estimated in MRFSS and 1968 to 1980 estimates derived from commercial inshore fishery landings, recreational discard losses since 1981 and commercial discard estimates since 1989. The model was allowed to fit survey length frequencies greater than 30 cm to counter the lack of discard length data in the fishery length frequencies. Selectivity periods were chosen based on regulatory changes in the fisheries. The three periods were 1968 to 1997, 1998 to 2000 and 2001 to 2010. The model was fit with a constant natural mortality of 0.4. Model output included total biomass, fishing mortality and population number at length. The population numbers at length were used to calculate annual estimates of spawning stock biomass (based on a length-weight equation and maturity at length from NEFSC survey results).

### Model results

Estimated fishing mortality declined steadily since a peak in 2001 of 1.21. The 2010 value was below  $F_{MSY}$  (0.42) with  $F_{mult}$  equal to 0.41, increasing from the 2009 estimate of 0.32.

Total biomass exceeded  $B_{MSY}$  (13,977 mt) in 2002 through 2003 then declined slightly. Estimates for 2010 (14,449 mt) remained above  $B_{MSY}$ . SSB followed a similar pattern, increasing above  $SSB_{MSY}$  (12,537 mt) in 2002-2005 then declining slightly in 2007, but increasing again to 13,926 mt in 2010. Recruitment estimated by the model was relatively constant through the time series with the exception of the 1999 and 2001 year classes. These cohorts appeared to be the driving force behind the increase in biomass and SSB. The estimated average recruitment (age one) in 2010 (2009 cohort) was 26.8 million fish.

### Projections

Deterministic projections for black sea bass were made using the SCALE model. Final values for catch, recruitment, etc. through 2010 were input as fixed values in the SCALE input. Catch for 2011 was assumed equal to the 2011 quota (2,041 mt). Length composition in 2011 was set equal to 2010 and assumed constant through 2013. Fishing mortality in 2011 was calculated by iterating across possible  $F$  values until the model predicted catch equivalent to the assumed 2011 catch. Projections for 2012 were completed by inputting fishing mortality, such as  $F_{MSY}$ , and allowing the model to predict the associated catch. The ratio of discards to landings applied to total catch estimates was assumed equal to the 2000 to 2009 average (20%).

Under the current 2011 quota, predicted fishing mortality was calculated as 0.24. The subsequent catch in 2012 for a fishing mortality equal to  $F_{MSY}$  (0.42) would result in an expected total catch of 3,551 mt and landings of 2,841 mt, while 75% of  $F_{MSY}$  (0.315), would project to a 2012 catch of 2,821 mt or landings of 2,256 mt. In all cases, the expected total Jan 1, 2013 biomass would exceed  $B_{MSY}$ . A similar projection fixing the catch at the 2010 quota would project to a 2012 fishing mortality of 0.22 and a 2013 biomass of 17,023 mt. Total biomass and SSB associated with each scenario are presented in Table 2. In all cases Jan 1, 2013 spawning biomass remains above  $SSB_{MSY}$ .



Table 1. Black sea bass catch (mt), 1968-2010, for stock north of Cape Hatteras, NC.  
2010 commercial discard estimates based on average from 2008-2009.

|      | Commercial<br>landings | Commercial<br>discard | Recreational<br>landings | Recreational<br>discards | Foreign<br>landings | Total<br>Catch (mt) |
|------|------------------------|-----------------------|--------------------------|--------------------------|---------------------|---------------------|
| 1968 | 1079                   |                       | 851                      |                          |                     | 1930                |
| 1969 | 1097                   |                       | 772                      |                          |                     | 1869                |
| 1970 | 970                    |                       | 1058                     |                          |                     | 2028                |
| 1971 | 566                    |                       | 540                      |                          |                     | 1106                |
| 1972 | 727                    |                       | 846                      |                          |                     | 1573                |
| 1973 | 1115                   |                       | 1145                     |                          |                     | 2260                |
| 1974 | 1023                   |                       | 1325                     |                          |                     | 2348                |
| 1975 | 1680                   |                       | 1791                     |                          |                     | 3471                |
| 1976 | 1557                   |                       | 1895                     |                          |                     | 3452                |
| 1977 | 1985                   |                       | 2267                     |                          |                     | 4252                |
| 1978 | 1662                   |                       | 1697                     |                          | 5                   | 3364                |
| 1979 | 1241                   |                       | 560                      |                          | 41                  | 1841                |
| 1980 | 977                    |                       | 1002                     |                          | 14                  | 1992                |
| 1981 | 1129                   |                       | 558                      | 65                       | 39                  | 1791                |
| 1982 | 1177                   |                       | 4500                     | 74                       | 21                  | 5771                |
| 1983 | 1513                   |                       | 1869                     | 137                      | 14                  | 3533                |
| 1984 | 1965                   |                       | 602                      | 65                       | 18                  | 2650                |
| 1985 | 1551                   |                       | 958                      | 90                       | 33                  | 2632                |
| 1986 | 1901                   |                       | 5621                     | 229                      | 10                  | 7761                |
| 1987 | 1890                   |                       | 880                      | 79                       | 4                   | 2853                |
| 1988 | 1879                   |                       | 1299                     | 252                      |                     | 3430                |
| 1989 | 1324                   | 108                   | 1488                     | 94                       |                     | 3014                |
| 1990 | 1588                   | 64                    | 1256                     | 209                      |                     | 3117                |
| 1991 | 1272                   | 14                    | 1885                     | 247                      |                     | 3418                |
| 1992 | 1364                   | 123                   | 1188                     | 170                      |                     | 2845                |
| 1993 | 1433                   | 252                   | 2194                     | 136                      |                     | 4016                |
| 1994 | 925                    | 23                    | 1333                     | 176                      |                     | 2457                |
| 1995 | 935                    | 38                    | 2815                     | 373                      |                     | 4162                |
| 1996 | 1524                   | 385                   | 1809                     | 280                      |                     | 3998                |
| 1997 | 1186                   | 28                    | 1932                     | 296                      |                     | 3442                |
| 1998 | 1163                   | 119                   | 519                      | 213                      |                     | 2013                |
| 1999 | 1315                   | 42                    | 746                      | 393                      |                     | 2495                |
| 2000 | 1208                   | 48                    | 1804                     | 822                      |                     | 3882                |
| 2001 | 1296                   | 123                   | 1545                     | 739                      |                     | 3703                |
| 2002 | 1571                   | 48                    | 1983                     | 818                      |                     | 4420                |
| 2003 | 1361                   | 69                    | 1498                     | 507                      |                     | 3436                |
| 2004 | 1398                   | 432                   | 762                      | 314                      |                     | 2905                |
| 2005 | 1290                   | 82                    | 852                      | 244                      |                     | 2469                |
| 2006 | 1271                   | 29                    | 898                      | 267                      |                     | 2464                |
| 2007 | 1016                   | 85                    | 1011                     | 339                      |                     | 2451                |
| 2008 | 854                    | 151                   | 713                      | 426                      |                     | 2145                |
| 2009 | 536                    | 113                   | 1049                     | 388                      |                     | 2086                |
| 2010 | 760                    | 132                   | 1351                     | 707                      |                     | 2950                |

Table 2. Projected estimates of catch, landings discards, and total spawning biomass (mt) under six projection scenarios. 2011 catch assumed equal to 2010.  $B_{msy} = 13,977$  mt,  $SSB_{msy} = 12,537$  mt.

|                          | <b>F</b> | <b>Catch (mt)</b> | <b>Landings (mt)</b> | <b>Discards (mt)</b> | <b>Total<br/>Biomass (mt)</b> | <b>SSB (mt)</b> |
|--------------------------|----------|-------------------|----------------------|----------------------|-------------------------------|-----------------|
| $F_{2012}=F_{msy}$       | 0.42     | 3,551             | 2,841                | 710                  | 15,459                        | 14,123          |
| $F_{2012} = 75\%F_{msy}$ | 0.32     | 2,821             | 2,256                | 564                  | 16,233                        | 14,889          |
| $F_{2012}$               | 0.28     | 2,510             | 2,008                | 502                  | 16,563                        | 15,216          |
| $F_{2012}$               | 0.29     | 2,589             | 2,071                | 518                  | 16,479                        | 15,133          |
| $F_{2012}$               | 0.30     | 2,674             | 2,139                | 535                  | 16,417                        | 15,071          |
| Status quo catch         | 0.22     | 2,041             | 1,633                | 408                  | 17,023                        | 15,672          |

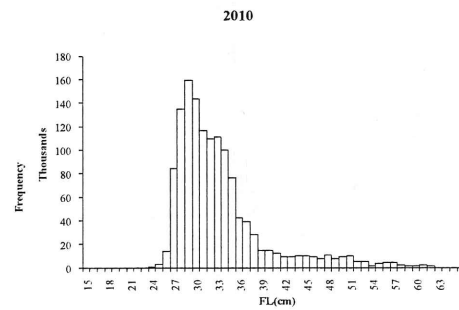
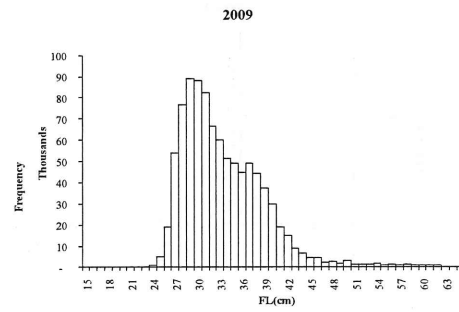
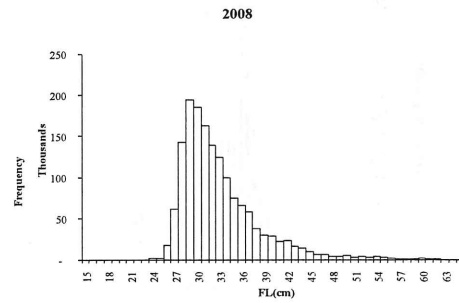
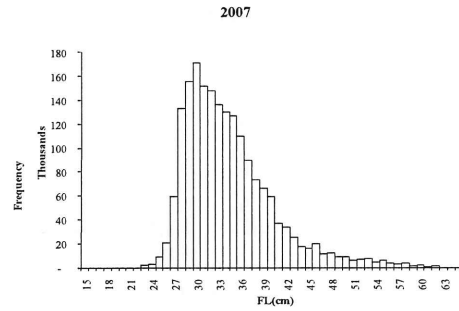
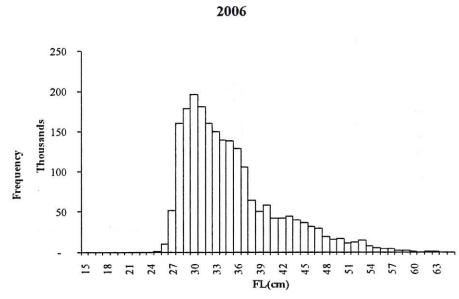


Figure 1. Length frequencies (cm) of commercial landings, 2006-2010.

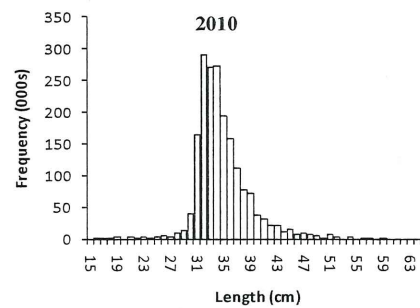
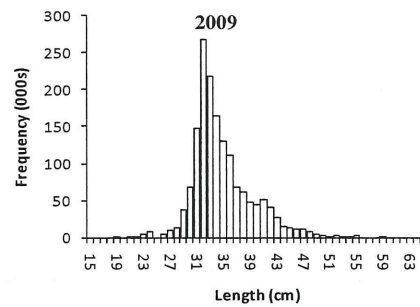
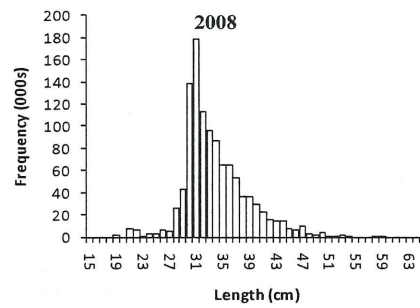
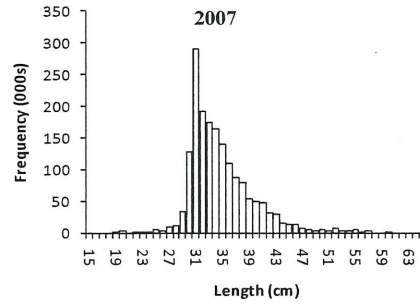
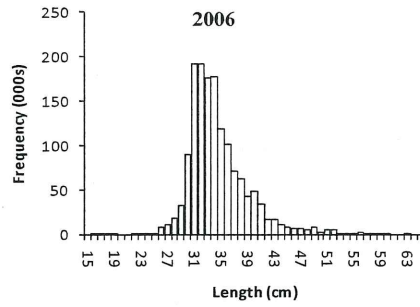


Figure 2. Length frequencies (cm) of recreational landings, 2006-2010.

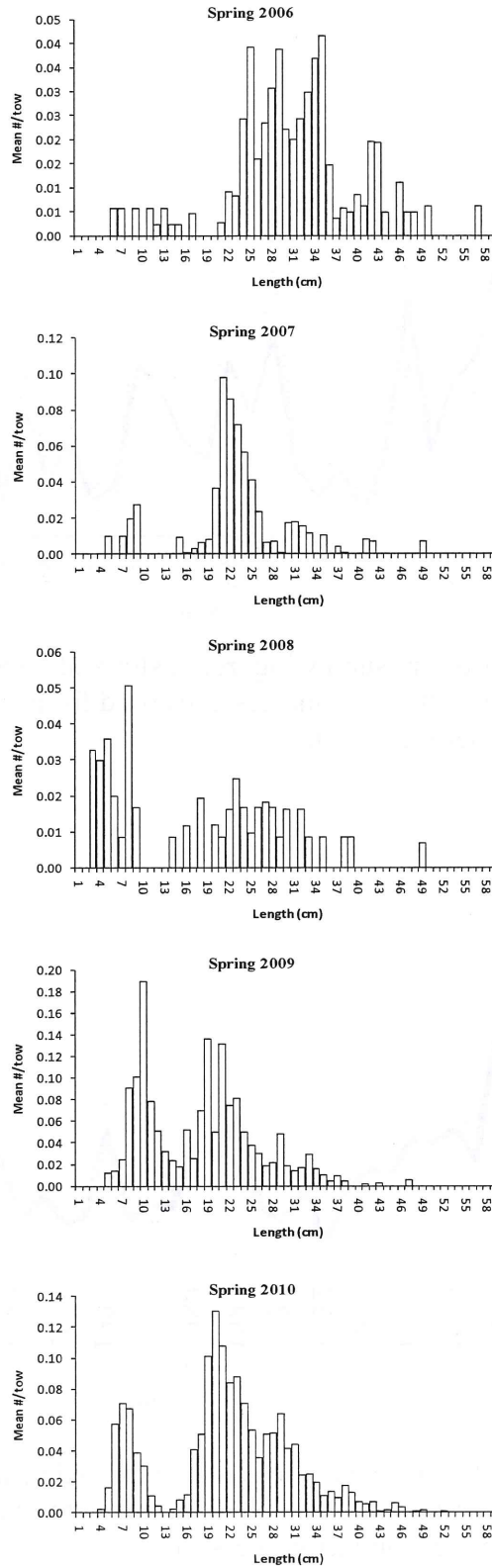


Figure 3. NEFSC spring offshore bottom trawl survey length frequencies (cm), 2006-2010.

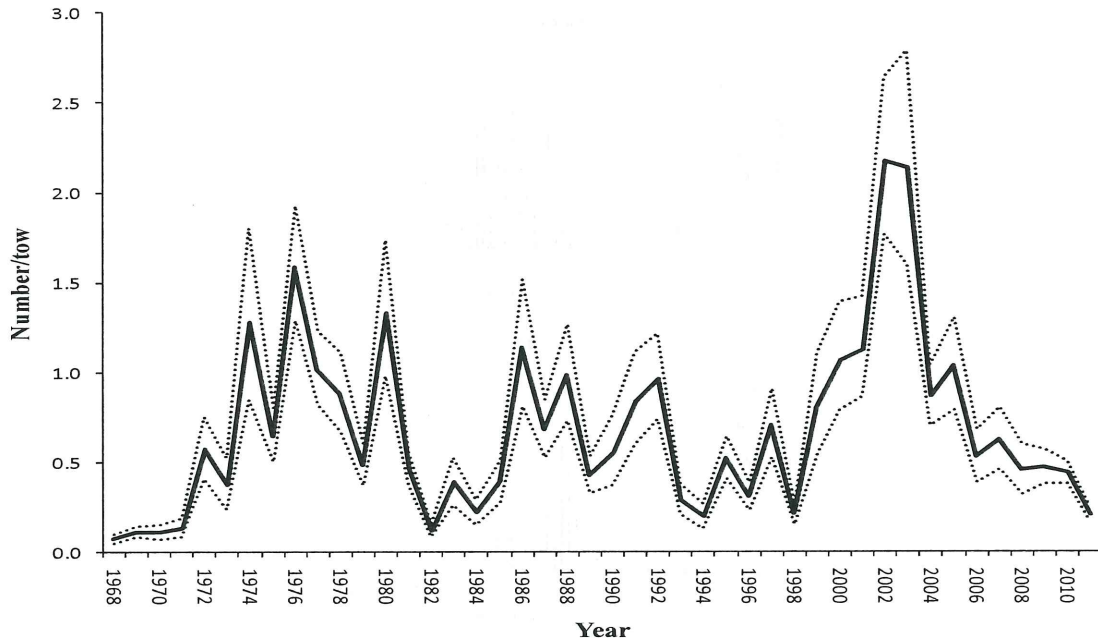


Figure 4. NEFSC spring offshore survey  $\log_e$  retransformed mean number per tow of black sea bass ( $\pm$  95% CI). 2009-2011 indices converted from H. Bigelow to Albatross IV units with conversion factor of 3.416.

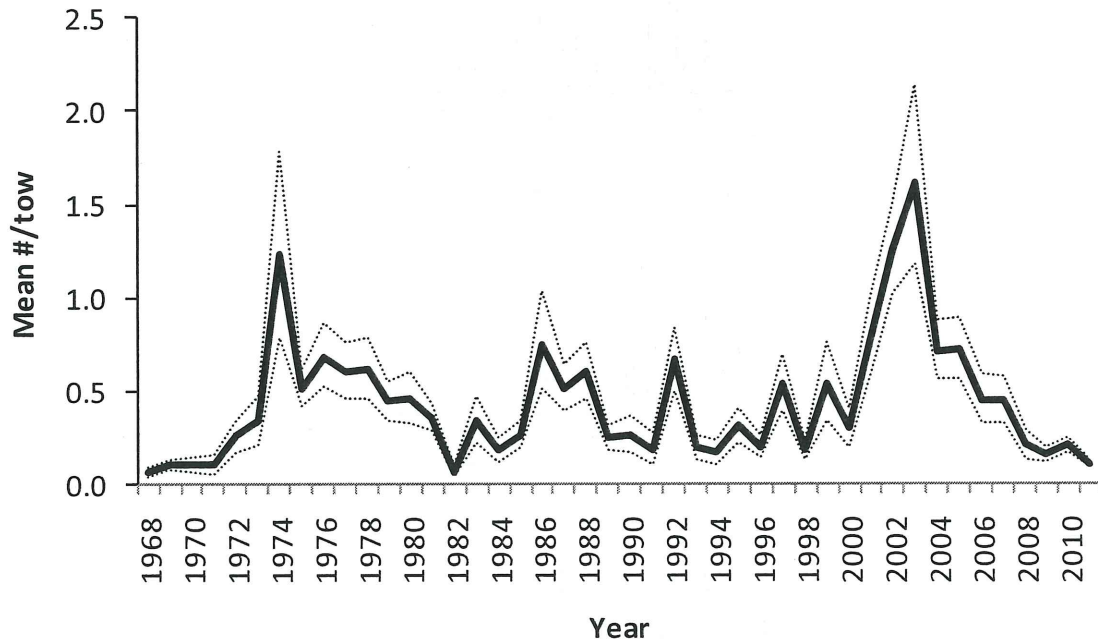


Figure 5. NEFSC spring offshore survey  $\log_e$  retransformed mean number per tow of black sea bass  $\geq$  22 cm ( $\pm$  95% CI). 2009-2011 indices converted from H. Bigelow to Albatross IV units with conversion factor of 3.416.

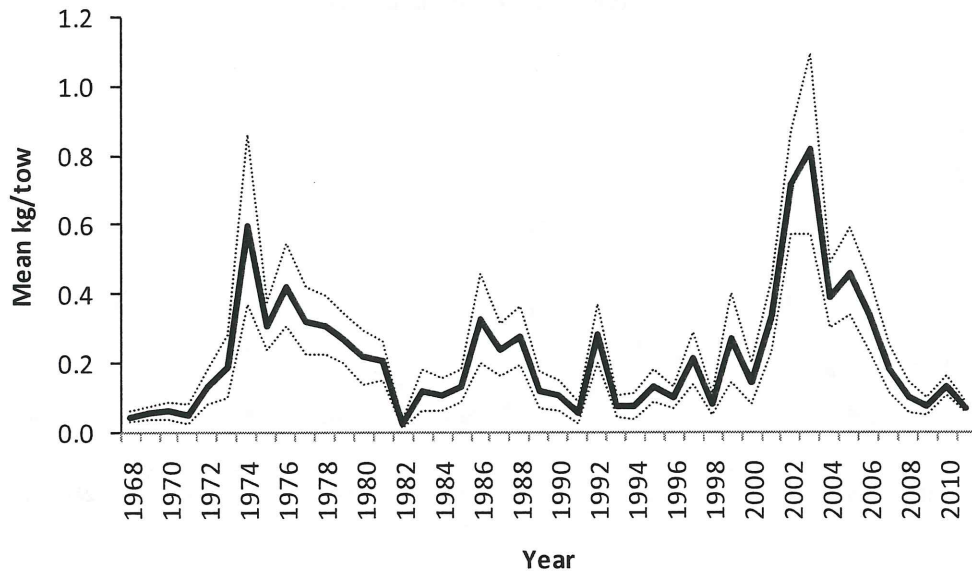


Figure 6. NEFSC spring offshore survey  $\log_e$  retransformed weight (kg) number per tow of black sea bass  $\geq 22$  cm ( $\pm$  95% CI). 2009-2011 indices converted from H. Bigelow to Albatross IV units with conversion factor of 3.416.

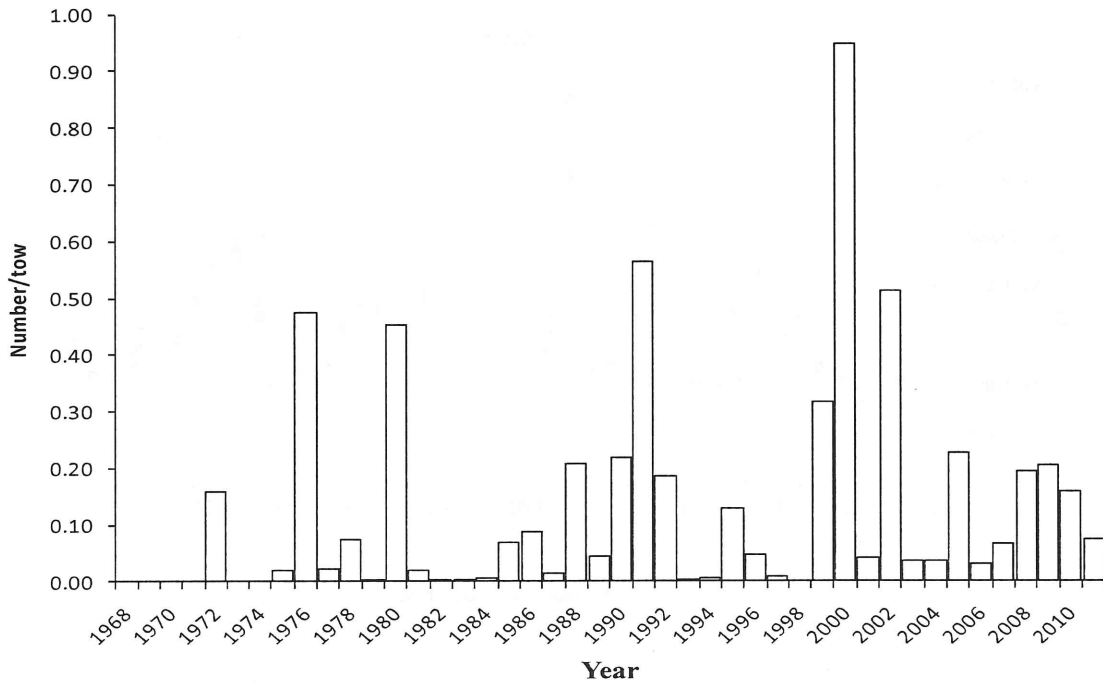


Figure 7. NEFSC spring offshore survey  $\log_e$  retransformed mean number per tow of black sea bass  $\leq 14$  cm, index of recruits. 2009-2011 indices converted from H. Bigelow to Albatross IV units with conversion factor of 3.416.

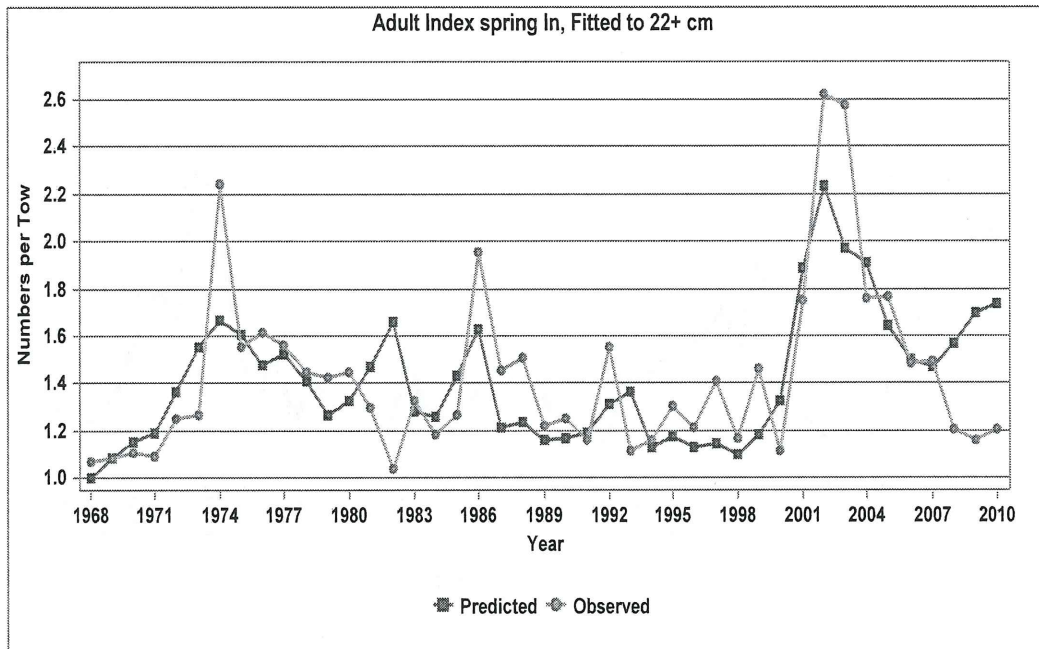


Figure 8. Observed and predicted black sea bass adult survey indices from SCALE model update 1968- 2010.

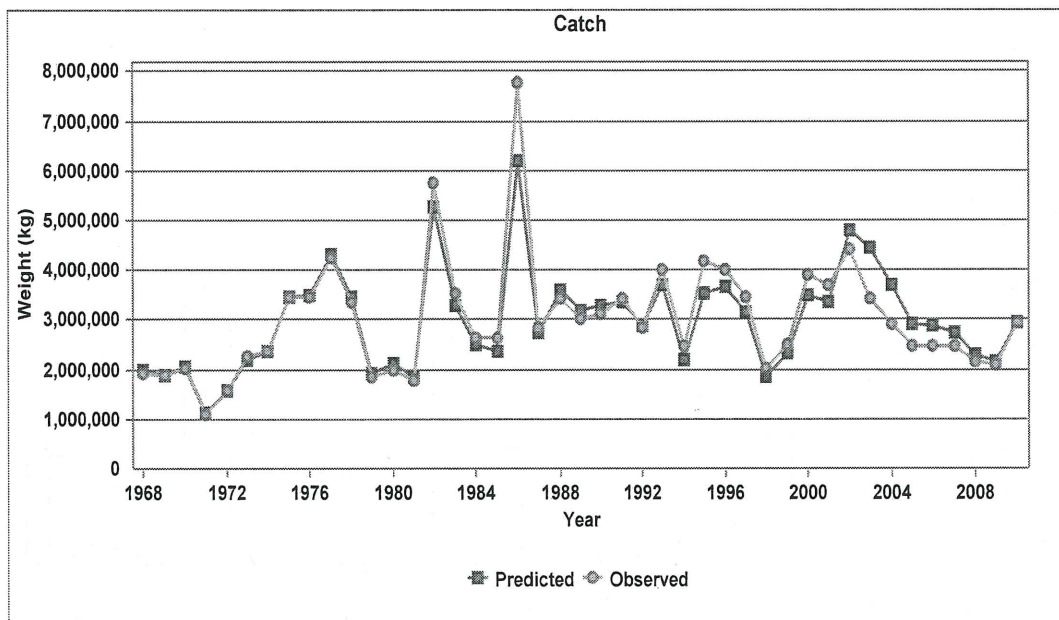


Figure 9. Observed and predicted black sea bass catch (mt) from SCALE model update through 2010.



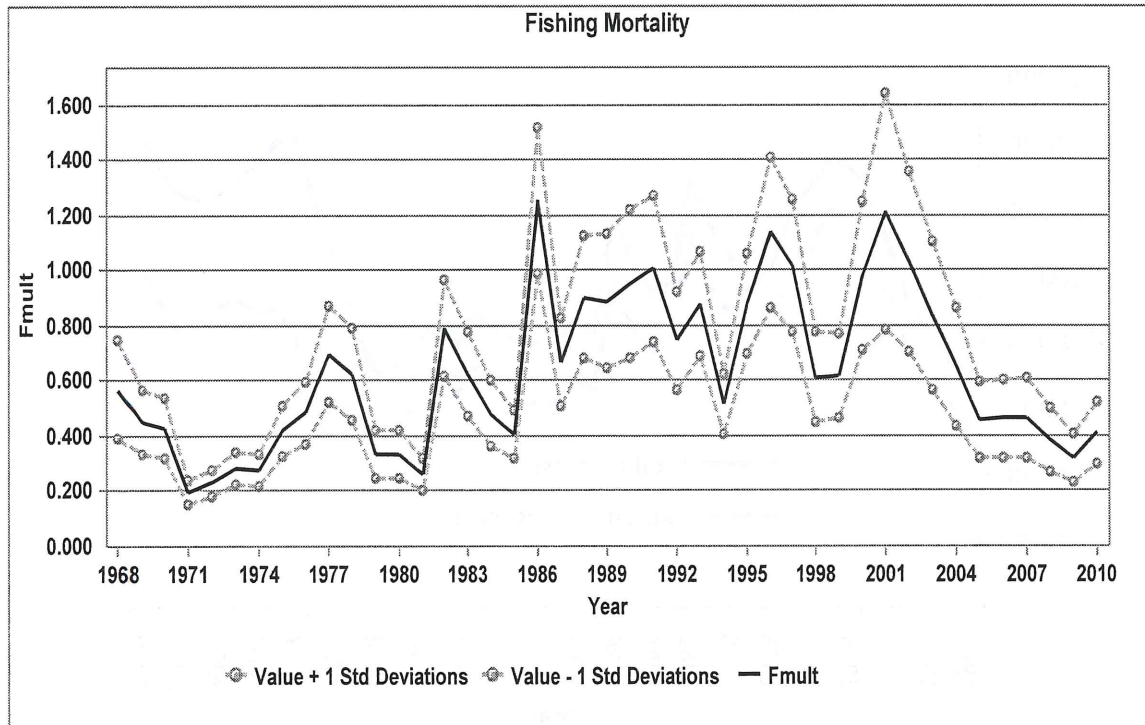


Figure 10. Estimated fishing mortality of black sea bass through 2010 from SCALE model.

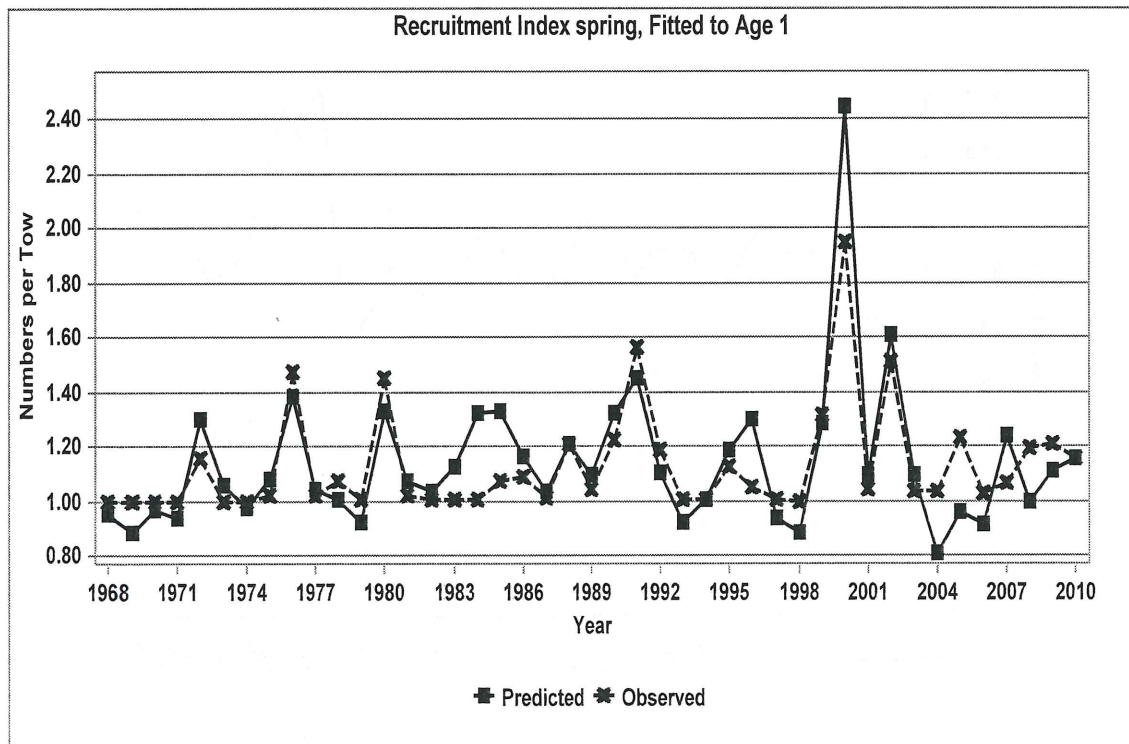


Figure 11. Predicted and observed black sea bass recruitment indices from updated SCALE model.

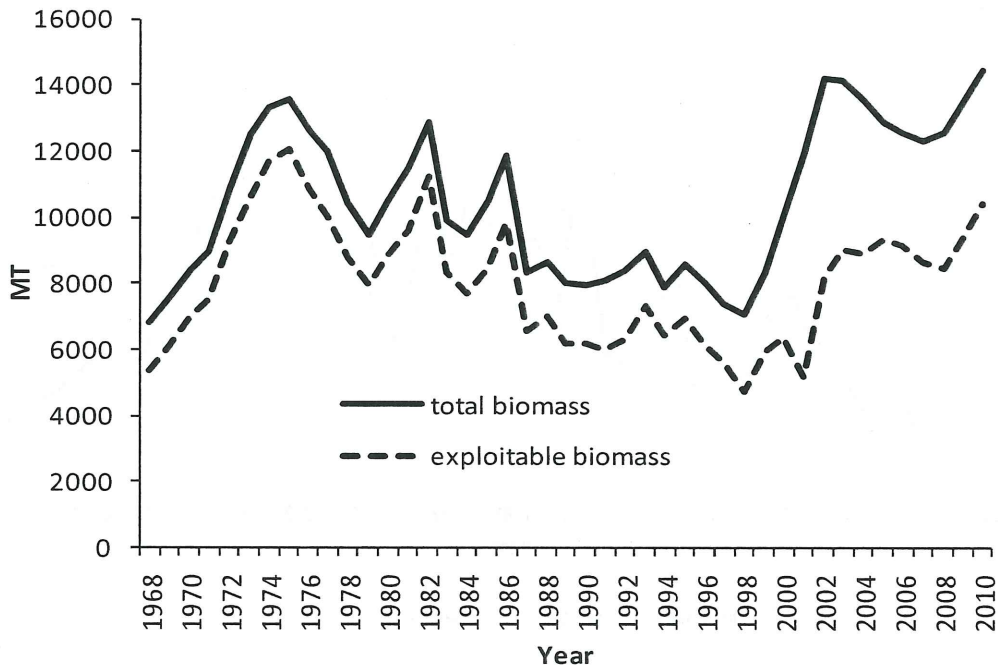


Figure 12. Estimated black sea bass total and exploitable biomass (mt) from SCALE model update, 1968-2010.

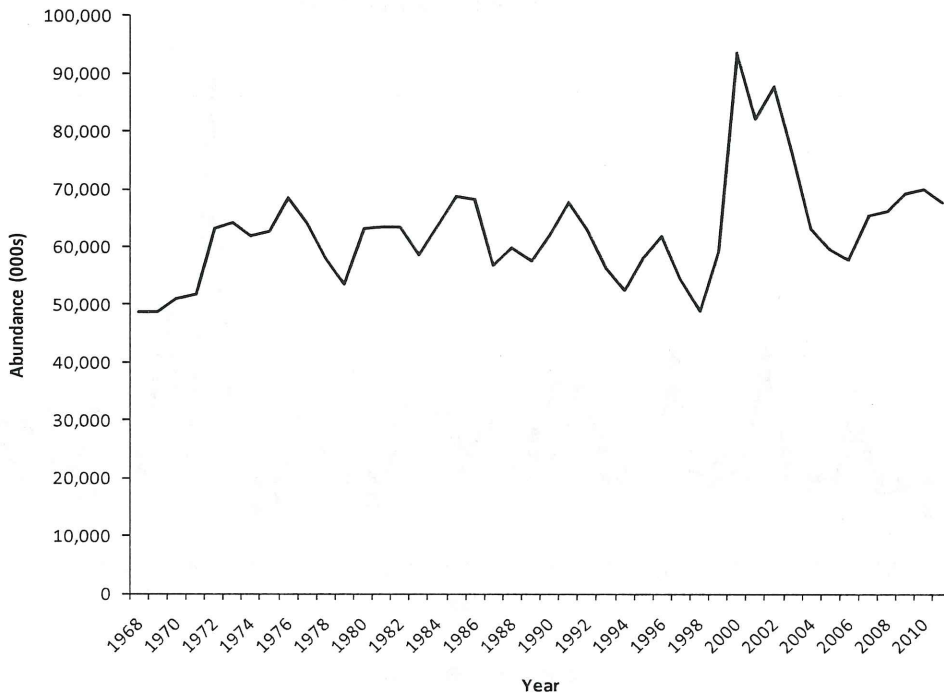


Figure 13. Model estimate of total black sea bass abundance (000s, Jan. 1<sup>st</sup>), from SCALE model update 1968-2010.