

B. BLACK SEA BASS ASSESSMENT SUMMARY FOR 2011

State of Stock:

The SARC-53 Review Panel did not believe that the new statistical catch at age model (ASAP) for black sea bass (*Centropristis striata*) brought forward to SARC-53 provided a sound scientific basis for management.

The last approved stock assessment model – a statistical catch at length (SCALE) model was approved at the Data Poor Working Group meeting in December 2008 (NEFSC 2009a, 2009b) and has been updated annually in support of management. The SCALE model was most recently used in June and July 2011 (MAFMC 2011; NEFSC 2011) to estimate the status of the stock compared to previously accepted reference points. Based on that analysis, a comparison of 2010 estimates of the spawning stock biomass and fishing mortality rate to existing biological reference points (SSB_{MSY} proxy estimate = 12,537 mt [27.6 million lbs] and F_{MSY} proxy estimate = 0.42) indicated that black sea bass was not overfished and overfishing was not occurring. SSB in 2010 was estimated to be 13,926 mt (30.7 million lbs) and the fully selected F was estimated to be 0.41. The 2010 stock was at 111% of the SSB_{MSY} proxy. Based on deterministic projections for 2012 at the F_{MSY} proxy (0.42), the resulting catch would be 3,551 mt (7.8 million lbs) with landings equal to 2,841 mt (6.3 million lbs) (assuming the release mortality rate that was used in June 2011).

Catch and Status Table: Black Sea Bass (mt)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Min	Max	Mean
Commercial landings ¹	1,299	1,587	1,359	1,405	1,298	1,285	1,037	875	523	751	523	1,635	1,221
Commercial discard ¹	187	24	58	370	29	16	57	37	165	110	16	483	103
Recreational landings ¹	1,545	1,983	1,498	762	852	898	1,011	713	1,049	1,351	519	2,815	1,341
Recreational discards ¹	309	391	314	142	150	173	220	252	228	231	33	391	147
Catch used in assessment ¹	3,340	3,985	3,230	2,679	2,330	2,372	2,326	1,877	1,965	2,444	1,877	3,985	2,812
Commercial quota (mt)	1,372	1,511	1,511	1,778	1,823	1,778	1,111	938	511	1,066	511	1,823	1,347
Recreational harvest limit (mt)	1,428	1,573	1,573	1,851	1,897	1,851	1,157	975	975	830	830	1,897	1,415

¹: Over the period 1984-2010

Stock Distribution and Identification:

The Mid-Atlantic Fishery Management Council (MAFMC) and Atlantic States Marine Fisheries Commission (ASMFC) Fishery Management Plan for black sea bass defines the management unit as all black sea bass from Cape Hatteras, North Carolina northeast to the US-Canada border (MAFMC 1999).

Catch:

The principal gears used in commercial fishing for black sea bass are fish pots, otter trawl and hand-line. After peaking at 9,900 mt (21.8 million lbs) in 1952, commercial landings markedly decreased during the 1960s, and have since ranged between about 600 (1.3 million lbs) and 2,000 mt (4.4 million lbs) (Figure B1). Commercial landings averaged 1,300 mt (2.9 million lbs) annually during 1988-1997. Commercial fishery quotas were implemented in 1998, and landings then ranged between 1,300 mt (2.9 million lbs) and 1,600 mt (3.5 million lbs) during 1998-2007. Recent quota restrictions resulted in declining commercial landings of 523 (1.2 million lbs) and 751 mt (1.7 million lbs) in 2009 and 2010, respectively. The recreational rod-and-reel fishery for black sea bass harvests a significant proportion of the total catch. After peaking in 1986, recreational landings averaged 1,700 mt (3.7 million lbs) annually during

1988-1997. Recreational fishery harvest limits were implemented in 1998, and landings then ranged between 500 mt (1.1 million lbs) and 2,000 mt (4.4 million lbs) during 1998-2010. Landings in 2010 were 1,350 mt (3.0 million lbs). Commercial fishery discards, although poorly estimated, appear to be a minor part of the total fishery removals from the stock, generally less than 200 mt (0.4 million lbs) per year. Recreational discards, assuming 15% hook and release mortality, are similar ranging from 30 (0.01 million lbs) to 390 mt (0.9 million lbs) per year.

Data and Assessment:

The age-structured model presented to the SARC-53 Review Panel was rejected. The last previously approved peer reviewed assessment model was a statistical catch at length model.

Biological Reference Points:

The 2008 DPSWG Peer Review Panel (NEFSC 2009a) recommended that F40% be used as a proxy for the FMSY overfishing threshold reference point and spawning stock biomass at F40% (SSB40%) be used as the proxy for the stock biomass target reference point. Estimates of the BRPs are F40% = 0.42, SSB40% = 12,537 mt (27.6 million lbs), and MSY = 3,903 mt (8.6 million lbs).

Ecosystem Considerations:

Black sea bass are a temperate reef fish utilizing natural habitats such as sponges and other soft bottom habitats, mussel beds, rocky habitats, shipwrecks and artificial reefs. Sea bass prey on small prey fishes and invertebrates and are preyed upon by sharks, skates and other predatory fishes such as weakfish, bluefish and summer flounder.

Special Comments:

The Review Panel endorses a switch to the use of an arithmetic survey index as opposed to a logarithmic survey index for use in future assessments.

Black sea bass is the only known protogynous hermaphroditic species north of Cape Hatteras, NC which is targeted by a fishery. The response of this species, as well as other hermaphroditic species, to exploitation is not fully understood.

The Review Panel notes that the work completed in preparing the ASAP model represents a considerable improvement in summarizing the information in the data.

The Review Panel felt that an age-structured approach has the potential to present a robust assessment approach for this species, even though the model brought forward in SARC-53 was not accepted. In particular, the Panel notes

- Inherent deficiencies in the data collection programs for this species limit the information available for the assessment; these issues include this species' strong association with structure during times when it is distributed in inshore regions
- There seems to be a degree of spatial structure within the managed stock that compromised the ability to fit a single age-structured model throughout the stock area.

The Review Panel recommends continuation and expansion of the current sampling programs that collect data on catch, abundance and biological characteristics of the stock including age.

The Review Panel suggests that new data, such as a species-specific survey, improved information on operational sex-ratios and information on mixing among population sub-units will likely be required to produce an assessment that provides an improved scientific basis for management.

The Review Panel notes that concerns regarding these issues will affect all black sea bass stock assessment approaches.

In considering all of these issues, the Review Panel suggest that development of an effective model is likely to require a considerable investment of additional effort and will not be achieved in the short term.

References:

Mid-Atlantic Fishery Management Council. (MAFMC). 1999. Amendment 12 to the Summer flounder, scup and black sea bass fishery management plan. Dover, DE. 398 p + appendix.

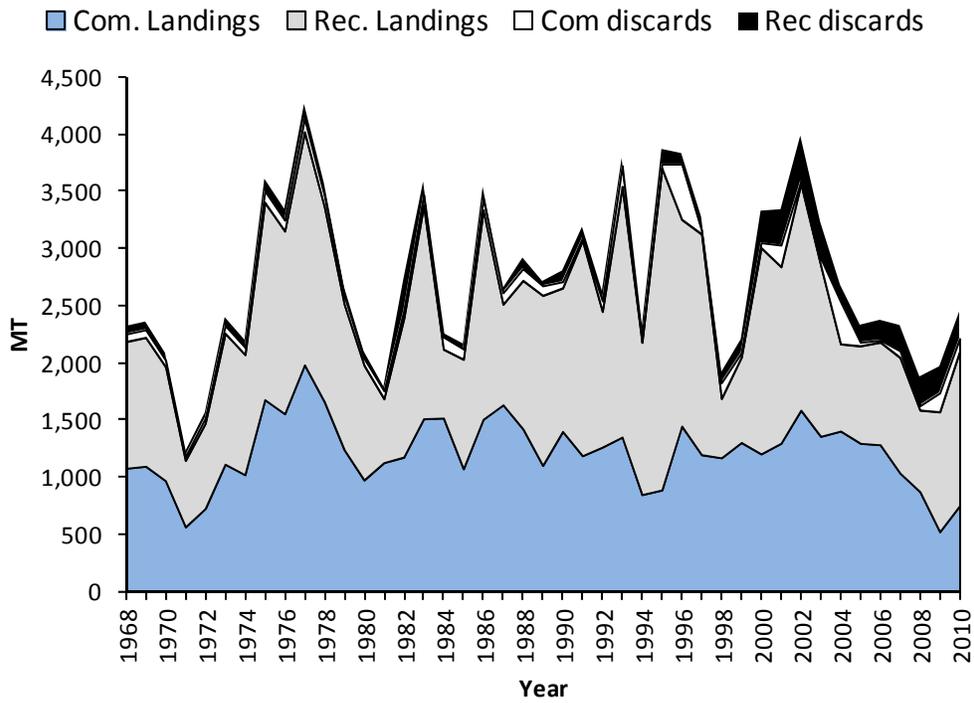
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Northeast Fisheries Science Center (NEFSC) 2009a. Report by the Peer Review Panel for the Northeast Data Poor Stocks Working Group, 20 January 2009. 34 p.

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Northeast Fisheries Science Center (NEFSC) 2011. Black sea bass 2012 projection update. Unpublished manuscript by Gary Shepherd. 12 pp.

Steimle, F.W., C.A. Zetlin, P.L. Berrien and S. Chang. 1999. Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-143. 50 pp.



B1. Components of total black sea bass catch (mt) (Commercial and Recreational).