MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901-3910
Phone: 302-674-2331 | Toll Free: 877-446-2362 | FAX: 302-674-5399 | www.mafmc.org
Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

DATE: September 24, 2013

TO: Council

FROM: Kiley Dancy, Staff

SUBJECT: Black Sea Bass Management Measures for 2014 and 2015

The following materials are enclosed for Council consideration of the above subject:

1) Summary of Monitoring Committee Recommendations (*See Summer Flounder Briefing Book Tab*)
2) September 2013 Scientific and Statistical Committee Meeting Report (*See Summer Flounder Briefing Book Tab*)
3) Staff Recommendation Memo
4) Comment letter from Capt. Monty Hawkins
5) Summer Flounder, Scup, and Black Sea Bass Fishery Performance Reports (*See Summer Flounder Briefing Book Tab*)
6) Black Sea Bass Advisory Panel Information Document

Links to the following additional reference materials can be found on the October 2013 briefing book page on the Council's website, at http://www.mafmc.org/briefing/october-2013:

1) April 2013 Black Sea Bass Data Workshop Recommendation Summary
2) January 2013 Scientific and Statistical Committee Meeting Report (special meeting for consideration of black sea bass issues)

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Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

DATE: September 5, 2013

TO: Chris Moore, Executive Director

FROM: Kiley Dancy, Staff

SUBJECT: Black Sea Bass Management Measures for 2014 and 2015

Executive Summary

Based on the latest stock assessment update in July of 2012, the black sea bass stock is not overfished and overfishing is not occurring. The 2011 stock was estimated to be at 102% of the spawning stock biomass at maximum sustainable yield (SSBMSY). Multi-year specifications were previously set for black sea bass through the 2014 fishing year (Table 1). Staff recommend no changes to the 2014 specifications and an extension of these same specifications into 2015.

Table 1: Specifications for black sea bass in 2014 (current) and 2015 (staff recommended).

2014 (current)	**ABC**	5.50 mil lb (2,495 mt)
	Commercial ACL = ACT	2.60 mil lb (1,179 mt)
	Recreational ACL = ACT	2.90 mil lb (1,315 mt)
2015 (staff recommended)	**ABC**	5.50 mil lb (2,495 mt)
	Commercial ACL = ACT	2.60 mil lb (1,179 mt)
	Recreational ACL = ACT	2.90 mil lb (1,315 mt)

After adjusting for an allowance of up to 3% of the total allowable landings (TAL) for the Research Set-Aside (RSA) Program in 2014, the commercial quota is 2.17 million lb (986 mt), and the recreational harvest limit is 2.26 million lb (1,026 mt). 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).

Introduction

The Magnuson-Stevens Act (MSA) requires each Council's Scientific and Statistical Committee (SSC) to provide ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch (ABC), prevention of overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for any given fishing year cannot exceed the ABC recommendation of the SSC. In addition, the Monitoring Committees established by the fishery management plan (FMP) are responsible for developing recommendations for management measures designed to achieve the recommended catch limits.

For fishing year 2015, the SSC will provide an ABC for black sea bass that addresses scientific uncertainty, and the Monitoring Committee will recommended annual catch targets (ACTs) and management measures to address management uncertainty. For 2014, both the SSC and Monitoring Committee will review the measures currently implemented and determine if changes may be warranted. Based on the SSC and Monitoring Committee recommendations, the Council will make a recommendation to the National Marine Fisheries Service (NMFS) Northeast Regional Administrator. Because these species are 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. In this memorandum, information is presented to assist the SSC and Monitoring Committee in developing recommendations for the Council and Board to consider for the 2014 and 2015 fishing years for black sea bass.

Additional relevant information about the fishery and past management measures is presented in the Fishery Performance Report for black sea bass developed by the Council and Commission Advisory Panels, as well as in the corresponding Black Sea Bass Information Document prepared by Council staff.

Catch and Landings

Based on dealer data and Marine Recreational Information Program (MRIP) data, 2012 commercial and recreational landings were 1.74 million lb (789 mt) and 3.30 million lb (1,497 mt), respectively. The 2013 commercial landings as of the week ending August 24, 2013, indicate that 79% of the coastwide commercial quota has been landed (Table 2).

Table 2: The 2013 black sea bass quotas and the amount of black sea bass landed by commercial fishermen, in lb, in each state.

	Commercial			Research
State	**Cumulative Landings (lb)[a]**	**Quota (lb)**	**Percent of Quota (%)**	**Set-Aside Landings (lb)a**
ME	0			0
NH	0			0
MA	140,542			11,771
RI	207,335			6,860
CT	20,047			358
NY	98,703			19,114
NJ	227,429			3,430
DE	48,242			0
MD	191,977			0
VA	421,081			103
NC	59,102			0
Other	0			0
Totals	**1,414,458**	**1,780,000**	**79**	**41,636**

[a] Quotas adjusted for research set-aside and overages. Source: NMFS Weekly Quota Report for week ending August 24, 2013.

Regulatory Review

In July 2012, the SSC met to recommend an ABC for black sea bass for fishing year 2013, and to consider specifying multi-year ABCs for up to three years. The SSC recommended ABCs for black sea bass for 2013, 2014, and 2015.

The overfishing limit (OFL) provided by the assessment update for 2013 was specified as 7.00 million lb (3,175 mt), based on an F_{MSY} proxy of $F_{40\%}$ = 0.44. However, the SSC did not endorse this estimate because of concerns about the unresolved uncertainty in the OFL related to stock mixing, life history, and natural mortality. The SSC recommended an ABC of 4.50 million lb (2,041 mt), based on the same constant catch approach used for black sea bass from 2010-2012.

In December of 2012, the Council requested that the SSC revisit its 2013 and 2014 recommendations for black sea bass ABC, re-examine the assessment level, and respond to a recommendation from the Monitoring Committee to examine additional black sea bass data. The SSC met in January 2013 to review and evaluate new information available relative to fishery performance (including recent catch data) and abundance and recruitment (i.e., state survey data). The SSC concluded that there was little information in these data that would lead to a change in the ABC recommendation, the constant catch approach, or the designation of the assessment as level 4. However, the SSC believed it was appropriate to re-evaluate whether the constant catch level used since 2010 (4.50 million lb) was still appropriate. The SSC evaluated the performance of the ABC and concluded that its continued application into 2013 and 2014 was overly conservative, and recommended a 2013-2014 ABC based on a revised constant

catch level of 5.50 million lb (2,494 mt). This corresponds to a commercial ACL and ACT of 2.60 million lb (1,179 mt) and a recreational ACL and ACT of 2.90 million lb (1,315 mt).

The SSC considered black sea bass to be a level 4 assessment, and considered the following to be the most significant sources of uncertainty: difficulty in determining appropriate reference points due to atypical life history strategy (protogynous hermaphrodite); assessment assumption of a completely mixed stock, despite tagging analyses suggesting otherwise; uncertainty 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); and concern about the application of trawl calibration coefficients (ALBATROSS IV vs BIGELOW) and their influence on the selectivity pattern and results of the assessment.

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.

Stock Status and Biological Reference Points

The most recent accepted 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/.

The biological reference points for black sea bass were updated as part of the 2012 assessment update[1], as the result of several changes made to the information incorporated into the SCALE model. The updated fishing mortality threshold for black sea bass is $F_{MSY} = F_{40\%}$ (as F_{MSY} proxy) = 0.44, and SSB_{MSY} is 24.00 million lbs (10,880 mt). The minimum stock size threshold, one-half SSB_{MSY} is estimated to be 12.00 million lb (5,440 mt).

The July 2012 assessment update indicates the black sea bass stock was not overfished and overfishing is not occurring in 2011, relative to the biological reference points. Fishing mortality (F_{MULT}) in 2011 was F = 0.21, below the fishing mortality threshold of F=0.44. Total stock biomass in 2011 was estimated at 28.0 million lb (12,700 mt), above B_{MSY}. SSB in 2011 is estimated at 24.57 million lb (11,145 mt), and was at 102% 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 2011 (2010 cohort) was 21.0 million fish.

[1]Shepherd, G.R. 2012. Black Sea Bass Assessment Summary for 2012. Northeast Fisheries Science Center.

Basis for 2014 and 2015 ABC Recommendation

Input from the Council's Visioning and Strategic Planning processes as well as from the Advisory Panel Fishery Performance Reports highlight stakeholder interest in increasing the stability of fishery management measures. This was a significant motivation in moving toward multi-year specifications, which are already in place in 2014 for black sea bass.

In April 2013, a black sea bass data workshop was sponsored by the Partnership for Mid-Atlantic Fisheries Science (PMFAS) and conducted by the Atlantic States Marine Fisheries Commission (ASMFC). The working group summarized available state, federal, and other fishery independent and dependent data and projects, and made a list of research recommendations to address concerns regarding uncertainties in the black sea bass stock assessment. The working group concluded that the additional data sets and analyses examined would not likely result in any near-term changes in the perception of uncertainty in the assessment, and similarly that it was highly unlikely that perception of uncertainty would change as the result of an assessment update. The working group recommended delaying the scheduled 2014 black sea bass benchmark stock assessment to 2016 or later, to allow for progress to be made on interim analyses and advances in modeling approaches.

Given that the current state of scientific information for black sea bass has changed little since the January 2013 SSC meeting, and that no new assessment updates are likely to be provided in 2014, staff recommend no changes to the 2014 specifications and recommend that these specifications be extended into the 2015 fishing year.

Other Management Measures

Recreational and Commercial ACLs

The acceptable biological catch (ABC) is equivalent to the total allowable catch (TAC) and the sum of the commercial and recreational ACL equals the ABC (Figure 2).

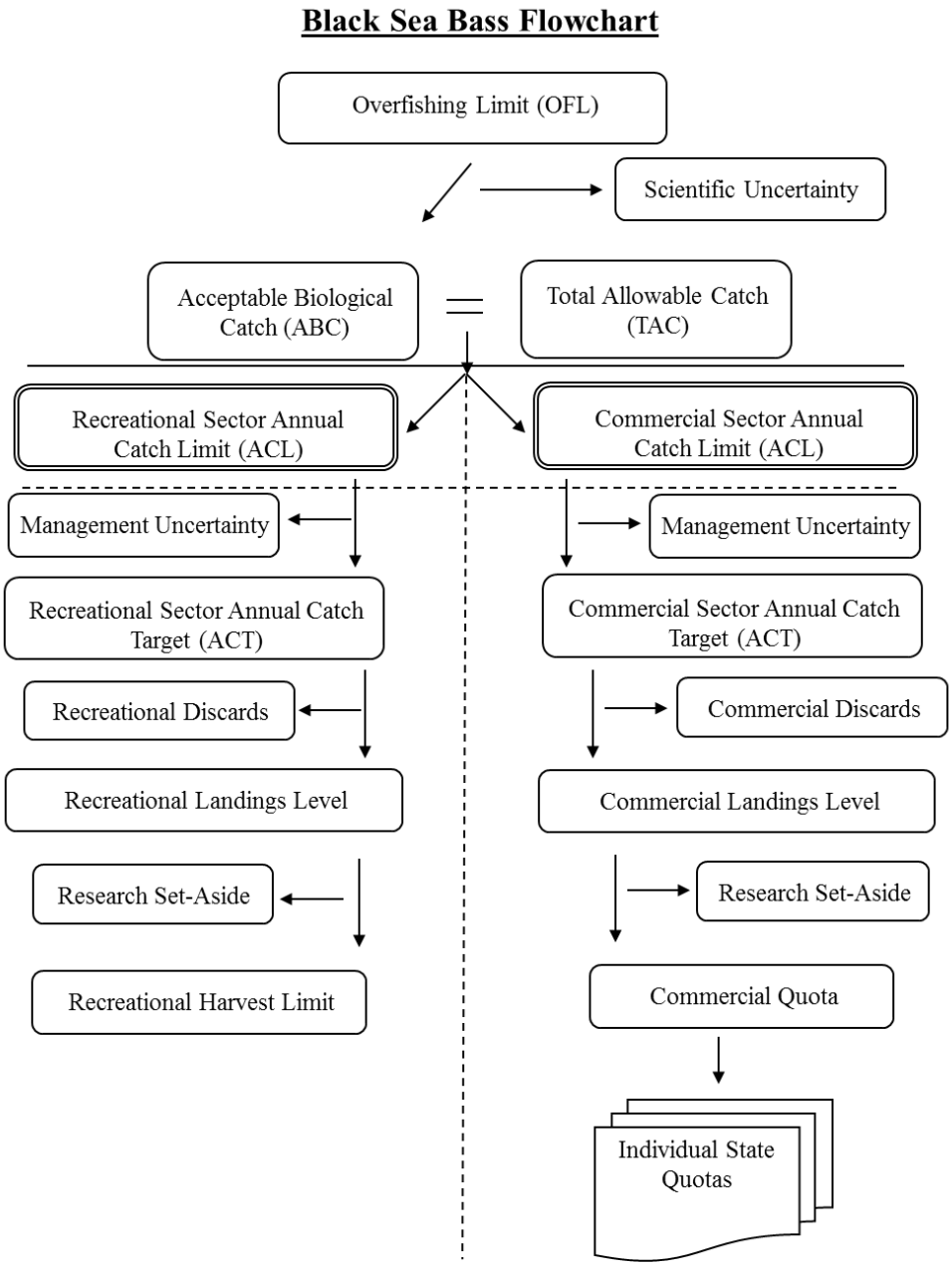

Figure 2: Flowchart for black sea bass catch and landings limits.

The ABC in place for 2014 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. Discards are apportioned based on the contribution from each fishing sector using the 2010-2012 average ratios; 61% of dead discards are attributable to the recreational fishery, 39% to the commercial.

Considerations for ACTs

The Black Sea Bass Monitoring Committee is responsible for recommending ACTs for the Council to consider. The relationship between the recreational and commercial ACTs, and other catch components are given in Figure 2. The Monitoring Committee may provide other recommendations relevant to setting catch limits consistent with the MSA. The Monitoring Committee should 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 for ACT recommendations, 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).

The recent year sector-specific landings performance indicates that the recreational fishery had been somewhat variable in its performance relative to the harvest limits, but has periodically experienced large overages, including a significant overage in 2012 (Table 3). Staff recommend a reduction in catch from the recreational ACL to address management uncertainty in the black sea bass fishery, including uncertainty with respect to the ability to constrain landings to desired levels. The application and appropriate magnitude of such a reduction should be evaluated by the Monitoring Committee.

The staff recommend the commercial ACL equal the commercial ACT because of the performance of commercial fishery and quota monitoring systems in place.

Table 3: Black sea bass commercial and recreational fishery performance relative to quotas and harvest limits, 2008-2012.

Year	Commercial Landings (mil lb)	Commercial Quota (mil lb)	Percent Overage(+)/ Underage(-)	Recreational Landings (mil lb)	Recreational Harvest Limit (mil lb)	Percent Overage(+)/ Underage(-)
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%
2011	1.684	1.711	-2%	1.146	1.781	-36%
2012	1.736	1.710	2%	3.30[1]	1.32	+150%
5-yr Avg.	-	-	-2%	-	-	+51%

[1] Includes recreational landings for all of North Carolina (not post-stratified at Cape Hatteras).

Commercial Quota, Recreational Harvest Limit, and Research Set-Aside

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) are equal to overall TAL. Current specifications include a commercial quota of 2.17 million lb (986 mt) and a recreational harvest limit of 2.26 million lb (1,026 mt) in 2014. The ASMFC allocates the commercial quota to each state based on the allocation percentages given in Table 4.

Table 4: 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
Totals	100

Specific management measures that will be used to achieve the harvest limit for the recreational fishery in 2014 and 2015 will not be determined until after the first four waves of the previous year's

recreational landings are reviewed. These data will be available in October 2013 (for fishing year 2013) and October 2014 (for fishing year 2014). The Monitoring Committee will meet in November of each year to review these landings data and make recommendations regarding changes in the recreational management measures (i.e., possession limit, minimum size, and season). Given the performance of the recreational fishery relative to the recreational harvest limit in recent 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 sizes for black sea bass in federal and state waters. The Council and Commission increased the size limit to an 11 inch-TL in 2002. Staff recommend that the size limit remain at 11 inch-TL. Amendment 9 also established gear regulations that became effective in December of 1996. 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 trawl mesh regulations.

The Council and Commission adopted modifications to the circle vent size in black sea bass pots/traps, effective in 2007, based on the findings of a Council and Commission sponsored workshop. The minimum circle vent size requirements for black sea bass pots/traps were increased from 2.375 inch to 2.5 inch. The requirements of 1.375 inch x 5.75 inch for rectangular vents and 2 inch for square vents remained unchanged. In addition, 2 vents are required in the parlor portion of the pot/trap. Staff recommend no change in these pot/trap regulations.

Dancy, Kiley

From: Capt. Monty Hawkins <mhawkins@mediacombb.net>
Sent: Wednesday, September 11, 2013 9:40 PM
To: Dancy, Kiley; Kerns, Toni; Coakley, Jessica; Gary Shepherd; John Manderson; Brown, Russ; Sam Rauch; Chris Moore; Beal, Robert; Bullard, John
Cc: O'Connell, Tom; Carrie Kennedy; Lynn Fegley; King, Howard; Luisi, Michael; Jim Uphoff
Subject: BSB's Response To Management

I believe you should all seriously ponder how the sea bass population climbed almost straight up from 1999 to 2003 despite recreational removals at greater than 50% - even 80% - of fish hooked.
When we were keeping 50 to 80% of all sea bass caught, the stock grew.
Now we keep well below 20% and the stock shrinks . .

Greetings Good Folks,
At the advisory panel meeting in Baltimore Tuesday a chart created by Gary was presented:
"Figure 2: Estimated black sea bass total and exploitable biomass (mt) from SCALE model update, 1968-2011. Also shown are the biological reference points associated with total biomass. Source: Shepherd 2012. "
Computer illiteracy exposed, I cannot copy & paste it. Googles easily.
Appearing to bottom in 1998 & peak in 2003, I think it very clearly shows the explosive population growth of sea bass in early management. It also shows how something has gone badly wrong since despite regulatory tightening in emergency closures & an enourmous northward habitat expansion in warming waters.
I believe you should all seriously ponder how the sea bass population climbed almost straight up despite recreational removals at greater than 50% - even 80% - of fish hooked.
I believe what I was told back then was true, "Every 9 inch sea bass has spawned, some twice."
Its nearly untrue now.
Bright blue knotheads unmistakable, we frequently saw 7.5 to 9 inch males in early management; sometimes by the thousand.
This year I've seen two. Two under 9 inch mature male sea bass..
In the early 2000s my clients often had limits. Pool winners were nearly always north of 4 pounds.
A cbass has to escape at least 7 years fishing effort to get 4 lbs.
Pool winners today are two pounds, sometimes three. Had a handful of fish over 4 this year.

Look at the catch data I've provided below. When we were keeping 50 to 80% of all sea bass caught the stock grew.
Now we keep well below 20% and the stock shrinks

..along with our season.

Were management to again increase our sea bass proportionally; Were we again to see our region's stock at, or near, habitat capacity: Only then would habitat's value be plainly seen.
If you learn to Fill Habitat To Capacity, then the only way to increase a population thereafter is to increase the habitat..
When a reef-fish population is nearing habitat capacity, the benefit of increasing habitat becomes plain to see.
It was in 2003.

Please note the lag in catch to regulation. That, for instance, all the fish we caught in 2003 were spawned by fish protected by a 9 & 10 inch size limit.. No closed season. No creel Limit..

You can't just shrug your shoulders and press on with tighter & tighter regulation.
You must discover what makes management work.

Regards,
Monty

One Week's Sea Bass Landings – An Average.

Year	Landed	Released	Total	% Kept	Size	Regs forming SSB
1997	19.1	4.3	23.4	81.6%	9	- 9 (self reg)
1998	21.1	3.1	24.2	87.2%	9	- 9 (partial state compliance)
1999	13.6	11.9	25.5	53.33%	10	- 9
2000	21.5	17.2	38.7	55.55%	10	- 9
2001	16.6	23.7	41.8	44.49%	11 *	- 10
2002	14.7	44.3	59.0	24.97%	— 11.5	- 10
2003	24.3	87.0	111.3	21.83%	— 12	- 10
2004	15.8	33.0	49.1	32.17%	12	- 11 (Feb/Mar Fluke Trawl Bycatch Event)
2005	18.5	43.3	61.8	29.93%	12	- 11.5
2006	18.9	53.1	72.0	26.24%	— 12	- 12
2007	16.6	32.6	49.8	33.33%	12	- 12
2008	12.7	32.5	45.2	28.09%	— 12	- 12
2009	13.3	57.1	70.5	18.86%	— 12.5	- 12
2010	10.1	27.0	37.0	27.29%	12.5	- 12 Gunshot Start
2011	12.9	82.5	95.3	13.53%	— 12.5	- 12 Gunshot
2012	07.7	38.5	45.1	17.07%	— 12.5	- 12.5 Gunshot
2013	05.2	28.7	33.9	15.34%	— 12.5	- 12.5 Gunshot

*First Year Of Possession Limit
** Gunshot Start (so the end of May should be outrageously good)
On "Regs forming SSB" I calculate size limit in play when the SSB was spawned.

Here I've assembled these various charts for comparison with older works.

Age WAA (g)

Age/weight from: **Estimating Black Sea Bass Natural Mortality Using Several Methods** - Julie L. Nieland and Gary R. Shepherd - October 2011

Original Graph in BOLD {page 28 - Table 1. Black sea bass mean weight at age (in grams)..} Conversion to pounds and brackets ( ) here from M. Hawkins and of no association to the authors.

Length Conversions Computed From "BSB Probability of Age at Length Key - G. Shepherd" by M. Hawkins. (attached) No one has reviewed these simple computations by M. Hawkins..

(0 - <0.25 lbs - 0 to 5.5 inches)

Age 1 - 112.92g - 0.25 lbs - 5.5 to 9.1 inches.

Age 2 - 243.19g - 0.54 lbs - 8.7 to 12.2 inches.

Age 3 - 395.48g - 0.871 lbs - (3 to 4 yrs) 10.6 to 16.1 inches.

Age 4 - 604.69g - 1.33 lbs - (4 to 7 yrs) 13.4 to 20.5 inches.

Age 5 - 861.95g - 1.90 lbs - (5 to 9 yrs) 16.5 to 22.0 inches.

Age 6 - 1279.68g - 2.82 lbs - Over 20 inches just becomes too fuzzy..

Age 7 - 1542.01g - 3.4lbs

Age 8 - 1821.36g - 4.01lbs

Age 9 - 1974.56g - 4.35 lbs

Age 10 - 2658.4g - 5.86 lbs

Age 11 - 3149.8g - 6.94 lbs

Age 12 - 3689.1g - 8.13 lbs

*

From tag returns we see a faster growth rate in southern Mid-Atlantic tautog than in their northern range. Presumably such a growth variance could also be found in sea bass.

As all living things, some individual fish grow faster - we know a 4 year old sea bass @ 20.5 inches will weigh more than 1.9 pounds..

Management should also look for false foundations of modern regulation in early MRFSS weights. From 1981 to 2000 the MRFSS has the average MAB sea bass at about .4 K or .88 pounds. That wouldn't have occurred until 2002 or so. The real average weight before and especially during early management would have been 0.125 K or .25 pounds....

Black Sea Bass Advisory Panel Information Document[1]

August 2013

Management System

The Fishery Management Plan (FMP) for black sea bass became effective in 1997 when it was incorporated into the Summer Flounder and Scup FMP. The FMP established the management unit for black sea bass (*Centropristis striata*) as the U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina to the U.S.-Canadian border. The FMP additionally included measures to ensure effective management of the black sea bass resource. Two management entities work cooperatively to develop fishery regulations for black sea bass: the Atlantic States Marine Fisheries Commission (ASMFC), and the Mid-Atlantic Fishery Management Council (MAFMC). The National Marine Fisheries Service (NMFS) works in conjunction with the MAFMC as the federal implementation and enforcement entity. This cooperative management endeavor was developed because significant portions of black sea bass catch are taken from both state (0-3 miles offshore) and Federal waters (3-200 miles offshore).

The commercial and recreational black sea bass fisheries are managed using catch and landings limits, commercial quotas, recreational harvest limits, minimum fish sizes, gear regulations, permit requirements, and other provisions as prescribed by the FMP. Black sea bass was under a stock rebuilding strategy beginning in 2000 until it was declared rebuilt in 2009. The FMP, including subsequent Amendments and Frameworks, is available on the Council website at: http://www.mafmc.org/fisheries/fmp/sf-s-bsb.

Basic Biology

Detailed information on black sea bass life history and habitat requirements can be found in the documents titled "Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics" (Steimle et al. 1999) as well as in an update of that document, "Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics (2nd Edition)" (Drohan et al. 2007). Electronic versions are available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/. Information contained in these documents is summarized here.

The northern population of black sea bass spawns in the Middle Atlantic Bight over the continental shelf during the spring through fall, primarily between Virginia and Cape Cod, Massachusetts. Spawning begins in the spring in the southern portion of the population range, i.e., off North Carolina and Virginia, and progresses north into southern New England waters in the summer and fall. Collections of ripe fish and egg distributions indicate that the species spawns primarily on the inner continental shelf between Chesapeake Bay and Montauk Pt., Long

[1] Data employed in the preparation of this document are from unpublished National Marine Fisheries Service (NMFS) Dealer, Vessel Trip Reports (VTRs), Permit, and Marine Recreational Statistics (MRFSS/MRIP) databases, as of August 2013, unless otherwise noted.

Island. The duration of the larval stage and habitat-related settlement cues are unknown; therefore, distribution and habitat use of this pelagic stage may only partially overlap with that of the egg stage. Adult black sea bass are also very structure oriented, especially during their summer coastal residency. Unlike juveniles, they tend to enter only larger estuaries and are most abundant along the coast. Larger fish tend to be found in deeper water than smaller fish. A variety of coastal structures are known to be attractive to black sea bass, including shipwrecks, rocky and artificial reefs, mussel beds and any other object or source of shelter on the bottom. In the warmer months, inshore, resident adult black sea bass are usually found associated with structured habitats. During the summer, adult black sea bass share complex coastal habitats with other fishes including tautog, hakes, conger eel, sea robins and other transient species. Essential Fish Habitat for black sea bass consists of pelagic waters, structured habitat (e.g., sponge beds), rough bottom shellfish, and sand and shell, from the Gulf of Maine through Cape Hatteras, North Carolina.

Black sea bass attain a maximum size of around 60 cm (23.6 in) and 4 kg (8.8 lb), with a maximum age for females of 8 and age 12 for males (DPSWG 2009). Maturity data is routinely collected on Northeast Fisheries Science Center (NEFSC) survey cruises and model estimates for length suggest 50 percent maturity occurs at 20.4 cm (8.0 inches) with 95 percent maturity attained by 28 cm (11.0 inches).

Adult black sea bass are generalist carnivores that feed on a variety of infaunal and epibenthic invertebrates, especially crustaceans (including juvenile lobster, crabs, and shrimp), small fish, and squid. The NEFSC food habits database lists the spiny dogfish, Atlantic angel shark, skates, spotted hake, summer flounder, windowpane, and goosefish as predators of black sea bass.

Status of the Stock

The most recent accepted benchmark assessment on black sea bass, which used a statistical catch at length (SCALE) model, was peer-reviewed and accepted in December 2008 by the Data Poor Stock Working Group (DPSWG) Peer Review Panel (DPSWG 2009). Reports on "Stock Status," including annual assessment and reference point update reports, Stock Assessment Workshop (SAW) reports, Stock Assessment Review Committee (SARC) panelist reports, and DPSWG reports and peer-review panelist reports are available online at the NEFSC website: http://www.nefsc.noaa.gov/saw/.

Based on the July 2012 assessment update, the stock was not overfished and overfishing was not occurring in 2011, relative to the DPSWG biological reference points. The 2011 stock was at 102% of the spawning stock biomass at maximum sustainable yield (SSB_{MSY}). Fishing mortality (F_{MULT}) in 2011 was F = 0.21, a decrease from F=0.41 in 2010 (Figure 1). This point estimate of F in 2011 is below the fishing mortality threshold of F=0.44. Estimates for 2011 total biomass were at 28.0 million lb (12,700 mt), above the value for B_{MSY}. Spawning stock biomass (SSB) in 2011 was estimated at 24.6 million lb (11,145 mt). 2011 SSB was 102% of SSB_{MSY} (24.0 million lb, 10,880 mt; Figure 2). 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 2011 (2010 cohort) was 21.0 million fish.

The DPSWG Panel noted that despite acceptance of the assessment model there was *"considerable uncertainty with respect to stock status*." The review Panel also recommended that the SSC *"recognize and allow for the sizeable uncertainty in stock status when establishing catch limits."*

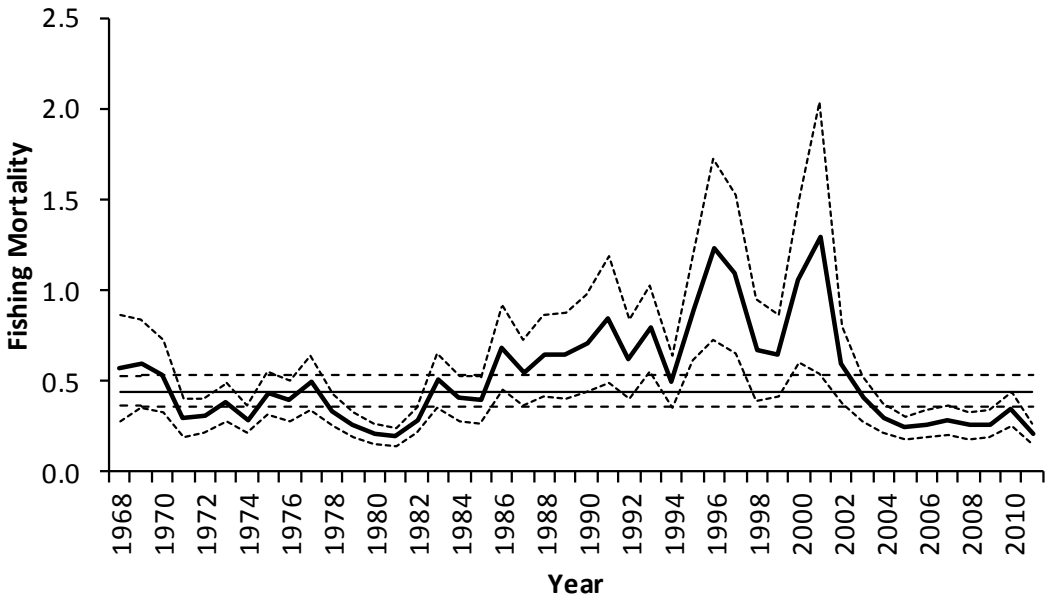

Figure 1: Estimated fishing mortality (+/- 2 standard deviations) of black sea bass from 1968-2011. Horizontal lines are $F_{MSY} \pm$ 80% confidence interval. Source: Shepherd 2012.

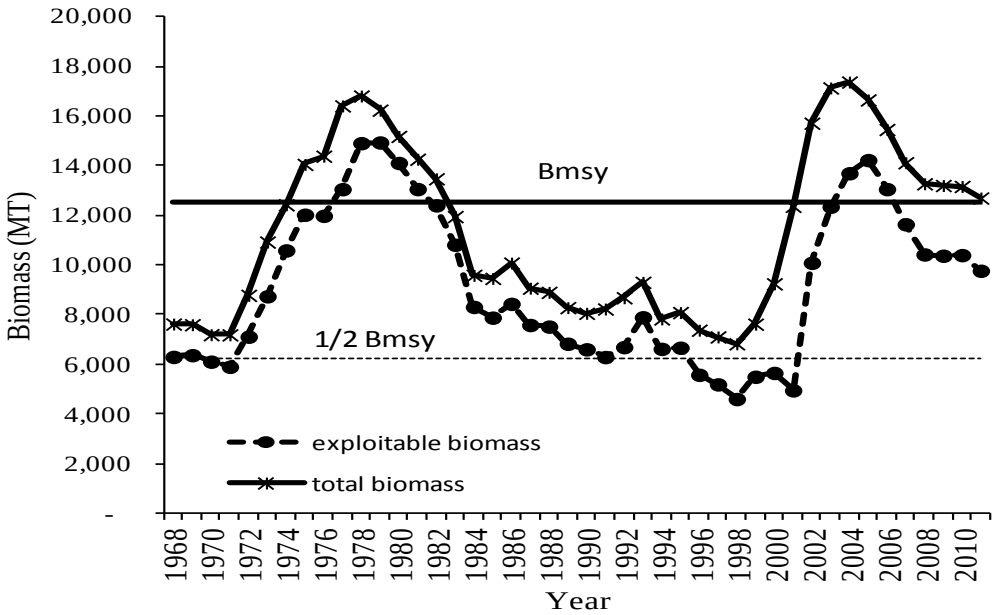

Figure 2: Estimated black sea bass total and exploitable biomass (mt) from SCALE model update, 1968-2011. Also shown are the biological reference points associated with total biomass. Source: Shepherd 2012.

Fishery Performance

There are significant commercial and recreational fisheries for black sea bass. Black sea bass is managed primarily using output controls (catch and landings limits), with 49 percent of the landings being allocated to the commercial fishery as a commercial quota and 51 percent allocated to the recreational fishery as a recreational harvest limit.

Commercial Fishery

In Federal waters, commercial fishermen holding a moratorium permit may fish for black sea bass. Permit data for 2012 indicate that 772 vessels held commercial permits for black sea bass. Total landings (commercial and recreational) peaked in the late 1980's at over 16 million lb, and in 2012 were about 5.0 million lb total (Figure 3).

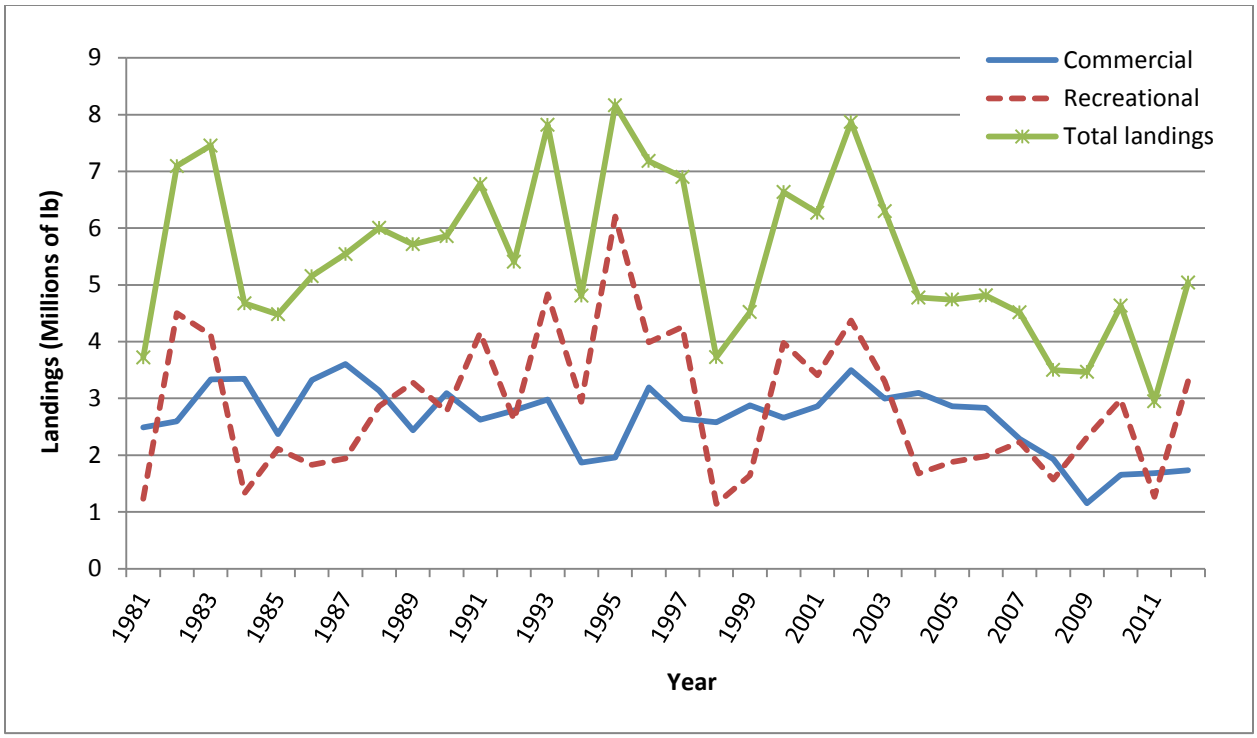

Figure 3: Commercial and Recreational U.S. Black Sea Bass Landings (Pounds) from Maine-North Carolina, 1981-2012.

Table 1 summarizes the black sea bass management measures for the 2003-2014 fishing years. Acceptable biological catch (ABC) levels have been identified for this stock since 2010, and recreational and commercial annual catch limits (ACLs), with a system of overage accountability for each ACL, were first implemented in 2012. It should be noted that catch limits include both projected landings and discards, whereas the commercial quotas and recreational harvest limits are landings based (i.e., harvest).

Table 1: Summary of management measures and landings for 2003 through 2014.

Management measures	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014[c]
ABC (m lb)	NA	NA	NA	NA	NA	NA	NA	4.500	4.500	4.500	5.50	5.50
TAC (m lb)	NA	NA	NA	NA	NA	NA	2.300	4.500	4.500	4.500	5.50	5.50
Commercial ACL (m lb)	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.980	2.60	2.60
Com. quota–adjusted (m lb)[a]	3.012	3.768	3.950	3.832	2.377	2.026	1.093	1.759	1.711	1.710	2.17	2.17
Commercial landings (m lb)	3.000	3.082	2.844	2.802	2.240	1.883	1.182	1.676	1.689	1.736	NA	NA
Recreational ACL (m lb)	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.860	2.90	2.90
Rec. harvest limit-adjusted (m lb)[a]	4.434	4.01	4.13	3.989	2.474	2.108	1.138	1.830	1.781	1.320	2.26	2.26
Recreational landings (m lb)	3.304	1.679	1.878	1.979	2.229	1.571	2.313	2.979	1.267	3.30[b]	NA	NA
Com. fish size (in)	11	11	11	11	11	11	11	11	11	11	11	11
Com. min. mesh size (in, diamond)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Threshold (lb)	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100
Vent size (in)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Recreational measures (minimum fish size (total length), possession limit, and open season)	12-in TL, 25 fish, 1/1-9/1 and 9/16-11/30	12-in TL, 25 fish, 1/1-9/7 and 9/22-11/30	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12.5-in TL, 25 fish, 1/1-10/5	12.5-in TL, 25 fish, 5/22-10/11 and 11/1-12/31	12.5-in TL, 25 fish, 5/22-10/11 and 11/1-12/31	12.5-in TL, 15 fish 1/1-2/28; 25 fish 5/19-10/14 and 11/1-12/31	12.5-in TL, 20 fish, 5/19-10/14 and 11/1-12/31	NA

[a]Adjusted for RSA and projected discards. [b] Includes all of North Carolina. NA=Not applicable or not yet available. [c] These reflect the regulations currently set for black sea bass in 2014, however, the Council and ASFMC will review these catch limits and management measures in October 2013 and may revise as necessary.

The ASMFC divides the black sea bass commercial quota among the states based on the allocation percentages given in Table 2, and states set measures to achieve their state-specific commercial quotas.

Table 2: The ASFMC black sea bass allocation formula for the commercial fisheries in each state.

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
Totals	100

National Marine Fisheries Service statistical areas are shown in Figure 4. Vessel trip report (VTR) data suggest that statistical area 616, which includes Hudson canyon, and statistical area 621, were responsible for the largest percentage of the catch. Statistical area 537 had the majority of trips that caught black sea bass (Table 3).

Table 3: Statistical areas that accounted for at least 5 percent of the black sea bass catch in 2012, NMFS VTR data.

Statistical Area	Black Sea Bass Catch (percent)	Black Sea Bass Trips (N)
616	16.56	368
621	16.52	369
615	11.05	172
622	9.20	87
537	6.99	657

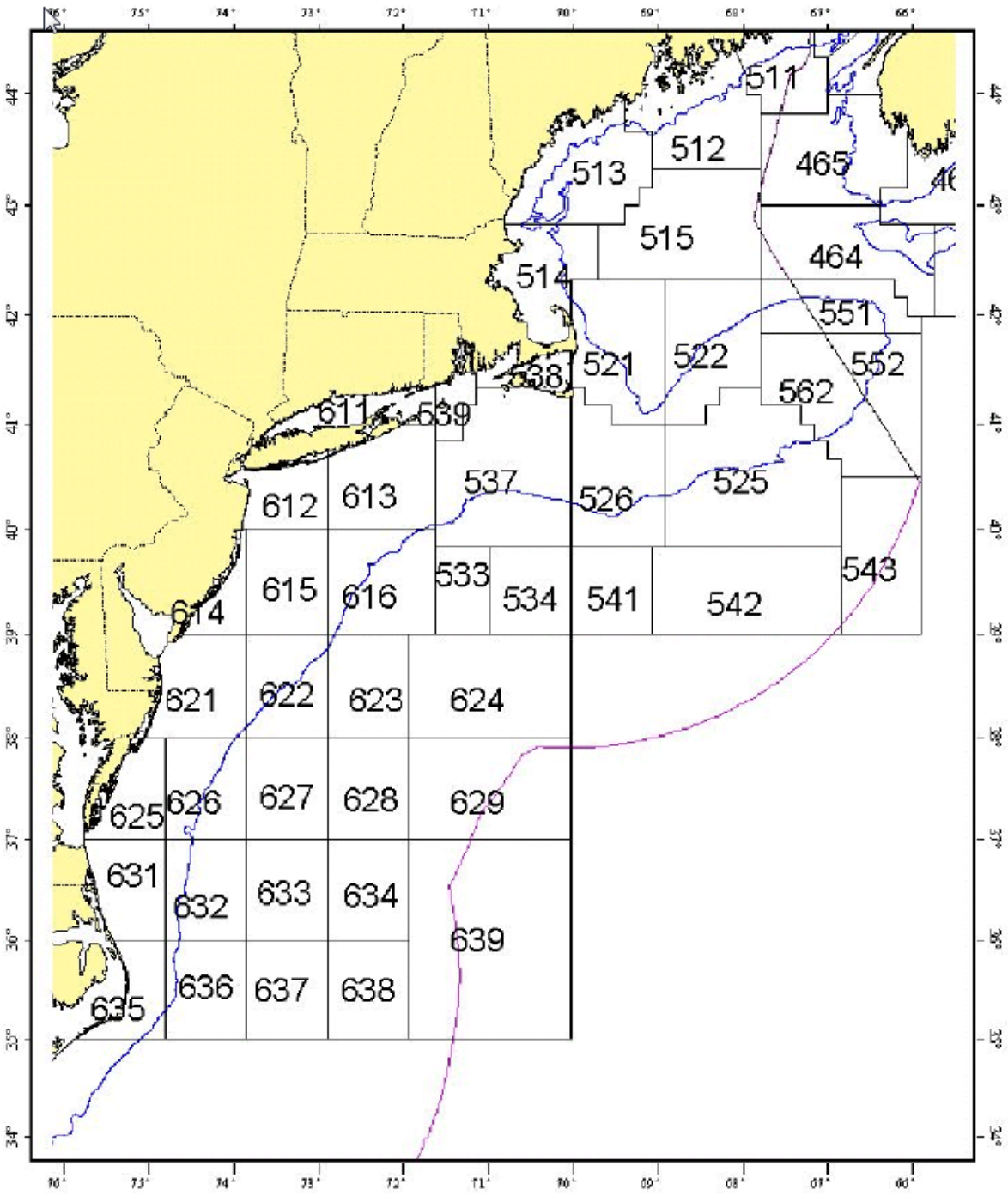

Figure 4: National Marine Fisheries Service Statistical Areas.

Based on VTR data for 2012, the majority of black sea bass landings were taken by bottom otter trawls (51 percent), followed by pots and traps (30 percent), hand lines (10 percent), and offshore lobster pots and traps (6 percent). Other gear types each accounted for less than 1 percent of landings. 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 (Table 1). 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 (Table 1). In addition, the minimum vent size requirements for black sea bass pots/traps are 2.5 inches for circle vents, 2 inches for square vents, or 1.375 by 5.75 inches for rectangular vents. Two vents are required in the parlor portion of the pot/trap.

Black sea bass ex-vessel revenues based on dealer data have ranged from $2.2 to $7.8 million for the 1994 through 2012 period. The mean price for black sea bass (unadjusted) has ranged from a low of $1.14/lb in 1996 to a high of $3.30/lb in 2012 (Figure 5). In 2012, 1.7 million pounds of black sea bass were landed generating $5.7 million in revenues ($3.30 lb).

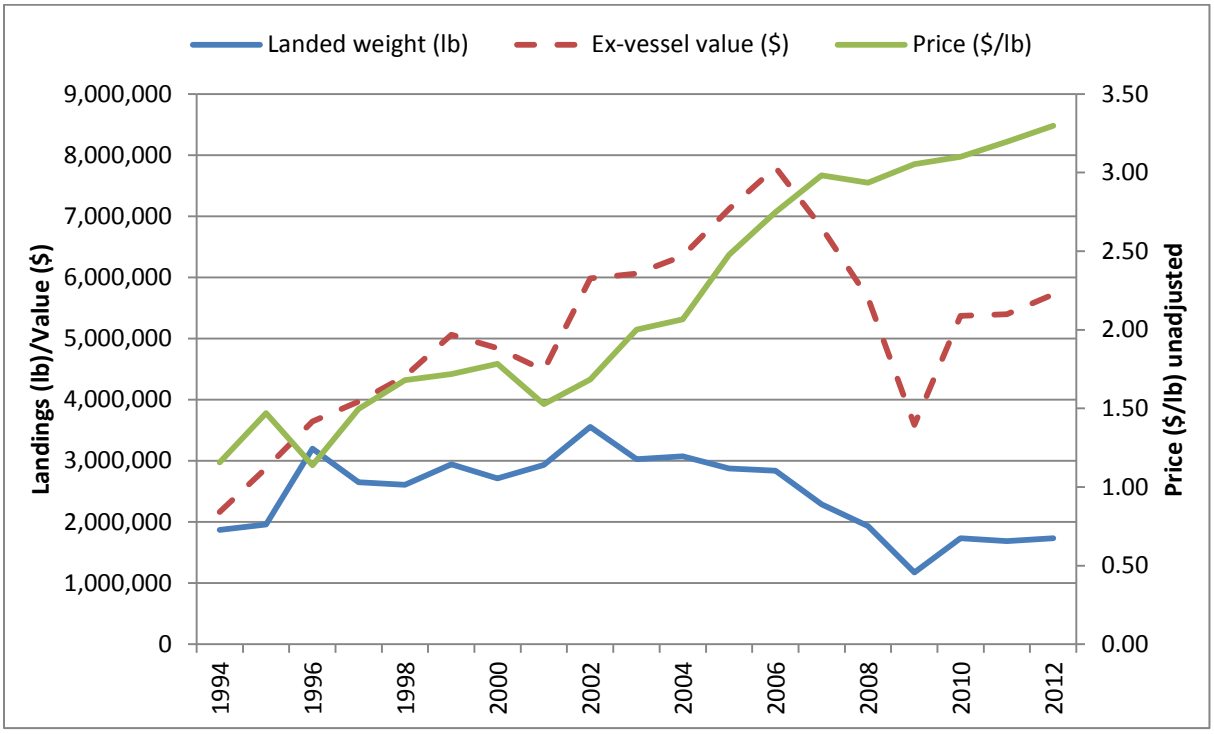

Figure 5: Landings, ex-vessel value, and price (unadjusted) for black sea bass, Maine through North Carolina, 1994-2012.

The ports and communities that are dependent on black sea bass are fully described in Amendment 13 to the FMP. Additional information on "Community Profiles for the Northeast US Fisheries" can be found at:
http://www.nefsc.noaa.gov/read/socialsci/community_profiles/

2012 NMFS dealer data were used to examine recent landings patterns among ports. The top commercial landings ports for black sea bass by pounds landed are shown in Table 4. A “top port” is defined as any port that landed at least 100,000 lb of black sea bass.

Table 4: Top ports of landing (in lb) for black sea bass (BSB), based on NMFS 2012 dealer data. Since this table includes only the "top ports," it may not include all of the landings for the year.

Port	Landings of BSB (lb)	# BSB Vessels
PT. PLEASANT, NJ	187,731	42
HAMPTON, VA	154,533	26
PT. JUDITH, RI	145,500	121
OCEAN CITY, MD	140,861	17
CHINCOTEAGUE, VA	104,377	16

Among the states from Maine through North Carolina, New York had the highest number of Federally permitted dealers (43) who bought black sea bass in 2012 (Table 5). All dealers bought approximately $5.7 million of black sea bass in 2012.

Table 5: Dealers reporting buying black sea bass, by state in 2012.

Number of Dealers	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Other
	37	36	10	43	27	3	6	15	18	0

Recreational Fishery

There is a significant recreational fishery for black sea bass in state waters, which occurs seasonally when the fish migrate inshore during the warm summer months. In Federal waters, the recreational black sea bass fishery is managed on a coastwide basis. State waters are also managed on a coastwide basis, with the exception of the last three years (i.e., 2011, 2012, 2013) when an ASMFC Addendum was developed to enable state-specific measures to be implemented. The 2013 recreational fishing measures in Federal waters are given in Table 1, and the 2013 state-specific measures are given in Table 6.

Table 6: Black sea bass recreational fishing measures in 2013, by state.

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts (Private and For-hire)	14	4 fish	May 11- October 31
Massachusetts (For-hire with Letter of Authorization from MA DMF)	14	10 fish	May 11- June 14
		20 fish	July 1- August 11 September 1- October 10
Rhode Island	13	3 fish	June 15- August 31
		7 fish	September 1- December 31
Connecticut (Private and Shore)	13	3 fish	June 15- August 31
		8 fish	September 1- October 29
For-hire*		8 fish	June 15-November 30
New York	13	8 fish	July 10- December 31
New Jersey	12.5	20 fish	May 19- August 8; September 27- October 14; November 1- December 31
Delaware	12.5	15 fish	January 1- February 28
		20 fish	May 19 - October 14 and November 1 - December 31
Maryland	12.5	15 fish	January 1 - February 28
		20 fish	May 19 - October 14 and November 1 - December 31
PRFC	12.5	15 fish	January 1 - February 28
		20 fish	May 19 - October 14 and November 1 - December 31
Virginia	12.5	15 fish	January 1 - February 28
		20 fish	May 19 - October 14 and November 1 - December 31
North Carolina (North of Cape Hatterass 35° 15'N Latitude)	12.5	15 fish	January 1 - February 28
		20 fish	May 19 - October 14 and November 1 - December 31

*Party/Charter Vessels enrolled In Monitoring Program

Recreational data have been available through the Marine Recreational Information Program (MRIP) since 2004, and prior to 2004 were available through the Marine Recreational Fishery Statistics Survey (MRFSS). Recreational catch and landings peaked in 1986 with landings in numbers and weight at the lowest levels in 2011 (Table 7). When anglers are intercepted through the surveys conducted for the recreational statistics

programs, they are asked about where the majority of their fish were caught (i.e., inland, state waters (<=3 miles), exclusive economic zone (EEZ; > 3 miles)). While these data are somewhat imprecise, they do provide a general indication of where the majority of black sea bass are landed recreationally, and indicate that a majority of the landings are now occurring in state waters (Table 8).

Table 7: Recreational black sea bass landings and data from the NMFS recreational statistics databases, 1981-2012.

Year	Catch ('000 of fish)	Landings ('000 of fish)	Landings ('000 lb)
1981	5,301	2,734	1,628
1982	11,615	10,249	10,054
1983	8,707	5,631	4,530
1984	4,330	2,491	1,961
1985	7,131	4,216	2,540
1986	29,167	21,904	12,461
1987	5,912	3,467	2,392
1988	9,363	4,060	3,945
1989	7,000	4,649	3,621
1990	9,622	4,269	3,047
1991	11,224	5,458	4,316
1992	8,296	3,869	2,914
1993	9,451	6,197	4,985
1994	7,688	3,571	3,054
1995	14,481	6,887	6,339
1996	8,437	3,764	4,125
1997	11,088	4,868	4,399
1998	5,699	1,259	1,290
1999	7,758	1,412	1,697
2000	17,667	3,755	4,122
2001	14,626	3,006	3,596
2002	15,080	3,421	4,442
2003	12,649	3,392	3,449
2004	8,884	1,925	2,307
2005	8,358	1,489	2,188
2006	8,729	1,392	1,886
2007	9,601	1,630	2,347
2008	11,102	1,342	2,094
2009	9,875	1,909	2,595
2010	11,133	2,335	3,286
2011	5,794	881	1,267
2012	14,553	1,946	3,302

Table 8: Percentage of black sea bass recreational landings (MRIP Type A+B1 in number of fish) by area (state vs. Federal waters), Maine through North Carolina, 2003-2012. Area information is self-reported based on the area where the majority of fishing activity occurred per angler trip.

Year	State <= 3 mi	EEZ > 3 mi
2003	22.1	77.9
2004	25.6	74.4
2005	29.9	70.1
2006	34.9	65.1
2007	34.8	65.2
2008	60.3	39.7
2009	67.5	32.5
2010	72.1	27.9
2011	63.8	36.2
2012	72.6	27.4
Avg. 2003 - 2012	48.4	51.6
Avg. 2010 - 2012	69.5	30.5

Table 9: State contribution (as a percentage) to total recreational landings of black sea bass, (MRIP Type A+B1 in number of fish), from Maine through North Carolina, 2010 and 2011.

State	2011	2012
Maine	0.0	0.0
New Hampshire	0.0	0.2
Massachusetts	22.1	26.7
Rhode Island	5.7	5.3
Connecticut	1.0	5.7
New York	31.2	16.5
New Jersey	16.9	37.8
Delaware	4.9	2.1
Maryland	5.4	1.7
Virginia	2.2	0.2
North Carolina	10.8	3.9
Total	**100%**	**100%**

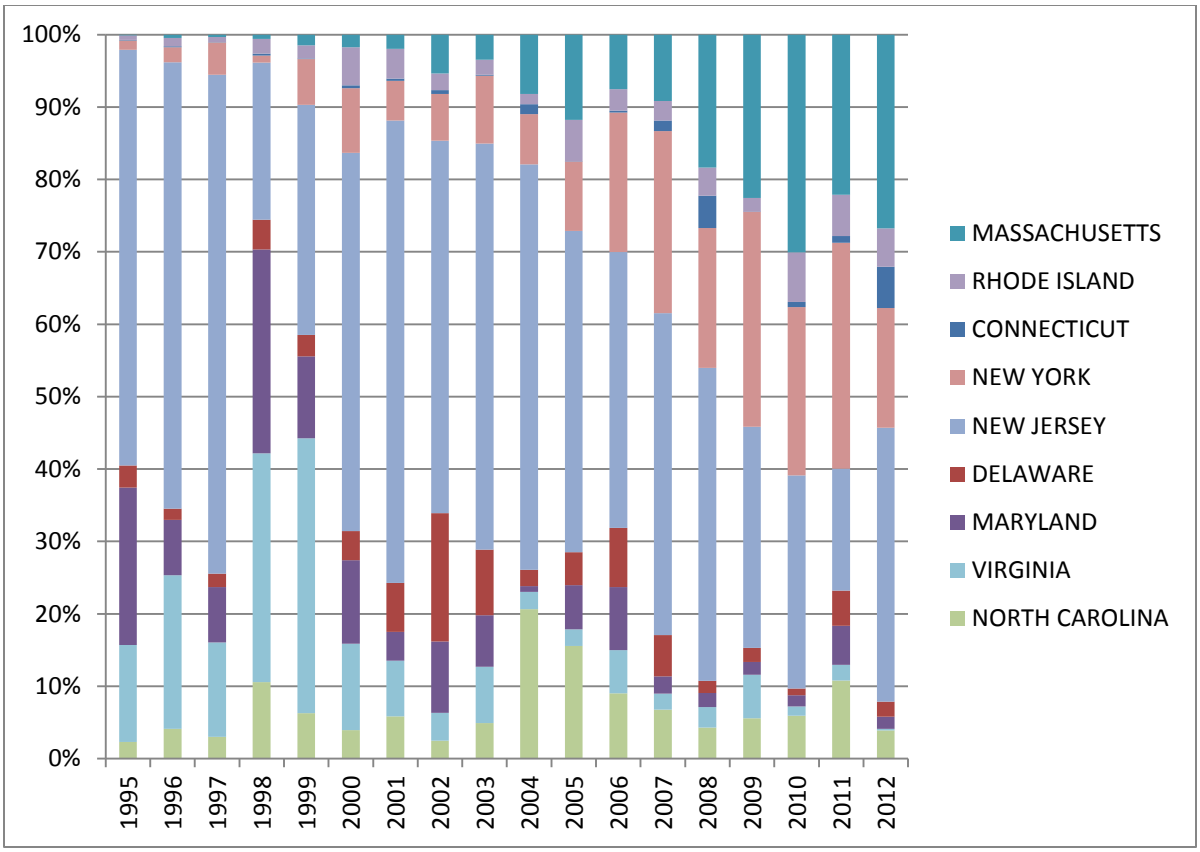

Figure 6: State contribution (as a percentage) of total recreational landings of black sea bass (MRIP Type A + B1 in number of fish), from Massachusetts through North Carolina, 1995-2012.

The states of Massachusetts, New Jersey, and New York land the majority of fish (Table 9; Figure 6). Since the mid-1990s, the state contributions of landings (in numbers of fish) have shifted somewhat, with Massachusetts and New York landing an increasing percentage (Figure 6).

In 2012, there were 808 recreational vessels (i.e., party and charter vessels) that held black sea bass Federal recreational permits. Many of these vessels also hold recreational permits for summer flounder and scup. Landings by mode indicate that although party/charter fishermen have historically been responsible for the majority of black sea bass landings, the private/rental fishery has accounted for the majority of landings in recent years (Table 10).

Table 10: The number of black sea bass landed from Maine through North Carolina by mode, 1981-2012.

Year	Shore	Party/Charter	Private/Rental
1981	452,101	1,440,171	841,480
1982	81,445	8,104,204	2,063,332
1983	222,011	4,005,707	1,403,508
1984	98,228	1,128,294	1,264,894
1985	163,447	2,393,048	1,659,703
1986	1,021,524	16,695,386	4,187,088
1987	71,956	1,157,244	2,238,164
1988	140,754	1,691,300	2,227,901
1989	237,968	1,991,670	2,419,649
1990	289,379	2,268,914	1,710,458
1991	250,675	2,586,149	2,621,274
1992	45,368	2,043,188	1,780,226
1993	54,675	4,579,665	1,562,229
1994	243,347	2,005,887	1,321,627
1995	275,982	5,197,229	1,413,571
1996	70,522	2,631,735	1,062,026
1997	8,337	3,950,335	908,840
1998	7,073	777,874	474,071
1999	19,231	621,355	771,259
2000	177,489	1,797,695	1,780,239
2001	14,034	1,826,851	1,164,977
2002	16,618	2,066,232	1,338,447
2003	10,760	2,073,130	1,308,496
2004	9,462	698,456	1,217,163
2005	13,110	605,934	869,466
2006	49,081	730,749	612,622
2007	9,865	909,873	709,905
2008	9,447	479,680	852,622
2009	23,992	442,106	1,442,842
2010	6,096	519,527	1,809,044
2011	8,177	310,764	561,727
2012	6,443	701,777	1,237,668
% of total, 1981 - 2012	3%	61%	36%
% of total, 2008 - 2012	1%	29%	70%

The NMFS angler expenditure survey summarizes a variety of costs associated with recreational fishing in the Northeast (Table 11). In addition, Steinback et al., 2009 summarized the reasons for fishing, with a majority of anglers (about 85 percent) fishing either mostly or fully for recreational purposes (Table 12).

Table 11: Average daily trip expenditures ($ unadjusted) by recreational fishermen in the Northeast region by mode, in 2006. Source: Gentner and Steinback (2008)

Expenditures	$		
	Party/Charter	Private/Rental	Shore
Private transportation	13.88	11.03	12.94
Public transportation	0.26	0.07	0.40
Auto rental	0.27	0.02	0.10
Food from grocery stores	7.40	4.92	7.33
Food from restaurants	8.70	3.42	9.28
Lodging	10.0	2.64	14.90
Boat fuel	0	9.54	0
Boat or equipment rental	0.05	0.19	0.03
Charter fees	57.76	0	0
Charter crew tips	3.0	0	0
Catch processing	0.02	0	0
Access and parking	0.44	1.11	1.32
Bait	0.31	3.42	3.25
Ice	0.39	0.59	0.39
Tackle used on trip	1.87	2.04	3.98
Tournament fees	1.10	0.04	0.02
Gifts and souvenirs	1.67	0.10	1.45
Total	107.13	39.14	55.39

Table 12: Purpose of Marine Recreational Fishing in the Northeast**.** Source: Steinback et al., 2009.

	Percent	Number of anglers in 2005 (thousands)
All for food or income	2.1	92.4
Mostly for food or income	<1.0	34.3
Both for recreation and for food or income	11.7	514.8
Mostly for recreation	13.2	580.8
All for recreation	72.2	3,176.8

References

Drohan AF, Manderson JP, Packer DB. 2007. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characteristics, 2nd edition. NOAA Tech Memo NMFS NE 200; 68 p.

Gentner, B. and S.Steinback. 2008. The economic contribution of marine angler expenditures in the United States, 2006. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-94, 301p.

Shepherd, G.R. 2012. Black Sea Bass Assessment Summary for 2012. Northeast Fisheries Science Center.

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

Steinback, S., K. Wallmo, P. Clay. 2009. Saltwater sport fishing for food or income in the Northeastern US: statistical estimates and policy implications. *Marine Policy* 33:49-57.

Northeast Data Poor Stocks Working Group. 2009. The Northeast Data Poor Stocks Working Group Report, December 8-12, 2008 Meeting. Part A. Skate species complex, deep sea red crab, Atlantic wolffish, scup, and black sea bass. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-02; 496 p.