



Mid-Atlantic Fishery Management Council

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MEMORANDUM

DATE: July 6, 2017

TO: Chris Moore, Executive Director

FROM: Brandon Muffley, Staff

SUBJECT: Review of Black Sea Bass Management Measures for 2018

Executive Summary

In February 2017, the Mid-Atlantic Fishery Management Council (Council) set two-year specifications for black sea bass, establishing revised catch and landings limits for the 2017 fishing year and new limits for 2018. These specifications were based on a benchmark stock assessment that was completed and peer reviewed in December 2016 (NEFSC 2017a). The Council and the Atlantic States Marine Fisheries Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) will review the 2018 black sea bass management measures during their joint meeting in August 2017. These measures may remain unchanged if the Scientific and Statistical Committee (SSC) determines that the previously recommended Acceptable Biological Catch (ABC) for 2018 (8.94 million pounds; 4,057 metric tons) is still appropriate and if the Council and Board recommend no changes to the previously implemented catch and landings limits. The Summer Flounder, Scup, and Black Sea Bass Monitoring Committee will also review recent fishery performance and make a recommendation to the Council and Board regarding any necessary modifications to the previously implemented 2018 Annual Catch Targets (ACTs) and commercial management measures (e.g., possession limits, quota period provisions, gear restrictions, and minimum fish size).

Based on the results of the benchmark stock assessment, the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2015, the terminal year of the assessment. The model-estimated spawning stock biomass (SSB) in 2015 was 48.89 million pounds (22,176 mt), 2.3 times the spawning stock biomass at maximum sustainable yield, $SSB_{MSY} = 21.31$ million pounds (9,667 mt). The average fishing mortality on ages 4-7 (F_{4-7}) in 2015 was estimated at $F=0.27$, which is 25% below the fishing mortality threshold reference point $F_{MSYPROXY} = F_{40\%} = 0.36$.

The Northeast Fisheries Science Center (NEFSC) provided a data update on black sea bass fishery catch, landings, and discards, as well as NEFSC and state survey catches through 2016. No new stock projections or estimates of stock status are available. The data update indicates that black sea bass biomass continues to be high and the 2015 year class appears to be above average in many of the state surveys, (with the exception of NJ and VA) as well as the preliminary 2017 NEFSC survey. Reported 2016 landings in the

commercial fishery were 2.50 million pounds (1,133 mt), about 93% of the 2016 commercial quota (2.70 million pounds, 1,226 mt). Estimated 2016 landings in the recreational fishery were 5.19 million pounds (2,354 mt), about 184% of the recreational harvest limit (2.82 million pounds, 1,280 mt). Total commercial and recreational landings in 2016 were 7.69 million pounds (3,488 mt). Total commercial and recreational dead discards were 2.23 million pounds (1,011 mt). Total catch in 2016 was about 9.92 million pounds (4,500 mt), about 149% of the 2016 ABC (NEFSC 2017b).

Staff recommend maintaining the previously adopted 2018 ABC of 8.94 million pounds as the basis for black sea bass management measures in 2018. This ABC results in a commercial Annual Catch Limit (ACL) of 4.32 million pounds (1,974 mt) and a recreational ACL of 4.59 million pounds (2,083 mt). Consistent with the prior year Monitoring Committee recommendation, staff recommend no reduction from the commercial and recreational ACLs to account for management uncertainty; therefore, both the commercial and recreational ACTs are set equal to their respective ACLs for 2018. After removing projected discards, the previously implemented 2018 black sea bass commercial quota is 3.52 million pounds (1,596 mt) and the recreational harvest limit is 3.66 million pounds (1,661 mt; Table 1).

In 2015, the Council and Commission's Monitoring and Technical Committees conducted a thorough review of current summer flounder, scup and black sea bass commercial management measures (MAFMC 2015). No changes to black sea bass measures were adopted; however, Council and Board members indicated that additional exploration of some measures may be warranted, as described under "Other Management Measures" in this document. Additional data and analyses are needed to address the questions raised, and staff will continue to work with the Monitoring and Technical Committees on these issues. Results of the Council funded 2016-2017 Collaborative Fisheries Research Program study to analyze the selectivity of multiple codend mesh sizes in the summer flounder, scup and black sea bass fisheries will be available later this year may be used to inform future changes in these fisheries. At this time, staff do not recommend any changes to the current commercial measures, including the 11-inch minimum fish size, mesh size requirements and seasonal thresholds, or pot/trap gear requirements.

Table 1: Currently implemented multi-year catch and landings limits for black sea bass for 2017-2018.

Management Measure	2017		2018		Basis
	mil lb.	mt	mil lb.	mt	
OFL	12.05	5,467	10.29	4,669	Stock assessment projections
ABC	10.47	4,750	8.94	4,057	Stock assessment projections/staff recommended application of Council risk policy
ABC Landings Portion	8.41	3,814	7.18	3,258	80.3% of ABC, based on average 2013 – 2015 % landings portion of total catch
ABC Discards Portion	2.06	936	1.76	799	19.7% of ABC, based on average 2013 – 2015 % discards portion of total catch
Commercial ACL	5.09	2,311	4.35	1,974	49% of ABC landings portion (per FMP allocation) + 47.2 % of ABC discards portion
Commercial ACT	5.09	2,311	4.35	1,974	Commercial ACL, less deduction for management uncertainty
Projected Commercial Discards	0.97	442	0.83	377	47.2% of ABC discards portion, based on 2013-2015 average % discards by sector
Commercial Quota	4.12	1,869	3.52	1,596	Commercial ACT, less discards
Recreational ACL	5.38	2,439	4.59	2,083	51% of ABC landings portion (per FMP allocation) + 52.8 % of ABC discards portion
Recreational ACT	5.38	2,439	4.59	2,083	Recreational ACL, less deduction for management uncertainty
Projected Recreational Discards	1.09	494	0.93	422	52.8 % of ABC discards portion, based on 2013-2015 average % discards by sector
Recreational Harvest Limit	4.29	1,945	3.66	1,661	Recreational ACT, less discards

Introduction

The Magnuson-Stevens Act (MSA) requires each Council's SSC to provide 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 annual ABC recommendations of the SSC. In addition, the Summer Flounder, Scup, and Black Sea Bass Monitoring Committee established by the Fishery Management Plan (FMP) is responsible for developing recommendations for management measures designed to achieve the recommended catch limits.

Multi-year specifications may be set for black sea bass for up to three years at a time. The SSC must recommend ABCs that addresses scientific uncertainty, while the Monitoring Committee must recommend annual catch targets (ACTs) that address management uncertainty. Based on the SSC and Monitoring Committee recommendations, the Council will make a recommendation to the National Marine Fisheries Service (NMFS) Greater Atlantic 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 catch limits and 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 2017-2019 fishing years for black sea bass.

Additional relevant information about fishery performance and past management measures is presented in the June 2017 Black Sea Bass Fishery Information Document prepared by Council staff and the June 2017 Fishery Performance Report for black sea bass developed by the Council and Commission Advisory Panels. These documents are available at: <http://www.mafmc.org/council-events/2017/july-2017-ssc-meeting>.

Recent Catch and Landings

Reported 2016 commercial black sea bass landings were approximately 2.50 million pounds (corresponding to 93% of the commercial quota), an increase from 2.29 million pounds in 2015 which corresponds to an increase in the 2016 quota. Preliminary 2017 coastwide commercial landings, according to the NMFS weekly quota reports as of the week ending June 24, 2017, indicate landings totaled 1.63 million pounds (738 mt) which accounts for 39% of the 2017 coastwide commercial quota (Table 2).

According to the Marine Recreational Information Program (MRIP) estimates, recreational landings in 2016 north of Cape Hatteras, North Carolina were 5.19 million pounds (1,719 mt), approximately 84% above the 2016 RHL of 2.82 million pounds. This was the highest recreational black sea bass harvest, in pounds, since 1995.

Table 2: 2017 black sea bass commercial quota and landings by state for the week ending June 24, 2017.

State	Cumulative Landings (lb)	Quota (lb) ^a	Percent of Quota (%)
ME	0	--	--
NH	0	--	--
MA	16,069	--	--
RI	238,961	--	--
CT	11,617	--	--
NY	124,524	--	--
NJ	322,048	--	--
DE	32,733	--	--
MD	289,763	--	--
VA	309,272	--	--
NC	279,930	--	--
Other	1,169	--	--
Totals	1,626,086	4,120,000	39

^a State-by-state quotas contained in the Commission’s FMP are not administered or monitored in-season by GARFO. Source: NMFS Weekly Quota Report for week ending June 24, 2017.

Currently Implemented 2017-2018 ABCs

The 2016 benchmark stock assessment for black sea bass serves as the basis for setting black sea bass catch and landing limits (NEFSC 2017a). At their January 2017 meeting, the SSC reviewed the most recent black sea bass benchmark stock assessment and peer review results, and provided recommendations for annual ABC levels for 2017-2019 (MAFMC 2017). The SSC recognized the substantial improvement in the black sea bass stock assessment and accepted the OFL estimates produced by the stock assessment for management use. The SSC determined the level of uncertainty of the OFL derived from the assessment required an SSC-specified coefficient of variation (CV) and recommended a CV of 60%. The SSC recognized the assessment conducted a thorough analysis and simulation testing regarding the unique life history (i.e. protogynous hermaphroditism) of black sea bass and concluded that no additional buffer for an atypical life history be applied and therefore used a probability of overfishing (p*) of 40%. Based on this application of the Council’s risk policy, the resulting SSC-recommended ABCs were 10.47 million pounds for 2017, 8.94 million pounds for 2018, and 7.97 million pounds for 2019. The declining pattern of the ABCs reflects the population responding to fishing at the OFL (F_{MSY}) and also the declining 2011 year class exiting the fishery. The stock assessment estimated the 2011 year class to be 68.9 million fish, nearly three times the average of 24.3 million fish and therefore this year class has played a key role in recent black sea bass stock dynamics.

The Council and Board set black sea bass specifications for the 2017-2018 fishing years in February 2017 based on the SSC’s ABC recommendations. The Council and Board did not set specifications for 2019 due to uncertainties related to a possibly large 2015 year class as well as the possibility of incorporating revised recreational catch estimates into an assessment update in 2018 that will be used for future year specification setting.

Table 3: ABC total catch, landings, discards, fishing mortality (F) and Spawning Stock Biomass (SSB) based on projections (2017-2018) from the 2016 benchmark black sea bass stock assessment (NEFSC 2017a). Projected catch, landings, discards, and SSB for 2017-2018 were calculated using a typical life-history application ($p^*=0.40$) and a 60% OFL CV.

Year	ABC Total Catch (mil lb)	ABC Total Catch (mt)	Landings (mil lb)	Landings (mt)	Discards (mil lb)	Discards (mt)	F	SSB (mil lb)	SSB (mt)
2016	6.67	3,024	5.53	2,510	1.13	514	0.27	41.11	18,647
2017	10.47	4,750	8.41	3,814	2.06	936	0.36	35.88	16,275
2018	8.94	4,057	7.18	3,258	1.76	799	0.36	31.29	14,183

The SSC considered the following to be the most significant sources of uncertainty with the determination of an OFL and ABC from the 2016 benchmark assessment (MAFMC 2017):

- The natural mortality rate (M) used in the assessment — because of the unusual life history strategy the current assumption of a constant M in the assessment model for both sexes may not adequately capture the dynamics in M
- The spatial distribution of productivity within the stock range;
- The level, temporal pattern, and spatial distribution of recreational catches;
- The nature of exchanges between the spatial regions defined in the assessment model

Stock Status and Biological Reference Points

The benchmark stock assessment for black sea bass was peer-reviewed and approved at the 62nd Stock Assessment Review Committee (SARC 62) in December 2016 (NEFSC 2017a). To address concerns raised during the SAW/SARC 53 review (NEFSC 2012) regarding potential spatial structure of the stock, the assessment modeled black sea bass as two separate sub-units (North and South) divided at approximately Hudson Canyon. Each sub-unit was modeled separately and the average F and combined biomass and spawning stock biomass (SSB) across sub-units were used to develop stock-wide reference points. As the result of this new information and changes to the modeling approaches, new biological reference points were developed as part of the assessment. Due to the lack of a stock/recruit relationship, a direct calculation of MSY and associated reference points (F and biomass) was not feasible and proxy reference points were approved for management use. SSB calculations and SSB reference points include both mature males and females. The average fishing mortality threshold for black sea bass is $F_{MSY} = F_{40\%}$ (as $F_{MSYproxy} = 0.36$, and the combined $SSB_{MSYproxy}$ target is 21.3 million pounds (9,667 mt). The minimum stock size threshold, $\frac{1}{2} SSB_{MSY}$ is estimated to be 10.7 million pounds (4,834 mt).

The 2016 benchmark assessment indicated that the black sea bass stock was not overfished and overfishing was not occurring in 2015, relative to the biological reference points. The average fishing mortality on ages 4-7 (F_{4-7}) in 2015 was estimated at $F=0.27$, which is 25% below the fishing mortality threshold of $F=0.36$. Total spawning stock biomass in 2015 was estimated at 48.9 million pounds (22,199 mt) which is 2.3 times above the target $SSB_{MSYproxy}$ of 21.3 million pounds (9,667 mt) and 4.6 times higher than the biomass threshold $SSB_{MSYproxy}$ of 10.7 million pounds (4,834 mt). Total January 1 stock biomass in 2015 was estimated at 70.7 million pounds (32,061 mt). The terminal year estimates of F and SSB provided here are retrospectively adjusted and do not change stock status.

Recruitment estimated by the model was relatively constant through the time series except for large peaks from the 1999 and 2011 year classes. Average recruitment from 1989 – 2015 equaled 24.3 million fish with the 1999 year class estimated at 37.3 fish and the 2011 year class estimated at 68.9 million fish. Since 2012, recruitment has been average with the latest cohort (2014 year class) estimated to be 24.9 million fish. The 2015 year class appears to be above average in many of the state surveys, (with the exception of NJ and VA) as well as the preliminary 2017 NEFSC survey.

Catch and survey data through 2016 indicate that black sea bass SSB remains high and the 2015 year class appears to be large (NEFSC 2017b).

Other Management Measures

Recreational and Commercial Annual Catch Limits

As defined by the Omnibus ACLs and AMs Amendment (Amendment 15 to the Summer Flounder, Scup, and Black Sea Bass FMP), the ABC includes both landings and discards, and is equal to the sum of the commercial and recreational ACLs for black sea bass (Figure 1). The Monitoring Committee is responsible for recommending ACLs and ACTs derived from the ABC recommendations of the SSC. The catch projections provided by the NEFSC are not separated into projected landings and discards. Data taken directly from the stock assessment was used to derive sector-specific ACL recommendations from the SSC approved ABCs. Specifically, the ABCs are apportioned into total landings and discards based on the 2013-2015 average portion of the catch which are believed to be most representative of the current fishery. Based on this evaluation, ABCs are apportioned into 80.3% landings and 19.7% discards. An evaluation of the proportion of landings and discards using the 2014-2016 average catch was conducted to compared to current ratios used to apportion the ABC. Using the updated average information, landings comprise 78% of the total catch and discards account for 22% of the catch. The slightly higher proportion of discards observed during this time period correspond to the peak black sea bass SSB and the lower landing limits in place. It is anticipated that discards will decline in 2017 and 2018 as some discards will be converted to landings as a result of the substantially higher 2017-2018 specifications and due to the declining sea bass SSB as the 2011 year class begins to decline in abundance and exit the fishery. Based on the allocation percentages in the FMP, 49% of the total allowable landings are allocated to the commercial fishery, and 51% to the recreational fishery.

Staff recommend no changes to the previously implemented 2018 commercial ACL of 4.35 million pounds (1,974 mt) and recreational ACL of 4.59 million pounds (2,083 mt).

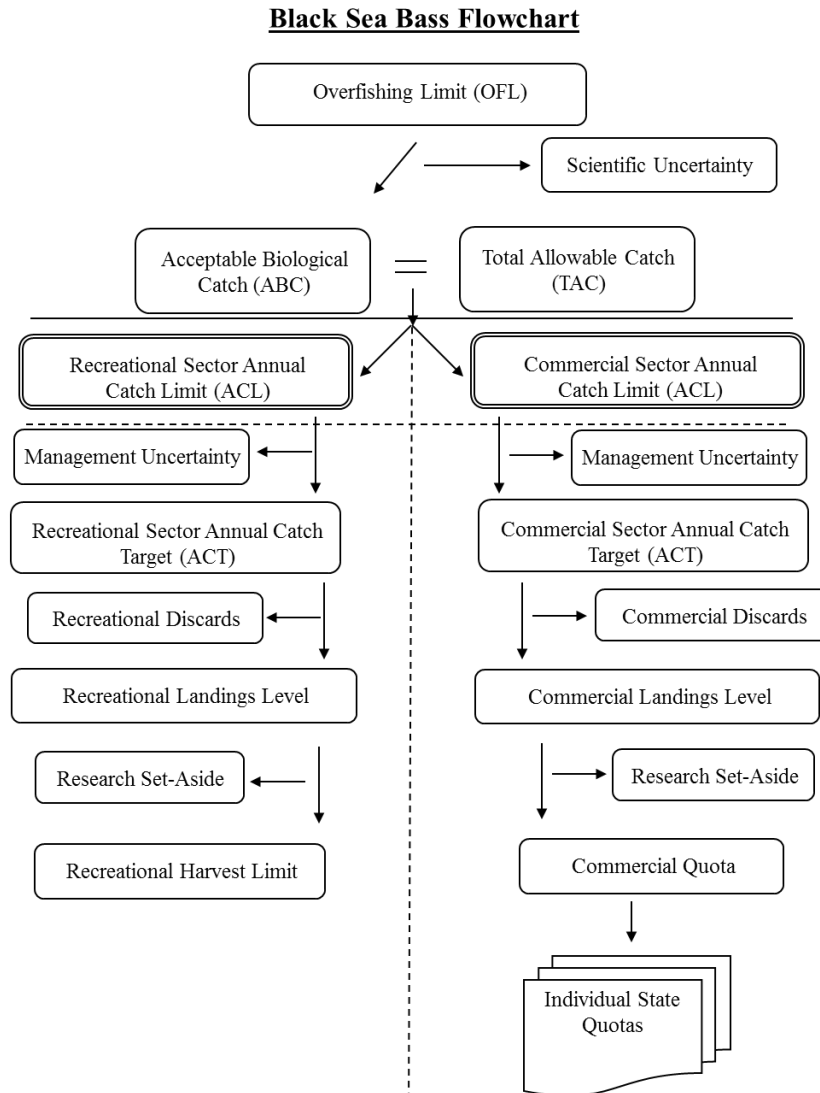


Figure 1: Flowchart for black sea bass catch and landings limits.

Annual Catch Targets

The Monitoring Committee is responsible for recommending Annual Catch Targets (ACTs), which are intended to account for management uncertainty, for the Council and Board’s consideration. The Monitoring Committee is responsible for considering all relevant sources of management uncertainty in the black sea bass fishery and providing 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 should be described and provided to the Council. The relationships between the recreational and commercial ACTs and other catch components are given in Figure 1.

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 discards) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels).

The sector-specific landings performance in recent years indicates that the commercial landings have generally been near the commercial quotas for most of the past five years (2012-2016) with less than a 1% difference between landings and the quota over this time period. The commercial quota monitoring system is timely and typically successful in constraining landings to the commercial quota. In contrast, the recreational fishery has generally exceeded its harvest limits in recent years, with periodic substantial overages (Table 4). The Monitoring Committee has noted that these recreational overages occurred when the black sea bass stock was rapidly expanding and availability to recreational anglers was very high. At the same time, due to the lack of an approved stock assessment for black sea bass the recreational harvest limits were set at levels not reflective of the large and increasing stock abundance; therefore, prior to 2017, making any consideration of recreational performance difficult to evaluate. Analysis using the 2016 stock assessment indicates that recreational harvest limits during the last few years would have been significantly higher (i.e. approximately double those implemented) if they had been set using the new assessment model, and overages would likely not have occurred to the same degree. Over the last two years, the Monitoring Committee and ASMFC Technical Committee have spent a great deal of time developing new and alternative methodologies to evaluate management uncertainty in the recreational fishery, the predictability and uncertainty in recreational catch estimates, and the influence of recreational regulations on harvest. These Committees plan continue to work to make improvements to the evaluation process for recreational measures. Staff recommend no changes to the currently implemented ACTs for 2018, which include no reduction in catch from the recreational or commercial ACLs so that each sector's ACT is set equal to the ACL.

Table 4: Black sea bass commercial and recreational fishery performance relative to quotas and harvest limits, 2012-2016.

Year	Commercial Landings (mil lb)	Commercial Quota (mil lb)	Percent Overage(+)/ Underage(-)	Recreational Landings (mil lb)	Recreational Harvest Limit (mil lb)	Percent Overage(+)/ Underage(-)
2012	1.72	1.71	+1%	3.19	1.32	+142%
2013	2.26	2.17	+4%	2.46	2.26	+9%
2014	2.18	2.17	0%	3.67	2.26	+62%
2015	2.29	2.21	+4%	3.79	2.33	+63%
2016	2.50	2.70	-7%	5.19	2.82	+84%
5-yr Avg.	-	-	-0.09%	-	-	+66.5%

Commercial Quotas and Recreational Harvest Limits

Projected discards are subtracted from the sector-specific ACTs to derive landings limits, which include annual commercial quotas and recreational harvest limits. Projected discards from the stock assessment are apportioned between the recreational and commercial fisheries using the average percentage of dead discards attributable to each sector over the past three years. Based on 2013-2015 discard data, 47.2% of discards were attributable to the commercial sector, and 52.8% to the recreational sector (Table 1). An evaluation of the 2014-2016 average discard information indicates a slight change with 48% of the discards attributable to the commercial sector and 52% to the recreational sector. The Monitoring Committee plans to evaluate discards and the ratios apportioned in the ABC and for each sector over the next couple of years to consider expected changes in discards resulting from changes in quota; specifically, the expectation that commercial discards will decrease with an increase in quota.

Table 5: 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 2018 will not be determined until after the first four waves of 2017 recreational landings are reviewed. These data will become available in October 2017. The Monitoring Committee will meet in November to review these data and make recommendations regarding any necessary changes in the recreational management measures (i.e., possession limit, minimum size, and season). The Board has initiated an addendum to develop recreational black sea bass management options for 2018. The addendum will evaluate the current ad-hoc regional management approach and develop options that achieve consistent/similar management measures within a region and alternatives to the existing regional structure (MA-NJ/DE-NC). The Council and Board are also considering the potential re-opening of the Wave 1 (January/February) recreational black sea bass season. Specific measures for Wave 1 and its implications for the rest of the recreational black sea bass season are currently being developed and evaluated for consideration at the joint Council and Board meeting in August 2017.

Given the performance of the recreational fishery relative to the recreational harvest limit in recent years and continued high recreational catch and harvest of black sea bass, the Monitoring Committee and ASMFC Technical Committee will need to continue to closely monitor and evaluate the effectiveness of

management measures (i.e., minimum size, possession limits, and seasons) designed to achieve the recreational harvest limit while preventing the recreational ACL from being exceeded. Potential management changes for 2018 currently under consideration by the Council and Board will need to be factored into this evaluation. Significant strides have been made recently by the Monitoring Committee and Technical Committee in developing new and alternative methodologies used to develop and evaluate effective recreational measures, taking into consideration the uncertainty in the recreational catch estimates and the performance of past measures. The Committees need to continue and finalize their evaluation and analyses for use in the development of 2018 recreational management measures.

Commercial Gear Regulations and Minimum Fish Size

Management measures in the commercial black sea bass fishery, other than quotas and harvest limits (i.e., minimum fish size, gear requirements, etc.), have remained constant since 2007.

Amendment 9 in 1996 incorporated black sea bass into the Summer Flounder FMP, and established an initial minimum fish size of 9 inches total length as part of an effort to reduce fishing mortality on immature black sea bass and increase spawning stock biomass. The Council and Commission increased the commercial minimum size to 10 inches TL in 1998, and to 11 inches TL in 2002. The 11-inch minimum size has remained unchanged since 2002.

Amendment 9 also established gear regulations that became effective in December of 1996, and were modified in 1998 and again in 2002. Current regulations, unchanged since 2002, state that trawl vessels whose owners have a black sea bass moratorium permit and possess 500 pounds or more of black sea bass from January 1 through March 31, or 100 pounds from April 1 through December 31 (i.e., the threshold or incidental possession limits), must fish with nets that have a minimum mesh size of 4.5-inch diamond mesh applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net. For codends with less than 75 meshes, the entire net must have a minimum mesh size of 4.5-inch diamond mesh.

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.

In the fall of 2015, the Council and Commission's Monitoring and Technical Committees conducted a thorough review of current commercial management measures (MAFMC 2015). The Committees, and subsequently the Council and Board, indicated that further exploration of some of these measures may be justified. Specifically, for black sea bass, this included assessing the feasibility of a common minimum mesh size for summer flounder, scup, and black sea bass, as well as summarizing past studies on mesh sizes and pot/trap configuration requirements for all three species. Stemming from this discussion, the Council funded a proposal received under the Council's 2016-2017 Collaborative Fisheries Research Program. This project proposes to analyze the selectivity of multiple codend mesh sizes relative to summer flounder, black sea bass and scup retention in the commercial bottom trawl fishery in the Mid-Atlantic region. The results of this study should be available in mid-2017 and may inform future consideration of adjustments to the black sea bass, scup, and/or summer flounder mesh sizes. At this time, staff do not recommend any changes to the current commercial measures, including the 11-inch minimum fish size, seasonal mesh size requirements and thresholds (4.5-inch mesh with 500-pound trigger from January-

March and 100-pound trigger from April-December), or other gear requirements (current pot/trap vent requirements detailed above).

References

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