



Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

DATE: July 3, 2018

TO: Chris Moore, Executive Director

FROM: Julia Beaty, Staff

SUBJECT: 2019 Black Sea Bass Management Measures

Executive Summary

In January 2017, the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) recommended acceptable biological catch levels (ABCs) for black sea bass for 2017-2019 based on biomass projections from the 2016 benchmark stock assessment. In February 2017, the Council and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) adopted the SSC's 2017 and 2018 ABC recommendations but decided to postpone adopting a 2019 ABC.

In July 2018, the SSC will review their previously-recommended 2019 ABC. The Council's Monitoring Committee will meet in July 2018 to review recent fishery performance and recommend 2019 Annual Catch Targets (ACTs) and any necessary modifications to the commercial possession limits, quota period provisions, gear restrictions, and minimum fish size. The Council and Board will meet in August 2018 to review the recommendations of the SSC and Monitoring Committee and to adopt catch and landings limits for 2019, as well as any desired changes to the commercial management measures.

Based on the results of the 2016 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. Spawning stock biomass (SSB) in 2015 was 48.89 million pounds (22,176 mt), 2.3 times SSB at maximum sustainable yield (i.e. $SSB_{MSY} = 21.31$ million pounds/9,667 mt). The average fishing mortality (F) on ages 4-7 in 2015 was 0.27, 25% below the fishing mortality threshold reference point (i.e. $F_{MSYPROXY} = F_{40\%} = 0.36$).

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 2017 (NEFSC 2018). 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 both the northern and southern surveys, as well as fishery discards.

According to dealer data, commercial fishermen landed 3.99 million pounds (1,809 mt) of black sea bass in 2017, about 97% of the commercial quota (4.12 million pounds, 1,869 mt) and the highest landings since at least 1982. According to the 2018 data update from the NEFSC, commercial dead discards were 1.78 million pounds (806 mt; NEFSC 2018). Commercial catch exceeded the 2017 commercial annual catch limit (ACL) of 5.09 million pounds (2,309 mt) by 13%.

According to the Marine Recreational Information Program (MRIP), recreational fishermen from Maine through Cape Hatteras, NC harvested 4.16 million pounds (1,887 mt) of black sea bass in 2017, about 97% of the RHL (4.29 million pounds, 1,946 mt). According to the 2018 data update from the NEFSC, recreational dead discards were 1.27 million pounds (576 mt; NEFSC 2018). Recreational catch was about 1% above the 2017 recreational ACL of 5.38 million pounds (2,083 mt).

Total commercial and recreational catch in 2017 was about 11.20 million pounds (5,080 mt), about 7% above the 2017 ABC of 10.47 million pounds (4,749 mt).

Council staff recommend maintaining the SSC's previously-recommended 2019 ABC of 7.97 million pounds (3,617 mt). Using the standard methodology for deriving other catch and landings limits, this ABC results in a commercial ACL of 3.98 million pounds (1,807 mt) and a recreational ACL of 3.99 million pounds (1,810 mt). Consistent with prior year's Monitoring Committee recommendations, staff recommend no reduction from the commercial and recreational ACLs to account for management uncertainty; therefore, both the commercial and recreational ACTs would be set equal to their respective ACLs for 2019. After removing projected discards, the commercial quota would be 2.95 million pounds (1,341 mt) and the recreational harvest limit (RHL) would be 3.08 million pounds (1,396 mt; Table 1).

An assessment update, with updated biomass projections, is expected to be available in early 2019. This update will incorporate updated catch and survey information through 2017, including estimates of the size of the 2015 year class as well as the revised MRIP time series of recreational catch estimates, which will be released in July 2018. The SSC, Monitoring Committee, Council, and Board will review their recommendations for 2019 measures after the assessment update is available. Thus, 2019 measures recommended in 2018 will likely be interim measures which will be adjusted mid-year in 2019. There are currently no catch and landings limits implemented for 2019; therefore, interim measures are necessary.

Staff do not recommend any changes to the current commercial measures, including the minimum fish size, possession limits, mesh size requirements, or pot/trap gear requirements.

Table 1: Currently implemented catch and landings limits for black sea bass for 2018 and staff recommended measures for 2019.

Management Measure	2018		Basis	2019		Basis
	mil lb.	mt		mil lb.	mt	
OFL	10.29	4,669	Stock assessment projections	9.18	4,163	Stock assessment projections
ABC	8.94	4,057	Stock assessment projections and Council risk policy	7.97	3,617	Stock assessment projections and Council risk policy
ABC Landings Portion	7.18	3,258	80.3% of ABC, based on average 2013–2015 landings as % of catch	6.03	2,737	75.7% of ABC, based on average 2015–2017 landings as % of catch
ABC Discards Portion	1.76	799	19.7% of ABC, based on avg. 2013–2015 discards as % of catch	1.94	880	24.3% of ABC, based on avg. 2015–2017 discards as % of catch
Projected Commercial Discards	0.83	377	47.2% of ABC discards portion, based on 2013-2015 avg. % discards by sector	1.03	446	53.0% of ABC discards portion, based on 2015-2017 avg. % discards by sector
Projected Recreational Discards	0.93	422	52.8 % of ABC discards portion, based on 2013-2015 avg. % discards by sector	0.91	414	47.0% of ABC discards portion, based on 2015-2017 avg. % discards by sector
Commercial ACL	4.35	1,974	49% of ABC landings portion (per FMP) + projected commercial discards	3.98	1,807	49% of ABC landings portion (per FMP) + projected commercial discards
Commercial ACT	4.35	1,974	Commercial ACL, with no deduction for management uncertainty	3.98	1,807	Commercial ACL, with no deduction for management uncertainty
Commercial Quota	3.52	1,596	Commercial ACT minus projected commercial discards	2.95	1,341	Commercial ACT minus projected commercial discards
Recreational ACL	4.59	2,083	51% of ABC landings portion (per FMP) + projected recreational discards	3.99	1,810	51% of ABC landings portion (per FMP) + projected recreational discards
Recreational ACT	4.59	2,083	Recreational ACL, with no deduction for management uncertainty	3.99	1,810	Recreational ACL, with no deduction for management uncertainty
RHL	3.66	1,661	Recreational ACT minus projected recreational discards	3.08	1,396	Recreational ACT minus projected recreational discards

Introduction

The Magnuson-Stevens Act (MSA) requires that the Council's SSC provide scientific advice for fishery management decisions, including recommendations on ABCs, prevention of overfishing, and achieving maximum sustainable yield (MSY). The SSC must recommend ABCs that address scientific uncertainty. The Council's catch limit recommendations cannot exceed the ABCs recommended by the SSC.

The Monitoring Committee develops recommendations for management measures to achieve the ABCs recommended by the SSC. Specifically, the Monitoring Committee recommends ACTs that are equal to or less than the ACLs to address management uncertainty, and recommends management measures designed to achieve these ACTs.

Summer flounder, scup, and black sea bass are cooperatively managed by the Council and the Commission under a joint Fishery Management Plan (FMP). The Council and the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board meet jointly each year to consider SSC and Monitoring Committee recommendations before deciding on proposed catch limits and other management measures. The Council and Board may set specifications for summer flounder, scup, and black sea bass for up to three years at a time. The Council and Board submit their recommendations to NMFS, which is responsible for implementation and enforcement of federal fisheries regulations.

This memorandum includes information to assist the SSC and Monitoring Committee in recommending catch and landings limits and commercial management measures for black sea bass in 2019. Additional information on fishery performance and past management measures can be found in the 2018 Black Sea Bass Fishery Information Document (MAFMC 2018A) and the 2017 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by the Council and Commission Advisory Panels (MAFMC 2018B).

Recent Catch and Landings

According to dealer data, about 3.99 million pounds (1,810 mt) of black sea bass were landed in 2017 by commercial fishermen, about 97% of the commercial quota. According to the Marine Recreational Information Program (MRIP) estimates, recreational fishermen landed 4.16 million pounds (1,887 mt) of black sea bass north of Cape Hatteras, North Carolina in 2017. This is approximately 3% below the 2017 RHL of 4.29 million pounds. This is the first time since 2011 that the recreational fishery did not exceed the RHL. It should be noted that the commercial and recreational catch and landings limits increased notably in 2017 as a result of the 2016 benchmark stock assessment (Table 2).

As of June 23, 2018, about 46% of the 2018 commercial quota of 3.52 million pounds (1,597 mt) had been landed (Table 3). Recreational harvest data for 2018 are not currently available.

Table 2: Black sea bass commercial and recreational fishery performance relative to quotas and RHLs, 2013-2017.

Year	Commercial Landings (mil lb)	Commercial Quota (mil lb)	Percent Overage/ Underage	Recreational Landings (mil lb)	RHL (mil lb)	Percent Overage/ Underage
2013	2.26	2.17	+4%	2.46	2.26	+9%
2014	2.18	2.17	0%	3.60	2.26	+59%
2015	2.29	2.21	+4%	3.79	2.33	+63%
2016	2.59	2.71	-4%	5.19	2.82	+84%
2017	3.99	4.12	-3%	4.16	4.29	-3%

Table 3: 2018 black sea bass commercial landings by state through the week ending June 23, 2018, according to NMFS weekly quota reports.

State	Cumulative Landings (lb)
ME	0
NH	0
MA	4,569
RI	186,583
CT	17,327
NY	106,187
NJ	300,106
DE	104,487
MD	287,479
VA	374,223
NC	243,526
Other	923
Total	1,625,410
2018 Commercial Quota	3,520,000

Previously Recommended 2019 ABC

At their January 2017 meeting, the SSC reviewed the 2016 black sea bass benchmark stock assessment and peer review results and recommended ABCs for 2017-2019 (MAFMC 2017). The SSC recognized the substantial improvement in the stock assessment, compared to previous assessments, 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 assessment conducted a thorough analysis and simulation testing regarding the unique life history (i.e. protogynous hermaphroditism) of black sea bass. Based on this, the SSC concluded that no additional buffer for an atypical life history should be applied and therefore used a probability of overfishing (p^*) of 40%. Based on this application of the Council's risk policy, the SSC recommended a 10.47 million pound (4,750 mt) ABC for 2017, a 8.94 million pound (4,057 mt) ABC for 2018, and a 7.97 million pound (3,617 mt) ABC for 2019 (Table 4). The

declining pattern of the ABCs reflects the population responding to fishing at the OFL (F_{MSY}) and the decreasing abundance of the large 2011 year class. The stock assessment estimated that 68.9 million fish were spawned in 2011, nearly three times the 1988-2014 average of 24.3 million fish. This year class 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 forthcoming revised recreational catch estimates into an assessment update that will be used for future year specification setting.

The 2018 data update from NEFSC confirmed that the 2015 year-class appears to be above average in both the northern and southern surveys, as well as fishery discards (NEFSC 2018). However, updated biomass projections incorporating data on this year class are not currently available. An assessment update, with updated biomass projections, is expected to be available in early 2019. This update will incorporate estimates of the size of the 2015 year class as well as the revised MRIP time series of recreational catch estimates, which are expected to be released in July 2018. The SSC, Monitoring Committee, Council, and Board will review their recommendations for 2019 measures after the assessment update is available. Thus, 2019 measures recommended by these groups in 2018 will likely be interim measures which will be adjusted mid-year in 2019. There are currently no catch and landings limits implemented for 2019; therefore, interim measures are necessary.

Table 4: ABC, fishing mortality (F), and SSB based on projections from the 2016 benchmark black sea bass stock assessment (NEFSC 2017a). Projected catch, landings, discards, and SSB for 2017-2019 were calculated using a typical life-history application ($p^*=0.40$) and a 60% OFL CV.

Year	ABC (mil lb)	ABC (mt)	F	SSB (mil lb)	SSB (mt)
2016	6.67	3,024	0.27	41.11	18,647
2017	10.47	4,750	0.36	35.88	16,275
2018	8.94	4,057	0.36	31.29	14,183
2019	7.97	3,617	0.36	28.26	12,820

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 most recent 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 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 SSB) was not feasible and proxy reference points were approved for management use. SSB calculations and SSB reference points account for 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 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 in 2015 was estimated at $F=0.27$, which is 25% below the fishing mortality threshold of $F=0.36$. Total SSB in 2015 was estimated at 48.9 million pounds (22,199 mt) which is 2.3 times the target $SSB_{MSYproxy}$ of 21.3 million pounds (9,667 mt) and 4.6 times the biomass threshold $SSB_{MSYproxy}$ of 10.7 million pounds (4,834 mt). The terminal year (i.e. 2015) estimates of F and SSB provided here are adjusted to account for retrospective patterns in the assessment 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 was 24.3 million fish, with the 1999 year class estimated at 37.3 million fish and the 2011 year class estimated at 68.9 million fish. Since 2012, recruitment has been about average, with the latest cohort included in the stock assessment (i.e. the 2014 year class) estimated to be 24.9 million fish.

The NEFSC provided a data update on black sea bass fishery catch, landings, and discards, as well as NEFSC and state survey catches through 2017 (NEFSC 2018). No new 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 both the northern and southern surveys, as well as fishery discards.

Other Management Measures

Recreational and Commercial Annual Catch Limits

The black sea bass ABC includes both landings and discards and is equal to the sum of the commercial and recreational ACLs (Figure 1). 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. The Monitoring Committee recommends ACTs, which are set equal to or less than the ACLs to account for management uncertainty.

The ABC is apportioned into expected landings and discards based on the most recent three year average portion of the catch. During 2015-2017, landings averaged 75.7% of total catch and discards averaged 24.3%. The catch and landings limits increased substantially between 2016 and 2017 as a result of the 2016 benchmark stock assessment. This increase would be expected to result in a decrease in discards as a proportion of total catch. Variation in recruitment can also impact discards. For example, large year classes such as the 2011 and 2015 year classes can lead to an increase in discards for a few years due to

commercial and recreational minimum size limits. If availability remains high when those fish are large enough to be retained, they can continue to influence discards when the fishing seasons are closed or due to possession limits being exceeded. Thus, the assumption that patterns in landings and discards in a future year will be similar to the most recent three year average percentage of landings and discards may not hold true. This will be considered by the Monitoring Committee at their July 2018 meeting.

Staff recommend a 2019 commercial ACL of 3.98 million pounds (1,807 mt) and recreational ACL of 3.99 million pounds (1,810 mt), based on the standard process for deriving ACLs from the ABC (Table 1, Figure 1).

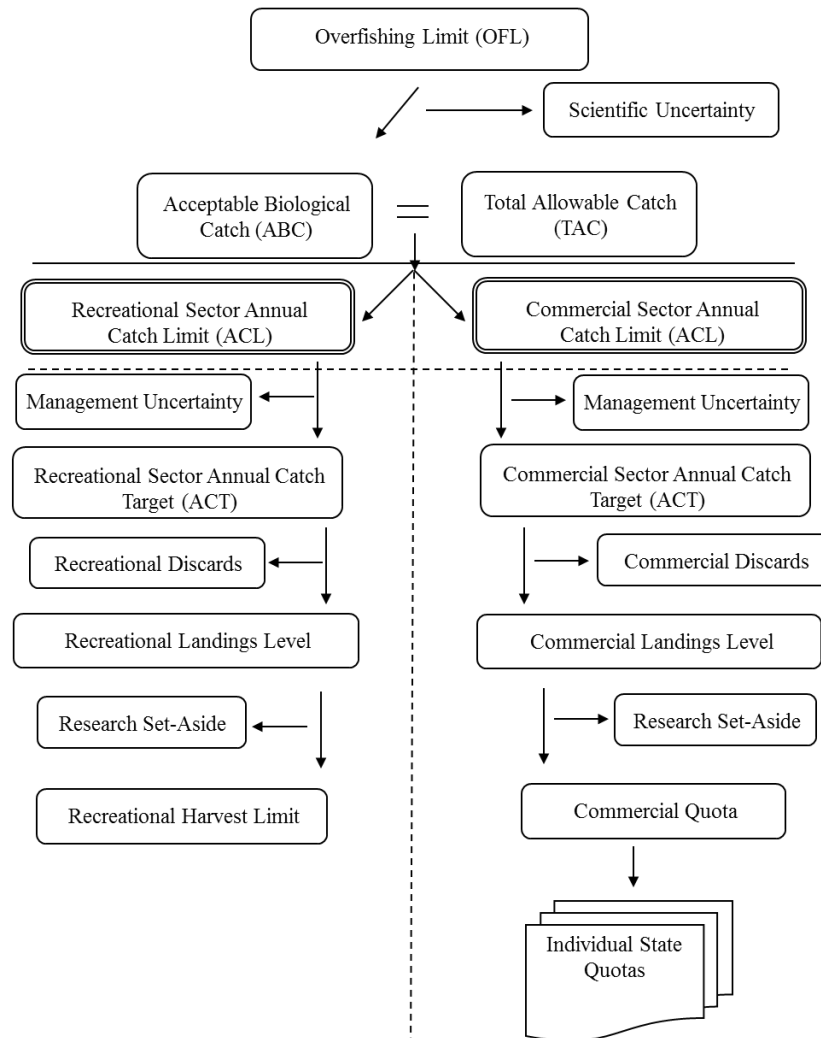


Figure 1: Flowchart for black sea bass catch and landings limits. The research set-aside program was suspended in 2014.

Annual Catch Targets

The Monitoring Committee considers all relevant sources of management uncertainty in the black sea bass fishery when recommending ACTs. 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).

Commercial landings have generally been near the commercial quotas for most of the past five years (2013-2017). The commercial quota monitoring system is timely and typically successful in constraining landings to the commercial quota. In contrast, the recreational fishery exceeded the RHL in several recent years, with periodic substantial overages (Table 2). 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 prior to 2017, the RHLs were set at levels not reflective of the large and increasing stock abundance. Analysis using the 2016 stock assessment indicates that RHLs during the few years prior to 2017 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.

In recent years, the Monitoring Committee and the Commission's 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 to continue to work to make improvements to the evaluation process for recreational measures.

For 2019, staff recommend no reduction in catch from the recreational or commercial ACLs so that each sector's ACT is set equal to the ACL.

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 RHLs. Projected discards 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 2015-2017 discard data, 53.0% of discards were attributable to the commercial sector and 47.0% to the recreational sector (Table 1). As stated above, the assumption that patterns in landings and discards in a future year will be similar to the most recent three year average percentage of landings and discards may not hold true. This will be considered by the Monitoring Committee at their July 2018 meeting.

After removing projected discards from the staff-recommended ACTs, the commercial quota would be 2.95 million pounds (1,341 mt) and the recreational harvest limit (RHL) would be 3.08 million pounds (1,396 mt; Table 1).

Commercial Gear Regulations and Minimum Fish Size

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 (TL) as part of an effort to reduce fishing mortality on immature black sea bass and increase SSB. 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 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, two 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 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 project which analyzed 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. Results confirmed that the current minimum mesh sizes for all three species are effective at releasing most fish smaller than the commercial minimum sizes (i.e. 14" total length for summer flounder, 9" total length for scup, and 11" total length for black sea bass). The study was not able to identify a common mesh size for all three species that would be effective at minimizing discards under the current minimum fish size limits. However, the authors concluded that a common mesh size of 4.5" or 5" diamond for scup and black sea bass would be effective at releasing undersized fish (Hasbrouck et al. 2018).

Council staff recommend no changes to the minimum mesh sizes for 2019. The Monitoring Committee will review the results of Hasbrouck et al. (2018) during their July 2018 meeting. If the Council wishes to consider modifications to the minimum mesh sizes, the objectives should be clarified. Possible objectives could include establishing a common minimum mesh size, minimizing discards, and/or maintaining or increasing catches of legal-sized fish; however, some of these objectives may be at odds with each other. Input from the commercial fishing industry should be sought before any minimum mesh size changes are considered. As the Monitoring Committee has noted in the past, changes to these requirements can create an economic burden for fishermen if they necessitate purchase of new nets.

Recreational Management Measures

Specific management measures that will be used to achieve 2019 RHL will not be determined until after the first four waves (i.e. January - August) of 2018 recreational landings are reviewed. These data will likely be available in October 2018. The Monitoring Committee will meet in November to review these data and make recommendations regarding any necessary changes in the recreational possession limits, minimum sizes, and seasons.

For 2018, the Council and Commission provided states the opportunity to open their recreational black sea bass fisheries during the month of February for the first time since 2013. The Council and Commission will consider doing so again for 2019.

Only North Carolina and Virginia opted to open their recreational black sea bass fisheries in February 2018. No black sea bass were harvested in North Carolina in February 2018. It was estimated that 4,826-5,206 pounds of black sea bass were harvested by recreational fishermen off Virginia in February 2018.

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