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 9, 2020

TO: Chris Moore, Executive Director

FROM: Julia Beaty, Staff

SUBJECT: 2021 Black Sea Bass Specifications

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Monitoring Committee in: 1) reviewing and potentially revising the previously approved 2021 catch and landings limits for black sea bass, 2) considering commercial management measures for 2021, and 3) considering any needed changes to the black sea bass recreational fishery in February 2021 only. Recreational management measures for the remainder of 2021 will be considered later in 2020. Additional information on fishery performance and past management measures can be found in the 2020 Black Sea Bass Fishery Information Document and the 2020 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.[1]

A black sea bass operational stock assessment was peer reviewed and accepted in August 2019. This assessment incorporated fishery catch and fishery-independent survey data through 2018, including revised recreational catch data provided by the Marine Recreational Information Program (MRIP) for 1989-2018.[2]

The 2019 operational assessment found that the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2018. Spawning stock biomass (SSB) in 2018 was 73.65 million pounds (33,407 mt, adjusted for retrospective bias), 2.4 times the updated biomass reference point (i.e., SSB_{MSY} proxy = $SSB_{40\%}$=31.07 million pounds/14,092 mt). The average fishing mortality rate (F) on fully selected ages 6-7 fish in 2018 was 0.42 (adjusted for retrospective

[1] Available at: http://www.mafmc.org/sf-s-bsb

[2] The revised MRIP data are based on a new estimation methodology accounting for changes to the angler intercept methodology and the transition from a telephone-based effort survey to a mail-based effort survey. The revised estimates of catch and landings are several times higher than the previous estimates for shore and private boat modes, substantially raising the overall black sea bass catch and harvest estimates. For example, estimates of black sea bass harvest in weight for 2014-2018 using the revised methodology are on average 2.32 times the estimates using the old methodology.

bias), 91% of the updated fishing mortality threshold reference point (i.e., F_{MSY} proxy = $F_{40\%}$ = 0.46).[3] The results of the 2019 operational assessment are described in more detail on pages 5-7.

The Council and the Atlantic States Marine Fisheries Commission's (ASMFC's or Commission's) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) approved 2020-2021 catch and landings limits for black sea bass in October 2019 based on the Acceptable Biological Catch (ABC) recommendations of the Council's SSC. These previously approved 2021 catch and landings limits are shown in Table 1 and were implemented via final rule on May 15, 2020 (85 Federal Register 29345).

The Council approved revisions to their risk policy in December 2019 with the intent that 2021 catch and landings limits would reflect the new policy. Therefore, the SSC is tasked with considering whether their previously recommended 2021 ABC should be revised to account for the change in the risk policy, or for other reasons.

The Monitoring Committee will review and, if appropriate, recommend changes to the previously approved 2021 Annual Catch Limits (ACLs), Annual Catch Targets (ACTs), commercial quotas, recreational harvest limits (RHLs). They will also recommend any necessary modifications to commercial gear restrictions, minimum fish sizes, and other commercial measures, and any necessary changes to the black sea bass recreational fishery for February 2021 only.

The Council and the Board will meet jointly in August 2020 to review the recommendations of the SSC and Monitoring Committee, as well as input from advisors. They will then consider revising their previously approved catch and landings limits for 2021, and any desired changes to the commercial management measures for 2021, as well as any desired changes the February 2021 recreational fishery. Recreational management measures for the remainder of 2021 will be considered in later in 2020.

As described in more detail below, staff recommend revisions to the 2021 catch and landings limits to account for revisions to the Council's risk policy. Staff also recommend that the discard projections used to calculate the 2021 catch and landings limits be revised to help prevent ABC and OFL overages. Staff also recommend revisions to the February 2021 recreational fishery to account for recent changes in the MRIP data. No other changes to recreational management measures in 2021 are recommended at this time. Recreational management measures for March-December will be consider later in 2020.

Staff do not recommend any changes to the current federal commercial management measures, including the minimum fish size, mesh size requirements and associated incidental possession limits, or pot/trap gear requirements for 2021.

[3] A prepublication copy of the August 2019 operational stock assessment report prepared for the Council and the SSC is available at: http://www.mafmc.org/ssc-meetings/2019/september-9-11

Table 1: Previously approved 2021 black sea bass catch and landings limits, staff recommendation for revisions, and revisions based only on the change in the Council's risk policy.

Measure	Previously approved			Staff recommended revision			Revision based only on P* change		
	mil lb	mt	Basis	mil lb	mt	Basis	mil lb	mt	Basis
OFL	17.68	8,021	2019 operational stock assessment projections	17.68	8,021	No change	17.68	8,021	No change from previously approved
ABC	15.07	6,835	Sept. 2019 SSC recommendation based on stock assessment projections & risk policy	17.45	7,916	P* change only	17.45	7,916	P* change only
ABC discards	3.68	1,671	24% of ABC, based on avg. 2016-2018 discards as % of catch	5.01	2,275	Sector-specific discards described below combined with requirement to allocate 49% of the landings portion of the ABC the com. fishery and 51% to the rec. fishery	4.19	1,900	Same basis as previously approved values. Updated based on revised ABC only.
Projected com. discards	1.40	637	38% of ABC discards, based on avg. 2016-2018 % of discards by sector	3.43	1,556	Calculated based on assumption that com. discards would be 36% of com. catch (2016-2018 avg.)	1.59	722	
Projected rec. discards	1.40	637	62% of ABC discards, based on avg. 2016-2018 % of discards by sector	1.58	719	Calculated based on assumption that rec. discards would be 20% of rec. catch (2016-2018 avg.)	2.60	1,178	
Com. ACL	6.98	3,167	49% of ABC landings portion (per FMP) + projected com. discards	9.52	4,320	49% of ABC landings portion (per FMP) + projected com. discards	8.09	3,670	
Com. ACT	6.98	3,167	Com. ACL, with no deduction for mgmt. uncertainty	9.52	4,320	Com. ACL, with no deduction for mgmt. uncertainty	8.09	3,670	
Com. quota	**5.58**	**2,530**	Com. ACT minus projected com. discards	**6.09**	**2,764**	Com. ACT minus projected com. discards	6.50	2,948	
Rec. ACL	8.09	3,668	51% of ABC landings portion (per FMP) + projected rec. discards	7.93	3,596	51% of ABC landings portion (per FMP) + projected rec. discards	9.36	4,246	
Rec. ACT	8.09	3,668	Rec. ACL, with no deduction for mgmt. uncertainty	7.93	3,596	Rec. ACL, with no deduction for mgmt. uncertainty	9.36	4,246	
RHL	**5.81**	**2,634**	Rec. ACT minus projected rec. discards	**6.34**	**2,877**	Rec. ACT minus projected rec. discards	6.76	3,068	

Introduction

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

The Monitoring Committee recommends management measures to achieve the SSC's recommended ABCs. Specifically, the Monitoring Committee recommends ACLs, ACTs, commercial quotas, RHLs, and management measures designed to achieve but not exceed the catch and landings limits.

Black sea bass are cooperatively managed by the Council and the Commission. The Council and the Commission's Management Board meet jointly each year to consider SSC and Monitoring Committee recommendations, as well as Advisory Panel input, before adopting catch and landings limits and other management measures. They may set specifications for these three species for up to three years at a time. The Council submits their recommendations to the National Marine Fisheries Service (NMFS). NMFS reviews, implements, and enforces federal fisheries regulations.

Recent Catch and Landings

Commercial and recreational landings both increased from 2018 to 2019 (Table 6, page 13). According to dealer data, commercial fishermen landed 3.53 million pounds (1,603 mt) of black sea bass in 2019, representing a less than 1% overage of the commercial quota of 3.52 million pounds (1,596 mt).

According to the revised MRIP data, recreational fishermen from Maine through Cape Hatteras, NC harvested 8.61 million pounds (3,907 mt) of black sea bass in 2019. This estimate should not be compared to the 2019 RHL as the RHL did not account for the revised MRIP estimates.

Commercial and recreational dead discard estimates for 2019 are not yet available; therefore, it is not possible to compare catch to the 2019 ACLs. A comparison of landings and dead discards by sector to the catch and landings limits during 2015-2018 is shown in Table 6 on page 13.

As of July 1, about 1.80 million pounds (815 mt) of black sea bass had been landed by commercial fishermen in 2020, corresponding to 32% of the 2020 commercial quota (5.58 million pounds/2,531 mt, Table 2). Commercial landings through July 1, 2020 show a very similar trend as in 2019. Commercial landings could have been higher in 2020 due to a 59% increase in the coastwide quota which became effective in mid-May; however, as described in more detail in the Fishery Performance Report written by advisors, widespread restaurant closures due to the COVID-19 pandemic impacted demand.

Preliminary recreational harvest estimates are currently only available through April 2020. This does not provide meaningful information about 2020 recreational harvest trends for black sea bass given that a very small percentage of black sea bass recreational harvest typically occurs during this time of year. Recreational harvest in the two states which participated in the optional February recreational open season in 2020 (i.e., Virginia and North Carolina) is described in more detail later in this memo.

Table 2: 2020 commercial black sea bass landings by state with data reported through July 1, 2020, according to preliminary data from NMFS weekly quota reports available at: https://www.fisheries.noaa.gov/new-england-mid-atlantic/quota-monitoring-greater-atlantic-region.

State	Landings (lb)
ME	0
NH	0
MA	7,440
RI	249,595
CT	14,557
NY	145,844
NJ	525,111
DE	157,061
MD	220,820
VA	287,955
NC	189,832
Total	**1,798,215**
2020 Commercial Quota	**5,580,000**
Percent of Quota Landed	**32%**

Stock Status and Biological Reference Points

A black sea bass operational stock assessment was peer reviewed and accepted in August 2019. This assessment retained the model structure of the 2016 benchmark stock assessment,[4] and incorporated fishery data and fishery-independent survey data through 2018, including revised recreational data provided by MRIP for 1989-2018. The following information is based on the prepublication draft of the August 2019 operational assessment prepared for use by the Council and SSC.[5]

As with the 2016 benchmark assessment, the 2019 operational assessment has a regional structure. The stock was modeled 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 with the 2016 benchmark assessment, the peer reviewers of the 2019 operational assessment concluded that "although the two-area model had a more severe retrospective pattern in opposite directions in each area sub-unit than when a single unit was assumed, it provides reasonable model estimates after the retrospective corrections and combining the two spatial units. Thus, even though reference points are generated and stock status determinations are conducted for each subunit, the combined projections should be used."

Due to the lack of a stock/recruit relationship, a direct calculation of MSY and associated reference points was not feasible and proxy reference points were used. SSB calculations and SSB reference points account for mature males and females. The reference points and terminal year SSB and F estimates from the 2019 operational assessment are shown in Table 3.

A comparison of the 2018 SSB and F estimates to the reference points indicates that the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in

[4] Available at: https://www.nefsc.noaa.gov/saw/reports.html
[5] Available at: http://www.mafmc.org/ssc-meetings/2019/september-9-11

2018. SSB in 2018 was estimated at 73.65 million pounds (33,407 mt, adjusted for retrospective bias), 2.4 times the updated biomass reference point (i.e., SSB_{MSY} proxy = $SSB_{40\%}$=31.07 million pounds/14,092 mt). The average fishing mortality rate on fully selected ages 6-7 fish in 2018 was 0.42 (adjusted for retrospective bias), 91% of the updated fishing mortality threshold reference point (i.e., F_{MSY} proxy = $F_{40\%}$ = 0.46; Table 3). The 2018 estimates of F and SSB were adjusted for internal model retrospective error (Figure 1). Figure 2 and Figure 3 show the time series of estimated SSB, recruitment, fishing mortality, and catch without retrospective adjustments.

The 2011 year class was estimated to be the largest in the time series at 144.7 million fish. The 2015 year class was the second largest at 79.4 million fish. Recruitment of the 2017 year class as age 1 in 2018 was estimated at 16.0 million, well below the 1989-2018 average of 36 million fish (Figure 2).

Updated estimates of spawning stock biomass, fishing mortality, and recruitment since the 2019 operational stock assessment are not currently available. In July 2020, the Northeast Fisheries Science Center (NEFSC) provided updated landings information as well as NEFSC trawl survey indices through spring 2020. This data update did not show signs of trends in catch or stock status which were not evident in the 2019 operational assessment or described elsewhere in this memo.

Table 3: Black sea bass biological reference points from the 2019 operational stock assessment.

Metric	Estimate
$SSB_{MSY\ proxy}$ = $SSB_{40\%}$ (biomass target)	31.07 mil lb / 14,092 mt
½ SSB_{MSY} (biomass threshold defining an overfished state)	15.53 mil lb / 7,046 mt
SSB in 2018	73.65 mil lb / 33,407 mt (2018). Adjusted for retrospective bias. 240% of SSB_{MSY}.
$F_{MSY\ proxy}$ = $F_{40\%}$ (threshold defining overfishing)	0.46
F in 2018	0.42 (2018). Adjusted for retrospective bias. Fully selected ages 6-7. 9% below F_{MSY}.

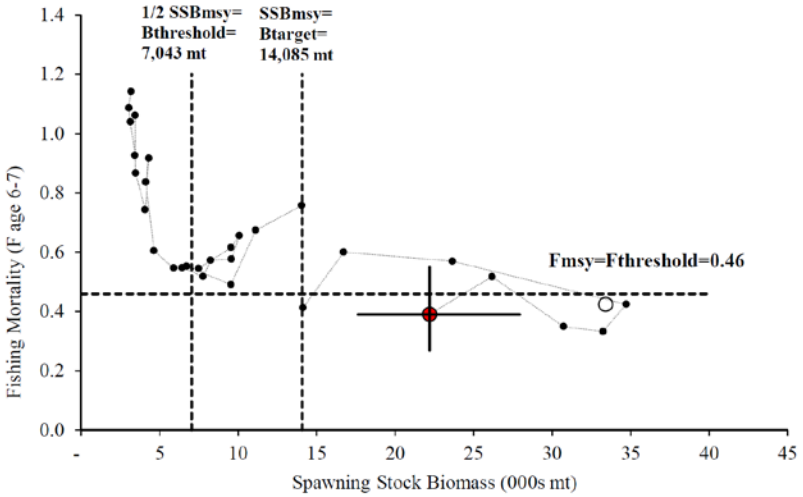

Figure 1: Estimates of black sea bass SSB and F relative to the biological reference points from the 2019 operational stock assessment. The red filled circle with 90% confidence intervals shows the un-adjusted 2018 estimates. The open circle shows the retrospectively adjusted estimates for 2018. (Source: prepublication copy of the August 2019 operational stock assessment report.)

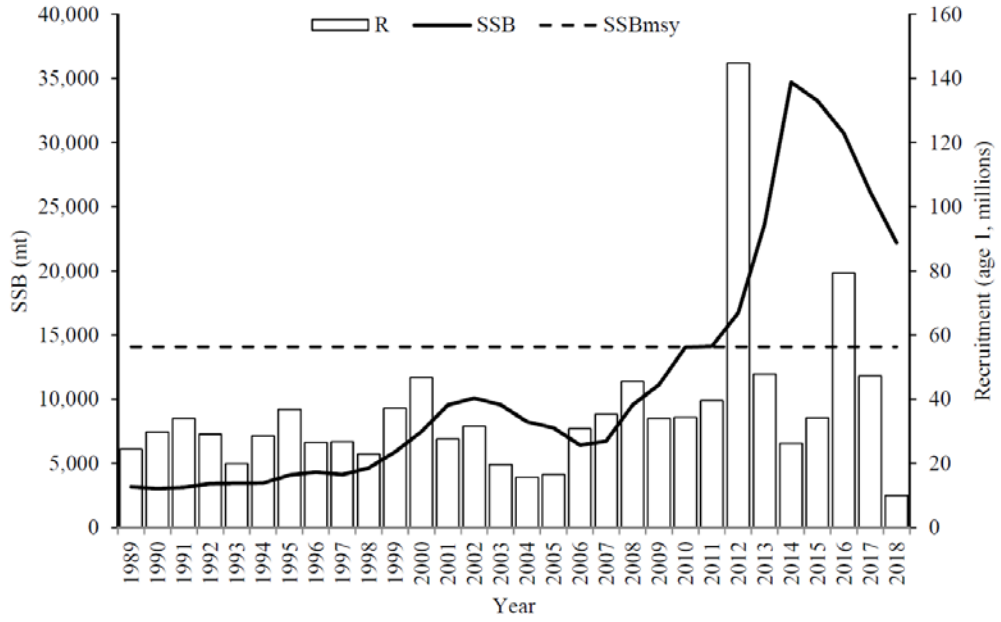

Figure 2: Black sea bass SSB and recruitment, 1989-2018 from the 2019 operational stock assessment. The horizontal dashed line is the updated biomass reference point. (Source: prepublication copy of the August 2019 operational stock assessment report.)

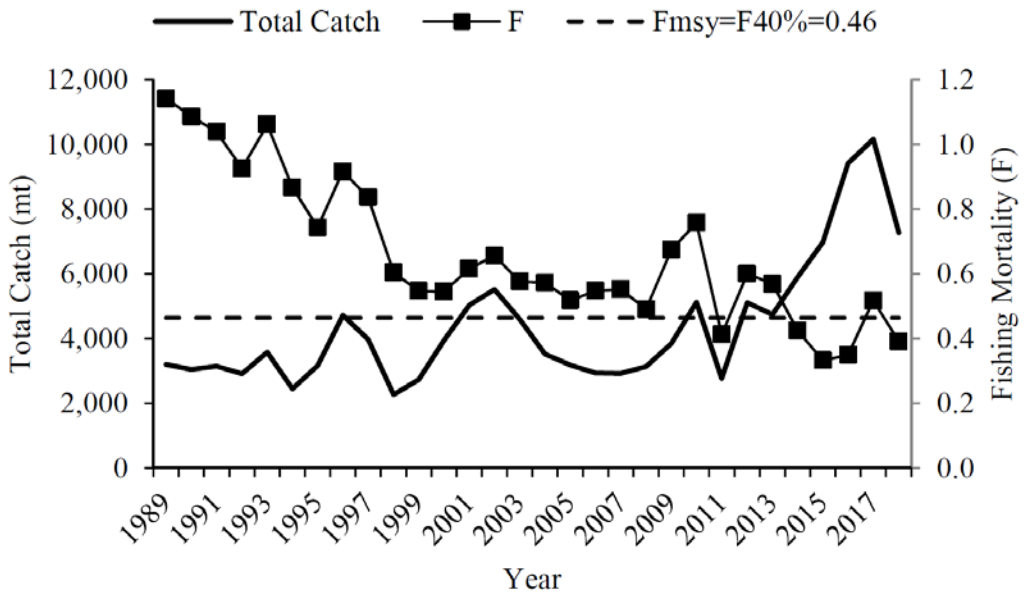

Figure 3: Total black sea bass catch and fishing mortality, 1989-2018, from the 2019 operational stock assessment. (Source: prepublication copy of the August 2019 operational stock assessment report.)

Review of Prior SSC Recommendations

In September 2019, the SSC recommended, and the Council and Board adopted 2020 and 2021 ABCs for black sea bass based on new stock status information and projections from the 2019 operational assessment.

The SSC applied a 100% coefficient of variance (CV) to the overfishing limit (OFL) when developing their ABC recommendations for 2020-2021. This represents an increase from the 60% OFL CV used for their 2017-2019 ABC recommendations.[6] A higher OFL CV results in a greater buffer between the OFL and the ABC to account for scientific uncertainty. The following text was copied directly from the SSC's September 2019 meeting summary[7] and describes their rationale for applying a 100% OFL CV for 2020-2021:

- There is a strong retrospective bias present in the assessment results and this pattern differs between the two spatial sub-areas.
- The fishery has a large recreational component (~60-80% of total harvest in recent years), and thus a substantial reliance on MRIP. Updated MRIP numbers differ substantially from the old estimates, and the updated estimate for one year (2016) was considered implausible owing to high variance in wave-specific data.
- Spatially explicit models were implemented in the 2016 benchmark assessment, and there were detailed efforts to explore the consequences of the misspecification of the spatial resolution of these models on perceptions of stock status.
- There were broadly consistent patterns in the fishery independent indices.

The SSC determined the following to be the most significant sources of scientific uncertainty associated with determination of the 2020-2021 OFLs and ABCs:

- The retrospective pattern was large enough to need the corrections (outside the 90% confidence intervals), and the additional uncertainty caused by applying the correction is unclear. The model for the northern sub-area has a larger retrospective pattern than the model for the southern sub-area.
- 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.
- The extent to which the spatial structure imposed reflects the dynamics within the stock. The combination of the values from the northern and southern sub-areas is done without weighting based on landings or biomass. It is unclear whether or how the uncertainty should be treated when the biological reference points are combined using simple addition.
- Future effects of temperature on stock productivity and range are highly uncertain.

Table 4 shows the 2020-2021 OFls and ABCs which were previously recommeded by the SSC and approved by the Council and Board. The ABC projections were based on the assumption that catch will be equal to the ABC each year; however, adjustments to projected catch in 2019 were made to account for the revised MRIP methodology. The projections were made separately for the northern and southern sub-units at F_{MSY}=0.46, then combined for total OFL and ABC calculations. Recruitment was sampled from the estimates for 2000-2018. The Council's ABC risk policy for a stock with a typical life history

[6] The SSC's 2017-2019 ABC recommendations and supporting rationale are summarized here: https://www.mafmc.org/s/January-2017-SSC-Report.pdf

[7] Available at: https://www.mafmc.org/s/September-2019-SSC-Meeting-ReportRevised.pdf

was applied, resulting in an ABC P* (i.e., probability of overfishing) of 40% on average across the two years. As previously stated and described in more detail below, the Council has since revised their risk policy. The SSC should consider whether revisions to their previously recommened 2021 ABC are necessary given the change in the risk policy.

Table 4: 2020-2021 OFL and ABCs recommended by the SSC and approved by the Council and Board in 2020, as well as associated fishing mortality rate, P*, and SSB projections. (Source: personal communication, Gary Shepherd, NEFSC.)

Year	OFL total catch		ABC total catch		ABC F	ABC P*	SSB	
	MT	Mil. lb	MT	Mil. lb			MT	Mil. lb
2020	8,795	19.39	6,835	15.07	0.30	38%	23,688	52.22
2021	8,021	17.68	6,835	15.07	0.33	42%	22,282	52.22

Revisions to the Council's Risk Policy

The Council first implemented a risk policy and ABC control rule in 2011 to comply with the 2006 re-authorization of the MSA. In 2017, the Council expressed interest in more comprehensively considering economic and social factors, in addition to biological factors, in their risk policy. In 2019, a workgroup comprised of NMFS staff, SSC members, academics, and Council staff was formed and tasked with developing and analyzing various risk policy alternatives in order to assess the short and long-term trade-offs between stock biomass protection and economic yield and benefits. Members of the workgroup built off their existing biological and economic management strategy evaluation models.

The Council considered nine different risk policy alternatives in December 2019, ultimately approving a combination of two alternatives.[8] The approved risk policy allows for increased risk under high stock biomass conditions (increased P* at most biomass levels, compared to the previous risk policy; Figure 4). The change is greatest for stocks with biomass above the target level (B_{MSY}). The revised risk policy retains the previous stock replenishment threshold (i.e., biomass levels where P*=0) of $B/B_{MSY} \leq 0.1$. The policy uses a linear ramping for B/B_{MSY} values less than 1.0 up to a maximum P* of 0.45 when stock biomass is at its target. For stocks with B/B_{MSY} values over 1.0, a second linear ramp is used up to a maximum P* of 0.49 for stocks at or above $B/B_{MSY} = 1.5$. In addition, the Council also removed the typical/atypical designation from the risk policy.

[8] Alternatives 2 and 8 described in the December 2019 discussion document available at http://www.mafmc.org/briefing/december-2019.

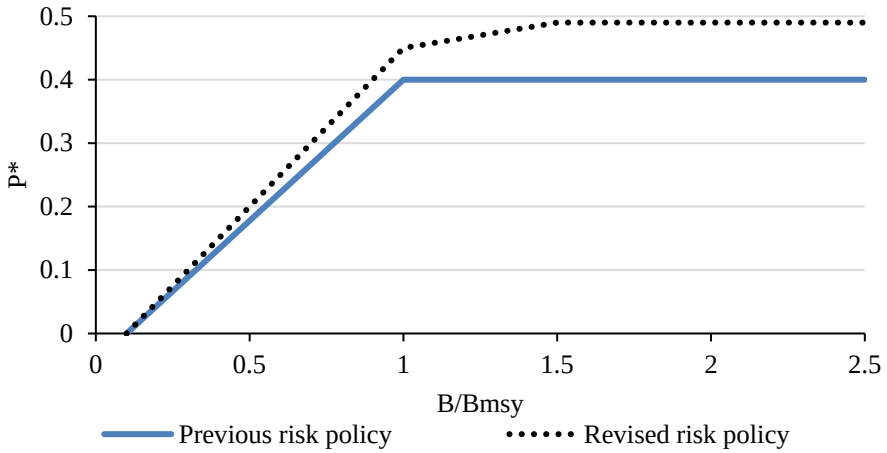

Figure 4: Acceptable probability of overfishing (P*) at different biomass levels under the Council's previous and revised risk policies.

Staff Recommendation for 2021 ABC

Staff recommend revising the previously approved 2021 black sea bass ABC based on the recent revisions to the Council's risk policy. This would revise the 2021 ABC from 15.07 million pounds (6,835 mt) to 17.45 million pounds (7,916 mt), a 16% increase (Table 5).

Table 5: 2021 black sea bass ABC and associated metrics considered in the Council's ABC control rule and risk policy, based on the SSC's previous OFL CV recommendation, as well the staff recommendations for revisions based on changes to the Council's risk policy.

Measure	Value
B/B_{MSY} in 2021 based on stock assessment projections	1.58
2021 OFL (not affected by risk policy change)	17.82 mil lb / 8,083 mt
OFL CV (not affected by risk policy change)	100%
P* under previous risk policy	42%[a]
P* under revised risk policy	49%
Previously approved 2021 ABC	**15.07 mil lb / 6,835 mt**
Revised 2021 ABC (staff recommendation based on revised P*)	**17.45 mil lb / 7,916 mt**
Difference between previously approved and staff recommendation for revised ABC	+16%

[a]The P* associated with the previously approved 2021 ABC exceeded 40% due to the averaging approach used to allow for constant ABCs across 2020 and 2021

Other Management Measures

2021 Discard Projections

It is necessary to project expected dead discards by sector to derive the commercial and recreational ACLs, the commercial quota, and the RHL from the ABC. Staff recommend reconsideration of the method used to project total and sector-specific discards for 2021 for the reasons described below.

Projected black sea bass discards are typically calculated by first dividing the ABC into a landings portion and a discards portion based on the most recent three year average proportions of total (commercial and recreational) landings and dead discards based on NEFSC data (i.e., the same data used in the stock assessment). The discards portion is then further divided into projected commercial discards and recreational discards based on the most recent three year average of dead discards by sector. The 2021 catch and landings limits previously approved by the Council and Board used this method of projecting discards by sector.

In September 2019, the Monitoring Committee noted that this method has repeatedly under-estimated discards in both the commercial and recreational sectors. For example, the commercial and recreational ACLs were exceeded every year during 2015-2018. In each case the overage was due at least in part to discards exceeding those projected through the specifications process. This resulted in ABC overages in every year during 2015-2018 (Table 6). Dead discard estimates for 2019 are not currently available; therefore, it is not known if the 2019 ABC was exceeded.

Despite multiple consecutive years of ABC overages, biomass has remained high (i.e., more than double the target level in the terminal year of both the 2016 and 2019 stock assessments). Continued high biomass despite multiple consecutive years of ABC overages is likely due at least in part to the buffer between the OFL and ABC starting in 2017 and the conservative ABCs that were set prior to 2017 due to the lack of a peer reviewed and approved stock assessment (personal communication, Gary Shepherd, NEFSC). **If the 2021 ABC is revised to account for the change in the Council's risk policy, the buffer between the OFL and the ABC will shrink from 15% to 1%, which will have a much greater risk of resulting in overfishing. For this reason, staff strongly recommend reconsideration of the methods used to project discards in order to prevent ACL and ABC overages in 2021.**

Staff recommend that the Monitoring Committee revisit their September 2019 recommendation for projected discards. The Council and Board reviewed this recommendation in October 2019 and instead decided to continue with the past approach for projecting discards (described above), which resulted in lower discard projections than those recommended by the Monitoring Committee. This decision was due in part to uncertainty about how discards would change in response to an increase in the landings limits for 2020-2021, as well as a desire to minimize negative impacts on the recreational fishery resulting from the disconnect between the revised MRIP estimates and the commercial and recreational sector allocations.

During their September 2019 meeting, the Monitoring Committee noted that trends in commercial quotas, landings, and discards since 1998 suggest that commercial black sea bass landings closely follow changes in the quota and that discards tend to scale up or down with increases or decreases in landings. They also noted that sector-specific discards as a proportion of sector-specific catch were relatively consistent during 2016-2018, even under varying commercial quotas and RHLs and highly variable recreational harvest estimates over that time period (including two years with outlier recreational estimates). They agreed that the past approach of projecting discards notably under-predicted discards, leading to ACL overages in both sectors. They therefore agreed that a new approach was warranted for black sea bass. They recommended that expected commercial and recreational discards in 2020-2021 be calculated based on the assumption that recreational dead discards would account for 20% of total recreational catch and commercial dead discards would account for 38% of total commercial catch, based on 2016-2018 averages using NEFSC data. The calculations also factored in the requirement that 49% of the landings proportion of the ABC must be allocated to the commercial fishery and 51% to the recreational fishery. In September 2019, the Monitoring Committee agreed that this methodology is more appropriate than the previous

methodology as it scales discards with expected changes in landings, consistent with observed patterns in the fishery. It also gives equal weight to the sector-specific proportions in each of the three years, thus downplaying the influence of any potential single year outliers. Staff recommend that the Monitoring Committee consider whether this method should be used to revise the 2021 discard projections. Updated discard projections based on this methodology are shown in Table 1.

It is worth noting that the NMFS Greater Atlantic Regional Fisheries Office (GARFO) and the NEFSC are working to develop a new system of estimating discards with the goal of both groups using the same estimates in the future. This work is ongoing. In recent years, the NEFSC discard estimates have been used for specifications calculations based on the advice of the Monitoring Committee. Staff recommend continued use of the NEFSC discard estimates in the specifications process until the outcome of the ongoing collaboration between GARFO and the NEFSC is known.

Recreational and Commercial ACLs

Based on the allocation percentages defined in the FMP, 49% of the total allowable landings (i.e., the proportion of the ABC that is expected to be landed as opposed to discarded) are allocated to the commercial fishery and 51% to the recreational fishery. These allocations are combined with expected commercial and recreational discards to calculate sector-specific ACLs.

These allocations were implemented through Amendment 9 (1996) and first came into effect in 1998. They were based on the proportions of commercial and recreational landings during 1983-1992 and do not reflect the current understanding of the proportion of catch and landings from the commercial and recreational sectors based on the revised time series of MRIP data and current commercial fishery data. The Council and Board are in the process of developing an FMP Amendment to consider if changes to these allocations should be made. Any changes made to these allocations will not be implemented until 2022 or later.

The change in the Council's risk policy and the staff recommendation for projected discards (both described above) would result in a revised 2021 commercial ACL of 9.52 million pounds (4,320 mt), an increase of 36% compared to the previously approved 2021 commercial ACL. It would result in a revised 2021 recreational ACL of 7.93 million pounds (3,596 mt), a decrease of 2% compared to the previously approved 2021 recreational ACL. Although the recreational ACL would decrease, as described below, the RHL would increase due to the recommended change in the discard estimates (Table 1).

Table 6: Commercial and recreational landings and dead discard compared to the 2015-2019 commercial quotas, RHLs, ACLs, ABCs, and OFLs. Landings and discard estimates for 2015-2018 were provided by the NEFSC, with the exception of commercial landings which are from dealer data.[9] Dead discard estimates for 2019 are not yet available; therefore, it is not possible to compare catch to the catch limits in 2019. The catch and landings estimates shown below may differ from those used by GARFO for ACL overage evaluation in some cases. Note that the 2015 and 2016 catch and landings limits for both sectors were not set based on a peer reviewed and accepted stock assessment and were likely not reflective of stock status and availability at the time.

Metric (mil lb or %)	**2015**	**2016**	**2017**	**2018**	**2019**
OFL and ABC overage/underages					
Total catch	8.02	12.93	11.74	10.07	--
OFL	N/A	N/A	12.05	10.29	10.29
OFL overage/underage	N/A	N/A	-3%	-2%	--
ABC	5.5	6.67	10.47	8.94	8.94
ABC overage/underage	46%	94%	12%	13%	--
Commercial overages/underages					
Commercial landings	2.38	2.59	4.01	3.46	3.53
Commercial quota	2.21	2.71	4.12	3.52	3.52
Quota overage/underage	8%	-4%	-3%	-2%	0%
Commercial discards	0.93	1.67	2.26	1.59	--
Commercial discards overage compared to projected amount	155%	282%	132%	92%	--
Commercial catch	3.31	4.26	6.27	5.05	--
Commercial ACL	2.6	3.15	5.09	4.35	4.35
Commercial ACL overage	27%	35%	23%	16%	--
Recreational overages/underages					
Recreational landings (old MRIP estimates)	3.79	5.23	4.19	3.92	--
RHL	2.33	2.82	4.29	3.66	3.66
RHL overage/underage (old MRIP estimates)	63%	85%	-2%	7%	--
Recreational discards (old MRIP estimates)	0.92	3.45	1.27	1.10	--
Rec. discards overage compared to projected amount (old MRIP estimates)	61%	394%	17%	18%	--
Recreational catch (old MRIP estimates)	4.71	8.67	5.46	5.02	--
Recreational ACL	2.9	3.52	5.38	4.59	4.59
Rec. ACL overage (old MRIP estimates)	62%	146%	2%	9%	--
Recreational landings (revised MRIP estimates)	9.81	13.52	12.55	8.84	8.61
Rec. dead discards (revised MRIP estimates)	2.17	3.07	3.6	2.28	--
Recreational catch (revised MRIP estimates)	11.98	16.59	16.15	11.12	--

[9] Under the federal regulations, all commercial landings in North Carolina from federally-permitted vessels count towards the quota. Landings from south of Cape Hatteras for state-only permitted vessels do not count towards the quota. The stock assessment only considers commercial landings north of Cape Hatteras.

Recreational and Commercial ACTs

ACTs are set less than or equal to the sector-specific ACLs to account for management uncertainty (Figure 5). 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 due to 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 Monitoring Committee considers all relevant sources of management uncertainty in the black sea bass fishery when recommending ACTs.

Commercial landings have not exceeded the quota by more than 1% since 2015 (2015-2019, Table 6). 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 substantial overages prior to 2017 (based on the old MRIP data, Table 6). It should be noted that the revised time series of MRIP data was released in July 2018 and was first incorporated into a stock assessment in August 2019; therefore, RHLs prior to 2020 did not account for these revised estimates. Past RHLs should not be compared against the revised estimates. In addition, the Monitoring Committee has noted that these recreational overages occurred when the stock was rapidly expanding and availability to 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 indicated that RHLs during the few years prior to 2017 would have been 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 ASMFC's Technical Committee have been working to develop 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. Some of this work has been incorporated into the ongoing Recreational Reform Initiative.[10]

The Monitoring Committee has generally not recommended deductions from the ACLs to the ACTs in either sector to account for management uncertainty. Staff recommend careful consideration of management uncertainty for 2021 given the potential for a greatly reduced scientific uncertainty buffer between the OFL and ABC under the Council's revised risk policy as well as due to concerns about discard projections described above. Specifically, if the projected discard estimates continue to be based on the past methodology which consistently under-estimated actual discards (Table 6), then management uncertainty may warrant more serious consideration than if an alternative approach to discards is used. It is worth noting that commercial and recreational discard projections cannot be calculated separately given that the sector allocations are landings-based, rather than catch based. This means that the discard projections in one sector impact the catch and landings limits in the other sector. Management uncertainty, however, can be addressed separately for each sector.

It is also worth noting that the 2020 discard estimates will likely be highly uncertain given several months without commercial fisheries observer coverage or MRIP angler access point sampling due to the COVID-19 pandemic. This will pose challenges for evaluating discards against projected estimates in future years.

[10] More information is available at: https://www.mafmc.org/actions/recreational-reform-initiative.

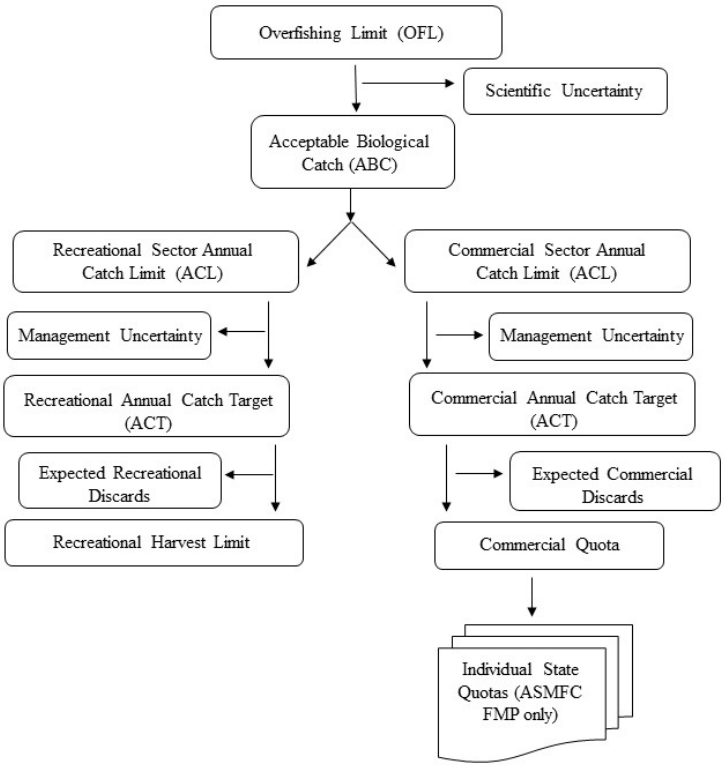

Figure 5: Flowchart for black sea bass catch and landings limits.

Commercial Quotas and Recreational Harvest Limits

Projected discards are subtracted from the sector-specific ACTs to derive annual commercial quotas and RHLs. Considerations related to projected 2021 discards are described above.

The change in the Council's risk policy and the staff recommendation for projected discards (both described above) would result in a revised 2021 commercial quota of 6.09 million pounds (2,764 mt), an increase of 9% compared to the previously approved 2021 quota. It would result in a revised 2021 RHL of 6.34 million pounds (2,877 mt), an increase of 9% compared to the previously approved 2021 RHL (Table 1).

An increase in the commercial quota would allow for increased commercial landings; however, the RHL will not increase enough to allow for increased recreational harvest or liberalized recreational management measures in 2021. This is because the revised MRIP estimates show much higher recreational harvest in recent years (Table 6) than any of the RHLs which are expected to result from the revised 2021 ABC given the fixed commercial/recreational allocation percentages defined in the FMP.

Commercial Minimum Fish Size, Gear Regulations, and Possession Limits

Amendment 9 (1996) established a commercial minimum fish size of 9 inches total length. The minimum fish size was increased to 10 inches in 1998, and to 11 inches in 2002. The 11-inch minimum size has remained unchanged since 2002.

Two escape vents are required in the parlor portion of pots/traps used to catch black sea bass. The Council and Commission adopted modifications to the size for circular vents, effective in 2007, based

on the findings of a Council and Commission sponsored workshop. The minimum circle vent size increased from 2.375 inches to 2.5 inches. The requirements of 1.375 inches x 5.75 inches for rectangular vents and 2 inches for square vents remained unchanged.

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 that possess 500 pounds or more of black sea bass from January 1 through March 31, or 100 pounds or more from April 1 through December 31, must fish with nets that have a minimum mesh size of 4.5-inch diamond mesh 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.

Beyond the possession limits associated with the minimum trawl mesh size, there are no federal waters commercial possession limits for black sea bass. Several states set commercial possession limits that apply within state waters to help ensure that commercial landings do not exceed each state's allocation as defined in the Commission's FMP. In recent years, a few advisors have requested consideration a federal waters commercial possession limit to help prevent negative impacts on the price of black sea bass resulting from individual trawl trips with high landings. Other advisors have disagreed with this recommendation. At this time, Council staff recommend no changes to the current federal regulations regarding commercial black sea bass possession limits.

The Council recently 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 inches total length for summer flounder, 9 inches total length for scup, and 11 inches 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 inches diamond for scup and black sea bass would be effective at releasing undersized fish.[11]

The Monitoring Committee reviewed the results of this study in 2018 and recommended no changes to the commercial minimum mesh sizes for 2019. They recommended clarification of the objectives of the Council regarding consideration of the mesh sizes (e.g., establishing a common minimum mesh size, minimizing discards, and/or maintaining or increasing catches of legal-sized fish). Input from the commercial fishing industry should be sought before any minimum mesh size changes are considered.

Staff will continue to work with the Monitoring Committee and Advisory Panel in 2020 to further analyze and consider potential changes to mesh size regulations. Currently, staff recommend no changes to the black sea bass minimum mesh sizes and associated possession limits, or other commercial management measures for 2021.

[11] [11] Hasbrouck, E., S. Curatolo-Wagemann, T. Froelich, K. Gerbino, D. Kuehn, P. Sullivan, J. Knight. 2018. Determining Selectivity and Optimum Mesh Size to Harvest Three Commercially Important Mid-Atlantic Species - A Report to the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission. Available at: http://www.mafmc.org/s/Tab08_SFSBSB-Mesh-Selectivity-Study-Apr2018.pdf

February 2021 Recreational Management Measures

The Council and the Commission allowed states to open their recreational black sea bass fisheries during February 2018-2020 under specific constraints. The recreational black sea bass fishery was previously closed during January and February for several years. States were required to opt-in to the February opening during 2018-2020. Participating states were required to have a 12.5 inch minimum fish size limit and a 15 fish possession limit during February (identical to the federal recreational measures). Participating states were required to adjust their recreational management measures during the rest of the year to account for expected February harvest to help ensure that the coastwide RHL was not exceeded as a result of the February opening. Expected February harvest by state was pre-defined based on an analysis of vessel trip report data from federally permitted for-hire vessels in February 2013, the last year the recreational fishery was open in February prior to 2018. To date, only Virginia and North Carolina have participated in this optional opening.

Detailed background information on the February recreational fishery in 2018-2020 and considerations for 2021 can be found in various documents which were previously provided to the Monitoring Committee and are available at: https://www.mafmc.org/council-events/2020/sfsbsb-mc-meeting-july27. This information is not repeated here.

During their May 2020 meeting, the Monitoring Committee reviewed performance of the recreational black sea bass fishery during February 2018-2020 and considered if any management changes are needed for February 2021. They will continue these discussions during their July 2020 meeting and make recommendations on any necessary changes for the Council and Board to consider in August 2020.

Staff recommend revisions to the values for expected February harvest by state to account for recent revisions to the MRIP (see the staff memo dated May 22, 2020, available at the link above). Staff also recommend that the Council and Board clarify certain aspects of the requirements for state participation in this optional opening, including requirements for quantifying February harvest and requirements for changes to recreational management measures later in the year if February harvest exceeds the expected value in any individual state. Staff caution against participation in this optional fishery by states which are not able to modify their measures later in the year to account for greater than expected February harvest.

The Monitoring Committee will discuss recreational management measures for the rest of 2021 in the fall of 2020, after preliminary MRIP data through August 2020 are available. Management measures for the February 2021 recreational fishery must be considered earlier in 2020 to allow sufficient time for the federal rulemaking process if any changes are needed.

Staff have no recommendations for recreational management measures for black sea bass during March-December 2021 at this time.