Mid-Atlantic Fishery Management Council
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Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: July 29, 2022

To: Council and Board

From: Julia Beaty, Staff

Subject: 2023 Black Sea Bass Specifications

On Tuesday, August 9, the Council and Board will review previously adopted 2023 black sea bass specifications and recommend revisions as needed. Measures to be considered include 2023 commercial and recreational catch and landings limits, the February recreational opening, as well as any changes to the commercial management measures for 2023. As described in the staff memo, previously approved 2023 commercial and recreational catch and landings limits will require revisions based on recent modifications to the commercial/recreational allocation percentages.

Materials listed below are provided for the Council and Board's consideration of this agenda item. As noted below, some materials are behind other tabs, and some will be available on the August 2022 Meeting Page at a later date.

1) Monitoring Committee meeting summary from July 28, 2022 (*behind Tab 3*)
2) July 2022 Scientific and Statistical Committee meeting report *(behind Tab 15)*
3) Staff memo on 2023 black sea bass specifications dated July 14, 2022
4) June 2022 Advisory Panel Fishery Performance Report and additional AP email comments received through July 8, 2021 *(behind Tab 3)*
5) 2022 Black Sea Bass Data Update
6) 2022 Black Sea Bass Fishery Information Document

The following document is also posted on the August 2022 Meeting Page as a supplemental briefing document:

1) Black Sea Bass Management Track Assessment for 2021

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MEMORANDUM

Date: July 14, 2022

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: 2023 Black Sea Bass Specifications

Revised 7/21/2022 to correct a typo in Table 3.

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 reviewing previously adopted 2023 commercial and recreational catch and landings limits and commercial management measures for black sea bass, and recommending revisions as needed.

The black sea bass stock from Maine through Cape Hatteras, North Carolina is jointly managed by the Council and the Atlantic States Fishery Management (Commission). Additional information on fishery performance and past management measures can be found in the 2022 Black Sea Bass Fishery Information Document and the 2022 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.[1]

The Magnuson-Stevens Fishery Conservation and Management Act requires the Council's SSC to provide scientific advice for fishery management decisions, including recommendations for Acceptable Biological Catch limits (ABCs), prevention of overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABCs recommended by the SSC.

According to the 2021 management track stock assessment, the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2019.[2] ABCs, commercial and recreational annual catch limits (ACLs) and annual catch targets (ACTs), commercial quotas, and Recreational Harvest Limits (RHLs) for 2022-2023 were set in 2021 based on the results of this assessment (Table 1).

In July 2022, the SSC will review their previously recommended 2023 ABC and consider if revisions are needed. Council staff recommend no revisions to the ABC as there is no new information to suggest a change is needed.

[1] Available at: https://www.mafmc.org/fishery-performance-reports
[2] Northeast Fisheries Science Center. 2022. Management Track Assessment June 2021. Northeast Fisheries Science Center reference document; 22-10. DOI: https://doi.org/10.25923/4m8f-2g46

Following the SSC meeting, the Monitoring Committee will review the 2023 commercial and recreational ACLs and ACTs, commercial quota, and RHLs, which are derived from the ABC. The ACLs, ACTs, quota, and RHL account for the commercial/recreational allocation defined in the FMP. In December 2021 Council and the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) revised the commercial/recreational allocation for black sea bass; therefore, the 2023 ACLs, ACTs, commercial quota, and RHL should be modified to account for the revised allocation.

Table 1 lists the staff recommended revisions to the 2023 ACLs, ACTs, commercial quota, and RHL based on the revised commercial/recreational allocation, no deduction for management uncertainty in either sector, and the discards projection methods described later in this memo. The final resulting values may differ based on the recommendations of the Monitoring Committee, the Council, and the Board.

The Monitoring Committee will also review the commercial management measures which can be modified through the specifications process, including the federal waters minimum fish size, minimum mesh size, and mesh exemption programs. Council staff recommend no revisions to these commercial management measures as there is no new information to suggest a change is needed.

The Monitoring Committee will also consider if changes are needed to the February recreational black sea bass opening which has been in place since 2018. As described in more detail later in this memo, changes are required to the non-preferred coastwide measures to allow this opening to occur in 2023. Other recreational management measures will be considered later in 2022.

The Council will meet jointly with the Board in August 2022 to review the recommendations of the SSC and Monitoring Committee, as well as input from the Advisory Panel, before reviewing commercial and recreational catch and landings limits and commercial management measures for 2023 and recommending revisions as needed. Recreational bag limits, size restrictions, and open/closed seasons for 2023 will be considered in late 2022 after preliminary recreational harvest estimates through August 2022 are available.

In summary, the staff recommendations for SSC and Monitoring Committee consideration are as follows:

- Maintain the previously recommended 2023 ABC.
- Set the commercial and recreational ACLs based on the revised commercial/recreational allocation.
- Take no deduction from the commercial and recreational ACLs to the ACTs for management uncertainty.
- Calculate 2023 projected commercial dead discards based on the method used for black sea bass during 2021-2022.
- Calculate 2023 projected recreational dead discards based on a simple three-year average of the most recent recreational dead discard estimates.
- Make no changes to the commercial management measures which can be modified through specifications.
- Modify the 2022 recreational non-preferred coastwide measures (which were waived in favor of state waters measures) to allow states to retain the ability to participate in the optional February recreational opening.

Table 1: Previously approved 2022-2023 catch and landings limits for black sea bass as well as staff recommended revisions for 2023. The final 2023 values may differ based on the recommendations of the SSC, Monitoring Committee, Council, and Board. Italicized text indicates a change in methodology for calculating the associated measure.

Measure	Previously Approved					Staff Recommended Revisions		
	2022		2023		Basis	2023		
	mil lb	mt	mil lb	mt		mil lb	mt	Basis
OFL	19.26	8,735	17.01	7,716	SSC recommendation based on stock assessment projections.	17.01	7,716	Same basis as previously approved.
ABC	18.86	8,555	16.66	7,557	SSC recommendations based on stock assessment projections and Council risk policy.	16.66	7,557	Same basis as previously approved.
ABC landings	13.20	5,990	11.66	5,291	ABC - expected com. and rec. dead discards	NA	NA	Not needed under new catch-based allocation.
Com. ACL	10.10	4,583	8.93	4,048	49% of ABC landings portion (com. allocation) + expected com. disc.	7.50	3,401	*45% of ABC (commercial allocation)*
Com. ACT	10.10	4,583	8.93	4,048	Equal to the ACL; no deduction for management uncertainty	7.50	3,401	Same basis as previously approved.
Expected com. dead discards	3.63	1,649	3.21	1,456	Com. dead disc. = 36% of com. catch (2017-2019 avg.)	2.70	1,224	Same basis as previously approved but accounting for allocation change.
Com. quota	6.47	2,934	5.71	2,592	Com. ACT minus expected com. dead discards	4.80	2,177	Same basis as previously approved.
Rec. ACL	8.76	3,972	7.74	3,509	51% of ABC landings portion (rec. allocation) + expected rec. disc.	9.16	4,156	*55% of ABC (recreational allocation)*
Rec. ACT	8.76	3,972	7.74	3,509	Equal to the ACL; no deduction for management uncertainty	9.16	4,156	Same basis as previously approved.
Expected rec. dead discards	2.02	917	1.79	810	Rec. dead disc. = 23% of rec. catch (2017-2019 avg)	3.04	1,378	*Three-year avg. of most recent discard estimates available (2017-2019)*
RHL	6.74	3,055	5.95	2,699	Rec. ACT minus expected rec. dead discards	6.12	2,778	Same basis as previously approved.

Stock Status and Biological Reference Points

A black sea bass management track stock assessment was peer reviewed and accepted in June 2021. This assessment retained the model structure of the 2016 benchmark stock assessment and incorporated fishery data and fishery-independent survey data through 2019. Data from 2020 were not incorporated due to significant gaps in some data sets due to the COVID-19 pandemic and the time required to consider how to best address those gaps. As with the 2016 benchmark and subsequent updates, terminal year estimates of spawning stock biomass, fishing mortality, and recruitment were adjusted for internal model retrospective error. The retrospectively adjusted values are compared against the reference points and used in management.

Due to the lack of a stock/recruit relationship, a direct calculation of maximum sustainable yield (MSY) and associated reference points (F and SSB) is not feasible and proxy reference points were used. SSB calculations and SSB reference points account for mature males and females.

The 2021 management track assessment indicates that the black sea bass stock was not overfished and overfishing was not occurring in 2019. Spawning stock biomass in 2019 was estimated at about 2.1 times the target level. Fishing mortality in 2019 was estimated to be 15% below the threshold level that defines overfishing (Table 2, Figure 1 - Figure 3).

The 2021 management track assessment indicates that the 2011 year class (i.e., fish spawned in 2011) was the largest in the time series and the 2015 year class was the second largest. The 2017 year class was well below the 1989-2018 average, but the 2018 year class was above average at (Figure 2). The 2018 year class is the most recent year class for which estimates are currently available.

A data update provided by the Northeast Fisheries Science Center (NEFSC) in July 2022 indicates that relative abundance from the NEFSC spring bottom trawl survey has steadily increased since 2015 (however, note that the 2020 index is based on an incomplete survey). Age composition data show evidence of the large 2011 year class, as well as above average 2015, 2016, and 2019 year classes.[3]

A black sea bass research track stock assessment is currently in development and is expected to be peer reviewed in February 2023. The research track assessment is not intended to provide outputs that will be used directly in management. Rather, the research track assessment model will be used in a management track assessment in the summer of 2023, which will incorporate the most recent data available and will provide outputs for use in management. Updated black sea bass management track assessments are expected to be available every other year.

[3] Black Sea Bass Data Update for 2022 provided by the Northeast Fisheries Science Center. Available at https://www.mafmc.org/ssc-meetings/2022/july-25-26

Table 2: Black sea bass biological reference points from the 2021 management track stock assessment.

	Spawning stock biomass	Fishing mortality rate (F)
Target	31.84 mil lb (14,441 mt)	N/A
Threshold	15.92 mil lb (7,221 mt)	0.46
Terminal year estimate (2019)	65.53 mil lb (29,769 mt) [a] 2.1 times target level	0.39[a] 15% below threshold level
Status	**Not overfished**	**Overfishing not occurring**

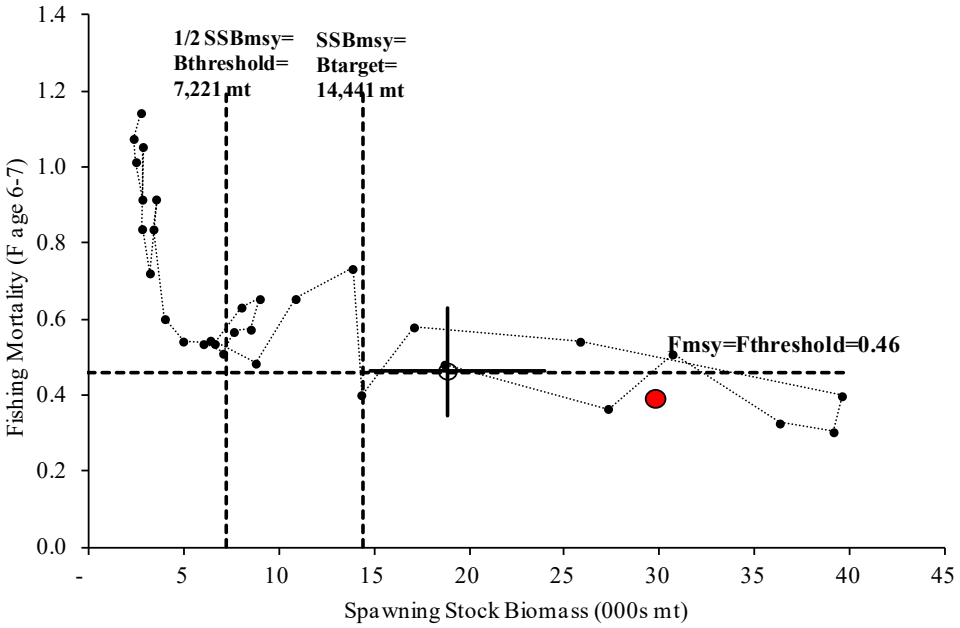


Figure 1: Estimates of black sea bass spawning stock biomass (SSB) and fully-recruited fishing mortality (F, peak at ages 6-7) relative to biological reference points. Open circle with 90% confidence intervals shows the assessment point estimates. The filled circle shows the retrospectively adjusted estimates which are used in management. Source: 2021 management track assessment.

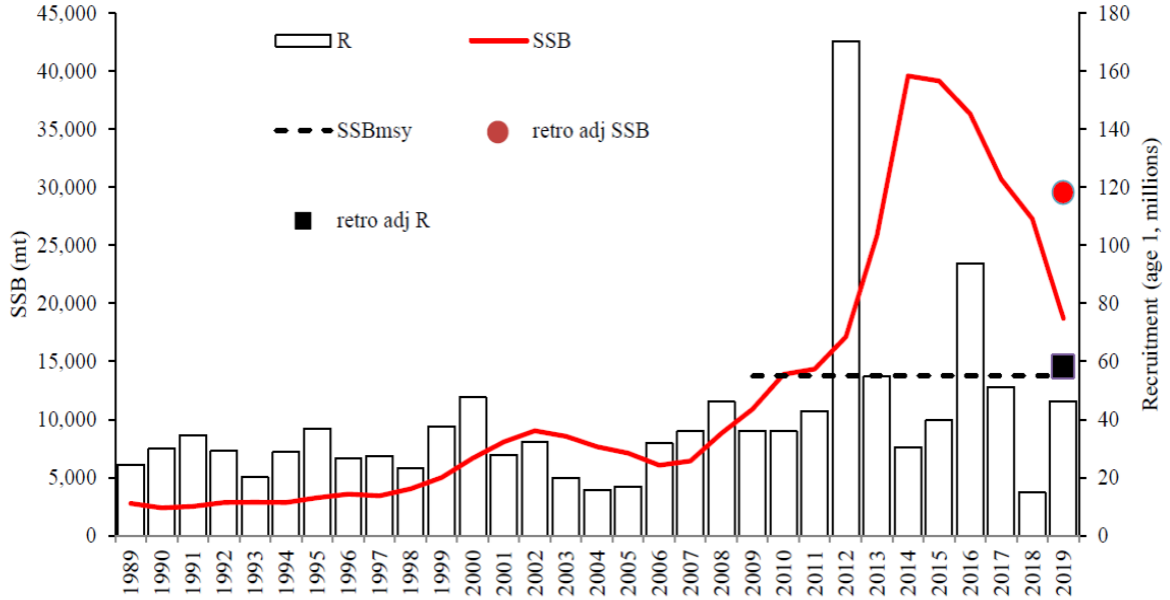


Figure 2: Black sea bass spawning stock biomass (SSB; solid line) and recruitment at age 1 (R; vertical bars), 1989-2019. The horizontal dashed line is the updated SSB_{MSY} proxy = $SSB_{40\%}$ =14,441 mt. SSB and recruitment estimates for 2019 were adjusted for a retrospective pattern in the stock assessment (red circle and black square, respectively). Adjusted values are used in management. Source: 2021 management track assessment.

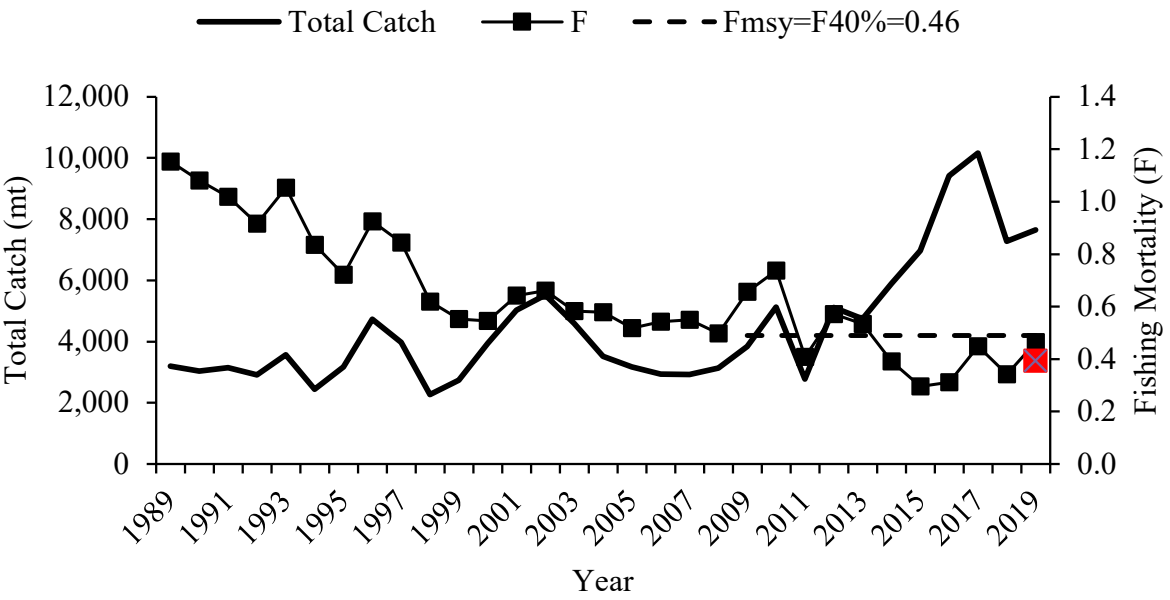


Figure 3: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 6-7; squares) for black sea bass. The horizontal dashed line is the updated F_{MSY} proxy = $F_{40\%}$ = 0.46. The red square is the retrospectively adjusted fishing mortality value for 2019. The adjusted value is used in management. Source: 2021 management track assessment.

Recent Catch and Fishery Performance

Commercial landings in 2021 were the highest in the entire time series of data back to 1989 and landings in 2020 were the second highest in the time series. Commercial landings during 2012-2019 were within 11% of the quota each year, with a 13% quota underage in 2020 and a 30% underage in 2021.[4] The commercial quota during 2020 and 2021 was notably higher than previous years (Table 3).

Based on data reported through July 6, 2022, 2.28 million pounds of black sea bass have been landed by commercial fishermen from Maine through Cape Hatteras, NC in 2022, corresponding to 35% of the 2022 commercial quota of 6.47 million pounds. Throughout 2022 to date, commercial landings have been slightly lower than 2021 landings.[5]

Commercial ACL overages occurred each year during 2013-2019 based on higher than expected discards. The method for calculating projected dead discards was revised starting with the 2021 specifications in an attempt to address this issue. Discard data for 2021 are not currently available; therefore, performance of the revised method cannot yet be evaluated.

In 2018, the Marine Recreational Information Program (MRIP) released revisions to the entire time series of recreational harvest and discard estimates. The black sea bass recreational catch and landings limits did not account for these revisions until 2020; therefore, recreational fishery performance compared to the catch and landings limits must be evaluated using the older MRIP data through 2019 and the revised MRIP estimates starting in 2020. As shown in Table 4, recreational harvest exceeded the RHL and recreational discards also exceeded the expected amount in most years since 2012, with a 56% RHL overage in 2020 and an 89% RHL overage in 2021. The Council and Board agreed to leave the recreational bag, size, and season limits unchanged in 2020 and 2021 despite anticipated RHL overages. This was viewed as a temporary solution to allow more time to consider how to fully transition the management system to use of the revised MRIP data through the Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda. Final action has been taken on both actions, which will have implications for 2023 recreational specifications, as described in more detail later in this document. The temporary status quo approach could not be maintained in 2022; therefore, the Council and Board approved a 20.7% reduction in recreational harvest compared to the 2018-2021 average in all states and federal waters with the goal of preventing an overage of the 2022 RHL. The impacts of these restrictions cannot yet be evaluated as preliminary estimates of recreational harvest and discards for 2022 are currently only available through wave 2 (March/April). These data do not provide meaningful insights into the 2022 recreational black sea bass fishery given that the recreational black sea bass fishery was closed through at least May 15 in all states except New Hampshire.

[4] Based on NEFSC data for landings, which may differ slightly from data used by the NOAA Fisheries Greater Atlantic Regional Fisheries Office.

[5] Based on data available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region

Table 3: Black sea bass commercial landings, dead discards, and dead catch compared to the commercial quota, projected commercial dead discards, and commercial ACL, 2012-2021. ACLs for black sea bass were first used starting in 2012. All values are in millions of pounds.

Year	Com. landings[a]	Com. quota[b]	Quota overage/ underage	Com. dead discards[a]	Projected com. dead discards[c]	Projected dead discards overage/underage	Com. dead catch[a]	ACL	ACL overage/ underage
2012	1.72	1.71	+1%	0.26	0.22	+18%	1.98	1.98	0%
2013	2.26	2.17	+4%	0.61	0.36	+69%	2.87	2.6	+10%
2014	2.40	2.17	+11%	1.01	0.36	+181%	3.41	2.6	+31%
2015	2.45	2.21	+11%	0.93	0.39	+138%	3.38	2.6	+30%
2016	2.50	2.71	-8%	1.67	0.44	+280%	4.17	3.15	+32%
2017	3.99	4.12	-3%	2.26	0.97	+133%	6.25	5.09	+23%
2018	3.34	3.52	-5%	1.59	0.83	+92%	4.93	4.35	+13%
2019	3.48	3.52	-1%	2.26	0.83	+172%	5.74	4.35	+32%
2020	4.29	5.58	-23%	Not currently available	1.4	TBD	TBD	6.98	TBD
2021	4.87	6.09	-20%	Not currently available	3.43	TBD	TBD	9.52	TBD

[a] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[b] The commercial quotas shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[c]Based on specifications calculations used to set the commercial ACL and quota.

Table 4: Black sea bass recreational landings, dead discards, and dead catch compared to the RHL, projected recreational dead discards, and recreational ACL, 2012-2021. ACLs for black sea bass were first used starting in 2012. Values are provided in the "old" and "new" MRIP units where available as the ACLs and RHLs did not account for the revised MRIP data until 2020. Therefore, overage/underage evaluations must be based in the old MRIP units through 2019 and the new MRIP units starting in 2020. All values are in millions of pounds.

Year	Rec. land. old MRIP units[a]	Rec. land. new MRIP units[b]	RHL [c]	RHL overage/ underage [d]	Rec. dead disc. old MRIP units[a]	Rec. dead disc. new MRIP units[b]	Projected rec. dead disc.[e]	Projected dead disc. overage/ underage [d]	Rec. dead catch old MRIP units[a]	Rec. dead catch new MRIP units[b]	ACL	ACL overage/ underage [d]
2012	3.26	6.97	1.32	+147%	0.80	2.31	0.50	+60%	4.07	9.28	1.86	119%
2013	2.64	5.92	2.26	+17%	0.65	1.65	0.57	+14%	3.29	7.57	2.9	13%
2014	3.85	7.74	2.26	+70%	0.84	1.85	0.57	+47%	4.69	9.59	2.9	62%
2015	4.11	9.81	2.33	+76%	0.82	2.17	0.57	+44%	4.93	11.98	2.9	70%
2016	5.19	13.52	2.82	+84%	1.21	3.07	0.7	+73%	6.40	16.59	3.52	82%
2017	4.50	12.55	4.29	+5%	1.27	3.60	1.09	+17%	5.77	16.15	5.38	7%
2018	3.82	8.84	3.66	+4%	1.1	2.28	0.93	+18%	4.92	11.12	4.59	7%
2019	3.46	8.63	3.66	-5%	0.5	3.24	0.93	-46%	3.96	11.87	4.59	-14%
2020	NA	9.06	5.81	+56%	NA	Not currently available	2.28	TBD	NA	TBD	8.09	TBD
2021	NA	11.98	6.34	+89%	NA	Not currently available	1.59	TBD	NA	TBD	7.93	TBD

[a] Based on the data update provided by the NEFSC in 2018 (most recent data from NEFSC in "old" MRIP units). Values for 2018 and 2019 were provided by GARFO.

[b] Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

[c] The RHLs shown for 2012-2014 reflect a 3% deduction for Research Set Aside.

[d] Based on a comparison with old MRIP data through 2019 and new MRIP data starting in 2020.

[e] Based on specifications calculations used to set the recreational ACL and RHL.

Review of Prior SSC Recommendations

In July 2021, the SSC recommended 2022 and 2023 ABCs for black sea bass based the Council's ABC control rule and risk policy, using stock status information and projections provided with the 2021 management track assessment.

The SSC maintained use of a 100% coefficient of variance (CV) applied to the overfishing limit (OFL) when developing their ABC recommendations for 2022-2023. The following text was copied directly from the SSC's July 2021 meeting summary[6] and describes their rationale for applying a 100% OFL CV:

- 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 also noted that retrospective bias had increased since the 2019 management track assessment and uncertainty in the 2020 recreational harvest and dead discards are high because of COVID-related disruptions to the MRIP survey in 2020.

The projections used by the SSC to calcuate the 2022-2023 OFLs and ABCs assumed that recreational harvest in 2021 would be the same as in 2020. This resulted in an expected RHL overage. The projections also assumed that the comercial sector would catch their full ACL without overages. Therefore, the assumed RHL overage resulted in an assumed 2021 ABC overage. The SSC agreed that this was an appropriate assumption given recent trends in recreaitonal harvest and given that the Council and Board maintained status quo recreational measures in 2020 and 2021 despite expected RHL overages.

The SSC recommended variable ABCs across 2022-2023 because the revisions to the Council's risk policy adopted in 2019 resulted in a greater than 50% probability of overfishing in one year when averaged ABCs were used. The ABCs recommended by the SSC are shown in Table 5.

The SSC determined the following to be the most significant sources of scientific uncertainty associated with determination of the 2022-2023 OFLs and ABCs in July 2021:

- 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 an equal M in the assessment model for both sexes — may not adequately capture potential sex-based differences in M.
- The spatial distribution of productivity within the stock range.

[6] Available at: https://www.mafmc.org/ssc-meetings/2021/july21-23

- 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 conducted 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.
- Estimates of 2020 harvest and dead discards in both the recreational and commercial sectors are highly uncertain because of COVID-related pauses in observer coverage and MRIP intercept surveys.

Table 5: 2022-2023 black sea bass OFLs and ABCs recommended by the SSC in July 2021, as well as associated fishing mortality rates (F), probability of overfishing (p*), spawning stock biomass (SSB), and projected biomass compared to target level (SSB/SSB_{MSY}).

Year	OFL		ABC		ABC F	ABC p*	SSB		SSB/ SSB_{MSY}
	MT	Mil. lb	MT	Mil. lb			MT	Mil. lb	
2022	8,735	19.56	8,555	18.86	0.41	0.49	22,637	49.91	1.57
2023	7,716	17.01	7,557	16.66	0.41	0.49	19,538	43.07	1.35

Staff Recommendations for 2023 ABC

Staff recommend no change to the previously adopted 2023 ABC of 16.66 million pounds (7,5571 mt). Available information, including the 2022 data update provided by the NEFSC, suggest that stock condition has not notably changed compared to the information considered when the SSC recommended this ABC in July 2022.

Recent Management Actions

The following sections briefly summarize recent management actions that should be considered during discussions of sector-specific catch and landings limits for 2023.

Commercial/Recreational Allocation Amendment

In December 2021, the Council and Commission revised the black sea bass commercial/ recreational allocation such that 45% of the ABC will now be allocated to the commercial fishery and 55% to the recreational fishery. Under the previous allocation, 49% of the amount of the ABC that was expected to be landed was allocated to the commercial fishery and 51% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation. The allocation will now be applied directly to the ABC. Figure 4 illustrates the differences in how specifications will be set under the revised catch-based allocation compared to the previous landings-based allocation.

The revised and previous allocations are not directly comparable due to the change from a landings-based to a catch-based allocation. However, the allocation revisions are expected to increase the recreational ACL and RHL and decrease the commercial ACL and quota compared to the previous allocation (e.g., Table 1).

The revised allocations are pending review by NMFS and if approved, are expected to be effective January 1, 2023. Therefore, the Monitoring Committee should recommend 2023 commercial and recreational ACLs, and other specifications that derive from the ACLs, based on the revised allocations.

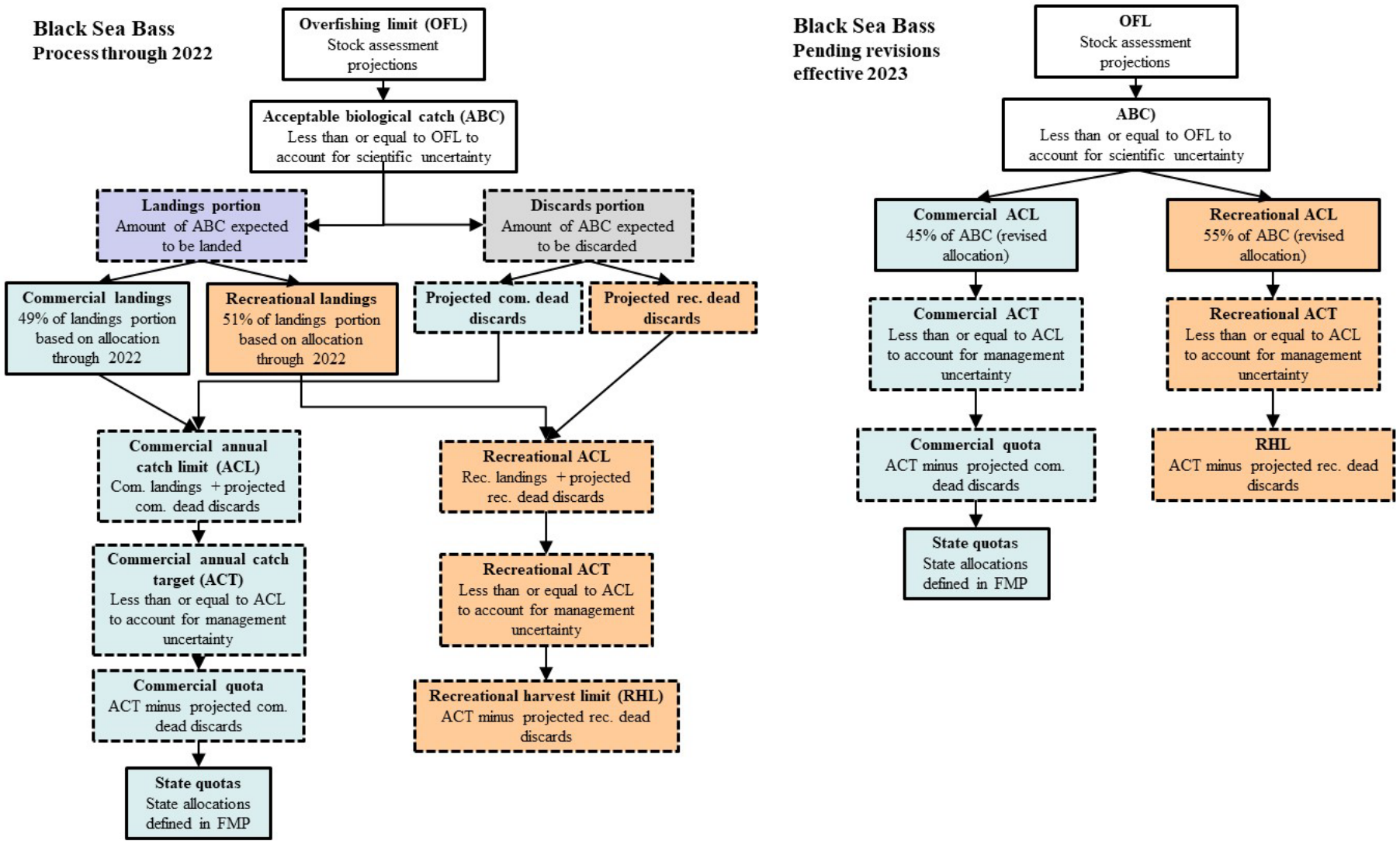


Figure 4: Process for setting black sea bass catch and landings limits through 2022 (left) and starting in 2023 (right). Dashed lines indicate where values are set based on Monitoring Committee recommendations through the annual specifications process.

Recreational Harvest Control Rule Framework/Addenda

In June 2022, the Council and the Commission's Interstate Fishery Management Program Policy Board took final action on the Recreational Harvest Control Rule Framework/Addenda, with the goal of using a new approach, called the Percent Change Approach, to set recreational measures for summer flounder, scup, and black sea bass starting in 2023. Under the Percent Change Approach, recreational measures will not be tied as closely to an RHL (or, by extension, an ACL) as previously required. Instead, the target harvest level will vary based on a comparison of a confidence interval around expected harvest under status quo measures to the upcoming two-year average RHL, as well as biomass compared to the biomass target. This approach will allow for RHL overages in some cases (and therefore, by extension, likely ACL overages) and underages in other cases.[7]

It is not possible to predict the target level of harvest for 2023 recreational measures because the 2023 RHL has not been set and calculations of expected harvest under status quo measures will not be finalized until later in 2022.

The Monitoring Committee should consider the implications of this approach when making recommendations for 2023 recreational specifications, including considerations related to management uncertainty and projected dead discards.

Sector Specific Catch and Landings Limits

Recreational and Commercial ACLs

Under the revised catch-based allocations described above, the commercial and recreational ACLs will be calculated by applying the 45% commercial/55% recreational allocation to the 2023 ABC. If no changes are made to the previously adopted 2023 ABC, this would result in a 2023 commercial ACL of 7.50 million pounds (3,401 mt) and a recreational ACL of 9.61 million pounds (4,156 mt; Table 1).

Recreational and Commercial ACTs

ACTs are set less than or equal to the sector-specific ACLs to account for management uncertainty (Figure 4). 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 catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or discards) or due to a lack of management precision (i.e., the ability to constrain catch to desired levels). The Monitoring Committee should consider all relevant sources of management uncertainty in the black sea bass fishery when recommending ACTs.

Recreational harvest is estimated through a statistical survey design (i.e., the MRIP program), as opposed to mandatory vessel and dealer reporting in the commercial fishery which is more of a census of the entire commercial fishery. The commercial fisheries are also mostly limited access (with some exceptions at the state level) and the commercial fisheries can be closed in-season when landings approach the quota. The recreational fisheries for these species are all open access and there is no in-season closure authority due to the timing of recreational data availability. For

[7] For more details on the Percent Change Approach, see https://www.mafmc.org/newsfeed/2022/mafmc-amp-asmfc-take-first-step-toward-recreational-management-reform-for-bluefish-sumer-flounder-scup-and-black-sea-bass

these reasons, recreational landings can be more difficult to constrain and predict than commercial landings.

The commercial quota monitoring system has largely been successful in preventing quota overages. As shown in Table 3, commercial landings have not exceeded the quota since 2015. Commercial ACL overages during 2016 through 2019 were the result of higher than expected commercial dead discards. Revisions to the projected discard methodology were made starting with the 2021 specifications to address this issue.

When considering the scale of the RHL overages and underages shown in Table 4, it is important to note that the catch and landings limits for both sectors were not set based on a peer reviewed and accepted stock assessment until 2017. Previous RHLs were likely lower than they could have been had an approved stock assessment been available to set catch and landings limits that were reflective of biomass levels at that time. In addition, as previously described, the notable 2020 and 2021 RHL overages were the result of the Council and Board leaving the bag, size, and season limits unchanged despite expected overages. This was a short-term approach to prevent major negative impacts to the recreational sector while changes to management were considered through the Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda. The temporary status quo approach could not be maintained in 2022; therefore, the Council and Board approved a 20.7% reduction in recreational harvest compared to the 2018-2021 average in all states and federal waters with the goal of preventing an overage of the 2022 RHL. The impacts of these restrictions on harvest in 2022 cannot be evaluated with currently available data.

As previously described, the impact of the Percent Change Approach on recreational black sea bass measures in 2023 is not yet known; therefore, the likelihood of this approach resulting in an ACL overage in 2023 cannot be accurately assessed at this point in time.

Based on the considerations described above for each sector, staff recommend no deduction from the 2023 commercial and recreational ACLs to the ACTs to account for management uncertainty.

Projected Dead Discards, Commercial Quota, and Recreational Harvest Limit

Projected dead discards by sector are subtracted from the ACTs to derive the commercial quota and RHL. The methodology to calculate projected dead discards is not prescribed in the FMP and can be modified on an annual basis. The methodology can vary by sector.

As described below, staff recommend continued use of the 2021-2022 discard projection method for the commercial fishery and a simple three-year average of discards for the recreational fishery when setting the 2023 quota and RHL.

For 2021-2022 specifications, black sea bass projected dead discards were calculated based on an assumption that dead discards as a proportion of total dead catch in each sector would be equal to the average sector-specific proportions during the most recent three years of available data. These calculations also accounted for the required 49% commercial, 51% recreational allocation of the amount of the ABC that was expected to be landed. This method could be adapted for 2023 specifications under the revised catch-based allocation by applying the 3-year average sector-specific proportions of landings and dead discards to the respective ACLs. As previously stated, 2019 is the most recent year for which dead discard estimates are currently available. Data provided with the 2021 management track assessment indicate that on average during 2017-2019, 36% of commercial dead catch was discarded and 23% of recreational dead catch was

discarded (Table 3, Table 4). Applying these percentages to the 2023 ACLs described above results in 2.70 million pounds of projected commercial dead discards and 2.14 million pounds of projected recreational dead discards. For the reasons described below, this could be a reasonable assumption for the commercial fishery in 2023; however, staff recommend consideration of a different approach for the recreational fishery.

Projected commercial dead discards under this method (i.e., 2.70 million pounds) exceed estimated commercial dead discards during 2012-2019; however, currently available discard data do not capture recent years of higher commercial quotas (Table 3). In addition, the 2023 commercial ACL is expected to exceed all commercial ACLs prior to 2021, even under the revised allocation (though it will decrease compared to 2021 and 2022). This discard projection method relies on an assumption that total commercial dead catch will equal the ACL. This may be a reasonable assumption for the commercial fishery as commercial landings are generally close to the quota and the discards overages shown in Table 3 occurred in years when a different method was used to project discards. The method used for 2021-2022, and recommended for use for the commercial fishery in 2023, aimed to address the issue of past under-prediction and to reduce the likelihood of future ACL overages due to discards. Performance of this method cannot be evaluated at this time as discard estimates for 2020-2021 are not currently available.

Black sea bass recreational bag, size, and season limits in state and federal waters remained virtually unchanged during 2018-2021. Measures were restricted in 2022 with the goal of achieving a 20.7% reduction in harvest in all states compared to 2018-2021 average harvest. The impacts of these restrictions on recreational discards are not yet known.

As previously stated, under the Percentage Change Approach, which will be used to set recreational measures starting in 2023, the recreational bag, size, and season limits will be less closely tied to an RHL (and by extension, an ACL) than in previous years. At this stage, it is not possible to accurately predict how recreational measures will change in 2023 as this will be determined based on analyses and further discussions which will occur later in 2022.

Given these uncertainties, the Monitoring Committee should consider whether it is appropriate to assume that recreational dead catch in 2023 will be equal to the ACL. As previously stated, the discard projection method described above relies on an assumption that catch in each sector will be equal the respective ACL.

For these reasons, staff recommend setting projected 2023 recreational dead discards to a simple three-year average based on the most recent data available. This does not require an assumption that recreational dead catch will be similar to the ACL. Based on currently available data (i.e., 2017-2019), this would result in 3.04 million pounds of projected recreational dead discards (Table 4).

Applying the staff-recommended dead discard projections to the recommended ACTs described above results in a 2023 commercial quota of 4.80 million pounds (2,177 mt) and a 2023 RHL of 6.12 million pounds (2,778 mt).

Commercial Management Measures

Federal regulations include several commercial management measures which can be modified through the annual specifications process. These measures are summarized below. Council staff recommend no changes to these measures for 2023 as there is no new information to suggest changes are needed.

The commercial minimum fish size in federal waters is 11 inches. This measure has remained unchanged since 2002.

Trawl vessels which 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. These measures have been unchanged since 2002.

Pot/trap regulations include minimum vent sizes of 2.5 inches in diameter if circular, 1.375 inches x 5.75 inches for rectangular vents, and 2 inches for square vents remained unchanged. In addition, two vents are required in the parlor portion of the pot/trap. These regulations have been unchanged since 2007.

In the fall of 2015, the Monitoring Committee conducted a thorough review of the commercial management measures which can be modified through specifications.[8] This review indicated that further exploration of potential modifications to some measures may be justified. Specifically, for black sea bass, this included assessing the feasibility of a common trawl minimum mesh size with summer flounder and scup. Stemming from this discussion, the Council funded a project which analyzed the selectivity of multiple codend mesh sizes relative to retention of these three species in the commercial bottom trawl fisheries. 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.[9]

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 Council's objectives regarding consideration the mesh sizes (e.g., establishing a common minimum mesh size, minimizing discards, and/or maintaining or increasing catches of legal-sized fish). A few advisors have requested continued consideration of a standardized minimum mesh size across two or more of the species.

Staff will continue to work with the Monitoring Committee and Advisory Panel to further analyze and consider potential changes to mesh size regulations. However, given other workload constraints, it is not likely that additional work on this topic can be done in 2022.

Recreational Management Measures

Starting in 2018, the Council and Commission provided states the opportunity to open their recreational black sea bass fisheries during the month of February under specific conditions. States must opt into this fishery. Participating states are required to match the federal recreational measures during the February opening. Participating states may need to adjust their measures during March-December to help ensure that participation in this optional opening does not

[8] The summary report is available at: http://www.mafmc.org/s/Tab11_SF-S-BSB-Commercial-Measures.pdf.
[9] 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

increase the likelihood of coastwide harvest increasing beyond the target level.[10] If changes are desired to the overall February recreational opening as described in the Council and Commission FMPs, those changes must be considered during the summer of the prior year to ensure sufficient time for federal rulemaking, if necessary. Considerations for individual states participating in this opening will occur separately through the Commission process.

If the Council and Board wish to maintain the February recreational opening in 2023, the current non-preferred coastwide measures must be revised. The non-preferred coastwide measures are used under the conservation equivalency process for waiving federal waters recreational black sea bass measures in favor of state waters measures. This federal conservation equivalency process was used for black sea bass for the first time in 2022. This process is separate from, but has implications for, the February recreational fishery.

The non-preferred coastwide measures are implemented in the federal regulations but waived in favor of state waters measures if it can be demonstrated that the combination of state measures will have the same impact on harvest as the non-preferred coastwide measures. Federal waters measures cannot remain waived from one year to the next. A rulemaking process is required each year to waive federal waters measures Due to the time needed for rulemaking, the non-preferred coastwide measures from the previous year are in place from January 1 until they are waived through the federal rulemaking process, usually in the spring.

The 2022 non-preferred measures include a season of May 15 – October 8, a minimum fish size of 14 inches, and a 5 fish possession limit. For these reasons, if the Council and Board wish to maintain the ability of states to participate in the optional February opening in 2023, the 2022 non-preferred coastwide measures should be modified to February 1-28, May 15-October 8, 14 inches, and 5 fish. This change is not intended to allow for any liberalizations in 2023. This change should only be used to allow continuation of the February opening under the same conditions as in previous years. The approach for other aspects of 2023 recreational management, including additional revisions to the non-preferred measures for 2023, if necessary, will be considered later in 2022.

The recreational bag, size, and season limits for March - December 2023 will be considered in late 2022 after the first four waves (i.e., January - August) of preliminary 2022 recreational harvest data are available (expected October 2022). Improved statistical methods for predicting the impacts of bag, size, and season limits on recreational harvest (i.e., the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model) may also be available by fall 2022. The Monitoring Committee will meet in November 2022 to review available data and model outputs and to make recommendations for recreational bag, size, and season limits for 2023. As previously described, 2023 will be the first year that recreational measures for summer flounder, scup, and black sea bass will be set using the Percent Change Approach.

[10] Through 2022, the target level for coastwide harvest was the RHL. Starting in 2023, the target level of coastwide harvest will be defined based on the Percent Change Approach, as previously described.

Black Sea Bass Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Reported 2021 landings in the commercial fishery were 2,211 mt, an increase of 14% from 2020 (1,945 mt) and 80% of the 2021 commercial quota (2,764 mt). Estimated 2021 landings in the recreational fishery were 5,436 mt, an increase of 32% from 2020 (4,110 mt) and 189% of the 2021 recreational harvest limit (2,877 mt). Total commercial and recreational landings in 2021 were 7,646 mt, an increase of 26% from 2020 (6,055 mt) (Figure 1).

Relative abundance derived from the NEFSC spring bottom trawl survey has steadily increased since 2015 (note that the 2020 index is based on an incomplete survey) (Figure 2). The large 2011 cohort was apparent in the 2013 aggregate index as well as age compositions from 2012-2017 (Figure 3). Age composition data also show above average 2015, 2016 and 2019 cohorts (Figure 3).

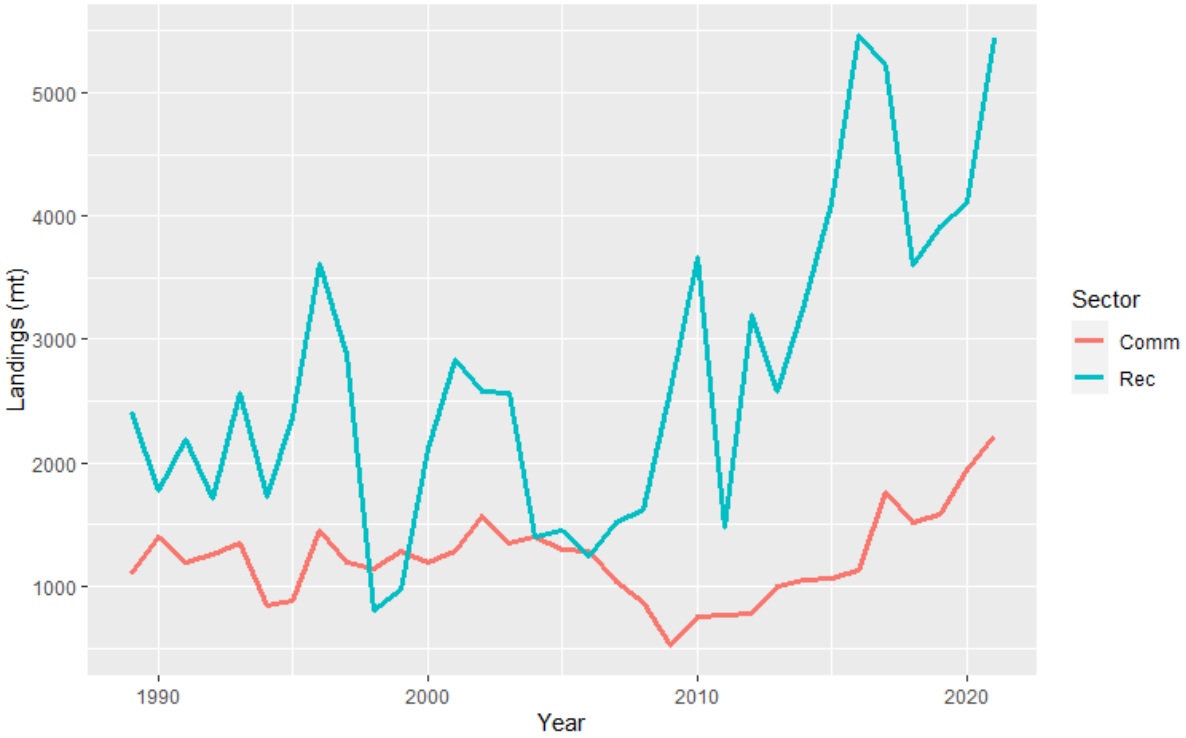
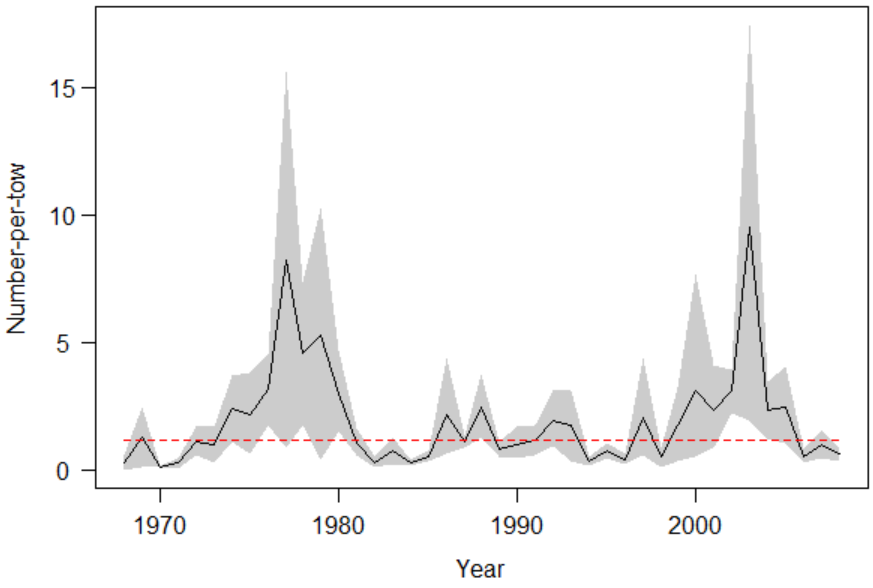


Figure 1. Black Sea Bass total fishery landings for 1989-2021.

a)



b)

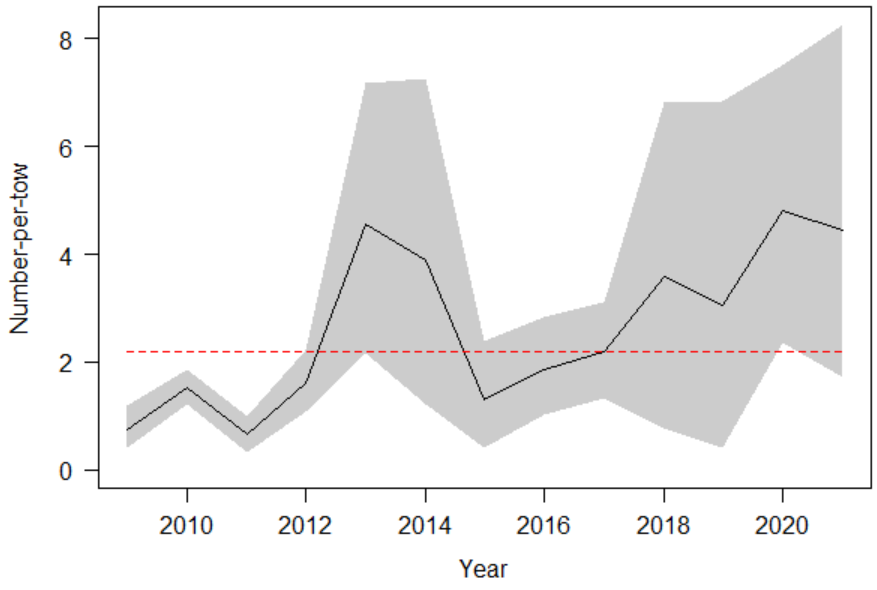


Figure 2. Black sea bass relative abundance (stratified mean number-per-tow ± 90% CI) derived from the NEFSC spring bottom trawl survey for the SV Albatross IV years of 1968-2008 (a) and the H. B. Bigelow years of 2009-2021 (b). The 2020 index is based on an incomplete survey. The red dotted line represents the median number-per-tow of each time series.

a)

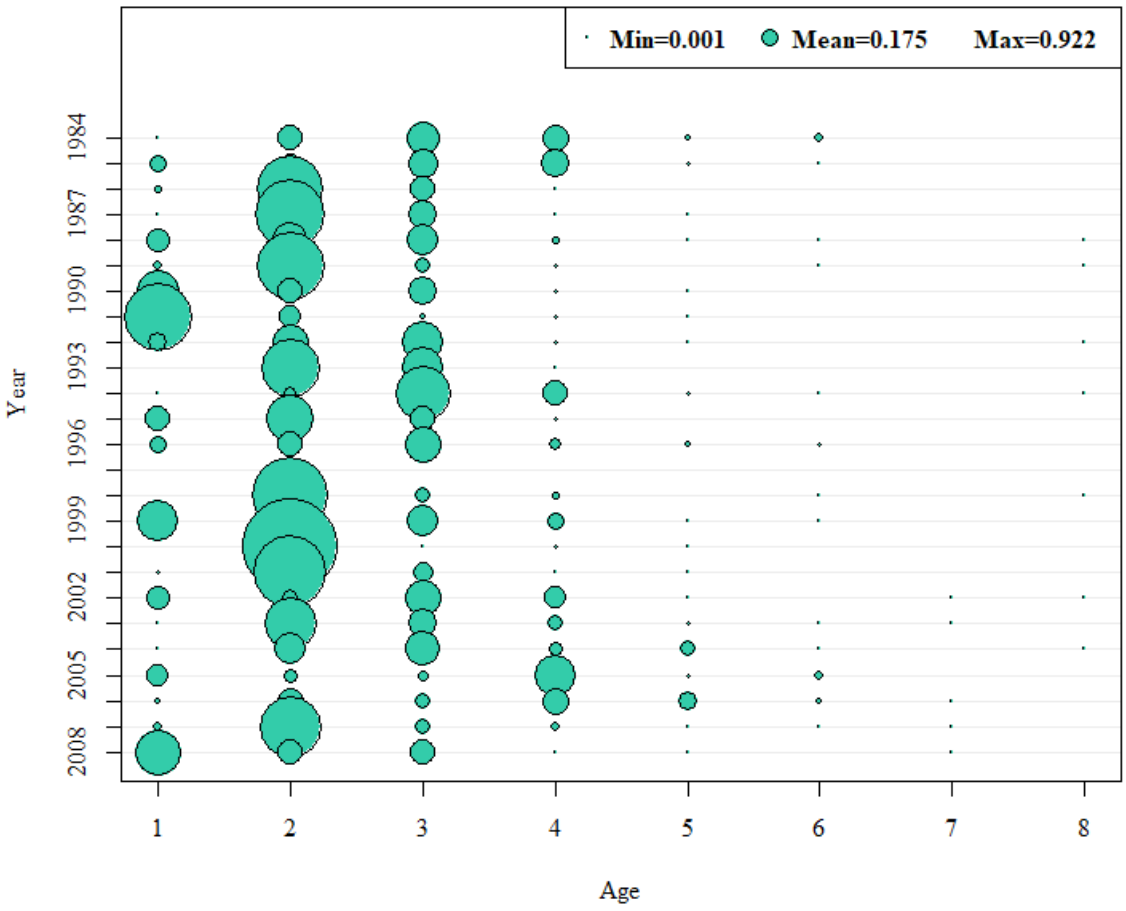


Figure 3: Black sea bass age composition (proportion-at-age) from the NEFSC spring bottom trawl survey for the Albatross IV years of 1984-2008 (a) and the H. B. Bigelow years of 2009-2021 (b).

b)

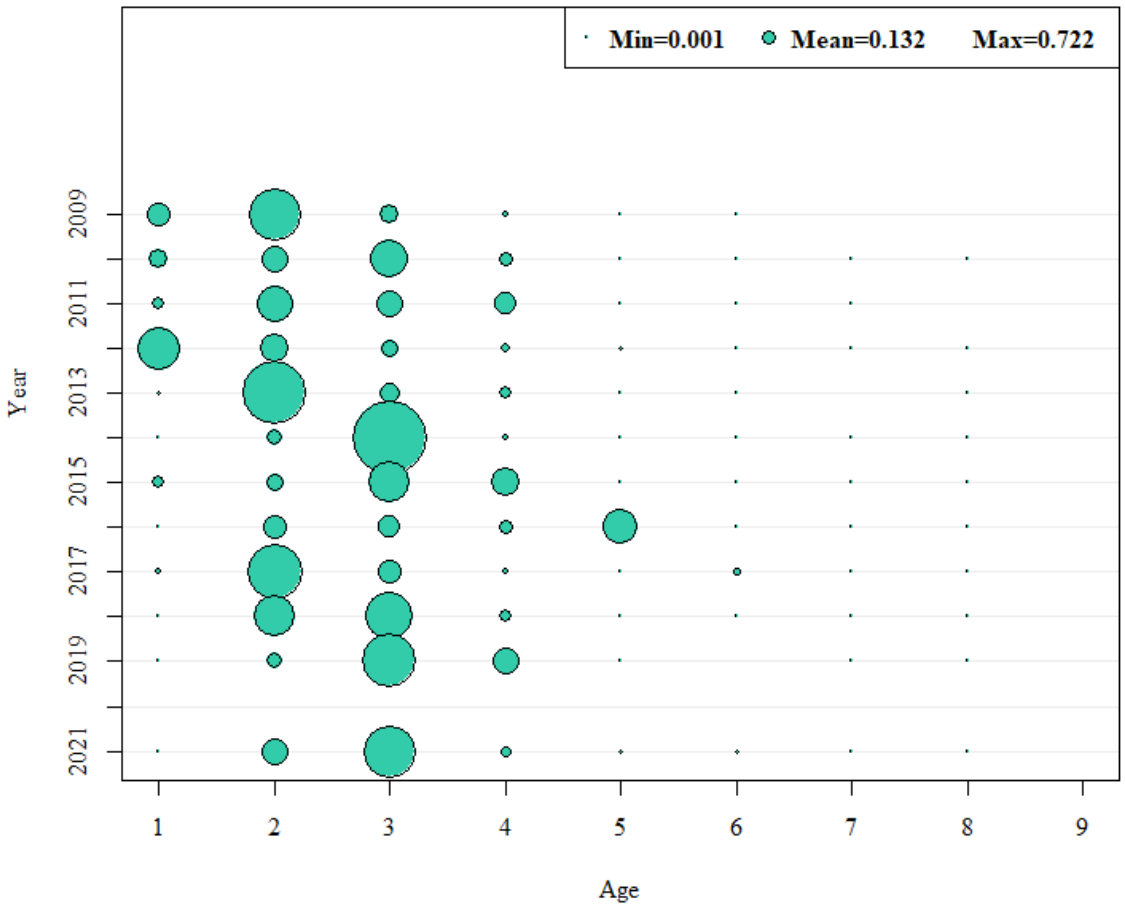


Figure 3, contd.: Black sea bass age composition (proportion-at-age) from the NEFSC spring bottom trawl survey for the Albatross IV years of 1984-2008 (a) and the H. B. Bigelow years of 2009-2021 (b).

Black Sea Bass Fishery Information Document

June 2022

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for black sea bass (*Centropristis striata*) with an emphasis on 2021. Data sources include unpublished National Marine Fisheries Service (NMFS) commercial fish dealer reports, vessel trip reports (VTRs), permit data, as well as Marine Recreational Information Program (MRIP) data and stock assessment information. All 2021 data should be considered preliminary. For more information on black sea bass management, including previous Fishery Information Documents, visit http://www.mafmc.org/sf-s-bsb.

Key Facts

- Black sea bass are not overfished and overfishing is not occurring, according to the most recent stock assessment. Spawning stock biomass in 2019 was estimated to be about 2.1 times the target level and fishing mortality was 15% below the threshold level.
- In 2021, about 4.52 million pounds of black sea bass were landed by commercial fishermen, the highest commercial landings in the time series going back to 1981.
- Commercial fish dealers paid an average of $2.76 per pound of black sea bass, an increase from the 2020 average price of $2.50, but below the 2012-2021 average of $3.52 per pound (all values adjusted to 2021 dollars). Recent prices reflect impacts of the COVID-19 pandemic on market demand.
- Recreational fishermen harvested an estimated 11.97 million pounds of black sea bass in 2021, a 32% increase from 2020 and the second highest landings in the time series going back to 1981.
- Anglers fishing from private/rental vessels accounted for 84% of recreational black sea bass harvest (in numbers of fish) in 2021.

Basic Biology

Black sea bass are distributed from the Gulf of Maine through the Gulf of Mexico. Genetic studies have identified three stocks within that region. This document focuses on the stock from the Gulf of Maine through Cape Hatteras, North Carolina.

Adult and juvenile black sea bass are mostly found on the continental shelf. Young of the year (i.e., fish less than one year old) can be found in estuaries. Adults show strong site fidelity during the summer and prefer to be near structures such as rocky reefs, coral patches, cobble and rock fields, mussel beds, and shipwrecks. Black sea bass migrate to offshore wintering areas starting in the fall. During the winter, young of the year are distributed across the shelf and adults and juveniles are found near the shelf edge. During the fall, adults and juveniles off New York and north move offshore and travel along the shelf edge to as far south as Virginia. Most return to northern inshore areas by May. Black sea bass off New Jersey to Maryland travel southeast to the

shelf edge during the late fall. Black sea bass off Virginia and Maryland travel a shorter distance due east to the shelf edge, which is closer to shore than in areas to the north.[1,2]

Black sea bass are protogynous hermaphrodites, meaning they are born female and some later transition to males, usually around 2-5 years of age. Male black sea bass are either of the dominant or subordinate type. Dominant males are larger than subordinate males and develop a bright blue nuccal hump during the spawning season. About 25% of black sea bass are male at 15 cm (about 6 inches), with increasing proportions of males at larger sizes until about 50 cm, when about 70-80% of black sea bass are male. Results from a simulation model highlight the importance of subordinate males in spawning success. This increases the resiliency of the population to exploitation compared to other species with a more typical protogynous life history. About half of black sea bass are sexually mature by 2 years of age and 21 cm (about 8 inches) in length. Black sea bass reach a maximum size of about 60 cm (about 24 inches) and a maximum age of about 12 years.[2, 3]

Black sea bass in the Mid-Atlantic spawn in nearshore continental shelf areas at depths of 20-50 meters. Spawning usually takes place between April and October. During the summer, adult black sea bass share habitats with tautog, hakes, conger eel, sea robins and other migratory fish species. Essential fish habitat for black sea bass consists of pelagic waters, structured habitat, rough bottom, shellfish, sand, and shell, from the Gulf of Maine through Cape Hatteras, North Carolina. Juveniles and adults mostly feed on crustaceans, small fish, and squid. The Northeast Fisheries Science Center (NEFSC) food habits database lists spiny dogfish, Atlantic angel shark, skates, spotted hake, summer flounder, windowpane flounder, and monkfish as predators of black sea bass.[1]

Status of the Stock

A black sea bass management track stock assessment was peer reviewed and accepted in June 2021.[4] This assessment retained the model structure of the 2016 benchmark stock assessment[2] and incorporated fishery data and fishery-independent survey data through 2019. Data from 2020 were not incorporated due to significant gaps in some data sets due to the COVID-19 pandemic and the time required to consider how to best address those gaps.

The 2021 management track assessment indicates that the black sea bass stock was not overfished and overfishing was not occurring in 2019. Spawning stock biomass in 2019 was estimated at about 2.1 times the target level. Fishing mortality in 2019 was estimated to be 15% below the threshold level that defines overfishing (Table 1, Figure 1 - Figure 3).[4]

The 2011 year class (i.e., fish spawned in 2011) was estimated to be the largest in the time series and the 2015 year class was the second largest. The 2017 year class was well below the 1989-2018 average, but the 2018 year class was above average at (Figure 2). The 2018 year class is the most recent year class for which estimates are currently available.[4]

Table 1: Black sea bass biological reference points from the 2021 management track stock assessment.[4]

	Spawning stock biomass	Fishing mortality rate (F)
Target	31.84 mil lb (14,441 mt)	N/A
Threshold	15.92 mil lb (7,221 mt)	0.46
Terminal year estimate (2019)	65.53 mil lb (29,769 mt) [a] 2.1 times target level	0.39[a] 15% below threshold level
Status	**Not overfished**	**Overfishing not occurring**

[a] Adjusted for retrospective bias

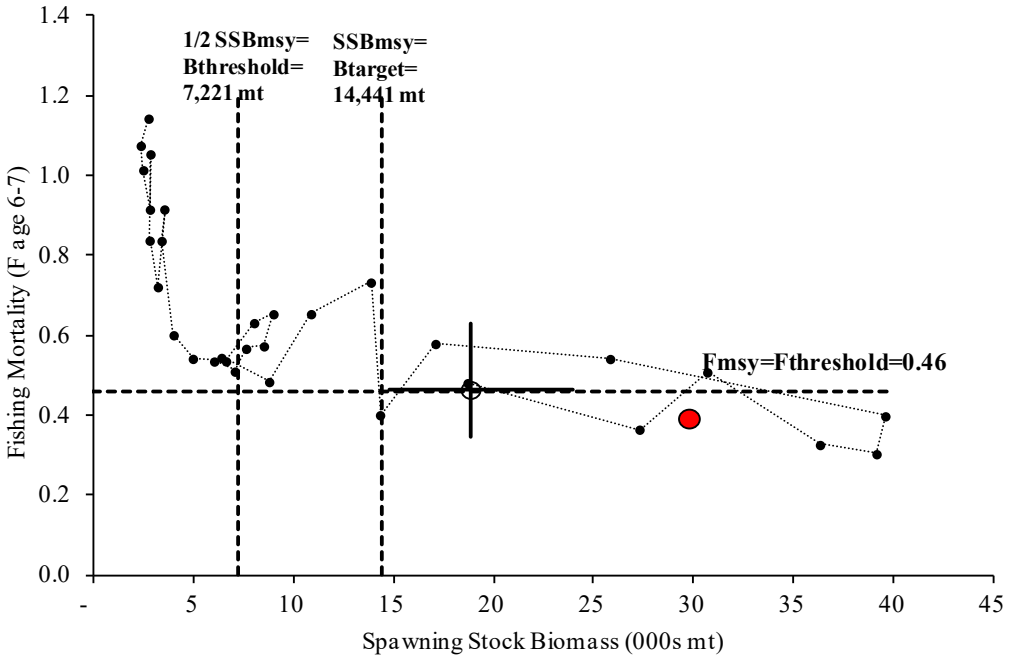


Figure 1: Estimates of black sea bass spawning stock biomass (SSB) and fully-recruited fishing mortality (F, peak at ages 6-7) relative to biological reference points. Open circle with 90% confidence intervals shows the assessment point estimates. The filled circle shows the retrospectively adjusted estimates which are used in management. Source: 2021 management track assessment.[4]

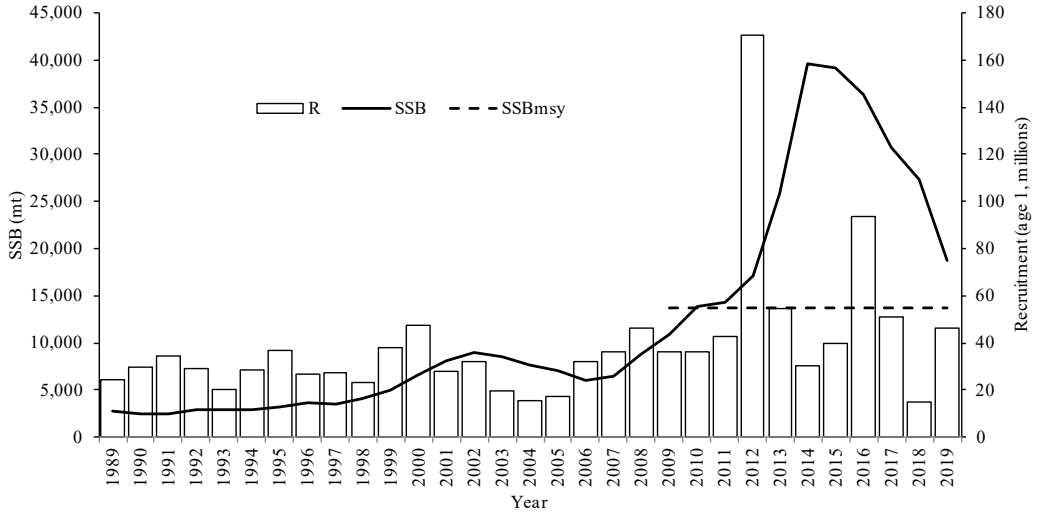


Figure 2: Black sea bass spawning stock biomass (SSB; solid line) and recruitment at age 1 (R; vertical bars), 1989-2019. The horizontal dashed line is the updated SSB_{MSY} proxy = $SSB_{40\%}$ =14,441 mt. SSB and recruitment estimates for 2019 were adjusted for a retrospective pattern in the stock assessment. The un-adjusted values are shown in this figure. Adjusted SSB in 2019 for comparison against the SSB_{MSY} proxy reference point is 29,769 mt. The adjusted recruitment value for 2019 is 79.4 million. Adjusted values are used in management. Source: 2021 management track assessment.[4]

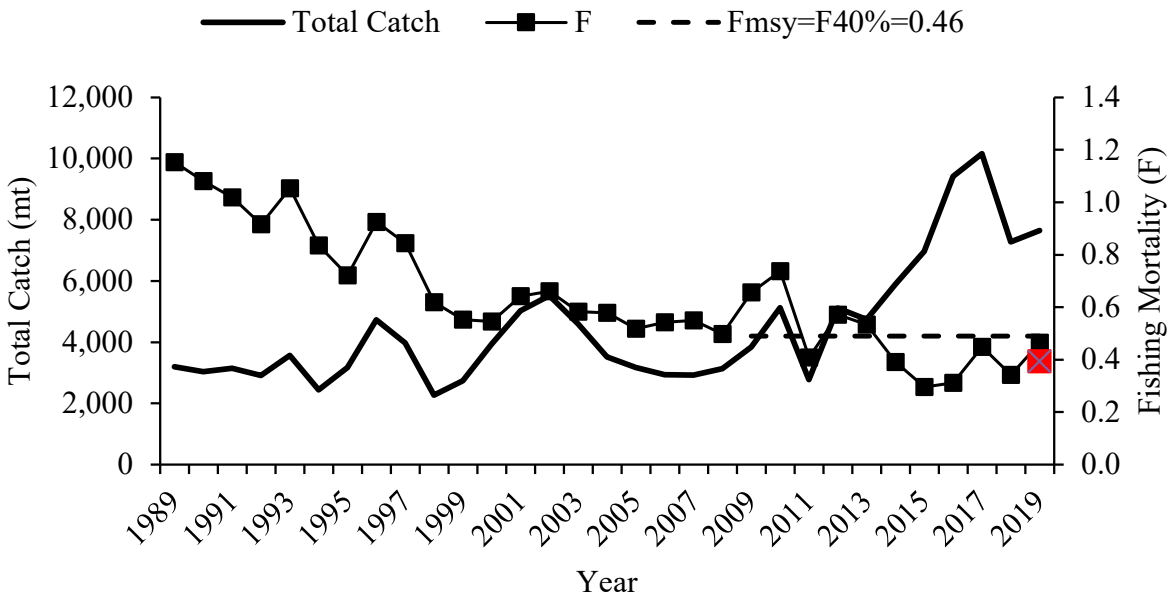


Figure 3: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 6-7; squares) for black sea bass. The horizontal dashed line is the updated F_{MSY} proxy = $F_{40\%}$ = 0.46. The red square is the retrospectively adjusted fishing mortality value for 2019. The adjusted value is used in management. Source: 2021 management track assessment.[4]

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) work cooperatively to develop commercial and recreational fishery regulations for black sea bass from Maine through Cape Hatteras, North Carolina. The Council and Commission work in conjunction with NMFS, which serves as the federal implementation and enforcement entity. This cooperative management system was developed because a significant portion of the catch is taken from both state waters (0-3 miles offshore) and federal waters (3-200 miles offshore). The joint management program began in 1996 with the approval of amendment 9 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP). The original FMP and subsequent amendments and framework adjustments are available at: www.mafmc.org/fisheries/fmp/sf-s-bsb.

Commercial and recreational black sea bass fisheries are managed using catch and landings limits, minimum fish sizes, open and closed seasons, gear regulations, permit requirements, and other regulations.

The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for black sea bass. The Council must either approve the ABC recommended by the SSC or a lower ABC. Currently, 49% of the total allowable landings (calculated by subtracting total expected dead discards from the ABC) are allocated to the commercial fishery as a commercial quota and 51% allocated to the recreational fishery as an RHL. In December 2021, the Council and Commission revised the commercial/recreational allocation such that 45% of the ABC will be allocated to the commercial fishery and 55% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation, such that the allocation will be applied directly to the ABC instead of to the total allowable landings. These changes are pending review by NMFS and if approved, are expected to be effective January 1, 2023.[5]

The Council and Commission also approve commercial and recreational annual catch targets (ACTs), which are set equal to or less than the respective ACLs to account for management uncertainty. To date, the black sea bass ACTs have always been set equal to the ACLs. The ABC, ACLs, and ACTs are catch limits which account for both landings and discards, while the commercial quota and recreational harvest limit (RHL) are landing limits. The commercial quota and RHL are calculated by subtracting expected discards from the respective ACTs (Table 2).

Fishery Landings Summary

Table 2 shows black sea bass catch and landings limits from 2012 through 2023, as well as commercial and recreational landings through 2021. Total landings (commercial and recreational) in 2021 totaled 16.48 million pounds and were the highest in the time series going back to 1981 (Figure 4).[6,7]

In July 2018, MRIP released revisions to their time series of recreational catch and harvest estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised estimates of catch and harvest are several times higher than the previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. NMFS used imputation methods to fill gaps in 2020 catch data with data collected in 2018 and 2019. These proxy data match the time, place, and fishing mode combinations that would have been sampled had the APAIS continued uninterrupted. Proxy data were combined with observed data to produce 2020 catch estimates using the standard estimation methodology. Commercial landings reporting in 2020 continued uninterrupted; however, as of completion of this document commercial discard data for 2020 and 2021 are currently unavailable due to COVID-19 related interruptions in observer coverage.

Table 2: Summary of catch and landings limits, and landings for commercial and recreational black sea bass fisheries from Maine through Cape Hatteras, NC 2012 through 2023. All values are in millions of pounds unless otherwise noted. 2023 catch and landings limits are pending review by the SSC, Monitoring Committee, Council, and Commission and may be revised.[6,7]

Management measure	2012[a]	2013[a]	2014[a]	2015[a]	2016[b]	2017[c]	2018[c]	2019[c]	2020[c]	2021[c,d]	2022[c,d]	2023[c, d,e]
ABC	4.50	5.50	5.50	5.50	6.67	10.47	8.94	8.94	15.07	17.45	19.26	17.01
Com. ACL & ACT	1.98	2.60	2.60	2.60	3.15	5.09	4.35	4.35	6.98	9.52	10.10	8.93
Commercial quota[e]	1.71	2.17	2.17	2.21	2.71	4.12	3.52	3.52	5.58	6.09	6.47	5.71
Commercial landings	1.72	2.26	2.40	2.38	2.59	4.01	3.46	3.52	4.24	4.52	--	--
% of com. quota landed	101%	104%	111%	108%	96%	97%	98%	100%	76%	74%	--	--
Rec. ACL & ACT	1.86	2.90	2.90	2.90	3.52	5.38	4.59	4.59	8.09	7.93	8.76	7.74
RHL[f]	1.32	2.26	2.26	2.33	2.82	4.29	3.66	3.66	5.81	6.34	6.74	5.95
Recreational landings, old MRIP estimates	3.18	2.46	3.67	3.79	5.19	4.16	3.82	3.46[g]	--	--	--	--
Recreational landings, revised MRIP estimates	7.04	5.69	7.24	9.06	12.05	11.50	7.92	8.61	9.05	11.97	--	--
% of RHL harvested (based on old MRIP estimates through 2018; new MRIP estimates for 2020-2021)[h]	241%	109%	162%	163%	184%	97%	104%	95%	156%	189%	--	--

[a] Catch and landings limits for 2010-2015 were based on a constant catch approach used by the Council's SSC to set the ABC.

[b] Catch and landings limits for 2016 were based on ABC that was set using a data poor management strategy evaluation approach.

[c] Catch and landings limits for 2017-2023 were set based on a peer reviewed and approved stock assessment. Starting with 2020, these catch and landings limits are based on a stock assessment that incorporates the revised time series of MRIP data.

[d] The catch and landings limits for 2021 and beyond account for revisions to the Council's risk policy.

[e] Previously adopted limits for 2023 will be reviewed in 2022 by the SSC, Monitoring Committee, and Council/Commission. The commercial and recreational ACLs, ACTs, RHL, and commercial quota are expected to be revised based on recently adopted changes to the commercial/recreational allocation.

[f] The commercial quotas and RHLs for 2006-2014 account for deductions for the Research Set Aside program.

[g] Provided to the NMFS Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center.

[h] The percent of RHL harvested is based on a comparison of the RHL to the previous or old MRIP estimates. The RHLs through 2019 did not account for the new MRIP estimates; therefore, it would be inappropriate to compare RHLs through 2019 to the revised MRIP estimates.

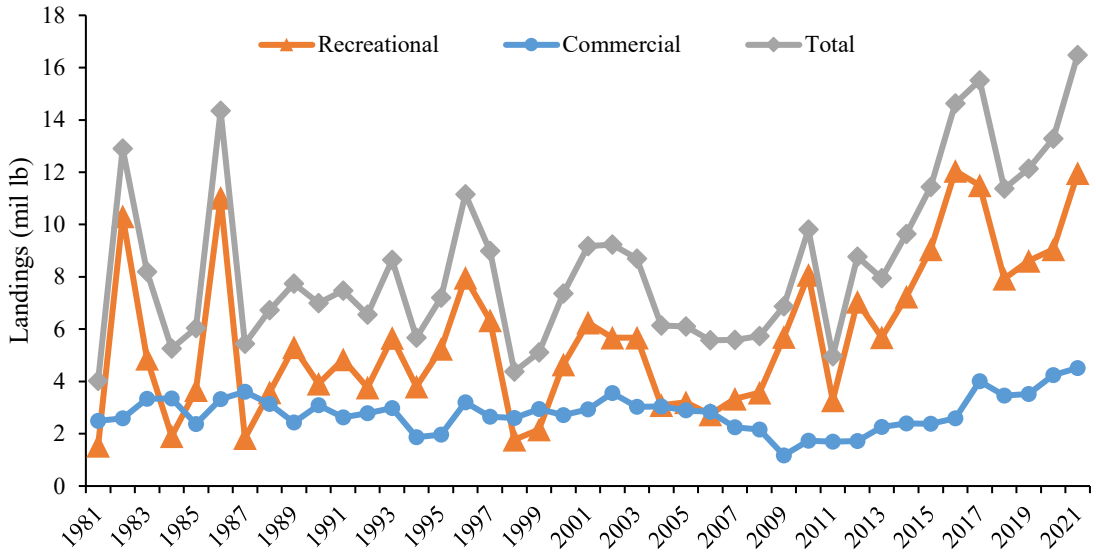


Figure 4: Commercial and recreational black sea bass landings in millions of pounds from Maine through Cape Hatteras, North Carolina, 1981-2021. [6,7]

Commercial Fishery

In 2021, about 4.52 million pounds of black sea bass were landed in the commercial fishery, the highest commercial landings in the time series of available data from 1981 through 2021. Commercial black sea bass landings generally follow the coastwide quota and the 2021 quota of 6.09 million pounds was higher than any previous quota (Table 2, Figure 3). The 2020 quota was not fully harvested in large part due to impacts of the COVID-19 pandemic on market demand. Some COVID-19 impacts likely continued into 2021. Commercial black sea bass landings were lowest in 2009, when 1.18 million pounds were landed and the lowest quota in the time series was implemented (1.09 million pounds).[7]

Black sea bass are a valuable commercial species. Total ex-vessel value averaged $11.91 million per year during 2019-2021. Landings and average price per pound (adjusted to 2021 dollars) were generally stable from 2010 through 2016. Landings increased in 2017 with an increase in the quota. On an annual coastwide level, the average price per pound tended to decrease with increases in landings since 2016 (Figure 5).[7] Prices are impacted by many factors in addition to landings. The relationship between landings and price varies at the regional, state, and sometimes port level based on market demand, state-specific regulations (e.g., seasonal openings), or individual trawl trips with high landings, all of which can be inter-related.

A total of 183 federally-permitted dealers from Maine through North Carolina purchased black sea bass in 2021. More dealers bought black sea bass in New York than in any other state (Table 3).[7]

According to federal VTR data, statistical area 616, which includes important fishing areas near Hudson Canyon, was responsible for the largest percentage (29%) of commercial black sea bass catch (landings and live and dead discards, as reported by captains) in 2021. Statistical area 615, off southern New Jersey accounted for the second highest proportion of catch (14%), followed by statistical area 621, off southern New Jersey, Delaware, and Maryland (11%); statistical area 613, south of Long Island (8%); statistical area 537, south of Massachusetts and Rhode Island (5%); and statistical area 631, off Virginia (5%; Table 4, Figure 6). Statistical area 613 had the highest

number of trips which reported black sea bass catch on federal VTRs in 2021 (1,230 trips), followed by statistical area 537 (1,016 trips).[8]

In 2021, most commercial black sea bass landings from state and federally-permitted vessels occurred in New York (50%), followed by New Jersey (32%), Massachusetts (29%), Rhode Island (22%), North Carolina (17%), and Virginia (12%).[7] The percentage of landings by state is generally driven by and closely matches the state-by-state commercial quota allocations. States set measures to achieve their state-specific commercial quotas. These allocations were first implemented in 2003. The Council and Commission recently revised these allocations such that they now are based partially on the original state allocations and partially on recent biomass distribution information. The revised allocations were first implemented in 2022.[9]

At least 100,000 pounds of black sea bass were landed in 11 ports in 9 states from Maine through North Carolina in 2021. These 11 ports collectively accounted for over 66% of all commercial black sea bass landings in 2021 (Table 5).[7]

Since 1997, a moratorium permit has been required to fish commercially for black sea bass in federal waters. In 2021, 645 of these permits were issued.[10]

A minimum commercial black sea bass size limit of 11 inches total length has been in place in federal waters since 2002. There is no federal waters black sea bass possession limit; however, many states have set possession limits for state waters.

About 65% of commercial black sea bass landings reported on federal VTRs in 2021 were caught with bottom otter trawl gear, 32% with pots/traps, and 3% with hand lines. Other gear types each accounted for less than 1% of total commercial landings reported on VTRs in 2021.[8] It is important to note that federal VTR data do not account for landings of black sea bass by vessels that are only permitted to fish in state waters. Some gear types (e.g., handlines) are more prevalent in state waters than in federal waters.

Any federally-permitted vessel which uses otter trawl gear and catches more than 500 pounds of black sea bass from January through March, or more than 100 pounds from April through December, must use nets with a minimum mesh size of 4.5-inch diamond mesh applied throughout the codend for at least 75 continuous meshes forward of the end of the net. Pots and traps used to commercially harvest black sea bass must have two escape vents with degradable hinges in the parlor. The escape vents must measure 1.375 inches by 5.75 inches if rectangular, 2 inches by 2 inches if square, or have a diameter of 2.5 inches if circular.

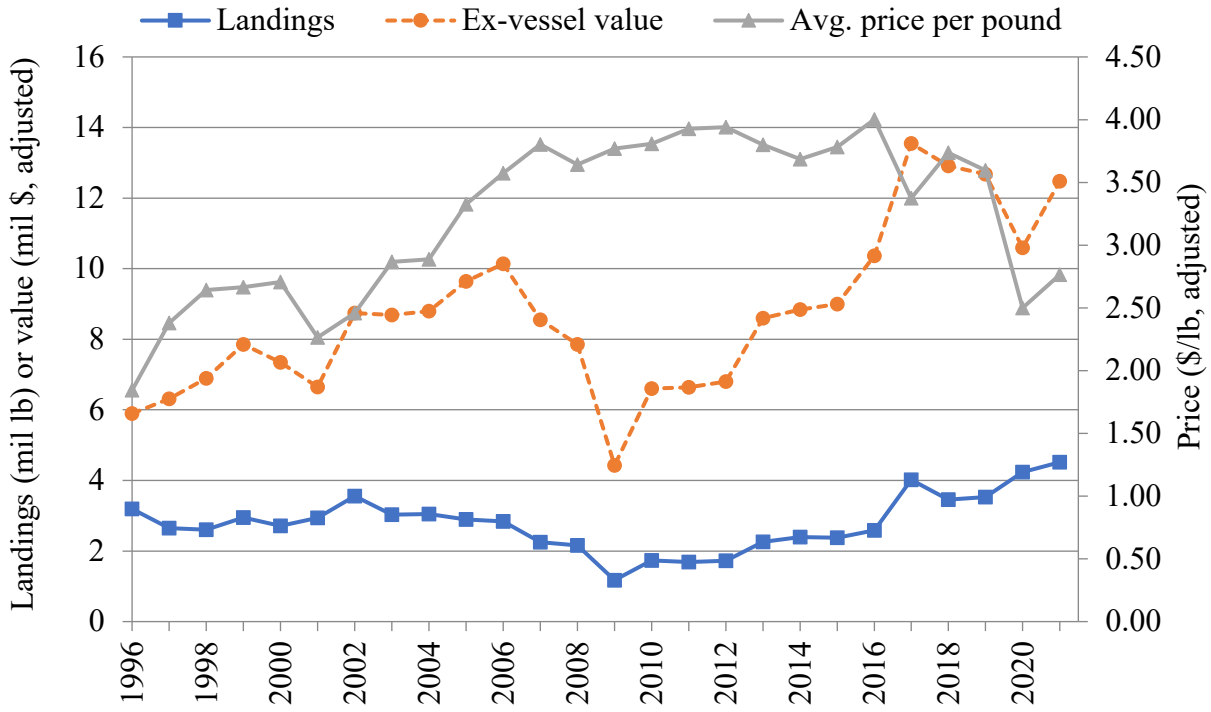


Figure 5: Landings, ex-vessel value, and average price for black sea bass, ME-NC, 1996-2021. Ex-vessel value and price are inflation-adjusted to 2021 dollars using the Gross Domestic Product Price Deflator.[7]

Table 3: Number of dealers, by state, reporting purchases of black sea bass in 2021.[7]

State	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number of dealers	0	0	29	22	10	50	32	3	8	12	17

Table 4: Statistical areas that accounted for at least 5% of the total commercial black sea bass catch (landings and dead discards) in 2021 based on federal VTRs, with associated number of trips.[8] Federal VTR data do not capture landings by vessels only permitted to fish in state waters.

Statistical Area	Percent of 2021 Commercial Black Sea Bass Catch	Number of Trips
616	29%	518
615	14%	198
621	11%	319
613	8%	1,230
537	5%	1,016
631	5%	80

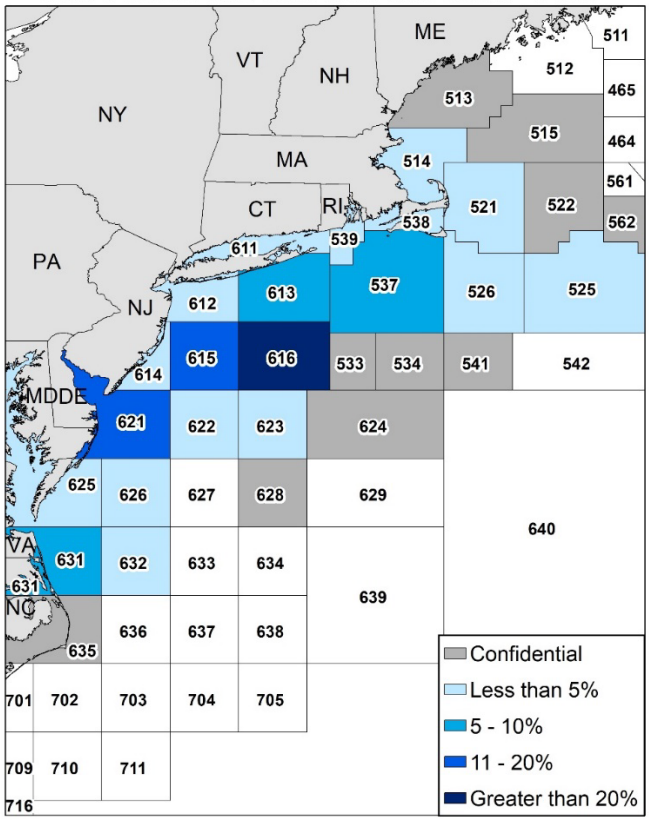


Figure 6: Proportion of black sea bass catch (landings and dead discards) by statistical area in 2021 based on federal VTR data. Confidential areas are associated with fewer than three vessels and/or dealers. The amount of catch not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.[8]

Table 5: Ports reporting at least 100,000 pounds of black sea bass landings in 2021, associated number of vessels, and percentage of total commercial landings. C = confidential.[7]

Port name	Pounds of black sea bass landed	% of total commercial black sea bass landed	Number of vessels landing black sea bass
Point Pleasant, NJ	578,285	13%	44
Point Judith, RI	502,419	11%	148
Ocean City, MD	482,005	11%	11
New Bedford, MA	292,178	6%	57
Cape May, NJ	277,670	6%	22
Montauk, NY	256,303	6%	108
Hampton, VA	197,356	4%	21
Sea Isle City, NJ	151,400	3%	8
Beaufort, NC	148,156	3%	38
Norfolk, VA	136,004	3%	5
Lewes, DE	C	C	C

Recreational Fishery

State and federal waters recreational management measures remained virtually unchanged from 2018-2021 (Table 6, Table 7). In 2022, state measures were modified with the goal of achieving a 20.7% reduction in harvest compared to the 2018-2021 average (Table 8). The Council and Commission agreed to use the federal conservation equivalency process to waive federal waters measures for black sea bass for the first time in 2022.

According to the most recent MRIP data, between 1981 and 2021, recreational catch (landings and live and dead discards) of black sea bass from Maine through Cape Hatteras, NC was lowest in 1984 at 4.73 million fish and was highest in 2021 at 42.67 million fish. Recreational harvest in weight was highest in 2016 at 12.05 million pounds; however, harvest in numbers of fish was highest in 1986 at 19.28 million fish. Recreational harvest in weight was lowest in 1981 at 1.53 million pounds, while harvest in numbers of fish was lowest in 1998 at 1.56 million fish (Figure 4, Table 10).[6]

It should be noted that the coastwide 2016 and 2017 MRIP estimates for black sea bass are viewed as outliers by the Monitoring and Technical Committees and the Scientific and Statistical Committee due to the influence of very high estimates in individual states and waves (i.e., New York 2016 wave 6 for all modes and New Jersey 2017 wave 3 for the private/rental mode). Steps have been taken to address uncertainty in these specific estimates in the stock assessment and in management.

Recreational harvest exceeded the 2020 RHL by 56% and the 2021 RHL by 89% (Table 2). The Council and Board agreed to leave the recreational bag, size, and season limits unchanged in 2020 and 2021 despite expected RHL overages. This was viewed as a temporary solution to allow more time to consider how to fully transition the management system to use of the revised MRIP data, including ongoing considerations related to the commercial/recreational allocation and the Recreational Reform Initiative. The 2020 and 2021 RHL overages will be discussed in development of 2023 recreational measures but is unlikely to impact the 2023 RHL and ACL given recent biomass estimates and the Council's Accountability Measures.[11]

In 2021, 52% of black sea bass harvested by recreational fishermen from Maine through Cape Hatteras, North Carolina (in numbers of fish) were caught in state waters and 48% in federal waters (Table 10). Most of the recreational harvest in numbers of fish in 2021 was landed in New Jersey (30%), followed by Massachusetts (19%), New York (14%), and Connecticut (13%; Table 11).[6]

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2021, 895 vessels held a federal party/charter permit.[10]

About 84% of the recreational black sea bass harvest in numbers of fish in 2021 came from anglers fishing on private or rental boats, about 12% from anglers aboard party or charter boats, and 4% from anglers fishing from shore (Table 12).[6]

Table 6: Federal black sea bass recreational measures, Maine - Cape Hatteras, NC, 2007 - 2022.

Year	Min. size	Bag limit	Open season
2007-2008	12”	25	Jan 1 - Dec 31
2009	12.5”	25	Jan 1 - Oct 5
2010-2011	12.5”	25	May 22 - Oct 11; Nov 1 - Dec 31
2012	12.5”	25	May 19 - Oct 14; Nov 1 - Dec 31
2013	12.5”	20	Jan 1 - Feb 28; May 19 - Oct 14; Nov 1 - Dec 31
2014	12.5”	15	May 19 - Sept 18; Oct 18 - Dec 31
2015-2017	12.5”	15	May 15 - Sept 21; Oct 22 - Dec 31
2018-2021	12.5”	15	Feb 1 - 28; May 15 - Dec 31
2022	Federal waters measures waived in favor of state measures		

Table 7: State waters black sea bass recreational measures in 2018-2021. The only changes made during these years were to maintain a Saturday opening (Massachusetts) or to account for harvest in the February opening (Virginia and North Carolina).

State	Min. Size	Bag Limit	Open Season
Maine	13”	10	May 19 - Sept 21; Oct 18 - Dec 31
New Hampshire	13”	10	Jan 1 - Dec 31
Massachusetts	15”	5	2018: May 19 - Sept 12
			2019 & 2020: May 18 - Sept 8
			2021: May 18 – Sept 8
Rhode Island	15”	3	Jun 24 - Aug 31
		7	Sept 1 - Dec 31
Connecticut private & shore	15”	5	May 19 - Dec 31
CT authorized party/charter monitoring program vessels	15”	5	May 19 - Aug 31
		7	Sept 1- Dec 31
New York	15”	3	Jun 23 - Aug 31
		7	Sept 1- Dec 31
New Jersey	12.5”	10	May 15 - Jun 22
		2	Jul 1- Aug 31
		10	Oct 8 - Oct 31
	13”	15	Nov 1 - Dec 31
Delaware	12.5”	15	May 15 - Dec 31
Maryland	12.5”	15	May 15 - Dec 31
Virginia	12.5”	15	2018: Feb 1 - 28; May 15 - Dec 31
			2019: Feb 1-28; May 15-31; June 22-Dec 31
			2020: Feb 1 - 29; May 29 - Dec 31
			2021: Feb 1-28; May 15-May 31; Jun 16-Dec 31
North Carolina, North of Cape Hatteras (35° 15’N)	12.5	15	2018: Feb 1 - 28; May 15 - Dec 31
			2019: Feb 1 - 28; May 17 - Dec 31
			2020: Feb 1 - 29; May 17 - Nov 30
			2021: May 15 - Dec 31

Table 8: State waters black sea bass recreational measures in 2022.

State	Min. Size	Bag Limit	Open Season
Maine	13”	10 fish	May 19-Sept 21; Oct 18-Dec 31
New Hampshire	13”	10 fish	Jan-Dec 31
Massachusetts	16”	4 fish	May 21-Sept4
Rhode Island private & shore	16”	2 fish	May 22-Aug 31
		3 fish	Sept 1-Dec31
Rhode Island for-hire		2 fish	June 18-Aug 31
		6 fish	Sept 1-Dec 31
Connecticut private & shore	16”	5 fish	May 19-Dec 1
CT authorized for-hire monitoring program vessels		5 fish	May 19-Aug 31
		7 fish	Sept 1-Dec 31
New York	16”	3 fish	June 23-Aug 31
		6 fish	Sept 1-Dec 31
New Jersey	13”	10 fish	May 17-Jun 19
		2 fish	July 1-Aug 31
		10 fish	Oct 7-Oct 26
		15 fish	Nov 1-Dec 31
Delaware	13”	15 fish	May 15-Dec 11
Maryland			
Virginia			
North Carolina North of Cape Hatteras (35° 15’N)			

Table 9: Estimated recreational black sea bass catch (harvest and live and dead discards) and harvest from Maine through Cape Hatteras, North Carolina, 2012-2021.[6]

Year	Catch (millions of fish)	Harvest (millions of fish)	Harvest (millions of pounds)	% of catch retained
2012	34.95	3.69	7.04	11%
2013	25.78	3.02	5.69	12%
2014	23.91	3.97	7.24	17%
2015	24.11	4.94	9.06	20%
2016	35.81	5.84	12.05	16%
2017	41.19	5.70	11.50	14%
2018	24.99	3.99	7.92	16%
2019	32.32	4.38	8.61	14%
2020	34.11	4.23	9.05	12%
2021	42.67	6.44	11.97	15%

Table 10: Estimated percentage of black sea bass recreational harvest (in numbers of fish) in state and federal waters, from Maine through Cape Hatteras, North Carolina, 2012-2021.[6]

Year	State waters	Federal waters
2012	71%	29%
2013	69%	31%
2014	72%	28%
2015	73%	27%
2016	61%	39%
2017	42%	58%
2018	61%	39%
2019	64%	36%
2020	57%	43%
2021	52%	48%
2012-2021 avg	62%	38%

Table 11: State-by-state contribution to total recreational harvest of black sea bass (in number of fish), Maine through Cape Hatteras, North Carolina, 2019 - 2021.[6]

State	2019	2020	2021	2019-2021 average
Maine	0.0%	0.0%	0.0%	0.0%
New Hampshire	0.0%	0.0%	0.0%	0.0%
Massachusetts	12.0%	13.6%	18.8%	14.8%
Rhode Island	11.8%	14.6%	7.9%	11.4%
Connecticut	11.8%	9.6%	13.0%	11.5%
New York	36.0%	30.1%	14.4%	26.9%
New Jersey	19.0%	19.2%	30.0%	22.7%
Delaware	1.0%	3.3%	5.5%	3.3%
Maryland	3.0%	1.9%	3.3%	2.7%
Virginia	5.3%	6.5%	6.9%	6.2%
North Carolina	0.1%	1.1%	0.1%	0.4%

Table 12: Percent of total recreational black sea bass harvest (in numbers of fish) by recreational fishing mode, Maine through North Carolina, 2012-2021.[6]

Year	Shore	Party/charter	Private/rental	Total number of fish (millions)
2012	1%	19%	80%	3.82
2013	2%	9%	89%	3.10
2014	3%	18%	79%	4.31
2015	0%	20%	79%	5.26
2016	4%	8%	88%	6.03
2017	1%	9%	90%	6.00
2018	2%	12%	86%	4.07
2019	3%	17%	79%	4.52
2020	2%	11%[a]	87%	4.32
2021	4%	12%	84%	6.48
2012-2021 avg	**2%**	**14%**	**84%**	**4.79**

[a] Party and charter fishing was restricted in all states for part of 2020 due to the COVID-19 pandemic.

References

[1] Drohan, A.F., J. P. Manderson, D. B. Packer. 2007. Essential fish habitat source document: black sea bass, *Centropristis striata*, life history and habitat characteristics, 2nd edition. NOAA Technical Memorandum NMFS NE 200.

[2] Northeast Fisheries Science Center. 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Report. Northeast Fisheries Science Center Reference Doc. 17-03. 822 p. Available at: https://www.nefsc.noaa.gov/publications/crd/crd1703/

[3] Blaylock, J. and G.R. Shepherd. 2016. Evaluating the vulnerability of an atypical protogynous hermaphrodite to fishery exploitation: results from a population model for black sea bass (*Centropristis striata*). *Fishery Bulletin* 114(4): 476-489.

[4] Northeast Fisheries Science Center. 2022. Management Track Assessment June 2021. Northeast Fisheries Science Center reference document; 22-10. DOI: https://doi.org/10.25923/4m8f-2g46

[5] For more information on the commercial/recreational allocation revisions, see the fact sheet at: https://www.mafmc.org/s/SFSBSB-Allocation-FAQs.pdf.

[6] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed June 2022. Available at: https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

[7] Unpublished NMFS commercial fish dealer data (i.e., "DERS"), which include both state and federal dealer data).

[8] Unpublished NMFS VTR data.

[9] More information on the Black Sea Bass Commercial State Allocation Amendment/Addendum is available at: https://www.mafmc.org/actions/bsb-commercial-allocation.

[10] Unpublished NMFS permit data.

[11] A summary of the accountability measures is available at: https://www.mafmc.org/s/AMs-description_SF_scup-BSB_Dec2020.pdf