



Mid-Atlantic Fishery Management Council

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MEMORANDUM

Date: November 7, 2018
To: Chris Moore, Executive Director
From: Julia Beaty, Staff
Subject: Black Sea Bass Recreational Management Measures for 2019

Introduction and Background

In August 2018, the Council and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Board (Board) recommended a 3.27 million pound recreational harvest limit (RHL) for 2019, an 11% reduction from the 2018 RHL (Table 1). The recommended 2019 RHL is based on the Scientific and Statistical Committee's (SSC's) acceptable biological catch (ABC) recommendation, the Monitoring Committee's recommendation that the annual catch target be set equal to the annual catch limit (ACL), and an assumption that the proportion of total landings and total discards, as well the proportions of commercial and recreational discards, will be the same as in 2013 - 2015.

The proposed 2019 RHL has not yet been approved and implemented by the National Marine Fisheries Service (NMFS). Staff at the NMFS Greater Atlantic Regional Fisheries Office (GARFO) have indicated that they may implement the 2018 RHL of 3.66 million pounds in 2019, rather than the Council and Board proposed 2019 RHL of 3.27 million pounds. Since the proposed rule has not yet published, GARFO's justification for a *status quo* RHL is unknown at this time.

The SSC's 2019 ABC recommendation is based on biomass projections provided with the 2016 benchmark stock assessment and application of the Council's ABC control rule and risk policy for a species with a typical life history. The 2016 benchmark stock assessment concluded that the stock was not overfished and overfishing was not occurring in 2015. Spawning stock biomass (SSB) in 2015 was approximately 2.3 times the SSB target. The fishing mortality rate in 2015 was 25% below the fishing mortality threshold reference point.¹

The 2011 year class was nearly three times the 1989-2015 average and has had a major impact on abundance, availability, and fishery catches in recent years. The size of the 2014 year class (the most recent year class for which abundance estimates are available) was comparable to average recruitment during 1989 - 2015.² Estimates of the size of the 2015-2018 year classes are not

¹ The 2016 benchmark stock assessment is available at: <https://www.nefsc.noaa.gov/publications/crd/crd1703/>

² Ibid

currently available; however, data on fishery catch, landings, and discards, as well as Northeast Fisheries Science Center (NEFSC) and state survey catches through 2017 suggest that the 2015 year class is above average in both the northern and southern states (Maine - New Jersey and Delaware - Cape Hatteras, North Carolina, respectively).³

Estimates of the size of the 2015 year class were not available to be incorporated into the 2016 benchmark stock assessment and associated biomass projections. As such, the SSC's 2019 ABC recommendation does not explicitly account for the size of 2015 year class. In July 2018, the SSC considered fishery and survey catches through 2017 and concluded that, in the absence of new biomass projections, there was no compelling reason to modify their 2019 ABC recommendation, which they first recommended in 2017 after considering the results of the 2016 benchmark stock assessment.⁴

Each year, the Monitoring Committee is tasked with recommending recreational management measures to constrain recreational harvest to the upcoming year's RHL. There are unique circumstances regarding the data available to inform development of 2019 recreational management measures. In July 2018, the Marine Recreational Information Program (MRIP) released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology, namely, a transition from a telephone-based effort survey to a mail-based effort survey. The revised estimates for most years 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 (Figure 1). Until these revised estimates are incorporated into stock assessments, the implications for stock status, biomass, and catch limits are uncertain. A black sea bass operational stock assessment update incorporating the new MRIP data as well as fishery and survey data through 2017 is expected to be completed in April 2019. Council staff recommend that the revised MRIP estimates not be used in management until after the operational stock assessment update is complete and the impacts of the new MRIP estimates on stock status and catch limits are known.

Back-calculated estimates based on the previous MRIP estimation methodology are currently available through August 2018. All 2018 estimates are preliminary. Council staff recommend that these back-calculated estimates be used to develop 2019 recreational management measures. Depending on the timing of availability of the results of the forthcoming operational stock assessment update and the priorities of the Council and Board, it may be possible to revise the 2019 recreational measures mid-year based on the new assessment information and the new MRIP estimates.

Past RHLs and Management Measures

Black sea bass RHLs ranged from a high of 4.29 million pounds in 2017 to a low of 1.14 million pounds in 2009. The RHLs have been declining since 2017 based on declining biomass projections associated with the 2016 benchmark stock assessment. As previously stated, the 2018 RHL is 3.66 million pounds and the Council and Board recommended 2019 RHL is 3.27 million pounds (Table 1).

³ Available at: http://www.mafmc.org/s/3_2018-Black-Sea-Bass-Data-Update_06_18.pdf

⁴ The July 2018 SSC meeting report is available at: <http://www.mafmc.org/s/July-2018-SSC-Report.pdf>

Black sea bass from Maine through Cape Hatteras, North Carolina are managed jointly by the Council in federal waters and the Commission and member states in state waters. NMFS implements and enforces measures in federal waters. Until 2010, the recreational black sea bass fishery was managed with coastwide measures as dictated by the Fishery Management Plan, which included an identical minimum fish size, possession limit, and open season in both state and federal waters. Since 2011, the Commission has developed addenda to enable state-specific and regional management measures in state waters, which has been referred to as “ad hoc regional management.” In recent years, this process has essentially resulted in two regions: the northern states of Massachusetts through New Jersey, which set state-specific measures, and the southern states of Delaware through North Carolina (north of Cape Hatteras), which typically set measures consistent with federal measures given that most harvest from those states is taken in federal waters. Most recreational harvest in the northern states occurs in state waters (Table 2); thus, landings in the northern states have been primarily constrained by state measures rather than federal measures. Where state and federal measures differ, federal party/charter permit holders are bound by whichever regulations are more restrictive, regardless of where they fish. The federal party/charter permit is an open access permit, which enables individuals to drop their federal permit when state waters are open but federal waters are closed, allowing them to fish in state waters during this time. They can reapply for the federal permit after this period of inconsistency is complete.

Since 2011, there has not been a consistent approach to achieving reductions or liberalizations in state and federal waters. Reductions in recreational harvest were required each year from 2013 through 2015, requiring implementation of more restrictive bag, size, and/or season limits in some or all states and in federal waters, depending on the year. Most harvest in recent years (e.g., approximately 94% during 2013-2017) came from Massachusetts - New Jersey (Figure 2); therefore, these states took greater reductions in 2015 and 2016 compared to Delaware - North Carolina and compared to federal waters. In 2016 and 2017, measures remained essentially unchanged from 2015 with minor changes in some states. Some liberalizations took place in 2018 (e.g., removal of the fall federal waters closure and liberalizations in some state waters seasons; Table 3 and Table 4).

In 2018, the Council and Board provided states the opportunity to open their recreational black sea bass fisheries during February for the first time since 2013 under specific constraints. They agreed to continue this approach in 2019. States must opt in to this fishery. Participating states will have a 12.5 inch minimum fish size limit and a 15 fish possession limit during February 2019. Those states may need to adjust their recreational management measures during the rest of the year to account for expected February harvest to help ensure that the coast-wide RHL is not exceeded. Expected February harvest by state will be defined as shown in Table 5 based on the recommendations of the Council and Board. At this time, it is not known which states intend to participate in the February 2019 fishery. In 2018, only Virginia and North Carolina participated in this fishery.

Recreational Catch and Landings Trends and 2018 Projections Based on Pre-Calibration MRIP Estimates

Recreational black sea bass catch fluctuated from a peak of 29.17 million fish in 1986 to a low of 4.33 million fish in 1984. Harvest fluctuated from a peak of 21.90 million fish and 12.46 million pounds in 1986 to a low of 0.82 million fish and 1.17 million pounds in 2011. Harvest from

Maine through Cape Hatteras, NC was estimated to be 4.16 million pounds in 2017, 3% below the 2017 RHL of 4.29 million pounds. This was the first time since 2011 that harvest was below the RHL (Table 1).

MRIP data for 2018 are currently incomplete and preliminary. To date, only the first four waves (January - August) of catch and landings data for 2018 are available. Preliminary data based on the “pre-calibration” MRIP methodology indicate that 7.62 million black sea bass were caught and 1.25 million black sea bass, or 2.47 million pounds, were harvested from Maine through Cape Hatteras, North Carolina during January - August 2018 (Table 6). Harvest in weight through August 2018 was about 13% below wave 1-4 harvest in 2017 and corresponds to about 67% of the 2018 RHL of 3.66 million pounds.

Preliminary wave 1-4 data for 2018 were used to project catch and harvest for the entire year by assuming the same proportion of catch and landings by wave and state as the 2015-2017 average proportions. Using 2015-2017 averages, as opposed to 2017 proportions by wave, should help account for interannual variability in MRIP estimates and interannual variability in availability of the strong 2011 and 2015 year classes. Modifications were made to the projections for Massachusetts, Delaware, Maryland, Virginia, and North Carolina to account for changes in the open seasons in 2018 compared to previous years.

The wave 1 harvest estimate for Virginia was increased by 3,166 fish and 6,459 pounds to account for recreational harvest during February 2018, which was not sampled by MRIP. The Virginia wave 1 catch estimate was increased by 4,175 fish. These catch and harvest estimates are based on data provided by Virginia Marine Resources Commission staff.

The projected wave 5 catch and harvest estimates for Delaware - North Carolina were doubled to account for an approximate doubling of the number of open days in wave 5 in those states in 2018 compared to 2015-2017.

The recreational black sea bass fishery in Massachusetts was open for 12 days during wave 5 in 2018 (September 1 - 12). Wave 5 had previously been closed in Massachusetts for several years, thus it is not possible to use past proportions of harvest by wave to predict 2018 wave 5 harvest in Massachusetts. Instead, the average wave 4 daily harvest in 2015-2017 was multiplied by 12 to generate a 2018 wave 5 harvest estimate. This is likely an over-estimate given that effort during wave 4 (July-August) is likely greater than during the wave 5 (September-October).

Council staff considered revising projected wave 5 harvest in Rhode Island to account for changes in the open season in 2018 compared to 2017. All of wave 5 was open in Rhode Island during 2018, 2016, and 2015; however, only 30 days were open in 2017. Staff calculated the average harvest per day in wave 5 during 2015-2017 and multiplied it by the number of open days in wave 5 in 2018. This resulted in 275,848 pounds of 2018 wave 5 harvest, compared to 316,353 pounds when projecting based on average proportions of harvest by wave during 2015-2017. Staff used the latter estimate when calculating the total coast-wide (Maine - Cape Hatteras, NC) 2018 projected harvest.

Based on this methodology, projected 2018 harvest from Maine through Cape Hatteras, North Carolina is 3.85 million pounds, 5% greater than the 2018 RHL of 3.66 million pounds. Projected harvest in numbers of fish is 1.97 million fish and projected catch is 14.16 million fish (Table 7 -

Table 10). As shown in Table 8, projected 2018 harvest is 7% lower than both 2017 harvest and average 2015-2017 harvest.

Wave 5 may account for a lesser proportion of 2018 landings in New York due to changes in the regulations in 2018 compared to 2016-2017 and 2015.⁵ Adjustments were not made to account for these changes in regulations. As such, projected 2018 wave 5 harvest in New York may be an over-estimate (Table 8).

New Jersey had four different bag limits, depending on the time of year, in 2018, three different bag limits in 2016 and 2017 and two different bag limits in 2015. New Jersey had two different minimum fish sizes during different times of year in 2018 and 2016 and a single minimum fish size in 2015 and 2017 (Table 3 and Table 4). These changes in regulations may invalidate the assumption that 2018 proportions of harvest by wave will be similar to 2015-2017 average proportions; however, due to the complexity of the regulation changes, no adjustments were made to the projections to account for these changes (Table 8).

For comparison purposes, when using only 2017 proportions of harvest by wave and the state-specific modifications described above, projected 2018 harvest is 4.36 million pounds, 13% greater than the estimate based on average 2015-2017 harvest. As previously stated, using 2015-2017 averages helps account for inter-annual variability in the MRIP data and in availability of black sea bass. As such, Council staff recommend using 2015-2017 averages as the basis for the 2018 projections.

Accountability Measures

Pound-for-pound paybacks of recreational ACL overages are not necessarily required in a subsequent fishing year. Instead, AMs are tied to stock status, and though paybacks are required in some circumstances, payback amounts are scaled relative to biomass, as described below.

The 3-year average recreational ACL is evaluated against the 3-year average of total catch. Both landings and dead discards are evaluated when determining if the 3-year average recreational ACL has been exceeded. If so, the appropriate AM will be determined based on the following criteria:

1. If the stock is overfished ($B < \frac{1}{2} B_{MSY}$), under a rebuilding plan, or the stock status is unknown: The exact amount, in pounds, by which the most recent year's recreational ACL has been exceeded, will be deducted in the following fishing year, or as soon as possible once catch data are available.
2. If biomass is above the threshold, but below the target ($\frac{1}{2} B_{MSY} < B < B_{MSY}$), and the stock is not under a rebuilding plan:
 - a. If only the recreational ACL has been exceeded, then adjustments to the recreational management measures (bag, size, and seasonal limits) would be made in the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measure and conditions that precipitated the overage.

⁵ 2018 measures included a 15 inch minimum size with a 3 fish bag limit during June 23 - August 31 and a 7 fish bag limit during September 1 - December 31. Measures in 2016 and 2017 included a 15 inch minimum size with a 3 fish bag limit during June 27 - August 31, an 8 fish bag limit during September 1 - October 31, and a 10 fish bag limit during November 1 - December 31. Measures in 2015 included a 14 inch minimum size with a 8 fish bag limit during July 15 - October 31 and a 10 fish bag limit during November 1 - December 31.

- b. If the ABC is exceeded in addition to the recreational ACL, then a single year deduction will be made as a payback, scaled based on stock biomass. The calculation for the payback amount is: (overage amount) * $(B_{msy}-B)^{1/2} B_{msy}$.
3. If biomass is above the target ($B > B_{MSY}$): Adjustments to the recreational management measures (bag, size, and seasonal limits) would be made in the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and conditions that precipitated the overage.

Average recreational catch in 2015-2017 was 4.38 million pounds, about 47% higher than the 2015-2017 average recreational ACL of 3.93 million pounds (Table 11). Given that biomass is currently above the target, the AM regulations require consideration of adjustments to the recreational bag, size, and/or season limits in response to this overage, taking into account the performance of the measures and conditions that precipitated the overage. Previous Monitoring Committee comments on this issue indicated that the 2015 and 2016 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, the RHLs were set at levels that were not reflective of the large and increasing stock abundance.⁶ The results of the 2016 benchmark stock assessment suggest that the 2015 and 2016 ACLs were not reflective of stock status and could have been much higher if a new assessment had been available at the time, and recreational overages would likely not have occurred to the same degree. For this reason, as in 2017, staff recommend that a recreational AM not be applied based on a comparison of 2015-2017 average catch to the 2015-2017 average ACL.

Monitoring Committee Responsibility

The Monitoring Committee is tasked with recommending recreational management measures that will ensure that the 2019 RHL is not exceeded. As previously stated, the Council and Board-recommended 2019 RHL is 3.27 million pounds, an 11% decrease from the 2018 RHL of 3.66 million pounds. GARFO may propose maintaining the 2018 RHL of 3.66 million pounds in 2019. A proposed rule for the 2019 RHL has not yet published.

Projected 2018 recreational harvest is 3.85 million pounds, 5% greater than the 2018 RHL and 18% greater than the Council and Board-recommended 2019 RHL. As such, the Monitoring Committee should consider if more restrictive bag, size, or season limits are necessary in state and/or federal waters to ensure that the 2019 RHL is not exceeded. The Monitoring Committee should also consider if any adjustments are needed to the projection methodology described on pages 3-4.

State waters measures will be determined in early 2019 through a separate Commission process after preliminary 2018 wave 5 and 6 data are available. As such, any Monitoring Committee recommendations for state waters measures will be revisited in early 2019. The state waters measures in Delaware through North Carolina (north of Cape Hatteras) have matched the federal waters measures for the past several years. Most recreational harvest in those states originates in federal waters, as opposed to Massachusetts through New Jersey, where state waters account for a greater proportion of harvest (Table 2). The Monitoring Committee should keep this in mind when

⁶ See January 26, 2017 Monitoring Committee meeting summary, available at: http://www.mafmc.org/s/Tab06_BSB-Specifications.pdf, pages 2-9.

recommending state and federal waters measures for 2019.

To aid in consideration of potential changes to management measures, additional information is provided on projected percent liberalizations or reductions in harvest associated with opening or closing one day per wave in Delaware - North Carolina (north of Cape Hatteras; Table 12), and on the length frequency of recreational harvest and discards (Figure 3). Staff recommendations for potential regulatory changes are provided later in this document.

Fishing Trips and Year Class Effects

In general, recreational fishing effort, catch, and harvest in the upcoming year is expected to be similar to harvest in the current year; however, this assumption does not always hold true.

Predicting the recreational fishing effort in 2019 is not straightforward. The number of directed recreational black sea bass trips is variable, but has been generally increasing since 2011 (Table 13). Changes in fishing site characteristics (travel costs, catch rates, available species, water quality, etc.), fishery management measures (e.g., possession limits, size restrictions, closed seasons), and angler demographics can affect fishing effort. Typically, the Monitoring Committee assumes that fishing behavior in the upcoming year will be similar to recent years; however, this assumption does not always hold true.

Year class strength influences fish availability, which in turn influences recreational catch and the impacts of management measures. For example, the 2011 year class was nearly three times the 1989-2015 average and has been much more prevalent in the northern states than in the southern states. This has resulted in much higher black sea bass availability in the northern states than in the southern states over the past several years, which has had a notable impact on recreational catches. The 2012 - 2014 year classes are estimated to be similar in abundance to the 1988-2014 average.⁷ Estimates of the size of the 2015 year class are not currently available, but catches in fisheries independent surveys and fishery discards suggest that the 2015 year class is above average in both the northern and southern states.⁸ In 2019, most of the remaining fish in the 2015 will year class will be large enough to be retained in the recreational fishery in most states and federal waters, assuming the minimum fish sizes remain unchanged from 2018 (Gary Shepherd, NEFSC, personal communication). This should be considered when developing recommendations for 2019 recreational management measures.

Staff Recommendation for 2019 Federal Recreational Measures

As previously stated, state waters measures for 2019 will be developed through a separate Commission process in early 2019. State waters measures in Delaware through North Carolina (north of Cape Hatteras) typically match the federal waters measures. Projected 2018 recreational harvest from Maine through Cape Hatteras, North Carolina is 3.85 million pounds. The Council and Board-recommended 2019 RHL is 3.27 million pounds. GARFO has indicated that they may implement a 3.66 million pound RHL for 2019 (identical to the 2018 RHL). Projected 2018 harvest

⁷ Northeast Fisheries Science Center. 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Report. US Department of Commerce, Northeast Fisheries Science Center Reference Doc. 17-03; 822 p. Available: at <http://nefsc.noaa.gov/publications/>.

⁸ Northeast Fisheries Science Center. 2018. Black Sea Bass 2017 Catch and Survey Information for Stock North of Cape Hatteras, NC - Report to the Mid-Atlantic Science and Statistical Committee. Available at: <http://www.mafmc.org/ssc-meetings/2018/july-17-18>

is 18% greater than the Council and Board-recommended 2019 RHL and 5% greater than the 2018 RHL. These values may change once preliminary wave 5 and 6 data are available and may change based on Monitoring Committee recommendations for revisions to the projection methodology, if any.

If a status quo RHL of 3.66 million pounds is implemented, then the 2018 harvest projections suggest that harvest should be reduced by 5% to ensure that the 2019 RHL is not exceeded. Given some level of uncertainty regarding the accuracy of the projections, combined with the current condition of the stock (i.e., SSB well above the target, fishing mortality below the threshold, and signs of an above-average 2015 year class), and given the forthcoming operational assessment update, which will incorporate the revised MRIP estimates and will provide updated information on stock status, Council staff recommend no changes to any state or federal waters recreational measures for 2019 if a status quo RHL of 3.66 million pounds is implemented.

If the Council and Board-recommended 2019 RHL of 3.27 million pounds is implemented, then the 2018 harvest projections suggest that harvest should be reduced by 18% to ensure that the 2019 RHL is not exceeded. In past years, given that most of the coastwide harvest occurs in Massachusetts - New Jersey state waters (Table 2, Figure 2), Council staff and the Monitoring Committee have recommended that those states adjust their measures to account for most of the needed reductions while the southern states (Delaware through North Carolina, north of Cape Hatteras) and federal waters measures remain unchanged. For 2019, staff recommend that measures be adjusted in northern and southern states and in federal waters to address the 18% reduction in harvest that will be necessary if a 3.27 million pound RHL is implemented. Federal waters and Delaware - North Carolina state waters measures were notably liberalized in 2018 due to removal of the September 22 - October 21 closure. Some northern states also liberalized their measures in 2018 (Table 3 and Table 4).

As previously stated, state waters measures will be developed through a separate process in early 2019 after preliminary wave 5 - 6 data are available. The needed 18% reduction under a 3.27 million pound RHL may be modified based on wave 5 - 6 data. Specific recommendations for federal waters measures are presented below. These recommendations are based on their expected impacts on harvest in Delaware - North Carolina (north of Cape Hatteras) based on the assumption that state waters measures in those states will continue to match the federal waters measures. Changes in the minimum fish size were not analyzed, given strong opposition to increases in minimum fish sizes in the past.

The analysis supporting the following recommendations assumed that changes in regulations would not result in changes in fishing behavior in 2019 compared to 2015-2017. For example, it was assumed that levels of non-compliance with a revised bag limit would be identical to levels of non-compliance with the 2018 bag limit. It was assumed that there would be full compliance with the season regulations. It was also assumed that harvest is evenly distributed throughout each wave. These assumptions are undoubtedly inaccurate; however, they are necessary given the data available and the difficulty in predicting changes in fishing behavior.

As previously stated, during 2015-2017, federal waters and state waters in Delaware through North Carolina (north of Cape Hatteras), and some other states, were closed for 30 days in wave 5; however, all of wave 5 was open in 2018. If this closure were to be re-instated in 2018, it would be expected to result in a 20% reduction in harvest in Delaware - North Carolina. To achieve an

18% reduction in harvest in Delaware - North Carolina, 26 days could be closed in wave 5, or 10 days in wave 5 and all of wave 6 could be closed. If days in both wave 5 and wave 6 are closed, staff recommend that they be consecutive (e.g., October 22 - December 31).

A year-round 6 fish bag limit would be needed to achieve an 18% reduction in harvest in Delaware - North Carolina (north of Cape Hatteras) if all other regulations were unchanged from 2018. A 6 fish bag limit achieves a nearly 21% reduction, while a 7 fish bag limit achieves a 17% reduction. A bag limit reduction of this magnitude is likely not desirable.

A combination of a year-round 12 fish bag limit (which alone achieves only a 4% reduction in harvest) and a closure during October 27 - December 31 results in an 18% reduction in harvest in Delaware through North Carolina (north of Cape Hatteras).

Similar to past years, the Council and Board should approve a set of backstop measures, to be implemented coastwide if Massachusetts through New Jersey do not take action to address the needed reduction. For 2018, the Council and Board approved a 14 inch minimum size, a 5 fish possession limit, and a season of May 15 - September 15 as backstop measures. These measures were calculated to achieve the 2018 RHL if implemented in all states and in federal waters. Council staff have not made similar calculations for backstop measures based on the Council and Board-recommended 2019 RHL of 3.27 million pounds. If the Monitoring Committee supports this approach, they should develop recommendations for appropriate backstop measures.

Table 1: Summary of federal waters management measures for the black sea bass recreational fishery, 1997-2018. All measures are in millions of pounds, unless otherwise noted.

Year	ABC	Rec. ACL	RHL ^a	Rec. harvest ^b	% over/under RHL	Possession limit (# of fish)	Size limit (inches, total length)	Open season
1997	-	-	-	4.4	-	-	9	1/1-12/31
1998	-	-	3.15	1.29	-59%	-	10	1/1-7/30 8/16-12/31
1999	-	-	3.15	1.7	-46%	-	10	1/1-12/31
2000	-	-	3.15	4.12	+31%	-	10	1/1-12/31
2001	-	-	3.15	3.6	+14%	25	11	1/1-2/28 5/10-12/31
2002	-	-	3.43	4.44	+29%	25	11.5	1/1-12/31
2003	-	-	3.43	3.45	+1%	25	12	1/1-9/1 9/16-11/30
2004	-	-	4.01	1.97	-51%	25	12	1/1-9/7 9/22-11/30
2005	-	-	4.13	1.88	-54%	25	12	1/1-9/7 9/22-11/30
2006	-	-	3.99	1.8	-55%	25	12	1/1-12/31
2007	-	-	2.47	2.17	-12%	25	12	1/1-12/31
2008	-	-	2.11	2.03	-4%	25	12	1/1-12/31
2009	-	-	1.14	2.56	+125%	25	12.5	1/1-12/31
2010	4.50	-	1.83	3.19	+74%	25	12.5	1/1-10/5
2011	4.50	-	1.84	1.17	-36%	25	12.5	5/22-10/1 11/1-12/31
2012	4.50	-	1.32	3.18	+141%	15 or 25 ^c	12.5	1/1-2/29 5/19-10/14 11/1-12/31
2013	5.50	2.9	2.26	2.46	+9%	20	12.5	5/19-10/14 11/1-12/31
2014	5.50	2.9	2.26	3.67	+62%	15	12.5	5/19-9/21 10/18-12/31
2015	5.50	2.9	2.33	3.79	+63%	15	12.5	5/15-9/21 10/22-12/31
2016	6.67	3.52	2.82	5.19	+84%	15	12.5	5/15-9/21 10/22-12/31
2017	10.47	5.38	4.29	4.16	-3%	15	12.5	5/15-9/21 10/22-12/31
2018	8.94	4.59	3.66	3.85 ^d	+5%	15	12.5	5/15-12/31
2019	7.97	4.10	3.27 ^e	-	-	TBD	TBD	TBD

^a RHLs for 2006-2014 are adjusted for Research Set Aside.

^b Harvest values prior to 2004 are for Maine through North Carolina. Values from 2004 through 2018 are for Maine through Cape Hatteras, North Carolina. All values are based on pre-calibration MRIP estimates.

^c 15 fish from 1/1-2/29; 25 fish from 5/19-10/14 and 11/1-12/31.

^d Projected using the methodology described on pages 3-4

^e Recommended by the Council and Board in August 2018. Not yet implemented.

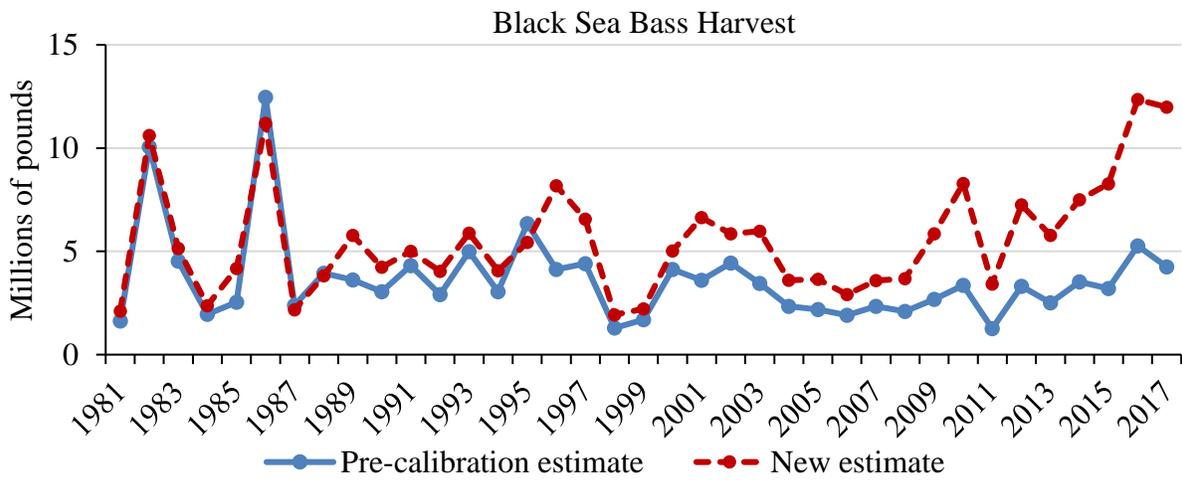
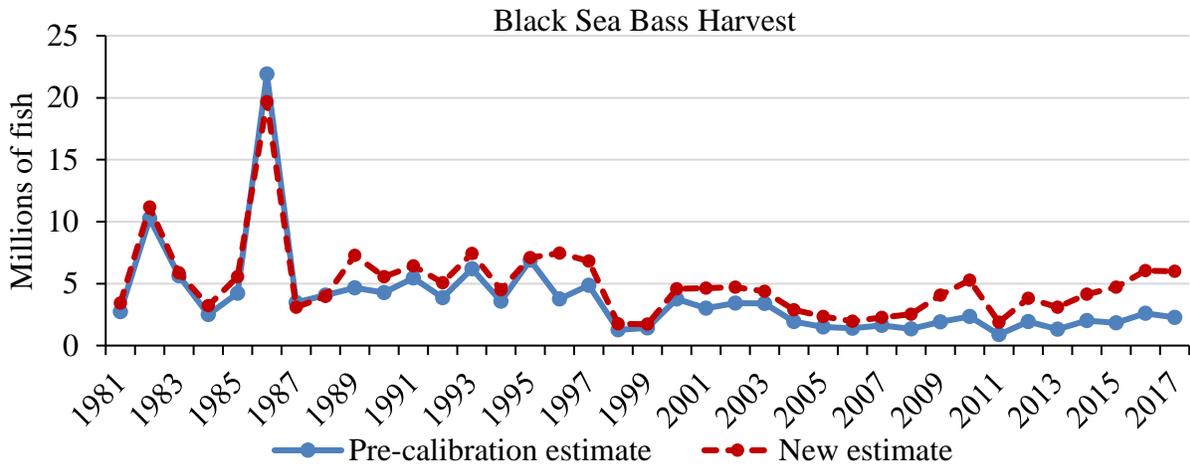
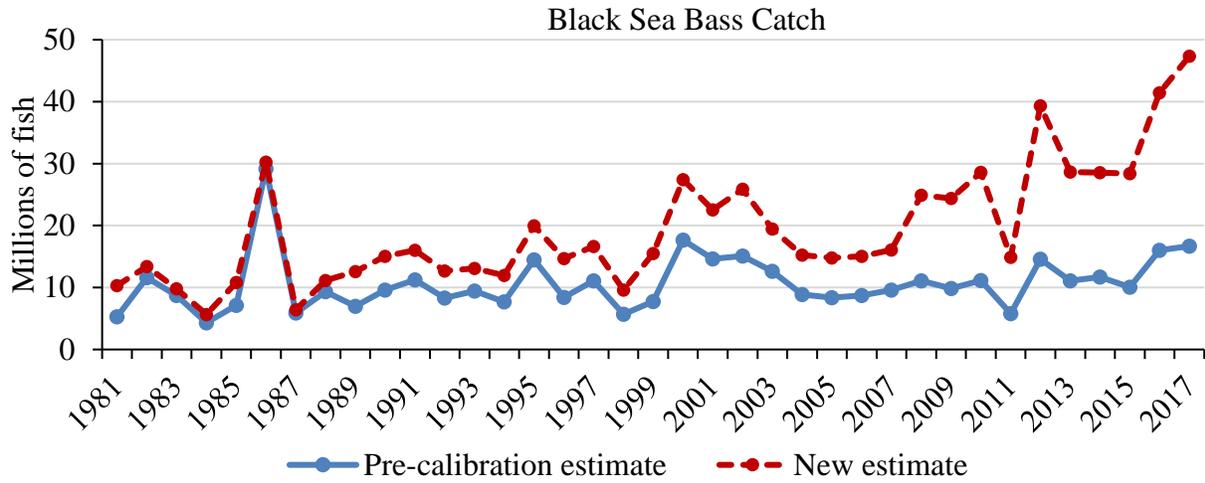


Figure 1: Recreational black sea bass catch in numbers of fish and harvest in numbers of fish and pounds, ME - NC, 1981 - 2017 based on pre-calibration MRIP estimates and revised MRIP estimates released July 2018.

Table 2: Average proportion of annual black sea bass recreational harvest in numbers of fish from state waters, by state based on pre-calibration MRIP estimates.

State	2014	2015	2016	2017	2018 (w1-4)	Average
ME	-	-	-	-	-	-
NH	-	-	-	-	-	-
MA	88%	100%	94%	80%	89%	90%
RI	78%	76%	83%	85%	83%	81%
CT	90%	96%	96%	90%	100%	94%
NY	74%	86%	51%	39%	66%	62%
NJ	8%	19%	34%	31%	32%	25%
DE	4%	5%	8%	7%	7%	6%
MD	0%	21%	49%	1%	0%	18%
VA	68%	4%	14%	7%	20%	16%
NC ^a	21%	4%	10%	7%	0%	11%
ME-NJ	64%	76%	68%	55%	69%	66%
DE-NC	14%	9%	27%	5%	13%	13%

^a Through Cape Hatteras

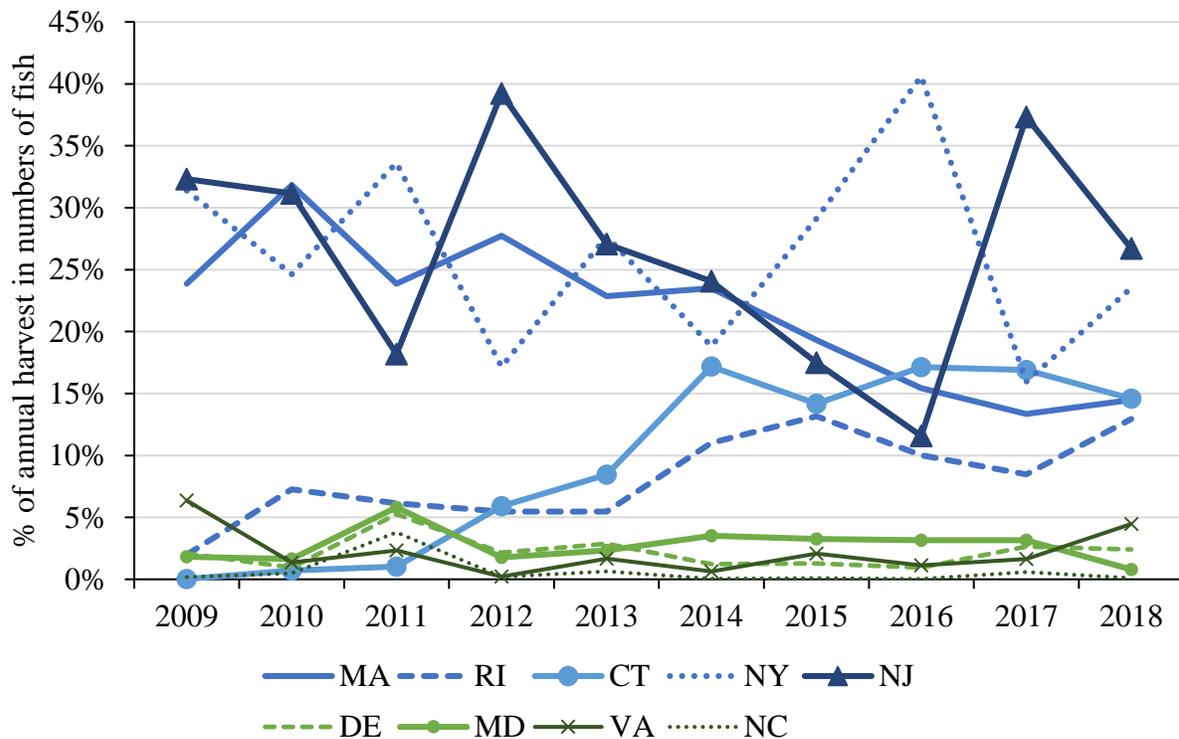


Figure 2: Percent of coastwide (i.e., Maine through Cape Hatteras, NC) annual harvest of black sea bass (in numbers of fish) by state, 2009-2018 based on pre-calibration MRIP estimates. 2018 values are projected based on the methodology described on pages 3-4.

Table 3: Black sea bass recreational management measures by state in 2017.

State	Minimum Size (inches)	Possession Limit	Open Season
ME	13	10 fish	5/19 - 9/21 & 10/18 - 12/31
NH	13	10 fish	1/1 - 12/31
MA	15	5 fish	5/21 - 8/31
RI	15	3 fish	5/25 - 8/31
		7 fish	9/1 - 9/21 & 10/22 - 12/31
CT private & shore	15	5 fish	5/1 - 12/31
CT authorized party/charter vessels	15	8 fish	5/1 - 12/31
NY	15	3 fish	6/27 - 8/31
		8 fish	9/1 - 10/31
		10 fish	11/1 - 12/31
NJ	12.5	10 fish	5/26 - 6/18
		2 fish	7/1 - 8/31
		15 fish	10/22 - 12/31
DE, MD, VA, & NC North of Cape Hatteras	12.5	15 fish	5/15 - 9/21 & 10/22 - 12/31

Table 4: Black sea bass recreational management measures by state in 2018.

State	Minimum Size (inches)	Possession Limit	Open Season
ME	13	10 fish	5/19 - 9/21 & 10/18 - 12/31
NH	13	10 fish	1/1 - 12/31
MA	15	5 fish	5/19 - 9/12
RI	15	3 fish	6/24 - 8/31
		7 fish	9/1 - 12/31
CT private & shore	15	5 fish	5/19 - 12/31
CT authorized party/charter vessels	15	5 fish	5/19 - 8/31
		7 fish	9/1 - 12/31
NY	15	3 fish	6/23 - 8/31
		7 fish	9/1 - 12/31
NJ	12.5	10 fish	5/15 - 6/22
	12.5	2 fish	7/1 - 8/31
	12.5	10 fish	10/8 - 10/31
	13	15 fish	11/1 - 12/31
DE, MD, VA, & NC North of Cape Hatteras	12.5	15 fish	5/15 - 12/31

Table 5: State allocations of 100,000 pounds of expected February black sea bass harvest.

State	Proportion of Wave 1 Catch	Allocation of 100,000 pounds
RI	0.29%	288
CT	0.06%	57
NY	9.41%	9,410
NJ	82.85%	82,850
DE	1.30%	1,297
MD	0.54%	541
VA	5.50%	5,496
NC ^a	0.06%	62
Total	100.00%	100,000

^a North of Cape Hatteras

Table 6: Recreational black sea bass harvest (in numbers of fish) by state, waves 1-4 (January - August), 2014-2018, based on pre-calibration MRIP estimates. 2018 values are preliminary.

State	2014	2015	2016	2017	2018
ME	0	0	0	0	0
NH	0	0	0	0	0
MA	349,059	338,465	360,575	293,573	252,263
RI	110,393	98,676	125,003	116,397	159,053
CT	127,188	117,860	367,191	242,910	196,957
NY	234,754	290,134	525,327	123,956	240,335
NJ	307,797	228,227	203,234	628,240	354,075
DE	18,010	12,383	16,858	31,979	10,846
MD	32,434	13,391	30,677	62,900	7,605
VA	4,384	34,441	23,934	16,397	31,012
NC ^a	619	1,237	807	12,675	1,793
Total	1,184,638	1,134,814	1,653,606	1,529,027	1,253,939

^a Through Cape Hatteras

Table 7: Average percent of black sea bass harvest (in weight) by wave and state in 2017, based on pre-calibration MRIP estimates.

State	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
ME	N/A	N/A	N/A	N/A	N/A	N/A
NH	N/A	N/A	N/A	N/A	N/A	N/A
MA	0%	0%	79%	21%	0%	0%
RI	0%	0%	28%	32%	39%	2%
CT	0%	0%	7%	58%	36%	0%
NY	0%	0%	0%	31%	54%	14%
NJ	0%	0%	56%	21%	14%	8%
DE	0%	0%	55%	5%	23%	17%
MD	0%	0%	23%	69%	3%	5%
VA	0%	0%	21%	21%	42%	16%
NC ^a	0%	0%	32%	64%	1%	3%
Total	0%	0%	36%	32%	26%	6%

^a Through Cape Hatteras

Table 8: Summary of 2018 harvest projections by state based on pre-calibration MRIP estimates.

State	2017 harvest	Avg 2015-2017 harvest	2015-2017 wave 1-4 as % of annual harvest	2018 wave 1-4 harvest	2018 projected annual harvest	% of projected 2018 harvest
ME	0	0	-	0	0	0%
NH	0	0	-	0	0	0%
MA	743,617	784,386	98%	639,437 ^a	706,307	18%
RI	426,405	478,370	51%	350,683 ^b	692,167	18%
CT	825,447	718,576	69%	462,892 ^b	672,408	17%
NY	770,850	1,302,874	45%	454,317 ^b	1,005,842	26%
NJ	1,137,317	654,705	76%	487,817 ^b	638,787	17%
DE	75,895	44,909	62%	15,993 ^c	29,876	1%
MD	102,656	94,901	53%	9,886 ^c	25,380	1%
VA	59,988	63,649	76%	49,892 ^c	79,271	2%
NC ^d	18,681	8,195	90%	2,521 ^c	2,967	0%
Total	4,160,856	4,150,565		2,473,437	3,850,749	

^a Wave 6 was projected based on 2018 wave 1 - 4 harvest and average 2015-2017 proportions of harvest by wave. Wave 5 harvest was set equivalent to average wave 4 harvest per day in 2015-2017 multiplied by 12 (the number of open days in wave 5 2018).

^b Harvest in waves 5 and 6 was projected based on 2018 wave 1 - 4 harvest and average 2015-2017 proportions of harvest by wave.

^c Harvest in waves 5 and 6 was projected based on 2018 wave 1 - 4 harvest and average 2015-2017 proportions of harvest by wave. The wave 5 values were doubled to account for a doubling of the open days in wave 5 in 2018 compared to 2015-2017.

^d Through Cape Hatteras

Table 9: Recreational black sea bass harvest (in numbers of fish) by state, waves 1-6 (January - December), 2014-2018, based on pre-calibration MRIP estimates. 2018 values are based on the projection methodology described on pages 3-4.

State	2014	2015	2016	2017	2018 projected
ME	0	0	0	0	0
NH	0	0	0	0	0
MA	457,100	342,554	392,239	294,467	284,902
RI	214,464	233,631	254,704	186,791	254,549
CT	334,201	251,643	435,624	372,730	287,109
NY	366,133	516,967	1,032,607	352,205	462,734
NJ	468,400	310,297	294,313	823,164	525,427
DE	23,878	22,899	24,168	58,082	47,200
MD	68,468	57,631	79,951	69,397	15,603
VA	12,605	36,863	28,913	35,977	87,886
NC ^a	696	1,966	864	13,062	2,203
Total	1,945,945	1,774,451	1,510,776	2,205,875	1,967,614

^a Through Cape Hatteras

Table 10: Recreational black sea bass catch and harvest by year, 1981-2018 based on pre-calibration MRIP estimates. 2018 values are based on the projection methodology described on pages 3-4. Catch and harvest values prior to 2004 are for Maine through North Carolina. Values from 2004 through 2018 represent Maine through Cape Hatteras, North Carolina.

Year	Catch (millions of fish)	Harvest (millions of fish)	Harvest (millions of lb)	% Released	Avg. weight of landed fish (lb)
1981	5.30	2.73	1.23	48%	0.45
1982	11.62	10.25	10.05	12%	0.98
1983	8.71	5.63	4.53	35%	0.80
1984	4.33	2.49	1.96	42%	0.79
1985	7.13	4.22	2.54	41%	0.60
1986	29.17	21.90	12.46	25%	0.57
1987	5.91	3.47	2.39	41%	0.69
1988	9.36	4.06	3.94	57%	0.97
1989	7.00	4.65	3.62	34%	0.78
1990	9.62	4.27	3.05	56%	0.71
1991	11.22	5.46	4.32	51%	0.79
1992	8.30	3.87	2.91	53%	0.75
1993	9.45	6.20	4.98	34%	0.80
1994	7.69	3.57	3.05	54%	0.85
1995	14.48	6.89	6.34	52%	0.92
1996	8.44	3.76	4.13	55%	1.10
1997	11.09	4.87	4.4	56%	0.90
1998	5.70	1.26	1.29	78%	1.02
1999	7.76	1.41	1.7	82%	1.21
2000	17.67	3.76	4.12	79%	1.10
2001	14.63	3.01	3.6	79%	1.20
2002	15.08	3.42	4.44	77%	1.30
2003	12.65	3.39	3.45	73%	1.02
2004	7.24	1.53	1.97	79%	1.29
2005	7.04	1.26	1.88	82%	1.49
2006	7.60	1.29	1.8	83%	1.40
2007	8.73	1.53	2.17	82%	1.42
2008	10.65	1.29	2.03	88%	1.57
2009	9.22	1.81	2.56	80%	1.41
2010	9.96	2.21	3.19	78%	1.44
2011	4.74	0.82	1.17	83%	1.43
2012	12.54	1.87	3.18	85%	1.70
2013	9.81	1.28	2.46	87%	1.92
2014	10.87	2.12	3.67	80%	1.73
2015	9.43	2.21	3.79	77%	1.71
2016	14.14	2.54	5.19	82%	2.04
2017	15.03	2.21	4.16	85%	1.88
2018 projected	14.16	1.97	3.85	86%	1.95

Table 11: AM evaluation for the black sea bass recreational fishery, comparing 2015-2017 average recreational catch from Maine through Cape Hatteras, NC to the 2015-2017 average recreational ACL.⁹

Year	Rec. ACL (mil lb)	Rec. Catch (mil lb)	% Over/Under
2015	2.90	3.79	+59%
2016	3.52	5.19	+82%
2017	5.38	4.16	+1%
Average	3.93	4.38	+47%

Table 12: Percent of Delaware through North Carolina (north of Cape Hatteras) black sea bass harvest (in numbers of fish) by wave, day per wave, and state, 2016-2017 based on pre-calibration MRIP estimates.

Wave	Days open 2016 & 2017 ^b	DE-NC ^a		DE		MD		VA		NC ^a	
		% of 2016-2017 ME-NC ^a harvest	% of 2016-2017 ME-NC ^a harvest per day in wave	% of 2016-2017 ME-NC ^a harvest	% of 2016-2017 ME-NC ^a harvest per day in wave	% of 2016-2017 ME-NC ^a harvest	% of 2016-2017 ME-NC ^a harvest per day in wave	% of 2016-2017 ME-NC ^a harvest	% of 2016-2017 ME-NC ^a harvest per day in wave	% of 2016-2017 ME-NC ^a harvest	% of 2016-2017 ME-NC ^a harvest per day in wave
1 Jan-Feb	0	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-
2 Mar-Apr	0	0.09%	-	0.00%	-	0.00%	-	0.00%	-	0.09%	-
3 May-Jun	47	28.31%	0.32%	12.28%	0.13%	10.66%	0.09%	5.26%	0.06%	1.96%	0.02%
4 Jul-Aug	62	30.73%	0.27%	3.46%	0.03%	19.48%	0.14%	7.73%	0.06%	2.29%	0.02%
5 Sept-Oct	31	26.14%	0.42%	5.27%	0.08%	14.63%	0.02%	6.25%	0.10%	0.03%	0.00%
6 Nov-Dec	61	10.52%	0.09%	5.50%	0.05%	3.34%	0.03%	1.66%	0.01%	0.12%	0.00%
Total	201	95.79%		26.50%		48.11%		20.90%		4.49%	

^aThrough Cape Hatteras

^bThe number of open days in each wave was unchanged from 2016 through 2018, with the exception of wave 5, which had 61 open days in 2018.

⁹ Recreational harvest is based on “pre-calibration” MRIP estimates downloaded in July 2018. Recreational dead discard estimates are from the 2018 data update from the NEFSC, available at: http://www.mafmc.org/s/3_2018-Black-Sea-Bass-Data-Update_06_18.pdf

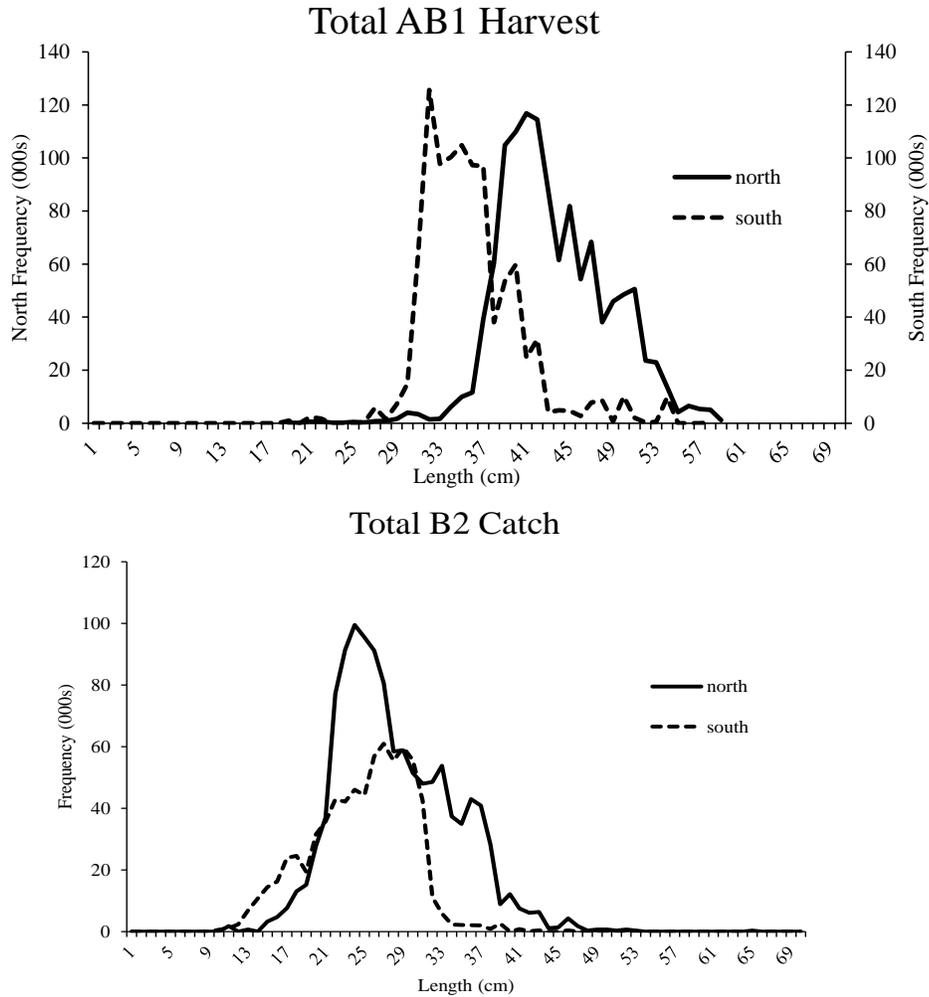


Figure 3: Top: length frequency (total length) of 2017 black sea bass recreational harvest, by region with Maine through New York corresponding to the northern region and New Jersey through Cape Hatteras, NC corresponding to the southern region. Bottom: Length frequency (total length) of 2017 black sea bass recreational dead discards (B2*15%), by region. In 2017, the recreational minimum fish size was 12.5 inches (31.75 cm) in federal waters and the southern states and was 13 or 15 inches (33.02 or 38.10 cm) in northern states. Both figures are from the 2018 data update from the NEFSC, available at: <http://www.mafmc.org/ssc-meetings/2018/july-17-18>.

Table 13: Number of recreational fishing trips for which black sea bass was the primary target species, Maine - North Carolina, based on pre-calibration MRIP estimates.

Year	Number of Directed Black Sea Bass Trips	Directed Black Sea Bass Trips As Percent of All Recreational Trips
2007	368,042	1.0%
2008	256,341	0.7%
2009	393,389	1.3%
2010	417,663	1.4%
2011	193,655	0.7%
2012	267,932	0.8%
2013	261,582	1.0%
2014	403,624	1.0%
2015	505,571	2.3%
2016	483,604	1.9%
2017	Not available	Not available