Atlantic States Marine Fisheries Commission

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MEMORANDUM

January 27, 2016

To: Summer Flounder, Scup, and Black Sea Bass Management Board

From: Summer Flounder, Scup, and Black Sea Bass Technical Committee

RE: 2016 Black Sea Bass Recreational Fishery Proposals

List of Participants

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The following memo contains the Summer Flounder, Scup, and Black Sea Bass Technical Committee Review of the Black Sea Bass and Scup State Proposals for the 2016 recreational fishery.

Black Sea Bass Recreational Proposals

The Board and Council met in December of 2015 to establish the 2016 recreational management program for Black Sea Bass. At this meeting, the Board and Council voted to set federal management measures so long as the northern states set ad-hoc regional measures to achieve the required reduction. The Board also approved Draft Addendum XXVII for public comment which proposes to continue the ad hoc regional approach (ad hoc regions: a northern region (Massachusetts – New Jersey) and southern region (Delaware – North Carolina)) used from 2013-2015 for the 2016 black sea bass recreational fishery.

Total estimated harvest for 2015 is projected to be 3.64 million pounds, resulting in a projected overage of approximately 1.31 million pounds of the 2015 recreational harvest limit (2.33 million pounds). Because the coastwide harvest and overage was driven by the northern region states, all reductions for 2016 are to be applied to these states (Massachusetts- New Jersey). As the 2016 black sea bass recreational harvest limit is approximately 2.82 million pounds, an estimated reduction of 23.2% will be required to achieve but not exceed the RHL.

The states of Delaware through North Carolina (North of Cape Hatteras) agreed to set their measures consistent with the proposed Federal regulations (MAFMC recommended 12.5 inch TL minimum fish size,15 fish possession limit, and open seasons from May 15 to September 21 and October 22 to December 31 to NOAA Fisheries).

The TC met via conference call on January 25th and review the following black sea bass recreational proposals for 2016. In reviewing the proposals, the TC noted the following concerns regarding recreational management in 2016:

1.) To achieve harvest reductions in 2015, most northern states put forward proposals to increase minimum size limits. The TC is in agreement that there is not a uniform approach to analyzing how these proposed changes impact the harvest amount in pounds given the regulatory change could increase the harvest in weight while reducing harvest in numbers of fish. The TC is committed to addressing this issue through harvest specification setting later in 2016.

2.) In recent years harvest reductions have focused on regional performance for the northern region states, regardless of state performance. While the states do not have specific allocations for recreational black sea bass, the northern states annually evaluate their previous year's harvest and set reductions from that harvest, creating de facto allocations. Intended reductions are met with varying success among states within the region. Nonetheless, the entire region is subjected to the same uniform reduction in the following year regardless of performance. The TC seeks guidance from the Board on how to address reductions and allocations in future years for black sea bass.

3.) The Board should consider the effect that increasingly complex regulations have on the TC's ability to calculate and evaluate regulatory proposals, such as possession limit split by time of year and fishing mode.

4.) Lastly, the TC members noted that more stability in management measures through regional management would be helpful, but continual year-to-year reductions have eliminated that stability. Once the 2016 Benchmark stock assessment is completed, the TC recommends reconsidering the ad-hoc regional approach. A reconsideration of the ad-hoc regional approach may provide new regional alignments that mirror the distribution and abundance of black sea bass. For example, New Jersey requested in their proposal the need to reconsider the state's grouping with the other northern states. The TC noted that this should be considered with the results of the 2016 Benchmark stock assessment in early 2017.

Methods:

The northern region attempted to construct regulations that are as similar as possible, while still to allowing some flexibility in setting management measures. This flexibility is an attempt to recognize that the states, particularly in the northern region, can have unique fisheries and a consistent set of regulations may have disparate effects across the region. When combining percentages together from multiple metrics, the use of an interaction calculation was employed. When using incrementally estimated harvest rates through simulation, the interaction term was not used. The equation for the interaction calculation is:

Total Reduction = (X+Y) - (X*Y);

X = The percentage decrease associated with seasonal closure(s).
Y= The percentage decrease associated with size/possession limit.

The Technical Committee (TC) members noted that while this approach is utilized by the northern states in crafting their proposals, there remains a need to standardize how non-compliant harvested fish are measured when crafting changes in management strategies within states.

Proposed Management Strategies for 2015

The following are the proposals from the states of the northern region.

Massachusetts

The 2015 Massachusetts' black sea bass regulations were: Open season May 23 – August 27, 8 fish bag limit, 14" minimum size.

These regulations resulted in the estimated recreational harvest of 351,000 fish, with a PSE of 16.9. A 23% reduction would result in a 2016 harvest target for Massachusetts of approximately 270,000 fish.

Several options are available that are likely to constrain harvest to 270,000 fish. These options focus on increasing regulatory compliance, reducing bag limit, and/or reducing season length.

Options:

Five regulatory options likely to meet the 23.2% reduction are presented in Table 1. The first two options only include changes to season length and thus maintain consistent size and bag limits relative to 2015. The next three options include combinations of season and bag limit to meet the 23.2% reduction. These options prioritize either Memorial or Labor Day weekend and focus on extending the season as long as possible. These three options also maintain a consistent size limit relative to 2015.

Table 1: Regulatory options available to reduce the harvest of the 2016 Massachusetts recreational black sea bass fishery 23.2% relative to 2015.

Seasonal Reduction Only				
Open Date	**Close Date**	**Bag Limit**	**Minimum Size**	**Expected Reduction (%)**
21-May	4-Jul	8	14"	23.5
28-May	30-Jul	8	14"	23.3
Bag Limit Reduction and Seasonal Adjustment				
Open Date	**Close Date**	**Bag Limit**	**Minimum Size**	**Expected Reduction (%)**
28-May	20-Aug	5	14"	23.2
30-May	5-Sep	4	14"	23.5
28-May	12-Sep	3	14"	23.9

Table 2. Bag Limit Reductions

Bag Limit	**% Reduction**
8	0
7	2.99
6	7.02
5	12.07
4	21.11
3	31.87
2	45.81
1	65.03

Methods:
Reductions are based on the 2015 Marine Recreational Information Program (MRIP) estimates. The MRIP survey relies on angler interviews and an effort survey to estimate and characterize harvest of recreationally important fish species. The performance of the recreational black sea bass fishery was evaluated using harvest estimates from the 2015 MRIP surveys. In all cases it was assumed that 2016 effort will be identical to 2015 effort.

Catch totals from the MRIP survey are based on the cumulative sum of the catch per intercept. Catch per intercept is calculated as the weighting factor (wp_int) multiplied by harvest (harvest.a.b1). Each intercept contains data on the number of contributors (cntrbtrs). The harvest per angler is calculated as harvest divided by the number of contributors.

Harvest per angler was modified to explore what would have happened in 2015 at a different bag limits. Catch per intercept was recalculated by multiplying the weighting factor by the modified harvest per angler, and then multiplying by the number of contributors to the intercept. To account for non-compliance with the bag limit, any bags exceeding 8 fish, the 2015 limit, were not modified. It was assumed that an angler that did not comply with a bag limit of 8 would not comply with a reduced bag limit.

In exploring the effect of reductions to bag limit, achieving a 23% reduction was unlikely until reducing the bag limit to 3 fish. A 3 fish bag limit in 2015 (Option 1) would've reduced harvest by 31%. If assuming that the 2016 fishery will behave similarly to the 2015 fishery, this option will allow Massachusetts to achieve the target catch without reducing season length.

To explore the effect of seasonal reduction on catch total, with status quo bag limits, the total number of fish that were caught per day within a specific wave were calculated. This resulted in a per day reduction of 6,458 fish per day in wave 3 and 1,769 fish per day in wave 4. For two options, season length was extended. When season length was extended, reductions were applied to the beginning of the season by implementing a later start date. To estimate the effects of adding days to the season in wave 5, the percent increase in harvest was based on the percent of harvest that occurred per day in wave 5 of 2014. When this percent (1.57%) is applied to the 2015 catch total, this results in a projected 5,538 fish per day for wave 5. This was done because the season was not open in wave 5 of 2015, and therefore, data from 2015 was not available. Note that the bag and size limit did not change in MA from 2014 to 2015.

When reductions in bag occurred while reductions in season were in place, the cumulative reduction was penalized by the product of the percent decrease associated with the seasonal closure and the percent decrease associated with a change to the size/possession limit.

TC Recommendation: Approve

Rhode Island

The following is how RI as a member of the Northern region calculated its reductions. As noted in the background section, the regions will attempt to construct regulations that are as similar as possible. While this is a goal of the following analyses, the Board adopted the Ad Hoc regional approach to allow some flexibility in setting management measures. This flexibility was an attempt to recognize that the states, particularly in the northern region, can have unique fisheries and a consistent set of regulations can have disparate effects across the region. The following is a set of regulations analyzing just RI data, but this

can be altered if a three state (NY, CT, and RI) set of regulations is preferred upon technical review.

Rhode Island Methodology

Rhode Island explored three methods of estimating 2016 recreational black sea bass options. Those considered included; 1.) seasonal reductions calculated from daily harvest rates based on RI's harvest from 2015 waves 1 – 5 and 2014 for wave 6; 2.) Bag limit reduction calculations based on RI's harvest from 2015 wave 5; and 3.) A combination bag and harvest reduction calculation based on RI's harvest from 2015 waves 1 – 5 and 2014 for wave 6 according to MRIP data.

Bag Limit Adjustments

Changes in harvest due to possession limit adjustments were analyzed using MRIP intercept data. In general, the analysis takes the intercept data for 2015 (only wave 5 were used for these analyses because RI had a 7 fish bag limit during wave 5 and 6, but only had a 1 fish bag limit during other times of the year), weights and expands it, and simulates the harvest effects of different bag limits had they been in effect in 2015. To be clear, RI presents options where the bag limit is increased in the early season and the increase in harvest is calculated by applying the harvest at bag changes from its late season data where the bag limit was at 7 fish. The underlying assumption for this analysis is that fishermen will harvest at consistent proportions by bag throughout the season.

Calculations were run under the assumption of continued non-compliance, as discussed by the technical committee. The bag limit analysis was performed using a portion of the code as developed by M. Bednarski of MADMF and modified for the RI dataset as was done in 2015 for the RI specifications. The results of the analysis are indicated below (Table 3).

Table 3. The projected effects of various bag limits on the 2016 Black Sea Bass recreational landings in the RI, calculated as percent decrease from current management configuration.

Bag	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2016 increase season 1	**0%**	**20%**	**36%**	**50%**	**62%**	**67%**	**70%**
2016 reduction season 2	**70%**	**50%**	**34%%**	**20%**	**8%**	**3%**	**0%**

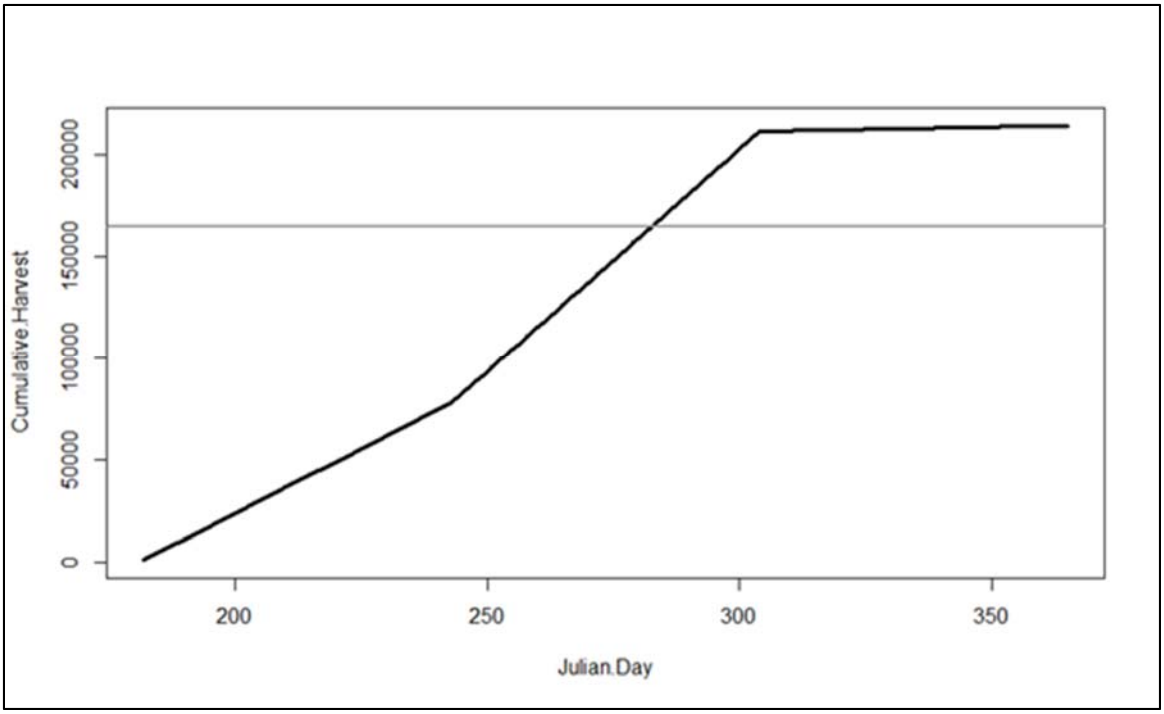

Figure 1. Results of the season analysis for RI. The results of the analysis are shown relative to the assumed target (horizontal grey line), which is calculated as a 23.2% reduction from 2015 harvest estimate.

Seasonal Adjustments

Seasonal adjustments were also calculated by using the MRIP intercept data. In general, the analysis takes the intercept data for 2015 (only waves 1 – 5 were available at the time of the analysis, therefore 2014 data used for wave 6), weights and expands it, and calculates a daily harvest level for the 2015 data. This harvest is then accumulated through time and compared against a 23.2% reduction from the 2015 total harvest amount. The point where the cumulative harvest line intersects the target line is the required 23.2% reduction in harvest. As noted above, calculations were run under an assumptions of continued non-compliance (Figure 1).

Combination Seasonal and Bag Limit Adjustments

Combination seasonal and bag limit adjustments were also calculated by using the MRIP intercept data. In general, the analysis takes the intercept data for 2015 (only waves 1 – 5 were available at the time of the analysis, therefore 2014 data used for wave 6), weights and expands it, and calculates a daily harvest level for the 2015 data under simulated bag limits. This harvest is then accumulated through time and compared against a 23.2% reduction from the 2015 total harvest amount, and simulates this harvest for various bag limit scenarios. The results below (Table 4) present the assumption of continued non-compliance.

Party and Charter Program

As an additional option, RI would like to entertain the possibility of adopting a program akin to the party and charter program in place in the state of CT. RI will develop a logbook for tracking landings (we may look to use existing electronic technologies), we will require party and charter vessels to obtain a permit to participate in the program. We will implement a requirement for vessels to comply with reporting

requirements, and if vessels fail to submit their reports, they will be dropped from the program. A list of qualifying vessels will be shared with RIDEM Law Enforcement officials. In 2016 the program will allow both party and charter vessels a 7 fish bag limit during waves 5 and 6, they will be closed during other periods of time. This is the same bag limit as was in place during wave 5 and 6 in 2015, and calculations were made per the exact same methodology as described above to account for this altered party and charter harvest. An additional reduction was applied to this program to allow for uncertainty in the knowledge of how many vessels will participate (non-participating vessels will abide by the standard 3 fish bag limit)(Table 3). One final note, the party and charter mode in RI only represented 13% of the harvest, so the danger of dramatically impacting total state recreational harvest is minimized.

Rhode Island Proposed Management Measures for 2016

The following are the proposals from RI (table 4). The options meet the required 23.2% reduction and follow the calculations as set forth above.

Table 4 – Rhode Island Black Sea Bass options for 2016 based on 2015 harvest (waves 1-5) and 2014 harvest (wave 6)

Bag Limit		**Minimum Size**	**Wave 3 (open days)**	**Wave 4 (open days)**	**Wave 5 (open days)**	**Wave 6 (open days)**	**Reduction**
Split Bag	3	14	-	62		-	0.235
	7		-	-	39	-	
Split Bag	3	14	-	38	-	-	0.236
	4		-	-	53	-	
Single Bag	3	14	-	62	40	0	0.236
Single Bag	3	14	-	43	61	61	0.236

Table 5-Additional RI option for 2016 with Party and Charter program

Mode	Bag Limit	Minimum Size	Wave 3 (open days)	Wave 4 (open days)	Wave 5 (open days)	Wave 6 (open days)	Reduction
Shore and Private/Rental Boat	3	14	-	43	61	61	0.272
Party and Charter	7	14	-	-	61	61	

<u>TC Recommendation:</u> Approve

Connecticut

In 2015 through wave 5 Connecticut harvested a total of 261,591 black sea bass. A 23.3% reduction would reduce harvest by 59,787 fish, estimating a 2016 harvest of 201,659 fish. All options provided in Table 6 indicate a reduction over the requirement.

Season

Harvest per day rates for waves 3 through 5 came directly from the 2015 landings provided by MRIP, specifically 749 fish per day for wave 3, 1,357 fish per day for wave 4 and 2,124 fish per day for wave 5. These catch rates were applied to both seasonal reduction options and options having an increase in season length. For the first time in eight years, 2014 had estimates of harvest for wave 6. Since 2015 estimates for wave 6 are not yet available, the 2014 data was used to calculate a daily rate of 23 fish per day.

Size / Possession

The MRIP sample size of black sea bass lengths in 2015 was 635 fish, of which, 378 were imputed and 257 measured. This sample size allowed an accurate length frequency table to be created for making liberalization estimates for the 2016 fishing year. The length frequency table was weighted by the MRIP effort estimates in all calculations. Two minimum lengths were evaluated. An increase to 14.5" resulting in a 16.9% reduction and 15" resulting in a 37.7% reduction.

The possession limit was analyzed using the MRIP catch table. The data was queried to include only trips having one angler (contribtrs = 1) in order to remove bias from trips having multiple anglers' harvest pooled. There was a total of 172 trips used in the analysis to adjust the creel limit in waves 3 and 4 combined and 95 trips used for wave 5 (Table 7). The proportion of 'saved' fish was then converted to number of fish and applied to the total season's harvest.

Party and Charter Vessel Program

In 2015 Connecticut continued the Party and Charter Black Sea Bass Logbook Program. The program started in 2013 when Connecticut opted to start the program in lieu of a 7% liberalization. In order for vessels to participate in the program, they were required to register with the state. They were also required to submit mandatory monthly catch reports. If vessels failed to submit their reports, they were immediately dropped from the program. A list of active qualifying vessels was maintained and shared with Conservation Law Enforcement. In 2015 the program allowed both party and charter vessels an 8 fish creel limit from June 21 to December 31.

Connecticut would like to continue the party and charter black sea bass program into 2016. All options including those with split mode regulations meet the required 23.3% reduction

Table 6. 2016 Connecticut Black Sea Bass Options**.**

	2015 MEASURES	**OPTION 1**	**OPTION 2**	**OPTION 3**	**OPTION 4**
PRIVATE MODE SEASON	June 1 – Dec 31	**June 27** – Dec 31	**July 24** – Dec 31	**May 1** – Dec 31	**June 16 – Oct 9** Nov 1 – Dec 31
PARTY/CHARTER SEASON	June 21 – Dec 31	**June 27** – Dec 31	**July 24** – Dec 31	**May 1** – Dec 31	**June 16 – Oct 9** Nov 1 – Dec 31
MINIMUM LENGTH	14”	**14.5”**	14”	**15”**	**14”**
PRIVATE MODE CREELWAVE 3 AND 4	3	3	3	**5**	**3**
PRIVATE MODE CREEL WAVE 5 AND 6	5	5	5	5	5
PARTY CHARTER CREEL	8	**6**	**6**	8	6

Table 7. 2016 Creel Reduction Table

Creel Reduction Table (Creel tab)			
PR	**WV3 and 4**	**Wv5 and 6**	**Combined**
3->2	0.15		
3->1	0.45		
5->4		0.02	
5->3		0.05	
5->2		0.12	
5->1		0.26	
P/C			
8->7	0.01	0	0.01
8->6	0.02	0.02	0.02
8->5	0.03	0.07	0.04
8->4	0.07	0.14	0.09
8->3	0.16	0.25	0.19
8->2	0.35	0.39	0.36
8->1	0.64	0.59	0.63

<u>TC Recommendation:</u> Approve

New York

In 2015, NY recreational anglers have harvested 710,696 black sea bass for a total 1,225,351 pounds through Wave 5 (preliminary data). Fishing also occurred in Wave 6 (November and December) which over the last 15 years accounts for an average of 5.7% (0.2 – 20.7%) of New York's annual recreational black sea bass harvest. Preliminary data for Wave 6 will be available mid-February and will be taken into account at that time. For the following reduction calculations, the MAFMC derived projection of New York's Wave 6 harvest (3,322 fish) will be used (Table 7).

New York's 2015 recreational black sea bass regulations included:

14.0" minimum size limit,
8 fish possession limit from July 15 – October 31 and
10 fish possession limit from November 1 – December 31

NY will use a combination of changes to season length and possession limit to reduce recreational harvest of BSB. Possession limits may vary by wave. The minimum size limit was increased by 1.0" inches for the 2015 season and this resulted in high rates of non-compliance in some modes and potential spatial differences in access to legal sized fish. To allow for angler adaptation to the recent increase in size limit, New York is not considering changes to the size limit for 2016.

The number of harvested fish in each wave is divided by the number of days open per wave to generate a wave specific daily rate which is used as a percentage of the annual harvest to determine the reduction value of each day in each wave (Table 8).

Weighted intercept data generated by MRIP was used to determine the reduction value of changes to the possession limit. This was done for the entire season and on a wave specific basis. Reductions were calculated taking into account the interaction between season length and possession limit changes (Table 8).

Table 8. New York's projected harvest for 2015 and possession limit analysis

WAVE DAILY RATE	3	4	5	MAFMC PROJ 6	PROJ. 2015 TOTAL
NEW YORK HARVEST	1,189	472,415	237,090	3,322	
DAYS OPEN	0	48	61	61	
DAILY RATE		9,842	3,887	54	
2015 PROJ TOTAL					714,016
PERC/DAY		1.38%	0.54%	0.01%	

POSSESSION LIMIT	ALL	WAVE 4	WAVE 5
2	35.4%	40.3%	25.8%
3	22.5%	26.6%	14.4%
4	14.4%	18.7%	5.9%
5	8.3%	12.3%	0.4%
6	4.8%	7.1%	0.2%
7	1.8%	2.7%	0.0%

The options below (Table 9) are examples of the kinds of regulatory changes New York is considering to achieve the required reduction. These include the removal (or addition) of days from either end of the

season and/or in season closures as well as a decrease in the possession limit. Possession limits may differ between waves but not within a wave. Final options will be generated using the same methodology after consideration of TC/Board approval, preliminary Wave 6 data, and input from New York's public. All options below include a 14.0" minimum size limit

Table 9. New York's Proposed Management Measures for 2016

OPTION	POSSESSION LIMIT	OPEN SEASON
2015	*8/10*	*July 15-Oct. 31/Nov. 1-Dec. 31*
1	3	July 16-Dec.31
2	4	July 22-Dec. 31
3	4	July 21-Oct. 31
4	4	July 15-Oct. 13
5	4	July 15-Sept. 21 and Oct. 10-Dec. 31
6	5	July 15-Sept. 21 and Oct. 21-Dec. 31
7	5	July 27-Dec. 31
8	5	July 15-Oct. 2
9	2/8/10	July 11-Aug. 31/Sept. 1-Oct. 31/Nov. 1-Dec. 31

TC Recommendation: Approve

New Jersey

New Jersey landed a MRIP estimated 452,634 fish in 2015 with a required reduction of 23% in 2016, the recreational New Jersey target is 348,528 fish. New Jersey explored several methods to estimate 2016 recreational black sea bass options. Those considered included estimates of harvest by wave based on the National Marine Fisheries Service (NMFS), Marine Recreational Information Program (MRIP). Since MRIP 2015 wave 6 data is not currently available, New Jersey used 2014 wave 6 estimates for the purpose of this exercise.

Seasonal Reduction: To calculate the reduction achieved through season changes, the total number of fish harvested per wave was divided by the total number of days open in the wave to create a daily harvest rate by wave (Table 10).

Bag Reduction: A bag reduction table was created by summing the total harvest by bag limit for all waves combined and using a stepwise approach to calculate each reduction in bag limit.

Size Reduction: Size reductions were calculated by summing all fish harvested by wave for the 2015 fishing. The percent reduction achieved was calculated the ratio of fish at each size including the non-compliant sizes with those harvested the previous year (Table 11).

Table 10. NJ 2015 Daily harvest rate by wave.

2015 Daily Harvest Rate

Total Length (Inches)	Wave 3 Daily Harvest (35)	Wave 4 Total Harvest (31)	Wave 5 Total Harvest (10)	Wave 6 Total Harvest (61)
Bag	15	2	15	15
12.5	8,314	1,036	6,090	1,125
13	7,297	780	3,989	793
13.5	6,773	619	3,305	673

Table 11. NJ 2016 Size reduction Table.

REDUCTION AT SIZE

Total Length (Inches)	Wave 3 Total Harvest	Wave 4 Total Harvest	Wave 5 Total Harvest	Wave 6 Total Harvest
12.5"	0.0%	0.0%	0.0%	0.0%
13.0"	-12.2%	-24.7%	-34.5%	-29.5%
13.5"	-18.5%	-40.2%	-45.7%	-40.1%

New Jersey's Proposed Management Strategies for 2016

Options that are being considered for New Jersey's 2016 black sea bass recreational fishery are listed in Table 12. All options were developed using the New Jersey MRIP harvest data from 2015 for waves 1-5 and 2014 wave 6 data. New Jersey is considering a split bag approach, as was applied in 2015, which would implement for example, a size limit of 12.5 inches and a possession limit of 15 fish during waves 3, 5, and 6 and a reduced possession limit during wave 4.

Please keep in mind that the options listed in Table 12 reflect potential options. New Jersey's Marine Fisheries Council's Black Sea Bass Committee and its advisors will convene to recommend their preferred options to the New Jersey Marine Fisheries Council for 2016. The Council will then meet to select an option. The option they select may or may not be one of the examples provided, but it will have been developed using the same methodology as the options listed in Table 12.

Recently, the Black Sea Bass Stock Assessment Working Group have evaluated new regional stock assemblages/components for the coastwide black sea bass population based on genetics work, tagging data, fisheries independent and dependent indices, catch-at-age information and recruitment patterns. These data suggest black sea bass stock differences north and south of the Hudson Canyon and associated Hudson River Drainage. Given this information, New Jersey requests that strong consideration be given to placing New Jersey in the Southern Region with Delaware through North Carolina, once the 2016 benchmark stock assessment has been completed.

Table 12. Management options for NJ's 2016 black sea bass recreational fishery based on average daily harvest rates from MRIP data achieving a 23 percent reduction in harvest.

NJ 2016 Black Sea Bass Example Options

			Wave 3	Wave 4	Wave 5	Wave 6	Perc Redx
example option 1	2016	bag3	15	2	15	15	
		size1	12.5	12.5	12.5	12.5	23.8
		days2	**22**	31	10	61	
		Season	**June 9-June 30**	July 1-July 31	Oct 22-Oct 31	Nov 1-dec 31	

			Wave 3	Wave 4	Wave 5	Wave 6	Perc Redx
example option 2	2016	bag3	**14**	2	**14**	**14**	
		size1	**13**	**13**	**13**	**13**	23.01
		days2	**33**	31	10	61	
		Season	**May 29-June 30**	July 1-July 31	Oct 22-Oct 31	Nov 1-dec 31	

			Wave 3	Wave 4	Wave 5	Wave 6	Perc Redx
example option 3	2016	bag3	**10**	2	**10**	**10**	
		size1	12.5	12.5	12.5	12.5	24.28
		days2	**26**	31	10	61	
		Season	**June 5-June 30**	July 1-July 31	Oct 22-Oct 31	Nov 1-dec 31	

			Wave 3	Wave 4	Wave 5	Wave 6	Perc Redx
example option 4	2016	bag3	**7**	2	**7**	**7**	
		size1	12.5	12.5	12.5	12.5	23.07
		days2	**33**	31	10	61	
		Season	**May 29-June 30**	July 1-July 31	Oct 22-Oct 31	Nov 1-dec 31	

TC Recommendation: Approve