Atlantic States Marine Fisheries Commission

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MEMORANDUM

March 13, 2019

To: **Summer Flounder, Scup, and Black Sea Bass Advisory Panel**

From: **Caitlin Starks, FMP Coordinator**

RE: **AP call on Black Sea Bass Commercial Management scheduled for Tuesday April 2, 2019 at 1:00 p.m.**

This memorandum serves as notice of an Advisory Panel call to review recent work pertaining to commercial black sea bass management on **Tuesday April 2, 2019 at 1:00 p.m.**

At the Commission's August 2018 Meeting, the Summer Flounder, Scup, and Black Sea Bass Management Board (Board) established a Working Group to identify management issues related to changes in stock distribution and abundance, and propose potential management strategies for Board consideration. In February 2019, the Working Group reported to the Board and identified two issues: (1) state commercial allocations implemented in 2003 do not reflect the current distribution of the resource, which has expanded significantly north of Hudson Canyon, and (2) federal coastwide quota can limit harvest opportunities for some states if another state's harvest overage results in a coastwide fishery closure. The Board requested the Plan Development Team (PDT) perform additional analyses and develop management options to address these issues.

At this current stage it would be most helpful for the Summer Flounder, Scup, and Black Sea Bass Advisory Panel (AP) members to provide input on potential management strategies the Board may consider. Included below is the draft call agenda and the Working Group's report.

If you have any questions, please contact Caitlin Starks, FMP Coordinator by phone: 703-842-0740 or by email to cstarks@asmfc.org

M19-13

Atlantic States Marine Fisheries Commission &
Mid-Atlantic Fishery Management Council

Summer Flounder, Scup, and Black Sea Bass Advisory Panel Conference Call
April 2, 2019
1:00 p.m. – 3:00 p.m.

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1) **Welcome** 1:00 p.m.

2) **Review Work on Commercial Black Sea Bass Management** 1:05 p.m.

a) Presentation of Working Group Report and PDT Analysis (*C.Starks)*

b) Discussion

a. Questions

b. Comments

c. Recommendations

3) **Next Steps** 2:30 p.m.

4) **Any other business/adjourn** 2:55 p.m.

To join the call, please dial: **1-888-585-9008,**
followed by the room number: **705-426-714**

Please register for the webinar using the following link:

https://attendee.gotowebinar.com/register/6284668124316717836

After registering, you will receive a confirmation email containing information about joining the webinar.

Black Sea Bass Commercial Working Group Report

January 17, 2019

Working Group Members: David Borden (Chair, RI), Nichola Meserve (MA), Matthew Gates (CT), Joe Cimino (NJ), Rob O'Reilly (VA)

ASMFC Staff: Caitlin Starks, Toni Kerns

Additional Attendees: Julia Beaty (MAFMC), Greg Wojcik (CT), Jason McNamee (RI), Tiffany Vidal (MA)

Statement of the Problem

The working group has identified two problems associated with the current FMP. First, the commercial black sea bass allocations to the states were originally implemented in 2003 as part of Amendment 13, loosely based on historical landings from 1980-2001. The state shares in Amendment 13 allocated 67% of the coast-wide commercial quota among the states of New Jersey through North Carolina (North of Cape Hatteras) and 33% among the states of New York through Maine. These state commercial allocations have been unchanged for 15 years. Meanwhile, the resource has experienced shifts in distribution and abundance, and changes in fishing effort and fishing behaviors have occurred.

There is scientific information to support these shifts. For example, according to the last black sea bass stock assessment, which modeled fish north and south of Hudson Canyon separately, the majority of the stock occurred in the south prior to the mid-2000s. Since then the biomass in the north has grown considerably and currently accounts for the majority of spawning stock biomass (Figure 1). While the region specific models created for the assessment were never intended to be stand-alone, this shift in black sea biomass distribution has been supported by peer reviewed journal articles (e.g., Bell et al., 2015).

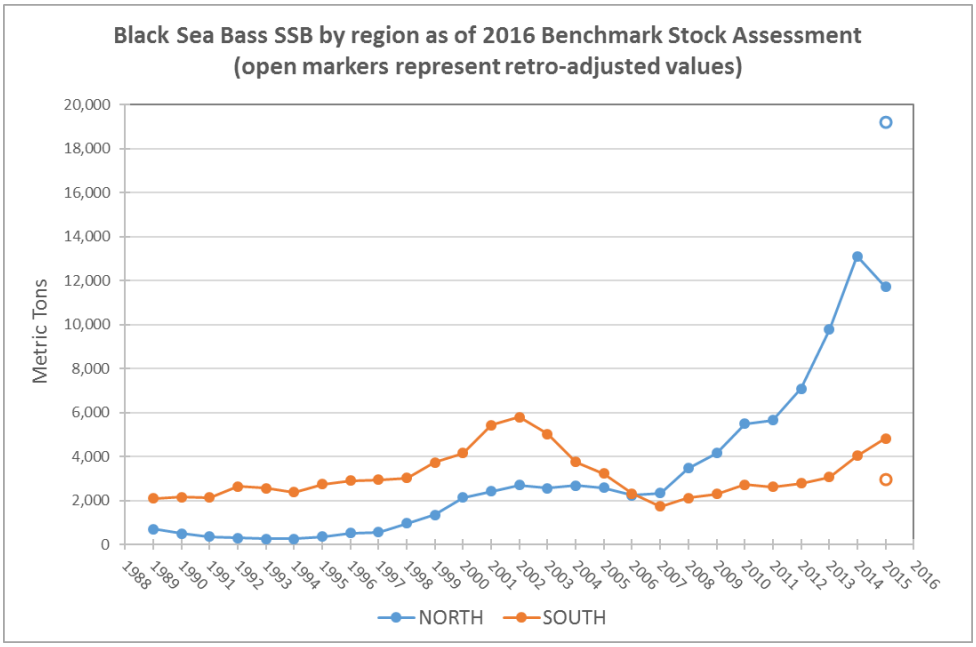

Figure 1: Black Sea Bass SSB by Region, 1989-2016. Source: 2016 Black Sea Bass Stock Assessment.

In some cases, expansion of the black sea bass stock into areas with historically minimal fishing effort has created significant disparities between state allocations and current abundance and resource availability. The most noteworthy example is Connecticut, which has experienced significant increases in black sea bass abundance and fishery availability in Long Island Sound in recent years but was only allocated 1% of the coastwide commercial quota based on landings from 1980-2001.

Any consideration of management changes by the Commission should be responsive to shifts in in black sea bass distribution, abundance, behavior, fishing effort and harvest by gear type. However, there are many additional factors requiring rigorous discussion and evaluation should reallocation be considered. Changes in allocations should take into account the following considerations and issues:

1. Allocations should be reviewed and revised on a regular basis to ensure equity of access and improve fishery efficiency (human safety, fuel use, and discards), using the latest and most appropriate data sources.
2. Changes in allocations should be linked to stock assessments to the extent practicable, or use other peer reviewed data sources. If such sources are unavailable, other scientific information such as state and federal survey indices could be used.
3. The relatively recent shift in spawning stock biomass does not mean that future abundance dynamics will proceed in the same manner, especially since a strong or weak year-class can provide an increase or decrease in abundance throughout the range or a portion of the range.
4. For states where resource availability has shifted significantly in recent years, the current allocations may provide either a disproportionate advantage or disadvantage if used as the basis for allocation adjustments (e.g. Connecticut's 1% allocation). Small changes to the original allocations may not reflect resource abundance, thus, adjustments may need to be made using a formula other than a simple percent change.
5. Participants in different areas have invested in the commercial fishery based on historic landing patterns as well as state management programs. For example, some mid-Atlantic states have adopted management through Individual Transferrable Quotas (ITQs), and the industry has invested in these fishing rights and infrastructure. To avoid unnecessary economic hardships and enhance the ability of the industry to respond and make long term business decisions, slow or gradual implementation of allocation changes should be considered.
6. Due to the high abundance relative to current allocations in the northern area, some states have lengthy closures that promote discards. Any reallocation formula should consider these factors and attempt to reduce closures and discards.
7. Review and reevaluation of commercial quota allocations should not occur in a vacuum and should take into account changes in recreational information. In particular, new recreational harvest estimates should be incorporated into the stock assessment before commercial changes are adopted.

A second problem relates to the provision in the FMP that prescribes a coastwide black sea bass quota managed by NOAA Fisheries. Under the current regulations, all states in the management unit are subject to fishery closures if a coastwide quota overage occurs, despite state-by-state quota management by the ASMFC. These closures can leave states with remaining commercial quota, especially ITQ, unable to utilize their full allocation of the resource. Management should aim to reduce impacts of state-specific commercial quota overages to other states. The working group recommends that the Mid-Atlantic Council consider actions to address this issue. For example, the working group

suggested the Council consider allowing conservation equivalency for the commercial fishery, similar to what is allowed for recreational black sea bass and summer flounder.

Objectives and Goals to Address the Problem

The WG identified the following as management objectives for commercial black sea bass:

- Ensure fishing mortality and spawning stock biomass are maintained within established thresholds and targets, and the stock is not overfished nor experiencing overfishing
- Improve equity in access to the fishery among the states
- Improve fishery efficiency (e.g. use of time, fuel and other resources; reducing discards)

The WG discussed the need to determine what metric(s) would be used to evaluate equity in access to the fishery. Some ideas discussed were socioeconomic benefits or opportunities, as well as resource availability related to the distribution of exploitable biomass and abundance. The WG noted discard reductions and increased efficiency would likely result from allocations based on more current information on the resource's distribution along the coast. However it was noted that fishery efficiency may also be impacted by factors other than resource allocation (e.g., allowances to possess multiple states' limits in the same trip).

The WG proposed the following information, particularly for recent years, should guide further development of management objectives and strategies.

- Descriptions of each state's fishery including but not limited to: management program, participation, effort, landings by gear, distribution of landings and trips, commercial size distribution, and socioeconomic information
- A comprehensive review of survey data for black sea bass to inform understanding of stock biomass/abundance distribution and availability to state commercial fisheries
- Current scientific information on the geographic shifts in black sea bass biomass

Potential Management Strategies

The WG agreed a wide range of options should be considered, and that some management strategies may require coordination with the Mid-Atlantic Fishery Management Council. Some of the ideas the WG supported exploring further included:

1. Adjustments to the state by state allocations. Potential options include:
    a. Status quo
    b. Dynamic approach modeled after the Transboundary Management Guidance Committee (TMGC) approach (Appendix I)
2. Defined timeline or trigger for reevaluation of allocations
    a. Future consideration of a strategy similar to the scup model to increase equitability in access for federal vessels (i.e. winter coastwide quota management and summer state-by-state quota management) (Appendix II)

As indicated in the problem statement, consideration should be given to how management approaches may impact fishery stakeholders in each region, and efforts made to balance negative economic impacts with enhanced equity and efficiency of the fishery along the coast.

Appendix I: Allocation Adjustment Strategies for Black Sea Bass

Northern Region Working Group
December 27, 2018

Introduction

The following proposal outlines a potential strategy for phasing in a new dynamic approach to allocation setting for the black sea bass fishery. This approach is modeled after the Transboundary Management Guidance Committee (TMGC) approach which set forth a similar approach for the management of shared Georges Bank resources between the United States of America and Canada.

As noted by Gulland (1980), the designation of units for management entails a compromise between the biological realities of stock structure and the practical convenience of analysis and policy making. For Black Sea Bass, the Atlantic Coast states from North Carolina to Maine use a single management unit encompassing the entire region. In 2016, the Black Sea Bass stock assessment went through a peer review process, and the model that was approved for management use split this stock in to two metapopulations; one north of the Hudson Canyon and the other south of the same. For a full description of the assessment and the stock structure discussion, see NEFSC (2017). Despite implementing this structure, the Black Sea Bass fishery is still managed as a single stock. This is logical in that there are not two distinct populations, however there have been some significant population dynamics differences between the two metapopulations that warrant consideration for allocation setting. This proposal sets forth an approach that creates a single management program for Black Sea Bass, while at the same time recognizing the best available science for this species population dynamics by allowing the allocations to shift in response to changes in these two metapopulations.

Principles of resource sharing include consideration of access to resources occurring or produced in close spatial proximity to the states in the management unit and historical participation in exploitation of the resources (Gavaris and Murawski 2004). The former has emerged from the changing distribution of the resource and the effects this creates within the fishery. The latter recognizes traditional involvement and investment in the development of a fishery. Both principles were incorporated in the TMGC sharing proposal, but historical participation was gradually down-weighted so that after an eight year phase-in period the annual allocation would be based primarily on resource distribution (Murawski and Gavaris 2004). The concept for the case of Black Sea Bass will be similar, though the change will be more gradual and will give more weight to the historical fishing effort to start, while slowly phasing in the distributional aspects over time.

Details for the calculations were described by Murawski and Gavaris (2004). Modifications to the original approach need to be made to recognize some of the major differences between the TMGC approach and the case of Black Sea Bass. Some of the major differences include the ability to use distributional differences as defined by a spatially explicit stock assessment, the state by state allocation system currently in place, the need to translate from regional to state specific allocations, and the potential to incorporate synoptic trawl survey information. This proposal uses the 2016 benchmark stock assessment results, the existing state by state allocations, and proposes some potential alternatives that make use of existing trawl survey information. As an additional element, a control rule is proposed that caps any annual change from being too large as an additional effort to keep changes over the short term from causing economic stress to a state jurisdiction.

Data and Methods

Formula

Adapted from the TMGC application (TMGC 2002), the approach for calculating the respective regional shares, which takes historical utilization in to account and adapts to shifts in resource distribution, is as follows:

$$\%RegionalShare = (\alpha_y * \sum_r StateSpecAlloc) + (\beta_y * \%ResDistr_{r,y}) \qquad (1)$$

Where α_y = percentage weighting for utilization by year; β_y = percentage weighting for resource distribution by year; $\alpha_y + \beta_y$ = 100%; $StateSpecAlloc$ = state specific allocation; $ResDistr$ = resource distribution; r = region; y = year

The region specific shares then need to be prorated in to the existing state specific allocation structure. This can be accomplished by:

$$NewStateAllocation = \frac{Allocation_s}{\sum_r StateSpecAlloc} * \%RegionalShare \qquad (2)$$

Where $Allocation_s$ = the specific state being calculated

The initial sharing formula is proposed to be based on the weighting of state utilization by 90% and resource distribution from the assessment by 10%. Thereafter, the percentage weighting will be changed in 10% annual increments until the weightings reached 10% utilization from historical allocations and 90% resource distribution from the assessment. This sharing agreement if implemented in 2020, will transition to a 90:10 resource distribution-to-utilization weighting by the 2027 fishing year if done annually. If longer durations are needed between recalculations, this would impact the end year accordingly.

Resource Utilization

Historical state specific commercial allocations for Black Sea Bass were last codified in Addendum XIX to the Fishery Management Plan for Black Sea Bass (FMP) (Table 1). These allocations could be used as the basis for the state utilization portion of the allocation formula. These allocations could remain intact even as the final yearly allocation changes based on equations 1 and 2, which is philosophically appropriate as this portion of the allocation formula is meant to represent the historical fishing aspects of the black sea bass fishery. Additional strategies could be used to set the initial allocation design as this is one important area of discussion amongst board members. The historical allocation design could also be adjusted incrementally to get the states in to a preferred alignment before codifying in to a static system that will be used in the allocation formula moving forward. Not having guidance on this aspect at this time, the example illustrated in this document will use the existing FMP state allocations.

Resource Distribution

This proposal offers two options for calculating the resource distribution. The first option would be to use the spatial stock assessment to determine the amount of resource in each region (north = NY, CT, RI, MA, NH, ME; south = NJ, DE, MD, VA, NC). The spatial stock assessment calculates a north and south biomass value, which can then be turned in to a proportion. The benefit of this approach is this number is calculated through a synthesis of many biological parameters and represents the best available science for the population. The drawback is that the assessment is updated periodically (not every year), therefore the information will not be evaluated every year, but would depend on the assessment cycle. Additionally, if the spatial stock assessment were to fail at some point in the future, this would impact the ability to do the dynamic allocation calculations. The current estimated allocation from the benchmark assessment would be 6,800 MT (January 1 biomass) in the south, 17,000 MT (January 1 biomass) in the north, equating to 29% of the biomass in the south and 71% of the biomass in the north (NEFSC 2017). It is important to note that these are estimated amounts from plots in the assessment document, if this were to be carried forward, exact amounts from the terminal year of the assessment would be used. Since data are readily available for this option, an example calculation and projection has been developed below.

A second option could be to use scientific surveys to allocate the resource. As in the TMGC method, a swept area biomass, considered a relative index of abundance, can be computed in each stratum and apportioned to the north and south regions in each year. The swept area biomasses can be summed to derive the biomass index for each area. This biomass index estimate derived from each survey represents a synoptic snapshot of resource distribution at a specific time during a year. Combining the results of multiple surveys requires an understanding of seasonal movement patterns and how much of the biological year each survey represents. For this reason it is proposed to use the National Marine Fisheries Service (NMFS) Trawl Survey in combination with the North East Area Monitoring and Assessment Program (NEAMAP) Survey. These are both well studied surveys, are currently used in the stock assessment, and are synoptic, covering both offshore and inshore strata. As an initial attempt, existing survey strata could be used to partition the survey information in to the two stock areas. The strata do not line up perfectly but are relatively close. This could be refined over time by developing area polygons that better align with the stock areas and using the spatial information from the surveys to partition in to the polygons. Additionally, there may be ways to use the state survey information within the analysis either directly by averaging those surveys in to the area swept biomass calculations or indirectly such as using them to verify or corroborate the information from the surveys used in the calculations. This is something that could be developed and integrated in to the process over time through discussions with the technical committee.

A robust locally-weighted regression algorithm (Cleveland 1979), referred to as LOESS, could then be used to remove both unpredictable fluctuations and sampling variation from survey observations. Per the TMGC approach, the proposal is to use a 30% smoothing parameter. The TMGC approach chose the level of smoothing as it reflected current trends, was responsive to changes, and provided the most appropriate results for contemporary resource sharing. The recommended default of two robustness iterations also was adopted (Cleveland 1979). Resource distributions could then be updated annually by incorporating data from the latest survey year available and dropping data from the earliest survey used in the previous year so that a consistent window of data is maintained. After the surveys are combined, the LOESS smoother will be applied to the survey data. The fixed resource utilization (90% weighting in year 1) and the most recent resource distributions as calculated by the surveys (10% weighting in year 1) can then be applied to the sharing formula to determine regional allocation shares for the upcoming fishing year. The

benefit of this approach is that it could be performed annually with more contemporary data. The drawback is that survey data is prone to variability. The LOESS smoothing and the control rule offered below are elements that are included to account for some of this variability to keep it from causing unreasonable changes in a single year.

Control Rule

In addition to the formula for calculating the regional allocations and then translating in to the state specific allocations, a secondary protective measure could also be added by way of a control rule. As an initial proposal, we are offering the following control rule structure:

$$\%RegionalShare = \begin{cases} 10\%, & \text{if } \Delta AnnualChange > 10\% \\ \%RegionalShare, & \text{if } \Delta AnnualChange \leq 10\% \end{cases}$$

This will protect against any abrupt change occurring in any given year and will allow the changes in allocation to occur incrementally.

Flexibility

By its nature, this approach has multiple areas of flexibility. These are all decision points that, once agreed to, can be added in to the equations so the approach can be standardized moving forward. The list of areas that can be adjusted are:

- The α and β parameters can be adjusted to change the way the utilization and distribution are weighted in the equation
- The increment of change in the α and β parameters can be adjusted to increase or decrease the transition speed
- The time horizon for the transition can be changed
- The initial state allocations can be changed or transitioned from those codified in Addendum XIX (see *Resource Utilization* section for various options)
- The technique for calculating the resource distribution has multiple options (see *Resource Distribution* section for various options)
- If a trawl survey approach were to be used, the way the LOESS algorithm is parameterized can be adjusted
- The control rule can be adjusted to be more or less protective of incremental changes

The optimal approach would be to work through all of these options and agree to a final set up for moving forward.

Results

Example

The following is an example using the output from the last assessment as the option for calculating the resource distribution. The first step is to apply the state specific allocations and resource distribution information to equation 1.

Sum of the southern allocations:

```
sum.south

## [1] 0.67
```

Sum of the northern allocations:

```
sum.north

## [1] 0.33
```

Resource distributions for the northern and southern areas based on the benchmark assessment:

```
dist.south = 0.29
dist.north = 0.71
```

These are the α and β parameters for equation 1 for year 1:

```
alpha = 0.9
beta = 0.1
```

This is equation 1 for each region, and implements the control rule:

```
# Region Specific Equation 1
South.Share = (alpha*sum.south) + (beta*dist.south)
North.Share = (alpha*sum.north) + (beta*dist.north)

# Control Rule
if (abs(South.Share-sum.south) > 0.1 | abs(North.Share-sum.north) > 0.1) {
  if (South.Share-sum.south > 0) {
    South.Share = (sum.south*(0.1))+sum.south
    North.Share = (sum.north*(-0.1))+sum.north}
  else {
    South.Share = (sum.south*(-0.1))+sum.south
    North.Share = (sum.north*(0.1))+sum.north}
}
```

This results in the following regional allocations in year 1:

```
## [1] 0.63

## [1] 0.37
```

In this case the change in allocation is less than 10%, so per the control rule the percent regional shares will not be changed to ten percent.

The second step is to prorate these in to state specific allocations.

```
state = c("Maine","New Hampshire","Massachusetts","Rhode Island","Connecticut","New Y
ork","New Jersey","Delaware","Maryland","Virginia","North Carolina")

for (i in 7:11) {
  New.South.Shares = (state.alloc[i]/sum.south)*South.Share
  print(paste(state[i], "=", round(New.South.Shares, digits=2)))

}
```

```
## [1] "New Jersey = 0.19"
## [1] "Delaware = 0.05"
## [1] "Maryland = 0.1"
## [1] "Virginia = 0.19"
## [1] "North Carolina = 0.1"
```

```
for (j in 1:6) {
  New.North.Shares = (state.alloc[j]/sum.north)*North.Share
  print(paste(state[j], "=", round(New.North.Shares, digits = 2)))

}
```

```
## [1] "Maine = 0.01"
## [1] "New Hampshire = 0.01"
## [1] "Massachusetts = 0.14"
## [1] "Rhode Island = 0.12"
## [1] "Connecticut = 0.01"
## [1] "New York = 0.08"
```

Assuming that the resource distribution remains the same and that these calculations could be done annually, a projection was performed and is presented in Table 2 below.

Tables

Table 1 - State by state allocations (ASMFC 2007)

State	Allocation
Maine	0.5
New Hampshire	0.5
Massachusetts	13.0
Rhode Island	11.0
Connecticut	1.0
New York	7.0
New Jersey	20.0
Delaware	5.0
Maryland	11.0
Virginia	20.0
North Carolina	11.0

Table 2 - A ten year projection assuming the resource distribution remains at the same amount as calculated in the last assessment and that the calculations could be performed annually. This projection follows the schedule as outlined in the “Formula” section of this document.

Year	Southern Share	Northern Share
2020	0.59	0.41
2021	0.56	0.44
2022	0.52	0.48
2023	0.48	0.52

2024	0.44	0.56
2025	0.40	0.60
2026	0.37	0.63
2027	0.33	0.67

References

ASMFC. 2007. ADDENDUM XIX TO THE SUMMER FLOUNDER, SCUP, AND BLACK SEA BASS FISHERY MANAGEMENT PLAN. 10 p. Available at: http://www.asmfc.org/uploads/file/addendumXIXFinal.pdf

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TMGC. 2002. Development of a Sharing Allocation Proposal for Transboundary Resources of Cod, Haddock and Yellowtail Flounder on Georges Bank. DFO Maritimes Region, Fisheries Management Regional Report 2002/01: 59 p.

Appendix II. Stepwise Transformation to "Scup Model" Quota System for Black Sea Bass

Concept:
Ultimately, this alternative would allocate quota into three unequal seasonal periods, as is done for scup. During the two winter periods, **January-April* ("Winter I") and **November-December* ("Winter II"), a coastwide quota system would be implemented in conjunction with a system of coastwide possession limits and other measures. In a "Summer" period, **May-October*, a state-by-state quota system would be implemented by the Commission, and state-specific measures would be set to constrain landings to the summer state quotas.

**Note: Quota periods could be refined, data is not yet available to fully describe the commercial harvest of black sea bass in time (by month) and space (state vs. federal waters).*

The switch to coastwide winter period management would occur after 5-10 years of incremental quota adjustments (as in the TMGC approach detailed by Jay McNamee) in response to changes in patterns of biomass distribution. That would allow managers to utilize more appropriate patterns of harvest in time and space to allocate among periods. As part of the Working Groups commitment to slow or gradual implementation of allocation changes to limit disruption, coastwide management during Winter I and Winter II could be implemented in subsequent years. Regular adjustments to the allocations among states (and potentially periods) should continue in perpetuity, in order to reflect the current distribution of the resource.

Rationale:
A significant portion of the commercial fishery is prosecuted in federal waters during the colder months, primarily by otter trawl. Utilizing a scup style management approach is particularly appropriate for black sea bass because this winter fishery is fishing on the mixed stock, fish from all across the northern and southern subunits of the stock aggregate together on the continental shelf. Commercial fishermen pursuing black sea bass at this time should have equitable access to the resource since all are traveling great distances from their home ports, expending fuel, and assuming similar safety risks. Fishing on relatively the same grounds under the same limits would also lend itself to improved sampling and discard estimation during this period. During the warmer months when the fish move inshore, state specific management of the commercial fishery is more appropriate.

Issues that require additional consideration:
36% of the coastwide quota is currently held by DE, MD, and VA; all states with ITQs fisheries for black sea bass. There may be no easy transition for states w/ ITQ fisheries because that model is so different from what the rest of the coast utilizes. Further information on when and where these states prosecute their fisheries is required to understand the potential impacts.