Atlantic States Marine Fisheries Commission

South Atlantic State/Federal Fisheries Management Board

August 2, 2016
10:15– 11:45 a.m.
Alexandria, Virginia

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/Call to Order *(J. Estes)*	10:15 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from May 2016	10:15 a.m.
3.	Public Comment	10:20 a.m.
4.	Discuss Commission Involvement in Cobia Management (*L. Daniel)* **Action** • Discuss possible management scenarios • Recommend to the ISFMP Policy Board how the Commission should be involved in cobia management	10:30 a.m.
5.	Red Drum Working Group Report (*J. Kipp)* • Presentation of progress on follow up tasks to the red drum assessment	11:05 a.m.
6.	Progress Report on the Spot and Atlantic Croaker Benchmark Stock Assessments (*J. Kipp*)	11:25 a.m.
7.	Consider 2015 Fishery Management Plan Review and State Compliance for Red Drum and Atlantic Croaker (*T. Kerns*) **Action**	11:35 a.m.
8.	Other Business/Adjourn	11:45 a.m.

The meeting will be held at the Westin, 400 Courthouse Square, Alexandria, Virginia; 703.253.8600

Vision: Sustainably Managing Atlantic Coastal Fisheries

MEETING OVERVIEW

South Atlantic State/Federal Fisheries Management Board Meeting
Tuesday, August 2, 2016
10:15 – 11:45 a.m.
Alexandria, Virginia

Chair: Jim Estes (FL) Assumed Chairmanship: 02/16	Technical Committee Chair: Red Drum: Mike Murphy (FL) Atlantic Croaker: Chris McDonough (SC)	Law Enforcement Committee Representative: Capt. Bob Lynn (NC)
Vice Chair: Pat Geer	Advisory Panel Chair: Tom Powers (VA)	Previous Board Meeting: May 5, 2016
Voting Members: NJ, DE, MD, PRFC, VA, NC, SC, GA, FL, NMFS, USFWS, SAFMC (12 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2016

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Discuss Commission Involvement in Cobia Management (10:30 -11:05 a.m.) Action

Background

- The South Atlantic Council Fishery Management Council (Council) requested the Commission consider joint or complementary management of cobia with the Council.
- In 2105, 82% of the cobia harvest occurred in state waters. The ACL was exceeded by approximately 91,000 pounds.
- The Council is looking for a more flexible management approach to allow for timely adjustments of measures but still provide equitable access across multiple jurisdictions while meeting conservation goals.
- The Policy Board directed staff to draft a white paper to outline how Cobia management would work under a joint, complementary, ASMFC only or Council only plan (**supplemental materials**).

Presentations

- L. Daniel will present the management white paper to the Board.

Board actions for consideration at this meeting

- Recommend how to the ISFMP Policy Board how the Commission should be involved in cobia management.

4. Red Drum Working Group Report (11:05 – 11:25 a.m.)

Background

- The 2016 update stock assessment and peer review was presented to the Board in May of 2016.
- The models , using Stock Synthesis framework, suggest overfishing is occurring in both the northern and southern regions. The northern model predicts low adult abundance (age 6+) since 1989. The southern model shows increasing F, resulting in low escapement of juveniles from the fishery.
- The Board had questions/concerns regarding the assessment inputs, reference points, and model types and tasked the TC/SAS to investigate several questions.
- The TC/SAS has begun work on the tasks.

Presentations

- J. Kipp will present progress on the TC/SAS tasks (**meeting materials)**

Board actions for consideration at this meeting

- None

7. Progress Update on Spot and Atlantic Croaker Stock Assessments (11:25 – 11:35 a.m.)

Background

- A data workshop for both species was held in September 2015.
- The first of two assessment workshops was held in February 2016.
- It is expected that both assessments will be completed in late 2016.

Presentations

- Stock assessment update by J. Kipp

7. 2016 Fishery Management Plan Reviews (11:35 -11:45 a.m.) Action

Background

- Atlantic Croaker State Compliance Reports are due on July 1, 2016. The Plan Review Team reviewed each state report and compiled the annual FMP Review. Delaware (commercial), South Carolina (commercial), Georgia (commercial and recreational), and Florida (commercial) have applied for *de minimis.*
- Red Drum State Compliance Reports are due on July 1, 2015. The Plan Review Team reviewed each state report and compiled the annual FMP Review. New Jersey and Delaware have applied for *de minimis.*

Presentations

- Overview of the Atlantic Croaker and Red Drum FMP Review Reports by T. Kerns. **(supplemental materials)**

Board actions for consideration at this meeting

- Accept 2016 FMP Reviews and State Compliance Reports
- Approve *de minimis* requests

10. Other Business/Adjourn

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

SOUTH ATLANTIC STATE/FEDERAL FISHERIES MANAGEMENT BOARD

The Westin Alexandria
Alexandria, Virginia
May 5, 2016

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ATTENDANCE

Board Members

Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA)
Russ Allen, NJ, proxy for D. Chanda (AA)
John Clark, DE, proxy for D. Saveikis (AA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Lynn Fegley, MD, proxy for D. Blazer (AA)
Ed O'Brien, MD, proxy for Del. Stein (LA)
Chris Batsavage, NC, proxy for B. Davis (AA)
Doug Brady, NC (GA)
Robert Boyles, SC (AA)
Patrick Geer, GA, proxy for Rep. Nimmer (LA)
Jim Estes, FL, proxy for J. McCawley (AA)
Spud Woodward, GA (AA)
Nancy Addison, GA (GA)
Martin Gary, PRFC
Wilson Laney, USFWS
John Carmichael, SAFMC

(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)

Ex-Officio Members

Staff

Toni Kerns
Robert Beal
Megan Ware
Mike Waine

Guests

Derek Orner, NOAA
Kelly Denit, NMFS

The South Atlantic State/Federal Management Board of the Atlantic States Marine Fisheries Commission convened in convened in the Edison Ballroom of the Westin Hotel, Alexandria, Virginia, May 5, 2016, and was called to order at 10:022 o'clock a.m. by Chairman Jim Estes.

CALL TO ORDER

CHAIRMAN JIM ESTES: I would like to call the South Atlantic Board to order please, if everybody can find their seats and take your conversations outside if you need to. My name is Jim Estes, I am the Administrative Commissioner from Florida, and I am going to try to facilitate the meeting today.

APPROVAL OF AGENDA

CHAIRMAN JIM ESTES: We all have an agenda. Are there any additions or changes suggested for the agenda? Seeing none; are there any objections to the approval of the agenda? Seeing none; the agenda is approved as written.

APPROVAL OF PROCEEDINGS

CHAIRMAN JIM ESTES: You all have proceedings from our February, 2016 meeting. Are there any suggested changes from those proceedings? Seeing none; are there any objections to approving those proceedings? Seeing none; those proceedings are approved.

PUBLIC COMMENT

CHAIRMAN JIM ESTES: I don't think that we have any folks that have signed up for public comment on items not on the agenda. Is there anyone in the gallery over here that would like to speak on items not on the agenda? Seeing none; we'll get right to our program. This is going to be a little bit unusual today.

We're going to have a couple presentations, and one of our presenters, Mike Murphy, could not make it here last night because of weather. The planes were flying around in circles apparently over Tampa, and he couldn't make it. We're going to try to have him on the phone to make his presentation via a webinar. Be patient with us, because we may have some audio issues.

2016 RED DRUM BENCHMARK STOCK ASSESSMENT REPORTS

NORTHERN STOCK

CHAIRMAN JIM ESTES: Maybe we can start out with Jeff. Can you present the red drum stock assessment for the northern region?

MR. JEFF KIPP: I'll start by going off just a little overview and background information. Then I'll get right into the results for the northern stock assessment. Then we'll continue on with Mike presenting on the southern stock assessment. Just to start off, I would like to thank the board for their patience as we've waited for these stock assessments for the red drum stocks. But just a little background on this red drum process. We did go to a SEDAR 44 review workshop with assessment models using stock synthesis statistical framework in August, 2015.

We were experiencing some issues in developing stable models. The objective of that review workshop changed a little bit; to receive recommendations from the Peer Review Panel so that we can improve and achieve stable models to be reviewed later for management advice. The Peer Review Panel during that process did endorse our transition to stock synthesis, and the information on that review workshop and the original stock assessment models are provided in SEDAR 44 stock assessment report, which was provided in your meeting materials. Following that review workshop we did work to make those recommendations and implement them into the stock synthesis models. Once we had achieved our final preferred models, those were evaluated in a desk review for the purpose of advising management of the red drum stocks.

The information on those final preferred models is in Addendum II to the SEDAR 44 stock assessment report, which was also provided in

meeting materials. Some quick background on assessment history, the red drum stock originally as a coastwide unit was assessed in 1990; and there were a couple other assessments through the nineties, using mostly per recruit analyses and virtual population analysis.

The most recent update of virtual population analysis was done in 2000. The most recent assessment was SEDAR 18 in 2009, when there was a transition from a virtual population analysis model to a statistical catch-at-age model. With that SEDAR 18, the peer review did note some limitations and concerns with the model used in that assessment.

First off the plus group was 6 plus for the stocks, and that includes 90 percent of the age structure in the northern stock, and 83 percent of the age structure in the southern stock. Therefore, there were no reliable abundance or biomass benchmarks coming from that assessment for either stock.

They did note that the plus group abundance is estimated in the initial population in those models was unexpectedly large; given the estimates of abundance in the younger age classes. In previous meetings with this board it was noted that a primary goal for management of these stocks was to declare an overfished or not overfished status.

For that to be done there was the need for reliable biomass estimates and a biomass benchmark. Also, the northern model specifically was fit to external tag-based F estimates in some published literature. This estimate was highly dependent on these estimates, which indicated some inconsistencies between those fishing mortality estimates and the other data sources in the model.

The peer reviewers did also note a lack of tagging program sampling design, and a potential for some areas being under sampled and others being over sampled; and therefore for those F estimates in the model, not necessarily representative of the entire stock unit. The catch-at-age data in that model was developed externally.

The peer reviewers noted that some of that data, specifically in then earlier years, was developed with sparse biological data and often pulled over the different fleets in the model. Also, the model structure was noted as a major source of uncertainty in the estimates of the stock status indicators. That structure was very sensitive to the scalars that were specified for selectivity at age in that model.

The southern stock estimates, all estimates including the SPR estimates out of that model, were too uncertain to make quantitative statements about stock status; and were used more for a qualitative in general determination of stock status for the southern stock. These limitations led us to stock synthesis framework. It is a supported peer reviewed framework for calibrating population dynamics models; and it serves as a platform moving forward for future stock assessments. It is widely used in the stock assessment community. It is highly flexible and customizable to many data types and stock characteristics. A lot of these options already built in to this framework were great for addressing some of the existing concerns noted in SEDAR 18 with the statistical catch-at-age model used in that assessment.

It is also a comprehensive proposition and quantification of data uncertainty, and provides model diagnostics for model misspecification. The red drum stocks are defined as two management units, a northern stock and a southern stock split at the North Carolina/South Carolina border. That is consistent with SEDAR 18 and some of the earlier virtual population analysis assessments done.

This split is supported by differences in genetics, life history characteristics, habitat use, and tagging data. Getting into the results of the northern red drum model, the age structure modeled in this model is from age zero; which

are fish spawned the previous fall, to 41 plus. Now there is a 41 plus, plus group as opposed to a 6 plus, plus group.

Just to clear up some confusion ahead of time, any time you see an age reference now with this under the stock synthesis framework, it is different than the definition under the old catch-at-age model. That is just because of how stock synthesis is configured. Age 0 in the stock synthesis model is Age 1 in SEDAR 18.

Any time you see a SEDAR 18 age referred to, just subtract one from that and that would be equal to the stock synthesis age structure. In this model there is an initial population estimated, and that would be in January, 1989, when the model starts. Those initial population estimates are informed by previous removals and also recruitment deviations.

Annual abundance and biomass are then projected forward from the initial population, from 1989 to 2013, our terminal year in our model; as a function of Age 0 recruitment, growth, maturity, natural mortality and fishing mortality. I did mention that we made some revisions to the assessment model following the SEDAR 44 review workshop, and just a quick overview on some of those changes that were made.

The model start year was changed from 1950 to 1989. We originally tried to bring some more historic information into the model. However, generally the peer reviewers noted that there was really only removals data prior to 1989; so there was really no information on the length compositions or any type of indices of abundance.

They suggested using 1989 as a start year, which is actually consistent with SEDAR 18. Fishing mortality parameterization was changed. The selectivity functions for the harvest fleets were simplified from a 6 parameter functional form to a 3 parameter functional form. There were also some selectivity changes that were excluded, relative to the model in the previous configuration.

Also the tag recapture sub-model was excluded from the base model in the new revised model. This is a figure with the input data used in the model by year and type. You've got year on the X axis and the data sources on the Y axis. There is catch from four different sources, there are two commercial fleets; one with gillnet and beach seine gears, and another commercial fleet with other types of gears. I think it is mostly fixed gears like pound nets.

There is a recreational harvest fleet, and then there is a recreational release fleet, which is assumed discards to the fish that are released alive in the recreational fishery. There were five abundance indices used in this model; the first in North Carolina JAI, which is their seine survey and would be Age 0 fish.

The North Carolina Independent Gillnet Survey for Age 0s and then also for Age 1s, the North Carolina Longline Survey, which is probably the most notable addition to the data sources from SEDAR 18; which covers the mature spawning portion of the stock, and a recreational CPUE from the MRIP data.

There is also length composition data that is fit to in the model for each of the fishing fleets, and then for indices of abundance that are aggregated over age; so that would be the North Carolina Longline Index and the recreational CPUE. Then there are also age-at-length compositions for the harvest fleets and also the North Carolina Longline Survey.

These are the removals for the northern stock from the commercial fleets. As you can see it is highly variable and dominated by the gillnet beach seine fleets. Most of those removals generally come from North Carolina. The gillnet beach seine fleet does include estimated discards. Those discards are observed as either discarded dead or discarded alive.

They include all the discarded dead fish and 5 percent of the discarded alive fish that are assumed to die post release. These are the recreational removals in the model; again highly variable, but you can see that there has been an increasing component of recreational release mortalities over time. Again, most of these removals generally come from North Carolina from year to year; I think with a notable exception in 2012, there is quite a large catch in Virginia.

Just a note, there is an assumed 8 percent mortality rate of the fish that are released alive in the recreational fisheries. These are the model fits to the indices of abundance; the four that cover the young-of-year or the sub-adult fish. The top left hand panel is the North Carolina seine survey, which is Age 0 fish.

Next to that in the top right hand panel is the independent gillnet survey, indexing Age 0 fish. In the lower left hand panel is the independent gillnet survey for the Age 1 fish, and in the lower right hand panel is the fit to the recreational CPUE index; which covers several age classes, which are informed by the length composition and the input age data.

You can see that these are quite variable across these age specific indices; and there does appear to be a slightly increasing trend over the recreational CPUE. This is the adult North Carolina Longline Index; starting at 2007 we have information from that through 2013. Again this covers multiple age classes informed by the length composition for that survey and the age data collected from that survey.

These are the selectivity estimates at length from the model. The three strongly dome shaped selectivity patterns in the middle of the figure are the harvest fleets. You can see that the harvest occurs within the slot limits between roughly 45 and 70 centimeters. The broader dome shaped selectivity patterns are from the recreational CPUE and the recreational discards that cover, mostly those sub-adult fish and then decline as those fish immigrate from the estuaries and are also protected by the upper end of the slot limit. Then the gold logistic or flat-top shaped selectivity curve is from the North Carolina Longline Survey. These are the fishing mortality estimates from the model for Ages 0 through 5 by fleets, with the gold line is the fishing mortality estimates for the recreational harvest fleet to the highest fishing mortality over the time series. The blue is from the commercial gillnet beach seine fleet.

The green line is fishing mortality for the commercial other fleet, other gears; and the red line is the fishing mortality of recreational releases or the discard mortality of those fish. You can see that there is generally a declining pattern in fishing mortality over all those fleets, with the exception of the recreational discard fleet; which does increase over that time.

These are just the annual fishing mortality estimates over all fleets for ages 0 through 5. You can see the fishing mortality declines through the nineties, and then generally becomes relatively stable through the remaining time series. These are the numbers estimated at age. You've got age class going up the Y axis with year along the X axis.

You can see that recruitment is quite variable and be able to look at that also in the next figure I have. The red line is the mean age of the population in that given year. You can see a slight decreasing trend in the mean age of the population. There are some older year classes you can see moving through the population; and those year classes are generally informed from that longline survey and the age data collected from that longline survey.

You can see in the lower right hand corner there does appear to be a response to that decreasing fishing mortality; although at a low rate. These are just the recruitment estimates, so just the Age 0 recruits in thousands of fish. You can see the solid blue dot is the average recruitment. Then the other recruitment estimates generally fluctuate around that average recruitment value with a notable large

year class in 2012; which are actually fish spawned in the fall of 2011.

The reference points looked at in this assessment was carried over from the last assessment and from Amendment II to the red drum fishery management plan; which are static spawning potential ratios. The SPR target identified in Amendment II is a 40 percent SPR, and the threshold is a 30 percent SPR.

Annual SPR values below the threshold indicate overfishing on the stock. These SPR values are a measure of reproductive potential, in terms of spawning stock biomass produced by a cohort over time. Here it is interpreted as the amount of spawning stock biomass that would make it through the population under the current fishing mortality, relative to if there was no fishing mortality occurring.

These are the SPR estimates for the northern stock. On the top figure are the annual SPR estimates, with 95 percent confidence intervals. You can see that the model is estimating SPR values that are below the threshold of 30 percent SPR throughout the time series. In the figure below that are the running three year averages, which the peer reviewers in SEDAR 18 noted as more informative due to the inter-annual variability in SPR.

You can see that decrease in fishing mortality reflected in the SPR values where SPR is decreasing over the early nineties. Then it increases after that and becomes relatively stable in the 2000s; looking at the three year running average. This is the spawning stock biomass level that is associated with that 40 percent SPR target. If the stock was fished for a long period of time under that SPR, the fishing mortality associated with that SPR level, this spawning stock biomass is the biomass that would be expected to be in the population. You can see here again the spawning stock biomass is estimated to be below that target level associated with a target SPR level throughout the model time series.

Looking at uncertainty of the model estimates, we did a retrospective analysis where you pealed years of data off and reran the model to try and identify if there is any kind of inconsistent bias in the estimates, as you peel that data off and go back in time. There is some slight variation in some of the population estimates; but there was no consistent pattern.

We also looked at sensitivity analysis, and we looked at quite a few different sensitivities. There is more information on each of these within the Addendum II. We looked at catch-at-age being input directly for the North Carolina Longline Index instead of length compositions. We looked at some different selectivity assumptions and functions.

We looked at a higher recreational release mortality rate of 16 percent. We tried estimating the natural mortality within the model, variance adjustments to the way the data are weighted within the model. We excluded the recreational CPUE index in a model run. We also included the North Carolina Independent Gillnet Age 2 Index.

We looked at including the base tag recapture sub-model that was originally in the stock synthesis model that went to the SEDAR 44 peer review workshop; and we also looked at an iteration of that with the tag reporting rates not estimated but fixed, at a value from the literature. Then also because some of the concerns we've seen that we'll get into coming up in the discrepancies between the estimates coming out of the stock synthesis model, and what was estimated in SEDAR 18.

We developed this alternative, what we're calling here a catch-at-age model where we input catch-at-age directly, which was much more similar to the inputs in SEDAR 18; to build sort of a bridge between the stock synthesis model and the old catch-at-age model used in SEDAR 18. These are plots of the SPR estimates from those different sensitivity model runs.

In the upper left hand panel you can see those are all the sensitivities that we included on the list before. You can see that most of them fall below the SPR threshold, with an exception of the sensitivity run with the tag-recapture model and the reporting rates fixed to 49 percent. We're assuming that 49 percent of tags are reported.

In the base model with the tag reporting rates estimated, those reporting rates were being estimated at 9 to 10 percent; so much lower than what is fixed from the literature, and that model is predicting a much larger stock with much lower fishing mortality. In the lower right hand corner is just the comparison without that tag reporting sensitivity run to look more closely at the other sensitivity runs.

The base model run is the dark bolded black lines; so that you can see how the other sensitivities fall around that base model. There was a lot of concern in obviously that tag recapture model and how to treat it and incorporate it into stock synthesis. We originally estimated the tag reporting rates within the model, and then went back and considered fixing that reporting rate; because during the peer review workshop we identified that as having a significant effect on the scale of the population estimates. I put together this table here to try and highlight some of the differences in the tag reporting rates, and how they're interpreted in stock synthesis and those that are available in the literature; to try and get at why some of these discrepancies are occurring, why there are some differences between what is estimated in stock synthesis with the other data sources, and what is available in the literature.

In the top row are the estimates from the base stock synthesis model with the tag recapture model; and as I mentioned the reporting rates are being estimated from 9 to 12 percent, depending on the fleet. This covers Ages 0 to 16, and these reporting rates are reported as fleet specific reporting rates; so they are estimated as fleet specific reporting rates.

The time period of fish tags used in the model is from 1989 to 2004. Released fish, so fish captured and released in the recreational fishery are not included in our model; due to how that model is configured. Some of the differences, these are all papers published by Bacheler, et al. with some reporting rate estimates.

The first is estimated at 18 percent, and that is closer than the others to the estimates coming out of the stock synthesis model. Those estimates are for, again the entire age range, so 0 to 3 plus is the way they have the age structure in that paper. But this reporting rate is for all fleets combined; so if there is variation in reporting rate by fleet, which we expect, then there would be differences between those reporting rates.

Also, the time period of tags used in that paper to estimate those reporting rates include the years 2005 and 2006, which are years when high reward tags were released into the population for a higher reward tag recapture study. There is likely the potential for increased reporting rate of also low reward tags; the original reward tags that are included in the earlier tag data.

In the Bacheler, et al. 2009 paper, there are some additional reporting rate estimates; these are much higher and that is the value that we used in the sensitivity run was the 0.49, so we're assuming that approximately 50 percent of tags were reported. These estimates were only for Age 1 fish. Those are the only ages used in this analysis.

Again, if there are differences in reporting rates across ages, particularly for those that fall outside the slot limit with these Age 1s mostly falling inside the slot limit; then those would lead to differences in reporting rates. Also some of the fleet designations are a little different. The reporting rates are for either all fleets combined, or the recreational and commercial fleets alone.

These estimates also include the years when there was high reward tags released into the population. These reporting rates in Bacheler, et al. in 2009 were estimated based on an assumed 100 percent reporting rate of high reward tags, which is a typical assumption in high reward tag studies. However, if that is not an accurate assumption and the reporting rate of those high reward tags is lower; that would bias the tag reporting rate of the low reward tags high.

There are some differences and I think these are to try and get at explaining why the differences are coming from the stock synthesis model, and the estimates reported in the literature. Also in addition to that these are the abundance estimates coming from SEDAR 18; which I'll get into in a minute. The stock synthesis base *model in blue and then the reporting rate alternative, with that reporting rate fixed. You can see the reporting rate estimate fixed essentially just scales the population up. The trends are exactly the same as the base model, it is just scaling the population estimates up for abundance; and that is going to result in a lower fishing mortality with the same catch levels going in. You can see here that those abundance estimates in the top left hand corner are Age 0 recruits.

Next to that are the Ages 0 through 5, abundance aggregated, and then in the lower panel are Ages 6 plus; so the plus group abundance. You can see that those abundance estimates coming from that tag reporting rate sensitivity run are consistently inconsistent with the estimates coming out of the stock synthesis model, and also SEDAR 18.

With this information and the inconsistencies in the tag reporting rates and how to treat that; the Stock Assessment Subcommittee made the decision to exclude the tag recapture model from the base model being presented to the desk reviewers for evaluation. Then this is a comparison to some of the estimates from past assessments.

There is a gold line that estimates spawning potential ratios from the virtual population analysis back in the nineties and 2000 by Vaughn and Carmichael, and it estimates SPR over a blocked period for two periods. Those SPR estimates are more in line with the catch-at-age alternative that we put together to bridge between stock synthesis base model and the SEDAR 18 results.

Then the SEDAR 18 results are much higher than what's being estimated in the stock synthesis base model, the stock synthesis catch-at-age alternative, and also the Vaughan and Carmichael SPR estimates. I'll go through a couple of slides here to explain why some of those differences are occurring.

The first is the selectivity; SPR values are highly dependent on selectivity estimates and highly sensitive to selectivity estimates. You can see that there are some differences in the selectivities being estimated by fleets from the SEDAR 18 model, the stock synthesis base model in orange, and the catch-at-age alternative model; which was built to bridge kind of the gap between those two models.

In the top left hand corner is the selectivity in the most recent years for the commercial gillnet beach seine fleet. In the panel next to that in the top right is the commercial other fleet. In the lower left hand corner is the recreational harvest fleet. Next to that on the lower right hand corner is the recreational discard mortalities. What you can see here is that the stock synthesis model tends to estimate selectivity at age higher for some of the older ages typically associated with above the slot limit than SEDAR 18, and also in some cases the catch-at-age alternative.

I will note that for SEDAR 18, again that was noted as a major model uncertainty was how to specify the selectivity estimates. Those estimates for some of the older ages had a constraint on them that would pull those estimates closer to a central value. In stock

synthesis the selectivity over the ages is estimated freely for all the ages.

There has been some note about the selectivity comparing to some selectivity estimates out of, again these Bacheler et al. papers that look at selectivity estimates through a tag recapture study. But I will note that in 2010, Bacheler et al. published a paper updating some of the selectivity estimates; which resulted in an increase in selectivity at age for some of those older ages above the slot limit. What I have in these figures is selectivity at length, which is how selectivity is estimated in stock synthesis. The stock synthesis estimates are the green lines, so again going by fleet in the top left hand corner is the commercial gillnet beach seine fleets; next to that is the commercial other fleet. In the lower left hand corner is the recreational harvest fleet, and next to that is the recreational discard fleet.

The stock synthesis selectivity estimates at length are in green and the Bacheler et al. 2010 selectivity estimates are in blue. You can see that they do match up quite well with the selectivity estimates from the stock synthesis model. The black lines indicate the management slot limit currently in place.

These shifts that they found in selectivity at length, these revisions, they also translate to higher selectivity at age for some of the intermediate ages. They showed the comparison to some of their estimates in their 2008 paper, and showed that they're estimating a higher selectivity at age for some of the ages above the slot limit.

Then this is a comparison of fishing mortalities from the Bacheler et al. 2008 paper in black, the stock synthesis base model in blue, and the SEDAR 18 model in red. Something to note here is, going back again as I noted before, the SEDAR 18 model fits to fishing mortality estimates from this Bacheler et al. paper.

As we would expect, it is fitting closely to those fishing mortality estimates and essentially treating those F estimates as data. Those F estimates are not included in stock synthesis. The hope was that the tag recapture data would be incorporated through the tag recapture model, but as I mentioned before that is not included in the base model.

The SEDAR 18 results are strongly influenced and driven by the fishing mortality estimates out of that Bacheler et al. paper, whereas the stock synthesis model does not incorporate those fishing mortality estimates. There is also a slight difference in the maturity schedules being used in stock synthesis relative to what was used in SEDAR 18.

In the data workshop we went back and reanalyzed some of the maturity data. This is all maturity data from a paper Ross et al. from 1995 and we were able to pull the data from that paper and found that the classification of developing fish was immature. Going by a more recent publication by Brown and Peterson and also et al. in 2011, which has been widely accepted as a standardized reproductive methodology paper, those fish were reclassified as mature.

This led to a slight increase in maturity at age, most notably for Age 3. The SPR estimates are also a function of the mature fish; so with the increase in maturity there is going to be a slight decrease in SPR relative to SEDAR 18, because more fish are vulnerable to the fishing mortality. Again just noting the abundance estimates, the primary difference between SEDAR 18 and stock synthesis base model is the plus group.

You can see that the Age 0 abundance in the upper left hand figure is quite similar for SEDAR 18 and stock synthesis; with the abundance aggregated over Ages 0 to 5 in the upper right hand figure. SEDAR 18 in the black line is estimating a little bit more of a response, it is estimating lower fishing mortality and estimating a little bit more of a response of the abundance of those age classes; but follows a similar trend to the stock synthesis base

estimates. If you look in the lower figure that is the abundance of the plus group. Again this, I think, goes back to the concern noted by the peer review in SEDAR 18 that the abundance of the plus group was highly uncertain; almost to the point of being uninformative. Whereas, stock synthesis makes an improvement on this by incorporating some catch information before the model times series, and also some recruitment deviations from the data included in the model to estimate a more accurate initial age structure.

Some recommendation from the peer reviewers, the most noted was probably to continue exploration and incorporation of that tag recapture sub-model in the stock synthesis model. Increased temporary resolution of model time step, right now it is an annual time step and there is some thought that because of fast growth of red drum throughout the year that we're finding the temporal resolution to a more seasonal model may improve the estimates of age and length.

Also a recommendation to further evaluate the data weighting within the model, and some recommendations from the Technical Committee, which has constantly been a concern is to collect size composition data from the recreational releases; to inform the size structure of those fish vulnerable to recreational discard mortality, and to further investigate the discard mortality rates of those fish.

SOUTHERN STOCK

CHAIRMAN JIM ESTES: That concludes the presentation on the northern stock, and I think we're going to transition over to Mike Murphy to present on the southern stock.

MR. MIKE MURPHY: I am going to go over a quick synopsis of the southern red drum assessment. Jeff has introduced a lot of the process in the review. Before reviewing some of the more important data inputs, I would like to also go over a quick review of previous assessments; if I could have the next slide.

Prior to 1996 red drum were managed as a single stock on the Atlantic Coast by the council and by the Atlantic States Marine Fisheries Commission, and '96 is recognized as two stocks for the reasons Jeff just outlined. Since then there have been assessments that have estimated static spawning potential ratio and a series of management benchmarks have been set up.

Early on Vaughan, in 1996, in Vaughan and Carmichael assessments found very low static SPRs, and the Commission went with a first-step approach of trying to recover the stock to a 10 percent SPR level. Then with that second assessment it was note that that recovery on that first step had occurred in the early nineties.

An update of the assessment methodology to a statistical catch-at-age resulted in a marked change in the estimated spawning potential ratio at SEDAR 18. As you can see while it was very uncertain, and as Jeff mentioned the final review was that only qualitative information could be taken from that assessment, the general upshot was that the red drum exceeded some of the management thresholds at the time, but that there was an obvious declining trend in the SPR.

The current assessment, SEDAR 44, is for the years '89 through 2013. Early versions of this assessment attempted to use data back through 1950, but in general reviewers discouraged that work because of the very sparse data prior to the late eighties; in terms of age structure and the uncertainty in the catch.

I'm just going to go over some important model inputs here pretty quickly. First the removals, the different fleets included in the service stock model are all exclusively recreational right now. There was a small commercial and still is a small commercial fishery in Georgia, and there was one in South Carolina. However, the Committee determined that the size structure

and landings of these were really equivalent to the recreational harvest; so small, commercial harvest was just included in the recreational harvest estimates. As Jeff mentioned, for the analysis of the live release deaths, that is the fish that are released in a live condition that eventually die, we assumed an 8 percent release discard mortality rate for the base model.

The graph shows that there has been a sharp drop in landings that the model didn't use, if you look at the early landings from the mid eighties down to 1989. Since then there has been a general overall increase in the total kill, which would be the green lines. The landings have been fairly flat, although recently they've increased; and the live release deaths have increased slowly over time.

Just as an aside, the red dash lines are actually the model fits to these data; so you can see that the model essentially replicates the landings that we input as data. The catch composition of each of the fleets is important to the stock synthesis model, and here I've just pulled out the 2011, 2013 averages showing the actual data in the black lines of the length frequencies for the different fleets in the assessment, and then the red dash line is the model predicted values.

I've also superimposed on these graphs the minimum and maximum sizes for the different states in green. You can see in all states the harvest fleets generally capture a lot of fish close to the minimum size limit. In particular Georgia, most of the catch is quite close to the minimum size limit; whereas in South Carolina and Florida a lot of the harvested catch is spread out throughout that slot limit.

There was a lot of effort to establish the sizes of released fish for this assessment. Jeff mentioned how really that is still a recommendation for more information. What the committee decided to do in the end was to use the tag and recaptured fish reported by anglers; as to have been released at the time of recapture as a proxy for the lengths of released fish in the recreational fishery.

In addition to that Florida that has a logbook that had some information from volunteer anglers on the sizes of their released fish. In general the data were almost exclusively from those South Carolina tag recapture-released animals. You can see the sizes of those fish are generally centered around the upper size limit, if not above the upper size limit.

Many of the releases in the red drum fishery are for large sub-adult fish with a minor proportion of them being at the lower end of the slot; according to the data used in the analysis. Now these of course infer ages within the analysis, the growth estimated in SS3 is used to convert the length composition data that is input into ages.

You can see from here again just a summary slide of the most recent average. Most of the harvest in South Carolina are Ages 0 to 1, in Georgia Age 0 and 1 also; with the predominance of Age 0s, and in Florida Age 1 and 2. The live releases are a much larger size age range from say, mostly Age 1 through Age 3 or 4.

Now, in addition to these removals there are several scientific surveys of red drum that we use to guide the determination of red drum abundance trends. Overall most of these indices supported the other indices that used gear that captured similar sized fish. Here I show four of the young-of-the-year or Age 0 indices; these are in orange, the South Carolina stop net. In blue the South Carolina trammel net survey from '94 onward. In black the Florida seine survey from '98 onward, and then the Georgia gillnet survey from 2003 onward. You can see the coherence in the trends.

The red line is the model fit to this age group. You can see that this includes small year classes that are consistently recorded for, say year 2000, and then another small year class in 2005, and some larger year classes like 2003 and a

more recent 2010 year class. If you look at this closely without a lot of these confidence limits, recruitment has shown a very slow increasing trend in the southern region.

Likewise we have relative abundance indices for Age 1, and these show the same coherence in general; a little bit less agreement between the indices, but you do see those same small year classes, just over the next year obviously, so for 2001 and then for 2007 of the small year classes I just mentioned.

A difference here in the most recent years in South Carolina we see a fairly strong downward trend from 2010 onward. This trend is not picked up in the Florida hull seine data; and I just mention that as really some reasoning behind sensitivity I'll mention in a minute. Finally for indices, we had a number of surveys on older age classes.

The MRIP Survey, which is a total catch rate for anglers that is standardized as an index of the overall abundance of the fish available to the recreational fishery. It is shown from 1991 to 2013 in the graph on the left in black. Superimposed on that is the Age 2 survey from Florida, which is the oldest age specific survey.

That may not actually capture the exact same age classes as the MRIP survey, but it was just convenient to throw on the slide. One thing I'll note here is that the MRIP survey had fairly tight confidence limits compared to the other indices. It has a strong impact on driving the trends and abundance for use in the model, and as opposed to what we saw for South Carolina these last three years or four years for the MRIP index actually indicates an increasing trend in abundance.

On the right we had a number of longline surveys that are being used to monitor the relative abundance of the adult portion of the stock. The fits to these are actually not great in the model because of the number of age classes involved. The dynamic changes in the surveys, for instance seen on the right with the South Carolina one mile survey that was conducted for a while in the mid-nineties and early 2000s that dynamics cannot be picked up by the analysis; because that generally is a sum of about 40 year classes that dominate in that group.

What the model is predicting is an increasing trend in abundance early on, which is seen a little bit in the later years of that survey; and then more of a leveling of the abundance in the surveys that you see on the right there, which are the Georgia longline in blue, and the South Carolina one-third mile longline, which is a revision of that one mile longline that was conducted earlier.

Jeff really went over well the assessment development and review process. I'm not going to mention anything further on that. What I'm going to do though is quickly go over the revised base model and the findings for changes in biomass, fishing mortality, recruitment, and the result in SPR. In these I'm going to include graphs that include the trends in those characteristics for the different sensitivities that were run. Sensitivities were run for different levels or different ways to estimate natural mortality, either within the SS3 model or external to the SS3 model; different levels of steepness, different levels of the release mortality. That 8 percent was bumped up to 16 percent as a sensitivity.

Whether the MRIP Index was included or whether it was excluded from the model, as I've mentioned that difference between the MRIP trend and some of the other indices caught the eye of the panels of that sensitivity, and then whether the tag/recapture data are included in the model or not.

I'm not going to really mention the retrospective analysis, but that was also conducted for the 2009 through 2012 terminal years. There was some indication of a retrospective effect on the total biomass, but not on fishing mortality or other features. Here is a slide of the assessment findings, the total

biomass and the spawning stock biomass, which much of that nearly doubled between 1989 and 2008; but then has remained flat through 2013

You can see that in the reflection of the fits to those longline indices. A sensitivity run using the lower steepness value of 0.8 can be seen as that green line that is well outside of the upper 95 percent confidence limit for spawning biomass. That sensitivity indicated a much larger stock. Another sensitivity of steepness at 0.9 also indicated a stock level that was at the 95th percentile confidence limit, so those were both influential in determining or influencing the models estimate of the total biomass.

When we excluded the MRIP Index it predicted much lower starting values of starting biomass; so that is that lower dotted line there. But the biomass recovered to about the same level as seen in the base model. You can see if you look at recruitment that upward trend that I mentioned earlier on when we were looking at the Age 0 indices.

Just for the sake of time, the sensitivities generally fell within the 95 percent confidence limits of the base model estimates with the sensitivity with the lowest steepness value which indicated the higher biomass; also indicating a higher level of recruitment. Now the summary average fishing mortality rates show the decreasing trend from the early nineties through the late nineties, and then a flat period a more recent increasing trend.

Again the sensitivities that were superimposed on the fishing mortality, the sensitivities for the higher biomass and recruitment of course indicated that the catch taken from that biomass resulted in a lower fishing mortality rate; and vice versa for the sensitivities that indicated a lower biomass or a lower recruitment.

Now the SPRs of course are quite related to the estimates of fishing mortalities; essentially in an inverse kind of way. The SPRs also showed, the base model showed a trend around the 30 percent threshold through the late nineties; bumping up above those levels for a little while, and then descending back to that area of 30 percent, until about 2010 when the SPR levels are estimated to be quite a bit lower than the threshold levels set as the benchmarks.

Now looking at the spawning potential ratio a little closer, again I indicated the sensitivities which indicated a higher biomass and lower Fs also showed a higher static SPR. That's what you can see as the green. In addition the sensitivity to the two X release mortality or the 16 percent release mortality indicated a much steeper drop off in SPR over time; which would be expected. As you've seen the number of released fish that subsequently died at 8 percent has increased through time; so that increasing catch is exacerbated if you assume that there has actually been the 16 percent release mortality.

That has a stronger impact on reducing the spawning potential ratio. Now I was just going to sort of end this summary talk with some graphs indicating how SPR has changed across analyses. Often we do within analyses retrospectives, but this is sort of an across analyses retrospective for SPRs.

I've showed this one already where the earliest estimates of SPRs were quite low, but based on much different data than we have available now; and then the SEDAR 18 estimate, which was highly uncertain but indicated at least a base level that was much above the 40 percent target. For SEDAR 44, we also developed a continuity model, which I would actually call a pseudo continuity model.

Where we used the SEDAR 18 model framework, but had to make some modifications to accommodate the new datasets that were used. It wasn't really just a continuation of the data that were used in SEDAR 18, but it was actually a replacement of those data with the newly adjusted MRIP information; and any other updates we had.

As you can see, if you use that and look at the continuity, we see a trend that is just below the SEDAR 18 line and continues on; but also with a decreasing trend in SPR. Superimposed on this is the SEDAR 44 base model. Here we see this marked depression in the estimate of SPR. Really the question out now is what can we attribute this to?

Here I've taken away the 95 percent confidence limits for the old SEDAR 18 model and then put the confidence limits on the new SEDAR 44 assessment model. One of the things we were interested in is to see if the aging of fish through the growth function in SS3 had a strong impact on the results.

What the green dotted line is is an externally generated age structure for the catches; as was done as import data for the continuity model, but applied to the SS3 model. It seems to for most of the time series, seems to indicate that SS3 and continuity approach are showing or giving fairly similar age structure data.

Some of the hope that may be going to a seasonal model and capturing growth in a better way; that may not really change the level of the SEDAR 44 assessment, because it seems to be consistent in terms of converting lengths to ages with the findings of the continuity model. But there are some differences in the weight at age, and as Jeff mentioned in maturity and all of those things put together could have certainly an impact on this level of SPR, this change that we're seeing.

Jeff mentioned in more detail than I'm going to mention, the continuity model selectivity functions were quite different than are used in SS3; and relied on some very simplified assumptions of relationships of selectivity between ages. There was some compression and some scaling issues that certainly made, at least when we started this process for a new assessment, made it clear to the assessment panel I think for the most part that it was time to move to another platform that would really eliminate some of that more subjective area of that analysis. Another thing that may be important here is that since we are beginning in 1989, the initial condition of the stock can have a very big impact on essentially this level of SPR.

Jeff hinted at that when he showed some of the 6 plus group biomass estimates, and how much different they were between the continuity in the SS3 model runs. I think some work needs to be done to investigate how that plays into setting this level of SPR.

Really with that, that is the information I wanted to provide for the southern stock. I'll end it there, and wait until after Jeff Brust's presentation for questions. Thank you.

PEER REVIEW PANEL REPORT

MR. JEFF BRUST: Thank you very much, my name is Jeff Brust. I was Chair of the Peer Review for both the northern and southern stocks of the red drum stock assessment. As Mike and Jeff have mentioned, this was a multi-step review process. The initial plan was for the completed models to go through the SEDAR 44 review in August of 2015.

The Peer Review Panel for that workshop was myself as Chairman, Gavin Fay with U. Mass, Dartmouth, and then three reviewers from the Center for Independent Experts. The CIE; Sven Kupschus, Carmen Fernández and Jamie Gibson, they are all very active in the CIE review process, and so you've probably seen their names before with other ASMFC related species.

As Jeff and Mike mentioned, the models were not complete at the time of the SEDAR review, so the objectives of that meeting was changed to provide guidance to the assessment team on how to continue the development of those models to establish stable and converged models. Following the SEDAR the assessment team went back, followed up on a lot of the suggestions that that the SEDAR panel suggested.

They completed the models in March of this year, and then the second step of the review process was a desk review that happened late March and early April. The reviewers for that were myself and Dr. Fay. There were ten terms of reference for this review listed up here. Because we did not have final models during the SEDAR review, we were not able to address all of the terms of reference during that review; so this is just a table of which terms of reference were addressed during which of the portions of the peer review.

Terms of Reference 1 and 2, they were addressed at the SEDAR. Term of Reference 3, this is the meat and potatoes of the assessment itself. Because we didn't have finalized models the panel was only able to provide guidance on this Term of Reference 3; the model structure and the parameterization.

Then the desk review this spring finalized the review of that as well as Terms of Reference 4, 5, 6, 7 and 8 and Term of reference 9 and 10, they were addressed mainly by the SEDAR, so again providing guidance on how to move forward both with the modeling and for future assessments. Our general conclusions are that both panels agree with the shift from the statistical catch-at-age framework to the SS3 framework.

It provides a lot more flexibility and incorporates a lot of the types of analyses that were being done externally before. I did want to mention, both panels felt that the assessment team put in an amazing amount of effort. They did a fantastic job, not only switching the model from the statistical catch-at-age framework to the SS3, developing the new input files; adding all the new bells and whistles that they weren't able to do in the SCA, as well as addressing the inquiries and the recommendations from the panels to develop these stable models. I wanted to make that known that we appreciate the work that they put in and we think they did a fantastic job. The panels both agree, while primarily the desk review, the preferred models as presented by Jeff and Mike, these represent the best available science that incorporates the scientific knowledge of the assessment team and the technical committees.

The overall finding that both northern and southern stocks are below the SPR 30 percent threshold, we support that. It is not on this slide, but overall we do recommend that these models are the ones that are used for management. We see them as suitable for management. Specifically for each of the Terms of Reference, the Term of Reference 1 is to evaluate the thoroughness of the data used in the models.

It is our conclusion that the assessment team conducted a thorough search of the available datasets. They evaluated each of the datasets, they had I think seven or eight specific criteria against which each of the datasets were evaluated. They did a thorough job against that. The panel supports the justifications for which indices and which datasets were included and how they were used in the model.

There were a couple of datasets that we suggested could get more evaluation. I think the northern model included a sensitivity run of one of the indices that was originally excluded; was recommended as possibly being included, so I believe that was included in the sensitivity runs. But overall they did a thorough job. We agree with the data sources that were used and how they were evaluated.

Term of Reference 2 is stock structure. The assessment team maintained the structure that has been used since 1996 or so, this is the split at the North Carolina/South Carolina border. This split is based on life history differences. There is some information from tagging data that there is limited movement across this border and there is some recent genetic work as well that supports this.

The panel concurs that this split is appropriate and should be maintained. Term of Reference 3 is to evaluate the methods and models used to

evaluate the population. Again, we agree that the shift to the SS3 was an appropriate move. Jeff mentioned a lot of the issues that SEDAR 18 had with the statistical catch-at-age the SS3 framework is more flexible, it is well tested, it is well supported, and it is used widely throughout the fisheries management.

There are a couple of new modules; the tagging module in particular. It is relatively new to the SS3 framework. It has gotten a lot of review at the beta testing level. I am not aware of it being used in practice a lot, so I think there is a growing body of evidence on how to use that module. The data that were being used for both the north and south in that module will definitely need some more exploration; particularly as we've seen that at least the northern model is sensitive to how those data are used.

The recommendation from the August workshop, the SEDAR workshop was to greatly simplify the models. The assessment team had extended the time series back to 1950; they had incorporated a number of selectivity time blocks. Because of the problems that we were seeing in the model stability and convergence, the panel recommended to greatly simplify the model get converged models that are working that are relatively realistic and then start adding complexity back in. The assessment team, they did that. They did a phenomenal job. They tracked down what appeared to be causing the major issues with the models that we saw back in August. They did significant dozens of sensitivity runs to evaluate the uncertainty in the model; and so the preferred models that were just presented now, we think they are a significant improvement over what was presented back in August.

There is still potential to add some complexity. The models were greatly simplified since August. Some of that complexity has been added back in for these preferred models. There is still some ability possibly to again, maybe extend the time series back prior to the 1989 start year. Term of Reference 4, evaluate the diagnostics, again I mentioned they did dozens of sensitivity runs; many of which were presented here.

The models are robust to most of the assumptions that are used for the data and the model framework. For those that are more sensitive, such as the tagging in the northern region, the panel agrees with the parameterization that was selected. It seemed based on the available information, particularly the tagging module; the way the tagging data is used in the preferred model is what we see as the best way to move forward at this time.

As both of them, Mike and Jeff mentioned, there are no consistent patterns in the retrospective pattern. Term of Reference 5 is to evaluate the methods used to characterize uncertainty in the estimated parameters. Again, both regions did a thorough job. They looked at a number of different ways to characterize uncertainty, likelihood, profiles, bootstrapping and a number of different ways.

In most cases the results were consistent among these different methods. There was some uncertainty. There was an error in some of the bootstrap runs that was noticed after it was too late to correct the model and get it out to the panel in time for review in the southern region; but overall we didn't feel that that was a debilitating aspect of the uncertainty characterization.

There were a couple other runs that we thought might be important to run; such as a sensitivity over the tag reporting rate. There were two that were done, possibly using the value from the Bacheler, 2008 paper of 0.18, or even doing a whole profile over a range of different values would have been very informative to see how the estimated parameters would change with those different values.

Essentially what level of reporting rate is critical to change from that overfishing to not overfishing status in terminal years? Term of Reference 6 was minority reports; there was no

minority report so that one was pretty easy. Term of Reference 7, recommend the best estimates of stock biomass and other biological parameters.

As I said, the panel concurs that the assessment reports as presented here, they incorporate the expert knowledge and best available science and so we conclude that the assessment reports represent the best estimate of population and fishery dynamics for both regions. Term of Reference 8, evaluate the choice of reference points.

The reference points that are used for this assessment were established under Amendment II back in 2002. The target is an SPR of 40 percent and a threshold of 30 percent. No alternative reference points were presented for this assessment, and the panel saw no reason why they should be changed. In recent years the average values for both the north and the south were below the threshold SPR value of 30 percent. Here you've seen these plots before. The top left is the northern SPR relative to both the target and the threshold, and the lower right is the south relative to the target and the threshold.

Term of Reference 9 is to review the research recommendations. The research recommendations generally fell out into two main categories; those for better understanding the life history of red drum and those that were relative to the model performance. During the SEDAR review the recommendation in the short term was to address the ones that could help us understand model performance.

The SEDAR panel also included or suggested additional research recommendations; which as I've mentioned the assessment team, they addressed a lot of those research recommendations in the short term. There are some life history ones that should be looked into. Jeff mentioned a couple, Mike mentioned a couple; in terms of release mortality rates and things like that.

There were a few recommendations within the desk review, but those were more investigative model performance kind of things for future assessments; rather than data collection type research recommendations. Term of Reference 10, recommend timing of the next benchmark, back in August this was addressed by the SEDAR panel. Back in August when we didn't have a complete model, the recommendation was to complete the models and do the next benchmark as quickly as possible.

I believe under the ASMFC process that is what this desk review was; so I believed we have addressed that one. Then following the next benchmark the timing of updates in the next benchmarks are, given the life history of this species and the long lived nature and the slow response possibly of the increase in biomass and SPR because of their long lived life history, the five year trigger is probably the minimum.

We might be able to go longer given the life history of this critter before we do the next benchmark. That is not withstanding any information that we get on life history or model performance or things like that that might be impetus for an updated benchmark. But based just on life history, five years at the very minimum is probably realistic. Just one conclusion, yes so again it was an impressive performance by the assessment team both in the north and the south. They've done a lot of work.

It is very impressive what they've done. The new modeling framework is an improvement over the statistical catch at age used during SEDAR 18. Both the northern and the southern models are well described and appropriately parameterized. They've adequately evaluated the uncertainty in the model structure and the data that was used for it. The results of both models are robust to most of the assumptions that are used. Again, the panel recommends both model are suitable for use in management. That Mr. Chairman is my presentation.

CHAIRMAN ESTES: Thank you, Jeff, Jeff and Mike. Obviously a whole bunch of work was done with this. I'm reminded of, I think it was the late 1990s when I did a simple VPA on black croppy in Lake Okeechobee and I thought I was on the cutting edge. I don't know what has happened to the world. Everything has gotten a lot more complicated, obviously.

I think what we'll do now is before we have questions maybe we'll have lunch, and during lunch you can chew your sandwich or whatever it is and chew the information that you just heard, and so we'll come back from lunch in a half hour at 12:15 and reconvene, if that is all right with everybody. Thank you.

(Whereupon a recess was taken.)

CHAIRMAN ESTES: What I originally thought that we would do with the questions, and I think there are going to be quite a few questions; because this was pretty complex. First of all, do we have Mike back on the phone yet? Hang on just a second, we'll call Mike back. Okay here we go.

I thought originally that it would be simpler to ask questions about the northern model and questions about the southern model and questions about the review. But I think after hearing all the information that we got today, I think it is just throw it open. Do we have questions about the assessment or the review?

MR. CHRIS BATSAVAGE: I guess going back to the information on the tagging data that was for the northern stock. There was obviously difficulty in estimating the reporting rate. They I guess tried the estimate of the reporting rate that was derived from the model and then the one from Bacheler et al. which is 0.49.

It was discussed here in the presentation that the 0.18 was considered but wasn't tried, and some of that was due to the concerns of that time period covered a couple years where there were high reward tags; so there might have been a little bias in the reporting rates. But I guess a question that I have about that is I think just even thinking forward as far as trying to use tagging data in the future.

With tagging studies part of your success in the reporting rate is just the outreach that you do to get the word out to the fishing community about the tags, and make sure that you are turning them in to the right group. That has come and gone over the years, as far as the amount of effort. If I guess more outreach is done in future tagging studies, could that also cause concerns regarding bias for trying to determine what an appropriate tag reporting rate might be for either looking at this further or future use down the road for the red drum assessment?

MR. BRUST: Yes, so currently one of the limitations of the tag recapture model within stock synthesis is that recording rates by fleet are not allowed to vary with time. This was one of the recommendations because of those releases of high reward tags and the expected increase or the potential increase in reporting rate of even low reward tags; due to the advertisement of those high reward tags in the population.

This was a primary recommendation by not only the stock assessment team, but also by the peer reviewers that we pursue incorporating a time varying tag recapture reporting rate into the model. Our hope is that that is something that can be incorporated down the road; and as I mentioned earlier, one of the reasons to moving to stock synthesis is that it is supported and peer reviewed and used in the assessment community. Kind of the authors and the leaders on that project are responsive to incorporating some of these bells and whistles or changes in options to the model; to incorporate some of these unique situations. If that was in the future plans to increase outreach, to try and increase reporting rate and buy-in of the tagging programs; that hopefully down the road could be incorporated through a time-varying tag reporting rate.

CHAIRMAN ESTES: Wilson, I think you were next.

DR. WILSON LANEY: I've got two questions. The first one is for Jeff and Jeff and Mike, I guess; and that is, do you all think that it could be because of the difficulty in sampling the full range of the population that that is a contributing factor to why the SPR is so apparently low? That is question one.

Then question two is, I know from some of the work that Julie Harris has done at NC State that there is a way that you can do some genetic evaluation on juveniles and get an estimate of the number of adults in the spawning population that had to produce that juvenile or those juveniles. It seems to me that we have an opportunity, possibly, to use that approach to get sort of an independent reality check on the SPR estimate, and especially since Robert in South Carolina.

South Carolina has selectively stocked some areas with juvenile red drum, and we would know in that case exactly how many parents they had. I mean you could do the genetics on the stocked fish; and determine that that estimate of parentage coincides with the numbers that you used to propagate those fish.

But then you could also do it on wild fish, and maybe that would be sort of a supplemental approach to our standard assessment techniques, to try to get an independent idea of what the spawning stock population size really is. Just any comments or thoughts you might have on that second question would be welcome as well. Thanks again guys for a super job on using all the data to the maximum extent you could, and doing a great job on the assessment.

MR. KIPP: Yes, I'll take a stab at those and let Mike jump in if he wants to add to it. One of the kinds of consistent uncertainties with red drum specifically is this selectivity of fish as they exit the slot limit and immigrate to the offshore population or the spawning population; and what that selectivity is, because the SPR estimates are highly sensitive to those selectivities; because SPR is just a function of the fishing mortality and the selectivity at age of those fish.

Ideally you would have a fishery that has flat top selectivity, at least one fishery where it provides a lot of information on the removals of red drum; and that provides information on kind of the magnitude of those fish that exit the slot and the older mature fish. Yes that is something to consider is the low frequency of catch of the adult fish.

There is not a lot of information on estimating that selectivity as those fish kind of move into less vulnerable states. The second question you had, Wilson, was on the genetics. There was a genetics study; I think it was in South Carolina. It may have been Tanya Darden; I can't remember exactly who the author on that was. But they did something along the lines of what you are referring to, which is trying to get kind of a genetic estimate of the population size.

I recall just a line in that publication or that study that said that the estimates on the population sizes from those genetic analyses corroborated the population sizes; strictly speaking I think qualitatively that the southern stock is much larger than the northern stock. But I don't know that it got more in depth than that. Mike, if you have anything to add.

MR. MURPHY: I could hear some of that. I would just have to say that those are certainly important information going forward. If we can nail down any kind of an absolute estimate of abundance of adults that would really help the scaling in the stock assessments. I know we've done some work on the Gulf Coast where we've taken fin clips from individual adult red fish; and actually been able to identify them as individuals, and use that as a natural tag.

It is certainly plausible to do a large scale tag recapture program if you can get enough, I guess volunteers or scientists to submit those

kinds of samples to a lab and set up something in a scientific fashion. It might be possible to get an estimate of the adult stock; which would be a huge plus for the assessment.

Now that has certainly been something on the Gulf Coast where there is a federal fisheries management plan still in place; where they've thrown lots and lots of money into the traditional mark/recapture estimates programs to try to get an estimate of the adult population size. That and things like egg and larval surveys, which are fraught with other errors to sort of back cast what was the number of adults that produced those numbers of eggs. That's it.

MR. JOE CIMINO: I want to thank well everybody for all the hard work that they've done. I guess I'll start with, I appreciate what Wilson has said and Mike's response; because I have concerns with both the models and kind of this scale of where they are estimating this biomass to be and the SPR rates. I certainly support if any further work can be done on that it would be appreciated.

I have one specific question for the northern assessment model as well; and I guess it may be to both Jeff's. Correct me if I'm wrong, but I didn't hear it much in the presentation, but the talk about only one JAI going into the northern model; and conflicting signals when you have large catch with an assumption that maybe there was a stronger juvenile recruit coming through the Chesapeake Bay.

My question is I guess basically, were there any thoughts on a way to address that; perhaps weight the North Carolina JAI with any of the information that is available north of them? Because it seems like, and this is the part where I would ask you to correct me if I'm wrong, but it seems like the model is sort of penalizing SPR here because of high catches.

I'm assuming that those high catches are really just coming because the fish are available. Any thoughts on a way to address it, was it enough of a concern? It didn't seem to make the presentation on one of the things to be addressed.

MR. KIPP: Yes that is something we saw, and I don't know if I can bring up a slide here just to illustrate. But right now there is only a North Carolina JAI in the model. There are no JAIs that we reviewed outside of that that we thought were useful for the model. We hoped that by bringing in the MRIP Index that that would incorporate some information outside of North Carolina. But that is something that we did see there. For example, in 2002 there was a large catch by the recreational fleet; both harvest and discard mortalities.

That is consistent with a large year class moving through the population. However, the indices if you look at the North Carolina JAI, the 2002 year class are the smallest over that entire index. If you look at the MRIP it is extremely large, but the model misses that signal coming through the MRIP Index and tries to kind of balance between that signal coming from the North Carolina Index and also from the MRIP Index; and essentially compromises between those indices and that conflicting signal.

There are some things we did with data weighting; there are things like iterative reweighting you can do that are built in within stock synthesis. Some of the sensitivities we did around that didn't suggest large differences in the population estimates. We didn't really pursue that any further than that; other than to note that there is the potential for pulses of fish that are missed through just having primarily North Carolina indices in the model.

MR. BRUST: To that point, Joe. I don't remember specifically if it made it into the research recommendations, but I do recall some discussion at the SEDAR workshop about only having one index. We know similar species there are regional variability among years. As this is showing, if they are not showing up in North Carolina where are they coming from? Having additional young-of-year indices from other regions would be very helpful to inform

the model, and help it figure out what is happening in years like this 2002 year class.

MR. CIMINO: Just a follow up. The JAI is a pipe dream for us, and hopefully eventually we will find a way to get a survey that captures these. I kind of was hoping to hear that there might be something else to explore that we could do to find a signal on these younger fish. My only thought is we did spend some time for a past assessment with this; doing length based stuff through our tagging program for smaller fish, and then kind of setting up ages based on seasonal length fins. I know North Carolina has done similar work, so just a thought.

MS. FEGLEY: I really recognize the challenges that this assessment has presented so kudos to the team for sticking with it and coming to this outcome. I do have a lot of questions. I always have some concerns when things look so different from benchmark to benchmark; although it does happen. I'm wondering, in particular I have some questions about the relationship between the spawning stock biomass and the SPR fishing mortality and recruitment.

I'm wondering can you pull up the graph of the SSB for the northern stock. I'm looking at Page 80 of the assessment; which has the SSB, the SBR and the recruitment all in one panel in the document. The question is it looks to me like the SSB, which is fairly flat through the recent part of the time series, and this speaks to this question of scale that Joe brought up. It looks to me like it's sitting right at about 1,000 metric tons. Is that right?

MR. KIPP: Kirby will bring this up. There was a slight error in the reporting of that spawning stock biomass in that figure that was provided in Addendum II. That was halved from what it should have been; and I apologize for not pointing that out earlier. This is the corrected. It is really just everything is just adjusted by 100 percent, so it is two times that in the spawning stock biomass plot. That's the only thing that was affected; trends, all the other estimates, SPR and everything else were not. It was just a reporting into that figure that was incorrect.

MS. FEGLEY: It is at about 4,000 metric tons. Is that a realistic number? It is pretty low; it's a pretty low number for a fish that lives out to 40 years. Just to move on from there. Then in 2012, we had that very high recruitment and then the F goes through the roof and the SPR goes down. I am just trying to put together in my head. I am trying to put it all together and what would cause the F to go up so high in 2012; concurrent with that large year class? Is that discards of little fish? Is that what's going on?

MR. KIPP: Yes so that would be attributed to a very high discard event. There were a lot of discarded fish, and again 8 percent of those are assumed to die post release. That affects the fishing mortality, and I think this comes back somewhat to the indices again. There is some conflicting information in the indices that are included in the model; where it doesn't suggest that that was necessarily as big of a year class as would account for all of that increasing catch.

Therefore it is going to estimate a high F, large removal and not that necessarily big of a year class. It was big, obviously for this time period, but you can see in the indices of abundance some are overestimated and some are underestimated for that year class. Again it is a conflict in that year class across these indices; and trying to compromise that fit to those different indices.

It comes out with a year class and then that large removal event, and estimates a high fishing mortality; which is then spread over all of the age classes in the fishery as a function of the selectivity of those fish at that age. That is why it is leading to a low SPR; then the first part of your question, the spawning stock biomass.

Again one of the differences between stock synthesis and the old catch-at-age model is that that initial population is estimated as a function of previous fishing; which is in this case we took

a ten year average of the removals observed and used that as kind of a catch before the model period, to fish down that stock.

It fits to that catch and then fishes down the stock to get it to a point where it thinks it is, and then also incorporates some deviations of those age classes in that initial population structure; based on other information in the data. For example, we saw a big year class coming through some of the older ages in that abundance plot.

That is mostly driven by the age data collected in the longline survey, which would suggest that that year class was a very large recruitment event way back in, I think it was the seventies, '74. It is estimating a very, very depleted spawning stock biomass in that initial year; which would indicate intense fishing pressure for a long period prior to the start of the model year.

CHAIRMAN ESTES: Other questions. No more questions so we had a couple of stock assessments, so now we need to discuss any actions that we might need to take. Is everybody tired from dinner?

DR. LANEY: Well, I guess one action Mr. Chairman would be to make a motion to approve or accept I guess in the terminology the assessment documents for management advice. I would move to make that motion.

CHAIRMAN ESTES: Do I have a second? John Clark second. If I can have it up on the board I'll read it. Move to approve the stock assessment for management advice. Let's have some discussion about that if we might.

MR. ROBERT H. BOYLES, JR.: Motion to postpone. I understand there are some questions about the assessment that I think I could benefit from some advice from the Technical Committee.

CHAIRMAN ESTES: I need some parliamentary assistance here.

EXECUTIVE DIRECTOR ROBERT E. BEAL: You'll need a second for Robert's motion to postpone; and Robert is that for a time certain?

MR. BOYLES: Yes, and I'm not trying to be cute here with this. I think there are some things that I could use some technical advice for. Let me be clear, I think it is important to acknowledge the terrific work of the assessment. Please don't look at this as a negative. I just think there are some questions that I've got going over in my mind. I don't really want to postpone it, Wilson. But I'm not quite ready to approve the assessment just yet. I've got some questions for the TC.

CHAIRMAN ESTES: Do we have a second? Lynn, a second from Lynn, now a discussion on the motion to postpone.

MS. FEGLEY: I just have a question. At such time if the report is approved and the report is that we're overfished and overfishing is occurring, I agree with Mr. Boyles. The work here is phenomenal and it is a challenging case; but there are just so many questions that I think need to be answered. Can somebody clarify? Does the plan, would the board be obligated to take management action immediately? Is that how that would work?

MS. MEGAN WARE: Under Amendment II that would trigger management action, so whether that would be an addendum or an amendment, however the board would want to proceed.

MR. A. G. SPUD WOODWARD: Mr. Chairman, we've not received any guidance from our Technical Committee on this matter. I think there are some things that we could benefit from if they were to do some things. I think I actually have the text of a motion that I've given to Megan that at the appropriate time I would like to put up for consideration.

CHAIRMAN ESTES? Okay, let's deal with this one first. Robert, is there a timeframe for your motion to postpone?

MR. BOYLES: Let me ask this question again, not trying to be cute here. I guess I've got a procedural question. I would think that we could get the information from the TC that is in the text that Mr. Woodward just referred to, I would think by the August meeting; but I would look to staff for that.

Megan, if that is something you thought the TC, we could convene on a conference call or a series of conference calls perhaps. I guess my question; Mr. Chairman is if we accept the assessment for management advice, can we still ask this question? Again I am not trying to be cute with the motion to postpone. But there are some things that I would feel more comfortable if I had a better handle on with myself.

MS. WARE: I think that is really going to depend on what work you guys want the TC to accomplish. Before we were talking about the statistical catch-at-age model and potentially looking at runs with that. In speaking yesterday, if we came to the conclusion that if we were just to add the data, the extra years of data to that model, not adding the longline survey or any new data sources; that that might take four months to do runs for both northern and southern and get those all complete and ready to go.

I think if you want to add additional data sources such as the longline survey and kind of beef up maybe that model a bit, it would take more like six months; because we would then probably want to peer review that if you are interested in using this for management. Again, I think it is dependent on the goals of what you guys have, if you are interested in pursuing a different model that is going to take longer. If you want to beef up that statistical catch-at-age model that will take a bit longer.

MR. BOYLES: Mr. Chairman let me be clear. My motion is not intended to postpone indefinitely, based on our training we had yesterday. We certainly want to move through and move on issue that we will need to move on. Let me say, Megan, when you said four months I was hopeful August. Let me say motion to postpone until the annual meeting.

EXECUTIVE DIRECTOR BEAL: We let Colette go about two hours too early I think. Robert, you asked a question earlier about if you approve the main motion to approve the assessment and peer review for management advice, what does that mean and can you change it? I think the short answer is no, you can't change it.

If you approve it for the document that you have in front of you now; the assessment and the results and the peer review for management advice that becomes the foundation for management advice, and the board will have to react to the information that is contained in that document. If this board is seeking additional technical work, one way to do it may be to – it gets tricky.

But modify the current motion that is on the board to postpone, and include the technical work that you guys would like to see. Move to postpone until the Technical Committee completes a certain list of tasks. Then the revisitation of that motion or the assessment is linked to when the TC finishes their work; it is not linked to a meeting of the commission. That may be one way to do it. That is up to the board. That may take a motion to amend your motion to postpone, but I think that is workable. We can stumble through that I think.

MR. BOYLES: I am not ready to approve this for management advice. I guess that is where I am. There are some questions that I've got. Having said that I recognize that there are some things we need to do. We've certainly got strong interest in this fishery in my state and some concern with my anglers about the status of the stock. We've worked ourselves into this so let me try this. Motion to postpone until the Technical Committee can review the information requested by the board and that information requested will be put up here shortly.

CHAIRMAN ESTES: Okay right now we didn't say this and I'm not probably going to do this right, but I'm treating this as a substitute motion for the original motion. Is there more discussion on that?

DR. LANEY: I'm scratching my head trying to remember our training yesterday, but from a parliamentary standpoint further anything if I was able to withdraw my motion; or would that just further confuse the issue?

CHAIRMAN ESTES: I'll look to Bob for help, but I think that we have another motion on the table, so I don't think that you can do that now. Is that correct, Bob?

EXECUTIVE DIRECTOR BEAL: Can you repeat the question, I was side barring with some folks.

CHAIRMAN ESTES: That's okay. Wilson asked if he could remove his original motion, withdraw it?

EXECUTIVE DIRECTOR BEAL: No, just because it is property of the board now and it's been debated and there are actually motions to amend it and change it that have been subsequently made. We're in an awkward spot. Robert started a second motion; you've got another motion to postpone. We need to sort the two motions to postpone out; I think is our first step.

CHAIRMAN ESTES: We cannot treat the second motion as a substitute motion for the first?

EXECUTIVE DIRECTOR BEAL: Yes okay, the wording is there now. You know the other option is to actually include the details of those tasks within this motion; if the board chooses to do that.

CHAIRMAN ESTES: I'm afraid to ask, but go ahead.

MR. ADAM NOWALSKY: Given that it's Mr. Boyles own motion, he would be within his realm of capability to amend his motion and then if there is no objection from the board that would then become his motion. He has the right to amend his own motion; and then as long as there is no objection that becomes the motion up for debate.

CHAIRMAN ESTES: Okay is there any objection to Robert amending his motion? Seeing none; Robert do you have an amendment?

MR. BOYLES: Mr. Chairman where I am is acknowledging the great work of the stock assessment, but with a number of questions that I think are appropriate for the Technical Committee to review. Some of those questions I think there is language, Megan that you've got that perhaps you could display for the group.

MS. WARE: Yes, let me get Kirby to finish what he's working on and then we'll pull that up.

MR. BOYLES: Mr. Chairman, since we've received unanimous consent for me to amend that motion that is what I would like to do. But I would like for the body to see the amendment, so give us just a moment please.

Mr. Chairman my motion is to amend the motion to postpone until the Technical Committee and the Stock Assessment Subcommittee can complete the following tasks. Evaluate if current biological reference point types and values are appropriate for red drum given the species life history. Investigate the feasibility of an F-based reference point for juvenile red drum. Evaluate how red drum life history and fishery management measures affect the validity of age-based models. Evaluate whether the South region continuity run in the statistical catch-at-age model can be made informative for management and if yes, complete that continuity run. Evaluate if a North region continuity run of the statistical catch-at-age model would be informative for management purposes, and if yes, complete a continuity run. Evaluate tag return rates for each region and determine if the tag return data should be incorporated into a new run of the SS3 model.

CHAIRMAN ESTES: I believe we already have a second. I suppose I am supposed to read this again. Move to postpone; to move the task of the Red Drum Technical Committee and Stock Assessment Subcommittee. Are we changing? Excuse me.

EXECUTIVE DIRECTOR BEAL: Can I barge in here for a moment Mr. Chairman. I think since the board gave Robert the latitude to modify his motion to postpone. I think this motion is simply worded; move to postpone the approval of the stock assessment peer review until. Take out the words to amend on the screen.

If this becomes the motion to postpone until all these tasks are completed, whenever this is done is when the board will come back and revisit this. Under this scenario there are really only two motions in play; the motion to postpone and then the original motion that was made by Dr. Laney to approve the documents. I think that reflects where the board wanted to go and the latitude they gave Robert, and it may simplify things. There are only two motions in play now.

CHAIRMAN ESTES: Got it, so let me read the substitute motion. Motion to postpone the approval of the stock assessment and peer review until the following tasks can be completed by the Technical Committee and the Stock Assessment Subcommittee with the following: Evaluate if current biological reference point types and values are appropriate for red drum, given the species life history.

Investigate the feasibility of an F-based reference point for juvenile red drum. Evaluate how red drum life history and fishery management measures affect the validity of age-based models. Evaluate whether the South region continuity run of the statistical catch-at-age model can be made informative for management; and if yes, complete a continuity run. Evaluate if a North region continuity run of the statistical catch-at-age model would be informative for management purposes; and if yes, complete a continuity run. Evaluate tag return rates for each region and determine if tag return data should be incorporated into a new run of the SS3 model; motion by Mr. Boyles, seconded by Ms. Fegley. Do we have any discussion about the motion?

MR. WOODWARD: I would just like to speak in favor of the motion. We don't have a crisis here. We've got a long-lived fish; we've got some metrics of the population that shows some stability. We don't have a depleted spawning biomass; at least we don't believe we do. What we've got is an indication of a trend that increasing fishing mortality that jeopardizes recruitment to this spawning stock biomass. I certainly support us taking a more deliberative and measured approach to make sure we gain as much confidence as we can before we consider making management changes.

CHAIRMAN ESTES: Other discussion?

MR. BOYLES: Again, I want to reiterate my appreciation and support of all the great work that has gone into this with the assessment. I think as Mr. Woodward suggested, this is something, there is a lot riding on this, particularly in the south. As I have indicated earlier, the data that we see in South Carolina certainly give us pause and we certainly want to make sure that we get this right; and find an appropriate management response forward.

I believe if these things, if we could get the TC and the SAS to help inform us on these things, then I would feel much more comfortable in moving forward with a management document. I want to be clear that I think at least from the anecdotal and scientific information from my state, there is strong interest and belief that we need to do something. But the standard to which we're held in our legislature requires that we make sure that we've got some of these

things sorted out, so thank you, Mr. Chairman, I would support the motion.

MR. BATSAVAGE: I also support the motion. Kind of adding to the previous comments, in terms of the Technical Committee review, I know obviously a lot of great work was done and it took a long time to get to where we are today; with all the data and the complexity of this model. I think this motion is kind of looking at some extra things to look at to kind of give us a clear picture of what the stock status is like.

But in kind of getting to where we are today. I understand that a lot of work was done in a short period of time; in order to kind of get to the May meeting. I think when this gets reviewed by the Technical Committee and the Stock Assessment Subcommittee that to try to give them the time necessary to accomplish these tasks.

This is a long list. Megan already kind of gave us a rough estimate of the time it could take to complete some of this stuff. I think it's just really important as Robert said to make sure we get this right, as far as what the stock status is. At the same time I understand as far as other tasks that this board and commission staff have, as far as stock assessments and all. This is going to maybe disrupt the schedule and that but I think this is important enough to try to be very thorough; as far as completing these to see what the stock status is.

CHAIRMAN ESTES: Other comments?

DR. LANEY: I certainly think that the list that Robert and presumably Spud have provided us; a worthy list and would certainly like to hear the answer to all of those evaluations myself. I just have a process question for Bob, I guess; and that is if we have assessments that have been done and we have a Peer Review Panel approval of those.

I guess we're not obligated to immediately go ahead and accept that. But it almost seems in some respects, and I can talk to Robert and Spud about this and Chris offline. But it almost seems in some respects like we don't like the answer and we're looking for a better answer maybe.

EXECUTIVE DIRECTOR BEAL: You know it is a good point, Wilson. I think this is more of some technical questions to get the board more comfortable with the answers of the assessment. Are there responses that the Technical Committee and Stock assessment Committee can provide to the board to make them more comfortable with it; or are there other ways of looking at the signal that came out of that assessment?

This has been done in the past, where the board at the Commission have received stock assessments and peer reviews and not been immediately approved and some additional tasking for the Tech Committee has been given. This isn't the first time that the Commission has gone down this road; for better or for worse.

But while I had my hand up, I think the other thing, and Chris started talking about it briefly; which is the assessment folks that were involved in this assessment. Their work plans were pretty full and they were already moving on to, I know Jeff Kipp was working on croaker and spot for this board and some of the state folks that had some involvement were moving on to other species as well.

I am not speaking for or against this motion. It is probably worthy of some discussion that if the technical folks are asked to do these things, there may be some delays in other assessments that are before the commission as well. The plan right now, I think Megan can probably comment better than I can on the exact workload.

There are two ways out of this box, one is to find some other help to work on red drum or spot and croaker at the state level; or the other is things may have to be postponed. I think those are both reasonable options. But we just need to have an open discussion about that and

really control the expectations about all the workload really for these folks, probably through the end of the calendar year; if not into next year. I don't know if staff can comment. Megan may have some ideas on other workloads and other projects that are going on. It's probably worthwhile.

MR. PAT GEER: Bob covered part of what I wanted to touch on. But I also wanted to perhaps ask Mike and Jeff if any pieces or elements of the tasks onboard within the motion have been addressed in part. If there are any comments you guys could make relative to continuity runs that may have already been done.

MR. MURPHY: When I looked at these, when we did the original assessment for review when the SS3 models are not in adequate shape, we did have continuity runs for the north and south. I think as you saw in my presentation, we do have estimates of SPR. Now, the only thing in these statements that gives me a little pause is whether these continuity runs can be made informative for management.

That is really not something the Technical Committee is going to be able to decide. We can certainly make it technically as accurate and proficient as we can. But I think it would require a review to find out if it is informative enough for management. That's all I have.

MR. KIPP: Yes, I don't have anything to add. I agree with Mike.

MR. JOHN CLARK: I certainly agree with the motion to postpone. Pat pretty much asked what I was curious about, was how much of this had already been considered. Just curious as to what the process would be to kind of change the reference points for this species.

MS. WARE: I just wanted to get back to Bob's comment about changes that this might have down the road or implications for other workload. I think that if we pursue the statistical catch-at-age model, as I said that is probably a four to six month endeavor; so that could delay croaker and spot assessments, which Jeff is currently working on.

It has the potential if it takes up to those six months to impact river herring and/or sturgeon. I just wanted to make sure the board is aware of that. That is fine if you guys want to prioritize red drum above those other assessments. I just wanted to make sure everyone kind of knows what the implications are moving forward.

John, to answer your question about reference points, we could task the TC to look at different options, come up with their recommendation. It would take an addendum to change the reference points, but I would recommend that if there is management action taken that that kind of all be included in one document.

CHAIRMAN ESTES: Any other comments or discussion?

MR. BOYLES: Again, maybe not to put too fine a point on it here. We have interest in South Carolina, as I've mentioned, with our fishery independent data as well as our fishery dependent data that give us pause about the status of our stock. As many of you have heard me talk about around the table, we are required to legislate management actions. We have as I said, a lot riding on this stock assessment, and our comments to some of our constituents, who have already approached our legislature about making management changes.

I don't want to have to do this twice. I think there are some things that clearly for the region that we need to make sure everybody is onboard; and so that is one of the motivations for my motion. Let's make sure we get this as tight and as right as we can for everybody to be onboard; so that I'll be confident in going to my general assembly and saying, hey we need to make some management changes and here's what we recommend.

MS. FEGLEY: Just a question for Bob or maybe Megan. If given the impacts of this on other assessments like sturgeon and herring. Would this have to go through the Policy Board at some point, or can this board just decide?

EXECUTIVE DIRECTOR BEAL: Lynn, that's a good point. We're kind of doing this on the fly, so it is hard to estimate exactly what the impacts would be to some of these other species. I know croaker and spot. Jeff was intending to kind of switch gears and to go over to both of those species and work on them directly between now and kind of the end of the year, or at least November; so Jeff, is that right, those two, if there is not additional assistance from the states.

Those two will be directly affected by this. I'm not sure about the other species that you mentioned, but there may be some impacts there as well. I think if this motion were to pass, it may make some sense for staff to go back and look at the timeline and the workload of other species, and get together on a conference call sooner rather than later with at least the state directors, if not the whole South Atlantic Board.

The state directors I say that because you folks are the ones that have control over the assessment folks in the states, and you can see what their workload looks like; and then come up with a plan for at least these three species that this board is working on. We can re-estimate the timing for spot and croaker and to get this red drum worked on, if that seems to make sense. Because you're doing this a little bit on the fly as well. You may not know exactly what the workload of all the assessment folks in your states are; and you may need to go back and talk to folks at home and see what horsepower is available from your states, and we can do some staff work to estimate timelines and other things and collateral damage. But we probably can't do all of that here today, and a conference call, seems to me anyway, to make a lot of sense to do in the next couple weeks if we can pull it off.

CHAIRMAN ESTES: Well, let's see where we're at. See if this all makes any difference. I think it is time for us to; all those in favor of the motion please raise your right hand. Let's back up, let me read it again. Motion to postpone the approval of the stock assessment and peer review for management advice until the following tasks can be completed by the Technical Committee and Stock Assessment Subcommittee.

Evaluate if current biological reference point types and values are appropriate for red drum, given the species life history. Investigate the feasibility of an F-based reference point for juvenile red drum. Evaluate how red drum life history and fishery management measures affect the validity of age-based models.

Evaluate whether the South region continuity run of the statistical catch-at-age model can be made informative for management; and if yes, complete a continuity run. Evaluate if a North region continuity run of the statistical catch at age model would be informative for management purposes; and if yes, complete a continuity run.

Evaluate tag return rates for each region and determine if tag return data should be incorporated into a new run of the SS3 model; motion by Mr. Boyles, seconded by Ms. Fegley. Having said that those in favor of the motion please raise your right hand, those not in favor like sign; abstentions, null votes. The motion passes 10 to 0. Now I think we have to go back and make this the original motion. I will read it again. I should probably have it memorized; motion to postpone the approval of the stock assessment.

MR. NOWALSKY: Point of order, Mr. Chairman.

CHAIRMAN ESTES: Yes, sir.

MR. NOWALSKY: It is not an amendment or a substitution that becomes the main motion, I don't believe. It was just a motion to postpone, so it is now done. Mr. Boyles as I recalled

modified his motion to postpone; which was accepted by the board. But that was the main motion. That is my belief of what transpired.

MR. BOYLES: Yes sir, Mr. Chairman. That is my understanding as well. If you recall, I believe the history here, Dr. Laney suggested a motion to approve. My motion was to postpone. My understanding of our procedure is that motion to postpone is now dispensed with the main motion. I think we're on to other business, so thank you, Adam.

CHAIRMAN ESTES: Thank you, Adam. Okay the next thing on our agenda was to discuss the next steps for management of red drum. I think that we can dispense with that agenda item right now. We don't need to go through all this again, I don't think.

PROGRESS REPORT ON SPOT AND ATLANTIC CROAKER ASSESSMENTS

CHAIRMAN ESTES: Jeff, if you would please talk about the stock assessment for spot and croaker.

MR. JEFF KIPP: I am just going to give a quick update to the board on the spot and croaker assessment progress. We did have our first stock assessment workshop in Charleston, South Carolina the week following the winter meeting; February 8th through the 10th, to discuss modeling approaches and some different analyses.

We are moving forward with a catch survey analysis as the model and a surplus production model for spot, and stock synthesis for croaker. We've had several progress calls since that assessment workshop; and we do have one coming up next week to review bycatch estimates. We will on that call schedule our second stock assessment workshop for later this summer. The review is currently scheduled for this fall; and that's all I had.

CHAIRMAN ESTES: Any questions for Jeff? Seeing none; we'll go on to our next agenda item.

MS. TONI KERNS: I don't have a question, do we need Mike? We hung up on him, okay. I was just going to say bye to Mike and we would hang up on him, so never mind.

NORTH CAROLINA REPORT ON SPANISH MACKEREL POUND NET LANDINGS

CHAIRMAN ESTES: The next agenda item is review of the North Carolina report on landings in the commercial pound net fishery. I think, Chris, you are going to make a presentation on that?

MR. BATSAVAGE: Just a verbal report that refers to basically the report that we provided. I think it was in the supplemental material for the South Atlantic Board; just a quick background. Addendum I to the Spanish Mackerel Fishery Management Plan allows states to reduce the commercial size limit to 11.5 inches forklength in the pound net fishery from July through September.

The report that we provided details the results of our sampling to monitor the impact on the harvest of Spanish mackerel in North Carolina. The pound net landings of Spanish mackerel last year in the state for pound nets were about 40,000 pounds; or 7 percent of the total commercial landings of Spanish mackerel.

Prior year landings from pound nets range anywhere from around 19,000 to over 38,000 pounds and accounted for about 3 to 4 percent of the total commercial landings in the state. When I talk about commercial landings in the state, by gear gillnets account for the vast majority of the landings; somewhere in the 90 percent range. Pound nets are a pretty small component of the landings.

The proportion of Spanish mackerel pound net landings in numbers of fish between that 11.5 and the otherwise 12 inch size limit during the

months of July through September was 7 percent in 2015, and has ranged from 8 to 16 percent since 2012. The proportion of Spanish mackerel pound net landings again in numbers of fish that were less than 11.5 inches during that July through September time period, were 15 percent in 2015; but that undersize rate has range anywhere from less than 1 percent to 16 percent since 2012.

Basically Spanish mackerel landings of fish less than 12 inches from the pound net fishery are very small. By that as an example, like last year it was around 5,000 pounds and in 2014 it was 1,100 pounds. You compare that to the total commercial harvest in the state it is fairly insignificant. Then finally, just so people are aware, if you read this report and compare it to the one from last year. There were a couple data corrections made from prior years. Those are described in the report, I basically wanted to just flag that to explain inconsistencies in the harvest proportions if someone was to look at last year's report and compare it to this one. That concludes the Spanish mackerel update.

ELECT VICE-CHAIR

CHAIRMAN ESTES: Do we have any questions for Chris? Okay we'll go to our last agenda item and that is elect a Vice Chair. Are there any nominations? Robert.

MR. BOYLES: I would like to nominate Pat Geer of Georgia to serve as Vice-Chair of the Board.

CHAIRMAN ESTES: Seconded by Russ, are there any other nominations? Is there any objection for Pat coming up here and replacing me? If not, congratulations, Pat.

ADJOURNMENT

CHAIRMAN ESTES: Meeting is adjourned.

(Whereupon the meeting was adjourned at 1:19 o'clock p.m. on May 5, 2016)

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: South Atlantic State/Federal Fisheries Management Board

FROM: Red Drum SAS/TC Working Group

DATE: July 15, 2016

SUBJECT: Progress on Red Drum Assessment Follow-up Tasks

At the ASMFC's May Meeting week, the South Atlantic Board (Board) was presented the 2016 Red Drum Stock Assessment and Peer Review. Members of the board had some concerns and questions regarding the assessment. The board developed several tasks for the Technical Committee and Stock Assessment Committee (TC/SAS) to address their concerns and questions. The TC/SAS working group has been working on the tasks assigned by the Board. Below is a summary of the progress made on each of the Board tasks.

Biological Reference Points

Board Task: Investigate whether the current biological reference point for overfishing (SPR40% target, SPR30% threshold) is appropriate given the species' long life history. This task is two-fold in that the Board is interested in whether spawning potential ratio is an appropriate metric and whether the 30% threshold and 40% target are suitable goals. The Board also requests the development for an overfished reference point recommendation.

Working Group Progress:
Spawning potential ratio (SPR) is one of the most (if not the most) commonly used reference points to assess overfishing. This is because *static* SPR (analogous to a "single year" of SPR, whereas *transitional* SPR is like a "running average") maps 1-to-1 with fishing mortality (F). However, it must be noted that it assumes the cohorts have been fished using a constant F pattern through their lifespans.[1] In other words, if there are changes in exploitation patterns, uncertainty around a static SPR (used in red drum's assessment) increases. Additionally, SPR in general does not necessarily measure the actual spawning potential of a population, so it "must be augmented by monitoring actual trends in the actual size of the spawning stock."[2]

The TC/SAS will continue exploring the literature and evaluate any potential alternatives for measuring overfishing. Regardless of what is settled, the SAS will follow the above suggestion and develop/propose a supplemental reference point (based on biomass or recruitment) to be used in conjunction with the overfishing reference point.

If it's decided that SPR is the appropriate overfishing reference point for red drum, the SAS will need to determine whether or not the threshold/target levels of 30%/40% are appropriate. The fishing mortality (if applied continuously) that produces an SPR of 35-40% is often

considered safe, especially with fisheries prone to recruitment variability (as seen with red drum).[3] For less resilient or data-poor stocks, a higher SPR value, such as $F_{70\%SPR,}$ may be warranted.[4] However, due to the large number of spawning age classes, red drum should theoretically be resilient.

The TC/SAS will discuss whether or not red drum should be considered "data-rich" and "resilient." These terms are always vague and relative, so it will be up to the TC/SAS to weigh the 30%/40% values against other alternatives for the SPR target and threshold.

Developing a reasonable overfished reference point will depend upon the reliability of spawning stock biomass (SSB) estimates, as the large plus-group (ages 7 onward grouped together) led to uncertainty in the SSB in the previous assessment. If that issue is resolved in this assessment, there may be more confidence in a biomass-based reference point. Clark (1991) suggests the neighborhood of 35-40% unfished biomass, saying, "*It is clear that even if unfished spawning biomass were known only very roughly, say with a precision of the half-to-double variety, one could still be reasonably sure of getting something close to MSY simply by holding the spawning biomass in vicinity of 35-40% of the estimated unfished level.*"[5]

One alternative the SAS is exploring is a recruitment-based reference point based on independent surveys. While not a biomass-based reference point, it can provide information on the abundance of fish that will soon enter the fishery. For example, North Carolina's seine survey, which measures age-0 abundance of red drum, has been shown to correlate with age-2 commercial harvest and age-2 recreational catch two years later.[6] This reference point could be employed in a manner similar to the "stoplight" frameworks for spot and Atlantic croaker, where thresholds that are breached in multiple years trigger management considerations and/or responses. Additionally, setting a biomass-based reference point based on maximum recruitment has already been suggested in the past,[7] so these two together could provide important stock information.

The TC/SAS will finish updating and running the proposed models (SS3 and now the traditional statistical catch-at-age) and evaluate the ability of spawning stock biomass to be used for developing overfished reference points. Additionally, the TC/SAS will need to determine the feasibility, for both the northern and southern regions, of utilizing independent data on recruitment (first, seeing if the southern region has an appropriate survey). After that, the TC/SAS will come up with the specific thresholds that would cause the fishery to go from "green to yellow" and "yellow to red."

Other ongoing analyses include fitting stock-recruit data and overlaying different values of escapement on the stock-recruit curves. This exercise will help determine roughly how much recruitment would be associated with various potential escapement rates. Preliminary analysis has already been done for the southern region and results suggest escapement of red drum could be as low as 20% before losses in recruitment are seen. This might be more difficult to do for the northern model, where environmental variability (*e.g.*, cold kills) often play a larger role in determining recruitment than spawning stock size. Also, the SAS is investigating whether enough

data exists to perform a meta-analysis for the purposes of estimating the stock-recruitment relationship.

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3. Clark, WG. 1993. The effect of recruitment variability on the choice of a target level of spawning biomass per recruit. Management of Exploited Fish, Alaska Sea Grant: 233-246.
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6. Bacheler, NM, LM Paramore, JA Buckel, FS Scharf. 2008. Recruitment of juvenile red drum in North Carolina: Spatiotemporal patterns of year-class strength and validation of a seine survey. *North American Journal of Fisheries Management* 28: 1086-1098.
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F-Based Reference Point

Board Task: Given concerns regarding the appropriateness of the current reference point and the lack of data on adult red drum, the Board would like to see an investigation of the feasibility of an F-based reference point that looks strictly at the harvest* of juvenile red drum. The Board looks for guidance on whether this type of reference point would provide an appropriate level of information for management.

** In a 6/13/2016 conference call, Robert Boyles confirmed that the Board's interpretation of 'harvest' does include B2 mortality.*

Working Group Progress:

Potential advantages of using sub-adult fishing mortality

- Since the majority of fishing mortality occurs on the sub-adult component of red drum, there is a tight link between sub-adult fishing mortality and spawning potential ratio (SPR). This close relationship is evident from the results produced by the Stock Synthesis 3 (SS3) base runs, which show log-linear relationships between SPR and sub-adult fishing mortality (sum of F, ages 0-5 years[1]) with R2 ≈ 0.99 (Fig. 1, top two panels).

[1] Ages using Stock Synthesis 3 notation. (i.e. Fish turn age 0 on their first Jan 1st of life at a biological age of ~4 months; they turn age 1 on their second Jan 1st of life at a biological age of ~16 months, etc.)

- An advantage of focusing on sub-adults is that it is the most data-rich part of the stock. This should provide greater certainty in estimating reference points associated with sub-adult data parameters.
- Focusing on sub-adult mortality may allow reference points to be estimated (and cross-validated) by a variety of methods. For example, in addition to estimates produced by stock assessment models, sub-adult mortality may be estimated from fishery-independent survey data, or from stand-alone tag return models. The latter two methods may enable reference points to be tracked more frequently (e.g. annually) than stock assessment updates (~5 years). (Note, however, that state-run fishery-independent surveys and tagging programs operate over relatively small spatial scales when compared with the scale of the entire northern and southern red drum stocks).

Potential disadvantages of using sub-adult fishing mortality

- It is unclear how to derive a suitable sub-adult F reference point. This issue has been addressed previously with Gulf of Mexico red drum. The Florida Division of Fisheries Management was requested to examine relationships between spawning stock, recruitment and escapement (i.e. sub-adult fishing mortality). They concluded that it is difficult to derive a suitable reference point due to poor information about stock recruitment relationships (Murphy, pers. comm., 2016). The lack of good stock-recruitment information results in a variety of equally feasible scenarios that produce very different sustainable escapement rates (see Fig. 2).
- Although most of the red drum fishery targets the sub-adults, B2 (live release) fishing mortality of fish outside the harvestable slot limit may also have an important effect on the sustainability of the stock. B2s are a significant source of red drum fishing mortality, although allocating B2 mortality across sizes/ages of red drum has been a particularly difficult issue in red drum stock assessments due to the lack of good information on the sizes of discarded fish. Notwithstanding these difficulties, results from the SS3 base runs suggest that adult fishing mortality has been increasing in the southern stock (Fig. 3). This agrees with anecdotal evidence of a growing catch-and-release fishery for adult red drum in some areas. Changes in adult mortality patterns have an obvious direct effect on spawning capability. Therefore, a risk of using just sub-adult F as a management reference point is that it fails to account for long-term changes in adult mortality rates, potentially depleting the spawning stock.
- Another potential risk of relying just on sub-adult F as a reference point is that, in order for the stock to be sustainable, it assumes no decline in recruitment over time. If recruitment were to decline, spawning stock biomass could also decline to unsustainable levels, even if sub-adult fishing mortality was maintained below a previously sustainable reference point. Stochastic variation in recruitment may have additional influences on the choice of a sub-adult F reference point (Holden & Conrad, 2015).

Figure 1 Relationships between static spawning potential ratio (SPR) and fishing mortality. (Data from Stock Synthesis 3 base runs for the southern (left) and northern (right) Atlantic red drum stock assessments). Top row: sub-adult fishing mortality (sum of ages 0-5); middle row: age 1 fishing mortality; bottom row: adult fishing mortality (sum of ages 6-40). Fitted lines are back-transformed linear regressions of Ln(SPR) vs F (solid lines: intercept fixed at SPR = 100%; dash-lines: intercept fitted).

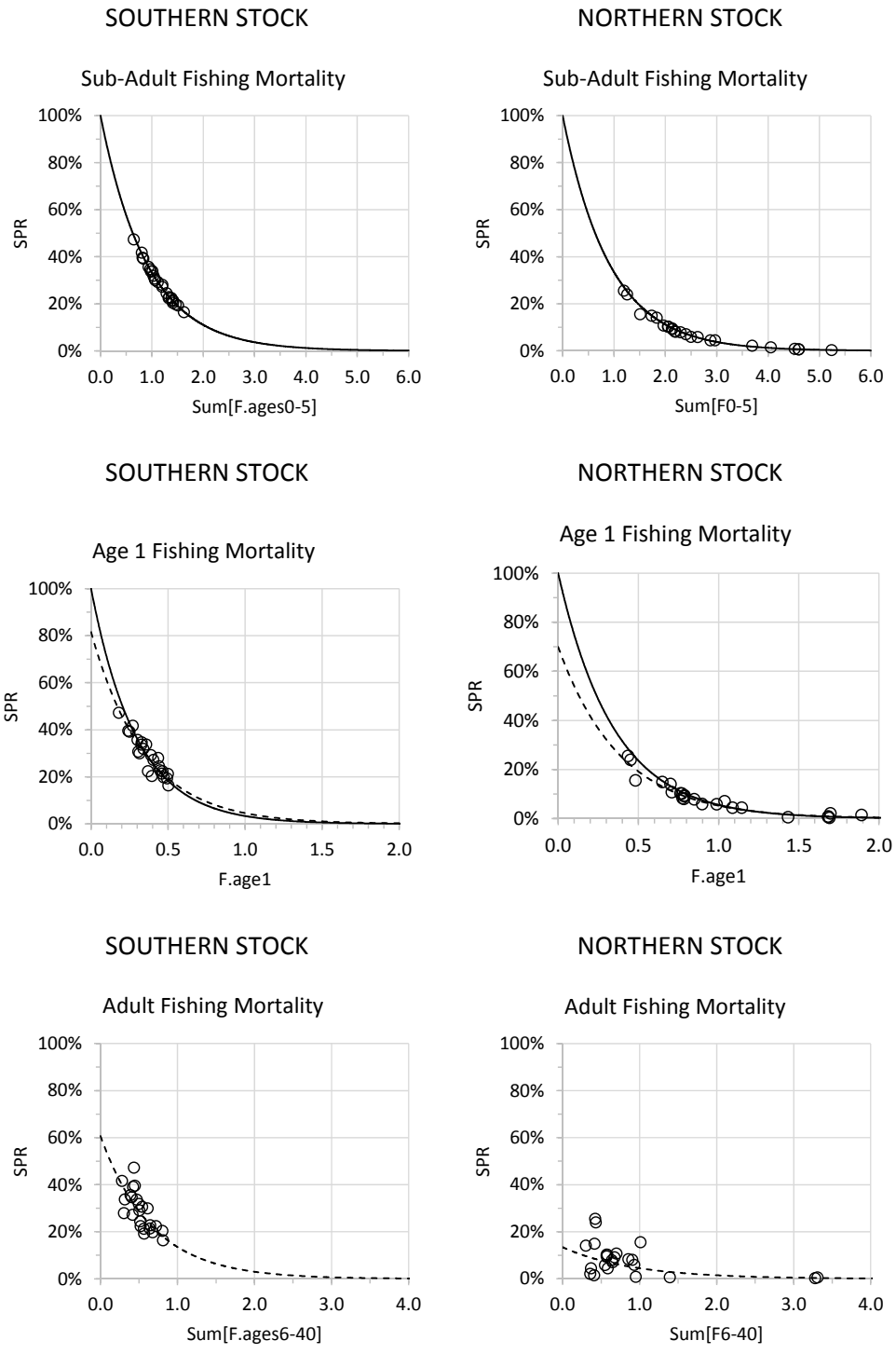
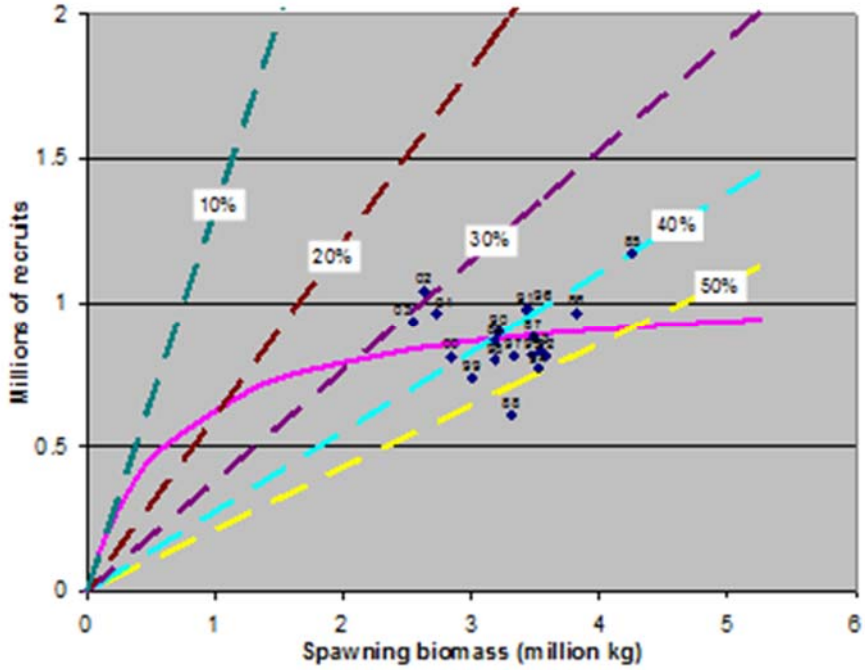


Figure. 2 Two plausible spawner-recruit relationships (pink lines fitted to blue diamonds) for Gulf of Mexico red drum that result in different sustainable levels of sub-adult escapement. Radiating dash lines show expected levels of recruitment (intersects with the pink spawner-recruit relationship) associated with sub-adult escapement rates (percentages). (Plots from Murphy, pers. comm., 2016).



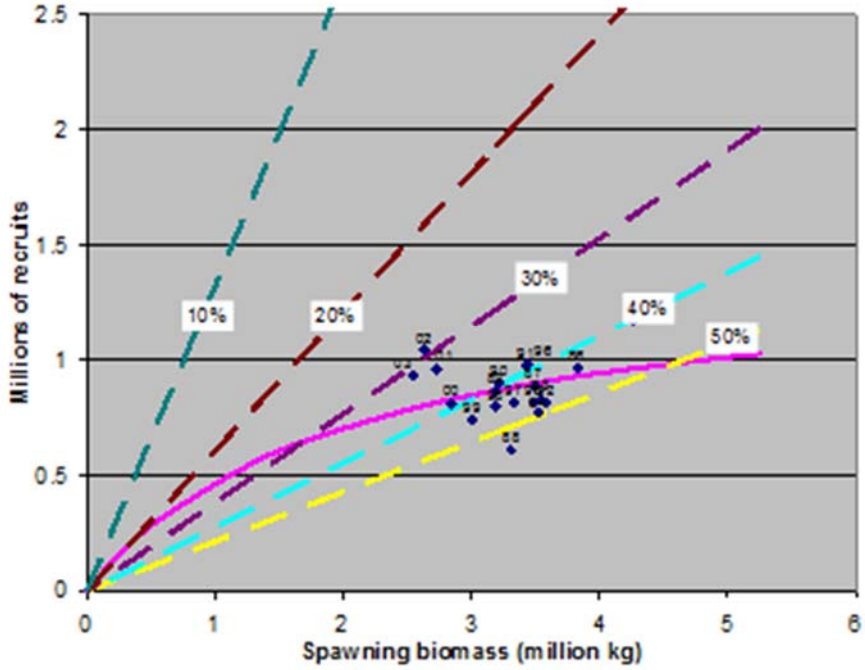
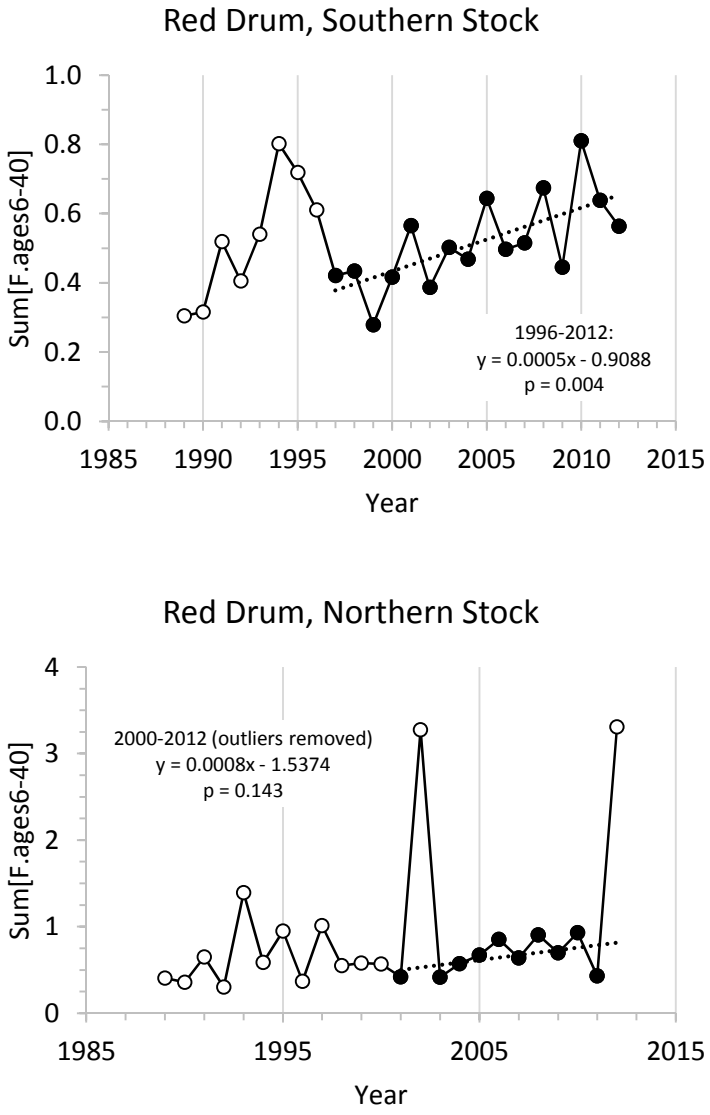


Figure 3. Temporal changes in adult red drum (ages 6-40) fishing mortality, based on outputs from Stock Synthesis 3 base runs.



Continuity Runs

Board Task

Southern Model Continuity Run: The Board asks for an investigation of whether the previous statistical-catch-at-age model would be useful for management and, if so, to conduct a continuity run for the southern region. The Board does not specify if the continuity run should only contain data sources used in SEDAR 18 and leaves it to the discretion of the investigators to incorporate new data sources as they see fit; if it is believed additional data sources will significantly improve the performance of the statistical-catch-at-age model, the Board encourages these additions.

Northern Model Continuity Run: The Board similarly asks for the investigation of whether the previous statistical-catch-at-age model would be useful for management in the northern region and, if so, to conduct a continuity run. The Board does not specify if the continuity run should strictly contain data sources used in SEDAR 18 and leaves it to the discretion of the investigators to incorporate new data sources as they see fit; if additional data sources will significantly improve the performance of the statistical-catch-at-age model, the Board encourages these additions.

Working Group Progress

The TC and SAS were tasked with conducting continuity runs of the statistical catch-at-age (SCAA) model used in SEDAR18 for comparison to the new Stock Synthesis 3 (SS3) model used in SEDAR44. The TC/SAS are updating the SCAA model inputs to correspond, as well as possible, with those used in SS3. Therefore, these are not true continuity runs (i.e. only updates to the data inputs used in SEDAR18). This will allow for a comparison of the results between the two models, focusing on the effect of the change in models between the two assessments.

The TC/SAS had a conference call at the end of June to discuss what changes would need to be made to inputs for the SCAA model to better match the inputs used for the SS3 model. All data inputs were checked by each state and updates are being made to the natural mortality, maturity, and weight-at-age vectors. In addition, indices were changed to match those used in SS3 and the adult long line surveys were added to the SCAA models. Due to time constraints and data concerns, the southern model will not include any tagging data and the northern model will only use tagging data through 2004, as in SEDAR18. Additional changes may also be made to the model code, such as not estimating the catchability coefficients for the indices and deriving them instead.

Once all updates to the data are finalized and changes are made within the model code, model runs will be conducted. While retrospective and some sensitivity analyses are expected to be done by the October management board meeting, the goal of these continuity runs will be to compare the SCAA output to the SS3 output. Should the Management Board wish to consider the SCAA as a preferred model, additional diagnostic tests (e.g. jitter analysis, additional sensitivity analysis, etc.) would need to be conducted following the October board meeting, as well as possibly another peer review to recommend this model for management use.

Tag Return Rates

Board Task: Given the sensitivity of the SS3 models to the tag return reporting rate, the Board asks for an evaluation of potential tag return rates for each region and determine if the tag return data should be incorporated into new model runs. The Board is specifically interested in a run which uses an 18% tag return rate, per the suggestion of the desk review report.

Working Group Progress

The final base run of the SS3 model for the southern stock estimated the reporting rate for the South Carolina harvest fleet of about 32%. This is within the range of reporting rates determined for inshore fisheries tagging programs in South Carolina in the past (21% Jenkins et al. 2000; 57-63% Denson et al. 2002), similar to rates reported by black drum and red drum anglers from Texas (28% Matlock 1981) but lower than reporting rates for a highly prized common snook fishery in Florida (60-70% Taylor et al. 2006). The base run of the SS3 model for the northern stock did not include tag-recapture data. When these data are included in the model, the model estimates reporting rates much lower (≈10%) than the reporting rates estimated in previous studies of tagged red drum in North Carolina (Table 1).

The exclusion of tag-recapture data from the southern base model had little impact on the estimates of spawning potential ratio (Fig. 4). This apparently indicates that the analysis of data for age/length composition, catch, indices of abundance, etc., gave similar estimates of fishing mortality as those derived when the tag/recapture data were included. The inclusion of tag-recapture data in the northern model also had little impact on the estimates of spawning potential ratio (Table 2).

When the reporting rates were fixed at different (and less likely) values in the southern base model, higher reporting rates of 60% gave SPR's similar to that estimated for SEDAR 18 and lower reporting rates of 18% gave SPR's that, on average, were about 30% lower than the basemodel levels. When the reporting rate for the recreational harvest fleet was fixed below ≈50% in the northern model (including the 18% scenario), the model estimated SPRs similar to the base model (Table 2). When the reporting rate was fixed at or greater than 50%, the model converged on a solution with much higher SPRs and a much larger stock size. Evaluation of the likelihoods of these reporting rate values shows a conflict among the data signals (Fig. 5). A low reporting rate is supported by the length composition data and the tag-recapture data, while a higher reporting rate is supported by the age data and index of abundance data. The total negative log likelihood increases as the reporting rate is fixed at increasing values, indicating the best model solution is the run with the reporting rates estimated. This ridged shift in model solutions as well as the apparent conflict among data sources may indicate a lack of information to estimate these parameters (Cass-Calay et al. 2014), given the northern stock base model configuration and input data.

Additional work is being conducted to analyze the tag-recapture data external to SS3 through a Brownie et al. (1985) or Seber (1970) approach to estimating survival. These analyses will be naïve to the change in selectivity across ages but adjustment factors based on the SS3-base-model estimated selectivities can be employed to correct for this bias.

Table 1. Reporting rate estimates from the SS3 model for northern stock red drum and from previous studies of tagged red drum in North Carolina.

Reporting Rate	Estimate	Ages	Fishery	Time Period of Fish	Treatment of Released Tags	Tags	M			
							0	1	2	3
SS3 Tag Model	0.09-0.12	0-16	Fleet-Specific	1989-2004	Not Included	NC DMF	0.2	0.129	0.1	0.1
Bacheler et al. 2008	0.18	0-3+	All Fleets Combined	1983-2006	Included	NC DMF	0.3	0.22	0.2	0.1
Bacheler et al. 2009	0.49	1	All Fleets Combined	2005-2007	Included	NC DMF	NA	0.38/0.04	NA	NA
Bacheler et al. 2009	0.77	1	Recreational Fleets Combined	2005-2007	Included	NCSU	NA	NA	NA	NA
Bacheler et al. 2009	0.44	1	Commercial Fleets Combined	2005-2007	NA	NCSU	NA	NA	NA	NA

Table 2. Static spawning potential ratio estimates for northern stock red drum from the base model and the model with tag-recapture data included and reporting rates estimated or the reporting rate of the recreational harvest fleet fixed at values from 10% to 95%.

Year	Base	Estimate Reporting Rate	Fixed Recreational Harvest Fleet Reporting Rate																		
			10%	15%	18%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
1989	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.52	0.56	0.59	0.62	0.64	0.66	0.68	0.70	0.71	0.72
1990	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.62	0.66	0.68	0.71	0.73	0.75	0.76	0.77	0.79	0.80
1991	0.07	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.10	0.76	0.78	0.80	0.82	0.83	0.84	0.86	0.86	0.87	0.88
1992	0.14	0.13	0.13	0.13	0.13	0.13	0.14	0.14	0.15	0.16	0.18	0.86	0.87	0.89	0.90	0.90	0.91	0.92	0.92	0.93	0.93
1993	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.69	0.72	0.75	0.77	0.79	0.80	0.81	0.82	0.83	0.84
1994	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.08	0.82	0.84	0.86	0.87	0.88	0.89	0.90	0.90	0.91	0.91
1995	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.77	0.79	0.81	0.83	0.84	0.85	0.86	0.87	0.88	0.88
1996	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.07	0.09	0.12	0.87	0.89	0.90	0.91	0.92	0.92	0.93	0.93	0.94	0.94
1997	0.16	0.14	0.14	0.15	0.15	0.16	0.17	0.18	0.19	0.21	0.26	0.90	0.91	0.92	0.93	0.93	0.94	0.94	0.95	0.95	0.95
1998	0.06	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.08	0.09	0.11	0.82	0.84	0.85	0.87	0.88	0.88	0.89	0.90	0.90	0.91
1999	0.10	0.09	0.09	0.10	0.10	0.10	0.11	0.12	0.13	0.14	0.17	0.84	0.85	0.87	0.88	0.89	0.90	0.90	0.91	0.91	0.92
2000	0.10	0.09	0.09	0.10	0.10	0.10	0.11	0.12	0.13	0.14	0.17	0.82	0.83	0.85	0.86	0.87	0.88	0.89	0.89	0.90	0.91
2001	0.26	0.24	0.24	0.25	0.25	0.25	0.26	0.27	0.28	0.30	0.33	0.86	0.88	0.89	0.90	0.91	0.91	0.92	0.92	0.93	0.93
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.59	0.63	0.66	0.68	0.70	0.72	0.74	0.75	0.76	0.77
2003	0.15	0.14	0.14	0.14	0.15	0.15	0.16	0.17	0.18	0.20	0.24	0.88	0.89	0.90	0.91	0.92	0.92	0.93	0.93	0.94	0.94
2004	0.09	0.08	0.09	0.09	0.09	0.10	0.11	0.11	0.13	0.14	0.18	0.84	0.86	0.87	0.88	0.89	0.90	0.91	0.91	0.92	0.92
2005	0.09	0.08	0.08	0.09	0.09	0.09	0.10	0.11	0.12	0.13	0.16	0.84	0.86	0.87	0.88	0.89	0.90	0.91	0.91	0.92	0.92
2006	0.08	0.07	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.12	0.15	0.83	0.85	0.86	0.87	0.88	0.89	0.90	0.90	0.91	0.91
2007	0.08	0.07	0.07	0.07	0.08	0.08	0.08	0.09	0.10	0.11	0.14	0.81	0.83	0.85	0.86	0.87	0.88	0.89	0.89	0.90	0.90
2008	0.08	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.12	0.14	0.81	0.83	0.85	0.86	0.87	0.88	0.89	0.89	0.90	0.90
2009	0.11	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.13	0.15	0.17	0.82	0.84	0.85	0.86	0.88	0.88	0.89	0.90	0.90	0.91
2010	0.06	0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.08	0.09	0.11	0.78	0.80	0.81	0.83	0.84	0.85	0.86	0.87	0.88	0.88
2011	0.24	0.23	0.23	0.23	0.24	0.24	0.25	0.26	0.27	0.29	0.32	0.88	0.89	0.90	0.91	0.91	0.92	0.93	0.93	0.93	0.94
2012	0.01	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.62	0.65	0.68	0.70	0.73	0.74	0.76	0.77	0.78	0.79
2013	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.07	0.76	0.79	0.81	0.82	0.84	0.85	0.86	0.86	0.87	0.88
Negative Log Likelihood		11,412	11,413	11,445	11,476	11,501	11,570	11,647	11,729	11,813	11,899	11,757	11,759	11,761	11,763	11,764	11,765	11,766	11,767	11,768	11,768

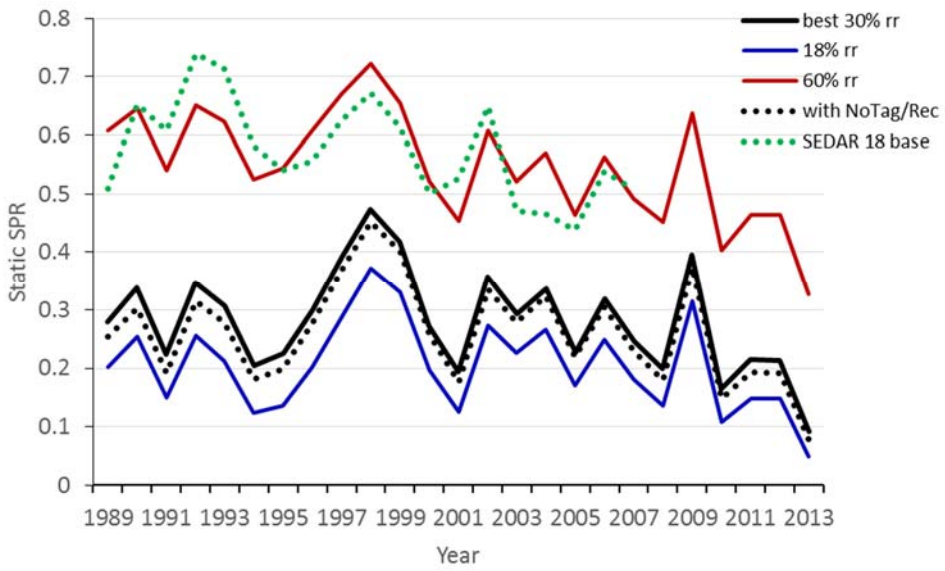


Figure 4. Static spawning potential ratios for southern stock red drum under different configurations for the inclusion of tag-recapture data into the analysis.

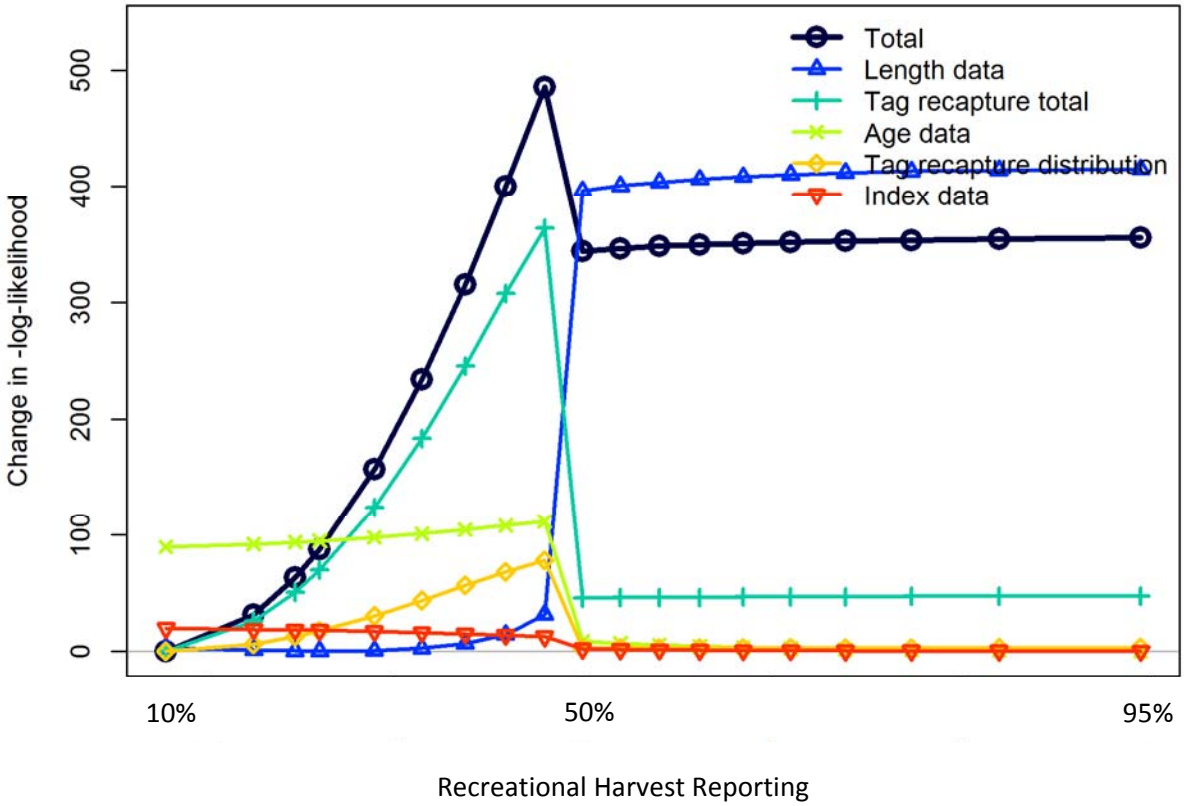


Figure 5. Change in negative log likelihood across different fixed values for the reporting rate of the recreational harvest fleet in the northern model.

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Validity of Age-Based Models

Board Task: The Board is concerned that the lack of information on adult red drum, especially in the northern stock, may impact the ability of the stock synthesis models to accurately

measure stock abundance. As a result, the Board asks for an evaluation of how red drum life history and current regulations (namely the moratorium on fishing in federal waters) may limit the validity of an age-based model such as SS3.

Working Group Progress

Age-based models provide a framework capable of providing managers with estimates of fishing mortality that can be separated into year and age effects as well as providing information on the abundance and age structure of a population, given all necessary inputs are available.

The prior stock assessment, SEDAR 18, incorporated a statistical catch-at-age model (SEDAR 18, 2009). The model used standard inputs such as fishery catches, abundance indices and age compositions but also, for the northern region, incorporated externally derived F-at-age estimates reported from a tag recapture model (Bacheler et al. 2009). The model configuration also included a very large proportion of the population in a plus group (ages-7+). This plus group was necessitated by the sparseness of information on adult fish from either dependent or independent sources and a scarcity of aging data at older ages. This dearth of information on the adult stock led to model results that were considered uninformative regarding biomass reference points. Determinations on the overfishing status, however, was considered useful through the use of static SPR, given that the majority of catch and indices were indicative of sub-adult ages (1-3).

For the northern stock, estimated parameters in the model were heavily influenced by the inclusion of the tagging data. This dependence on the tagging data was a concern, particularly with how the model was configured (i.e. tagging estimates used were derived external to the model). A high priority research need in the review recommended that the tagging data should be integrated within the SCA model to ensure that assumptions used when analyzing the tagging data would be fully incorporated into the estimates of the SCA. The southern stock, which lacked F-at-age estimates from tagging data, had much higher uncertainty in the SPR estimates.

The move from the SCA model to the SS3 framework was in response to recommendations from SEDAR 18 and the ongoing need to provide managers with reliable estimates of spawning stock biomass. SS3 provides an integrated modelling approach that is capable of addressing many of the concerns made during SEDAR 18. For example, SS3 allows for integration and analysis of tagging data internal to the model. The framework also allows for the direct fitting of index, length and age composition data. The integrated design requires less processing and/or assumptions about data external to the model and is capable of accounting for uncertainty in the various data inputs.

Lack of information on adult red drum

As noted above, the lack of information on adult red drum has precluded prior assessments from providing reliable estimates of spawning stock biomass. More recent efforts through the red drum longline surveys in Georgia, South Carolina and North Carolina provide fishery

independent indices of abundance and age-structure information that is incorporated into the SS3 framework. While informative, it should be noted that relative to the life-span of red drum (40+ years), these indices offer a short time-series for evaluation (2007 for Georgia and North Carolina; 1994 for South Carolina).

Some noted sources of data gaps and assumptions impacting estimates for adult red drum include:

1. Regulations
   - Regulations implemented by the states between 1998-2002 prohibited harvest on adults (no harvest over 27 inches from states NJ south) limiting information on this portion of the stock.
   - Concern also exists with accurate accounting when adult harvest was legal. Adult red drum catches have traditionally been noted as poorly represented in the catch. In part, low catches could be due to a large portion of the adult fishery occurring at night while recreational sampling was exclusively in daytime hours. Extending MRIP sampling to include night time intercepts has been a long-standing research recommendation of the TC (note: night sampling is in place under MRIP where it is "needed" as described by NOAA but this did not start until 2016).
2. Life History and management strategy
   - Ontogenetic shifts in life history likely reduce availability of red drum to the fishery with increasing age. Immature fish are described as ubiquitous with shorelines and shallow habitat in estuaries. This changes with the onset of maturity (age 3+) and subsequent movement out of estuaries (presumably to areas of reduced vulnerability; i.e. offshore).
   - No fishery dependent or independent surveys fully select for fish over a wide range of sizes, particularly as fish move from sub-adults to adults. Most surveys collect data on sub-adults or juveniles. The adult indices from the longline surveys are likely fully selected around age 5+.
   - There can be difficulty in estimating selectivity given the decreased availability due to both the life history changes and the slot limit. Model results will be sensitive to any assumptions about the descending limb of a dome shaped selectivity curve.
3. Size distribution of recreational releases
   - Length information on releases is largely unknown and must be assumed from other sources.
   - The proportion of releases to harvest has increased over time, increasing any potential bias. Release mortality exceeds harvest mortality in some years.
   - Decreased bag limits, increasing catch and release practices in the fishery, and possible increased effort in the fishery have led to an increase in the number of fish released alive.
   - Size distribution for all releases (sub-adult and adult) is implied from tagging data. To the extent that these tagged fish do not represent the size of fish in the population at-large, the resulting assumed length frequency will be biased. Potential exists in the north that this is biased towards large fish due to volunteers in the red drum tagging program being instructed not to tag red drum under 27 inches.

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OPINIONS & RESPONSES

COBIA CRISIS RESPONSE WAS PERFECT FOR SOUTH CAROLINA

South Carolina officials get it right on cobia crisis

By Dan Kibler July 01, 2016

South Carolina's well thought-out and measured response to the crisis of cobia should be an example for other states, especially several neighbors to the north.

The S.C. Department of Natural Resources' marine division knew several years ago that it might have a problem on its hands with cobia numbers. Fishermen were all telling the same story: they weren't seeing as many of the extremely popular gamefish during the spring spawning run in the Broad River and Port Royal and St. Helena sounds as in past years.

SCDNR studies showed that those fish, genetically, were a specific sub-species of a larger population that migrates north each spring and south again in the fall. These fish live off our coast and migrate inshore to spawn, then back out. They don't start in Key West and wind up off the Chesapeake Bay.

South Carolina officials were ahead of the cobia crisis, but states to our north had other ideas. Photo by Brian Cope

SCDNR knew there were problems. Federal fisheries managers warned of more potential problems late last fall, informing all Atlantic coast states north of Florida that too many cobia had been caught during 2015 and that they could expect some possible restrictions in 2016 to ensure that the annual catch quota wasn't exceeded a second year in a row.

SCDNR got to work immediately, and when federal officials announced on March 8 that cobia fishing in federal waters would close on June 20, the state already had legislation in the works to change regulations to try and avoid the over-harvest. On April 29, the governor signed a bill that closed the season south of Jeremy's Inlet on Edisto Island from May 1-May 31 and cut the daily creel limit in the same area from two to one, with a limit of no more than three cobia per boat for that period of time between June 1 and the federal closure on June 20.

Mel Ball, director of SCDNR's marine division, said, "We were already in the process of establishing the area from Edisto south to the Georgia line ... when this overage occurred."

Now, contrast this with our neighbors. In late May, the commission that oversees North Carolina's marine fisheries voted to go out of compliance with the feds. The agency came up with a plan that would extend the season through September, with a lower creel limit, higher size minimum and a division of the cobia pot that was obviously done to satisfy the charter captains north of Cape Hatteras who were the ones who had caught most of the 2015 overage. A week later, the commission that oversees Virginia's marine fisheries voted to go out of compliance with the feds in state waters, keeping the season open until Aug. 30 but instituting a one-fish daily creel limit (two fish per boat) and a 40-inch size minimum.

The complaint heard from both states? "If we'd had more time. If we'd known earlier, we could have done something."

Apparently, officials in South Carolina were listening last fall, and our cobia fishery will be better for it.

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SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

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Dr. Michelle Duval, Chair | Charlie Phillips, Vice Chair
Gregg T. Waugh, Executive Director

July 15, 2016

Mr. Robert E. Beal
Executive Director
Atlantic States Marine Fisheries Commission
1050 N. Highland St., Suite 200 A-N
Arlington, VA 20001

Dear Bob:

On behalf of the South Atlantic Fishery Management Council, I am requesting the Atlantic States Marine Fisheries Commission review the enclosed draft Coastal Migratory Pelagics Framework 4 (Cobia) document at your upcoming August 2016 meeting. John Carmichael will be attending and he will be able to answer any questions that may arise concerning the amendment. Public hearings are being held in August and the schedule is available from our website: http://safmc.net/meetings/public-hearing-and-scoping-meeting-schedule. Please note that we are holding a hearing on August 9th in Virginia Beach during the Mid-Atlantic Council's meeting. In addition, a webinar Q&A and hearing will be held on August 1st to provide the public unable to attend a hearing an opportunity to comment. Any assistance in spreading the word about these hearings would be greatly appreciated.

The Commission is a trusted partner in developing all of our fishery management plans, and we value the Commission's input. The public comment period ends at 5 pm on August 19th and our staff will be compiling all comments and input for our September briefing book. We would appreciate receiving the Commission's comments by August 22nd so that they can be included in our briefing book.

We also know that you will be discussing the Council's request that the Commission consider participating in joint or complimentary management of the cobia resource with the Council. John will be able to answer any questions the Commission may have.

We look forward to continuing our strong partnership in managing our fishery resources. Please do not hesitate to contact me if you have any questions.

Best regards,

Gregg T. Waugh
Executive Director

cc: Council members and staff
Louis Daniel
Monica Smit-Brunello
Jack McGovern, Rick DeVictor, and Karla Gore
Bonnie Ponwith, Theo Brainerd, and Adyan Rios
Rob O'Reilly

Draft
Framework Amendment 4
to the Fishery Management Plan for the Coastal Migratory Pelagics Fishery of the Gulf of Mexico and Atlantic Region

Management Measures for Atlantic Cobia

July 15, 2016

Environmental Assessment Regulatory Impact Review Regulatory Flexibility Analysis

A publication of the South Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration (NOAA) Award Number FNA10NMF4410012

Framework Amendment 4 to the Fishery Management Plan for the Coastal Migratory Pelagics Fishery of the Gulf of Mexico and Atlantic Region with Environmental Assessment and Regulatory Impact Review

Proposed action:	Modify recreational and commercial management measures for Atlantic migratory group cobia
Lead agency:	Framework Amendment – South Atlantic Fishery Management Council (South Atlantic Council) Environmental Assessment – National Marine Fisheries Service (NMFS) Southeast Regional Office
For Further Information Contact:	South Atlantic Fishery Management Council 4055 Faber Place, Suite 201 North Charleston, SC 29405 843-571-4366/ 866-SAFMC-10 www.safmc.net Kari MacLauchlin Kari.MacLauchlin@safmc.net NMFS, Southeast Region 263 13th Avenue South St. Petersburg, FL 33701 727-824-5305 http://sero.nmfs.noaa.gov Karla Gore Karla.Gore@noaa.gov

Summary

The South Atlantic Fishery Management Council (South Atlantic Council) is proposing Framework Amendment 4 to the Fishery Management Plan for the Coastal Migratory Pelagics Fishery (CMP FMP) in the Gulf of Mexico and Atlantic Region (Framework Amendment 4) to consider changes to harvest limits, recreational fishing year, and recreational accountability measures for Atlantic migratory group cobia.

In accordance with the provisions set forth in the Magnuson-Stevens Fishery Conservation and Management Act and regulations found at 50 CFR 622.389 (Adjustment of Management Measures), the intent of Framework Amendment 4 is to lengthen the recreational fishing season under the current constraints of the annual catch limit in place and provide fair access to the Atlantic cobia resource for fishermen in all states. Framework Amendment 4, with the integrated Environmental Assessment, will be available for public review before and during each South Atlantic Council meeting where the action will be discussed, during the proposed rule phase of the rulemaking process, and online at www.safmc.net.

Actions

Action 1. Modify the recreational management measures for Atlantic cobia
Action 1-1: Modify the recreational harvest limits for Atlantic cobia
Action 1-2: Modify the minimum size limit for Atlantic cobia

Action 2. Modify the recreational fishing year for Atlantic cobia*

Action 3. Modify the recreational accountability measures for Atlantic cobia

Action 4. Establish a commercial trip limit for Atlantic cobia

*NOTE: The current framework procedure for the CMP FMP does not allow changes to the fishing year through a framework amendment. In September 2016, the South Atlantic Council will need to remove the action from Framework Amendment 4, and start work on an FMP amendment (plan amendment) that will include an action to change the fishing year.

Abbreviations and Acronyms Used in the FMP

ABC	acceptable biological catch
ACL	annual catch limits
AM	accountability measures
ACT	annual catch target
B	a measure of stock biomass in either weight or other appropriate unit
B_{MSY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{MSY}
B_{OY}	the stock biomass expected to exist under equilibrium conditions when fishing at F_{OY}
B_{CURR}	The current stock biomass
CLM	Commercial Landings Monitoring System
CMP	coastal migratory pelagics
CPUE	catch per unit effort
EA	environmental assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
ESA	Endangered Species Act
F	a measure of the instantaneous rate of fishing mortality
$F_{30\%SPR}$	fishing mortality that will produce a static SPR = 30%
F_{CURR}	the current instantaneous rate of fishing mortality
F_{MSY}	the rate of fishing mortality expected to achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}
F_{OY}	the rate of fishing mortality expected to achieve OY under equilibrium conditions and a corresponding biomass of B_{OY}
FEIS	final environmental impact statement
FMP	fishery management plan
FMU	fishery management unit
HAPC	Habitat Area of Particular Concern
M	natural mortality rate
MARMAP	Marine Resources Monitoring Assessment and Prediction Program
MFMT	maximum fishing mortality threshold
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistics Survey
MRIP	Marine Recreational Information Program
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
OFL	overfishing limit
OY	optimum yield
PSE	percent standard error
RIR	regulatory impact review
SEDAR	Southeast Data Assessment and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
SPR	spawning potential ratio
SRD	Science and Research Director
SSC	Scientific and Statistical Committee

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Chapter 1. Introduction

1.1 What Actions are Being Proposed?

Framework Amendment 4 to the Fishery Management Plan for Coastal Migratory Pelagic Resources (CMP FMP) in the Gulf of Mexico and Atlantic Region includes actions to modify recreational and commercial harvest limits, change the recreational fishing year and modify recreational accountability measures for Atlantic migratory group cobia in the exclusive economic zone (EEZ) from the Georgia/Florida line through the Mid-Atlantic region.

The current framework procedure for the CMP FMP does not allow changes to the fishing year through a framework amendment. In September 2016, the South Atlantic Fishery Management Council (South Atlantic Council) will need to remove Action 2 from Framework Amendment 4, and start work on an FMP amendment (plan amendment) that will include an action to change the recreational fishing year. The South Atlantic Council is also exploring options for latitudinal season openings for recreational harvest of Atlantic cobia, which would be included in a future plan amendment.

1.2 Who is Proposing these Actions?

The coastal migratory pelagics (CMP) fishery is managed jointly by the Gulf of Mexico Fishery Management Council (Gulf Council) and the South Atlantic Council. Amendments to the FMP (plan amendments) must be approved by both the Gulf Council and the South Atlantic Council. Because this is a framework amendment that applies to the South Atlantic and Mid-Atlantic regions, only the South Atlantic Council is proposing the actions and will give final approval on the actions. The plan and framework amendments are submitted to the National Marine Fisheries Service (NMFS), which implements the actions on behalf of the Secretary of Commerce. NMFS is a line office in the National Oceanic and Atmospheric Administration.

South Atlantic
Fishery Management Council

- Responsible for conservation and management of fish stocks
- The South Atlantic Council consists of 13 voting members appointed by the Secretary of Commerce and 4 non-voting members. The Mackerel Committee of the South Atlantic Council also includes two voting seats for representatives from the Mid-Atlantic Fishery Management Council. The management area is from 3 to 200 nautical miles off the coasts of North Carolina, South Carolina, Georgia, and Florida through the Atlantic side of Key West. The South Atlantic Council manages the CMP Fishery through the Mid-Atlantic region.
- Develop management plans/amendments and recommends regulations to NMFS for implementation

1.3 Why is the South Atlantic Council Considering Action?

In 2015, recreational landings for the Atlantic migratory group (Georgia to New York[1]) cobia exceeded the 2015 recreational annual catch limit (ACL) of 630,000 lbs. The current accountability measure for Atlantic cobia requires that if landings exceed the ACL, the National Marine Fisheries Service (NMFS) must file a notice to reduce the length of the following recreational season by the amount necessary to ensure recreational landings may achieve the recreational annual catch target (ACT), but do not exceed the recreational ACL.

On March 9, 2016, NMFS announced that the 2016 recreational season for Atlantic cobia in federal waters would close on June 20, 2016. Because the closure would be at the time of year when recreational fishing for cobia is highest, the early closure is expected to have negative social and economic impacts on recreational anglers, for-hire businesses, for-hire clients, and associated support businesses, such as tackle shops. The negative effects of the closure will likely be most significant for recreational fishermen and businesses in North Carolina and Virginia. **Table 1.3.1** shows recreational landings of cobia by state.

Table 1.3.1. Recreational landings of Atlantic cobia from 2005-2015. Data sources: MRIP and SEFSC

Year	VA Landings	NC Landings	SC Landings	GA Landings	TOTAL ATLANTIC
2005	577,284	322,272	5,793	3,358	908,707
2006	733,740	104,259	101,018	4,824	943,841
2007	322,887	90,197	268,677	64,708	746,469
2008	167,949	66,258	50,108	257,690	542,006
2009	552,995	123,061	76,229	3,997	756,282
2010	232,987	561,486	65,688	79,855	940,015
2011	136,859	121,689	3,565	90,375	352,488
2012	36,409	68,657	224,365	105,193	434,623
2013	354,463	492,969	19,130	29,224	895,786
2014	214,427	277,489	31,927	20,642	544,485
2015	718,647	630,373	123,952	67,804	1,540,776

* There are no MRIP-estimated recreational landings of Atlantic cobia in states north of Virginia.

The South Atlantic Council is considering changes to management measures for Atlantic cobia harvest in federal waters in order to extend the fishing seasons for commercial and recreational harvest under the current annual catch limits, and to provide fair access to the Atlantic cobia resource for fishermen in all states. The framework amendment includes actions to modify the recreational bag limit, establish a recreational vessel limit, increase the recreational minimum size limit, change the recreational accountability measures, and modify the commercial harvest limits.

The Council also included an action to change the recreational fishing year in this framework amendment (Action 2). ***However, changes to the fishing year cannot be made through the framework procedure and the action will be moved to a future fishery management plan amendment at the September 2016 Council meeting.***

[1] No landings were reported north of Virginia.

Federal regulations for commercial and recreational harvest of Atlantic cobia in the EEZ (Georgia through New York) include a minimum size limit of 33 inches fork length (FL) and a possession limit of 2 fish per person per day. Regulations are consistent for state waters of Georgia and some areas of South Carolina (see below). In the Mid-Atlantic, recreational harvest in state waters of New Jersey and New York is subject to a minimum size limit of 37 inches total length (TL) and a bag limit of 2 fish per person per day.

Virginia, North Carolina and South Carolina have recently implemented management changes for cobia harvest in state waters. Effective June 1, 2016, the recreational harvest limits in Virginia state waters is 1 fish per person and 2 fish per boat; the minimum size limit is 40 inches total length (TL) and no more than one cobia over 50 inches TL is allowed per boat; no gaffing will be permitted; and state waters will close for the year on August 30, 2016. The meeting summary is available at: http://www.mrc.virginia.gov/Commission_Summaries/cs0516.shtm.

In February 2016, the North Carolina Marine Fisheries Commission approved a reduction in the recreational bag limit in North Carolina state waters to one fish per person per day effective on February 27, 2016 (see http://portal.ncdenr.org/web/mf/proclamation-ff-09-2016). The North Carolina Commission made additional changes to cobia harvest in state waters in May 2016. Effective May 23, 2016, the recreational minimum size limit is 37 inches fork length and state waters will close on September 30, 2016. On for-hire trips, the harvest limit is 4 cobia per vessel per day or 1 cobia per person per day if fewer than four people are on board. Private recreational harvest is only allowed on Monday, Wednesday and Saturday, with a vessel limit of 2 cobia per day and a bag limit of 1 cobia per person per day if there is only one person on board. Shore-based cobia harvest is allowed seven days a week with a recreational bag limit of 1 fish per person per day. The proclamation is available here: http://portal.ncdenr.org/web/mf/proclamation-ff-25-2016.

In April 2016, the governor of South Carolina approved legislation to establish a Southern Cobia Management Zone, which included state waters from Jeremy Inlet, Edisto Island, to the South Carolina/Georgia boundary. Effective May 1, 2016, cobia harvest in the Zone is limited to catch and release only for May 1 through May 31, and is limited to 1 fish per person per day or 3 fish per vessel per day, whichever is lower, from June 1 through April 30. The full language of the bill is available here: https://legiscan.com/SC/text/H4709/2015.

In March 2016, the South Atlantic Council sent a letter to the Atlantic States Marine Fisheries Commission (ASMFC) requesting that the ASMFC consider complementary management measures for cobia. In May 2016, the Interstate Fisheries Management Program Policy Board discussed cobia and the ASMFC has started exploring options for the development of an interstate fishery management plan for cobia. The Policy Board directed the South Atlantic Board of the ASMFC to develop alternatives for developing an FMP that is either joint, complementary, or exclusively managed by the Commission in order to determine what type of FMP is the best way to move forward. Minutes from the Policy Board meeting are available here: https://youtu.be/x5N02CdnPRQ. In August 2016, the ASFMC's South Atlantic Board will discuss management of cobia and review potential directions for complementary management.

CMP Joint Fishery Management Plan Objectives

The current management objectives in the joint CMP FMP as amended are:

1) The primary objective of this FMP is to stabilize yield at the maximum sustainable yield (MSY), allow recovery of overfished populations, and maintain population levels sufficient to ensure adequate recruitment.
2) To provide a flexible management system for the resource which minimizes regulatory delay while retaining substantial Council and public input in management decisions and which can rapidly adapt to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups or by areas.
3) To provide necessary information for effective management and establish a mandatory reporting system for monitoring catch.
4) To minimize gear and user group conflicts.
5) To distribute the total allowable catch of Atlantic migratory group Spanish mackerel between recreational and commercial user groups based on the catches that occurred during the early to mid-1970s, which is prior to the development of the deep water run-around gillnet fishery and when the resource was not overfished.
6) To minimize waste and bycatch in the fishery.
7) To provide appropriate management to address specific migratory groups of king mackerel.
8) To optimize the social and economic benefits of the CMP fisheries.

The actions proposed in the amendment specifically help to meet CMP FMP Objectives 2 and 8.

1.3.1 Purpose and Need Statement

Purpose for Action

The purpose of this amendment is to revise the management measures for Atlantic migratory group cobia to ensure consistent, stable and equitable fishing opportunities for all participants in the Atlantic cobia component of the CMP fishery.

Need for Action

The need for this amendment is to respond to changing fishery characteristics for Atlantic migratory group cobia, while increasing social and economic benefits of the CMP fishery through sustainable fishing opportunities and harvest of Atlantic cobia.

1.4 Which species and areas would be affected by the actions?

Three species—king mackerel, Spanish mackerel, and cobia—are included in the CMP FMP; however, cobia is the only species addressed in this framework amendment. Cobia is managed as two migratory groups—Atlantic and Gulf of Mexico. The actions in this amendment would address management of Atlantic migratory group cobia (Atlantic cobia) only.

The stock boundary between the Atlantic and Gulf of Mexico groups of cobia is established at the Georgia/Florida line, with the Atlantic cobia management area extended through the Mid-Atlantic region (**Figure 1.4.1**). The boundary is based on the approach used in the most recent stock assessment (SEDAR 28, 2013), which incorporated new information about the two stocks through genetic data and tagging studies. Although cobia caught off the east coast of Florida are considered Gulf cobia and counted toward the Florida east coast's allocation of the Gulf annual catch limit (ACL), the South Atlantic Council manages the area through the Council boundary in the Florida Keys.

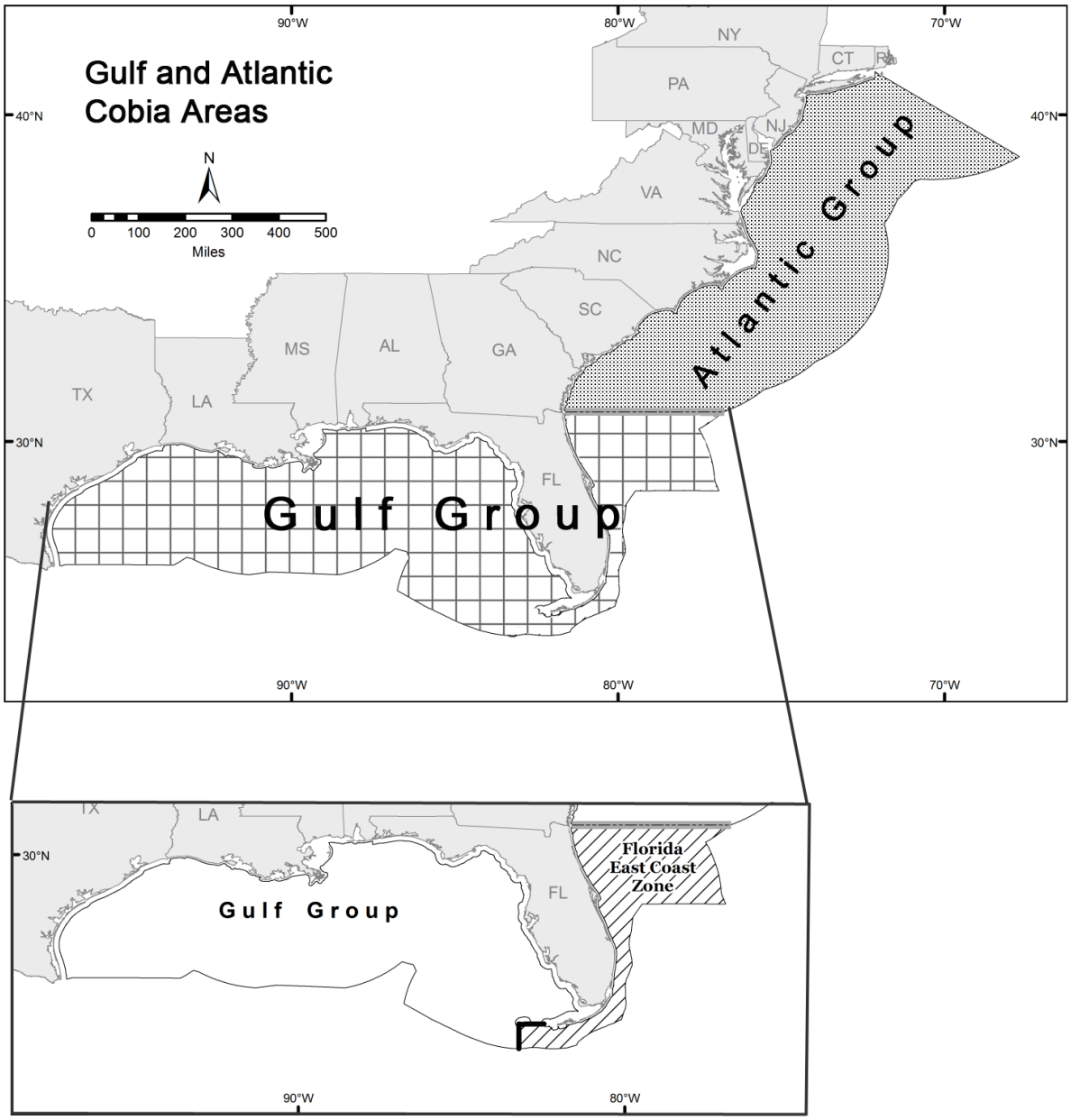

Figure 1.4.1. Boundary between Atlantic and Gulf group cobia

Chapter 2. Proposed Actions and Alternatives

Action 1: Modify the recreational management measures for Atlantic cobia

Action 1-1: Modify the recreational harvest limits for Atlantic cobia

Alternative 1 (No Action). Do not modify the possession limit of 2 fish per person per day for Atlantic cobia that are not sold.

Preferred Alternative 2. Establish a recreational bag limit for Atlantic cobia.
- **Preferred Sub-alternative 2a**. 1 fish per person per day
- **Sub-alternative 2b**. 2 fish per person per day

Preferred Alternative 3. Establish a recreational vessel limit for Atlantic cobia.
- **Sub-alternative 3a**. 1 fish per vessel per day
- **Sub-alternative 3b**. 2 fish per vessel per day
- **Preferred Sub-alternative 3c**. 3 fish per vessel per day
- **Sub-alternative 3d**. 4 fish per vessel per day
- **Sub-alternative 3e**. 5 fish per vessel per day
- **Sub-alternative 3f**. 6 fish per vessel per day

Action 1-2: Modify the minimum size limit for recreational harvest of Atlantic cobia

Alternative 1 (No Action). Do not modify the minimum size limit of 33 inches fork length (FL) for recreational and commercial harvest of Atlantic cobia.

Preferred Alternative 2. Modify the minimum size limit for Atlantic cobia for recreational and commercial harvest of Atlantic cobia.
- **Sub-alternative 2a**. 34 inches FL
- **Sub-alternative 2b**. 35 inches FL
- **Preferred Sub-alternative 2c**. 36 inches FL
- **Sub-alternative 2d**. 37 inches FL
- **Sub-alternative 2e**. 38 inches FL
- **Sub-alternative 2f**. 39 inches FL
- **Sub-alternative 2g**. 45 inches FL
- **Sub-alternative 2h**. 50 inches FL

NOTE: Action 1-2 includes language to apply changes to the minimum size limit to commercial harvest, but the Council indicated that this action would apply to only recreational harvest.

Analysis of the alternatives assumed that the changes to the minimum size limit would apply only to recreational harvest. At their September 2016 meeting, the Council will revise the language to specify that the action applies to only the recreational minimum size limit, and will consider modifying the commercial minimum size limit in a future amendment.

Discussion:

Action 1 includes two sub-actions that would implement recreational harvest limits through personal bag limits, vessel limits, minimum size limits, or a combination of these management measures. The intent of this action is to ensure a longer fishing season for recreational cobia, and a combination of harvest limits and size limits are often effective in slowing the rate of harvest.

Action 1-1 includes alternatives to modify the recreational possession limit and to establish a vessel limit. Currently in the federal regulations, Atlantic cobia are designated as "sold" or "not sold" to differentiate between commercial and recreational harvest, respectively. The current possession limit for commercial and recreational trips harvesting Atlantic cobia in federal waters is the same: 2 fish per person.

Under **Alternative 1 (No Action)**, the current recreational possession limit for Atlantic cobia would remain as 2 fish per person. **Preferred Alternative 2** would establish the recreational bag limit as 1 fish per person per day (**Preferred Sub-alternative 2a**) or 2 fish per person per day (**Sub-alternative 2b**). **Preferred Alternative 3** would establish a vessel limit for recreational cobia harvest at 1 fish (**Sub-alternative 3a**), 2 fish (**Sub-alternative 3b**), 3 fish (**Preferred Sub-alternative 3c**), 4 fish (**Sub-alternative 3d**), 5 fish (**Sub-alternative 3e**) or 6 fish (**Sub-alternative 3f**).

Table 2.1.1 shows the estimated dates when recreational landings would meet the recreational ACL of 620,000 lbs (for 2016 and subsequent years) under the different combinations of bag/vessel limit and minimum size limit based on recreational harvest patterns in 2013 through 2015. Estimated dates when recreational landings would reach the recreational ACL are later in the fishing year or not at all if the bag limit is 1 per person, and for the lower vessel limits. Larger minimum size limits also extend estimated date for reaching the recreational ACL.

The current preferred alternatives in **Actions 1-1** and **1-2** (highlighted in **Table 2.1.1**) are estimated to result in landings reaching the recreational ACL around the third week of July, under the current recreational fishing year of January 1- December 31 and assuming consistent harvest limits in state and federal waters.

Table 2.1.1. Estimated dates when Atlantic cobia recreational landings would meet the recreational ACL (620,000 lbs for 2016 and subsequent years) under the range of minimum size limits, bag limits, and vessel limits, under the current fishing year of January 1- December 31. Highlighted cells are the current Preferred Sub-alternatives in Action 1.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per person	2-Jul	5-Jul	10-Jul	17-Jul	23-Jul	31-Jul	5-Aug	None	None
2 per person	30-Jun	3-Jul	7-Jul	14-Jul	20-Jul	28-Jul	1-Aug	None	None
Vessel Limit									
1	30-Jul	4-Aug	11-Aug	22-Aug	22-Sep	None	None	None	None
2	11-Jul	15-Jul	20-Jul	28-Jul	5-Aug	15-Aug	21-Aug	None	None
3	5-Jul	9-Jul	13-Jul	20-Jul	27-Jul	5-Aug	10-Aug	None	None
4	3-Jul	6-Jul	11-Jul	18-Jul	24-Jul	2-Aug	7-Aug	None	None
5	2-Jul	6-Jul	10-Jul	17-Jul	23-Jul	1-Aug	6-Aug	None	None
6	30-Jun	4-Jul	8-Jul	15-Jul	21-Jul	29-Jul	3-Aug	None	None

Note: This analysis assumed that the recreational bag limit, vessel limit and minimum size limit would be consistent in state and federal waters for the South Atlantic and Mid-Atlantic regions. Additionally, the estimated dates were generated based on recreational landings from 2013-2015.

Table 2.1.2 shows the current regulations in state waters compared to the bag limits and vessel limits in **Preferred Alternatives 2** and **3** in **Action 1-1.**

Table 2.1.2. Bag limits and vessel limits in state waters of Virginia, North Carolina, South Carolina and Georgia, compared to limits in options under **Preferred Alternatives 2** and **3** in **Action 1-1.**

	Bag limit	**Vessel limit**	**Consistent Sub-alternatives**
Virginia	1 fish	2 fish	Sub-alternatives 2a (Pref), 3b
North Carolina	1 fish	For-hire: 4/vessel or 1 person when less than 4 people on board Private: 2 fish on vessels with more than 1 person on board	Sub-alternative 2a (Pref), 3d (for-hire), 3b (private)
South Carolina – north of Jeremy Inlet, Edisto Island	2 fish	None	Sub-alternative 2b
South Carolina- south of Jeremy Inlet, Edisto Island	1 fish June 1- Apr 30 Catch and release only May 1-May 31	3 fish per vessel or 1 fish per person, whichever is lower	June 1- Apr 30: Sub-alternatives 2a (Pref) and 3c (Pref)
Georgia	2 fish	None	Sub-alternative 2b

Action 1-2 includes alternatives to modify the current minimum size limit for recreational harvest of Atlantic cobia. Under **Alternative 1 (No Action)**, the minimum size limit for recreational harvest would remain at 33 inches fork length. **Sub-alternatives 2a-2h** under **Preferred Alternative 2** would increase the minimum size limit to 34, 35, 36, 37, 38, 39, 45, or 50 inches fork length. **Table 2.1.3** shows the current minimum size limits in state waters compared to the options minimum size limit in **Preferred Alternative 2.**

Table 2.1.3. Minimum size limits in state waters of Virginia, North Carolina, South Carolina and Georgia, compared to limits in options under **Preferred Alternative 2** in **Action 1-2.**

	Minimum size limit	**Consistent Sub-alternatives**
Virginia	40 inches total length	None, but comparable to Sub-alternatives 2b or 2c (Pref).
North Carolina	37 inches fork length	Sub-alternative 3d
South Carolina	33 inches fork length	Alt 1 No Action
Georgia	33 inches fork length	Alt 1 No Action

Comparison of Alternatives:

Biological Effects
Overall, the lower harvest limits combined with higher minimum size limit will be most effective to decrease recreational landings. The Council has currently selected **Preferred Alternative 2, Preferred Sub-alternative 2c** under Action 1-2, which is a minimum size limit of 36 inches fork length (FL). Action 1-2, **Preferred Alternative 2, Preferred Sub-Alternative 2c** (36 inch size limit) in combination with the preferred alternatives of **Action 1-1, Preferred Alternative 2, Preferred Sub-Alternative 2a** (1 fish bag limit) **and Preferred Alternative 3, Preferred Sub-alternative 3c** (three fish per vessel limit) would result in a decrease in landings of 15.1%.

Economic Effects
MRIP estimates indicate that on most trips where cobia are landed, there is not more than one cobia harvested per person. Based on this assumption, is not likely that lowering the bag limit to 1 fish per person will impact most recreational cobia trips. While the overall economic effect is expected to be minor, some CS may be lost on trips when more than 1 fish per person could be kept and the angler desires to do so. The economic effects of a vessel limit are similar to those described under a reduced bag limit, but these effects will be more pronounced on trips where the vessel limit is more restrictive than the bag limit. **Action 1-1/Preferred Sub-alternative 3c** is expected to reduce cobia harvest by 4.4%, signaling some potential negative economic effects. It is unclear how this option will impact overall fishing effort and thus for-hire NOR or revenue for other fishing-related businesses, but the lower vessel limit options are more likely to create heightened negative economic effects.

In general, increasing the size limit for a species typically has little long-term economic effect unless the larger size limit is set so high that it negatively impacts long-term effort or it results in greater numbers of fish reaching spawning size and/or fish have higher fecundity prior to being harvested. **Action 1-2/Preferred Sub-alternative 2c** sets the size limit at 36 inches FL and is expected to initially decrease harvest by 10.7%, showing that the majority of cobia kept are at or

above this limit and most trips will not be negatively affected. There may be some positive economic benefits from this size limit change should it help maintain or increase the overall cobia stock biomass in the long-term as well as prevent closures or prolong the fishing season.

When the implementation of vessel limits, reduced bag limits, and increased size limits are taken into the account, they are anticipated to mitigate the likelihood of a harvest closure if the recreational ACL is caught or prolonging the harvest season. Should a harvest closure occur, there may be loss of CS and anglers may decide to forgo some fishing trips due to the closure, depending on the closure timing. While some economic benefits will still be realized from catch and release fishing during a harvest closure, anglers often value being able to harvest cobia, resulting in a decrease in overall recreational effort. As a consequence, there will be negative economic effects to for-hire operators and other fishing related businesses due to the reduced recreational fishing activity and the reduction in angler expenditures on durable and non-durable goods that go along with this activity.

Social Effects

In general, the social effects of modifying the recreational harvest limits would be associated with the biological costs of each alternative as well as the effects on current recreational fishing opportunities. While the potential measures in this action could restrict recreational fishing opportunities for Atlantic cobia, the harvest limits could help to extend the recreational fishing season by slowing the rate of harvest. Different levels of recreational fishing opportunities under each alternative could affect recreational anglers and for-hire businesses targeting Atlantic cobia, particularly in North Carolina and Virginia. In general, benefits to the recreational sector will result from harvest limits that lengthen the fishing season, but still maintain harvest limits large enough to have minimum effect on recreational trip satisfaction.

The social effects of the potential harvest limits will depend on the effect on how the measures or combination of measures can restrict the number of fish that can be kept, which could affect recreational trip satisfaction, and the trade-off required to keep the season open by slowing the rate of harvest.

Administrative Effects

Establishing bag limits, vessel limits and size limits will have result in an administrative burden associated with rulemaking, outreach, education and enforcement. However, the impact is expected to be minimal based on the alternatives proposed in this amendment.

Action 2: Modify the recreational fishing year for Atlantic cobia

Alternative 1 (No Action). Do not modify the current recreational fishing year of January 1 through December 31.

Preferred Alternative 2. Modify the recreational fishing year for Atlantic cobia to be May 1 through April 30.

Alternative 3. Modify the recreational fishing year for Atlantic cobia to be June 1 through May 31.

Alternative 4. Modify the recreational fishing year for Atlantic cobia to be April 1 through March 31.

NOTE: Changes to the fishing year cannot be made through the framework procedure so the Council will need to move Action 2 to a plan amendment at their September 2016 meeting. This will delay action if the Council decides to change the recreational fishing year.

Discussion:

Action 2 includes alternatives to modify the recreational fishing year for Atlantic cobia. The Council is considering this change because a later start date of the fishing year may result in recreational landings reaching the recreational ACL later in the year, after the primary time of year when cobia is targeted. **Figure 2.2.1** shows the peak in recreational landings around the middle of the year.

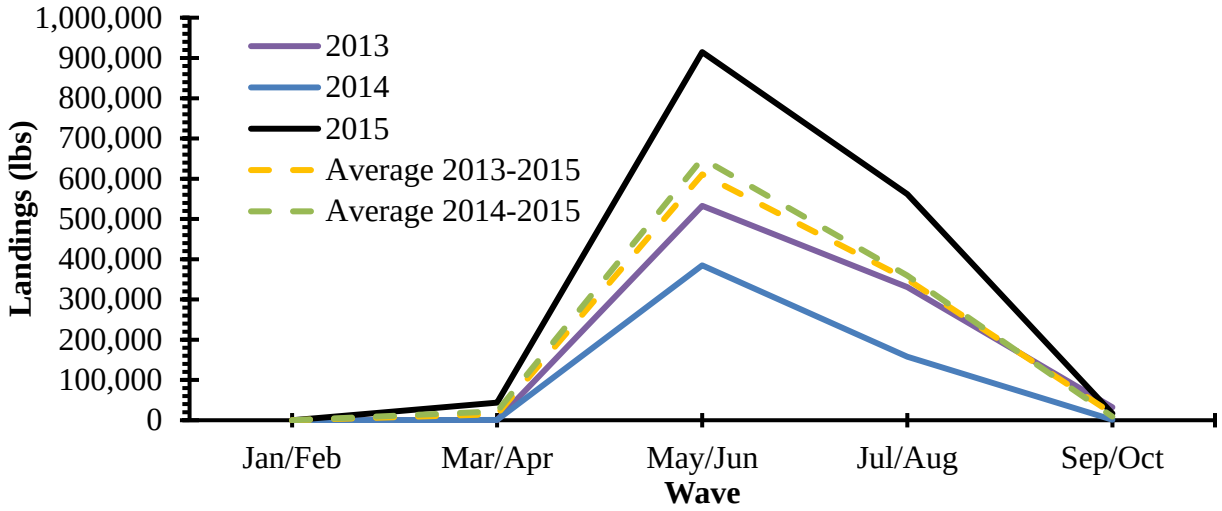

Figure 2.2.1. Atlantic recreational landings for January-October of 2013, 2014, 2015, average 2013-2015 landings, and average 2014-2015 landings by two-month wave. The landings for 2015 are preliminary. Source: SEFSC Recreational ACL Dataset

Alternative 1 (No Action) would not change the current recreational fishing year of January 1 through December 31. **Preferred Alternative 2** would change the recreational fishing year to start on May 1 and end on April 30; **Alternative 3** would change the recreational fishing year to start on June 1 and end on May 31; and **Alternative 4** would change the recreational fishing year to April 1 through March 31.

Table 2.2.1 shows the estimated dates when recreational landings would reach the recreational ACL under the potential harvest limits in Action 1 if the fishing year was May 1 through April 30 (**Preferred Alternative 2**). Under the bag limit, vessel limit and minimum size limit that the Council has currently selected as the preferred alternatives in Action 1, recreational landings would likely reach the ACL between July 19 and July 23 if the fishing year opened on May 1. These estimates assume that regulations are consistent in state and federal waters, and is based on recreational landings patterns in fishing years 2013 through 2015.

Table 2.2.1. Estimated dates when Atlantic cobia recreational landings would meet the recreational ACL under the range of minimum size limits, bag limits, and vessel limits, if the fishing year is changed to May 1-April 30 (**Preferred Alternative 2**). Highlighted cells are the current Preferred Sub-alternatives in Action 1.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per Person	5-Jul	8-Jul	13-Jul	19-Jul	26-Jul	3-Aug	8-Aug	None	None
2 per Person	2-Jul	6-Jul	10-Jul	16-Jul	23-Jul	31-Jul	4-Aug	None	None
Vessel Limit									
1 per Vessel	2-Aug	7-Aug	14-Aug	25-Aug	20-Mar	None	None	None	None
2 per Vessel	14-Jul	18-Jul	23-Jul	31-Jul	8-Aug	18-Aug	24-Aug	None	None
3 per Vessel	8-Jul	12-Jul	16-Jul	23-Jul	30-Jul	8-Aug	13-Aug	None	None
4 per Vessel	6-Jul	9-Jul	14-Jul	21-Jul	27-Jul	5-Aug	10-Aug	None	None
5 per Vessel	5-Jul	8-Jul	13-Jul	20-Jul	26-Jul	4-Aug	9-Aug	None	None
6 per Vessel	3-Jul	7-Jul	11-Jul	18-Jul	24-Jul	1-Aug	6-Aug	None	None

Note: As with **Table 2.1.1** this analysis assumed consistent regulations in state and federal waters, and estimated the dates based on recreational landings from 2013-2015.

As noted above, changes to the fishing year are not allowed under the framework procedure for the Coastal Migratory Pelagics Fishery Management Plan. The Council will move this action to a plan amendment, which will delay action on any potential change to the recreational fishing year. The Council will review the effects of the potential change to the recreational fishing year

because the start date of the fishing year could affect season length under the potential changes to bag limit, vessel limit and minimum size limit in Action 1.

Comparison of Alternatives:

Biological Effects
If the Council were to select more restrictive management harvest limits (**Action 1-1**) or minimum size limits (**Action 1-2**), there would be the potential to extend the season. Under **the** most restrictive harvest limits and minimum size limits in **Action 1**, it is expected that recreational landings would not reach the recreational ACL. Changing the fishing year in **Preferred Alternative 2** would only increase the time before landings reached the recreational ACL by about three days from **Alternative 1 (No Action),** largely because the pulse nature of the fishery, and the bulk of the landings occur during May/June and the landings from January-April are minimal. Under **Alternative 3**, landings would not reach the ACL until later in the fishing year, and would ensure that the fishery would be open during the early part of the year, giving fishing opportunities to those fishing off North Carolina and South Carolina. **Alternative 4** provides a very similar closure date as **Alternative 1** and **Alternative 2** because the bulk of the landings occur in May, just after the proposed start of the fishing year.

Economic Effects
Changing the start and end dates of a fishing year does not in and of itself create economic effects except if the entire ACL is taken prior to the end of the fishing year. Overall, ensuring that each state has a time period to harvest cobia while the fish are present in large numbers off of their coastal waters would ensure economic benefits are derived from the cobia fishery and the economic value and impacts are distributed in an equitable manner among coastal communities in the South and Mid Atlantic. The majority of cobia effort and harvest occurs after May 1, therefore **Preferred Alternative 2** and **Alternative 4** will have minimal impacts on the overall cobia fishery. Under **Preferred Alternative 2** and more so under **Alterative 3**, there is potential for negative economic effects to occur if harvest was closed for the remainder of a given fishing year in the southern part of the range at the beginning of the typical cobia season, especially in Georgia, South Carolina, and North Carolina.

Social Effects
Modification to the fishing year and establishing closed season could have negative effects on the recreational sector by limiting fishing opportunities, but could also benefit the recreational sector by allowing the season to be open during peak harvest times during the year. Because recreational most harvest occurs in May-July, current landings patterns indicate that the estimated dates when recreational landings would reach the recreational ACL are similar under **Alternative 1 (No Action), Preferred Alternative 2**, and **Alternative 4,** and would have similar effects on recreational fishermen and associated businesses. Starting the fishing year on June 1 (**Alternative** 3) may help keep recreational landings from reaching the recreational ACL early in the summer, but could also restrict access to cobia in the late spring and early summer months if there is a current or future management measure that results in a closure at the end of the fishing year.

Alternatives 2-4 also would result in different fishing years for the commercial and recreational sectors. This would increase the complexity of Atlantic cobia management, in addition to limiting the conditions that could be places on accountability measures, as discussed in **Section 4.3**.

Administrative Effects

There will be no difference in the administrative burden between **Preferred Alternative 2**, **Alternative 3 and Alternative 4**. However, these action alternatives will have a greater administrative burden than **Alternative 1 (No Action.** These impacts will be associated with rule-making, quota monitoring, outreach and education and enforcement.

Action 3: Modify the recreational accountability measures for Atlantic cobia

Alternative 1 (No Action): Do not revise the recreational accountability measures (AMs) for Atlantic cobia as established in Amendment 18 (GMFMC/SAFMC 2011).

Preferred Alternative 2. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, ~~then during the following fishing year,~~ recreational landings will be monitored for a persistence in increased landings. If necessary, the Regional Administrator shall publish a notice to reduce the length of the following fishing season to ensure that recreational landings meet the recreational ACT but do not exceed the recreational ACL, based on the recreational landings in the previous year. The length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT for 2016 and subsequent fishing years is 500,000 lbs, as established in CMP Amendment 20B.

Sub-alternative 2a. The Regional Administrator will reduce the length of the following fishing year only if the species is overfished.

Preferred Sub-alternative 2b. The Regional Administrator will reduce the length of the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 2c. The Regional Administrator will reduce the length of the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

Alternative 3. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, the Regional Administrator shall publish a notice to reduce the recreational ACL in the following fishing year by the amount of the recreational overage. The length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT would also be adjusted according to the following formula: recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

Sub-alternative 3a. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the species is overfished.

Sub-alternative 3b. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 3c. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

Alternative 4. If recreational landings reach or are projected to reach the recreational ACL, the Regional Administrator shall publish a notice to close the recreational sector for the remainder of the fishing year, unless, using the best scientific information available, the Regional Administrator determines that a closure is unnecessary.

Sub-alternative 4a. If the species is overfished.

Sub-alternative 4b. Regardless of the overfished status of the species.

Alternative 5. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, ~~then during the following fishing year,~~ recreational landings will be monitored for a persistence in increased landings. If necessary, the Regional Administrator shall publish a notice to reduce the recreational vessel limit for the following fishing year to ensure that recreational landings meet the recreational ACT but do not exceed the recreational ACL, based on the recreational landings in the previous year. The recreational vessel limit will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT for 2016 and subsequent fishing years is 500,000 lbs, as established in CMP Amendment 20B.

Sub-alternative 5a. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the species is overfished.

Sub-alternative 5b. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 5c. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

Discussion:

The AMs for the Atlantic migratory group of cobia were established in Amendment 18 (GMFMC/SAFMC 2011) as follows:

Commercial

The commercial AM for this stock is to prohibit harvest, possession, and retention when the commercial quota (total ACL x commercial allocation) is met or projected to be met. All purchase and sale is prohibited when the commercial quota is met or projected to be met.

If total Atlantic cobia landings exceeds the stock ACL, and Atlantic cobia are overfished, based on the most recent status of U.S. Fisheries Report to Congress, the commercial ACL for following fishing year will be reduced by the amount of any applicable sector-specific ACL overage in the prior fishing year.

Recreational

If the recreational sector quota (total ACL x recreational allocation) is exceeded, the Regional Administrator shall publish a notice to reduce the length of the following fishing year by the amount necessary to ensure landings do not exceed the recreational sector ACT for the following fishing year, but only if the Total ACL is exceeded. The season length will allow recreational landings to achieve the applicable recreational ACT but not exceed the applicable recreational ACL.

To calculate the recreational season length if this AM is triggered, the RA will use the following direction from Amendment 18:

Compare the recreational ACL with recreational landings over a range of years. For 2011, use only 2011 landings. For 2012, use the average landings of 2011 and 2012. For 2013 and beyond, use the most recent three-year (fishing years) running average. If in any year the ACL is changed, the sequence of future ACLs will begin again starting with a single year of landings compared to the ACL for that year, followed by two-year average landings compared to the ACL in the next year, followed by a three-year average of landings ACL for the third year and thereafter.

If the recreational ACL is exceeded, the Assistant Administrator for Fisheries shall file a notification with the Office of the Federal Register to reduce the recreational ACL in the following year by the amount of the overage, if the Total ACL is exceeded and the stock is overfished. The ACT would also be adjusted according to the following formula: recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

Because Amendment 20B (GMFMC/SAFMC 2014) changed the ACL beginning in 2015 (based on the SEDAR 28 (2013) stock assessment), only the 2015 landings are used to determine whether the recreational or stock ACL was exceeded such that the AM is triggered. For 2015, both the recreational ACL and the stock ACL were exceeded, and NMFS published a notice to reduce the length of the 2016 fishing season to ensure that 2016 recreational landings did not exceed the 2016 recreational ACL.

Alternative 1 (No Action) would not modify the recreational AMs for Atlantic cobia, with no changes to the three-year rolling average used for evaluation when landings exceed the ACL. **Preferred Alternative 2** would modify the recreational AMs reduce the season length of the following fishing year if recreational landings exceeded the recreational annual catch limit (ACL), and the evaluation would be *based only on that year's recreational landings*. Under **Sub-alternative 2a**, the reduced season length would be implemented only if Atlantic cobia were designated as overfished. Under **Preferred Sub-alternative 2b,** the AM would only be triggered if the total ACL was exceeded as well as the recreational ACL. Under **Sub-alternative 2c**, the season would be shortened if both the recreational and total ACL were exceeded, and Atlantic cobia was designated as overfished.

Alternative 3 would modify the recreational AMs reduce the recreational ACL of the following fishing year if recreational landings exceeded the recreational annual catch limit (ACL). Under **Sub-alternative 3a**, the reduced recreational ACL would be implemented only if Atlantic cobia were designated as overfished. Under **Sub-alternative 3b,** the AM would only be triggered if the total ACL was exceeded as well as the recreational ACL. Under **Sub-alternative 3c**, the season would be shortened if both the recreational and total ACL were exceeded, and Atlantic cobia was designated as overfished. **Sub-alternative 3c** is consistent with the current post-season AM to reduce the recreational ACL under **Alternative 1 (No Action).**

Alternative 4 would modify the recreational AMs to include an in-season closure if recreational landings met or were projected to meet the recreational ACL. The in-season closure would occur only if Atlantic cobia are designated as overfished under **Sub-alternative 4a**, but would occur regardless of stock status under **Sub-alternative 4b.** An in-season closure could help reduce the

likelihood of a substantial overage of the recreational ACL, because recreational harvest could be prohibited sooner.

Alternative 5 would establish a recreational AM to reduce the recreational vessel limit during the following fishing year if recreational landings exceeded the recreational annual catch limit (ACL), and the evaluation would be *based only on that year's recreational landings*. The reduced vessel limit would only apply for the fishing year following the year with the overage. After the year with the reduced vessel limit, the vessel limit would return to the permanent limit as determined in Action 1-1, unless recreational landings continue to exceed the recreational AM. If this occurs for more than one year, there could be multiple years with a vessel limit lower than the permanent vessel limit specified in Action 1-1.

Under **Sub-alternative 5a**, the reduced vessel limit would be implemented only if Atlantic cobia were designated as overfished. Under **Sub-alternative 5b,** the AM would only be triggered if the total ACL was exceeded as well as the recreational ACL. Under **Sub-alternative 5c**, the vessel limit would be reduced the next fishing year if both the recreational and total ACL were exceeded, and Atlantic cobia was designated as overfished.

Under this action, the Council may select multiple alternatives and sub-alternatives as the preferred alternatives to establish the AM system for recreational harvest of Atlantic cobia. The post-season accountability measures of a reduced season length (**Preferred Alternative 2**), reduced recreational ACL (**Alternative 3**) and reduced vessel limit (**Alternative 5**) could be used *in combination or separately* to mitigate an overage and/or ensure the subsequent fishing year's landings do not exceed that year's ACL, as determined by the Regional Administrator.

Table 2.3.1 contains a summary of the recreational AMs under each alternative and sub-alternative. The highlighted sections show the AMs that would align with the preferred alternatives in the Generic AM amendment (SAFMC 2015).

Table 2.3.1. Summary of Recreational AMs under the alternatives

	In-season AM	**Post-season AM**
Alternative 1 (status quo)	No in-season closure	Reduced season length so ACT is met but ACL not exceeded ONLY if rec ACL and total ACL are exceeded. Use the rolling average of most recent 3 years. Reduce the recreational ACL if rec ACL and total ACL are exceeded, AND Atlantic cobia is designated as overfished.
Alternative 2. Sub-alt 2a		Reduce season length based on last year's landings if overfished
Alternative 2. Sub-alt 2b (Preferred)		Reduce season length based on last year's landings if total ACL exceeded

Table 2.3.1 continued. Summary of Recreational AMs under the alternatives		
	In-season AM	**Post-season AM**
Alternative 2. Sub-alt 2c		Reduce season length based on last year's landings if total ACL exceeded and overfished
Alternative 3 Sub-alt 3a		Reduce rec ACL by amount of the overage if overfished
Alternative 3 Sub-alt 3b		Reduce rec ACL by amount of the overage if total ACL exceeded
Alternative 3 Sub-alt 3c		Reduce rec ACL by amount of the overage if total ACL exceeded and overfished
Alternative 4 Sub-alt 4a	In-season closure when rec ACL is met or projected to be met if overfished	
Alternative 4 Sub-alt 4b	In-season closure when rec ACL is met or projected to be met regardless of stock status	
Alternative 5. Sub-alt 5a		Reduce vessel limit based on last year's landings if overfished
Alternative 2. Sub-alt 5b		Reduce vessel limit based on last year's landings if total ACL exceeded
Alternative 5. Sub-alt 5c		Reduce vessel limit based on last year's landings if total ACL exceeded and overfished

Comparison of Alternatives:

Biological Effects

Under the current AMs, NMFS must file a notice at or near the beginning of the following fishing year to reduce the length of the recreational season by the amount necessary to ensure recreational landings may achieve the recreational ACT, but do not exceed the recreational ACL. To determine whether an ACL has been exceeded, Amendment 18 required using 2011 landings in the first year, then the average of 2011/12 in the second year and then a three-year average of landings in the third year onwards, unless an ACL changed, in which case the first single year of landings will be compared to the ACL. Because Amendment 20B changed the ACL beginning in 2015 (based on the stock assessment), only the 2015 landings are used to determine whether the recreational or stock ACL was exceeded such that the AM is triggered. For 2015, both the recreational ACL and the stock ACL were exceeded, and thus, the length of the 2016 fishing

season must be reduced.

Economic Effects
Assuming the recreational ACL is exceeded, greater short-term negative economic effects would be expected from **Alternative 3** sub-alternatives than from **Alternative 2** sub-alternatives. Minimizing ACL overages under **Alternative 4** has long-term positive economic effects. The overall economic effects of **Alternative 5** would vary based on the severity of the vessel limit reduction. However, if the ACL is not exceeded in any given season, there would be no differences between **Alternatives 1-5**.

Social Effects
Accountability measures can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. In general, the most long-term benefits for the stock and for sustainable fishing opportunities will result from a combination of measures to slow the rate of harvest during the year (as in **Preferred Alternative 2** and **Alternative 5**) and to mitigate an overage in a following year (as in **Alternatives 3** and **4**). Implementing a lower vessel limit as the accountability measure in **Alternative 5**, particularly as the first measure in a series of potential post-season AMs, would be expected to have less negative effects on recreational fishermen than a post-season that would shorten the season. However, some flexibility in how these AMs are triggered, such as conditions in the sub-alternatives of the stock being overfished or the total ACL being exceeded, can help to mitigate the negative short-term impacts on fishermen and associated businesses and communities.

Administrative Effects
Modifying the accountability measure is an administrative action which will have implications for rule making, outreach and education. However, none of the alternatives are expected to be more administratively burdensome than the others.

Action 4: Establish a commercial trip limit for Atlantic cobia

Alternative 1 (No Action). Do not modify the possession limit of 2 fish per person per day.

Alternative 2. Establish a commercial trip limit for Atlantic cobia of 2 fish per person per day. The trip limit will decrease to 1 fish per person per day when 75% of the commercial ACL has been met.

Alternative 3. Establish a commercial trip limit for Atlantic cobia of 6 fish per vessel per day. The trip limit will decrease to 3 fish per vessel per day when 75% of the commercial ACL has been met.

Alternative 4. Establish a commercial trip limit for Atlantic cobia of 2 fish per person per day, with no more than 6 fish per vessel per day. The trip limit will decrease to 1 fish per person per day, with no more than 3 per vessel per day when 75% of the commercial ACL has been met.

Discussion:

Cobia are unique among federally managed species in the southeast region, in that there is no federal commercial permit requirement to harvest cobia from federal waters to sell commercially. The daily possession limit of two cobia per person applies to both recreational and commercial catch. This makes the distinction between recreationally caught cobia and commercially caught cobia difficult, and the regulations define them as "cobia that are not sold" and "cobia that are sold." For purposes of this discussion, we will use the following terms interchangeably: "recreational" with "cobia that are not sold" and "commercial" with "cobia that are sold."

Although there is not a federal commercial permit requirement to fish for and sell cobia caught in federal waters, all cobia from federal waters must be sold to a federally permitted dealer. Therefore, cobia harvested from a vessel fishing without any federal vessel fishing permit may only sell to a dealer that has a state license but not a federal license.

Alternative 1 (No Action) would not change the possession limit of 2 fish that applies to commercial harvest of Atlantic cobia. **Alternative 2** would establish a commercial trip limit of two fish per person per day with a possible reduction to one fish per person per day when commercial landings reach or are projected to reach 75% of the commercial ACL (37,500 lbs). **Alternative 3**, if added, would establish a vessel limit for commercial harvest of Atlantic cobia of 6 fish per vessel per day. When commercial landings reach or are projected to reach 75% of the commercial ACL, the vessel limit will decrease to 3 fish per vessel per day. Reducing the commercial landings of commercial catch through bag or vessel limits proposed in **Alternative 2** and **Alternative 3** may reduce commercial harvest enough to lengthen the fishing season.

In this action, the Council is considering a commercial trip limit with a step-down when 75% of the commercial ACL is met to extend the season length by slowing the rate of harvest, and to reduce the risk of commercial harvest exceeding the commercial ACL. The commercial ACL for

Atlantic cobia is 50,000 lbs in 2016 and subsequent years, and the trigger for the step-down under **Alternatives 2-4** would be 37,500 lbs.

Table 2.4.1 shows the month each year when actual Atlantic cobia commercial landings reached 75% of the current commercial ACL and when landings reached 100% of the current commercial ACL. The analysis is based on the commercial fishing year of January 1 through December 31 (the Council it not considering a change for the commercial fishing year). In more recent years, the step-down would have occurred in the fall or late summer, but in years with lower landings, a step-down may not occur at all.

Additional analysis is in progress and will be included in the next version of the document.

Table 2.4.1. Estimated month when actual Atlantic cobia commercial landings reached 75% of the commercial ACL (37,500 lbs ww) and the current commercial ACL (50,000 lbs ww).

Year	Total Commercial Landings	Month when landings reached 75% of ACL	Month when landings reached current ACL
2005	29,290	--	--
2006	31,990	--	--
2007	32,037	--	--
2008	33,739	--	--
2009	42,385	November	--
2010	56,393	September	November
2011	33,963	--	--
2012	42,176	September	--
2013	53,108	August	November
2014	69,197	August	September
2015 (P)	83,148	July	August

Note: 2015 landings are preliminary.
Data sources: SERO Quota Monitoring and SEFSC.

Comparison of Alternatives:

Biological Effects
Based on historic landings, in many years the reduced trip limit would not go into effect. In recent years, reducing the trip limit when 75% of the ACL was met would likely have extended the season and prevented potential closures of the commercial fishery. **Alternatives 2-4** would potentially be more restrictive than **Alternative 1 (No Action)** because it would reduce the commercial trip limit to 1 fish per person when 75% of the commercial ACL is reached, restricting harvest of cobia on commercial trips.

Economic Effects
Generally, trip limits are not considered to be economically efficient because they require an increase in the number of trips and associated trip costs to land the same amount of fish.

However, the negative economic effects of this inefficiency can be offset by price support resulting from the supply limitations and the lengthening of seasons. Given the relatively restrictive commercial limit on cobia of 2 fish per person per day, the fewer the trips that have to stop keeping cobia because the trip limit has been reached would result in the least amount of direct negative economic effect, assuming the ACL is not met and the season does not close. Presumably the step down in trip limits present in **Alternative 2** through **Alternative 4** would allow the commercial cobia fishery to remain open longer, which may help offset the negative economic effects of the reduced trip limit.

Social Effects

In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met. In most years, it is more unlikely that the step-down in **Alternatives 2-4** at 75% of the commercial ACL will be implemented and the effects of **Alternative 1 (No Action)** through **Alternative 4** would be minimal or none for the commercial sector. However, in years with higher levels of commercial landings, the lower commercial limit in **Alternatives 2-4** may help slow the rate of harvest and reduce the likelihood of an early in-season closure or an overage.

Administrative Effects

There will be no difference in the administrative burden between **Alternative 2**, **Alternative 3 and Alternative 4**. However, these action alternatives will have a greater administrative burden than **Alternative 1**. These impacts will be associated with rule-making, quota monitoring, outreach and education and enforcement.

Chapter 3. Affected Environment

This section describes the affected environment in the proposed project area. The affected environment is divided into five major components:

- **Habitat environment** (Section 3.1)
- **Biological environment** (Section 3.2)
- **Economic environment** (Section 3.3)
- **Social environment** (Section 3.4)
- **Administrative environment** (Section 3.5)

3.1 Habitat Environment

The South Atlantic Fishery Management Council (South Atlantic Council) has management jurisdiction of the federal waters (3-200 nautical miles) offshore of North Carolina, South Carolina, Georgia, and Florida. The continental shelf off the southeastern U.S., extending from the Dry Tortugas, Florida, to Cape Hatteras, North Carolina, encompasses an area in excess of 100,000 square km (Menzel 1993). Based on physical oceanography and geomorphology, this environment can be divided into two regions: Dry Tortugas, Florida, to Cape Canaveral, Florida, and Cape Canaveral, Florida, to Cape Hatteras, North Carolina. The continental shelf from the Dry Tortugas, Florida, to Miami, Florida, is approximately 25 km wide and narrows to approximately 5 km off Palm Beach, Florida. The shelf then broadens to approximately 120 km off Georgia and South Carolina before narrowing to 30 km off Cape Hatteras, North Carolina. The Florida Current/Gulf Stream flows along the shelf edge throughout the region. In the southern region, this boundary current dominates the physics of the entire shelf (Lee et al. 1994).

In the northern region, additional physical processes are important and the shelf environment can be subdivided into three oceanographic zones (Atkinson et al. 1985; Menzel 1993), the outer shelf, mid-shelf, and inner shelf. The outer shelf (40-75 meters (m)) is influenced primarily by the Gulf Stream and secondarily by winds and tides. On the mid-shelf (20-40 m), the water column is almost equally affected by the Gulf Stream, winds, and tides. Inner shelf waters (0-20 m) are influenced by freshwater runoff, winds, tides, and bottom friction. Water masses present from the Dry Tortugas, Florida, to Cape Canaveral, Florida, include Florida Current water, waters originating in Florida Bay, and shelf water. From Cape Canaveral, Florida, to Cape Hatteras, North Carolina four water masses are found: Gulf Stream water; Carolina Capes water; Georgia water; and Virginia coastal water.

Spatial and temporal variation in the position of the western boundary current has dramatic effects on water column habitats. Variation in the path of the Florida Current near the Dry Tortugas induces formation of the Tortugas Gyre (Lee et al. 1992, 1994). This cyclonic eddy has horizontal dimensions of approximately 100 km and may persist near the Florida Keys for several months. The Pourtales Gyre, which has been found to the east, is formed when the Tortugas Gyres moves eastward along the shelf. Upwelling occurs in the center of these gyres, thereby adding nutrients to the near surface (<100 m) water column. Wind and input of Florida Bay water also influence the water column structure on the shelf off the Florida Keys (Smith 1994; Wang et al. 1994). Further, downstream, the Gulf Stream encounters the "Charleston Bump", a topographic rise on the upper Blake Ridge where the current is often deflected offshore resulting in the formation of a cold, quasi-permanent cyclonic gyre and associated upwelling (Brooks and Bane 1978). On the continental shelf, offshore projecting shoals at Cape Fear, Cape Lookout, and Cape Hatteras, North Carolina, affect longshore coastal currents and interact with Gulf Stream intrusions to produce local upwelling (Blanton et al. 1981; Janowitz and Pietrafesa 1982). Shoreward of the Gulf Stream, seasonal horizontal temperature and salinity gradients define the mid-shelf and inner-shelf fronts. In coastal waters, river discharge and estuarine tidal plumes contribute to the water column structure.

The water column from Dry Tortugas, Florida, to Cape Hatteras, North Carolina, serves as habitat for many marine fish and shellfish. Most marine fish and shellfish release pelagic eggs when spawning and thus, most species utilize the water column during some portion of their early life history (Leis 1991; Yeung and McGowan 1991). Many fish inhabit the water column as adults. Pelagic fishes include numerous clupeoids, flying fish, jacks, cobia, bluefish, dolphin, barracuda, and the mackerels (Schwartz 1989). Some pelagic species are associated with particular benthic habitats, while other species are truly pelagic.

3.2 Biological and Ecological Environment

3.2.1 Fish Populations Affected by this Amendment

The actions in this amendment only apply to the cobia sector of the coastal migratory pelagics fishery.

3.2.1.1
Cobia is a member of the family Rachycentridae but is managed in the CMP FMP because of its migratory behavior. Cobia is distributed worldwide in tropical, subtropical and warm-temperate waters. In the western Atlantic it occurs from Nova Scotia, Canada, south to Argentina, including the Caribbean Sea. It is abundant in warm waters off the coast of the U.S. from the Chesapeake Bay south and throughout the Gulf. Cobia prefer water temperatures between 68-86°F. Seeking shelter in harbors and around wrecks and reefs, cobia is often found off south Florida and the Florida Keys. As a pelagic fish, cobia are found over the continental shelf as well as around offshore reefs. It prefers to reside near any structure that interrupts the open water such as pilings, buoys, platforms, anchored boats, and flotsam. Cobia is also found inshore inhabiting bays, inlets, and mangroves.

3.2.1.2 Cobia Reproduction

Cobia form large aggregations, spawning during daylight hours between June and August in the Atlantic Ocean near the Chesapeake Bay, off North Carolina in May and June, and in the Gulf during April through September. Spawning frequency is once every 9-12 days, spawning 15-20 times during the season. During spawning, cobia undergo changes in body coloration from brown to a light horizontal-striped pattern, releasing eggs and sperm into offshore open water. Cobia have also been observed spawning in estuaries and shallow bays with the young heading offshore soon after hatching. Cobia eggs are spherical, averaging 1.24mm in diameter. Larvae are released approximately 24-36 hours after fertilization.

3.2.1.3 Cobia Development Growth and Movement Patterns

Newly hatched larvae are 2.5 mm (1 inch) long and lack pigmentation. Five days after hatching, the mouth and eyes develop, allowing for active feeding. A pale yellow streak is visible, extending the length of the body. By day 30, the juvenile takes on the appearance of the adult cobia with two color bands running from the head to the posterior end of the juvenile.

Weighing up to a record 61 kg (135 lbs), cobia are more common at weights of up to 23 kg (50 lbs). They reach lengths of 50-120 cm (20-47 inches), with a maximum of 200 cm (79 inches). Cobia grow quickly and have a moderately long life span. Maximum ages observed for cobia in the Gulf were 9 and 11 years for males and females, respectively, while off the North Carolina coast maximum ages were 14 and 13 years, respectively. Females reach sexual maturity at 3 years of age and males at 2 years in the Chesapeake Bay region. During autumn and winter months, cobia migrate south and offshore to warmer waters. In early spring, migration occurs northward along the Atlantic coast.

3.2.2 Description of the Fishery

Currently, no commercial vessel permit is required for harvest or sale of cobia. Recreational fishermen may sell cobia to federal dealers if they have a for-hire CMP permit or a commercial king or Spanish mackerel permit. Cobia is considered a limited harvest species and the commercial trip limit and recreational bag limit are two per person per day.

Cobia from the east coast of Florida are part of the Gulf of Mexico migratory group. Cobia from the Florida/Georgia border north to New York are considered one stock and have an ACL of 50,000 lb for the commercial sector and 620,000 lbs for the recreational sector.

Commercial landings have declined since the highest landings in 1996 (Vondruska 2010). Over the last 5 years (2011-2015), annual landings have averaged approximately 50,516 lb (**Table 3.2.2.1**). Most commercial cobia landings are in Florida and landings are highest during summer.

Recreational Landings off Virginia and North Carolina have been increasing in recent years and in 2015, landings off Virginia and North Carolina accounted for the highest landings in the

region (**Table 3.2.2.1**). Landings in New York are relatively minor. According to landings data, the majority of these landings originate from state waters (e.g., pound net landings or landings originating within Chesapeake Bay)

Table 3.2.2.1. Annual commercial and recreational landings of cobia in the Atlantic.

Year	Commercial Landings	Recreational Landings
2005	29,290	915,300
2006	31,990	980,071
2007	32,037	745,776
2008	33,739	537,767
2009	42,385	760,841
2010	56,393	938,527
2011	33,963	347,527
2012	42,176	496,173
2013	53,108	895,925
2014	69,197	544,952
2015	83,148 (P)	1,541,535

Source: SEFSC ACL Landings Dataset, 2015 Commercial Quota Monitoring Program
Landings in whole weight.

Table 3.2.2.2. Recreational landings (pounds whole weight) of cobia from Georgia through New York during 2013-2015.

Year	GA	SC	NC	VA	Total
2013	29,224	19,130	492,969	354,463	895,786
2014	20,642	31,927	277,489	214,427	544,485
2015	67,804	123,952	630,373	718,647	1,540,776

Source: Southeast Fisheries Science Center

3.2.3 Status of Stocks

Cobia

Both the Gulf and Atlantic migratory groups of cobia were assessed by SEDAR 28 in 2013. The SEDAR 28 stock assessment for Atlantic migratory group cobia (2013c) determined that the stock is not overfished or experiencing overfishing. The Gulf Council's review (GMFMC 2013a) of the SEDAR 28 stock assessment of Gulf migratory group cobia (2013a) determined that the stock was not overfished or experiencing overfishing.

3.2.4 Protected Species

All sea turtle species occurring in the Atlantic Ocean are listed as either endangered or threatened under the Endangered Species Act (ESA). The actions discussed in this amendment may potentially affect five sea turtle species: the endangered leatherback, the endangered hawksbill, the endangered Kemp's ridley, the Northwest Atlantic distinct population segment

(DPS) of the threatened loggerhead, and the threatened green, except for breeding populations of green turtles in Florida, which are listed as endangered.

The South Atlantic and Carolina DPS of the threatened Atlantic sturgeon, and the endangered smalltooth sawfish, also occur within the area encompassed by the CMP FMP. Additionally, two threatened *Acropora* coral species, elkhorn and staghorn, can be found in areas off Florida.

Species of large whales protected by the ESA that occur throughout the Atlantic Ocean include the blue whale, humpback whale, fin whale, North Atlantic right whale, sei whale, and the sperm whale. Additionally, the West Indian manatee also occurs both in the Gulf of Mexico and the Atlantic Ocean. These species are also considered depleted under the Marine Mammal Protection Act (MMPA). Depleted and endangered designations afford special protections from captures, and further measures to restore populations to recovery or the optimum sustainable population are identified through required recovery (ESA species) or conservation plans (MMPA depleted species). Numerous other species of marine mammals listed under the MMPA occur throughout the Atlantic Ocean.

Aside from the aforementioned protected species, portions of designated critical habitat *Acropora* corals and the North Atlantic Right Whale also occur within areas encompassed by the alternatives in this amendment.

In a 2015 biological opinion, NMFS determined that the proposed continued authorization of the CMP Fishery, including the cobia sector is not likely to adversely affect any listed whales (i.e., blue, sei, sperm, fin, humpack, or North Atlantic right whales), Gulf sturgeon, or elkhorn and staghorn corals. NMFS also determined that CMP Fishery is not likely to adversely affect designated critical habitats for elkhorn and staghorn corals or loggerhead sea turtles, and will have no effect on designated critical habitat for North Atlantic right whale.

Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles, Atlantic sturgeon, and the smalltooth sawfish are all likely to be adversely affected by the CMP fishery. Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles area all highly migratory, travel widely throughout the GOM and South Atlantic, and are known to occur in areas subject to shrimp trawling. The distribution of Atlantic sturgeon and smalltooth sawfish within the action area is more limited, but all of these species do overlap in certain regions of the action area and these species have the potential to be been incidentally captured in CMP fisheries. According to the 2015 Biological Opinion on CMP fisheries (NMFS 2015), the only gear type likely to adversely effect sea turtles, smalltooth sawfish, and Atlantic sturgeon is gill nets.

The Gulf and South Atlantic CMP hook-and-line fishery is classified in the 2013 Marine Mammal Protection Act List of Fisheries as a Category III fishery (78 FR 53336, August 29, 2013), meaning the annual mortality and serious injury of a marine mammal resulting from the fishery is less than or equal to 1% of the maximum number of animals, not including natural moralities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

The Gulf and South Atlantic CMP gillnet fishery is classified as a Category II fishery. This classification indicates an occasional incidental mortality or serious injury of a marine mammal

stock resulting from the fishery (1-50% annually of the potential biological removal). The fishery has no documented interaction with marine mammals; NMFS classifies this fishery as Category II based on analogy (i.e., similar risk to marine mammals) with other gillnet fisheries.

3.3 Economic Environment

3.3.1. Commercial Sector

There is no federal permit required for the commercial harvest of Atlantic migratory group cobia. However, commercial harvest of cobia in the EEZ may be sold only to dealers with a federal dealer permit. As of May 16, 2016, there were 417 entities with a Gulf and South Atlantic Dealer permit.

Total Landings and Dockside Revenues

Additional information on commercial landings and fishing for cobia can be found in Amendment 18 to the CMP FMP (GMFMC/SAFMC 2011) and Amendment 20B to the CMP FMP (GMFMC/SAFMC 2014), and is incorporated herein by reference.

Prior to 2015, the management area for Atlantic cobia extended from the east coast of Florida through New York. Effective in 2015, the harvests of cobia in east Florida has been considered part of the Gulf migratory group, thus the current management area for Atlantic cobia extends from Georgia through New York. For this section, all states from Virginia to New York are combined as one area denoted as MA (Mid-Atlantic).

From 2010 through 2015, annual commercial landings of Atlantic cobia ranged from approximately 33,000 lbs whole weight (ww) to 83,000 lbs ww (**Table 3.3.1.1**). Dockside revenues from those landings ranged from approximately $79,000 to $233,000 (2014 $) (**Table 3.3.1.1**). The average dockside price for those six years was $2.43 per lb ww (2014$). The highest landings and revenues occurred in 2015 whereas the lowest for both landings and revenues occurred in 2011. When Florida east coast was still part of the management area for Atlantic cobia, commercial harvest reached the sector's quota of 125,712 lbs ww in 2014 and was closed on December 11, 2014. Under the modified management area, the quota for Atlantic cobia was revised to 60,000 lbs ww in 2015 and 50,000 lbs ww in 2016 and thereafter. Although landings exceeded the 2015 quota, no quota closure was imposed. As of May 31, 2016, commercial landings of Atlantic cobia were about 11,718 lbs. This amount trails slightly that of the 2015 landings from January through May.

North Carolina has been the top producer of cobia, followed by the Mid-Atlantic states and South Carolina/Georgia (**Table 3.3.1.1)**. Georgia and South Carolina landings are combined for confidentiality purposes because of the relatively small amount of cobia landings in Georgia. Virginia (not shown in the table) accounted for most of the Mid-Atlantic landings. One notable feature for the Mid-Atlantic area is the surge in landings in 2013 and 2014, although they were still lower than landings in North Carolina. Mid-Atlantic landings continued to increase in 2015 but not as rapidly as in the previous two years.

Table 3.3.1.1. Commercial Atlantiic cobia landings (lbs ww) and revenues (2014 $) by state/area, 2010-2015.

	GA/SC	NC	MA	Total
	Pounds (ww)			
2010	3,174	43,737	9,364	56,275
2011	4,610	19,950	9,233	33,793
2012	3,642	32,008	6,309	41,959
2013	4,041	35,496	13,095	52,632
2014	4,180	41,848	23,111	69,139
2015	3,555	52,315	27,277	83,148
Average	3,867	37,559	14,732	56,158
	Dockside Revenues (2014 $)			
2010	$11,377	$70,377	$19,976	$101,730
2011	$19,666	$37,893	$21,666	$79,224
2012	$15,554	$66,887	$14,597	$97,038
2013	$15,639	$79,397	$35,792	$130,828
2014	$13,320	$95,462	$67,972	$176,754
2015	$11,151	$147,160	$75,360	$233,672
Average	$14,451	$82,863	$39,227	$136,541

Georgia landings are very small and so are combined with those of South Carolina.
Source: SEFSC Commercial ACL Dataset (December 2015) for 2010-2014 data; D. Gloeckner (pers. comm., 2016) for 2015 data.

Commercial fishermen harvest cobia using various gear types. In **Table 3.3.1.2**, hook and line includes handline, longline, power assisted line, and troll line while "others" includes traps, other net gear, dredges/gigs/spears, and unclassified gear. Handline has been the foremost gear type used in harvesting cobia, followed closely by gillnets, and then by a host of other types. Within the other category, the largest landings were assigned to "unclassified gear." Although not shown in the table, handline accounted for the biggest share of the hook and line landings. Longline has been a minor gear type in the commercial harvest of cobia.

Table 3.3.1.2. Commercial Atlantic cobia landings (lb ww) and revenues (2014$) by gear, 2010-2015.

	Hook and Line	Gillnets	Others	Total
	Pounds (ww)			
2010	26,758	23,495	6,022	56,275
2011	18,322	9,177	6,294	33,793
2012	12,962	21,091	7,906	41,959
2013	28,356	13,343	10,933	52,632
2014	37,082	23,540	8,517	69,139
2015	37,702	36,417	9,030	83,148
Average	26,864	21,177	8,117	56,158
	Dockside Revenues (2014 $)			
2010	$49,095	$38,605	$14,030	$101,730
2011	$39,265	$18,242	$21,717	$79,224
2012	$29,677	$43,875	$23,486	$97,038
2013	$69,433	$30,206	$31,189	$130,828

2014	$99,959	$55,275	$21,520	$176,754
2015	$108,165	$100,130	$25,377	$233,672
Average	$65,932	$47,722	$22,886	$136,541

"Hook and line" includes handline, longline, power assisted line, and troll line; "others" include traps, dredges/gigs/spears, other net gear, and unclassified gear.
Source: SEFSC Commercial ACL Dataset (December 2015) for 2010-2014 data; D. Gloeckner (pers. comm., 2016) for 2015 data.

On average, May is the peak month for cobia landings and dockside revenues (**Figure 3.3.1.1)**. January through April and December are the lowest months for landings and revenues. There are, however, some notable variations from the general average. Two peak landings occurred in 2012 (June and October) and in 2014 (May and August) (**Figure 3.3.1.2**). In terms of revenues, the 2014 peak occurred in August (**Figure 3.3.1.3**). In 2010 and 2011, landings steeply dropped off after their peaks, but in later years the decline appears to be more gradual. This perhaps suggests an increasing interest in fishing for cobia later in the year. Noticeable is the November and December spike in landings and revenues for 2015 relative to the earlier years.

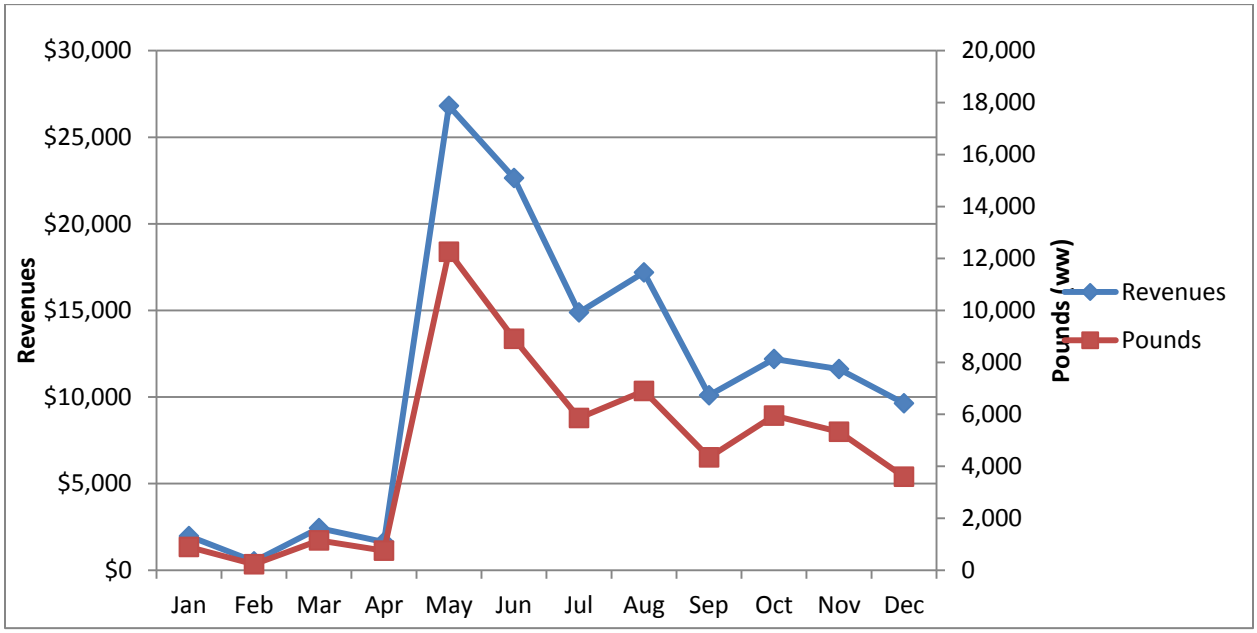

Figure 3.3.1.1. Average (2010-2015) monthly Atlantic cobia landings (lbs ww) and revenues (2014 $).
Source: SEFSC Commercial ACL Dataset (December 2015) for 2010-2014 data; D. Gloeckner (pers. comm., 2016) for 2015 data.

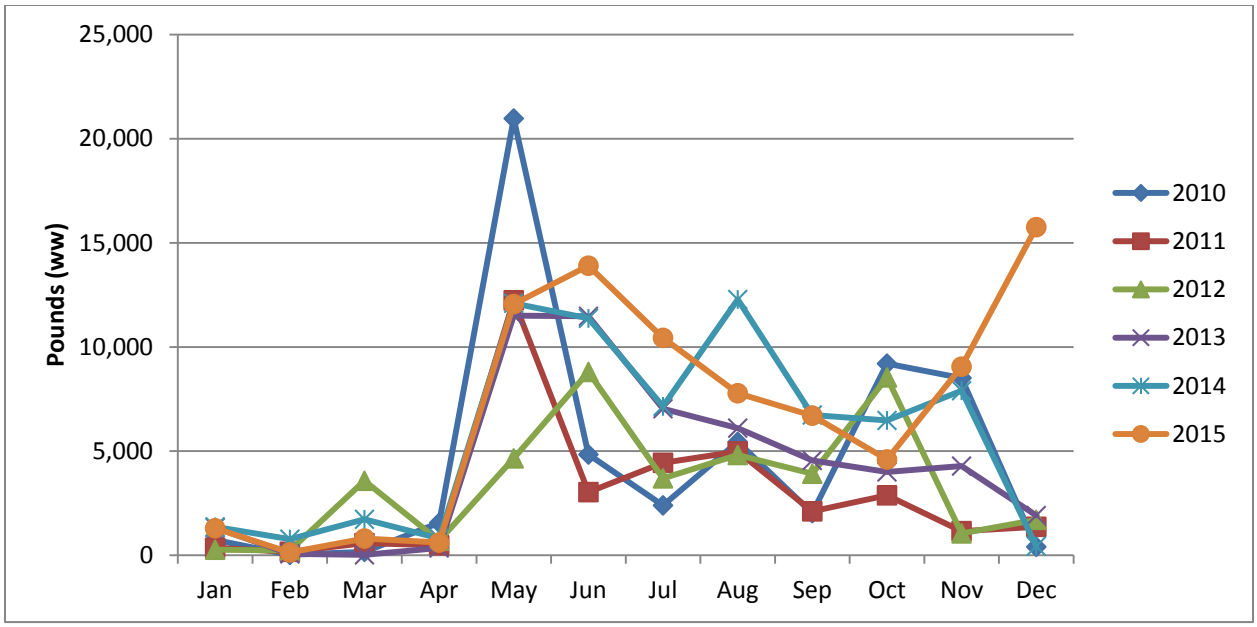

Figure 3.3.1.2. Monthly Atlantic cobia landings (lbs ww), 2010–2015. Source: SEFSC Commercial ACL Dataset (December 2015) for 2010-2014 data; D. Gloeckner (pers. comm., 2016) for 2015 data.

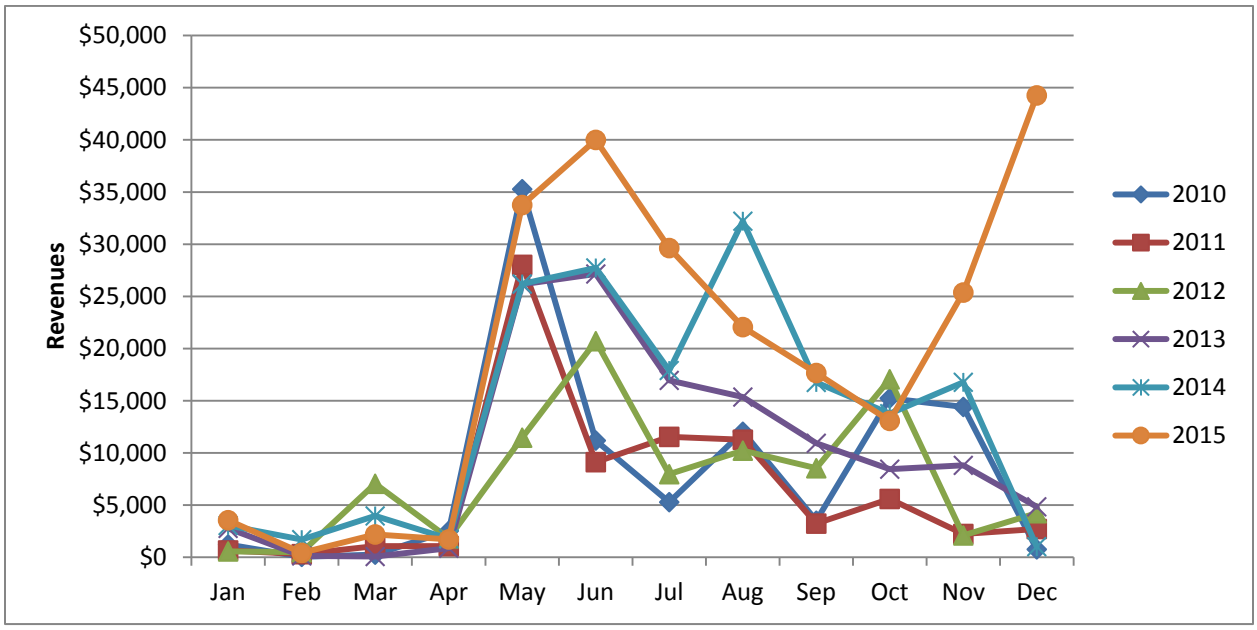

Figure 3.3.1.3. Monthly Atlantic cobia revenues (2014 $), 2010–2015.
Source: SEFSC Commercial ACL Dataset (December 2015) for 2010-2014 data; D. Gloeckner (pers. comm., 2016) for 2015 data.

Vessel Trips, Landings, and Dockside Revenues

The following vessel trip level summary is based on logbook information for landings and NMFS Accumulated Landings System (ALS) for prices and so would not exactly match with the landings and revenues presented above. From 2010 through 2015, excluding the Mid-Atlantic states, an annual average of 98 vessels took 318 commercial trips that combined landed an

average of 13,469 lbs gutted weight (gw) of cobia annually with a dockside value (2014 dollars) of $31,115 (**Table 3.3.1.3**). Average annual dockside revenue from cobia represented approximately 3.6% of total dockside revenues from trips that landed cobia from 2010 through 2015.

Table 3.3.1.3. South Atlantic vessels and trips with cobia landings by weight (lb gw) and dockside revenue (2014 $), 2010–2015.

Year	Number vessels that landed cobia	Number trips that landed cobia	Cobia landings (lb gw)	Dockside revenue from cobia (2014 $)	'Other species' landed with cobia (lb gw)	Dockside revenue from 'other species' landings (2014 $)	Total dockside revenue (2014 $) from trips with cobia landings
2010	96	320	15,422	$30,665	359,263	$815,180	$845,845
2011	96	265	9,695	$23,919	337,688	$879,590	$903,509
2012	92	331	13,027	$30,078	307,053	$707,214	$737,292
2013	103	335	14,078	$34,612	311,009	$891,488	$926,099
2014	109	383	15,384	$36,623	340,692	$882,715	$919,338
2015	89	273	13,206	$30,793	248,572	$797,419	$828,213
Average	98	318	13,469	$31,115	317,380	$828,934	$860,049

Source: SEFSC-SSRG Economic Panel Data, 2016.

On average, the vessels that harvested cobia also took 2,338 trips per year without cobia landings. Combining all sources of revenues, the average annual dockside revenues of vessels that landed cobia was $74,066 (2014 dollars) (**Table 3.3.1.4**). Annual dockside revenue from cobia landings represented, on average, approximately 0.4% of the total dockside revenue from all commercial landings from 2010 through 2015. Average annual dockside revenue per vessel from all landings was $74,066 as compared to $318 per vessel from cobia only.

Table 3.3.1.4. South Atlantic dockside revenues (2014 $) from all sources for vessels that landed cobia in trips with or without cobia, 2010–2015.

Year	Number vessels that landed cobia	Dockside revenue from cobia (2014 $)	Dockside revenue from 'other species' jointly landed with cobia (2014 $)	Dockside revenue from 'other species' landed on trips without cobia (2014 $)	Total dockside revenue (2014 $)	Average total dockside revenue per vessel (2014 $)
2010	96	$30,665	$815,180	$4,803,688	$5,649,533	$58,849
2011	96	$23,919	$879,590	$5,427,004	$6,330,512	$65,943
2012	92	$30,078	$707,214	$4,876,666	$5,613,958	$61,021
2013	103	$34,612	$891,488	$5,697,926	$6,624,025	$64,311

2014	109	$36,623	$882,715	$9,600,851	$10,520,189	$96,515
2015	89	$30,793	$797,419	$7,871,829	$8,700,042	$97,753
Average	98	$31,115	$828,934	$6,379,661	$7,239,710	$74,066

Source: SEFSC-SSRG Economic Panel Data, 2016.

Tabulation of vessel/trip level information for Mid-Atlantic vessels similar to that in Table 3.3.1.3 or Table 3.3.1.4 is not available. However, an approximation of similar information for the Mid-Atlantic vessels is presented in Table 3.3.1.5 that focuses only on cobia landings and revenues. Total revenues from cobia landings and revenues are the same as those presented in Table 3.3.1.1 and vessel/trip information is based on dealer weighout database (Larkin, pers. comm. 2016).

Table 3.3.1.5. Mid-Atlantic vessels and trips with cobia landings by weight and dockside revenue (2014 $), 2010–2015.

Year	Number of vessels that landed cobia	Number of trips that landed cobia	Cobia landings	Dockside revenue from cobia (2014 dollars)	Revenue per vessel from cobia
2010	25	129	9,364	$19,976	$799
2011	21	139	9,233	$21,666	$1,032
2012	22	131	6,309	$14,597	$664
2013	32	134	13,095	$35,792	$1,119
2014	21	153	23,111	$67,972	$3,237
2015	25	383	27,277	$75,360	$3,014
Average	24	178	14,732	$39,227	$1,644

Source: Table 3.3.1.1 for cobia landings and revenues; dealer weighout database for vessels and trips.

Imports

Information on the imports of fish (fresh, frozen, or other product forms) is available at: http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataProduct.html. In 2014, the U.S imported approximately 2.5 million metric tons of edible fishery products, valued at $20.2 billion. Information on the imports of each individual species is not generally available, but imports of cobia have been reported in the last few years. Imports of cobia were 435 metric tons valued at $2.54 million in 2012, 641 metric tons valued at $4.433 million in 2013, and 769 metric tons valued at $7.032 million in 2014. These amounts are contrasted with the total domestic harvest of cobia of 82.3 metric tons valued at $0.519 million in 2012, 93 metric tons valued at $0.633 million in 2013, and 102.5 metric tons valued at $0.695 million in 2014 (data available at: http://www.st.nmfs.noaa.gov/commercial-fisheries/publications/index). Although the levels of domestic production and imports are not totally comparable for several reasons, including considerations of different product form such as fresh versus frozen, and possible product mislabeling, the difference in the magnitude of imports relative to amount of domestic harvest is indicative of the dominance of imports in the domestic market. Final comparable data for more recent years is not currently available.

Commercial Sector Business Activity

Estimates of the business activity (economic impacts) in the U.S. associated with Atlantic cobia harvests were derived using the model developed for and applied in NMFS (2011). Business activity for the commercial sector is characterized in the form of jobs, income impacts (wages, salaries, and self-employed income), and output (sales) impacts (gross business sales). Income impacts should not be added to output (sales) impacts because this would result in double counting. The estimates of economic activity include the direct effects (effects in the sector where an expenditure is actually made), indirect effects (effects in sectors providing goods and services to directly affected sectors), and induced effects (effects induced by the personal consumption expenditures of employees in the direct and indirectly affected sectors). The average annual total ex-vessel revenues from cobia and their associated economic activities are presented in **Table 3.3.1.6**.

Table 3.3.1.6. Average (2010-2015) annual dockside revenues from Atlantic cobia and associated business activities. Dollar values are in 2014 dollars.

State	Average Annual Dockside Revenue (thousands)	Total Jobs	Harvester Jobs	Output (Sales) Impacts (thousands)	Income Impacts (thousands)
GA/SC[1]	$14.192	1	1	$47	$20
NC	$82.863	5	2	$285	$120
MA[2]	$39.227	3	1	$188	$69

[1]Combines revenues from Georgia and South Carolina but uses South Carolina multipliers.
[2]Combines revenues from all Mid-Atlantic states but uses Virginia multipliers.
Source: Economic impact results calculated by NMFS SERO using the model developed for NMFS (2011b).

3.3.2 Recreational Sector

The following focuses on recreational landings and effort (angler trips) for Atlantic group cobia. The major sources of data summarized in this description are the Recreational ACL Dataset (SEFSC MRIPACLspec_rec81_15wv6_17Mar16_w14and15LACreel) for landings and the NOAA fisheries website for accessing recreational data (http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index) for effort. Additional information on the recreational sector of the CMP fishery contained in previous amendments is incorporated herein by reference [see Amendments 18 and 20B].

The recreational sector is comprised of a private component and a for-hire component. The private component includes anglers fishing from shore (all land-based structures) and private/rental boats. The for-hire component is composed of charter boats and headboats (also called partyboats). Although charter boats tend to be smaller, on average, than headboats, the key distinction between the two types of operations is how the fee is determined. On a charter boat trip, the fee charged is for the entire vessel, regardless of how many passengers are carried, whereas the fee charged for a headboat trip is paid per individual angler.

Permits

A federal charter/headboat (for-hire) vessel permit is required for harvesting CMP species, including cobia, when fishing on for-hire vessels. The South Atlantic for-hire permit is an open access system. As of May 16, 2016, there were 1,494 valid (non-expired) or renewable South Atlantic charter/headboat pelagic fish permits. A renewable permit is an expired permit that may not be actively fished, but is renewable for up to one year after expiration. Although the for-hire permit application collects information on the primary method of operation, the resultant permit itself does not identify the permitted vessel as either a headboat or a charter boat, operation as either a headboat or charter boat is not restricted by the permitting regulations, and vessels may operate in both capacities. However, only selected headboats are required to submit harvest and effort information to the NMFS Southeast Region Headboat Survey (SRHS). Participation in the SRHS is based on determination by the SEFSC that the vessel primarily operates as a headboat. There were 73 South Atlantic vessels registered in the SRHS as of February 22, 2016 (K. Fitzpatrick, NMFS SEFSC, pers. comm.).

Information on South Atlantic charter boat and headboat operating characteristics, including average fees and net operating revenues, as reported in Holland et al. (2012), and financial and economic impact information on Northeast for-hire vessels, as reported in Steinback and Brinson (2013), is incorporated herein by reference.

There are no specific federal permitting requirements for recreational anglers to fish for or harvest cobia. Instead, anglers are required to possess either a state recreational fishing permit that authorizes saltwater fishing in general, or be registered in the federal National Saltwater Angler Registry system, subject to appropriate exemptions. As a result, it is not possible to identify with available data how many individual anglers would be expected to be affected by this proposed amendment.

Harvest

On average, from 2010 through 2015, the recreational sector landed approximately 793,000 lbs ww of Atlantic cobia (**Table 3.3.2.1**). North Carolina has been the dominant state in recreational landings of cobia, followed by the Mid-Atlantic states, South Carolina, and Georgia. Virginia (not shown in the table) accounted for most of the recreational landings in the Mid-Atlantic. Noticeable in the table is the surge in the recreational landings of cobia for all states in 2015, resulting in 2015 landings that were more than double the recreational ACL.

The private/rental mode has been by far the most dominant fishing mode for harvesting cobia (**Table 3.3.2.2**). Headboats have provided the lowest contribution to recreational landings of cobia. Information reported in **Table 3.3.2.2** indicates that the 2015 surge in recreational landings can be attributed to substantial landings increases by the charter and private/rental fishing modes. Charter boat landings more than doubled while private/rental mode landings more than tripled in 2015. In the particular case of the South Carolina charter boat sector, increasing landings of cobia caught from offshore waters (greater than 3 miles) partly compensated for the declining landings from estuarine and nearshore waters (0-3 miles) since about 2007 [South Carolina Cobia Management Needs (PowerPoint Presentation), SC DNR, 2016].

Table 3.3.2.1. Annual recreational landings (lbs ww) of Atlantic cobia, by state, 2010-2015.

	Georgia	South Carolina	North Carolina	Mid-Atlantic	Total
2010	77,064	63,678	559,476	237,528	937,746
2011	88,049	1,554	119,678	137,931	347,213
2012	102,996	222,353	66,645	103,995	495,989
2013	28,427	19,159	492,998	354,463	895,048
2014	19,768	32,010	277,846	214,426	544,050
2015	67,250	124,057	631,024	718,647	1,540,978
Average	63,926	77,135	357,945	294,498	793,504

2015 data is preliminary.
Source: SEFSC MRIPACLspec_rec81_15wv6_17Mar16.

Table 3.3.2.2. Annual recreational landings (lbs ww) of Atlantic cobia, by fishing mode, 2010-2015.

	Charter	Headboat	Private/Rental	Shore	Total
2010	133,110	2,747	789,996	11,893	937,746
2011	23,608	1,886	282,728	38,990	347,213
2012	39,729	1,671	385,777	68,811	495,989
2013	73,623	5,485	815,940	0	895,048
2014	46,528	5,701	453,871	37,950	544,050
2015	102,941	1,741	1,400,338	35,957	1,540,978
Average	69,923	3,205	688,108	32,267	793,504

2015 data is preliminary.
Source: SEFSC MRIPACLspec_rec81_15wv6_17Mar16.

Peak recreational landings of cobia occurred in the May-June wave each year from 2010 through 2015 (**Figure 3.3.2.1**). Recreational landings steeply increased from the March-April wave to their peak and also steeply declined after the peak wave. Landings are concentrated around the May-June and July-August waves.

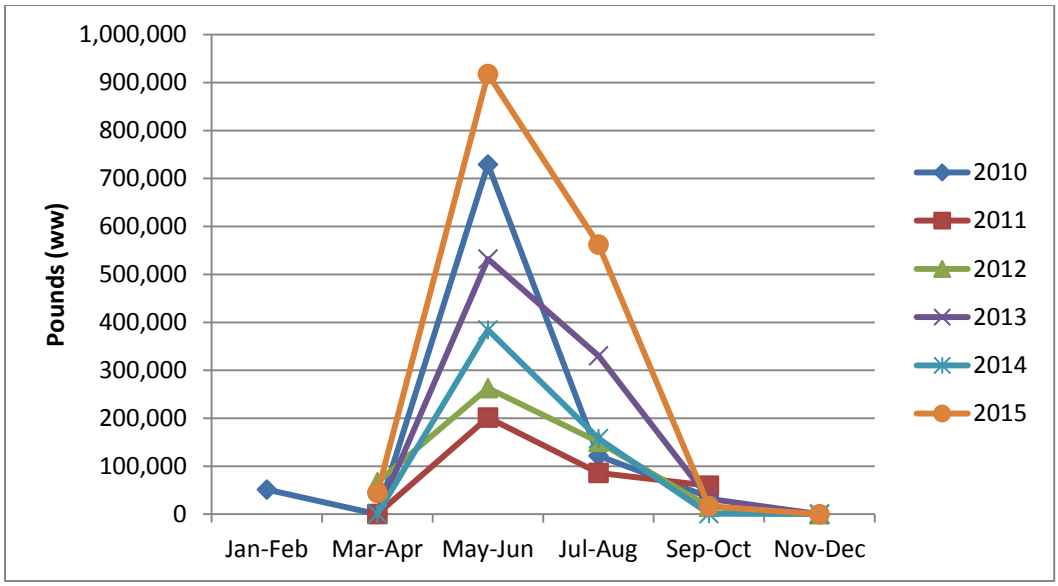

Figure 3.3.2.1. Distribution of Atlantic cobia recreational harvest, by wave, 2010-2015. 2015 data is preliminary.
Source: SEFSC MRIPACLspec_rec81_15wv6_17Mar16.

Effort

Recreational effort derived from the Marine Recreational Statistics Survey/Marine Recreational Information Program (MRFSS/MRIP) database can be characterized in terms of the number of trips as follows:

Target effort - The number of individual angler trips, regardless of duration, where the intercepted angler indicated that the species or a species in the species group was targeted as either the first or second primary target for the trip. The species did not have to be caught.

Catch effort - The number of individual angler trips, regardless of duration and target intent, where the individual species or a species in the species group was caught. The fish did not have to be kept.

Total recreational trips - The total estimated number of recreational trips in the Gulf, regardless of target intent or catch success.

Other measures of effort are possible, such as the number of harvest trips (the number of individual angler trips that harvest a particular species regardless of target intent), and directed trips (the number of individual angler trips that either targeted or caught a particular species), among other measures, but the three measures of effort listed above are used in this assessment.

Estimates of annual Atlantic cobia effort (in terms of individual angler trips) for 2010-2015 are provided in **Table 3.3.2.3** for target trips and **Table 3.3.2.4** for catch trips. Target and catch trips are shown by fishing mode (charter, private/rental, shore) for each state. Estimates of cobia

target and catch trips for additional years, and other measures of directed effort, are available at http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Cobia, like dolphin, is one of the few species where target trips generally exceed catch trips. The 2010-2015 average target trips were 4,519 for the charter mode, 130,360 for the private/rental mode, and 28,293 for the shore mode (**Table 3.3.2.3**). In contrast, the average catch trips were 3,114 for the charter mode, 33,329 for the private/rental mode, and 6,840 for the shore mode (**Table 3.3.2.4**). This is suggestive of a relatively strong interest in fishing for cobia among recreational anglers across all fishing modes. For each state, the private/rental mode has been the most dominant fishing mode both in target and catch effort.

Table 3.3.2.3. Target trips for Atlantic cobia, by fishing mode and state, 2010-2015.

Year	Charter				
	Georgia	S. Carolina	N. Carolina	Mid-Atlantic	Total
2010	0	3,349	3,029	358	6,736
2011	22	2,940	1,416	525	4,903
2012	0	1,025	345	156	1,526
2013	160	0	2,446	24	2,630
2014	0	1,452	1,703	295	3,450
2015	792	1,290	2,765	3,022	7,869
Average	162	1,676	1,951	730	4,519
	Private/Rental				
2010	5,453	14,228	49,358	67,730	136,769
2011	4,030	24,554	26,400	49,180	104,164
2012	2,495	57,543	23,320	37,706	121,064
2013	12,235	22,373	50,883	53,981	139,472
2014	1,322	23,365	50,112	49,075	123,874
2015	12,236	9,684	58,658	76,241	156,819
Average	6,295	25,291	43,122	55,652	130,360
	Shore				
2010	0	2,030	14,950	9,838	26,818
2011	0	0	10,090	2,366	12,456
2012	0	914	12,444	14,939	28,297
2013	0	627	15,977	5,693	22,297
2014	0	2,395	17,085	18,565	38,045
2015	0	363	21,925	19,554	41,842
Average	0	1,055	15,412	11,826	28,293

2015 data is preliminary
Source: http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 3.3.2.4. Catch trips for Atlantic cobia, by fishing mode and state, 2010-2015.

Year	Charter				
	Georgia	South Car.	North Car.	Mid-Atlantic	Total
2010	97	1,301	4,398	237	6,033
2011	400	0	1,655	135	2,190
2012	140	372	472	156	1,140

2013	160	48	2,798	24	3,030
2014	55	110	1,559	72	1,796
2015	0	879	2,652	963	4,494
Average	142	452	2,256	265	3,114
	Private/Rental				
2010	3,320	2,939	18,433	13,600	38,292
2011	4,145	606	8,156	9,291	22,198
2012	3,296	5,134	4,869	6,658	19,957
2013	1,157	3,699	21,047	14,256	40,159
2014	1,436	2,957	10,561	14,803	29,757
2015	2,351	4,396	18,740	24,121	49,608
Average	2,618	3,289	13,634	13,788	33,329
	Shore				
2010	0	0	6,192	0	6,192
2011	0	0	6,528	0	6,528
2012	0	0	7,983	2,055	10,038
2013	0	0	2,673	0	2,673
2014	0	3,268	6,128	0	9,396
2015	0	2,697	3,514	0	6,211
Average	0	994	5,503	343	6,840

2015 data is preliminary
Source: http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Headboat data in the Southeast does not support the estimation of target or catch effort because target intent is not collected and the harvest data (the data reflects only harvest information and not total catch) are collected on a vessel basis and not by individual angler. **Table 3.3.2.5** contains estimates of the number of headboat angler days for the South Atlantic states for 2010-2015. Georgia and South Carolina data are combined for confidentiality purposes.

Table 3.3.2.5. South Atlantic headboat angler days, by state, 2010-2015.

	GA/SC	NC	TOTAL
2010	46,908	21,071	67,979
2011	46,210	18,457	64,667
2012	42,064	20,766	62,830
2013	42,853	20,547	63,400
2014	44,092	22,691	66,783
2015	41,479	22,716	64,195
Average	43,934	21,041	64,976

Source: NMFS Southeast Region Headboat Survey (SRHS).

Economic Value

Economic value can be measured in the form of consumer surplus (CS) per additional cobia kept on a trip for anglers (the amount of money that an angler would be willing to pay for a fish in excess of the cost to harvest the fish). There is no available estimate of CS for cobia, but dolphin or king mackerel CS estimates may be close proxies. The estimated values of the CS per fish for a second, third, fourth, fifth, and sixth king mackerel kept on a trip are approximately $100, $67,

$49, $39, and $32, respectively. For dolphin, the values for the second, third, fourth, fifth, and sixth kept fish are $15.19, $10.13, $7.46, $5.88, and $4.85, respectively (Carter and Liese 2012; values updated to 2014 dollars).

With regards to for-hire businesses, economic value can be measured by producer surplus (PS) per passenger trip (the amount of money that a vessel owner earns in excess of the cost of providing the trip). Estimates of the PS per for-hire passenger trip are not available. Instead, net operating revenue (NOR), which is the return used to pay all labor wages, returns to capital, and owner profits, is used as a proxy for PS. The estimated NOR value is $153.45 (2014 dollars) per charter angler trip (Liese and Carter 2012). The estimated NOR value per headboat angler trip is $52.97 (2014 dollars) (C. Liese, NMFS SEFSC, pers. comm.). Estimates of NOR per cobia target trip are not available.

Recreational Sector Business Activity

Estimates of the business activity (economic impacts) associated with recreational angling for cobia were derived using average impact coefficients for recreational angling for all species, as derived from an add-on survey to the MRFSS to collect economic expenditure information, as described and utilized in NMFS (2011). Estimates of these coefficients for target or catch behavior for individual species are not available. Estimates of the average expenditures by recreational anglers are also provided in NMFS (2011) and are incorporated herein by reference.

Business activity for the recreational sector is characterized in the form of jobs, output (sales) impacts (gross business sales), and value-added impacts (difference between the value of goods and the cost of materials or supplies). Job and output (sales) impacts are equivalent metrics across both the commercial and recreational sectors. Income impacts (commercial sector) and value-added impacts (recreational sector) are not equivalent, though similarity in the magnitude of multipliers generated and used for the two metrics may result in roughly equivalent values. Similar to income impacts, value-added impacts should not be added to output (sales) impacts because this would result in double counting.

Estimates of the average cobia effort (2010-2015) and associated business activity (2014 dollars) are provided in **Table 3.3.2.6** for South Atlantic states and Virginia. Cobia target trip is selected as the measure of cobia effort. Target trips for cobia in the Mid-Atlantic, other than Virginia, are very negligible.
3
The estimates of the business activity associated with recreational trips for cobia are only available at the state level. Addition of the state-level estimates to produce a regional or national total will underestimate the actual amount of total business activity because summing the state estimates will not capture business activity that leaks outside the individual states. A state estimate only reflects activities that occur within that state and not related activity that occurs in another state. For example, if a good is produced in South Carolina but sold in North Carolina, the measure of business activity in North Carolina associated with the sale in North Carolina does not include the production process in South Carolina. Assessment of business activity at the national (or regional) level would capture activity in both states and include all activity except that which leaks into other nations.

It is noted that these estimates do not, and should not be expected to, represent the total business activity associated with a specific recreational harvest sector in a given state or in total. For example, these results do not state, or should be interpreted to imply, that there are only 11 jobs associated with the charter sector in South Carolina. Instead, as previously stated, these results relate only to the business activity associated with target trips for cobia. Few businesses or jobs would be expected to be devoted solely to cobia fishing. The existence of these businesses and jobs, in total, is supported by the fishing for, and expenditures on, the variety of marine species available to anglers throughout the year.

Table 3.3.2.6. Summary of cobia target trips (2010-2015 average) and associated business activity, South Atlantic states. Output and value added impacts are not additive. Dollar values are in thousands and in 2014 dollars.

	Georgia	South Carolina	North Carolina	Virginia*
	Charter			
Target Trips	162	1,676	1,951	730
Output/Sales Impact	$71	$988	$994	$85
Value Added Impact	$40	$570	$567	$144
Jobs Impact	1	11	10	1
	Private/Rental			
Target Trips	6,295	25,291	43,122	55,558
Output/Sales Impact	$285	$1,162	$3,319	$2,145
Value Added Impact	$178	$686	$2,017	$3,408
Jobs Impact	3	14	32	34
	Shore			
Target Trips	0	1,055	15,412	11,826
Output/Sales Impact	$0	$140	$1,795	$337
Value Added Impact Impact	$0	$83	$1,056	$535
Jobs	0	2	19	6
	All Modes			
Target Trips	6,457	28,022	60,485	68,114
Output/Sales Impact	$356	$2,290	$6,108	$2,567
Value Added Impact	$218	$1,339	$3,641	$4,088
Jobs Impact	4	26	61	41

*Headboat target trips in Virginia are negligible.
Source: Effort data from the MRIP, economic impact results calculated by NMFS SERO using the model developed for NMFS (2011b).

Estimates of the business activity (impacts) associated with headboat effort for cobia in the Southeast are not available. The headboat sector in the Southeast is not covered in the MRFSS/MRIP, so estimation of the appropriate impact coefficients for the headboat sector has not been conducted. While appropriate impact coefficients are available for the charter sector, potential differences in certain factors, such as the for-hire fee, rates of tourist versus local participation, and expenditure patterns, may result in significant differences in the business impacts of the headboat sector relative to the charter sector.

3.4 Social Environment

With the establishment of two migratory groups of cobia and setting of ACLs and ACTs in Amendment 18 and the establishment of a subzone for the Florida East Coast Zone in Amendment 20B to the Coastal Pelagic Fishery Management Plan (SAFMC 2012) the recent harvesting patterns reflect shifts in effort or changes in species range/status. The community description below is divided into the two subzones of Atlantic Group and Florida East Coast Zone with both recreational and commercial fishing communities identified for both zones and a description of Mid-Atlantic fishing communities included. The regional quotients are based upon their subzone landings. For more comprehensive demographic descriptions of many communities included, see the SERO Community Snapshots [2] and for Mid-Atlantic communities, see the NEFSC Community Snapshots.[3]

South Atlantic Group Recreational Fishing Communities

There is little data on cobia harvest at the community level for recreational fishing communities. One set of data that does provide some indication of where cobia is recreationally harvested is from the headboat survey. **Figure 3.4.1** provides cobia landings trends for fishing communities in the South Atlantic Group for the time series from 2010 to 2014. The communities of Calabash, NC, Tybee Island, GA and Atlantic Beach, NC have all seen increases in their landings trend since 2010 in **Figure 3.4.1**. Others like Myrtle Beach, SC and Carolina Beach, NC have seen a recent downturn in their landings from 2013 to 2014.

[2] http://sero.nmfs.noaa.gov/sustainable_fisheries/social/community_snapshot/index.html
[3] http://www.nefsc.noaa.gov/read/socialsci/communitySnapshots.php

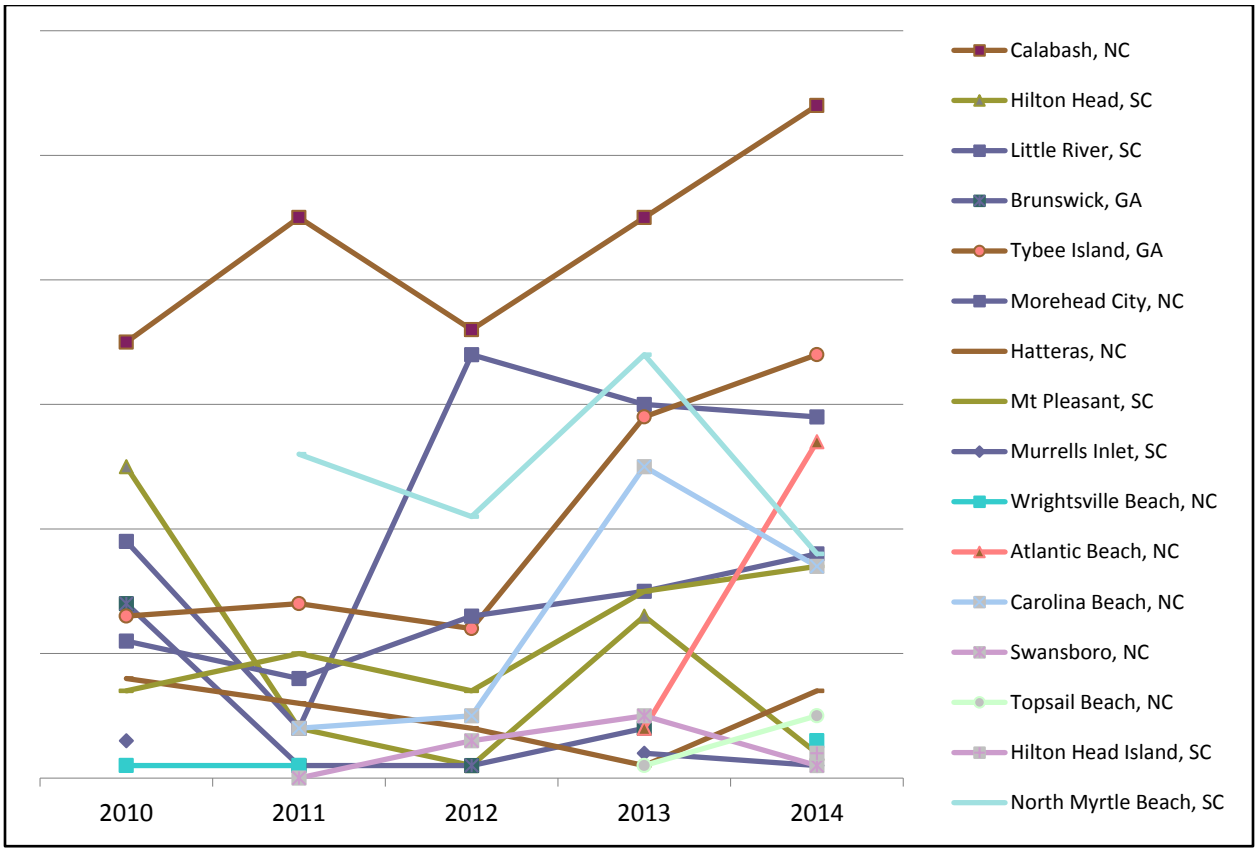

Figure 3.4.1. Cobia Headboat Landing Trends Atlantic Group Fishing Communities.
Source: NMFS Southeast Region Headboat Survey (SRHS).

Recreational fishing communities for the Atlantic Group are listed in **Figure 3.4.2**. These communities were selected by their index ranking based on a factor analysis of a number of criteria including number of charter permits and recreational fishing infrastructure as listed under the Marine Recreational Information Program (MRIP) survey identified within each community. There are two thresholds included in **Figure 3.4.2** that correspond to both1 and ½ standard deviations from the mean. The recreational engagement score is standardized so the mean is zero. Several communities in North Carolina and South Carolina exceed the threshold of 1 standard deviation which suggests those communities are highly engaged in recreational fishing. While this measure is not specific to cobia, but an overall recreational engagement measure, it is assumed that there would be more harvest of cobia from these ports recreationally because of increased effort.

The communities of Atlantic Beach, Hatteras, Manteo, Morehead City, NC and Charleston, Hilton Head, Little River and Murrells Inlet, SC all exceed the threshold of 1 standard deviation and likely have some dependence upon recreational fishing. The communities of Carolina Beach, Kill Devil Hills, Nags Head, Oak Island, Wanchese, Wilmington, NC and Mount Pleasant, SC all exceed the ½ standard deviation threshold and would also likely have some dependence upon recreational fishing within their economies, but not as much as those that exceed both thresholds. These communities may experience some effects of changes to management as they exhibit substantial recreational fishing activity. Unfortunately, we are

unable at this time to describe cobia harvest within a community and must rely on an overall recreational fishing measure.

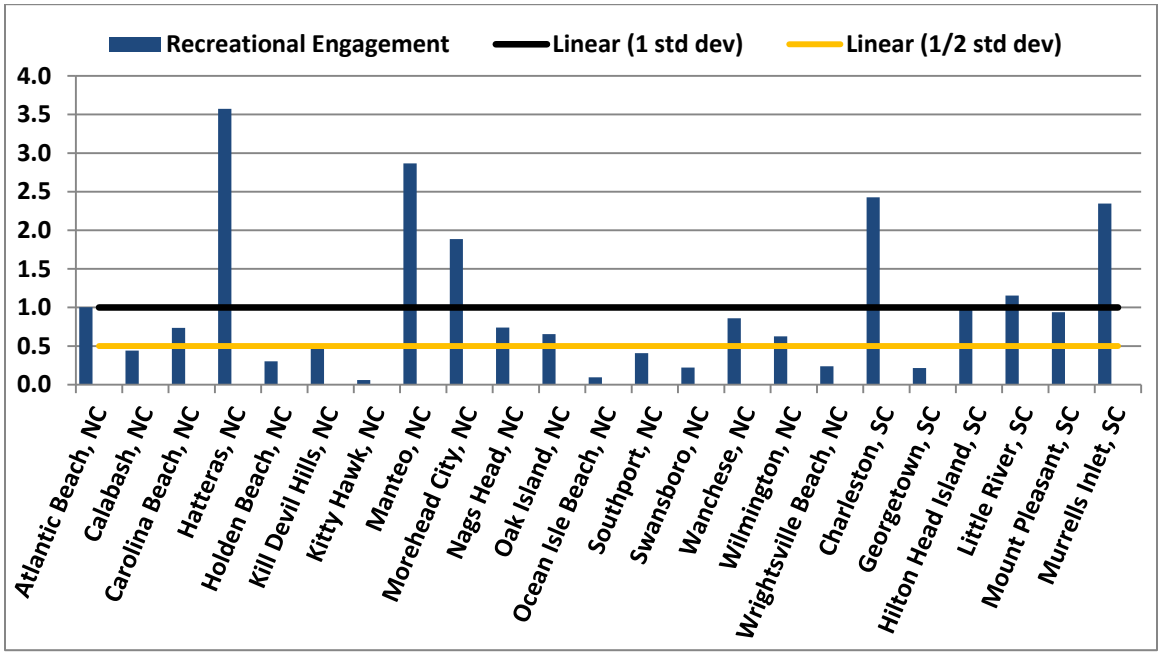

Figure 3.4.2. Recreational Engagement for Cobia Atlantic Group Fishing Communities. Source: SERO Community Social Vulnerability Indicators 2016.

Atlantic Group Commercial Fishing Communities

The communities ranked in **Figure 3.4.3** represent those top 16 communities in terms of their commercial landings of cobia within the Atlantic Group states. The data are based upon dealer data aggregated at the community level. The communities are ranked according to their landings of cobia as a percent of all cobia landings within the Atlantic Group. The community of Hatteras has seen a marked increase in its RQ for cobia in 2014, whereas other communities, such as Wanchese and Avon have seen a marked decrease in their RQ in the past few years. In fact, most communities in **Figure 3.4.3** have seen decreases in their RQ.

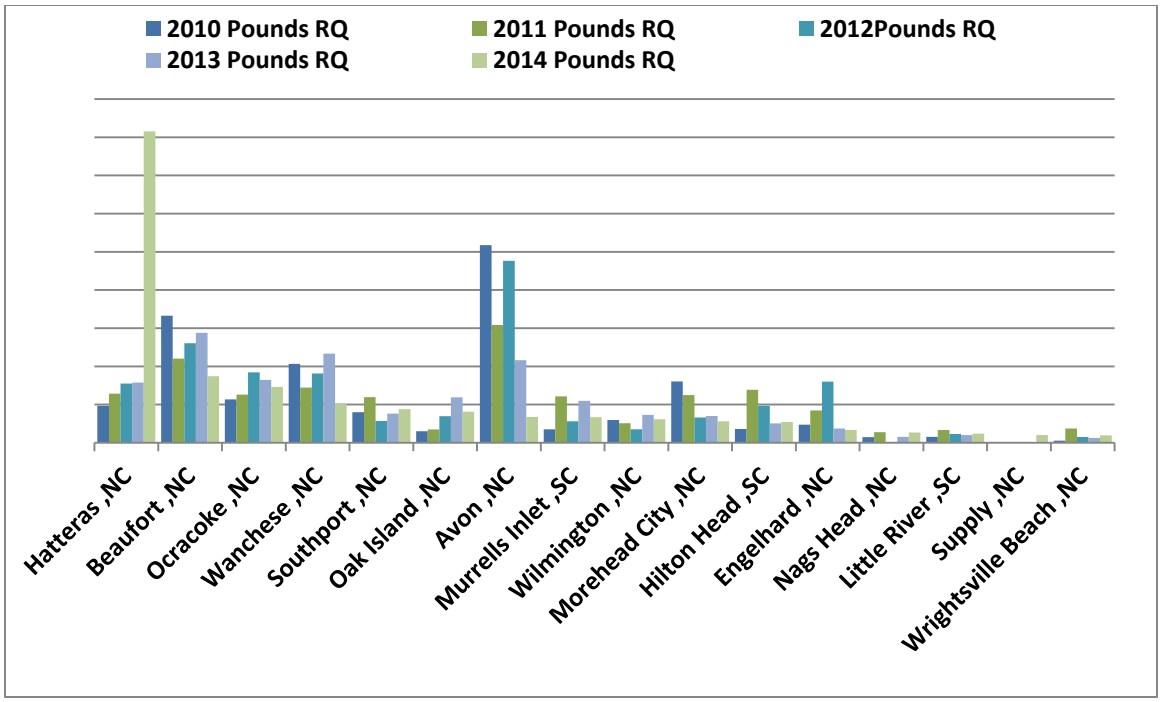

Figure 3.4.3. Cobia Commercial Regional Quotient for Atlantic Group Fishing Communities. SEFSC Commercial ALS Dataset with dealer address

Mid-Atlantic Group Recreational Fishing Communities

Data on the recreational harvest of cobia from the Northeast headboat survey is sparser than for the South Atlantic. Many landings data do not have a homeport associated with them. From the data that is available the communities of Other Northumberland, VA and Hampton, VA have seen recent increases in their cobia harvest. Most of the recreational harvest of cobia in the Mid-Atlantic is from private boat sector (Personal communication, Eric Thunberg NEFSC) for which we do not have data at the community level.

Mid-Atlantic Group Commercial Fishing Communities

Commercial landings of cobia in the Mid-Atlantic have recently increased as shown in **Figure 3.4.4**. The communities of Arlington (County), VA; Norfolk, VA; and Frederick (County), VA have seen substantial increases in their cobia harvest in 2014.

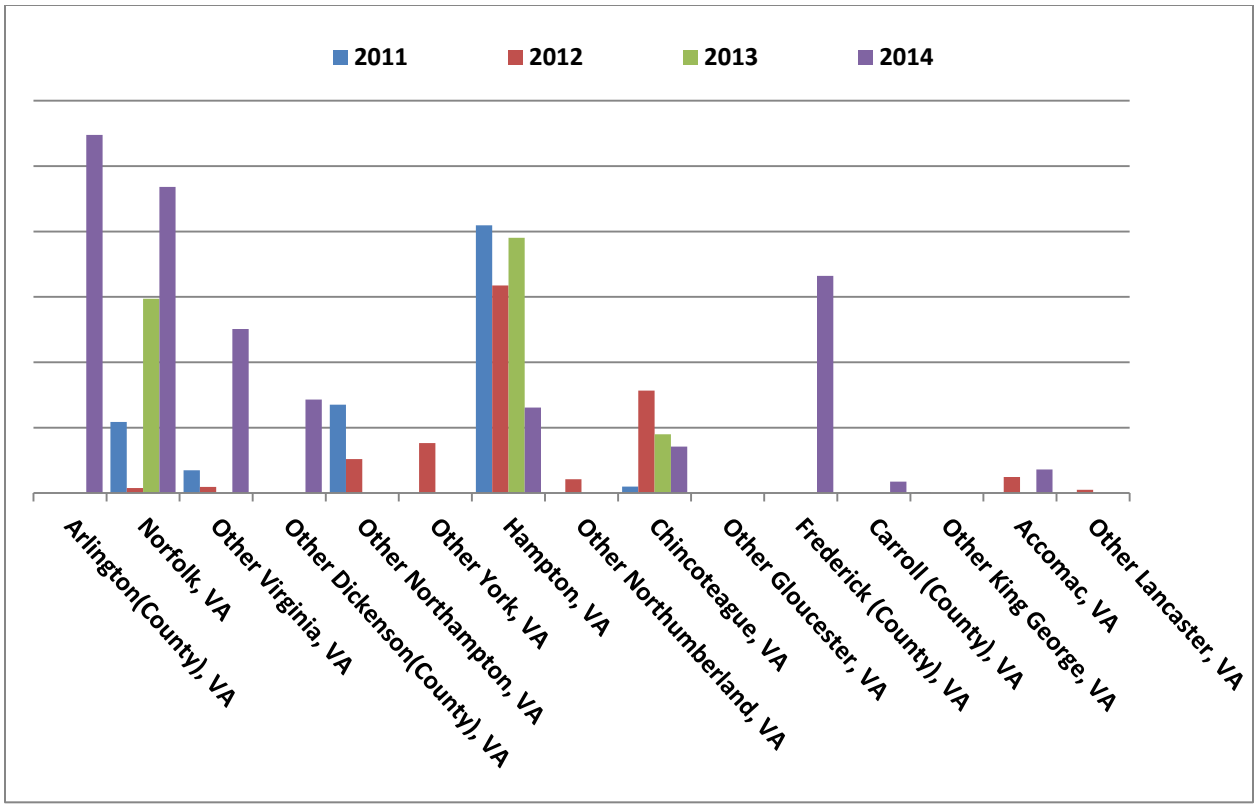

Figure 3.4.4. Cobia Commercial Regional Quotient for Mid-Atlantic Group Fishing Communities. NEFSC Commercial Landings Dataset with dealer address. Eric Thunberg (Pers Comm 2016).

Environmental Justice

Executive Order 12898 requires federal agencies conduct their programs, policies, and activities in a manner to ensure individuals or populations are not excluded from participation in, or denied the benefits of, or subjected to discrimination because of their race, color, or national origin. In addition, and specifically with respect to subsistence consumption of fish and wildlife, federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and/or wildlife for subsistence. This executive order is generally referred to as environmental justice (EJ).

The three indices are poverty, population composition, and personal disruptions. The variables included in each of these indices have been identified through the literature as being important components that contribute to a community's vulnerability (Jepson and Colburn 2013; Jacob et al. 2013). Indicators such as increased poverty rates for different groups, more single female-headed households and households with children under the age of 5, disruptions such as higher separation rates, higher crime rates and unemployment all are signs of populations experiencing vulnerabilities. These vulnerabilities signify that it may be difficult for someone living in these communities to recover from significant social disruption that might stem from a change in their ability to work or maintain a certain income level. For those communities that exceed the threshold of 1 Standard Deviation for all indices, it would be expected that they would exhibit vulnerabilities to sudden changes or social disruption that might accrue from regulatory change.

The suite of indices created to examine the social vulnerability of Atlantic Group fishing communities are depicted in **Figures 3.4.5** and **3.4.6**. No community exceeds both thresholds for all three vulnerabilities in **Figure 3.4.5**. The community of Manteo seems to demonstrate the most vulnerability by exceeding the 1 standard deviation threshold for Poverty and exceeding the ½ standard deviation for Personal Disruption. Calabash, Southport, Morehead City and Wilmington are the only other communities that exceed a threshold for any of their indicators.

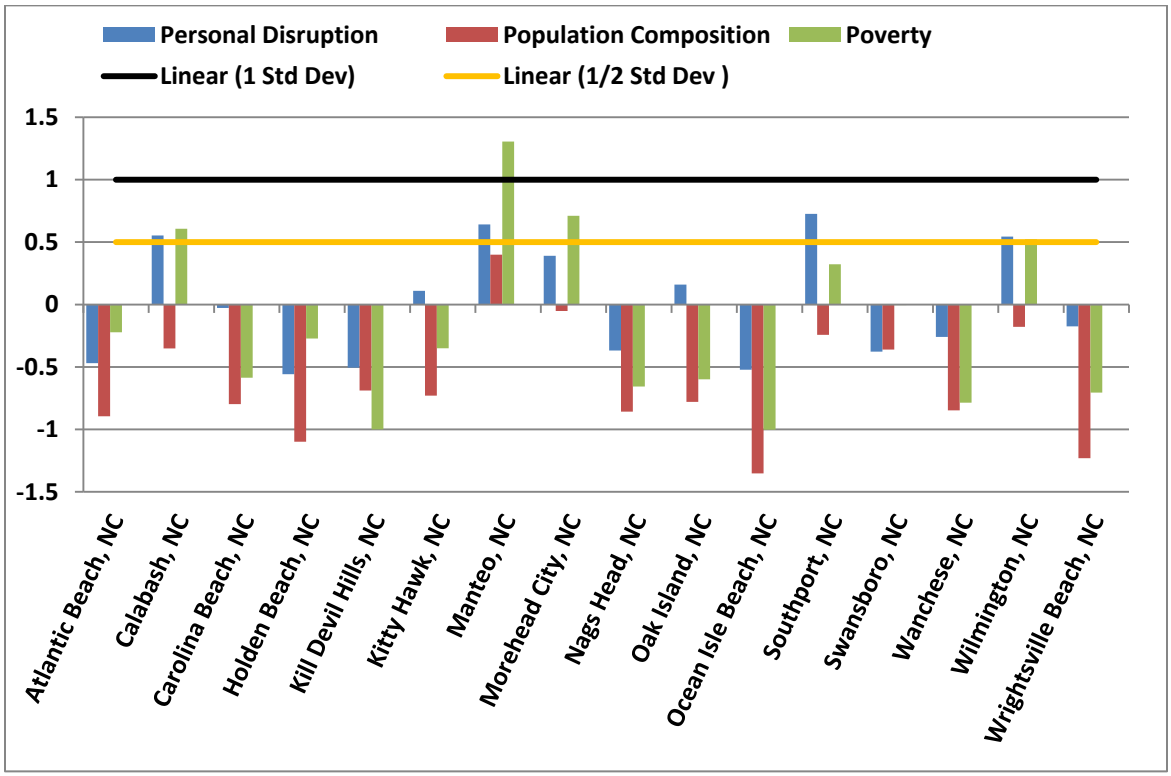

Figure 3.4.5. Social Vulnerability Indices for Atlantic Group Fishing Communities.
Source: SERO Community Social Vulnerability Indicators 2016.

The other communities that were included in the Atlantic Group also demonstrate little vulnerability, except Georgetown, SC and Beaufort, NC. These two communities exceed the 1 Standard Deviation thresholds for both personal disruption and poverty. Georgetown, SC has a relatively high score for the population composition measure which includes number of minorities.

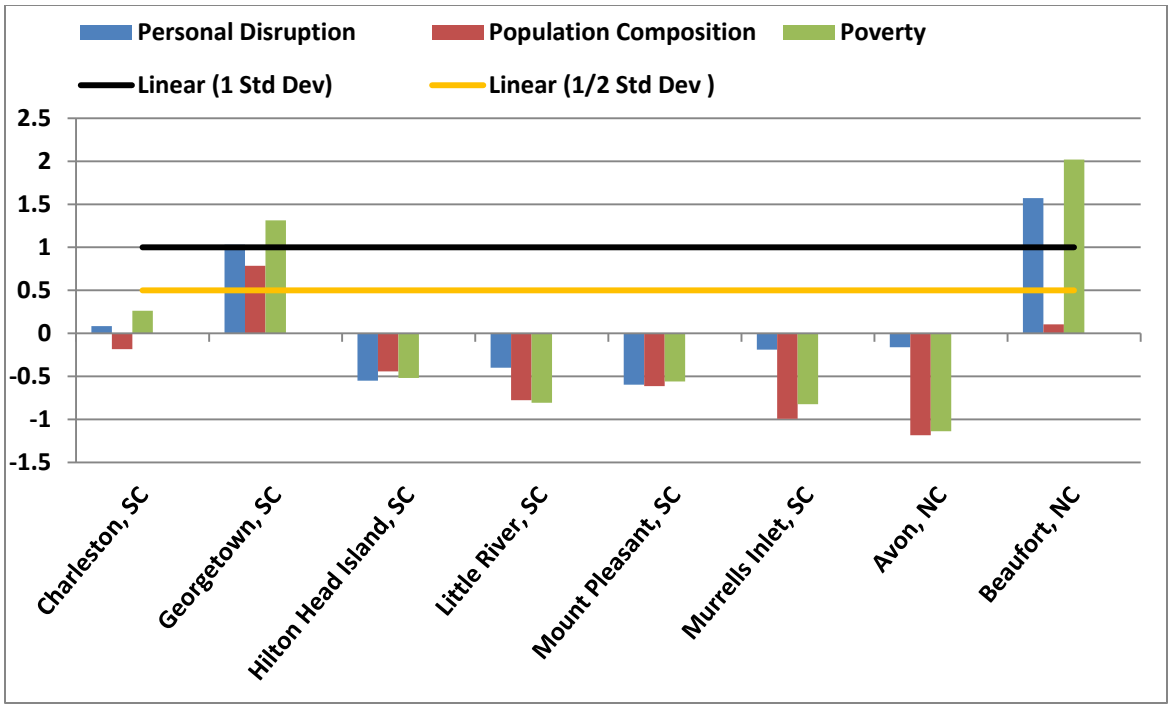

Figure 3.4.6. Social Vulnerability Indices for Atlantic Group Fishing Communities.cont.
Source:
SERO Community Social Vulnerability Indicators 2016.

For the Mid-Atlantic communities presented in **Figure 3.4.7**, District 9 in Accomack County, VA and Norfolk are the only communities that exceed one or both thresholds for all three indices. Districts 3 and 6 in Accomack County also demonstrate some vulnerability with both personal disruption and poverty exceeding one or both thresholds; the same is true for District 5 in Northampton County, VA.

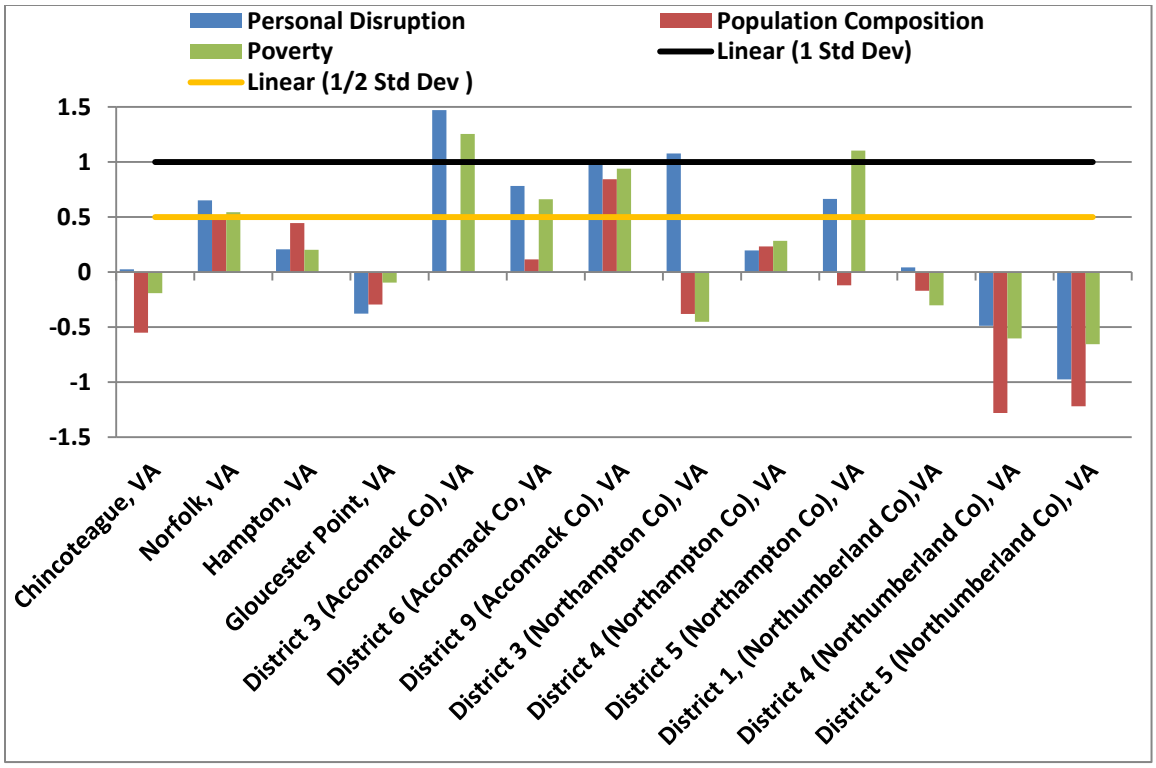

Figure 3.4.7. Social Vulnerability Indices for Mid-Atlantic Group Fishing Communities
Source: SERO Community Social Vulnerability Indicators 2016.

While these measures identify those communities that demonstrate social vulnerability, we cannot say for sure that fishermen in these communities will suffer the same vulnerabilities. Although we have information concerning the community's overall status with regard to minorities and poverty and other social vulnerabilities, we do not have such information for fishermen themselves. Therefore, we can only place our fishing activity within the community as a proxy for understanding the role that these social indicators have in the vulnerability of those being affected by regulatory change. While subsistence fishing is also an activity that can be affected by regulatory change, we have very little, if any, data on this activity at this time. We assume that the effects to other sectors will be similar to those that affect subsistence fishermen who may rely on cobia.

3.5 Administrative Environment

3.5.1 The Fishery Management Process and Applicable Laws

3.5.1.1 Federal Fishery Management

Federal fishery management is conducted under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. 1801 et seq.), originally enacted in 1976 as the Fishery Conservation and Management Act. The U.S. claims through the Magnuson-Stevens Act, sovereign rights and exclusive fishery management authority over most fishery resources within the EEZ, an area extending 200 nautical miles (nm) from the seaward

boundary of each of the coastal states, and authority over U.S. anadromous species and continental shelf resources that occur beyond the U.S. EEZ.

Responsibility for federal fishery management decision-making is divided between the U.S. Secretary of Commerce (Secretary) and eight regional fishery management councils that represent the expertise and interests of constituent states. Regional councils are responsible for preparing, monitoring, and revising management plans for fisheries needing management within their jurisdiction. The Secretary is responsible for collecting and providing the data necessary for the councils to prepare fishery management plans and for promulgating regulations to implement proposed plans and amendments after ensuring that management measures are consistent with the Magnuson-Stevens Act and with other applicable laws. In most cases, the Secretary has delegated this authority to NMFS.

The South Atlantic Council is responsible for conservation and management of fishery resources in federal waters of the U.S. South Atlantic. These waters extend from 3 to 200 nm offshore from the seaward boundary of the States of North Carolina, South Carolina, Georgia, and east Florida to Key West. The South Atlantic Council has 13 voting members: one from NMFS; one each from the state fishery agencies; and eight public members appointed by the Secretary. Non-voting members include representatives of the U.S. Fish and Wildlife Service, US Coast Guard (USCG), and Atlantic States Marine Fisheries Commission (ASMFC).

The Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) has two voting seats on the South Atlantic Council's Mackerel Committee but does not vote during Council sessions. The Mid-Atlantic Council is responsible for fishery resources in federal waters off New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. The coastal migratory pelagic fishery is jointly managed with the Gulf of Mexico Fishery Management Council (Gulf Council). Therefore, the Gulf Council reviewed CMP Framework 2 and voted to approve it for Secretarial review.

The Councils use their respective Scientific and Statistical Committees (SSC) to review data and science used in assessments and fishery management plans/amendments. Regulations contained within FMPs are enforced through actions of the NMFS' Office for Law Enforcement (NOAA/OLE), the USCG, and various state authorities.
The public is involved in the fishery management process through participation at public meetings, on advisory panels, and through council meetings that, with some exceptions, are open to the public. The regulatory process is in accordance with the Administrative Procedures Act, in the form of "notice and comment" rulemaking, which provides extensive opportunity for public scrutiny and comment, and requires consideration of and response to those comments.

3.5.1.2 State Fishery Management

The purpose of state representation at the Council level is to ensure state participation in federal fishery management decision-making and to promote the development of compatible regulations in state and federal waters. The state governments have the authority to manage their respective state fisheries including enforcement of fishing regulations. Each of the eight states exercises legislative and regulatory authority over their states' natural resources through discrete administrative units. Although each agency listed below is the primary administrative body with

respect to the state's natural resources, all states cooperate with numerous state and federal regulatory agencies when managing marine resources.

The states are also involved through the Gulf States Marine Fisheries Commission and the ASMFC in management of marine fisheries. These commissions were created to coordinate state regulations and develop management plans for interstate fisheries.

NMFS' State-Federal Fisheries Division is responsible for building cooperative partnerships to strengthen marine fisheries management and conservation at the state, inter-regional, and national levels. This division implements and oversees the distribution of grants for two national (Inter-jurisdictional Fisheries Act and Anadromous Fish Conservation Act) and two regional (Atlantic Coastal Fisheries Cooperative Management Act and Atlantic Striped Bass Conservation Act) programs. Additionally, it works with the commissions to develop and implement cooperative State-Federal fisheries regulations.

More information about these agencies can be found from the following web pages:
Florida Fish and Wildlife Conservation Commission http://www.myfwc.com
Georgia Department of Natural Resources, Coastal Resources Division http://crd.dnr.state.ga.us/
South Carolina Department of Natural Resources http://www.dnr.sc.gov/
North Carolina Department of Environmental and Natural Resources
http://portal.ncdenr.org/web/guest/
Virginia Marine Resources Commission http://www.mrc.virginia.gov/

3.5.1.3 Enforcement

Both the NOAA/OLE and the USCG have the authority and the responsibility to enforce regulations. NOAA/OLE agents, who specialize in living marine resource violations, provide fisheries expertise and investigative support for the overall fisheries mission. The USCG is a multi-mission agency, which provides at sea patrol services for the fisheries mission.

Neither NOAA/OLE nor the USCG can provide a continuous law enforcement presence in all areas due to the limited resources of NOAA/OLE and the priority tasking of the USCG. To supplement at sea and dockside inspections of fishing vessels, NOAA entered into Cooperative Enforcement Agreements with all but one of the states in the Southeast Region (North Carolina), which granted authority to state officers to enforce the laws for which NOAA/OLE has jurisdiction. In recent years, the level of involvement by the states has increased through Joint Enforcement Agreements, whereby states conduct patrols that focus on federal priorities and, in some circumstances, prosecute resultant violators through the state when a state violation has occurred.

NOAA General Counsel issued a revised Southeast Region Magnuson-Stevens Act Penalty Schedule in June 2003, which addresses all Magnuson-Stevens Act violations in the Southeast Region. In general, this penalty schedule increases the amount of civil administrative penalties that a violator may be subject to up to the current statutory maximum of $120,000 per violation. The Final Penalty Policy was issued and announced on April 14, 2011 (76 FR 20959).

Chapter 4. Environmental Effects and Comparison of Alternatives

4.1 Action 1: Modify the recreational management measures for Atlantic cobia

Action 1-1: Modify the recreational harvest limits for Atlantic cobia

Alternative 1 (No Action). Do not modify the possession limit of 2 fish per person per day for Atlantic cobia that are not sold.

Preferred Alternative 2. Establish a recreational bag limit for Atlantic cobia.
- **Preferred Sub-alternative 2a**. 1 fish per person per day
- **Sub-alternative 2b**. 2 fish per person per day

Preferred Alternative 3. Establish a recreational vessel limit for Atlantic cobia.
- **Sub-alternative 3a**. 1 fish per vessel per day
- **Sub-alternative 3b**. 2 fish per vessel per day
- **Preferred Sub-alternative 3c**. 3 fish per vessel per day
- **Sub-alternative 3d**. 4 fish per vessel per day
- **Sub-alternative 3e**. 5 fish per vessel per day
- **Sub-alternative 3f**. 6 fish per vessel per day

Action 1-2: Modify the minimum size limit for recreational harvest of Atlantic cobia

Alternative 1 (No Action). Do not modify the minimum size limit of 33 inches fork length (FL) for recreational and commercial harvest of Atlantic cobia.

Preferred Alternative 2. Modify the minimum size limit for Atlantic cobia for recreational and commercial harvest of Atlantic cobia.
- **Sub-alternative 2a**. 34 inches FL
- **Sub-alternative 2b**. 35 inches FL
- **Preferred Sub-alternative 2c**. 36 inches FL
- **Sub-alternative 2d**. 37 inches FL
- **Sub-alternative 2e**. 38 inches FL
- **Sub-alternative 2f**. 39 inches FL
- **Sub-alternative 2g**. 45 inches FL
- **Sub-alternative 2h**. 50 inches FL

NOTE: Action 1-2 includes language to apply changes to the minimum size limit to commercial harvest, but the Council indicated that this action would apply to only recreational harvest. Analysis of the alternatives assumed that the changes to the minimum size limit would apply only to recreational harvest. At their September 2016 meeting, the Council will revise the language to specify that the action applies to only the recreational minimum size limit, and will consider modifying the commercial minimum size limit in a future amendment.

4.1.1 Biological Effects

Action 1-1 and **Action 1-2** would implement harvest limits through recreational bag limits, vessel limits, size limits, or a combination of these management measures. Recreational cobia landings for the Atlantic migratory group (Georgia to New York[1]) in 2015 were substantially higher than previous years. The 2015 recreational landings were higher than both 2013 and 2014 landings (**Table 4.1.1.1**).

Table 4.1.1.1. Recreational landings (lbs) for Waves 1 through 5 for 2013, 2014, and 2015 by state. In 2013, 138 lbs were reported for Wave 6; no landings in Wave 6 of 2014; and only 71 lbs were reported for Wave 6 in 2015. All landings for 2015 are preliminary.

		2013		2014		2015	
Wave	**State**	**Landings**	**Wave Total**	**Landings**	**Wave Total**	**Landings**	**Wave Total**
1		0	0	0	0	0	0
2	NC	121		600		142	
	SC	306	427	24	624	44,310	44,452
3	GA	8,801		18,028		66,928	
	SC	11,781		15,976		71,916	
	NC	445,578		228,231		585,568	
	VA	66,476	532,636	122,740	384,975	193,795	918,208
4	GA	20,395		2,500		876	
	SC	6,914		15,449		7,619	
	NC	16,456		48,246		33,881	
	VA	286,937	330,703	91,687	157,882	519,139	561,514
5	GA	28		114		0	
	SC	129		478		107	
	NC	30,814		412		10,782	
	VA	1,050	32,021	0	1,004	5,713	16,601
Total			895,787		544,485		1,540,775

Source: SEFSC Recreational ACL Dataset

[1] No landings were reported north of Virginia.

The 2015 recreational landings from Waves 1-5 reached 245% of the recreational ACL and 231% of the stock ACL (recreational and commercial ACLs combined). Only 71 pounds whole weight of cobia were reported in Wave 6 of 2015. The majority of the landings occurred off Virginia and North Carolina with much lower landings off Georgia and South Carolina. Florida landings (both east and west coast) are considered to be part of the Gulf of Mexico stock.

The number of cobia caught per person in 2014 and 2015 were not statistically significantly different between the years (t-test, df = 1, P = 0.8495). However, from 2013 to 2015 there was an increase in the average weight of cobia (**Figure 4.1.1.1**) which contributed to the high landings of cobia in 2015. Another contributing factor to the high landings of cobia in 2015 was the increase in fishing effort. The recreational trips that targeted cobia from New York to Georgia increased by 25% from 2014 to 2015 (**Figure 4.1.1.2**).

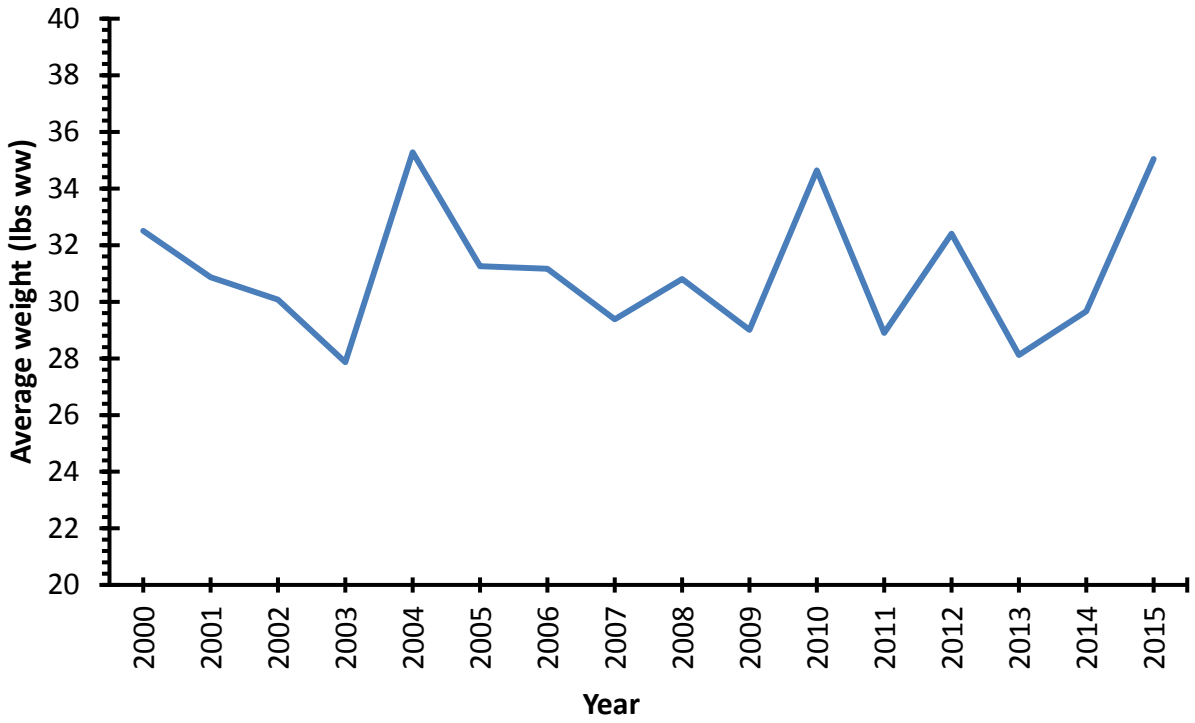

Figure 4.1.1.1 Average weights of cobia from New York to Georgia. The average weight for 2015 is preliminary. Source: SEFSC Recreational ACL Dataset

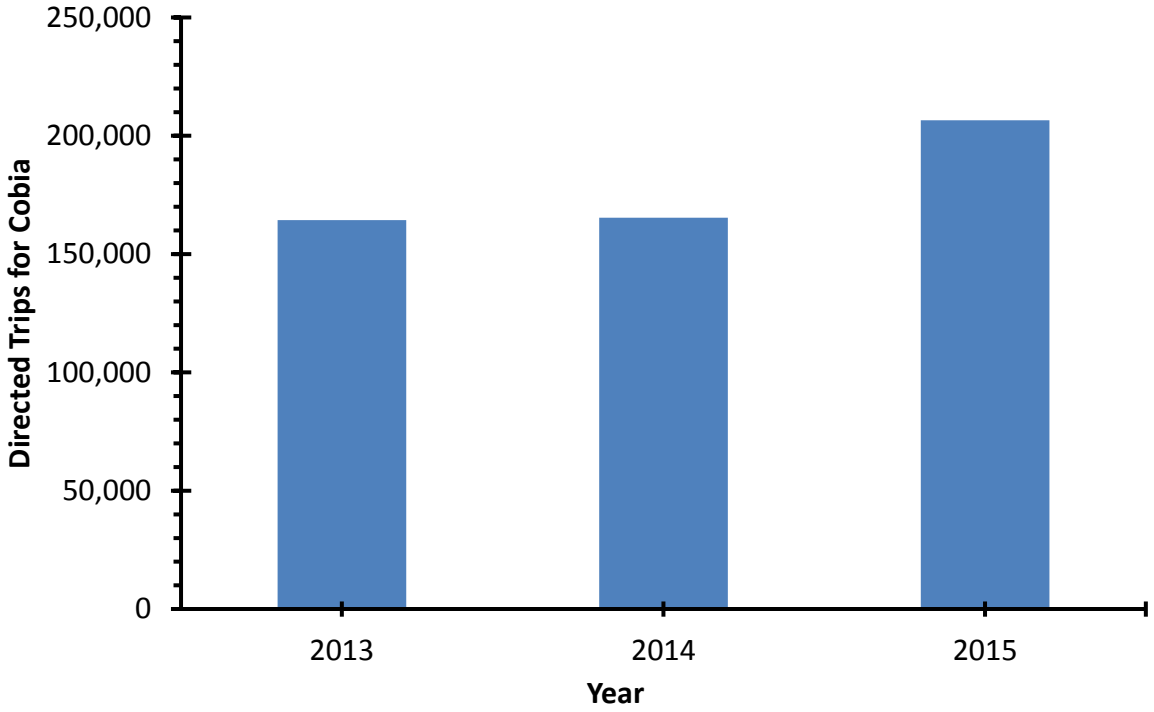

Figure 4.1.1.2. Directed recreational trips for cobia from New York to Georgia. The number of trips for 2015 are preliminary. Source: NOAA Office of Science and Technology Dataset

The recreational cobia sector closed on June 20, 2016 because the fish harvested was 245% greater than the annual catch limit. The actions in this amendment are intended to lengthen the fishing season for recreational cobia sector in upcoming years by implementing a combination of harvest limits and size limits. **Action 1-1** analyzes the impact harvest limits and an increase in the minimum size limits will have on recreational cobia. **Table 4.1.1.2** shows the estimated percent decrease of the combinations of actions under **Action 1-1** and **Action 1-2.** The reductions assume the regulations are implemented in both state and federal waters. The recreational bag limit for both North Carolina and Virginia is one fish per person.

Alternative 1 (No Action) would not modify the possession limit of 2 fish per person per day for Atlantic cobia that are not sold. Under this alternative, with current rates of fishing effort, it would be expected that the Atlantic cobia landings would not decrease from previous years.

At their June 2016 meeting, the Council selected **Preferred Alternative 2, Preferred Sub-Alternative 2a (one fish per person bag limit) and Preferred Alternative 3, Preferred Sub-alternative 3c (three fish per vessel limit).** The Council's intent was that whichever was more restrictive would apply. For example, if there were less than three people on the vessel, the one fish per person bag limit would apply. If there were more than three people on a vessel, the three fish per vessel limit would apply**.**

Table 4.1.1.2. Estimated percent decrease in Atlantic cobia landings for a combination of minimum size limits, bag limits, and vessel limits as proposed by Action 1-1 and Action 1-2. The highlighted cells indicate the Preferred alternatives.

	Action 1-2 Minimum Size Limit								
	Alt 1 33 inch FL	**Sub-alt 2a** 34 inch FL	**Sub-alt 2b** 35 inch FL	**Sub-alt 2c** 36 inch FL	**Sub-alt 2d** 37 inch FL	**Sub-alt 2e** 38 inch FL	**Sub-alt 2f** 39 inch FL	**Sub-alt 2g** 45 inch FL	**Sub-alt 2h** 50 inch FL
Action 1-1 Harvest Limits	Bag Limit								
Sub-alt 2a 1 per Person	2.0	4.9	8.1	12.7	16.7	21.3	23.8	59.5	73.7
Sub-alt 2b 2 per Person	0	0	0	0	0	0	0	0	0
Vessel Limit									
Sub-alt 3a 1 per Vessel	20.4	23.3	26.5	31.1	35.1	39.7	42.2	77.9	92.1
Sub-alt 3b 2 per Vessel	8.8	11.7	14.9	19.5	23.5	28.1	30.6	66.3	80.5
Sub-alt 3c 3 per Vessel	4.4	7.3	10.5	15.1	19.1	23.7	26.2	61.9	76.1
Sub-alt 3d 4 per Vessel	2.7	5.6	8.8	13.4	17.4	22.0	24.5	60.2	74.4
Sub-alt 3e 5 per Vessel	2.1	5.0	8.2	12.8	16.8	21.4	23.9	59.6	73.8
Sub-alt 3f 6 per Vessel	0.9	3.8	7.0	11.6	15.6	20.2	22.7	58.4	72.6

Preferred Alternative 2, **Preferred Sub-alternative 2a** and **Sub-alternative 2b** would establish a recreational bag limit of one or two fish, respectively. Under a one fish recreational bag limit, with the current size limit of 33 inches (**Preferred Alternative 2, Preferred Sub-alternative 2a**), a 2% reduction would be seen in the landings of Atlantic cobia. **Sub-alternative 2b**, which would continue the two fish bag limit, would not result in a reduction of landings.

Preferred Alternative 3 and associated sub-options would implement a vessel limit of one to six fish per vessel per day. **Preferred Alternative 3, Preferred Sub-alternative 3c** would implement a three fish per vessel harvest limit. Based on the analysis in **Table 4.1.2,** this harvest limit alone would result in a 4.4% reduction in Atlantic cobia landings. All of the other sub-alternatives under **Preferred Alternative 3** would result in a reduction of landings, with the highest reduction being a one fish vessel limit, at 20.4% (**Preferred Alternative 3, Sub-alternative 3a**) and the lowest reduction with a six fish vessel limit at .9% (**Preferred Alternative 3, Sub-alternative 3f** . If the minimum size limit is increased under Action 1-2 the reduction in landings would increase.

The reduction in Atlantic cobia landings decreases as the bag limits and vessel limits are paired with an increased size limit (**Action 1-2**). Alternatives were considered to keep the size limit at 33 inches FL (**Alternative 1**) or Sub-alternatives under **Preferred Alternative 2** to increase it to 34 inches FL (**Sub-alternative 2a**), 35 inches FL (**Sub-alternative 2b**), 36 inches FL (**Preferred Sub-alternative 2c**), 37 inches FL (**Sub-alternative 2d**) 38 inches FL (**Sub-alternative 2e**), 39 inches FL (**Sub-alternative 2f**), 45 inches FL (**Sub-alternative 2g**) and 50 inches FL (**Sub-alternative 2h**).

The Council has currently selected **Preferred Alternative 2, Preferred Sub-alternative 2c** under Action 1-2, which is a minimum size limit of 36 inches fork length (FL). Action 1-2, **Preferred Alternative 2, Preferred Sub-Alternative 2c** (36 inch size limit) in combination with the preferred alternatives of **Action 1-1, Preferred Alternative 2, Preferred Sub-Alternative 2a** (1 fish bag limit) **and Preferred Alternative 3, Preferred Sub-alternative 3c** (three fish per vessel limit) would result in a decrease in landings of 15.1%.

This amendment is also proposing changes to the fishing year start date so it is useful to review the analysis under **Action 2**. This analysis predicts the date when the ACL will be reached based on the proposed harvest limit and size limits in Action 1-1 and Action 1-2.

4.1.2 Economic Effects

Action 1-1

The current recreational possession limit for Atlantic cobia in federal waters is 2 fish per person with no vessel limit and a minimum size limit of 33 inches fork length, however in 2016, the states of South Carolina, North Carolina, and Virginia have implemented various cobia regulations specifying alternative size limits, vessel limits, harvest days and/or harvest seasons for state waters (**Table 2.1.1**). Given the varying cobia regulations that are in place, it is difficult to estimate the economic effects, but assuming the Council's selected management options for cobia are also adopted in state waters, the anticipated economic effects are as follows.

Alternative 2 establishes the definition of a recreational bag limit. Functionally, **Sub-alternative 2b** (2 fish per person bag limit) is equivalent to **Alternative 1 (No Action)** for the recreational sector (2 fish per person possession limit for Atlantic cobia that are not sold), therefore there are no anticipated economic effects. **Preferred Sub-alternative 2a** would limit the possession of cobia to 1 fish per person. MRIP estimates indicate that on most trips where

cobia are landed, there is not more than one cobia harvested per person. Based on this assumption, is not likely that lowering the bag limit to 1 fish per person will impact most recreational cobia trips. In relation to overall harvest, the marginal decrease from the reduced bag limit is approximately 2%, signaling a likely minimal impact on consumer surplus (CS) in the recreational cobia fishery (**Table 4.1.1.2**). While the overall economic effect is expected to be minor, some CS may be lost on trips when more than 1 fish per person could be kept and the angler desires to do so. Additionally, some for-hire operations and other fishing-related businesses may be negatively impacted should anglers decide to forgo taking or take fewer trips for cobia due to the lowered bag limit. The extent to which angling effort will be impacted is unknown and will be variable, but this may especially be a concern for anglers and fishing related businesses at times when substitute fish species are not readily available.

Alternative 3, **Sub-alternatives 3a – 3f** range from 1 to 6 fish per vessel in one fish increments, with **Sub-alternative 3f** (6 fish per vessel) being least restrictive compared to **Sub-alternative 3a** (1 fish per vessel). The economic effects of a vessel limit are similar to those described under a reduced bag limit, but these effects will be more pronounced on trips where the vessel limit is more restrictive than the bag limit. **Preferred Sub-alternative 3c** is expected to reduce cobia harvest by 4.4%, signaling some potential negative economic effects. It is unclear how this option will impact overall fishing effort and thus for-hire NOR or revenue for other fishing-related businesses, but the lower vessel limit options are more likely to create heightened negative economic effects.

Action 1-2

In general, increasing the size limit for a species typically has little long-term economic effect unless the larger size limit is set so high that it negatively impacts long-term effort or it results in greater numbers of fish reaching spawning size and/or fish have higher fecundity prior to being harvested. Size limits that result in more spawning and/or higher fecundity would result in more direct, long-term, positive economic effects presumably through the availability of increased numbers of fish in the future. However, there can be some direct, short-term negative economic effects as fewer fish would be available to harvest until the current population grows into the new minimum size and/or the biomass of harvestable fish increases. The further that the increase in size limit differs from **Alternative 1 (No Action)**, the probability increases for lengthened short-term negative economic effects, but this action could also eventually result in greater long-term positive economic outcomes as long as the increased size limit would result in a larger spawning biomass that would create additional fishing and harvest opportunities.

Size limits set towards the upper typical biological limits of cobia length has the potential to discourage fishing effort in the short and long-term if the likelihood of a successful fishing trip that involves harvesting cobia is not likely. In this case, it can be expected that negative economic effects will occur as fishery participants reduce effort or switch to substitute fisheries that may exhibit a lower CS or may reduce expenditures, thereby negatively effecting for-hire and fishing related businesses as well as the economies of coastal communities. **Preferred Sub-alternative 2c** sets the size limit at 36 inches FL and is expected to initially decrease harvest by 10.7%, showing that the majority of cobia kept are at or above this limit and most trips will not be negatively affected **(Table 4.1.1.2)**. It is unclear at this time how many trips this size limit

would impact, but given the relatively fast growth of cobia and how close this size limit is to the current size limit of 33 inches FL, short-term negative economic effects are expected to be minimal. There may be some positive economic benefits from this size limit change should it help maintain or increase the overall cobia stock biomass in the long-term as well as prevent closures or prolong the fishing season.

When the implementation of vessel limits, reduced bag limits, and increased size limits are taken into the account, they are anticipated to mitigate the likelihood of a harvest closure if the recreational ACL is caught or prolonging the harvest season. Should a harvest closure occur, there may be loss of CS and anglers may decide to forgo some fishing trips due to the closure, depending on the closure timing. While some economic benefits will still be realized from catch and release fishing during a harvest closure, anglers often value being able to harvest cobia, resulting in a decrease in overall recreational effort. As a consequence, there will be negative economic effects to for-hire operators and other fishing related businesses due to the reduced recreational fishing activity and the reduction in angler expenditures on durable and non-durable goods that go along with this activity. The extent to which these negative economic effects may occur and the distribution of the effects will be highly dependent on the timing of the harvest closure. The earlier the harvest closure, the greater the likely overall negative economic effects, and the more concentrated these effects will be in states residing in the northern range of the typical cobia spawning migration in the Atlantic, namely North Carolina and Virginia.

Assuming the ACL is equally met under the different alternatives, there are potential economic benefits of prolonging the time that harvest is open with measures that decrease the number of fish landed per trip, but maintain or increase the number of trips taken. While there is no specific CS value available for recreationally caught Atlantic cobia, proxy values are available for dolphin and king mackerel, and are included in **Section 3.3.2**. These values show a diminishing marginal return per fish as more fish are kept on a trip. Under this scenario, keeping harvest per trip at a lower level via a combination of bag limits, trip limits, and/or size limits while maximizing fishing effort will help increase overall CS in the recreational cobia fishery. Additionally, the higher levels of effort will help maintain NOR for charter and head boat operators.

Table 4.1.2.1 shows the estimated number of cobia landed per state from 2013-2015. Average total landings over the time series were used to calculate estimated CS under a range of size limits, bag limits, and vessel limits in relation to the reductions specified in **Table 4.1.1.2 (Section 4.1.1**). Estimated values of CS for king mackerel as found in **Section 3.3.2** were used as a proxy for cobia, as recreational bag limits and size limits are more similar for these two species than for dolphin. Given the range of CS estimates per fish based on how many fish are kept on a trip, the value for the second kept fish ($100) and the sixth kept fish ($32) were used to provide an upper bound **(Table 4.1.2.2)** and lower bound **(Table 4.1.2.3)** estimate of overall CS for recreational cobia landings under the different regulatory scenarios. It is important to note that these CS estimates are for harvest only and do not include economic benefits that may be derived from catch and release fishing or the economic effects of varying projected closure dates.

Table 4.1.2.1. Annual recreational landings (numbers of fish) of Atlantic cobia, by state/region, 2013-2015.

Year	GA	SC	NC	MA	Total
2013	1,189	634	19,224	10,586	31,633
2014	792	1,137	9,804	6,404	18,137
2015	2,282	4,182	16,166	21,755	44,385
Average	1,421	1,984	15,065	12,915	31,385

Source: http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/queries/index.

Table 4.1.2.2. Upper bound estimate of consumer surplus (2014 $) for Atlantic cobia landings under a combination of minimum size limits, bag limits, and vessel limits.

	Minimum Size Limit (FL)								
	33”	34”	35”	36”	37”	38”	39”	45”	50”
Bag Limit									
1 per Person	$3,075,730	$2,984,714	$2,884,282	$2,739,911	$2,614,371	$2,470,000	$2,391,537	$1,271,093	$825,426
2 per Person	$3,138,500	$3,047,484	$2,947,052	$2,802,681	$2,677,141	$2,532,770	$2,454,307	$1,333,863	$888,196
Vessel Limit									
1 per Vessel	$2,498,246	$2,407,230	$2,306,798	$2,162,427	$2,036,887	$1,892,516	$1,814,053	$693,609	$247,942
2 per Vessel	$2,862,312	$2,771,296	$2,670,864	$2,526,493	$2,400,953	$2,256,582	$2,178,119	$1,057,675	$612,008
3 per Vessel	$3,000,406	$2,909,390	$2,808,958	$2,664,587	$2,539,047	$2,394,676	$2,316,213	$1,195,769	$750,102
4 per Vessel	$3,053,761	$2,962,744	$2,862,312	$2,717,941	$2,592,401	$2,448,030	$2,369,568	$1,249,123	$803,456
5 per Vessel	$3,072,592	$2,981,575	$2,881,143	$2,736,772	$2,611,232	$2,466,861	$2,388,399	$1,267,954	$822,287
6 per Vessel	$3,110,254	$3,019,237	$2,918,805	$2,774,434	$2,648,894	$2,504,523	$2,426,061	$1,305,616	$859,949

Table 4.1.2.3. Lower bound estimate of consumer surplus (2014 $) for Atlantic cobia landings under a combination of minimum size limits, bag limits, and vessel limits.

	Minimum Size Limit (FL)								
	33”	34”	35”	36”	37”	38”	39”	45”	50”
Bag Limit									
1 per Person	$984,234	$955,108	$922,970	$876,771	$836,599	$790,400	$765,292	$406,750	$264,136
2 per Person	$1,004,320	$975,195	$943,056	$896,858	$856,685	$810,486	$785,378	$426,836	$284,223
Vessel Limit									
1 per Vessel	$799,439	$770,313	$738,175	$691,976	$651,804	$605,605	$580,497	$221,955	$79,341
2 per Vessel	$915,940	$886,815	$854,676	$808,478	$768,305	$722,106	$696,998	$338,456	$195,842
3 per Vessel	$960,130	$931,005	$898,866	$852,668	$812,495	$766,296	$741,188	$382,646	$240,032
4 per Vessel	$977,203	$948,078	$915,940	$869,741	$829,568	$783,370	$758,262	$399,719	$257,106
5 per Vessel	$983,229	$954,104	$921,966	$875,767	$835,594	$789,396	$764,288	$405,745	$263,132
6 per Vessel	$995,281	$966,156	$934,018	$887,819	$847,646	$801,447	$776,339	$417,797	$275,184

4.1.3 Social Effects

In general for **Action 1-1**, the social effects of modifying the recreational harvest limits would be associated with the biological costs of each alternative (see **Section 4.1.1**), as well as the effects on current recreational fishing opportunities. While **Alternatives 2** and **3** could restrict recreational fishing opportunities for Atlantic cobia, the harvest limits could help to extend the recreational fishing season by slowing the rate of harvest.

Different levels of recreational fishing opportunities under each alternative could affect recreational anglers and for-hire businesses targeting Atlantic cobia, particularly in North Carolina and Virginia (see **Section 3.3**). In general, benefits to the recreational sector will result from harvest limits that result in a longer fishing season but still maintain harvest limits large enough to have minimum effect on recreational trip satisfaction.

The social effects of the potential harvest limits will depend on the effect on how the measures or combination of measures can restrict the number of fish that can be kept, which could affect recreational trip satisfaction, and the trade-off required to keep the season open by slowing the rate of harvest. **Table 4.1.3.1** shows the estimated date when recreational landings would reach the current recreational ACL (620,000 lbs) under the combination of the harvest limits in Action 1. The estimated dates in **Table 4.1.3.1** indicate how each combination can slow the rate of harvest, which would be expected to not trigger any current or future accountability measures for recreational harvest of Atlantic cobia. Overall, the higher minimum size limits and lower bag and vessel limits are more likely to slow the rate of harvest, but will also likely affect trip satisfaction.

Table 4.1.3.1. Estimated dates when Atlantic cobia recreational landings would meet the recreational ACL (620,000 lbs for 2016 and subsequent years) under the range of minimum size limits, bag limits, and vessel limits, under the current fishing year of January 1- December 31. Highlighted cells are the current Preferred Sub-alternatives in Action 1.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per person	2-Jul	5-Jul	10-Jul	17-Jul	23-Jul	31-Jul	5-Aug	None	None
2 per person	30-Jun	3-Jul	7-Jul	14-Jul	20-Jul	28-Jul	1-Aug	None	None
Vessel Limit									
1	30-Jul	4-Aug	11-Aug	22-Aug	22-Sep	None	None	None	None
2	11-Jul	15-Jul	20-Jul	28-Jul	5-Aug	15-Aug	21-Aug	None	None
3	5-Jul	9-Jul	13-Jul	20-Jul	27-Jul	5-Aug	10-Aug	None	None
4	3-Jul	6-Jul	11-Jul	18-Jul	24-Jul	2-Aug	7-Aug	None	None
5	2-Jul	6-Jul	10-Jul	17-Jul	23-Jul	1-Aug	6-Aug	None	None
6	30-Jun	4-Jul	8-Jul	15-Jul	21-Jul	29-Jul	3-Aug	None	None

Note: This analysis assumed that the recreational bag limit, vessel limit and minimum size limit would be consistent in state and federal waters for the South Atlantic and Mid-Atlantic regions. Additionally, the estimated dates were generated based on recreational landings from 2013-2015.

In general, measures that reduce the number of fish that a recreational angler can keep may negatively affect trip satisfaction. Under alternatives that would maintain the current measures (**Alternative 1 (No Action)** and **Sub-alternative 2b** in **Action 1b**, and **Alternative 1 (No Action)** in **Action 1**-2) will have the identical effects on recreational fishermen, which will be minimal at the individual level when considering trip satisfaction. However, no changes to the harvest limits will likely result in recreational landings reaching the recreational ACL earlier in the year, which could trigger recreational accountability measures (AMs) or require additional measures to be implemented in the future.

As measures are more restrictive, there would be more expected negative effects on trip satisfaction for recreational fishermen. Additionally, lower vessel limits will have more negative effects on boats and trips with more fishermen on board, such as on headboat trips. The most negative short-term effects would be expected under **Preferred Sub-alternative 2b** than under **Sub-alternative 2b** under **Action 1-1.** The most negative effects on recreational fishermen would be expected from the vessel limits in **Action 1-1/Preferred Alternative 3** under **Sub-alternative 3f**, followed by **Sub-alternative 3e**, **Sub-alternative 3d**, **Preferred Sub-alternative 3c**, **Sub-alternative 3b**, and then **Sub-alternative 3a.** When considering the minimum size limit in **Action 1-2**, the most negative effects on trip satisfaction and recreational fishermen would be expected under **Sub-alternative 2h**, followed by **Sub-alternative 2h, Sub-alternative 2g, Sub-alternative 2f, Sub-alternative 2e, Sub-alternative 2d, Preferred Sub-alternative 2c, Sub-alternative 2b** and then **Sub-alternative 2a**.

4.1.4 Administrative Effects

Establishing bag limits, vessel limits and size limits will have result in an administrative burden associated with rulemaking, outreach, education and enforcement. However, the impact is expected to be minimal based on the alternatives proposed in this amendment.

4.2 Action 2: Modify the fishing year for Atlantic cobia

Alternative 1 (No Action). Do not modify the current fishing year of January 1 through December 31.

Preferred Alternative 2. Modify the fishing year for Atlantic cobia to be May 1 through April 30.

Alternative 3. Modify the fishing year for Atlantic cobia to be June 1 through May 31.

Alternative 4. Modify the fishing year for Atlantic cobia to be April 1 through March 31.

4.2.1 Biological Effects

Under **Alternative 1 (No Action)**, the fishing year would remain aligned with the calendar year. **Alternative 2** would implement a fishing year to start May 1 which corresponds with peak landings (**Figure 4.2.2.1**). **Alternative 3** would modify the fishing year to be June 1-May 31. **Alternative 4** would modify the fishing year to start April 1 and run through March 31st.

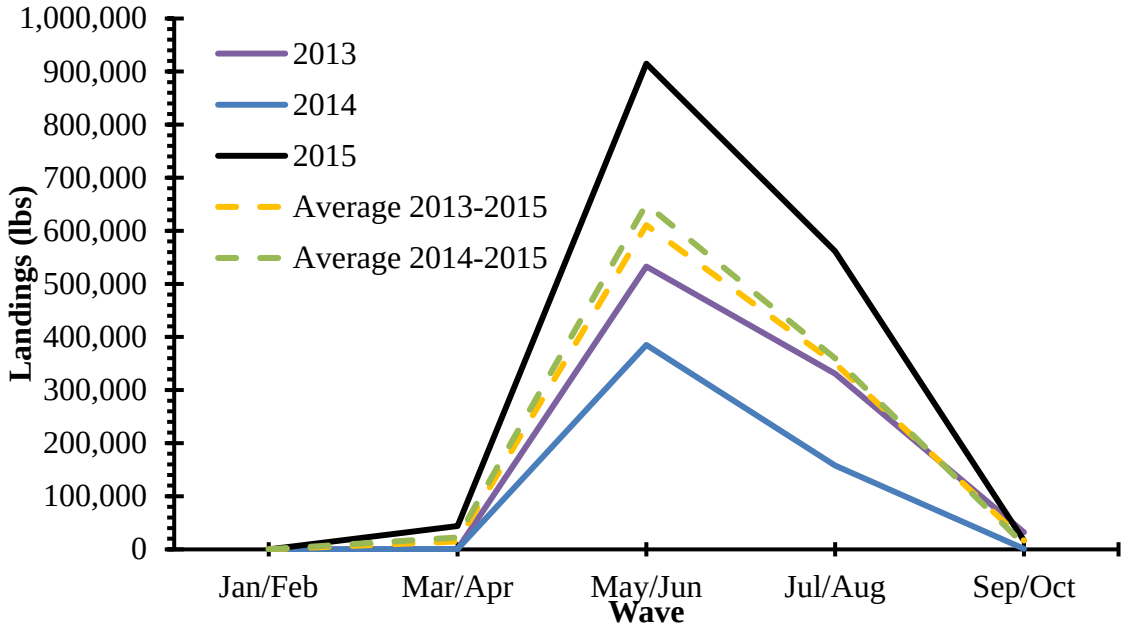

Figure 4.2.2.1. Atlantic recreational landings for January-October of 2013, 2014, 2015, average 2013-2015 landings, and average 2014-2015 landings by two-month wave. The landings for 2015 are preliminary. Source: SEFSC Recreational ACL Dataset

Under **Alternative 1** (No Action) the fishing year would remain aligned with the calendar year. Action 1-2, **Preferred Alternative 2, Preferred Sub-Alternative 2c** (36 inch size limit) in combination with the preferred alternatives of **Action 1-1, Preferred Alternative 2, Preferred**

Sub-Alternative 2a (1 fish bag limit) **and Preferred Alternative 3, Preferred Sub-alternative 3c** (three fish per vessel limit) would result in an in-season closure of about July 20th (**Table 4.2.1**). If the Council were to select more restrictive management harvest limits (**Action 1-1**) or minimum size limits (**Action 1-2**), there would be the potential to extend the season. Under **Action 1-1, Preferred Alternative 3, sub-alternative 3a and Action 1-2, Preferred Alternative 2, sub-alternative 2h**, the most restrictive harvest limits and minimum size limits, it is expected that no in season closure would occur.

Table 4.2.1.1. Estimated ACL overage dates for **Alternative 1 (no Action)** of **Action 2** under a range of size limits, bag limits, and vessel limits as proposed in **Action 1-1** and **Action 1-2**. Alternative 1 has the current fishing year of January 1 through December 31st. The highlighted cells indicate the Preferred Alternatives under Action 1-1 and Action 1-2.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per person	2-Jul	5-Jul	10-Jul	17-Jul	23-Jul	31-Jul	5-Aug	None	None
2 per person	30-Jun	3-Jul	7-Jul	14-Jul	20-Jul	28-Jul	1-Aug	None	None
Vessel Limit									
1	30-Jul	4-Aug	11-Aug	22-Aug	22-Sep	None	None	None	None
2	11-Jul	15-Jul	20-Jul	28-Jul	5-Aug	15-Aug	21-Aug	None	None
3	5-Jul	9-Jul	13-Jul	20-Jul	27-Jul	5-Aug	10-Aug	None	None
4	3-Jul	6-Jul	11-Jul	18-Jul	24-Jul	2-Aug	7-Aug	None	None
5	2-Jul	6-Jul	10-Jul	17-Jul	23-Jul	1-Aug	6-Aug	None	None
6	30-Jun	4-Jul	8-Jul	15-Jul	21-Jul	29-Jul	3-Aug	None	None

Note: This analysis assumed that the recreational bag limit, vessel limit and minimum size limit would be consistent in state and federal waters for the South Atlantic and Mid-Atlantic regions. Additionally, the estimated dates were generated based on recreational landings from 2013-2015.

Preferred Alternative 2 would modify the fishing year for cobia to be from May 1 - April 30. This would ensure that the season is open during the peak landings period of May/June (**Figure 4.2.1.1**). **Table 4.2.1.2** estimates the date the ACL would be reached, based on the average of 2013-2015 landings. This table provides closure dates for all alternatives under Action 1-1 and Action 1-2. The combination of Action 1-2, **Preferred Alternative 2, Preferred Sub-Alternative 2c** (36 inch size limit) and the preferred alternatives of **Action 1-1, Preferred Alternative 2, Preferred Sub-Alternative 2a** (1 fish bag limit) **and Preferred Alternative 3, Preferred Sub-alternative 3c** (three fish per vessel limit) **and Action 3, Preferred Alternative 2** would result in an in-season closure of about July 23rd. This would only increase the fishing year by about three days from **Alternative 1** (no action) largely because the pulse nature of the fishery. As shown in **Figure 4.2.1**, the bulk of the landings occur during May/June and the landings from January-April are minimal. If the Council were to select more restrictive management harvest limits (**Action 1-1**) or minimum size limits (**Action 1-2**), there would be the potential to extend the season or with the most restrictive harvest limits and minimum size limits.

For example, under **Action 1-1, Preferred Alternative 3, sub-alternative 3a and Action 1-2, Preferred Alternative 2, sub-alternative 2h**, the most restrictive harvest limits and minimum size limits, it is expected that no in season closure would occur.

Table 4.2.1.2. Estimated ACL overage dates for **Action 2, Preferred Alternative 2** under a range of size limits, bag limits, and vessel limits as proposed in Action 1-1 and Action 1-2. Alternative 2 proposes a fishing year of May 1 through April 30. The highlighted cells indicate the Preferred Alternatives under Action 1-1 and Action 1-2.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per Person	5-Jul	8-Jul	13-Jul	19-Jul	26-Jul	3-Aug	8-Aug	None	None
2 per Person	2-Jul	6-Jul	10-Jul	16-Jul	23-Jul	31-Jul	4-Aug	None	None
Vessel Limit									
1 per Vessel	2-Aug	7-Aug	14-Aug	25-Aug	20-Mar	None	None	None	None
2 per Vessel	14-Jul	18-Jul	23-Jul	31-Jul	8-Aug	18-Aug	24-Aug	None	None
3 per Vessel	8-Jul	12-Jul	16-Jul	23-Jul	30-Jul	8-Aug	13-Aug	None	None
4 per Vessel	6-Jul	9-Jul	14-Jul	21-Jul	27-Jul	5-Aug	10-Aug	None	None
5 per Vessel	5-Jul	8-Jul	13-Jul	20-Jul	26-Jul	4-Aug	9-Aug	None	None
6 per Vessel	3-Jul	7-Jul	11-Jul	18-Jul	24-Jul	1-Aug	6-Aug	None	None

Note: This analysis assumed that the recreational bag limit, vessel limit and minimum size limit would be consistent in state and federal waters for the South Atlantic and Mid-Atlantic regions. Additionally, the estimated dates were generated based on recreational landings from 2013-2015.

Alternative 3 would modify the fishing year for cobia to be from June 1-May 31. **Table 4.2.1.3** estimates the date the ACL would be reached, based on the average of 2013-2015 landings. This table provides closure dates for all alternatives under Action 1-1 and Action 1-2. The combination of **Action 1-2**, **Preferred Alternative 2**, **Preferred Sub-Alternative 2c** (36 inch size limit) and the preferred alternatives of **Action 1-1**, **Preferred Alternative 2**, **Preferred Sub-Alternative 2a** (1 fish bag limit) and **Preferred Alternative 3**, **Preferred Sub-alternative 3c** (three fish per vessel limit) with the fishing year change proposed under Alternative 3 would result in an in-season closure of about May 8th. The bulk of the landings occur in May (**Figure 4.2.1.1**) and under this alternative the fishery would be closed during their peak season. This action would ensure that the fishery would be open during the early part of the year, giving fishing opportunities to those fishing off North Carolina and South Carolina, although the landings have been historically low in North Carolina in Wave II (**Table 4.1.1.1**).

Table 4.2.1.3. Estimated ACL overage dates for **Action 2, Alternative 3** under a range of size limits, bag limits, and vessel limits as proposed in Action 1-1 and Action 1-2. Alternative 3 proposes a fishing year of June 1 through May 31. The highlighted cells indicate the Preferred Alternatives under Action 1-1 and Action 1-2.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per Person	4-Oct	18-Apr	19-May	25-May	30-May	14-May	16-May	None	None
2 per Person	31-Aug	27-Oct	1-May	4-May	8-May	12-May	14-May	None	None
Vessel Limit									
1 per Vessel	13-May	16-May	19-May	25-May	30-May	None	None	None	None
2 per Vessel	3-May	5-May	8-May	12-May	16-May	21-May	24-May	None	None
3 per Vessel	4-Apr	2-May	4-May	8-May	12-May	16-May	19-May	None	None
4 per Vessel	22-Oct	1-May	3-May	7-May	10-May	14-May	17-May	None	None
5 per Vessel	7-Oct	21-Apr	3-May	6-May	9-May	14-May	16-May	None	None
6 per Vessel	7-Sep	19-Mar	2-May	5-May	8-May	13-May	15-May	None	None

Note: This analysis assumed that the recreational bag limit, vessel limit and minimum size limit would be consistent in state and federal waters for the South Atlantic and Mid-Atlantic regions. Additionally, the estimated dates were generated based on recreational landings from 2013-2015.

Alternative 4 would modify the fishing year for cobia to be from April 1-March 31. **Table 4.2.1.4** estimates the date the ACL would be reached, based on the average of 2013-2015 landings. This table provides closure dates for all alternatives under Action 1-1 and Action 1-2. The combination of Action 1-2, **Preferred Alternative 2, Preferred Sub-Alternative 2c** (36 inch size limit) and the preferred alternatives of **Action 1-1, Preferred Alternative 2, Preferred Sub-Alternative 2a** (1 fish bag limit) **and Preferred Alternative 3, Preferred Sub-alternative 3c** (three fish per vessel limit) with the fishing year change proposed under Alternative 4 would result in an in-season closure of about July 22. This alternative provides a very similar closure date as **Alternative 1** and **Alternative 2** because the bulk of the landings occur in May, just after the proposed start of the fishing year.

Table 4.2.1.4. Estimated ACL overage dates for **Action 2, Alternative 4** under a range of size limits, bag limits, and vessel limits as proposed in **Action1-1** and **Action 1-2**. Alternative 4 proposes a fishing year of April 1 through March 31. The highlighted cells indicate the Preferred Alternatives under Action 1-1 and Action 1-2.

	Minimum Size Limit (inches fork length)								
	33	34	35	36	37	38	39	45	50
Bag Limit									
1 per Person	3-Jul	7-Jul	11-Jul	18-Jul	25-Jul	2-Aug	7-Aug	None	None
2 per Person	1-Jul	4-Jul	8-Jul	15-Jul	21-Jul	29-Jul	3-Aug	None	None
Vessel Limit									
1 per Vessel	31-Jul	6-Aug	13-Aug	23-Aug	22-Oct	None	None	None	None
2 per Vessel	12-Jul	17-Jul	22-Jul	30-Jul	6-Aug	16-Aug	22-Aug	None	None
3 per Vessel	6-Jul	10-Jul	15-Jul	22-Jul	29-Jul	7-Aug	12-Aug	None	None
4 per Vessel	4-Jul	8-Jul	12-Jul	19-Jul	26-Jul	3-Aug	8-Aug	None	None
5 per Vessel	3-Jul	7-Jul	11-Jul	18-Jul	25-Jul	2-Aug	7-Aug	None	None
6 per Vessel	2-Jul	5-Jul	10-Jul	16-Jul	23-Jul	31-Jul	5-Aug	None	None

With all of these fishing year alternatives if the Council were to select more restrictive management harvest limits (**Action 1-1**) or minimum size limits (**Action 1-2**), there would be the potential to extend the season. If the Council were to consider the most restrictive harvest limits (**Action 1-1, Preferred Alternative 2**) and minimum size limits (**Preferred Alternative 2**, **sub-alternative 2e, sub-alternative 2f, sub-alternative 2g and sub-alternative 2h**), there would likely not be an in-season closure. **Action 1-1, Preferred Alternative 3, Preferred sub-alternative 3c** in combination with the more restrictive minimum size limits under Action 1-2 (**Preferred Alternative 2**, **sub-alternative 2e, sub-alternative 2f, sub-alternative 2g and sub-alternative 2h)** would also result in no in-season closure.

4.2.2 Economic Effects

Changing the start and end dates of a fishing year does not in and of itself create economic effects except if the entire ACL is taken prior to the end of the fishing year. Shifting the start date to a time that would result in a lower CS in the recreational fishery could result in negative economic effects. The opposite would be true if the start of the fishing year was changed to a period when the fish would be more valuable.

Overall, ensuring that each state has a time period to harvest cobia while the fish are present in large numbers off of their coastal waters would ensure economic benefits are derived from the cobia fishery and the economic value and impacts are distributed in an equitable manner among coastal communities in the South and Mid Atlantic. While some economic benefits for the recreational sector will be accrued from catch and release fishing during a time when harvest is

closed, overall recreational effort will be higher when harvest is allowed. This increased effort will lead to more interactions with cobia, thus contributing to higher CS and economic impacts that may be attributed to the species.

The majority of cobia effort and harvest occurs after May 1, therefore **Preferred Alternative 2** and **Alternative 4** will have minimal impacts on the overall cobia fishery. Under **Preferred Alternative 2** and more so under **Alterative 3**, there is potential for negative economic effects to occur if harvest was closed for the remainder of a given fishing year in the southern part of the range at the beginning of the typical cobia season, especially in Georgia, South Carolina, and North Carolina. If this closure were to potentially last until June 1 under **Alternative 3** anglers in these states could lose the majority of their opportunity to harvest cobia, thereby reducing CS in the cobia fishery and creating negative economic effects for the for-hire sector, other fishing related business, and coastal communities in these states.

4.2.3 Social Effects

Modification to the fishing year and establishing closed season could have negative effects on the recreational sector by limiting fishing opportunities, but could also benefit the recreational sector by allowing the season to be open during peak harvest times during the year. A later start date (**Preferred Alternative 2, Alternative 3,** and **Alternative 4**) could help extend the season into the summer or later. **Tables 4.2.1.1-4.2.1.4** (**Section 4.2.1**) show the estimated dates when recreational landings would reach the recreational ACL under the potential measures in **Action 1** under different fishing years, which gives an idea of how fishing year would affect the rate of harvest.

Because recreational most harvest occurs in May-July, current landings patterns indicate that the estimated dates when recreational landings would reach the recreational ACL are similar under **Alternative 1 (No Action), Preferred Alternative 2**, and **Alternative 4** (**Tables 4.2.1.1**, **4.2.1.2** and **4.2.1.4**) and would have similar effects on recreational fishermen and associated businesses. Starting the fishing year on June 1 (**Alternative 3; Table 4.2.1.3**) may help keep recreational landings from reaching the recreational ACL early in the summer, but could also restrict access to cobia in the late spring and early summer months if there is a current or future management measure that results in a closure at the end of the fishing year.

Alternatives 2-4 also would result in different fishing years for the commercial and recreational sectors. This would increase the complexity of Atlantic cobia management, in addition to limiting the conditions that could be places on accountability measures, as discussed in **Section 4.3**.

4.2.4 Administrative Effects

There will be no difference in the administrative burden between **Alternative 2**, **Alternative 3 and Alternative 4**. However, these action alternatives will have a greater administrative burden than **Alternative 1.** These impacts will be associated with rule-making, quota monitoring, outreach and education and enforcement.

4.3 Action 3: Modify the recreational accountability measures for Atlantic cobia

Alternative 1 (No Action): Do not revise the accountability measures (AMs) for Atlantic cobia.

Preferred Alternative 2. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, recreational landings will be monitored for a persistence in increased landings. If necessary, the Regional Administrator shall publish a notice to reduce the length of the following fishing season to ensure that recreational landings meet the recreational ACT but do not exceed the recreational ACL, based on the recreational landings in the previous year. The length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT for 2016 and subsequent fishing years is 500,000 lbs, as established in CMP Amendment 20B.

Sub-alternative 2a. The Regional Administrator will reduce the length of the following fishing year only if the species is overfished.

Preferred Sub-alternative 2b. The Regional Administrator will reduce the length of the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 2c. The Regional Administrator will reduce the length of the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

Alternative 3. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, the Regional Administrator shall publish a notice to reduce the recreational ACL in the following fishing year by the amount of the recreational overage. The length of the recreational season will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT would also be adjusted according to the following formula: recreational sector ACT equals sector ACL[(1-PSE) or 0.5, whichever is greater].

Sub-alternative 3a. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the species is overfished.

Sub-alternative 3b. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 3c. The Regional Administrator will reduce the recreational ACL and ACT of the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

Alternative 4. If recreational landings reach or are projected to reach the recreational ACL, the Regional Administator shall publish a notice to close the recreational sector for the remainder of the fishing year, unless, using the best scientific information available, the Regional Administrator determines that a closure is unnecessary.

Sub-alternative 4a. If the species is overfished.

Sub-alternative 4b. Regardless of the overfished status of the species.

Alternative 5. If recreational landings, as estimated by the Science and Research Director, exceed the recreational ACL, recreational landings will be monitored for a persistence in increased landings. If necessary, the Regional Administrator shall publish a notice to reduce the recreational vessel limit for the following fishing year to ensure that recreational landings meet the recreational ACT but do not exceed the recreational ACL, based on the recreational landings in the previous year. The recreational vessel limit will not be reduced if the Regional Administrator determines, using the best scientific information available, that a reduction is unnecessary. The ACT for 2016 and subsequent fishing years is 500,000 lbs, as established in CMP Amendment 20B.

Sub-alternative 5a. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the species is overfished.

Sub-alternative 5b. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the total ACL (commercial ACL and recreational ACL) is exceeded.

Sub-alternative 5c. The Regional Administrator will reduce the recreational vessel limit for the following fishing year only if the species is overfished **and** the total ACL (commercial ACL and recreational ACL) is exceeded.

4.3.1 Biological Effects

As discussed above, the accountability measures (AM) for the Atlantic migratory group of cobia were established in Amendment 18 to the FMP. The current AM for the recreational sector requires that if the sum of the recreational and commercial landings exceed the stock ACL (recreational ACL plus commercial ACL) the AM is triggered. In this case, the National Marine Fisheries Service (NMFS) must file a notice at or near the beginning of the following fishing year to reduce the length of the recreational season by the amount necessary to ensure recreational landings may achieve the recreational ACT, but do not exceed the recreational ACL. To determine whether an ACL has been exceeded, Amendment 18 required using 2011 landings in the first year, then the average of 2011/12 in the second year and then a three-year average of landings in the third year onwards, unless an ACL changed, in which case the first single year of landings will be compared to the ACL. Because Amendment 20B changed the ACL beginning in 2015 (based on the stock assessment), only the 2015 landings are used to determine whether the recreational or stock ACL was exceeded such that the AM is triggered. For 2015, both the recreational ACL and the stock ACL were exceeded, and thus, the length of the 2016 fishing season must be reduced.

4.3.2 Economic Effects

The modifications to the recreational AMs proposed in **Action 3** will potentially make the accountability measures for Atlantic cobia the same as or closer to those set by the Council for other species (SAFMC 2016). **Alternative 2** options are potentially less restrictive than those of **Alternative 3**, as **Alternative 2** options will monitor landings for a persistence in increased landings, and would result in a reduced length of following season, if necessary. **Alternative 3** options will automatically reduce the recreational sector ACL in the next season by the amount

of overage. Assuming the recreational ACL is exceeded, greater short-term negative economic effects would be expected from **Alternative 3** options than from **Alternative 2** options. However, if the ACL is not exceeded in any given season, there would be no differences between **Action 3** alternatives.

Alternative 4 gives the regional administrator (RA) authority to implement in season closures for cobia in case the ACL is met or project to be met. If the ACL is exceeded, the regional administrator could close the fishery to limit the size of the overage. **Sub-alternative 4a** would allow the RA to implement an in season closure only if the species is overfished. **Sub-alternative 4b** would allow the closure regardless of stock status. Minimizing ACL overages has long-term positive economic effects.

Alternative 5 is similar to **Alternative 2**, but allows the RA to implement reduced recreational vessel limits for cobia in case the ACL is consistently exceeded after being monitored for persistence. The overall economic effects would vary based on the severity of the vessel limit reduction.

4.3.3 Social Effects

Accountability measures can have significant direct and indirect social effects because, when triggered, can restrict harvest in the current season or subsequent seasons. While the negative effects are usually short-term, they may at times induce other indirect effects through changes in fishing behavior or business operations that could have long-term social effects. Some of those effects are similar to other thresholds being met and may involve switching to other species or discontinuing fishing altogether. Those restrictions usually translate into reduced opportunity for harvest which in turn can change fishing behaviors through species switching if the opportunity exists. That behavior can increase pressure on other stocks or amplify conflict. If there are no opportunities to switch species then losses of income or fishing opportunities may occur which can act like any downturn in an economy for fishing communities affected. If there is a substantial downturn then increased unemployment and other disruptions to the social fabric may occur. While these negative effects are usually short term, they may at times induce other indirect effects through the loss of fishing infrastructure that can have a lasting effect on a community.

In general, the most beneficial in the long term for the stock and for sustainable fishing opportunities a combination of an in-season closure and a payback provision. However, some flexibility in how these AMs are triggered, such as conditions of the stock being overfished or the total ACL being exceeded, can help to mitigate the negative short-term impacts on fishermen and associated businesses and communities.

Alternative 1 (No Action) would not modify the current recreational AMs for Atlantic cobia, including the use of the three-year rolling average in the evaluation of an overage. The rolling average may penalize the recreational sector by incorporating one year of very high landings into the evaluation of recreational landings for the next three years. **Preferred Alternative 2** would remove the rolling average and use only the most recent year's landings to evaluate the overage.

This would likely be more beneficial to recreational fishermen because one year of high landings would not result in multiple years of a shortened season. The conditions to trigger the AM in **Sub-alternative 2a**, **Preferred Sub-alternative 2b**, and **Sub-alternative 2c** help to reduce the likelihood that the AM will be triggered, and only if it is necessary to minimize negative effects on the Atlantic cobia resource.

Alternative 3 would implement a reduction in the subsequent year's recreational ACL if there is an overage, which could negatively affect the season length and recreational fishing opportunities. However, the conditions under **Sub-alternatives 3a-3c** will help to only implement the AM when necessary to minimize negative effects on the Atlantic cobia resource. **Alternative 4** would modify the AMs to include an in-season closure if the recreational ACL is expected to be met, which could help to avoid exceeding the ACL and post-season AMs to be triggered, but could also shorten the current year's fishing season. It would be less likely that an in-season closure would be triggered under **Sub-alternative 4a** than under **Sub-alternative 4b**.

Implementing a lower vessel limit as the accountability measure in **Alternative 5**, particularly as the first measure in a series of potential post-season AMs, would be expected to have less negative effects on recreational fishermen than a post-season that would shorten the season. The conditions to trigger the AM in **Sub-alternatives 5a-5c** help to reduce the likelihood that the AM will be triggered, and only if it is necessary to minimize negative effects on the Atlantic cobia resource.

4.3.4 Administrative Effects

Modifying the accountability measure is an administrative action which will have implications for rule making, outreach and education. However, none of the alternatives are expected to be more administratively burdensome than the others.

4.4 Action 4: Establish a commercial trip limit for Atlantic cobia

Alternative 1 (No Action). Do not modify the possession limit of 2 fish per person per day.

Alternative 2. Establish a commercial trip limit for Atlantic cobia of 2 fish per person per day. The trip limit will decrease to 1 fish per person per day when 75% of the commercial ACL has been met.

Alternative 3. Establish a commercial trip limit for Atlantic cobia of 6 fish per vessel per day. The trip limit will decrease to 3 fish per vessel per day when 75% of the commercial ACL has been met.

Alternative 4. Establish a commercial trip limit for Atlantic cobia of 2 fish per person per day, with no more than 6 fish per vessel per day. The trip limit will decrease to 1 fish per person per day, with no more than 3 per vessel per day when 75% of the commercial ACL has been met.

4.4.1 Biological Effects

Cobia are unique among federally managed species in the southeast region, in that no federal commercial vessel fishery permit is required to commercially harvest cobia in federal waters. In federal waters there is a daily possession limit of two cobia per person that applies to both recreational and commercial catch. This makes the distinction between recreationally caught cobia and commercially caught cobia difficult, and the regulations define them as "cobia that are not sold" and "cobia that are sold." For purposes of this discussion, we will use the following terms interchangeably: "recreational" with "cobia that are not sold" and "commercial" with "cobia that are sold." Although a federal commercial vessel fishing permit is not required to fish for and sell cobia, federally permitted dealers can only buy cobia harvested from federally permitted fishing vessels; therefore, cobia harvested from a vessel fishing without any federal vessel fishing permit may only sell to a dealer that has a state license but not a federal license. The ACL for commercial cobia from Georgia to New York is 60,000 pounds.

The action alternatives under Action 4 propose a commercial trip limit once 75% of the commercial ACL is reached. **Alternative 1 (no action)** would not change the possession limit of cobia of 2 fish per person per day. **Alternative 2** would modify the commercial trip limit of 2 fish per person per day once 75% of the ACL to 1 fish per person per day. **Alternative 3** proposes a commercial trip limit of six fish per vessel per day but this would be decreased to three fish per vessel per day once 75% of the ACL has been met. **Alternative 4** would establish a commercial trip limit of 2 fish per person per day with no more than six fish per vessel per day. Once 75% of the ACL has been met, the trip limit will decrease to 1 fish per person per day with no more than three fish per vessel.

Table 4.4.1 reviews the commercial landings from 2005-2015 as well as when the landings

reached 75% of the ACL.

Table 4.4.1.1 Estimated month when actual Atlantic cobia commercial landings reached 75% of the commercial ACL (37,500 lbs ww) and the current commercial ACL (50,000 lbs ww).

Year	Total Commercial Landings	Month when landings reached 75% of ACL	Month when landings reached current ACL
2005	29,290	--	--
2006	31,990	--	--
2007	32,037	--	--
2008	33,739	--	--
2009	42,385	November	--
2010	56,393	September	November
2011	33,963	--	--
2012	42,176	September	--
2013	53,108	August	November
2014	69,197	August	September
2015	83,148 (P)	July	--

Based on historic landings, in many years the reduced trip limit would not go into effect. Outside of a brief closure period in December 2014, the commercial cobia fishery has not faced a closure, but some years the ACL has been exceeded. The amended ACL for the Atlantic stock cobia (GA to NY) did not go into effect until 2015. However, based on **Table 4.4.1,** in recent years, reducing the trip limit when 75% of the ACL was met would likely have extended the season and prevented potential closures of the commercial fishery.

Alternative 2 would potentially be more restrictive than **Alternative 1 (No Action)** because it would reduce the commercial trip limit to 1 fish per person when 75% of the commercial ACL is reached, restricting harvest of cobia on commercial trips. Without additional trip-level analyses, it is not possible at this time to determine how restrictive a 6 fish or 3 fish per vessel per day would be in comparison to cobia landings that have occurred on commercial trips in recent years **(Alternative 3**). Presumably the step down in trip limits present in **Alternative 2** through **Alternative 4** would allow the commercial cobia fishery to remain open longer, which may offer benefits to the fishermen by allowing a longer season.

4.4.2 Economic Effects

Generally, trip limits are not considered to be economically efficient because they require an increase in the number of trips and associated trip costs to land the same amount of fish. However, the negative economic effects of this inefficiency can be offset by price support resulting from the supply limitations and the lengthening of seasons. Given the relatively restrictive commercial limit on cobia of 2 fish per person per day, the fewer the trips that have to

stop keeping cobia because the trip limit has been reached would result in the least amount of direct negative economic effect, assuming the ACL is not met and the season does not close. There are no specific trip costs available for trips landing cobia, therefore specific values associated with trip costs cannot be estimated.

Alternative 2 would potentially be more restrictive than **Alternative 1 (No Action)** because it would reduce the commercial trip limit to 1 fish per person when 75% of the commercial ACL is reached, reducing revenue received from cobia landed on commercial trips. **Alternative 3** would establish a vessel limit of 6 fish per vessel per day that would decrease to three fish per vessel per day. Without additional trip-level analyses, it is not possible at this time to determine how restrictive a 6 fish or 3 fish per vessel per day would be in comparison to cobia landings that have occurred on commercial trips in recent years. Presumably the step down in trip limits present in **Alternative 2** through **Alternative 4** would allow the commercial cobia fishery to remain open longer, which may help offset the negative economic effects of the reduced trip limit.

Based on historic landings, in many years the reduced trip limit would not go into effect. Outside of a brief closure period in December 2014, the commercial cobia fishery has not faced a closure, but some years have seen the ACL exceeded. Additionally, the amended ACL for the Atlantic stock cobia (GA to NY) did not go into effect until 2015. However, based on **Table 4.4.1.1**, in recent years, reducing the trip limit when 75% of the ACL was met would likely have extended the season and prevented potential closures of the commercial fishery. There are long-term economic benefits to not exceeding the ACL and actions that prevent or delay closures would allow fishermen to continue to produce income from cobia incidentally caught later in the year.

4.4.3 Social Effects

In general, a commercial trip limit may help slow the rate of harvest, lengthen a season, and prevent the ACL from being exceeded, but trip limits that are too low may make fishing trips inefficient and too costly if fishing grounds are too far away. Additionally, if the trip limit is too low, the commercial ACL may not be met.

However, commercial harvest of Atlantic cobia is limited and likely comes from incidental catch on trips targeting other species. Additionally, the commercial limit is already very low as applied at the crew member level or the vessel level. In most years, it is more unlikely that the step-down in **Alternatives 2-4** at 75% of the commercial ACL will be implemented (**Table 4.4.1.1**) and the effects of **Alternative 1 (No Action)** through **Alternative 4** would be minimal for the commercial sector. However, in years with higher levels of commercial landings, the lower commercial limit in **Alternatives 2-4** may help slow the rate of harvest and reduce the likelihood of an early in-season closure or an overage.

4.4.4 Administrative Effects

There will be no difference in the administrative burden between **Alternative 2**, **Alternative 3 and Alternative 4**. However, these action alternatives will have a greater administrative burden than **Alternative 1**. These impacts will be associated with rule-making, quota monitoring, outreach and education and enforcement.

Chapter 5. Council's Choice for the Preferred Alternatives

5.1 Modify the recreational management measures for Atlantic cobia

Action 1-1: Modify the recreational harvest limits for Atlantic cobia

Action 1-2: Modify the minimum size limit for recreational harvest of Atlantic cobia

5.1.1 Public Comments and Recommendations

5.1.2 Council's Choice for Preferred Alternative

5.2 Modify the recreational fishing year for Atlantic cobia

5.2.1 Public Comments and Recommendations

5.2.2 Council's Choice for Preferred Alternative

5.3 Modify the recreational accountability measures for Atlantic cobia

5.3.1 Public Comments and Recommendations

5.3.2 Council's Choice for Preferred Alternative

5.4 Establish a commercial trip limit for Atlantic cobia

5.4.1 Public Comments and Recommendations

5.4.2 Council's Choice for Preferred Alternative

Chapter 6. Cumulative Effects

TO BE UPDATED

6.1 Affected Area

The immediate impact area would be the federal 200-mile limit of the Atlantic off the coasts of South Carolina, Georgia, and east Florida to Key West, which is also the South Atlantic Fishery Management Council's (South Atlantic Council) area of jurisdiction. The range of the affected species is described in **Section 3.2**. For this action, the cumulative effects analysis (CEA) includes an analysis of actions and events dating back to 2010 and through what is expected to take place approximately before or within 2015-2016.

6.2 Past, Present, and Reasonably Foreseeable Actions Impacting the Affected Area

Past Actions

The reader is referred to **Appendix C** for a list of all past regulatory activity for species in the CMP FMP. Recently implemented actions are listed below.

Amendment 18 to the CMP FMP (GMFMC/SAFMC 2011) established annual catch limits (ACL), annual catch targets (ACT), and accountability measures (AM) for king mackerel, Spanish mackerel, and cobia. The amendment also established both Atlantic and Gulf of Mexico (Gulf) migratory groups for cobia; modified the framework procedures; and removed the following species from the fishery management unit: cero, little tunny, dolphin and bluefish.

Generic amendments have been implemented requiring headboats in the South Atlantic and Gulf to report each week through electronic means. Regulations in the South Atlantic went into place on January 27, 2014, and regulations in the Gulf went into place on March 5, 2014.

Amendment 20A (GMFMC/SAFMC 2013a) allows certain types of sale of recreationally caught fish in each region. For the Atlantic region, Amendment 20A allows the sale of recreationally caught king and Spanish mackerel only from state-permitted tournaments where the proceeds are donated to charity. In addition, the amendment removes the income requirement for king and Spanish mackerel commercial permits. This action could increase the number of Spanish mackerel permits, which are open access.

Amendment 20B (GMFMC/SAFMC 2014b), which has been approved by the Gulf of Mexico and South Atlantic Fishery Management Councils, would establish transit provisions for travel through areas that are closed to king mackerel fishing, establish regional quotas for Atlantic migratory group king and Atlantic migratory group Spanish mackerel, modify the CMP FMP framework procedures, and modify the Gulf and Atlantic migratory group cobia ACLs and ACTs. NMFS published the proposed rule for Amendment 20B on October 31, 2014. The

amendment is expected to be approved for implementation prior to implementation of Framework Amendment 2.

The Joint Dealer Reporting Amendment, which was effective on August 7, 2014, is intended to improve the timeliness and accuracy of fisheries data reported by permitted dealers. The amendment created one dealer permit for all federally-permitted dealers in the southeast region. Previously, no dealer permit was previously required for CMP species. Requiring dealers to report landings data electronically each week is expected to improve in-season quota monitoring efforts, which would increase the likelihood that AMs can be implemented prior to commercial ACLs being exceeded.

A formal consultation was recently completed for the coastal migratory pelagics (CMP) fishery, triggered by the 2012 listing of five distinct population segments (Gulf of Maine, New York Bight, Chesapeake Bay, Carolina, and South Atlantic) of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) under the Endangered Species Act. Additionally, in August 2014, the NMFS issued a final determination to newly list five Caribbean coral species found in the South Atlantic region as threatened and to maintain the threatened listing for the *Acropora* species (elkhorn and staghorn coral).

Reasonably Foreseeable Future Actions

Expected Impacts from Past, Present, and Future Actions

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6.3 Consideration of Climate Change and Other Non-Fishery Related Issues

Climate Change

The Environmental Protection Agency's climate change webpage (http://www.epa.gov/climatechange/) provides basic background information on measured or anticipated effects from global climate change. A compilation of scientific information on climate change can be found in the United Nations Intergovernmental Panel on Climate Change's Fourth Assessment Report (IPCC 2007). Those findings are incorporated here by reference and are summarized. Global climate change can affect marine ecosystems through ocean warming by increased thermal stratification, reduced upwelling, sea level rise, and through increases in wave height and frequency, loss of sea ice, and increased risk of diseases in marine biota. Decreases in surface ocean pH due to absorption of anthropogenic carbon dioxide emissions may affect a wide range of organisms and ecosystems. These influences could negatively affect biological factors such as migration, range, larval and juvenile survival, prey availability, and susceptibility to predators.

In the Southeast, general impacts of climate change have been predicted through modeling, with few studies on specific effects to species. Warming sea temperature trends in the southeast have been documented, and animals must migrate to cooler waters, if possible, if water temperatures

exceed survivable ranges (Needham et al. 2012). Mackerels and cobia are migratory species, and may shift their distribution over time to account for the changing temperature regime. However, no studies have shown such a change yet. Higher water temperatures may also allow invasive species to establish communities in areas they may not have been able to survive previously. An area of low oxygen, known as the dead zone, forms in the northern Gulf each summer, which has been increasing in recent years. Climate change may contribute to this increase by increasing rainfall that in turn increases nutrient input from rivers. This increased nutrient load causes algal blooms that, when decomposing, reduce oxygen in the water (Kennedy et al. 2002; Needham et al. 2012). Other potential impacts of climate change to the southeast include increases in hurricanes, decreases in salinity, altered circulation patterns, and sea level rise. The combination of warmer water and expansion of salt marshes inland with sea-level rise may increase productivity of estuarine-dependent species in the short term. However, in the long term, this increased productivity may be temporary because of loss of fishery habitats due to wetland loss (Kennedy et al. 2002). Actions from this amendment are not expected to significantly contribute to climate change through the increase or decrease in the carbon footprint from fishing.

Weather Variables

Hurricane season is from June 1 to November 30, and accounts for 97% of all tropical activity affecting the Atlantic basin. These storms, although unpredictable in their annual occurrence, can devastate areas when they occur. Although these effects may be temporary, those fishing-related businesses whose profitability is marginal may go out of business if a hurricane strikes.

Deepwater-Horizon Oil Spill

On April 20, 2010, an explosion occurred on the Deepwater Horizon MC252 oil rig, resulting in the release of an estimated 4.9 million barrels of oil into the Gulf. In addition, 1.84 million gallons of Corexit 9500A dispersant were applied as part of the effort to constrain the spill. The cumulative effects from the oil spill and response may not be known for several years.

Indirect and inter-related effects on the biological and ecological environment of the CMP fishery in concert with the Deepwater Horizon MC252 oil spill are not well understood at this time. Changes in the population size structure could result from shifting fishing effort to specific geographic segments of populations, combined with any anthropogenically induced natural mortality that may occur from the impacts of the oil spill. Direct and indirect impacts on the food web from phytoplankton, to zooplankton, to mollusks, to top predators in the South Atlantic have not been significant and are not likely to be significant in the future.

6.4 Overall Impacts Expected from Past, Present, and Future Actions

The proposed management actions are summarized in **Chapter 2** of this document. Detailed discussions of the magnitude and significance of the impacts of the preferred alternatives on the human environment appear in **Chapter 4** of this document. None of the impacts of the action in this framework, in combination with past, present, and future actions have been determined to be significant. Though Amendment 20A, Amendment 20B, Framework Amendment 1, and South Atlantic Framework Action 2013, all supported by Environmental Assessments, contain actions that affect the species addressed in this framework action (Framework Amendment 2), the

additive effects, beneficial and adverse, on the species and the fishery are not expected to result in a significant level of cumulative impacts.

The proposed action would not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places as these are not in the South Atlantic Exclusive Economic Zone (EEZ). This action is not likely to result in direct, indirect, or cumulative effects to unique areas, such as significant scientific, cultural, or historical resources, park land, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas as the proposed action is not expected to substantially increase fishing effort or the spatial and/or temporal distribution of current fishing effort within the South Atlantic region. The U.S. Monitor, Gray's Reef, and Florida Keys National Marine Sanctuaries are within the boundaries of the South Atlantic EEZ. The proposed actions are not likely to cause loss or destruction of these national marine sanctuaries because the actions are not expected to result in appreciable changes to current fishing practices.

6.5 Monitoring and Mitigation

The effects of the proposed action are, and will continue to be, monitored through collection of landings data by states, NMFS, stock assessments and stock assessment updates, life history studies, economic and social analyses, and other scientific observations. The proposed action relates to the harvest of an indigenous species in the Atlantic, and the activity being altered does not itself introduce non-indigenous species, and is not reasonably expected to facilitate the spread of such species through depressing the populations of native species. Additionally, it does not propose any activity, such as increased ballast water discharge from foreign vessels, which is associated with the introduction or spread on non-indigenous species.

None of the beneficial or adverse impacts from the proposed management action (as summarized in **Chapter 2** of this document) have been determined to be significant. See **Chapter 4** for the detailed discussions of the magnitude of the impacts of the preferred alternatives on the human environment. The action in CMP Framework Amendment 2 would not have significant biological, social, or economic effects because even though the action could extend fishing opportunities, accountability measures are also considered, and are in place to ensure overfishing does not occur. Therefore, the cumulative effects of the action proposed in CMP Framework Amendment 2 are not expected to affect bycatch, diversity and ecosystem structure of fish communities, or safety at sea of fishermen targeting CMP species, and other species managed by South Atlantic Council. Based on the cumulative effects analysis presented herein, the proposed action will not have any significant adverse cumulative impacts compared to, or combined with, other past, present, and foreseeable future actions

Chapter 7. List of Interdisciplinary Plan Team (IPT) Members

Name	Agency/Division	Title
Kari MacLauchlin	SAFMC	IPT Lead/Fishery Social Scientist
Karla Gore	SERO /SF	IPT Lead/Fishery Biologist
David Carter	SEFSC	Economist
Brian Cheuvront	SAFMC	Deputy Director
Rick DeVictor	SERO/SF	Fishery Biologist
John Hadley	SAFMC	Fishery Economist
Stephen Holiman	SERO/SF	Economist
Michael Jepson	SERO/SF	Fishery Social Scientist
Michael Larkin	SERO/LAPP	Biologist
Tony Lamberte	SERO/SF	Economist
Jennifer Lee	SERO/PR	Protected Resources
Scott Sandorf	SERO	Technical Writer
Noah Silverman	SERO	NEPA Specialist
Monica Smit-Brunello	NOAA GC	General Counsel
Iris Lowery	NOAA GC	General Counsel
Jocelyn D'Ambrosio	NOAA GC	General Counsel

NMFS = National Marine Fisheries Service, GMFMC = Gulf of Mexico Fishery Management Council, SAFMC = South Atlantic Fishery Management Council, SF = Sustainable Fisheries Division, PR = Protected Resources Division, SERO = Southeast Regional Office, HC = Habitat Conservation Division, GC = General Counsel, OLE= Office of Law Enforcement

Chapter 8. Agencies Consulted

Responsible Agencies

Coastal Migratory Pelagics Framework Amendment 2

South Atlantic Fishery Management Council (Administrative Lead)
4055 Faber Place Drive, Suite 201
Charleston, South Carolina 29405
843-571-4366/ 866-SAFMC-10 (TEL)
843-769-4520 (FAX)
www.safmc.net

Gulf of Mexico Fishery Management Council
2203 North Lois Avenue, Suite 1100
Tampa, Florida 33607
813-348-1630/ 888-833-1844 (TEL)
www.gulfcouncil.org

Environmental Assessment:

NMFS, Southeast Region
263 13th Avenue South
St. Petersburg, Florida 33701
727- 824-5301 (TEL)
727-824-5320 (FAX)

List of Agencies, Organizations, and Persons Consulted

SAFMC Law Enforcement Advisory Panel
SAFMC King and Spanish Mackerel Advisory Panel
SAFMC Scientific and Statistical Committee
North Carolina Coastal Zone Management Program
South Carolina Coastal Zone Management Program
Georgia Coastal Zone Management Program
Florida Coastal Zone Management Program
Florida Fish and Wildlife Conservation Commission
Georgia Department of Natural Resources
South Carolina Department of Natural Resources
North Carolina Division of Marine Fisheries
Virginia Marine Resources Commission
Atlantic States Marine Fisheries Commission
National Marine Fisheries Service

- Washington Office
- Office of Ecology and Conservation
- Southeast Regional Office
- Southeast Fisheries Science Center

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Appendix A. Glossary

Allowable Biological Catch (ABC): Maximum amount of fish stock than can be harvested without adversely affecting recruitment of other components of the stock. The ABC level is typically higher than the total allowable catch, leaving a buffer between the two.

ALS: Accumulative Landings System. NMFS database which contains commercial landings reported by dealers.

Biomass: Amount or mass of some organism, such as fish.

B_{MSY}: Biomass of population achieved in long-term by fishing at F_{MSY}.

Bycatch: Fish harvested in a fishery, but not sold or kept for personal use. Bycatch includes economic discards and regulatory discards, but not fish released alive under a recreational catch and release fishery management program.

Catch Per Unit Effort (CPUE): The amount of fish captured with an amount of effort. CPUE can be expressed as weight of fish captured per fishing trip, per hour spent at sea, or through other standardized measures.

Charter Boat: A fishing boat available for hire by recreational anglers, normally by a group of anglers for a short time period.

Cohort: Fish born in a given year. (See year class.)

Control Date: Date established for defining the pool of potential participants in a given management program. Control dates can establish a range of years during which a potential participant must have been active in a fishery to qualify for a quota share.

Constant Catch Rebuilding Strategy: A rebuilding strategy where the allowable biological catch of an overfished species is held constant until stock biomass reaches B_{MSY} at the end of the rebuilding period.

Constant F Rebuilding Strategy: A rebuilding strategy where the fishing mortality of an overfished species is held constant until stock biomass reached BMSY at the end of the rebuilding period.

Directed Fishery: Fishing directed at a certain species or species group.

Discards: Fish captured, but released at sea.

Discard Mortality Rate: The % of total fish discarded that do not survive being captured and released at sea.

Derby: Fishery in which the TAC is fixed and participants in the fishery do not have individual quotas. The fishery is closed once the TAC is reached, and participants attempt to maximize their harvests as quickly as possible. Derby fisheries can result in capital stuffing and a race for fish.

Effort: The amount of time and fishing power (i.e., gear size, boat size, horsepower) used to harvest fish.

Exclusive Economic Zone (EEZ): Zone extending from the shoreline out to 200 nautical miles in which the country owning the shoreline has the exclusive right to conduct certain activities such as fishing. In the United States, the EEZ is split into state waters (typically from the shoreline out to 3 nautical miles) and federal waters (typically from 3 to 200 nautical miles).

Exploitation Rate: Amount of fish harvested from a stock relative to the size of the stock, often expressed as a percentage.

F: Fishing mortality.

Fecundity: A measurement of the egg-producing ability of fish at certain sizes and ages.

Fishery Dependent Data: Fishery data collected and reported by fishermen and dealers.

Fishery Independent Data: Fishery data collected and reported by scientists who catch the fish themselves.

Fishery Management Plan: Management plan for fisheries operating in the federal produced by regional fishery management councils and submitted to the Secretary of Commerce for approval.

Fishing Effort: Usually refers to the amount of fishing. May refer to the number of fishing vessels, amount of fishing gear (nets, traps, hooks), or total amount of time vessels and gear are actively engaged in fishing.

Fishing Mortality: A measurement of the rate at which fish are removed from a population by fishing. Fishing mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Fishing Power: Measure of the relative ability of a fishing vessel, its gear, and its crew to catch fishes, in reference to some standard vessel, given both vessels are under identical conditions.

$F_{30\%SPR}$: Fishing mortality that will produce a static SPR = 30%.

$F_{45\%SPR}$: Fishing mortality that will produce a static SPR = 45%.

F_{OY}: Fishing mortality that will produce OY under equilibrium conditions and a corresponding biomass of B_{OY}. Usually expressed as the yield at 85% of F_{MSY}, yield at 75% of F_{MSY}, or yield at 65% of F_{MSY}.

F_{MSY}: Fishing mortality that if applied constantly, would achieve MSY under equilibrium conditions and a corresponding biomass of B_{MSY}

Fork Length (FL): The length of a fish as measured from the tip of its snout to the fork in its tail.

Framework: An established procedure within a fishery management plan that has been approved and implemented by NMFS, which allows specific management measures to be modified via regulatory amendment.

Gear restrictions: Limits placed on the type, amount, number, or techniques allowed for a given type of fishing gear.

Growth Overfishing: When fishing pressure on small fish prevents the fishery from producing the maximum poundage. Condition in which the total weight of the harvest from a fishery is improved when fishing effort is reduced, due to an increase in the average weight of fishes.

Gulf of Mexico Fishery Management Council (GFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The GFMC develops fishery management plans for fisheries off the coast of Texas, Louisiana, Mississippi, Alabama, and the west coast of Florida.

Head Boat: A fishing boat that charges individual fees per recreational angler onboard.

Highgrading: Form of selective sorting of fishes in which higher value, more marketable fishes are retained, and less marketable fishes, which could legally be retained are discarded.

Individual Fishing Quota (IFQ): Fishery management tool that allocates a certain portion of the TAC to individual vessels, fishermen, or other eligible recipients.

Longline: Fishing method using a horizontal mainline to which weights and baited hooks are attached at regular intervals. Gear is either fished on the bottom or in the water column.

Magnuson-Stevens Fishery Conservation and Management Act: Federal legislation responsible for establishing the fishery management councils and the mandatory and discretionary guidelines for federal fishery management plans.

Marine Recreational Fisheries Statistics Survey (MRFSS): Survey operated by NMFS in cooperation with states that collects marine recreational data.

Maximum Fishing Mortality Threshold (MFMT): The rate of fishing mortality above which a stock's capacity to produce MSY would be jeopardized.

Maximum Sustainable Yield (MSY): The largest long-term average catch that can be taken continuously (sustained) from a stock or stock complex under average environmental conditions.

Minimum Stock Size Threshold (MSST): The biomass level below which a stock would be considered overfished.

Modified F Rebuilding Strategy: A rebuilding strategy where fishing mortality is changed as stock biomass increases during the rebuilding period.

Multispecies fishery: Fishery in which more than one species is caught at the same time and location with a particular gear type.

National Marine Fisheries Service (NMFS): Federal agency within NOAA responsible for overseeing fisheries science and regulation.

National Oceanic and Atmospheric Administration: Agency within the Department of Commerce responsible for ocean and coastal management.

Natural Mortality (M): A measurement of the rate at which fish are removed from a population by natural causes. Natural mortality can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous is that percentage of fish dying at any one time.

Optimum Yield (OY): The amount of catch that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

Overfished: A stock or stock complex is considered overfished when stock biomass falls below the minimum stock size threshold (MSST) (e.g., current biomass < MSST = overfished).

Overfishing: Overfishing occurs when a stock or stock complex is subjected to a rate of fishing mortality that exceeds the maximum fishing mortality threshold (e.g., current fishing mortality rate > MFMT = overfishing).

Quota: % or annual amount of fish that can be harvested.

Recruitment (R): Number or percentage of fish that survives from hatching to a specific size or age.

Recruitment Overfishing: The rate of fishing above which the recruitment to the exploitable stock becomes significantly reduced. This is characterized by a greatly reduced spawning stock, a decreasing proportion of older fish in the catch, and generally very low recruitment year after year.

Scientific and Statistical Committee (SSC): Fishery management advisory body composed of federal, state, and academic scientists, which provides scientific advice to a fishery management council.

Selectivity: The ability of a type of gear to catch a certain size or species of fish.

South Atlantic Fisheries Management Council (SAFMC): One of eight regional councils mandated in the Magnuson-Stevens Fishery Conservation and Management Act to develop management plans for fisheries in federal waters. The SAFMC develops fishery management plans for fisheries off North Carolina, South Carolina, Georgia, and the east coast of Florida.

Spawning Potential Ratio (Transitional SPR): Formerly used in overfished definition. The number of eggs that could be produced by an average recruit in a fished stock divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

% Spawning Per Recruit (Static SPR): Formerly used in overfishing determination. The maximum spawning per recruit produced in a fished stock divided by the maximum spawning per recruit, which occurs under the conditions of no fishing. Commonly abbreviated as %SPR.

Spawning Stock Biomass (SSB): The total weight of those fish in a stock which are old enough to spawn.

Spawning Stock Biomass Per Recruit (SSBR): The spawning stock biomass divided by the number of recruits to the stock or how much spawning biomass an average recruit would be expected to produce.

Total Allowable Catch (TAC): The total amount of fish to be taken annually from a stock or stock complex. This may be a portion of the Allowable Biological Catch (ABC) that takes into consideration factors such as bycatch.

Total Length (TL): The length of a fish as measured from the tip of the snout to the tip of the tail.

Appendix B. Alternatives Considered but Rejected

Appendix C. History of Management

The Fishery Management Plan for Coastal Migratory Pelagic Resources in the Gulf of Mexico and South Atlantic Region (CMP FMP; GMFMC/SAFMC 1982), with an environmental impact statement (EIS), was approved in 1982 and implemented by regulations effective in February 1983. Managed species included king mackerel, Spanish mackerel, and cobia. The CMP FMP treated cobia as one stock in the Atlantic and Gulf of Mexico (Gulf) and established the maximum sustainable yield (MSY) at 1.057 million pounds (mp). The optimum yield (OY) was defined as all cobia equal to or larger than 33 inches fork length (FL) that can be harvested by U.S. fishermen under current fishery conditions, and possession of cobia less than at 33 inches FL was prohibited. The management objective for cobia was to institute management measures necessary to increase yield per recruit and average size and to prevent overfishing.

CMP FMP Amendments

1. **Amendment 1,** with EIS, implemented in September 1985, provided a framework procedure for pre-season adjustment of total allowable catch (TAC) and established the fishing year as January 1 through December 31. The minimum size limit was designated as 33 inches FL or 37 inches total length (TL). Additionally, the Councils designated Problem #5 for the CMP FMP to address as: Cobia are presently harvested at a size below that necessary for maximum yield and may be overfished in some areas beyond the management area; most southeastern states have not yet adopted the recommended minimum size limit; no management action has been taken by states which have jurisdiction over cobia populations in Chesapeake Bay, which appear to have been overfished; and federal enforcement capability is limited and not believed to be very effective in this case.

Amendment 2, with an environmental assessment (EA), implemented in July 1987, except for the charter vessel permit requirements that became effective in August 1987. The amendment established federal permit requirements for for-hire vessels fishing for coastal migratory pelagics in the EEZ. For-hire vessels would comply with bag limits but could fish under a commercial quota with a commercial permit when not on under charter.

Amendment 3, with EA, was partially approved in August 1989, revised, resubmitted, and approved in April 1990. It prohibited drift gillnets for coastal pelagic species and purse seines for the overfished migratory groups of mackerels.

Amendment 5, with EA, implemented in August 1990, made the following changes in the management regime:

- Revised a specified problem that the condition of the cobia stock is unknown and increased landings over the last ten years have prompted concern about overfishing. The MSY is set at 1 mp.
- Specified parameters for ‘overfishing’ and ‘overfished’ designations
- Added cobia to the annual stock assessment procedure;

- Cobia possession limit is 2 fish per person per day with a 1-day possession limit.

Amendment 6, with EA, implemented in November of 1992, made the following changes:

- Identified additional problems and an objective in the fishery;
- Provided for rebuilding overfished stocks of mackerels within specific periods;
- Provided for biennial assessments and adjustments;
- Specified the minimum size limit 33 inches FL (remove reference to 37 inches TL).
- MSY set at 2.2 mp based on the 1992 Report of the Mackerel Stock Assessment Panel.

Amendment 8, with EA, implemented in March 1998, made the following changes to the management regime:

- Extend the management area for cobia through New York, i.e., through the jurisdiction of the Mid-Atlantic Fishery Management Council. Note: This action extended the 2 fish bag limit and 33"FL minimum size limit through the Mid-Atlantic Council's area.
- Established allowable gear in the South Atlantic and Mid-Atlantic areas as well as providing for the Regional Administrator to authorize the use of experimental gear;
- Overfishing: For species like cobia, when there is insufficient information to determine whether the stock or migratory group is overfished (transitional SPR), overfishing is defined as a fishing mortality rate in excess of the fishing mortality rate corresponding to a default threshold static SPR of 30 percent. If overfishing is occurring, a program to reduce fishing mortality rates to at least the level corresponding to management target levels will be implemented.
- Modified the Stock Assessment Panel process.
- Optimum Yield (OY) for cobia is set at MSY, currently 2.2 million pounds, in accord with the recommendation of the SPRMSC that, because of limited data, SPR not be used for cobia.
- Established various data consideration and reporting requirements under the framework procedure;
- Modified the seasonal framework adjustment measures and specifications; and revised specified problems in the fishery for the FMP

1. **Amendment 11**, with SEIS, partially approved in December 1999, included Maximum sustainable yield for species in the coastal migratory pelagic management unit is unknown. The Council reviewed alternatives and concluded the best available data supports using 30% Static SPR as a proxy for MSY. Note: This was not approved.
2. Optimum Yield (OY) for the coastal migratory pelagic fishery is the amount of harvest that can be taken by U.S. fishermen while maintaining the Spawning Potential Ration (SPR) at or above 40% Static SPR.
3. Overfishing for all species in the coastal migratory pelagics management unit is defined as a fishing mortality rate (F) in excess of the fishing mortality rate at 30% Static SPR (F30%Static SPR) which is the coastal migratory pelagics MSY proxy. The "threshold level" for all species in the coastal migratory pelagic management unit is defined as 10% Static SPR.

Amendment 13, with SEIS, implemented August 2002, established two marine reserves in the EEZ of the Gulf in the vicinity of the Dry Tortugas, Florida known as Tortugas North and Tortugas South in which fishing for coastal migratory pelagic species is prohibited. This action

complements previous actions taken under the National Marine Sanctuaries Act.

Amendment 18, with EA, implemented in January 2012 established ACLs, ACTs, and AMs for cobia. The amendment established Atlantic and Gulf migratory groups for cobia with the stock boundary set at the management boundary between the councils, and also modified the framework procedures.

Amendment 20B, with EA, implemented in March 2015 revised the ACLs and ACTs for Atlantic and Gulf cobia based on the recent stock assessment (SEDAR 28). The amendment also modified the boundary between Atlantic and Gulf cobia to be at the Georgia/Florida state line, to align with the stock boundary used in SEDAR 28.

Appendix D. Bycatch Practicability Analysis

Appendix E. Regulatory Impact Review

Appendix F. Regulatory Flexibility Analysis

Appendix G. Other Applicable Law

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for fishery management in federal waters of the Exclusive Economic Zone. However, fishery management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making are summarized below.

Administrative Procedures Act
All federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day waiting period from the time a final rule is published until it takes effect.

The proposed rule associated with this amendment will include a request for public comment, and if approved, upon publication of the final rule, there will be a 30-day wait period before the regulations are effective in compliance with the APA.

Coastal Zone Management Act
Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that directly affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency

determination are set forth in NOAA regulations at 15 C.F.R. part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary of Commerce, NMFS will determine if this framework amendment is consistent with the Coastal Zone Management programs of the states of Florida, Georgia, South Carolina, to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Information Quality Act

The Information Quality Act (IQA) (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the IQA directs the Office of Management and Budget (OMB) to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: 1) ensure information quality and develop a pre-dissemination review process; 2) establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and 3) report periodically to OMB on the number and nature of complaints received.

Scientific information and data are key components of fishery management plans (FMPs) and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the IQA, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

CMP Framework Amendment 2 uses the best available information and makes a broad presentation thereof. The Southeast Fisheries Science Center has reviewed the document, and has determined the information contained in this document was developed using best available scientific information. Therefore, this document is in compliance with the IQA.

Endangered Species Act (ESA)

The ESA of 1973 (16 U.S.C. Section 1531 et seq.) requires that federal agencies must ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of

threatened or endangered species or the habitat designated as critical to their survival and recovery. The ESA requires NMFS to consult with the appropriate administrative agency (itself for most marine species, and the U.S. Fish and Wildlife Service for all remaining species) when proposing an action that may affect threatened or endangered species or adversely modify critical habitat. Consultations are necessary to determine the potential impacts of the proposed action. They conclude informally when proposed actions may affect but are "not likely to adversely affect" threatened or endangered species or designated critical habitat. Formal consultations, resulting in a biological opinion, are required when proposed actions may affect and are "likely to adversely affect" threatened or endangered species or adversely modify designated critical habitat.

NMFS completed a biological opinion, evaluating the impacts of the CMP fishery on ESA-listed species on August 13, 2007 (NMFS 2007). The opinion concluded the fishery would not affect ESA-listed marine mammals, *Acropora* corals, Gulf sturgeon, or listed critical habitat for North Atlantic right whales, and is not likely to jeopardize the continued existence or recovery of any listed sea turtle species or smalltooth sawfish. However, the opinion did state that the CMP fishery would adversely affect sea turtles and smalltooth sawfish and thus NMFS issued an Incidental Take Statement for these species. Reasonable and Prudent Measures to minimize the impact of these incidental takes were specified, along with Terms and Conditions to implement them.

Subsequent to the biological opinion, NMFS made several modifications to the list of protected species for which they are responsible. These changes included: (1) the designation of *Acropora* critical habitat, (2) the determination that the loggerhead sea turtle population consists of nine distinct population segments (DPSs; 76 FR 58868), (3) the listing of five DPSs of Atlantic sturgeon, and (4) the designation of critical habitat for the Northwest Atlantic DPS of loggerhead sea turtles (79 FR 39855). Further, NMFS has proposed the listing of 66 additional coral species (7 of which are in the South Atlantic or Gulf of Mexico) and the reclassification of *Acropora* from threatened to endangered (77 FR 73220).

NMFS addressed how the designation of *Acropora* critical habitat could impact the determinations of the 2007 biological opinion in a consultation memorandum. NMFS concluded the continued authorization of the CMP fishery, is not likely to adversely affect *Acropora* critical habitat (May 18, 2010). NMFS is similarly addressing how the CMP fishery could affect the newly designated critical habitat for the NWA loggerhead DPS in an additional memorandum. This memorandum was completed on November 3, 2014.

The listing of five DPSs of Atlantic sturgeon triggered reinitiation of consultation under Section 7 of the ESA because the previous opinion did not consider what effects the CMP fishery is likely to have on this species. Atlantic sturgeon are known to be captured by fishermen fishing for CMP species, therefore NMFS Protected Resources must analyze the impacts of these potential interactions. The Sustainable Fisheries Division requested reinitiation of Section 7 consultation on November 26, 2012. Following the request for consultation the Sustainable Fisheries Division considered the effects of the fishery on Atlantic sturgeon and developed ESA 7(a)(2) and 7(d) determinations in a January 11, 2013, memorandum. The CMP fishery is currently operating under the 7(a)(2) and 7(d) determinations while consultation proceeds.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas. It also prohibits the importing of marine mammals and marine mammal products into the United States. Under the MMPA, the Secretary of Commerce (authority delegated to NMFS) is responsible for the conservation and management of cetaceans and pinnipeds (other than walruses). The Secretary of the Interior is responsible for walruses, sea otters, polar bears, manatees, and dugongs.

Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to make sure that they stay at optimum levels. If a population falls below its optimum level, it is designated as "depleted." A conservation plan is then developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, to govern the taking of marine mammals incidental to commercial fishing operations. This amendment required the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; development and implementation of take-reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries; and studies of pinniped-fishery interactions. The MMPA requires a commercial fishery to be placed in one of three categories, based on the relative frequency of incidental serious injuries and mortalities of marine mammals. Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing; Category II designates fisheries with occasional serious injuries and mortalities; and Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

Under the MMPA, to legally fish in a Category I and/or II fishery, a fisherman must take certain steps. For example, owners of vessels or gear engaging in a Category I or II fishery, are required to obtain a marine mammal authorization by registering with the Marine Mammal Authorization Program (50 CFR 229.4). They are also required to accommodate an observer if requested (50 CFR 229.7(c)) and they must comply with any applicable take reduction plans.

The 2015 proposed List of Fisheries classifies the Gulf and South Atlantic coastal migratory pelagic hook-and-line fishery as a Category III fishery (79 FR 50589, August 25, 2014). Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities. The Gulf and South Atlantic coastal migratory pelagic gillnet fishery is classified as Category II fishery. This classification indicates an occasional incidental mortality or serious injury of a marine mammal stock resulting from the fishery (1-50% annually of the potential biological removal). The fishery has no documented interaction with marine mammals; NMFS classifies this fishery as Category II based on analogy (similar risk to marine mammals) with other gillnet fisheries.

The action in this framework amendment is not expected to negatively impact marine mammals.

Essential Fish Habitat

The amended Magnuson-Stevens Act included a new habitat conservation provision known as Essential Fish Habitat (EFH) that requires each existing and any new FMPs to describe and identify EFH for each federally managed species, minimize to the extent practicable impacts from fishing activities on EFH that are more than minimal and not temporary in nature, and identify other actions to encourage the conservation and enhancement of that EFH. To address these requirements the South Atlantic Fishery Management Council has, under separate action, approved an environmental impact statement (SAFMC 1998) to address the new EFH requirements contained within the Magnuson-Stevens Act. Section 305(b)(2) requires federal agencies to obtain a consultation for any action that may adversely affect EFH.

An EFH consultation was completed on October 16, 2014, for this action, and determined that no adverse impacts on EFH is expected.

Executive Orders

E.O. 12630: Takings

The Executive Order on Government Actions and Interference with Constitutionally Protected Property Rights that became effective March 18, 1988, requires each federal agency prepare a Takings Implication Assessment for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Clearance of a regulatory action must include a takings statement and, if appropriate, a Takings Implication Assessment. The NOAA Office of General Counsel will determine whether a Taking Implication Assessment is necessary for this amendment.

E.O. 12866: Regulatory Planning and Review

Executive Order 12866: Regulatory Planning and Review, signed in 1993, requires federal agencies to assess the costs and benefits of their proposed regulations, including distributional impacts, and to select alternatives that maximize net benefits to society. To comply with E.O. 12866, NMFS prepares a Regulatory Impact Review (RIR) for all fishery regulatory actions that either implement a new fishery management plan or significantly amend an existing plan. RIRs provide a comprehensive analysis of the costs and benefits to society of proposed regulatory actions, the problems and policy objectives prompting the regulatory proposals, and the major alternatives that could be used to solve the problems. The reviews also serve as the basis for the agency's determinations as to whether proposed regulations are a "significant regulatory action" under the criteria provided in E.O. 12866 and whether proposed regulations would have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act.

On June 12, 2014, the Small Business Administration issued a final rule revising the small business size standards for several industries effective July 14, 2014 (79 FR 33647). The rule increased the size standard for Finfish Fishing from $19.0 to $20.5 million, Shellfish Fishing from $5.0 to $5.5 million, and Other Marine Fishing from $7.0 to $7.5 million.

In light of these new standards, NMFS has preliminarily determined that the proposed action would not have a significant economic impact on a substantial number of small entities.

E.O. 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations

This Executive Order mandates that each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions. Federal agency responsibilities under this Executive Order include conducting their programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefit of, or subjecting persons to discrimination under, such, programs policies, and activities, because of their race, color, or national origin. Furthermore, each federal agency responsibility set forth under this Executive Order shall apply equally to Native American programs. Environmental justice considerations are discussed in detail in **Section 3.4**.

The action in this framework amendment is not expected to negatively impact minority or low-income populations.

E.O. 12962: Recreational Fisheries

This Executive Order requires federal agencies, in cooperation with states and tribes, to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities through a variety of methods including, but not limited to, developing joint partnerships; promoting the restoration of recreational fishing areas that are limited by water quality and habitat degradation; fostering sound aquatic conservation and restoration endeavors; and evaluating the effects of federally-funded, permitted, or authorized actions on aquatic systems and recreational fisheries, and documenting those effects. Additionally, it establishes a seven-member National Recreational Fisheries Coordination Council (Council) responsible for, among other things, ensuring that social and economic values of healthy aquatic systems that support recreational fisheries are considered by federal agencies in the course of their actions, sharing the latest resource information and management technologies, and reducing duplicative and cost-inefficient programs among federal agencies involved in conserving or managing recreational fisheries. The Council also is responsible for developing, in cooperation with federal agencies, states and tribes, a Recreational Fishery Resource Conservation Plan - to include a five-year agenda. Finally, the Order requires NMFS and the U.S. Fish and Wildlife Service to develop a joint agency policy for administering the ESA.

The action in this framework amendment does not affect the recreational sector of the coastal migratory pelagic fishery.

E.O. 13132: Federalism

The Executive Order on Federalism requires agencies in formulating and implementing policies, to be guided by the fundamental federalism principles. The Order serves to guarantee the division of governmental responsibilities between the national government and the states that was intended by the framers of the Constitution. Federalism is rooted in the belief that issues not

national in scope or significance are most appropriately addressed by the level of government closest to the people. This Order is relevant to FMPs and amendments given the overlapping authorities of NMFS, the states, and local authorities in managing coastal resources, including fisheries, and the need for a clear definition of responsibilities. It is important to recognize those components of the ecosystem over which fishery managers have no direct control and to develop strategies to address them in conjunction with appropriate state, tribes and local entities (international too).

No federalism issues have been identified relative to the actions proposed in this amendment.

References

National Marine Fisheries Service (NMFS). 2007. Biological Opinion, ESA Section 7 Consultation for the Continued Authorization of Fishing under the Fishery Management Plan (FMP) for Coastal Migratory Pelagic Resources in the Atlantic and Gulf of Mexico (CMPR FMP). NMFS Southeast Regional Office Protected Resources Division: St. Petersburg, FL.

South Atlantic Fishery Management Council (SAFMC). 1998. Comprehensive Amendment Addressing Essential Fish Habitat in Fishery Management Plans in the South Atlantic Region, including environmental assessment, regulatory impact review, and fishery impact statement. South Atlantic Fishery Management Council, Charleston, South Carolina. Available at: http://ocean.floridamarine.org/efh_coral/pdfs/Comp_Amend/EFHAmendCovTOC.pdf.