SOUTH ATLANTIC FISHERY MANAGMENT COUNCIL

SCIENTIFIC AND STATISTICAL COMMITTEE

SSC Meeting Report

April 9 - 11, 2013

Crowne Plaza
North Charleston, SC

Final

PURPOSE

Topics to address during this meeting:

- SEDAR 38 and 41 planning
- Review assessments of, and provide fishing level recommendations for, black sea bass, cobia and Spanish mackerel
- Consider ABC control rule modifications and ABC recommendations
- Review the annual research prioritization plan
- Discuss the assessment peer review process
- Review Snapper-Grouper Regulatory Amendment 14
- Review Coral Amendment 8
- Receive an update on fishery independent sampling

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*** Indicates documents not available for the first Briefing Book.**

SAFMC PUBLIC COMMENT PROCESS

Written comment:

Written comment on SSC agenda topics is to be distributed to the Committee through the Council office, similar to all other Council briefing materials. Written comment to be considered by the SSC shall be provided to the Council office no later than one week prior to an SSC meeting. For this meeting, the deadline for submission of written comment is 12:00 pm Tuesday, April 2, 2013.

SAFMC
4055 Faber Place Drive
Suite 201
North Charleston, SC 29405

Verbal comment:

Two opportunities for comment on agenda items will be provided during SSC meetings. The first will be at the beginning of the meeting, and the second near the conclusion, when the SSC reviews its recommendations. Those wishing to comment should indicate such in the manner requested by the Chair, which may be through a show of hands or a written list if the number of interested parties is extensive, who will then recognize individuals to come forward and provide comment. All comments are part of the record of the meeting.

1. INTRODUCTION

1.1. Documents

Agenda
Attachment 1. Minutes of the October 2012 meeting

1.2. Action

Introductions
Review and Approve Agenda
Approve Minutes

The SSC meeting was called to order at 3:00 pm, as scheduled.

The agenda was adopted without change and the minutes of the October 2012 meeting were adopted without further comment or changes. Member introductions were made. The Chair reviewed the agenda and outlined the general format and conduct of the meeting.

2. PUBLIC COMMENT

The public will be provided two opportunities to comment on SSC agenda items during this meeting. The first at the start of the meeting, and the final will be provided at the end during the review of recommendations. Those wishing to make comment should indicate their desire to do so to the Committee Chair.

Accordingly, at this point in the meeting the Chair opened the floor for the first opportunity for public comment. Public comments were provided by Mr. Russell Hudson (Directed Sustainable Fisheries).

3. SEDAR ACTIVITIES

3.1. Documents

Attachment 2. SEDAR Assessment List
Attachment 3. 2014 SEDAR Projects Summary
Attachment 4. SEDAR 38 TORs and schedule

3.2. Overview

The SEDAR Steering Committee met in February 2013 to finalize 2014 assessment priorities. SAFMC stocks to assess include benchmarks for red snapper and red porgy, and an update for gag grouper. The planned update of greater amberjack will be delayed until possibly 2015 due to a lack of resources within the SEFSC. The SSC is asked to review the preliminary

2014 project schedule and identify any possible conflicts or data deadline issues.

The SSC is asked to provide guidance on models to consider for the 2014 benchmark of red snapper. Prior assessments were based on the BAM model, the standard used for assessments of South Atlantic stocks. In making initial plans for 2014 assessments, the analytical team questioned whether consideration should be given to assessing the stock simultaneously with the Stock Synthesis model framework during SEDAR 41. Considering two model packages during this assessment will likely require that an additional 2014 project be dropped, such as the update of gag grouper.

The SSC is asked to suggest participants, and review the schedule and terms of reference for SEDAR 38, king mackerel. This assessment will consider the Gulf and South Atlantic Migratory units of king mackerel and will therefore involve representatives from both the Gulf and South Atlantic Councils.

The SSC is asked to provide guidance on stocks to assess in 2015 and beyond. Prioritizing assessments for 2015 will be particularly useful to the Council, as the Steering Committee will consider 2015 priorities in Fall 2013.

Table 1. SEDAR Assessment Projects for the South Atlantic, 2013-2017.

Year	Stocks	Status
2013	1.Gray triggerfish B 2. Blueline Tile B 3. Snowy STD 4.Black Sea Bass U	Final
2014	1. Red Snapper B 2.Red Porgy B 3. Gag U	Final
2015	1. gray snapper B 2. Dolphin B 3. Wahoo B 4. Tilefish ? Red grouper U ? Vermilion U? Greater Amberjack U?	Tentative
2016	white grunt B Speckled Hind B Warsaw grouper B wreckfish B Red Snapper U Snowy U Blueline U	Tentative
2017	Red Porgy U + Black Sea Bass U (rebuild target 2016) Gag U	Tentative

3.3. Action

- Review and Comment on the 2014 SEDAR schedule

The SSC reviewed the current SEDAR schedule and assessment plan (table above). In general, the Committee agrees with the proposed schedule but offers the following suggestions:

- *Substitute the potential 2015 Tilefish assessment by a Scamp benchmark assessment.*

- Provide guidance on red snapper models (SEDAR 41)

The SSC discussed this issue and felt it would not be appropriate or necessary to provide guidance on assessment models at this early stage in the process. According to the usual SEDAR process models to be used in stock assessments are discussed by the Assessment Panel (part of the Terms of Reference) with input from the Data Workshop panels (re. the types of data available). Further comment and input on the adequacy and applicability of models used in SEDAR assessments is provided by the Review Panel, and lastly by the SSC.

The Committee feels that SEDAR provides an adequate process for choosing assessment models.

- Approve SEDAR 38 TORS and schedule

The SSC had no comments or concerns and the SEDAR 38 TORS and schedule were approved as provided.

- Identify SSC and other participants for SEDAR 38

Drs. Scott Crosson and Marcel Reichert volunteered to serve on the Assessment Workshop.

Drs. Jim Berkson and Churchill Grimes volunteered for the Review Workshop.

- Provide guidance on future assessment priorities

4. ABC CONTROL RULE

4.1. Documents

Attachment 5. ORCS Workshop report
Attachment 6. Landings trends
Attachment 7. ABC Control Rule

4.2. Overview

A second SSC ORCS (Only Reliable Catch Stocks) workshop will be held immediately prior to this meeting. The SSC will discuss workshop recommendations and consider if modifications to the ABC control rule are necessary. The SSC will also consider applying the modified ABC control rule to support updated ABC recommendations for unassessed stocks addressed during the ORCS workshops.

4.3. Presentation

ORCS Workshop Recommendations -- Luiz Barbieri

4.4. Action

- Recommend modifications to the ABC Control rule
- Recommend ABC values for ORCS

SSC RECOMMENDATION:

Application of the ORCS method to set ABC for several unassessed South Atlantic stocks was completed during this second workshop. However, final review and approval by the Council is still needed before ABC values can be formally adopted. Please refer to the ORCS Workshop Report for a more detailed discussion of ORCS Workshop results and recommendations.

The SSC also discussed modifications to the ABC Control Rule to: 1) adopt the ORCS method for setting ABC for catch only stocks, and 2) create a new tier to accommodate unassessed stocks that do not qualify for application of the ORCS method (i.e., stocks without reliable catch series). Based on these discussions the Committee recommends that the ORCS method be used for Tier 4 of the ABC Control Rule, and that a new Tier 5 based on application of the Decision Tree Approach be created for stocks that do not qualify for Tier 4.

5. BLACK SEA BASS ASSESSMENT UPDATE REVIEW

5.1. Documents

Attachment 8. Black Sea Bass Assessment Update

5.2. Overview

An updated assessment of black sea bass was requested last fall, to evaluate the impacts of the fishery in recent years and an increase in fishery independent survey abundance. The SSC is asked to review the update assessment and provide revised fishing level recommendations as necessary.

The Council is holding a special meeting on May 13, 2013, to consider black sea bass fishing level recommendations. To allow time for distribution of briefing materials for that meeting, the SSC is asked to expedite distribution of its recommendations on this agenda item and provide them to the Council by April 18. If the full SSC report of this meeting is not completed at this time, the SSC may provide these recommendations via a memo or letter from the SSC Chair to the Council.

5.3. Presentation

A presentation was made through a webinar.

5.4. Action

- Consider whether the update is adequate for providing management advice.
- Provide fishing level recommendations consistent with the ABC control rule.
- Comment on assessment uncertainties
- Provide guidance on the next assessment - type and timing.

SSC RECOMMENDATION:

The SSC accepts this assessment update as representing the best available scientific information on the current status of black sea bass in South Atlantic waters and considers it appropriate for SAFMC management decisions.

Results suggest that spawning stock has decreased and rebounded throughout the full assessment period (1978–2012). The terminal (2012) estimate of spawning stock is one of the highest values of the time series, above SSB_{MSY} (SSB_{2012}/SSB_{MSY}=1.03), and well above MSST (SSB_{2012}/MSST =1.66), using the Council's definition of MSST as (1 - M) SSB_{MSY}. The estimated fishing rate has exceeded the MFMT (represented by F_{MSY}) throughout the time series, but has recently dropped below F_{MSY}. The terminal estimate is well below F_{MSY} ($F_{2011-2012}/F_{MSY}$ = 0.66). Thus, point estimates from this update assessment indicate that the stock has recovered and is not experiencing overfishing.

Since this assessment falls under Tier 1 of our ABC control rule, ABC was obtained according to a P-star value. A summary of results from applying the ABC control rule is presented below:

Assessment Information:	*Tier 1 (0%)*
Uncertainty Characterization:	*Tier 2 (2.5%)*
Stock Status:	*Tier 2 (2.5%)*
Risk Analysis:	*Tier 2 (5%)*
Total adjustment	*10%*
P-star value:	*40%*

The SSC recommends using 3-year projections at P=50% for OFL and at P*=40% for ABC (see Tables 19 and 20 from the assessment report below).*

Table 19. Acceptable biological catch (ABC) in units of 1000 lb whole weight, based on the annual probability of overfishing $P^* = 0.4$. F = fishing mortality rate (per yr), SSB = mid-year spawning stock (1E10 eggs), Pr(SSB > SSB_{MSY}) = proportion of replicates rebuilt (i.e., SSB above the base-run point estimate of 256), R = recruits (1000 age-0 fish), D = discard mortalities (1000 lb whole weight), and L = landings (1000 lb whole weight). ABC (1000 lb whole weight) includes landings and discard mortalities. Annual ABCs are a single quantity while other values presented are medians.

Year	F	P^*	SSB	Pr(SSB > SSB_{MSY})	R	D(1000 lb)	L(1000 lb)	ABC(1000 lb)
2013	0.65	0.4	289.7	0.80	33230	125.6	2133	2258
2014	0.64	0.4	253.0	0.47	31913	111.0	1992	2102
2015	0.64	0.4	246.2	0.43	31519	107.3	1814	1921

Table 20. Acceptable biological catch (ABC) in units of 1000 lb whole weight, based on the annual probability of overfishing $P^* = 0.5$. F = fishing mortality rate (per yr), SSB = mid-year spawning stock (1E10 eggs), Pr(SSB > SSB_{MSY}) = proportion of replicates rebuilt (i.e., SSB above the base-run point estimate of 256), R = recruits (1000 age-0 fish), D = discard mortalities (1000 lb whole weight), and L = landings (1000 lb whole weight). ABC (1000 lb whole weight) includes landings and discard mortalities. Annual ABCs are a single quantity while other values presented are medians.

Year	F	P^*	SSB	Pr(SSB > SSB_{MSY})	R	D(1000 lb)	L(1000 lb)	ABC(1000 lb)
2013	0.71	0.5	289.9	0.80	33295	136.4	2296	2433
2014	0.71	0.5	247.8	0.43	31685	119.5	2074	2194
2015	0.71	0.5	239.0	0.39	31147	115.5	1857	1973

The SSC also discussed how to proceed given that projection results indicate an ABC that is higher than the MSY estimated by the assessment. This discrepancy is caused by the fact that the first year of the projections (2013) coincided with the year when the large 2010 class of recruits became available to the fishery as three-year-olds. In other words, the MSY values estimated during the projection period (i.e., yield at P=50%) are higher than the point estimate generated with data through 2012 and the ABC values obtained at P*=40% also reflect this higher biomass productivity.*
After much discussion the Committee reached consensus on accepting stock status determination based on the deterministic results summarized on Table 17 of the assessment report (shown below for your reference) but provides catch level recommendations based on the probabilistic estimates obtained through the P analysis. The probabilistic stock status results provide the Council with a better idea of the uncertainty associated with the point estimates. Note that the SSC's ABC recommendations below include landings PLUS discards.*

One of the key uncertainties with the assessment and projections is the strength of the 2010 year class. The update assessment shows a strong year class in 2010 yet these fish had not recruited to the fishery in the last two years of the assessment (2011 and 2012; recruit at age-3 in 2013). The estimated high 2010 year class is based on fishery-independent monitoring data. The projected ABCs are highly-dependent on the estimate of 2010 year class strength AND this estimate has high uncertainty because it is predominantly informed by one source of information (fishery-independent monitoring).

Quantity	Units	Estimate	SE
F_{MSY}	y^{-1}	0.610	0.381
$85\%F_{\mathrm{MSY}}$	y^{-1}	0.518	0.324
$75\%F_{\mathrm{MSY}}$	y^{-1}	0.457	0.285
$65\%F_{\mathrm{MSY}}$	y^{-1}	0.396	0.247
$F_{30\%}$	y^{-1}	NA	NA
$F_{40\%}$	y^{-1}	NA	NA
$F_{50\%}$	y^{-1}	1.89	0.643
B_{MSY}	mt	5617	716.7
$\mathrm{SSB}_{\mathrm{MSY}}$	1E10 eggs	256	32.8
MSST	1E10 eggs	159	25.2
MSY	1000 lb	1780	105.63
D_{MSY}	1000 fish	288	91.48
R_{MSY}	1000 age-0 fish	35843	1165
Y at $85\%F_{\mathrm{MSY}}$	1000 lb	1772.56	96.44
Y at $75\%F_{\mathrm{MSY}}$	1000 lb	1756.45	101.31
Y at $65\%F_{\mathrm{MSY}}$	1000 lb	1726.76	104.2
$F_{2011-2012}/F_{\mathrm{MSY}}$	—	0.659	0.24
$\mathrm{SSB}_{2012}/\mathrm{MSST}$	—	1.66	0.51
$\mathrm{SSB}_{2012}/\mathrm{SSB}_{\mathrm{MSY}}$	—	1.03	0.23

Black Sea Bass Status and Fishing Level Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation	No (SSB/SSBmsy=1.03)	68% MCB runs above SSBmsy
Overfishing evaluation	No (F/Fmsy=0.66)	93% MCB runs below Fmsy
MFMT	0.61	0.71 (median)
SSBmsy (1E10 eggs)	256	241.277 (median)
MSST (1E10 eggs)	159	149.085 (median)
MSY (1000 lb)	1,780	
Y at 75% Fmsy (1000 lb)	1,756.45	
ABC Control Rule Adjustment	10%	
P-Star	40%	
OFL (1000 lb)	1,780 (MSY)	2,433 (2013 L+D) 2,194 (2014 L+D) 1,973 (2015 L+D)
ABC Recommendation (list by year if appropriate) (1000 lb)		2,258 (2013 L+D) 2,102 (2014 L+D) 1,921 (2015 L+D)

6. SEDAR 28 STOCK ASSESSMENT REVIEW

6.1. Documents

Attachment 9. SEDAR 28 Cobia Stock Assessment Report
Attachment 10. SEDAR 28 Spanish Mackerel Stock Assessment Report
Attachment 11. CIE Reviews

6.2. Presentation

Presentations will be made through a webinar.

6.3. Overview

The SSC is asked to review the SEDAR 28 benchmark stock assessments of cobia and Spanish mackerel, and provide fishing level recommendations.

6.4. Action

The following Terms of Reference should be considered for both assessments.

- Consider whether the assessment is adequate for providing management advice.
- Provide Fishing Level Recommendations for cobia consistent with the ABC control rule.
- Provide guidance and advice on assessment uncertainties

- Provide recommendations on the next assessment (type and timing)

SSC RECOMMENDATIONS:

Spanish mackerel

The SSC accepts this benchmark assessment as representing the best available scientific information on the current status of Spanish mackerel in South Atlantic waters and considers it appropriate for SAFMC management decisions.

The current stock status in the base run from the Beaufort Assessment Model was estimated to be $SSB_{2011}/MSST=2.29$. The current level of fishing is $F_{2009\text{-}2011}/F_{MSY} = 0.526$, with $F_{2011}/F_{MSY} = 0.521$. Therefore, the stock is not overfished and is not undergoing overfishing. The qualitative results on terminal stock status were similar across presented sensitivity runs, indicating that the stock status results were robust given the provided data and can be used for management.

Since this assessment falls under Tier 1 of our ABC control rule, ABC was obtained according to a P-star value. A summary of results from applying the ABC control rule is presented below:

Assessment Information:	*Tier 2 (2.5%)*
Uncertainty Characterization:	*Tier 2 (2.5%)*
Stock Status:	*Tier 1 (0%)*
Risk Analysis:	*Tier 2 (5%)*
Total adjustment	*10%*
P-star value:	*40%*

The SSC recommends using 5-year projections at P=50% for OFL and at P*=40% for ABC (see tables below). These were provided following the SSC meeting. Full details on the projection results and methods are included in a revision to the SEDAR 28 Stock Assessment Report for Spanish Mackerel.*

ABC values

Year	F	P*	SSB mt	Probability (SSB > SSBmsy)	Total Yield (landings + discards) 1,000 pounds
2013	0.59	0.4	4222	0.89	4808
2014	0.58	0.4	3943	0.72	4508
2015	0.56	0.4	3919	0.66	4396

OFL Values

Year	F	P*	SSB mt	Probability (SSB > SSBmsy)	Total Yield (landings + discards) 1,000 pounds

2013	0.66	0.5	4198	0.88	5312
2014	0.66	0.5	3722	0.65	4878
2015	0.65	0.5	3628	0.58	4712

Spanish Mackerel Status and Fishing Level Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation	No (SSB/MSST=2.29)	87% MCB runs above SSBmsy
Overfishing evaluation	No (F/Fmsy=0.526)	89% MCB runs below Fmsy
MFMT	0.69	0.67 (median)
MSST	2,127 mt	2,234 mt (median)
MSY	2,750 mt	2,732 mt (median)
ABC Control Rule Adjustment	10%	
P-Star	40%	
OFL		P*=0.5 for 2013-2016
ABC Recommendation (list by year if appropriate)		P*=0.4 for 2013-2016

The SSC recommends having the Spanish mackerel assessment updated in 2017.

Cobia

The SSC accepts this benchmark assessment as representing the best available scientific information on the current status of cobia in South Atlantic waters and considers it appropriate for SAFMC management decisions.

The current stock status in the base run from the Beaufort Assessment Model was estimated to be $SSB_{2011}/MSST=1.75$. The current level of fishing is $F_{2009-2011}/F_{MSY} = 0.599$, with $F_{2011}/F_{MSY} = 0.423$. Therefore, the stock is not overfished and is not undergoing overfishing. The qualitative results on terminal stock status were similar across presented sensitivity runs, indicating that the stock status results were robust given the provided data and can be used for management.

Since this assessment falls under Tier 1 of our ABC control rule, ABC was obtained according to a P-star value. The SSC had an extensive discussion over application of dimension IV of the ABC Control Rule (Risk Analysis) since the PSA evaluation was done for the entire range of the stock, whereas SEDAR 28 was done with a range starting at the GA-FL line and north—which is a very small portion of the landings and may have different biological parameters than for considering the entire population as a whole.

After much discussion, the group consensus was to change the age at maturity category in the PSA analysis for Cobia from high to low. The new PSA score puts Cobia at a medium risk.

A summary of results from applying the ABC control rule is presented below:

Assessment Information:	*Tier 2 (2.5%)*
Uncertainty Characterization:	*Tier 2 (2.5%)*
Stock Status:	*Tier 1 (0%)*
Risk Analysis:	*Tier 2 (5%)*
Total adjustment	*10%*
P-star value:	*40%*

The SSC agreed this assessment thoroughly characterized uncertainty. The Committee recommends using 3-year projections at P=50% for OFL and at P*=40% for ABC (see tables below). These results are based on the probabilistic projections provided following the SSC meeting, and documented in Addendum 2.*

ABC values

Year	F	P*	SSB mt	Probability (SSB > SSBmsy)	Total Yield (landings + discards) 1,000 pounds
2013	0.412	0.4	587.2	0.57	815.1
2014	0.404	0.4	567.5	0.54	768.6
2015	0.388	0.4	561.4	0.53	726.7
2016	0.379	0.4	563.5	0.53	706.5

OFL Values

Year	F	P*	SSB mt	Probability (SSB > SSBmsy)	Total Yield (landings + discards) 1,000 pounds
2013	0.478	0.5	575.0	0.55	922.7
2014	0.478	0.5	536.4	0.50	845.5
2015	0.472	0.5	517.3	0.48	792.8
2016	0.469	0.5	508.1	0.47	766.7

Cobia Status and Fishing Level Recommendations

Criteria	Deterministic	Probabilistic
Overfished evaluation	No (SSB/SSBmsy=1.75)	SSB>MSST for 90% of MCB runs
Overfishing evaluation	No (F/Fmsy=0.599)	F<MFMT for 94% of MCB runs
MFMT	0.461	0.480

MSST	397.2 mt	379.2 mt
MSY	808,000 lb	772,600
ABC Control Rule Adjustment	10%	
P-Star	40%	
OFL		P*=0.5 for 2013-2016
ABC Recommendation (list by year if appropriate)		P*=0.4 for 2013-2016

Finally, the SSC recommended updating the assessment in 2017, but consider Cobia a low priority stock (i.e., not overfished and not undergoing overfishing).

7. SAFMC ANNUAL RESEARCH PRIORTIES

7.1. Documents

Attachment 12. SAFMC Research Plan

7.2. Overview

The Revised MSA requires that Councils regularly provide prioritized research needs to NOAA Fisheries. Plans addressing SAFMC needs are prepared annually, reviewed by the SSC, and approved by the Council. The SSC is asked to comment on the current version.

7.3. Action

- Review and comment

Considering that this list of research priorities is very similar to what the Council submitted last year the SSC would like to request an update from the SEFSC regarding progress to date on addressing these research priorities. Perhaps something annual that can be added to the SAFE report. Also, the Committee would like to get clarification on how these priorities get translated into requests for research proposals. It seems that none of these priorities have been added to requests for proposals in the South Atlantic.

Other SSC suggestions and recommendations include:

- *NMFS should monitor the mixing rates of Gulf and South Atlantic King Mackerel.*
- *Clarify that Goliath belongs in the "Special Needs" stocks and not in the secondary stocks.*
- *Request staff distribute a Word version of these research priorities so individual SSC members can add any additional topics, specificity, goals, etc.*

8. ASSESSMENT PEER REVIEW PROCESS

8.1. Documents

Attachment 13. DRAFT Assessment Peer Review Process**
(Document will be distributed via email when available)

8.2. Overview

At the October 2012 meeting the SSC convened a sub-group to develop a process for peer reviewing stock assessments, particularly those offered outside the SEDAR process, and to offer a process for consideration by the Committee at this meeting.

The following is taken from the October 2012 SSC Report:

In general, the Committee felt that 'outside' assessments should be handled through a SEDAR-like process, i.e., outside analysts would contact SEDAR staff for coordination with data providers, SSC members, etc. in order to begin an assessment for a particular species. Subsequently, the assessment would be formally reviewed by a legitimate process (CIE, SSC, etc.). Several SSC members wanted to emphasize the importance of a data workshop for every assessment. A "closet" assessment is problematic because there is no participation from the beginning and, therefore, no discussion of the appropriateness of the data, applicability of the model, etc.

The Committee discussed the need for developing criteria for document submittal and presentations. It was emphasized that analysts and/or groups involved in these types of assessments should be made aware of the need to share their data and models/software beyond the initial assessment process (i.e., availability/willingness to participate in follow-up work should be a criterion). However, the system needs to be flexible enough to accommodate outside people willing to accept the administrative and analytical burden associated with this process. Also, the process should be broad enough to accommodate all types of analyses, not just stock assessments.

An SSC subcommittee was appointed to draft a list of criteria and develop a short report on what would be required for the SSC to accept review of outside assessments/analyses.

Subcommittee composition: Steve Cadrin (Chair), John Boreman, Scott Crosson, Doug Vaughan, Anne Lange, Churchill Grimes, and Jim Berkson.
The subcommittee will focus on two main issues: (1) standards and (2) process for handling non-traditional assessments.

Some items to be considered by this subcommittee include:

- *Establishment of a panel composed of Council staff and SSC members to screen review requests and help coordinate with SEDAR.*
- *A mechanism for non-panel members to participate/comment. Perhaps discussion by entire group of interested parties, but panel has ultimate say on review.*

- *What if analysis is so complicated it can't be reviewed after the fact? In some cases SSC needs to have insight/involvement in what decisions are made throughout the process. May want to lay out criteria for an assessment where SSC must be involved from the beginning.*
- *Criteria should be instructive to the people proposing an analysis for review, so they are able to take the necessary steps to prepare the analysis for SSC review in advance.*
- *Need to include all parties who have a stake and wish to be involved in some capacity. Do not want for anyone to feel shut out of this process.*
- *Discuss use of ACCSP data standards, which are readily available to everyone and allow replicability of analysis and results.*

8.3. Action

- Recommend criteria and approaches for considering and peer reviewing stock assessments developed outside of the SEDAR process.

SSC RECOMMENDATION:

The SSC reviewed and discussed the criteria and approaches outlined in the draft document submitted by Dr. Steve Cadrin. Although the subcommittee had not had a chance to properly review and edit the document before its April meeting, the SSC felt compelled to move ahead and complete this task at this meeting given the Council's request to consider this a high priority—especially in light of ongoing litigation related to this matter.

The SSC agreed on focusing specifically on 3rd party stock assessments meant to inform management decisions with a specific focus on setting catch levels.

*A revised document inclusive of SSC comments and suggestions was developed (**SAFMC SSC Peer Review Process**) and is appended to this report. This document is being submitted to the Council and will be discussed at its June meeting.*

9. FISHERY INDEPENDENT REEF FISH SAMPLING

9.1. Documents

Attachment 14. MARMAP/SEAMAP-SA/SEFIS REPORT

9.2. Presentation

Overview of sampling programs and recent results: Marcel Reichert. SC DNR.

9.3. Overview

The Committee will be provided an update and summary presentation on efforts to monitor reef fish populations in the South Atlantic.

9.4. Action

Review and comment as necessary

SSC RECOMMENDATION:

The SSC thanked Dr. Reichert for the presentation. Given recent improvements and programmatic developments associated with the MARMAP/SEAMAP-SA/SEFIS fishery-independent sampling programs the Committee appreciates the opportunity to be presented with an overview and summary of these important South Atlantic programs.

10. SNAPPER-GROUPER REGULATORY AMENDMENT 14

10.1. Documents

Attachment 15. Regulatory Amendment 14 Draft

10.2. Overview

Staff Contact: Myra Brouwer

This amendment addresses management measures for several snapper grouper species. Proposed actions include:

- Amberjack – fishing year
- Gray triggerfish – consistent size limit measurement
- Black sea bass fishing year (recreational and commercial)
- Vermilion snapper – modify commercial fishing seasons
- Hogfish – increase the minimum size limit
- Modify aggregate grouper bag limit
- Modify commercial accountability measure for gag
- Modify the recreational accountability measure for vermilion snapper

10.3. RA14 Schedule

NOI	May 23, 2012
Scoping Complete	January/February 2012
Council reviews options & makes recommendations	March 2013
SSC review	April 2013
APs review	April/May 2013
Council review & approve for Public Hearing	June 2013
Public Hearings	August 2013
Final Review & Submission	September 2013

Regulations implemented 2014

10.4. Action

Review and comment on the Actions.

SSC RECOMMENDATION:

The SSC noted that not all the proposed changes provide socio-economic benefits. It doesn't seem possible to get a good grasp on the actual socio-economic benefits to the entire fishery when there are some people for and some opposed to these changes. Due to the schedule and amount of analyses required the SSC requests a final opportunity to review this amendment after analyses are completed. Specifically, the Committee suggests that the SEP be given the opportunity to review in more detail by e-mail.

Additionally, the SSC recommends that socio-economic issues of this nature be prioritized in the Council's research priority plan given the increased need for this type of information and the high degree of uncertainty in socio-economic analysis—due to short timelines with regulatory amendment preparation as well as the relatively large number of changes in the management process.

11. CORAL AMENDMENT 8

11.1. Documents

Attachment 16. Coral Amendment Draft

11.2. Overview

Staff Contact: Anna Martin & Roger Pugliese

Staff contact: Anna Martin
New discoveries of deepwater coral ecosystems were brought forward by the Council's Coral Advisory Panel in 2011. The AP's recommendations have led the Council to propose boundary modifications to the original coral protection areas to increase protections for deepwater coral based on new information in the South Atlantic. Areas proposed for modification include: Oculina Bank Habitat Area of Particular Concern (HAPC), Stetson-Miami Terrace Coral HAPC, and Cape Lookout HAPC. The Council is also considering a transit provision through the Oculina Bank HAPC. The actions to modify Coral HAPCs were originally included in Comprehensive Ecosystem-Based Amendment 3 and were split out from this Amendment during the June 2012 Council meeting.

11.3. Schedule:

Scoping Complete.....February 2012
Council reviews options & makes recommendations..... June 2012-March 2013

SSC review..... April 2013
APs review..... 2012 & 2013
Council review & approve for Public Hearing ..... June 2013
Public Hearings..... August 2013
Final Review & Submission ..... September 2013
Regulations implemented 2014

11.4. Action

Review and comment on AP recommendations and analyses.

- Do the proposed modifications to the Coral HAPCs meet the Purpose and Need for Coral Amendment 8?
- AP recommendations are based on discoveries of new deepwater coral habitat outside of HAPC boundaries. Do they warrant measures identified in Coral Amendment 8?

SSC RECOMMENDATION:

The SSC understands this is the last opportunity to review this document before it goes to the Council for final action. However, the SSCC has offered to be of any assistance in reviewing additional analyses (such as the Socio-Economic analysis) via e-mail or other practical means.

By consensus the Committee agreed that the proposed actions that modify the CHAPCs succeed in addressing the Purpose and Need of Coral Amendment 8 and, therefore, actions in Coral Amendment 8 are warranted to protect coral in these areas.

12. OTHER AMENDMENTS AND ACTIONS

12.1. Documents

12.2. Overview

Numerous amendments are in development for consideration by the Council in 2013. The SSC is provided the following brief update on the status of each action currently in progress. Although no specific TORs are posed for these items, this is an opportunity for the Committee to provide feedback on alternatives and analyses in these actions.

12.3. Snapper-Grouper Regulatory Amendment 16

Snapper Grouper Regulatory Amendment 16 considers options to minimize derby conditions in the commercial golden tilefish longline fishery and extend the season. Fishermen have proposed alternatives for analysis that would require fishing on a set schedule, i.e., every other week. However, at the March 2013 meeting, the Council requested that staff convene a meeting of the longline endorsement holders as soon as

Amendment 18B is implemented in 2013. The latter would establish the longline endorsement program and other management measures for the golden tilefish fishery. The Council's intent is to hold public hearings on Regulatory Amendment 16 in August 2013.

12.4. Snapper-Grouper Regulatory Amendment 17

Regulatory Amendment 17 is considering MPAs to provide protection to speckled hind and Warsaw grouper. The Council will consider purpose and need statements in September 2013.

12.5. Snapper-Grouper Amendment 22

At the September 2012 meeting, the Council directed staff to begin development of an amendment to implement a recreational tag program for red snapper and deepwater snapper grouper species (golden tilefish, snowy grouper and wreckfish). Options will be presented to the Council at the June or September 2013 meeting.

> *SSC Comments: the SEP is very interested in this issue as a research topic since it has potential to spread to other fisheries and there has been very little analysis done in regards to marine recreational fisheries. There is economic data that could be collected for this issue that would be of high value to management decisions.*

12.6. Snapper-Grouper Amendment 30

Amendment 30 is considering VMS requirements.

12.7. Coastal-Migratory Framework Action

This Framework includes actions to change the minimum size limit for Atlantic Group king mackerel; adjust the commercial trip limit in the Florida East Coast Sub-zone for Atlantic Group king mackerel; create an exemption to the size limit for Atlantic Group Spanish mackerel gillnets in August and September; and allow a portion of a third net in the Atlantic Group Spanish mackerel gillnet fishery. The Council will review actions and alternatives in March 2013; approve for public hearings in June 2013; and submit for final approval in September or December 2013.

12.8. Coastal-Migratory Pelagic Amendment 19

Joint Amendment 19 was reviewed at a joint meeting with the South Atlantic and Gulf Mackerel Committees in March 2013. The amendment will be approved for public hearing in June 2013 and reviewed for final approval in September 2013. The actions include consideration of a prohibition on bag limit sales of king mackerel and Spanish mackerel, including an exemption for tournament sales; options to reduce the number of king mackerel commercial permits by eliminating inactive permits or making inactive permits non-transferable; and modifications to income requirements for king mackerel and Spanish mackerel commercial permits.

12.9. Coastal-Migratory Pelagic Amendment 20

Joint Amendment 20 was reviewed in March 2013, and will be approved for public hearing in June 2013 and reviewed for final approval in September 2013. The actions include changes to zone and sub-zone allocations, fishing seasons and commercial trip limits for Gulf Group king mackerel. Additionally there are actions to: establish transit provisions through closed king mackerel areas; consider a commercial quota for North Carolina king mackerel and Spanish mackerel; modify the framework procedure to allow the Councils to make changes to ABCs, ABC/ACL control rules, and AMs through frameworks; and adjust the cobia ACL and ACT.

12.10. Coastal-Migratory Framework Action

The South Atlantic CMP Framework Action was reviewed in March 2013. The amendment will be approved for public hearing in June 2013 and reviewed for final approval in September 2013. Actions include: modifying the minimum size limit for Atlantic Group king mackerel; changes to the commercial trip limit in the Florida East Coast Sub-zone for Atlantic Group king mackerel; modifications to at-sea transfer provisions for the Atlantic Group Spanish mackerel gillnet fishery; and adjustments in the Atlantic Group Spanish mackerel commercial quota and trip limit system.

12.11. Comprehensive Ecosystem Based Amendment 3

12.12. Dolphin-Wahoo Amendment 5

The SSC reviewed the planned actions for Dolphin Wahoo Amendment 5 in October. The actions that remain in the document that the SSC reviewed at that time include revising the ABCs, ACLs, recreational ACTs, and sector AMs for dolphin and wahoo, modify the sector allocations and the framework procedure for dolphin and wahoo. At their March 2013 meeting, the Council added an action to look at establishing commercial trip limits for dolphin. Council and Regional Office staff are preparing the analyses and draft document for review by the Council at their June 2013 meeting, where the Council is expected to vote to send the draft amendment out for public hearings in August 2013. The Council is scheduled to vote to submit the document to the US Secretary of Commerce at their September 2013 meeting.

13. COUNCIL WORKPLAN UPDATE

13.1. Documents

Attachment 17. SAFMC Work Plan, March 2013

13.2. Overview

The Committee is provided the SAFMC work plan "Follow-up" document at each meeting so it can stay informed of Council activities. Questions or comments about specific items should be addressed to the staff assigned to each FMP, as summarized below.

- Coastal Migratory Pelagic - Kari MacLauchlin

- Corals - Anna Martin
- Fishery Ecosystem Plan - Roger Pugliese
- Snapper Grouper - Myra Brouwer
- Spiny Lobster
- Golden Crab - Brian Cheuvront

14. OTHER BUSINESS

14.1.1. Reappointments to the SSC.

John Carmichael explained the SSC reappointment scheduled and that the deadline for submission of documents for reappointment is by the Council Briefing Book in May. Members up for reappointment are: Luiz Barbieri, Jim Berkson, Jeff Buckel, Churchill Grimes, George Sedberry, and Steve Cadrin.

15. REPORT AND RECOMMENDATIONS REVIEW, PUBLIC COMMENT

The public is provided an additional opportunity to comment on SSC recommendations and agenda items.

Public comments were provided by Mr. Russell Hudson (Directed Sustainable Fisheries).

The Committee is provided an opportunity to review its report and final recommendations.

Timing for Black Sea Bass Recommendations: The Council will hold a meeting to discuss black sea bass fishing levels on May 13, 2013. To allow adequate time for preparation and distribution of the meeting materials, the SSC is asked to provide its recommendations to the Council based on review of the black sea bass assessment update, Item 5 in this agenda, by April 18 through a memo from the SSC chair to the Council Chair.

The Final SSC report should be provided to the Council by May 3, 2013.

16. NEXT MEETINGS

16.1. SAFMC SSC MEETINGS

2013 Meetings Scheduled

October 22-24, 2013: Charleston

2014 Tentative Dates

April 22 -24, 2014

October 28 - 30, 2014

16.2. SAFMC Meetings

2013 Council Meetings
June 10-14, 2013: Stuart, FL
September 16-20, 2013: Charleston, SC
December 2-6, 2013: Wilmington, NC
2014 Council Meetings
March 3- 7, Savannah GA
June 9 - 13, Ponte Vedra Beach, FL
September 15 - 19, Charleston SC
December 1 - 5, New Bern, NC

17. ADJOURN

Meeting adjourned.

Addenda

Addendum 1.

SAFMC SSC Peer Review Process
(includes April 2013 SSC Meeting Edits)

April 11, 2013

Background
The South Atlantic Scientific and Statistical Committee proposes that the South Atlantic Fishery Management Council adopt a policy that specifies a process for the SSC to provide scientific peer review. Such a process is authorized by the Magnuson-Stevens Fishery Conservation and Management Act, and National Standard Guidelines provide principles for a peer review process.
National Standard 2 in the Act mandates that "*Conservation and management measures shall be based upon the best scientific information available*." The Act also states that "*Each Council shall establish, maintain, and appoint the members of a scientific and statistical committee to assist it in the development, collection, evaluation, and* ***peer review of such statistical, biological, economic, social, and other scientific information as is relevant to such Council's development and amendment of any fishery management plan***"; and "*Each scientific and statistical committee shall provide its Council ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch, preventing overfishing, maximum sustainable yield, and achieving rebuilding targets, and reports on stock status and health, bycatch, habitat status, social and economic impacts of management measures, and sustainability of fishing practices*" (emphasis added).
Draft guidelines for National Standard 2 list "*widely accepted principles for evaluating BSIA:* ***relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review***." The guidelines recognize that "*the time available to review scientific information and the importance of that information to fishery management decisions are also variable… However, the development of such scientific information should be in accordance with the principles of transparency and openness... The proposed NS2 guidelines provide guidance that is fundamental for the reliability and integrity of scientific information to be used by NMFS and the Councils to effectively manage and conserve our nation's living marine resources*."
The draft National Standard 2 guidelines specify that Best Scientific Information Available is determined through regional peer review process (e.g., SEDAR), but SSC recommendations can deviate from regional peer review process recommendations if justification is provided. The SSC recognizes that SEDAR is the preferred process for determining Best Scientific Information Available when time and resources are available. However, the SSC also recognizes that the Council may wish to consider scientific information that has not been reviewed by SEDAR. Therefore, the Council and SSC should develop a review process for topics of limited scope that maintain principles of Best Scientific Information Available and are consistent with National

Standard 2 guidelines. Ideally, the process would be recognized by SEFSC and SERO so that SSC recommendations are consistent with status determination.

Proposed Review Process

The intention of this document is to describe an SSC Review Process that is responsive to new and relevant scientific information, promotes responsible scientific advice, provides rationale for deciding to initiate a SSC review (or not), encourages scientific advancements, improves the scientific basis of fishery management, complements the SEDAR process, and adds value to the science and management system.

This document provides proposed standards and a process for SSC Review of stock assessment information that is prepared outside of the regular Council and agency channels (e.g., SEDAR, or Agency analyses). These are commonly known as "3rd party" stock assessments. Analyses proposed for SSC review under this process should be address Council priorities.

The following provides general instructions and process guidance for those considering preparing and submitting assessment analyses for council consideration.

I. A proposal shall be submitted to the SSC addressing methods and sources for obtaining data and methods of analysis. Such proposals should be submitted to the SSC in advance, ideally before starting work to ensure data and analytical standards are met. Proposals shall be submitted to the Council office for distribution to SSC.

Items to address in the proposal include:

1) Indicate how the proposed work addresses Council priorities and the reasoning for the work to be conducted outside of existing assessment procedures.

2) Data providers, sources, and means of validation.
   a. data or data protocols should ideally be previously peer reviewed and validated (e.g., through a SEDAR-type process),
   b. If prior peer reviewed data are not available, data shall be otherwise validated in a way appropriate to the analysis that satisfies SSC (methods to be addressed in the proposal; may be specific to the analytical needs; and could include written documentation from data providers, or *a priori* SSC review, or convening of a SEDAR style data workshop)

2) Scope of Work and documentation of the general analytical method.
   a. Ideally, methods used should be based on previously peer reviewed techniques (e.g., published, applied successfully to other stocks, and supported by peer review application to other stocks).

3) Acknowledgement of SSC peer review process, and a commitment to participate in the review according to the process described here, and to complete supplemental work as necessary.
    a. supplemental work includes
        i. those additional assessment runs deemed necessary by the review body
        ii. Projections and evaluations of uncertainty as necessary to develop fishing level recommendations through the ABC control rule.

4) Project Timeline and expected data of distribution of completed report.
    a. This will allow the SSC and Council to adequately plan for a timely review of the completed work.
    b. Project personnel are responsible for informing the Council and SSC of any significant delays or difficulties anticipated in meeting the proposed delivery schedule.

II. Proposal review:
1. Proposals will be reviewed by the SSC.
2. Proposals will be distributed to the SSC membership, via mail or electronic means, as received at the Council office.
3. Proposal review will be conducted through conference call, webinar, or as part of an otherwise scheduled SSC meeting.
    a. An SSC conference call or webinar, as determined by the SSC chair in consultation with Council Staff, will be scheduled not sooner than 6 weeks following receipt of a proposal for review.
    b. If a regularly scheduled SSC meeting falls near the timing of a possible proposal review conference call or webinar, there is time on the SSC agenda, and the item can be added to that agenda without violating notification policies, the proposal review will be included in the SSC agenda.
4. The SSC will provide a written memorandum detailing their review of the proposal. Any deficiencies noted shall be clearly stated along with proposed methods of resolution.

III. Submission of completed analysis

1. Once the work is completed, the complete documentation of the data, methods, results, routine diagnostics and interpretations shall be submitted through the Council to the SSC for review and consideration.

IV. The peer Review Process for completed work

1. The Peer Review will be conducted by a panel of reviewers appointed by the Council.
    a. The appointment process shall be similar to that used to appoint participants to SEDAR Review Workshop Panels.
    b. Because this is not a SEDAR Review Panel, reviewers need not be members of the SEDAR review pool.
    c. The SSC will provide the Peer Review Panel Chair.
    d. Participants may include SSC members, State and Federal agency scientists, university researchers, or other experts as deemed appropriate and qualified.
    e. Participants may include independent experts, such as those provided by the CIE.
        i. Comments of outside experts may be obtained through written (desk) review rather than by their participation in the review panel.
2. The Peer Review will be guided by Terms of Reference approved by the Council.
    a. The SSC will provide the Council recommended Terms of Reference.
3. The Peer Review will be conducted as an open meeting, either in-person or through electronic meeting methods.
    a. The SSC will provide the Council a recommendation on the timing of the review, the specific method of convening the panel (in person or electronic), the time necessary to complete the review work, and Terms of Reference for the Review.
    b. Public notice of the review will be provided through the Federal Register and by posting to the Council website.
4. Peer Review Timing
    a. Peer Reviews must be conducted no less than 5 weeks before the SSC meeting where the topic is to be discussed and recommendations made.
    b. Timing of the Peer Review will be determined by the Council, based on recommendations of the SSC and Council Staff.
5. Peer Review Process Administration
    a. The preceding process for arranging the peer review may be conducted simultaneously to the analytical work, to ensure prompt review of completed work.
6. Product of the review panel

a. The Review Panel will prepare a written report documenting the review activities, findings, and addressing the Terms of Reference.
b. The Peer Review Report will be provided by the Chair to Council Staff for distribution to SSC.
c. Additional work requested by the review panel is to be completed by the project personnel, and submitted to the SSC in accordance with standard documentation guidelines.

Addendum 2.

P* and Associated Analyses for South Atlantic Cobia SEDAR 28 Stock Assessment

Sustainable Fisheries Branch, National Marine Fisheries Service,
Southeast Fisheries Science Center,
101 Pivers Island Rd, Beaufort, NC 28516
April 15, 2013

Introduction

This document responds to requests for P* projections and related information from the SEDAR 28 South Atlantic cobia stock assessment following the April 2013 meeting of the SSC. The SSC requested the following additional information from the Monte Carlo Bootstrap (MCB) uncertainty analysis described in the assessment report: 1) The percentage of runs with SSB > MSST; 2) the percentage of runs with F < MFMT; and 3) the median values of F_{msy}, MSST, and MSY from the uncertainty runs. P* projections were also requested with specified probabilities of exceeding the overfishing limit in any projection year of P*=0.4 and P*=0.5.

Uncertainty Analysis

The MCB analysis is fully described in the assessment report (SEDAR 2012). The median values requested from the MCB runs are shown in Table 1 along with the point estimates from the base run. The percentage of MCB runs with SSB > MSST was 89.7%. The percentage of MCB runs with F < MFMT was 93.8%.

Table 1. Management quantities from the SEDAR 28 South Atlantic cobia stock assessment. "Estimate" refers to the point estimate from the base run of the cobia catch-age model. "MCB value" refers to the median of the 3196 MCB runs that were retained and used to characterize uncertainty.

Quantity	Units	Estimate	MCB value
F_{MSY}	y^{-1}	0.461	0.480
MSST	mt	397.2	379.2
MSY	1000 lb	808	772.6
$F_{2009\text{-}2011}/F_{MSY}$	—	0.599	—
SSB_{2011}/MSST	—	1.75	—

P Analysis*

Acceptable biological catch (ABC) was computed using the sequential PASCL approach of Shertzer et al. (2010), a refinement of the probability-based approach described in Shertzer et al. (2008). This approach solves for annual levels of projected landings that are consistent with a preset acceptable probability of overfishing (P*) in any year of the projection time period. The method considers uncertainty in F_{MSY} as characterized by the MCB analysis described in the SEDAR 28 South Atlantic cobia stock assessment report (SEDAR 2012). No implementation uncertainty is included so that annual catch targets are considered to be centered on the ABC. Two 5-yr projections were run with P* = 0.5 and P* = 0.4. These values were recommended by the SSC following review of the assessment, which showed the stock is not overfished nor experiencing overfishing. Projections were run for the five years following the terminal year of the assessment (2012-2016). The structure of the projection model is described in SEDAR (2012). The first year of new management is assumed to be 2013, which is the earliest year that management could respond to this assessment. Point estimates of initial abundance at age in the projection (start of 2012), other than at age 1, were taken to be the 2011 estimates from the assessment, discounted by 2011 natural and fishing mortalities. The initial abundance at age 1 was computed using the estimated spawner-recruit model and a 2011 estimate of SSB. In the assessment, the terminal two years of recruitment did not deviate from the spawner-recruit curve, which influenced the abundances of ages 1-2 ($N_{1\text{-}2}$) in

2011. In the projections, lognormal stochasticity was applied to these abundances based on recruitment variation (σ_R). Thus, the initial abundance in year one (2012) of the projections included this variability in $N_{2\text{-}3}$, as well as in the SSB_{2011} used to compute initial recruits, N_1. Because the assessment ended in 2011, the projections required an initialization period (2012). The fully selected fishing mortality rate during the initialization period was taken to be the geometric mean of fully selected F from 2009-2011. Any changes in fishing effort were assumed to begin in 2013.

To characterize uncertainty in future stock dynamics, stochasticity was included in replicate projections, each an extension of a single MCB assessment model fit. Thus, projections carried forward uncertainties in natural mortality, steepness, and historical recreational landings, as well as in estimated quantities such as spawner-recruit parameters, selectivity curves, and in initial (2012) abundance at age. Initial and subsequent recruitment values were generated with stochasticity using a Monte Carlo procedure, in which the estimated Beverton-Holt model of each MCB fit was used to compute mean annual recruitment values. Variability was added to the mean values by choosing multiplicative deviations at random from the recruitment deviations estimated for that chosen MCB run.

The procedure generated 10,000 replicate projections of MCB model fits drawn at random (with replacement) from the MCB runs. In cases where the same MCB run was drawn, projections would still differ as a result of stochasticity in projected recruitment streams. Precision of projections was represented graphically by the 5th and 95th percentiles of the replicate projections.

Annual ABC (landings plus discard mortalities in 1000 lb whole weight) was computed for the years 2013-2016. Projected values from this assessment are show in Figure 1 and 2 and Table 2 and 3. In general, ABC increased with a higher acceptable probability of overfishing (P*) while spawning stock biomass decreased. Because implementation uncertainty was considered zero, these ABC values should be considered possible catch limits. Implementation uncertainty could be included in which case these values would be adjusted downward in setting annual catch targets (ACTs).

The projection method applied here assumed the catch taken from the stock was the annual ABC. If the projection had applied a catch level lower than the ABC, say at ACT < ABC, then the corresponding reduction in applied F would have resulted in higher stock sizes, and higher ABCs in subsequent years.

Comments on Projections:

- In general, projections of fish stocks are highly uncertain, particularly in the long-term (> 3-5 years). The large confidence intervals on estimated F and associated spawning stock biomass in 2015-2016 (Figure 1-2), suggests projections beyond 3 years are highly uncertain for this stock.

- Although these projections included many sources of uncertainty, they did not include structural (model) uncertainty. That is, projection results are conditional on one set of functional forms used to describe population dynamics, selectivity, recruitment, etc.

- Fisheries were assumed to continue fishing at their estimated current proportions of total fishing effort, using the estimated current selectivity patterns. New management regulations that alter those proportions or selectivities would likely affect projection results.

- These projections did not consider any error in implementing regulations (e.g., landings in excess of the ABC). If implementation error were included the projections would be altered.

- The projections assume that the estimated spawner-recruit relationship applies in the future and that past residuals reflect future uncertainty in recruitment. If future recruitment changes, due to environment or harvest effects, then stock trajectories will be altered.

References

SEDAR, 2012. SEDAR 28 Stock Assessment Report for South Atlantic Cobia.
Shertzer, K.W., M.H. Prager, and E.H. Williams. 008. A probability-based approach to setting annual catch levels. Fishery Bulletin 106:225-232.
Shertzer, K.W., M.H. Prager, and E.H. Williams. 2010. Probabilistic approaches to setting acceptable biological catch and annual catch targets for multiple years: Reconciling methodology with National Standards Guidelines. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 2:451-458.

Table 2. Acceptable biological catch (ABC) in units of 1000 lb whole weight based on the annual probability of overfishing P* = 0.4. F = fishing mortality rate (per yr), SSB = mid-year spawning stock biomass (mature female biomass in metric tons whole weight), Pr(SSB > SSB_{MSY}) = proportion of replicates where SSB was above the point estimate of SSB_{MSY} = 536.8 mt, R = recruits (1000 age-1 fish), and L = Landings plus discards (1000 lb whole weight). ABC (1000 lb whole weight) includes landings and discard mortalities. Annual ABCs are a single quantity while other values presented are medians.

Year	F	P*	SSB	Pr(SSB > SSBmsy)	R	ABC (1000 lb)
2013	0.412	0.4	587.2	0.57	114132	815.1
2014	0.404	0.4	567.5	0.54	114869	768.6
2015	0.388	0.4	561.4	0.53	110234	726.7
2016	0.379	0.4	563.5	0.53	108437	706.5

Table 3. Acceptable biological catch (ABC) in units of 1000 lb whole weight based on the annual probability of overfishing P* = 0.5. F = fishing mortality rate (per yr), SSB = mid-year spawning stock biomass (mature female biomass in metric tons whole weight), Pr(SSB > SSB_{MSY}) = proportion of replicates where SSB was above the point estimate of SSB_{MSY} = 536.8 mt, R = recruits (1000 age-1 fish), and L = Landings plus discards (1000 lb whole weight). ABC (1000 lb whole weight) includes landings and discard mortalities. Annual ABCs are a single quantity while other values presented are medians.

Year	F	P*	SSB	Pr(SSB > SSBmsy)	R	ABC (1000 lb)
2013	0.478	0.5	575.0	0.55	114132	922.7
2014	0.478	0.5	536.4	0.50	114136	845.5
2015	0.472	0.5	517.3	0.48	108420	792.8
2016	0.469	0.5	508.1	0.47	105306	766.7

Figure 1. P* = 0.4 projection results. For this assessment, discards were combined with landings so the ABC reflects both landings and dead discards. Annual ABCs (panel F) are a single quantity while other values presented are medians. Error bars represent the 5th and 95th percentiles of the 10,000 projection runs.

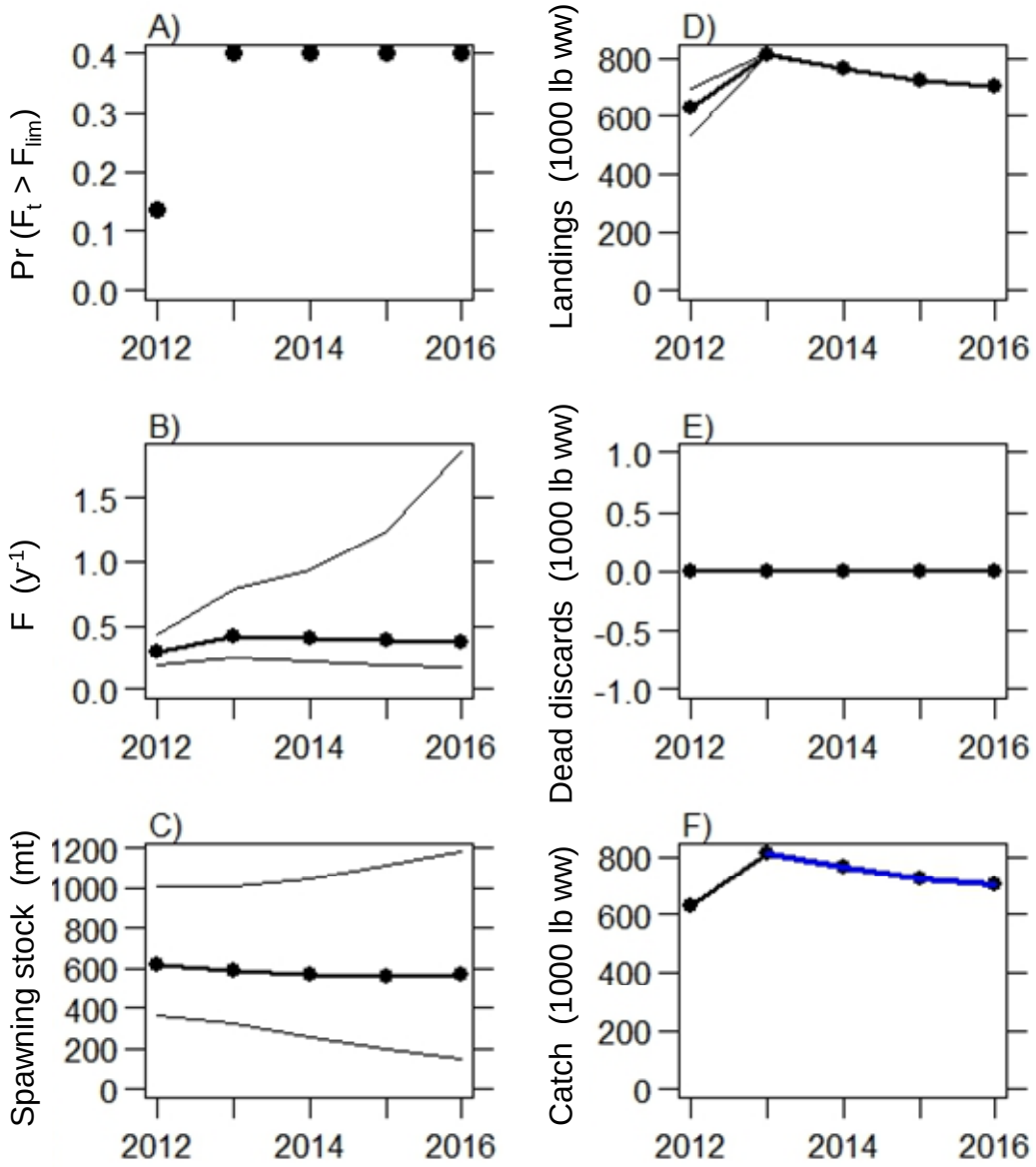

Figure 2. P* = 0.5 projection results. For this assessment, discards were combined with landings so the ABC reflects both landings and dead discards. Annual ABCs (panel F)

are a single quantity while other values presented are medians. Error bars represent the 5th and 95th percentiles of the 10,000 projection runs.