Standing and Special Reef Fish SSC Meeting
January 21-22, 2010
Kenner, Louisiana

Note: All documents and presentations given at the meeting are available on the Gulf Council ftp server:

ftp.gulfcouncil.org (anonymous login)
folder: Archived meetings
sub-folder: Shrimp AP and Shrimp-Lobster-Reef-Fish SSC meeting - Jan 2010
sub-sub-folder: Reef Fish SSC

Species Groupings Analyses

Nick Farmer gave a Powerpoint presentation on analyses of species associations for possible species groupings for annual catch limits (Farmer - GOM ACL Species Groupings 15Jan2010.pptx). The analyses used commercial logbook data and headboat data to look at catches by area fished (and by depth for the commercial logbook data). Several different types of analyses were performed including hierarchical cluster analysis, binary clusters, and nodal analyses. The analyses supported the current shallow-water grouper complex. It also supported several other complexes, including a mid-water complex that includes red snapper, vermilion snapper, and gray triggerfish, and the current deep-water grouper complex, plus various other groupings. However, the results found that greater amberjack is a poor indicator of abundance for the unassessed jack species. A report describing the analyses is currently being reviewed by the Science Center. The SSC felt that the analyses was a good starting point for establishing groupings, but that there were other factors about the biology of the stocks that should also be considered. Mr. Farmer noted that he did a cluster analyses based on life history characteristics, but the results were not very significant. Steven Atran expressed his hope that the analyses could lead to recommendations for species groupings by the April Council meeting.

ABC Control Rule

Luiz Barbieri gave a presentation on ABC Control Rule options for "data-rich" and "data poor" species (Barbieri-Gulf_ABC_Control_Rule_Jan2010.ppt). The presentation noted that for "data rich" stocks a method called the *P** (P-star) approach is being developed by the ABC Control Rule Working Group to develop the appropriate level of probability of overfishing within the 15% to 45% range previously specified by the Council. *P** is a value that is defined as the probability of catch exceeding the true overfishing limit for the stock. The calculation of ABC based on this approach requires three things: a *P** value, an estimate of OFL (e.g., MSY), and an estimate of uncertainty about the estimate of OFL sufficient to convert the *P** value into the same units as OFL (e.g., pounds). The *P** ABC Control Rule table being developed consists of a point system where several dimensions are evaluated and assigned points including assessment information, characterization of uncertainty, stock status and productivity-susceptibility

analyses (see first attachment and second attachment). Once a point value for *P** is determined, an ABC corresponding to the probability level can be derived. However, even if enough information is available to calculate *P**, if data available for the assessment are insufficient to provide either the estimate of OFL or uncertainty about this estimate then the *P** approach will not provide an ABC value. In such 'data poor' cases alternative approaches are needed that require less information.

Richard Fulford presented a draft "Decision tree" based on an approach currently in use by the North Pacific Fishery Management Council (NPFMC) for determining of ABC for groundfish stocks (see third attachment). Dr. Fulford provided a description of the Decision tree as follows:

> The SSC is currently developing a 'data poor' approach that is based on an approach currently in use by the North Pacific Fishery Management Council (NPFMC) for determining of ABC for groundfish stocks (cite working paper). This approach covers a range of scenarios that allow for the most information to be used in determining ABC, while remaining flexible enough to account for multiple levels of data quantity. Five 'data poor' dimensions are proposed and the first dimension requires a determination by the SSC that data are insufficient for the *P** approach. **Dimension Two** deals with assessments for which proxy-base point estimates of OFL (e.g., F_{MSY}, B_{MSY}) are available but no measure of uncertainty. In this case the approach is to set OFL at the assessment value and set the buffer between OFL and ABC based on a ratio of fishing mortality estimates at two pre-determined levels of the spawning potential ratio (SPR). For instance the NPFMC has established the ratio of $F_{40\% SPR}/F_{35\% SPR}$as their ABC buffer. This ratio adjusts ABC based on the proportional increase in fishing mortality associated with a 5% reduction in SPR. The SSC needs to establish the appropriate SPR ratio for Gulf of Mexico stocks. In **Dimension Two** the buffer may also be increased if a stock is determined to be overfished or in danger of becoming overfished in the future. The stock status component of this dimension is used by the NPFMC but it is under review for use in the Gulf Council's ABC control rule. **Dimension Three** applies the same approach as **Dimension Two** for determining the buffer between OFL and ABC, but uses a relative proxy for OFL and the determination of stock status (e.g., $B_{40\% SPR}$ rather than B_{MSY}). This dimension applies to stocks for which data are insufficient to provide a point estimate of MSY or B_{MSY}. **Dimension Four** applies to stocks for which only a catch history and possibly some life history data are available for an assessment. Three tiers are under consideration which provide three options for estimation of OFL : an SPR approach, an F=M approach, or an average catch approach. ABC is then estimated based on a pre-determined buffer (e.g., 75% of OFL). The final dimension applies to stocks for which even a reliable catch history is not available and this dimensions calls for pooling of assessment data to move these stocks into the higher dimensions either through species grouping or through the use of data from a related index stock.
>
> The SSC and ABC Control Rule Working Group are in the process of reviewing these 'data poor' approaches with the goal of setting the various components of each dimension (marked in red on the Table) so that the range of acceptable risk is

comparable between data rich and data poor approaches and is consistent with Council guidance and National Standard 1 guidelines. Additional Council guidance may be required to set some of these values, particularly the value below which fishing must cease under NS1 guidelines (i.e., "a" value in the Decision Tree).

Reef Fish SSC – Day 2

On the second day of the Reef Fish SSC meeting there was not a quorum (10 members were present, 11 needed for a quorum). However, additional modifications were made to the *P** and Decision Tree tables. The SSC felt that the stock status dimension was a management concern rather than a measure of scientific uncertainty, and removed that dimension from the *P** table. It was replaced with a dimension to characterize uncertainty due to process error, as opposed to observation error (with specific tiers still to be determined).

Several tiers representing poor quality information had previously been removed on the basis that such stocks would not qualify for the *P** approach, but that left the *P** table producing a range of overfishing probabilities at the upper end of the 15% to 45% range that the Council requested in October rather than the full range. Some SSC members felt that it was appropriate to leave the *P** calculations at the upper end of that range (e.g., 30% to 45%) since the *P** method would only apply to stocks that were data-rich and would thus have less uncertainty. After discussion, many of the SSC members present concluded that even data-rich stocks could have a lot of uncertainty associated with the assessment results due to uncertainty in the data or the process, and therefore the *P** point system should be adjusted to produce a full range of probabilities within 15% to 45%. However, since there was no strong consensus among the SSC members present, it was suggested that the Council be presented with some case studies that would give them a sense of what such a range would do under "data rich" and "data poor" approaches.

The ABC Decision Table was modified to allow it to direct analyses to the *P** method for stocks that had either an actual estimate of MSY or an estimate of MSY proxy as long as a measure of error around the MSY or MSY proxy estimate could be derived. Values in red in the data-poor portion of the decision tree are values where the North Pacific SSC sought guidance from their Council. However, the Reef Fish SSC felt that it needed to study these sections further before determining how to modify the approach to best fit the Gulf of Mexico stocks. One suggestion was to evaluate some data-rich stocks using both the *P** and the data poor methods, and use the variables in the data-poor methods to tune the analyses to produce the same results for a given stock.

One variable where the SSC does need guidance from the Council is the variable "a" in the decision tree. The National Standard 1 Guidelines state that the ABC control rule should consider reducing fishing mortality as stock size declines and may establish a stock abundance level below which harvest would not be allowed. The variable "a" represents a stock condition below which harvest would not be allowed.

The SSC requests guidance from the Council on setting a level of stock abundance below which harvest will not be allowed (i.e., ABC will be set to zero).

a. **No action. Do not specify a minimum level of stock abundance**
b. **5% of B_{MSY} (proposed by North Pacific Council)**
c. **10% of B_{MSY} (proposed by Pacific and South Atlantic Councils)**
d. **Some other level of stock abundance**

For reference, the current red snapper update assessment places the current (2008) stock status at 17% of B_{MSY} proxy, However, the SEDAR 7 benchmark assessment place the red snapper status in 2003 at 6% of the B_{MSY} proxy.

The SSC reviewed a recommendation from the Ecosystem SSC to add a dimension to the *P** table to account for ecosystem uncertainty. The Ecosystem SSC met last December, and recommended that an ecosystem dimension be added to the ABC Control Rule using the following criteria:

1. Trophic interactions
2. Fisheries
3. Habitat
4. Social vulnerability
5. Climate sensitivity

For criteria 1 and 2 (trophic interactions and fisheries), the Ecosystem SSC noted that from an ecosystem standpoint the emphasis should be on evaluating what the effect of management actions on a given species would be on other species. The SSC discussed the Ecosystem SSC's recommendation, but questioned whether, from the standpoint of estimating MSY, these concerns represented scientific uncertainty or management uncertainty. They also questioned how these criteria could be integrated into an ABC control rule, particularly since the Ecosystem SSC themselves had no recommendations on how to integrate the criteria. SC members concluded that, while this might be an issue for future consideration, they were not ready to integrate it into the first iteration of the control rule.

Although the SSC made considerable progress in developing the ABC control rules for data-rich and data-poor species, an additional SSC meeting will be needed in March to complete the job. In addition, the ABC Control Rule Working Group may also need to meet in February, or prior to the SSC.

Goliath Grouper SEDAR Benchmark Assessment Terms of Reference

Julie Neer summarized the terms of reference for a SEDAR benchmark assessment to be conducted in 2010. The Florida Fish and Wildlife Conservation Commission will be the lead agency for the assessment. A catch-free model that was used in the 2004 SEDAR 6 goliath grouper assessment will be used in this assessment, and the results will be in terms of proxies. There is more information available now about goliath grouper than there was in 2004. The

SSC noted that the TOR had been put together quickly to facilitate a 2010 assessment. The FWC had not yet reviewed the TOR, and the SSC only received the TOR during their meeting and did not have a chance to review it in advance. However, it is based on a standard SEDAR template. Following discussion, the SSC, noting their lack of a quorum, passed the following motion

> **Without objection, the non-quorum consensus (10 of 21 members) is that the Standing and Special Reef Fish SSC has no concerns with the goliath grouper SEDAR benchmark assessment terms of reference.**

Proposed National Standard 2 Guidelines

Note: This discussion began during the Shrimp SSC meeting and continued in the Reef Fish SSC meeting. Discussion focused on the peer review process and on conflicts of interest. It was clarified that, for a benchmark assessment, the SEDAR Review Panel would be the final arbiter of whether an assessment as the best available scientific information, although the entire SSC was expected to participate in the discussion as non-voting participants. For conflicts of interest, it was noted that the paragraph on independence required that peer reviewers must not have participated in the development of the work product or scientific information under review. Depending on how strictly it's enforced, this could potentially disqualify nearly every Science Center scientist from serving on a review panel, although there would be no conflict with them participating on data or workshop panels. Also, members of the SSC involved in data or assessment workshops would not be able to participate in review workshops as voting members, though they could observe and comment as SSC members. The SSC had no comments to forward to the Council, but were encouraged to submit individual comments that they may have directly to NMFS.

Other Business – ABC Rounding Error

In the December 2009 Reef Fish SSC meeting, the SSC recommended a red snapper ABC for 2010 equal to 75% of OFL, or 6.945 million pounds. This ABC value was stated with 3 significant decimal point digits. However, the OFL value from which it was derived contained only 2 significant decimal points (9.26 million pounds). Basic mathematical rules state that when measurements are multiplied or divided, the answer can contain no more significant figures than the least accurate measurement. Furthermore, ABC has historically been expressed to a precision of 2 decimal points. For these reasons, Council staff recommended rounding the ABC to 6.95 million pounds. However, the NMFS Regional Office stated that rounding up would violate the ABC voted on by the SSC, and rounding down would result in withholding 5,000 pounds from the fishery. The SSC was asked to clarify their intent as to the appropriate ABC. However, given what was considered the trivial nature of the dispute and the lack of a quorum, the SSC declined to comment or vote.

Standing SSC Members present

Doug Gregory, Jr., Chair
Harry Blanchet. V. Chair
Charles Adams
Luiz Barbieri
Benjamin Blount
Shannon Cass-Calay
Richard Fulford
Read Hendon
Walter Keithly
Elbert Whorton

Special Reef Fish SSC present

Barbara Dorf
Douglas Peter

Attachment 1. *P** Point Table (under construction)

ABC Control Rule for 'non-data poor' species
(P* range of 15% to 45%)

Dimensions	Tiers	Score
Assessment Information	**1. Quantitative, age-structured assessment that provides estimates of exploitation and biomass; includes MSY-derived benchmarks.** **2. Quantitative, age-structured assessment provides estimates of either exploitation or biomass, but requires proxy reference points.** **3. Quantitative , non-age-structured assessment. References may be based on proxy.**	**0.00** **0.00** **0.00**
Characterization of Uncertainty (Observation Error)	**1. High. This tier represents those assessments that include resampling (e.g., bootstrapping or Monte Carlo techniques) of important or critical inputs such as natural mortality, old landings, discard rates, age and growth parameters, etc.** **2. Medium: This tier represents assessments in which key uncertainties are addressed via statistical techniques and sensitivities, but the full uncertainties are not carried forward into the projections and reference point calculations.**	**0.00** **0.00**
Characterization of Uncertainty (Process Error)	***1. Tiers still being developed***	**0.00** **0.00** **0.00**
PSA	**1. Low Risk. Productivity High, Vulnerability Low, Susceptibility Low** **2. Moderate Risk. Moderate Productivity, Moderate Vulnerability, Moderate Susceptibility** **3. High Risk. Low Productivity, High Vulnerability, High Susceptibility**	**0.00** **0.00** **0.00**

Attachment 2. Possible tiers for Characterization of Uncertainty dimensions in *P** table.

	Characterization of Model Uncertainty	Penalty
1a.	The OFL pdf provided by the assessment model includes an appropriate characterization of observation and process error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with bootstrapping/Monte Carlo simulation and the full uncertainty has been carried forward into the projections.	0
1b.	The OFL pdf provided by the assessment model includes an approximation of observation and process error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with ***SENSITIVITY RUNS*** and the full uncertainty has been carried forward into the projections.	-1
1c.	The OFL pdf provided by the assessment model includes an incomplete approximation of observation and process error. The uncertainty in important inputs (such as natural mortality, discard rates, discard mortality, age and growth parameters, landings before consistent reporting) has been described with ***SENSITIVITY RUNS*** but the full uncertainty ***HAS NOT*** been carried forward into the projections.	-2
2a.	Retrospective patterns have been described, and are not significant.	0
2b.	Retrospective patterns have been described and are moderately significant.	-1
2c.	Retrospective patterns ***have not*** been described ***or*** are large.	-2
3a.	Forecast error (examination of past performance of models on the same species) has been examined as is not signficant.	0
3b.	Forecast error (examination of past performance of models on the same species) has been examined and is moderate.	-1
3c.	Forecast error (examination of past performance of models on the same species) has been examined and is large ***or has not been*** examined.	-2
4a.	Known environmental covariates are accounted for in the assessment.	0
4b.	Known environmental covariates are **partially** accounted for in the assessment.	-1
4c.	Known environmental covariates ***are not*** accounted for in the assessment.	-2

Attachment 3. Draft ABC Rule Decision Tree (under construction)

<table>
<tr><th colspan="3">Decision tree for separating data rich and data poor species</th></tr>
<tr><th>Dimensions</th><th>Tiers</th><th>Action</th></tr>
<tr><td>1) Data quality decision rule</td><td>1. Quantitative assessment provides estimates of exploitation and biomass; includes MSY-derived benchmarks with pdf.
2. Quantitative assessment provides point estimates of proxy reference points for exploitation or biomass without a pdf.
3. Quantitative assessment that provides relative measures of exploitation or biomass; absolute measures of status are unavailable; references may be based on proxy.
4. Reliable catch history available
5. Scarce or unreliable catch records</td><td>1. Goto P* table (data rich)
2. Goto Dimension 2
3. Goto Dimension 3
4. Goto Dimension 4
5. Goto Dimension 5</td></tr>
<tr><td>2) MSY proxy</td><td colspan="2">2a Stock status B/Bmsy > 1;
F_{OFL} = Fmsy
F_{ABC} <= Fmsy * (F40%/F35%)

2b Stock status a < B/Bmsy<= 1
F_{OFL} = Fmsy
F_{ABC} <= Fmsy * (F40%/F35%)* ((B/Bmsy) - a)/(1-a)

2c Stock status B/Bmsy<= a
F_{OFL} = 0
F_{ABC} = 0

Fmsy and Bmsy defined using proxy values
red = need to establish best scientific values based on GOM stocks and Council derived values for acceptable risk.</td></tr>
<tr><td>3) Relative reference points</td><td colspan="2">3a Stock status B/B40% > 1
F_{OFL} = F30%
F_{ABC} <= F40%

3b Stock status a < B/B40%<= 1
F_{OFL} = F35% * ((B/B40%) - a)/(1-a)</td></tr>
</table>

		F_{ABC} <= **F40%** * ((B/**B40%**) - **a**)/(1-**a**)
	3c	Stock status B/**B40%**<= **a** F_{OFL} = 0 F_{ABC} = 0
4) Catch history	4a	SPR based analysis possible; status unknown F_{OFL} = **F30%** F_{ABC} <= **0.75** * F_{OFL}
	4b	Reliable estimates of natural mortality rate M; status unknown F_{OFL} = M F_{ABC} <= **0.75** * M
	4c	Reliable catch history (> 10 yrs before current); status unknown OFL = average catch of the time series ABC <= **0.75** * OFL
5) Minimal catch data	Apply dimension 4 based on similar species PSA style adjustment for risk Stock complex with benchmarks based on most data rich species	