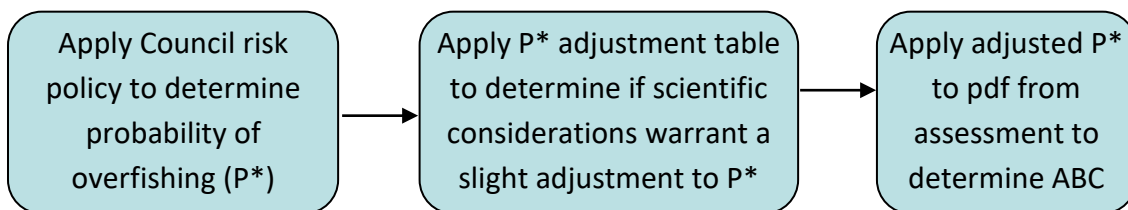Dear members of the ABC Control Rule Working Group,

In preparation for the upcoming ABC control rule webinar series, please accept the following comments by Ocean Conservancy. We have followed the control rule development process and its application in the Gulf with great interest and have some suggestions for the consideration of this working group for improving the control rule. We laid out our analysis of current control rule shortcomings in our letter to the Gulf Council in November last year, and are attaching the relevant portion here for your reference.

The main issue with the control rule that we think needs to be addressed is that the tiers, as they are currently written, do not accommodate the full spectrum of current stock assessment outputs. The P* method is an elegant way of selecting allowable catch based on uncertainties in the stock assessment, but it should only be applied when the probability density function actually approximates the true uncertainty in the assessment, and this has not been the case for any of the Gulf assessments to which this tier has been applied to date. Realistically, very few stocks will fall into tier 1 of the ABC control rule, and at least one more tier is needed between tier 1 and the current tier 2 to fully accommodate SEDAR stock assessment outputs. The current tier 2 is meant to be used for alternative stock assessment outputs, and this tier should be retained for when these types of alternative assessments, such as DCAC or DB-SRA, can be applied to Gulf stocks. Below, we offer specific comments for each tier of the control rule.

Tier 1 – P*
This tier should be retained but used only when reliable pdfs which incorporate the major sources of scientific uncertainty can be produced by the assessment. If this is not the case, the stock should be moved to a lower tier. In addition to use of this tier for stocks that do not have reliable pdfs, we also have some concerns about the method of ABC calculation. The problem is that tier 1 mixes uncertainty and risk in an attempt to make up for a missing Council risk policy. The Council provided the desirable range of overfishing probabilities but gave no further instruction for how it wanted this range to be applied to the different species. In the absence of this risk policy, the SSC developed the risk determination table which reduces ABC from OFL based on shortcomings in the assessment that would be expected to result in pdfs which underestimate scientific uncertainty. Here is the problem that we see with this approach: Let's assume that we that we have two assessments that both meet the tier 1 requirement of capturing the main sources of scientific uncertainty in the pdf. The first assessment characterizes uncertainty perfectly (for the purpose of the risk determination table, this means scores of zero for each element), and a second one but does not describe this uncertainty perfectly (some non-zero scores for risk determination table elements). Uncertainty in the first assessment is very large while in the second one it's very small. In other words, in the first assessment, we are very uncertain about where MSY/OFL is, but we know exactly how uncertain we are while in the second assessment we are much more certain about where MSY/OFL is, but we don't know

exactly how certain. The ABC advice that would come out of the control rule for the first assessment is a buffer of zero (ABC=OFL) and for the second assessment it would be a non-zero buffer (ABC is less than OFL). Intuitively, it just doesn't seem to make sense to recommend no buffer if the uncertainty is very large but we know exactly how large it is and recommend a buffer if we know the uncertainty is very small but we don't know exactly how small it is. The issue is, as we stated above, that tier 1 mixes risk and uncertainty. A solution would be for the Council to specify a risk policy that consists of more than a range of overfishing probabilities and provides guidance for how to select a specific P* within that range for each species (based on ecological and socio-economic risk considerations). This risk policy would have to reflect the trade-offs between different management objectives and could be determined with stakeholder input. Then, if the SSC determines that a slight adjustment to P* is necessary because the pdf does not fully capture uncertainty (even though it does capture the main sources of uncertainty, as stipulated by the conditions of use for this tier), this adjustment can be made to the risk-policy determined P*, not the upper bound of 50 percent. The purpose of this step would be to recommend an ABC that corresponds to an actual probability of overfishing as close as possible as that prescribed by the Council. The process we envision would look something like this:

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[ Apply Council risk        ]      [ Apply P* adjustment table   ]      [ Apply adjusted P*    ]
[ policy to determine        ] ---> [ to determine if scientific  ] ---> [ to pdf from           ]
[ probability of             ]      [ considerations warrant a    ]      [ assessment to         ]
[ overfishing (P*)           ]      [ slight adjustment to P*      ]      [ determine ABC         ]
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Alternatively, if the SSC does not want to go through the P* adjustment phase, the SSC could attempt to develop a methodology to adjust the pdf itself to account for missing uncertainty descriptions.

Of course, the first thing that is needed for all this is a Council risk policy, and the SSC and ABC control rule working group could help by making recommendations to the Council about different alternatives for what such a risk policy might look like and what kind of information would be needed to specify it.

(new) Tier 2 – no adequate pdf
We think a new tier is needed between the current tier 1 and 2 that addresses stocks for which traditional stock assessment outputs are available but there is no reliable pdf. This issue has come up with every stock assessment to which tier 1 has been applied to date. The pdfs are so narrow that the ABC buffer produced by the tier 1 control rule does not represent the true probability of overfishing at that catch level. This could result in the Council following all its control rules and still ending up in an overfished condition, which would then necessitate quota reductions and rebuilding plans. A new tier is necessary to deal with stocks which have pdfs that are not

accounting for the major sources of scientific uncertainty. For this new tier, the P* method could still be applied but the pdf would have to be generated outside the assessment. The SSC could specify one (or several) default uncertainty levels to use, similar to the Pacific SSC's sigma approach. Ideally, the specification of sigma would underlie some type of meta-analysis, similar to what was done in the Pacific, that estimates the average level of scientific uncertainty in assessments that would fall into this tier (see Ralston et al. 2010). Another option for this tier would be to not use a probabilistic approach but to develop a different way for reducing ABC from OFL based on other specifiable criteria (such as productivity and susceptibility or ecosystem factors).

<u>(current) Tier 2 (should consider making tier 3) – alternative assessments</u>
The current tier 2 should be retained to use when data-limited stock assessment methods can be applied, but moved down on the control rule ladder. Perhaps the wording for this tier could be rephrased to make its intended use more clear. The current ABC setting method for this tier is non-descript and dependent on a non-existent Council risk policy. It is difficult to improve this without knowing the assessment method that would be used for this tier. The South Atlantic ABC control rule levels 2 and 3 also deal with non-traditional assessment approaches, and the Gulf SSC could use that control rule for ABC calculation suggestions. Additionally, the SSC could ask the Science Center analysts to provide more specific advice based on their knowledge of what kinds of outputs these assessments would likely produce.

<u>(current) Tier 3 (should consider making tier 4) – landings history only</u>
The basic concept of this tier is logical and echoed in a number of other recommendations on this topic. Catches for species that are not of concern can be kept at current levels or allowed to be increased slightly and catches for species that are of concern should be reduced or at least capped. The problems with see with this tier is that there is no scientifically defensible basis for the use of standard deviation multiples to determine the level of allowable catch increases or for the percentages to determine decreases. We suggest that the working group discuss the potential of applying the recommendations from the ORCS ad-hoc working group on specifying ABC for species with catch history only. The ORCS working group approach suggests average catch multipliers based on statistical modeling. The Gulf ABC control rule working group could consider adopting those multipliers or performing their own evaluations of potential multipliers.

The ORCS working group also presents a potential methodology for evaluating stock status (determining whether a species should be in tier 3a or 3b) that is worth evaluating by this group. The current condition for use of tiers 3a and 3b are vague and could be improved. For tier 3a, the control rule currently states "Based on expert evaluation of the best scientific information available, recent historical landings are without trend, landings are small relative to stock biomass, or the stock is unlikely to undergo overfishing if future landings are equal to or moderately higher than the mean of recent landings." We see a number of issues with this

condition. First, using only recent catch trends could be misleading if historic catches are very different from recent catches. Second, using catch trends alone to infer population status has been shown to be an unreliable method of status determination and third, stock biomass for these species is generally unknown. The first two conditions, therefore, do not seem to help much for making the distinction between 3a and 3b. That leaves only expert evaluation for both tiers 3a and 3b. The ORCS approach also relies heavily on expert evaluation, but in a more structured manner, by proposing that a number of attributes be evaluated for each stock or stock complex to help make the distinction between heavily or moderately/lightly exploited. The Gulf ABC control rule working group could consider adopting that approach or developing their own attributes.

The need for validation

The purpose of the ABC is to prevent overfishing. We cannot know how well a new control rule will achieve this goal of preventing overfishing unless the control rule is evaluated. This is particularly important for the tiers where a probabilistic approach is not possible. Simulation testing would allow the SSC to test out the control rule under a number of different scenarios and verify the approach or expose issues prior to implementing the rule. We strongly encourage the SSC to work with the Science Center on evaluating and validating the current and new ABC control rule to avoid having to frequently revise the rule as new issues become apparent with every new stock assessment.

We look forward to further refinement of the Gulf ABC control rule to fit the needs of the fishery and the ecosystem.

Sincerely,

Claudia Friess, OC