OVERVIEW OF OPTIONS FOR DEALING WITH REVISED ESTIMATES OF CATCH AND CPUE IN THE CCSBT OPERATING MODEL AND MANAGEMENT PROCEDURE

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A. Review of SBT Farming

1. The Australian surface fishery data are only used to provide input on catches of this fishery. Effort or CPUE data for this fishery are not used as inputs to the OM, and are not incorporated in the CPUE series used as indices of SBT abundance. Changes in past catches in this fishery therefore do not directly influence the CPUE indices used in the OM., and only the question of past catch and age-composition derived from size frequency needs to be addressed.

2. Alternative past catch series for this fishery can be incorporated in the OM in various ways:

a) One of the series is chosen as a "best estimate" base case, and other alternative past catch series are used as robustness tests in evaluating the performance of the MP. The Commission will need to give clear guidance on which catch series is considered "best", and which other options to use as alternates in robustness testing. Some measure of the relative plausibility of alternative past catch series would be useful.

b) If more than one past catch series is considered equally plausible, these can both / all be incorporated in the OM as alternates in the OM reference set. The Commission will need to give clear guidance on which past catch series to use. This approach will require significant modification of the OM code to add an additional axis of uncertainty (past catch series). There will also be a need to assign plausibility weights to the alternative past series, and Commission guidance will be required on this (e.g. are all scenarios equally plausible). This latter approach will require substantial OM revision, re-conditioning and re-evaluation of performance, which will be unlikely this year. A dedicated technical meeting will be required in 2007 to test and agree on the weightings and new OM Reference Set, with a view to evaluating results at the 2007 SAG/SC meeting..

3. Once guidance is provided by the Commission on what past catch series to consider for this fishery, it should be easy to calculate these, as they should amount to scaling of catches by some percentage/s. However, the SAG/SC will have to know if such scaling percentage/s should be constant or variable over time.

B. Review of Japanese Market Data

4. Options for the incorporation of revised or alternative past LL catch data are similar to those for the surface fishery. Alternative past catch series can either be incorporated as alternative robustness tests, after Commission guidance on a "best estimate" base case to use, or multiple alternative past catch series can be included as plausibility-weighted inputs to the OM.

5. However, the estimation of these past catches is not as straightforward as for the surface fishery. As far as possible, Commission guidance will need to be given regarding which fishery / fisheries this past catch should be allocated to (i.e. LL1, LL2, LL3 or LL4), and in what proportions, so that catches can be converted to the correct catch-at-size and raised catch in numbers for the various fisheries.

6. In addition to determining correct catch-at-size, it is essential to know what proportion of this estimated past un-reported catch should be attributed to the LL fisheries whose data are used to generate the five CPUE series used to assess stock status and condition the OM: the Japanese LL1 in areas 4 - 9 and months 4 - 9, New Zealand Charter and Australian Joint Venture fisheries. It is equally important to know how to estimate the fishing effort associated with under-reported past catch by these fleets, so that the five CPUE indices used in the OM can be re-estimated using the revised past catch and effort data. Those members responsible for calculating the five CPUE series used (Australia: Nominal and Laslett Core; Japan: ST-Windows, B-Ratio Proxy, Geostat Proxy) will need to give further guidance on what they need to know about alternative past CPUE scenarios to re-generate these indices.

> (Note: It is not actually necessary to estimate effort for the entire under-reported catch. CPUE could be based on just a portion of the catch, ***as long as effort corresponds to that portion***. For example, if the unreported catch comes from other boats, even if later unloaded on registered LL boats, the effort may be correct as long as it is the effort used to catch the reported catch. However, if the reported effort is the total effort but only a portion of the catch obtained ***with that*** effort is reported, then obviously the CPUE is underestimated. The SAG/SC could go a long way to incorporating revised past catch data if we at least know the proportion of the unreported catch that came from the actual registered fleet during normal operations.)

7. Guidance will also be required from the Commission on how far back the revised past catches and CPUE must be taken. The critical factor driving the OM assessments and MP recommendations is the ***trend*** in LL1 CPUE over time. It is not possible, without actually running the assessments under alternative revised catch scenarios, to say whether these alternative past catch and CPUE scenarios will result in a more optimistic or more pessimistic view of the state of the stock. However, alternate views on the proportional allocation of past catch under-reporting to the various fleets, coupled with how far back in time this is taken, are likely to result in increased uncertainty around CPUE indices, and could conceivably result in alternative CPUE series as divergent as the past Constant Squares and Variable Squares CPUE series. As happened with the large divergence between CS and VS CPUE indices, this would result in high uncertainty around OM assessments, projection results and management advice. If at all possible, going back to that level of divergence in CPUE trends, and that level of disagreement about the state of the stock, should be avoided. The Commission should attempt to narrow that uncertainty by making informed judgements on how best to allocate past under-reporting of catch to fisheries, and how to estimate associated CPUE trends.

C. OM Revision / Up-Dating Work Required

8. Under any of the above scenarios, the OM code will need to be updated to be able to deal with the input of alternative past catch scenarios. If agreement can be reached on one “best” base case for past catch and CPUE, this code updating will be easier. A single, revised, “best” past catch and CPUE will serve as the base case in the OM, to replace the current past

catch data. Alternative series would then be used as robustness tests. Much of this could probably be done before the coming SAG/SC (although the schedule is tight), and revised constant catch projections (with robustness tests) used to give updated advice on recommended initial catch cuts to reduce short-term risks. Further MP re-tuning and testing would follow in 2007, with a view to recommending final MP implementation at CCSBT14 in 2007.

9. However, if more than one past catch scenario is considered plausible, and if these all have to be catered for in the OM, then this will essentially require the same process and amount of work that was done in 2004/2005 in development of the OM, MP and management recommendations put to the Commission at CCSBT12 last year. Specifications and initial evaluation of OM revisions and re-conditioning will have to be conducted at the coming SAG/SC meetings, a small technical Meeting will need to be held in early 2007 to finalise an updated OM reference set, with additional weightings of alternative past catch and CPUE series, and agreement on the "best" past catch and CPUE series to be used by the MP.

D. Updating and Re-Tuning of the MP (CMP2)

10. The MP will need to be re-tested to ensure that it still performs reliably and robustly using the revised past catch and CPUE data, and then re-tuned to meet the Commission's management and re-building objectives using the revised data. (Further guidance from the Commission is still needed on these objectives, for the short and longer term.)

11. Whereas it is possible (although a substantial amount of work) to incorporate multiple alternative past catch and CPUE series into an updated OM, the MP itself (CMP2) uses a single "best estimate" series of past catches, and a single "best" CPUE index (currently the median of the five agreed series). Even if a number of alternative past catch and CPUE scenarios are integrated into the OM, it will still be necessary to decide on "best" past catch and CPUE series to use in the MP, and how to calculate these (e.g. the median of a number of agreed series, or the one considered most likely, if one can be identified).

E. Future Estimates of Catch and CPUE

12. Forward projections for the purpose of developing recommendations for initial catch cuts assume that catch values used in these projections will be effectively implemented. The MP process also assumes that recommended TACs are effectively implemented as recommended by the MP, or that any deviations from the recommended TAC (over- or under-catches) will be correctly estimated and incorporated into the "best estimate" catch series input into the MP. For resultant management recommendations to be effective, the Commission will either need to ensure that future catches are effectively monitored and reported, ***or*** will need to give the SAG/SC guidance on what future catch under-reporting levels, and associated CPUE, to use in making projections, or running the MP.

13. To start with, we need:
- An estimate of the catch in 2006 (the first year of the projections).
- Estimates of F for constant catch projections.
- To decide whether 2007 would be the first catch to set (i.e. this would be equivalent to the quota cuts in 2006 evaluated at the last SAG).