

To: Working Part on Temperate Tuna
From: Dr. Rishi Sharma, IOTC Stock Assessment Scientist
Date: 20th August, 2012.
Re: ASPIC Review

The analysis presented in the WP meetings is reasonable. The future projection analysis is good, and suggests a lowering of the current rate and harvest for stock resiliency. However, the following issues should be examined in more detail:

- 1) Issues on the CPUE indices are problematic as the model doesn't converge with either the Japanese or Taiwanese data separately. I am surprised that the Taiwan data is not converging either as the declining trend should help the model converge. Using the average is problematic as the indices are saying different things (Japan increasing, Taiwan staying stable or declining) so we could get an incorrect result when we average this as well as the catches by these sectors.
- 2) What were the values of M used in the analysis? Was a sensitivity run on this?
- 3) What were the values of Steepness used in the analysis? Was a sensitivity run on this?
- 4) A more thorough investigation on catchability and selectivity needs to be examined as we know that the fleet targeted certain catches in different durations.
- 5) Catchability is probably not constant over the entire time period, so what is the effect of this?
- 6) Similarly, selectivity is not the same over the entire time period so what is the effect of this. Both CPUE standardization papers presented in 2012, mention the fact that targeting occurred on other species and was the cause of decline, but no effort has been taken to use this in the assessment in either the catchability or selectivity parameters (Fournier and Archibald 1982).
- 7) A display of the actual parameter values and number of parameters used would be useful in the assessment.
- 8) In the future projections (Table 4, Figures 10 & 11), it is not entirely clear how F was projected. Was it fixed and projected, or was the catch fixed and then F calculated as a ratio. The choice has implications on management, and the former should be the correct way of doing the projections. Please address this issue.

If this approach is to be used, a more thorough investigation of the assumptions of M and its effect on the assessment should be made, as well as steepness. In addition, time varying catchability (or by periods) should be attempted as well as selectivity changes should be attempted. Finally the effect of weighting the different indices should be examined, and separately fitting to each index would be illustrative as well (Schnute and Richards 2001).

References

Fournier, D. and Archibald, C.P. 1982. A General Theory of Analyzing Catch at Age Data. *Can. J. Fish. Aquat. Sci.* **39**: 1195-1207.

Schnute, J. T. and L. J. Richards, 2001. Use and abuse of fishery models. *Can. J. Fish. Aquat. Sci.* **58**: 10–17.