Post-processing of data from the 2005 data exchange

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Abstract

This paper documents the data updates and changes to processing methods used by CSIRO to provide data for the 2005 data exchange. The data provided are used as inputs for the management procedures operating model and stock assessment models. We also document the collaborative work on identifying reasons for the differences in the NRIFSF and CSIRO calculations of the CPUE input file components.

Introduction

This paper documents the data updates and changes to processing methods used by CSIRO to provide data for the 2005 data exchange. More detail on data provided, and post-processing methods used, can be found in last year's data processing documentation (see Preece et al, 2004 (CCSBT-ESC/0409/27)) and papers that have been provided to the SAG, SC and trilateral meetings in the past.

In addition, to data provision, CSIRO was involved in examination of the differences in the CPUE input file creation by NRIFSF and CSIRO. CSIRO also provided advice to New Zealand on methods for substitution and raising of their size data, calculation of CAA and collation of the NZ joint venture component of the CPUE input file, because until recently CSIRO has provided these data to the CCSBT members.

Data provided by Australia for the 2005 data exchange

Data were provided by Australia for the 2005 data exchange by the Bureau Rural Resources (BRS) and CSIRO.

BRS provided the following items and details of the methods used to obtain these data are not discussed here: Total catch by Fleet, Mortality allowance usage for the East Coast PSAT Tagging Project, Catch and Effort, Raised catch data, and Raised Size Data.

CSIRO provided data for the following items:

1. CSIRO was asked to locate the agreed percentages for the mortality of the non-retained fish in 1995 and 1996 in the Japanese longline fishery. The agreed mortality rate was 23.53%. The details are recorded in the following papers: Preece et al, 2001 (CCSBT-SC/0108/21) and more detail in Polacheck et al, 1997 (CCSBT-SC/9707/20). The number of non-retained fish that were estimated to have died and were included in the CAA in previous years was calculated to be: 7061 in 1995 and 3761 in 1996.

2. Catch at age for the Australian domestic longline catch. The CAA by 5 x 5 x month for the years 2002, 2003 and 2004 were provided. Three years of CAA were calculated because the size data for these three years were updated this year. See appendix 1 of last year's data processing paper for details about ageing methods (Preece et al, 2004 (CCSBT-ESC/0409/27))

3. Catch-at-age for the Australia surface fishery by season (July-June). Data were provided for the seasons 2002-2004, ages 0-20, from cohort slicing (proportional ageing method - see CCSBT-ESC/0409/27).

4. CPUE input data. CSIRO provided the 3 input component files for the CPUE series calculations. The 3 components are: Australian Joint venture data (unchanged from previous years because there has been no Australian joint venture fishing), NZ joint venture data, and Japanese Longline data. Documentation of the methods used and details of investigations into the differences between the CSIRO and NRIFSF calculations are provided below.

5. CPUE series. Normalised Nominal and Laslett Core Area CPUE series (1969 to 2004) were provided.

6. Indonesian longline age and size composition. Length and age frequency by both calendar years and fishing seasons were provided. Length frequency was provided for 2003 and 2004 (calendar years) and the 2003/04 season. Length data for earlier years/seasons is unchanged. Age frequency, from direct ageing, was provided for the 1994/95 to 2003/04 seasons and for the 1997 to 2002 calendar years. The age frequency by season are slightly changed from last year for 2 reasons: 1) we have used catch date where this information is available rather than landing date which can be 2-4 w after catching. In the past we used landing date for all otoliths. This change means that a few fish belong to a different spawning season (66 fish out of approximately 4000). 2) In the 2001/02 season there are changes in ageing for some fish because of a bias in ageing detected between the primary and secondary otolith readers which has now been corrected (Farley and Davis, 2003 (CCSBT-ESC/0309/18)). See Farley and Davis 2005 (CCSBT-ESC/0509/16) for more detail.

7. Catch-at-Age for the Indonesia spawning ground fisheries. Catch at age data by season (July-June) for the seasons 2003 and 2004 from direct age data were provided. These data should be updated for all seasons (back to 1994/95) at next year's data exchange.

8. Aerial survey indices and CVs. The analysis was redone to include the 2005 data. The entire time series has been provided. See Bravington et al, 2005 (CCSBT-ESC/0509/22).

9. Tag releases, recoveries and reporting rates. Tag release and recovery data were updated. The definition of year/season for tag recoveries was altered at the 2004 SAG to be from November-October. Updated reporting rates were provided to the special MP meeting in Seattle in February 2005 (see Eveson and Polacheck, 2005 (CCSBT-MPTM/0502/05)).

10. Direct ageing data from the CSIRO Australian surface fishery otolith collection and the Indonesian otolith collection. Australia surface fishery otolith data were provided for 2001-2004 and data from the Indonesian collection for 1994-2004.

11. Mortality allowance (RMA) usage for the Taiwan/CSIRO collaborative global archival tagging.

Collaborative investigations into differences in CPUE input file calculations

Considerable effort was made to identify the possible causes of differences in the CSIRO and NRIFSF CPUE input files (the differences were in the Japanese longline component). To facilitate identifying differences, CSIRO changed their software to include ageing to 8 decimal places and providing figures to 6 decimal places (for the Japanese longline CPUE input component only). Ages 0-20+ were provided this year to assist the investigations.

Two main differences were identified that remain unresolved. 1) NRIFSF uses the start of the month and CSIRO uses the middle of the month for data that are aggregated by month. 2) Taking into account item 1 (middle of month or start of month), it appears that there is also a difference caused by the time-fraction of the year that is used in the proportional aging method.

For the Japanese longline data, which is aggregated by month, the CSIRO method uses the middle of the month to adjust cutpoints, and is calculated simply as the middle of the relevant month out of 12 months (i.e. a fish caught in May will have its cut-point adjusted by 4.5/12). The NRIFSF method which uses the start of the month, appears to be using something other than a simple calculation like 4/12 for the start of May. Manual checking of the ageing of 10 fish caught in May 1996 in square –30 155 (lat lon) indicate that the NRIFSF results would have used the fraction of the year of 4.23/12, which is around the 1st week of May rather than the start of May (4/12), to get the results in their file. This could be caused by a more complex method for calculating the time of the year. NRIFSF plans to investigate further. In addition we should discuss whether middle of month or start of month or some alternative should be used as the fraction of the year for proportional aging of these data.

For the Japanese longline component of the CPUE input file, the data used were data from the CCSBT database (provided in January) and the updated data for 2003 and 2004 also provided through CCSBT.

New Zealand CPUE input file component

The CSIRO preparation of the New Zealand CPUE input component was calculated using data from the CCSBT database for years 1989 – 2002 (CCSBT data provided in January). These data were aged in the same manner as last year (see CCSBT-ESC/0409/27).

The data provided for years 2003 and 2004 were aged using the cohort age method as in the previous years. The size data (NZ observer LF data for 2003-4.xls) was provided with actual date of catch which was used when ageing. The catch was raised using the larger of the total catches from either the observer size data or the raised catch data for each 5 x 5 x month strata (using the RAISED_SBT_CATCH table provided in NZRaisedCatches_2003_2004.mdb).

Summary and acknowledgements

Two items need to be resolved in the calculations of the Japanese longline CPUE input component. These are: 1) For data aggregated by month, should the start of month or middle of month be used in ageing? 2) How should the fraction of the year be calculated? Suggestions for these two items have been made by CSIRO.

Data provision from CSIRO was enhanced this year by the processes for data collation at the CCSBT. We extend our thanks to Bob Kennedy for this. Further progress was made in identifying differences in the CSIRO and NRIFSF CPUE inputs calculations thanks to Norio Takahashi. CSIRO data contributors are thanked for their timely provision of data.

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