

REPORT OF THE CCSBT CPUE Modelling Group Webinar (April 2012)

Dates and Timing

Seattle: Thursday 12 April, 4pm
Buenos Aires: Thursday 12 April, 8pm
London: Thursday 12/Friday 13 April, midnight
Cape Town: Friday 13 April, 1am
Jakarta Friday 13 April, 6am
Taipei: Friday 13 April, 7am
Seoul & Tokyo: Friday 13 April, 8am
Canberra/Hobart: Friday 13 April, 9am
Wellington: Friday 13 April, 11am

Attachments

Attachment 1: List of Participants (and initials used in text)
Attachment 2: Meeting Documents
Attachment 3 Links to documents etc.

Agenda items 1 and 2 (Introduction).

The Chair welcomed participants. The agenda and timetable for the meeting were agreed.

Agenda 3a: Were there changes in the early period of the LL fishery?

The Original motivation for this item was the concern that initial declines in the CPUE series might possibly be used as a basis to list SBT with CITES using the decline criteria. The consensus (provided by DB and BK) now seems to be that the assessment would provide the most informed description of decline and that therefore the initial decline in the CPUE series was a lesser priority than had previously been thought.

KS was not able to contact Talbot Murray about the early CPUE data in the last few days but would be happy to follow up if the group wished since he represents a lot of corporate memory in the SBT fishery! KS further pointed out that prior to 1970, the initial biomass (and therefore current stock status based on the initial biomass) is largely a function of the cumulative catch history. The model will produce a biomass that allows the assumed catch to be taken. Hence he did not think we should worry about CPUE changes 1969-72 although they were very dramatic.

Action: KS to contact Talbot Murray at his convenience.

It was asked what analyses (e.g. vessel effects) could be made of available data from this period. TI stated that there are logbook data in the early period. But its data quality is less than recent years. He noted that the vessel ID is included in original shot-by-shot data so it must be available but he was am not familiar with the original data for the earlier period. CD noted that we need to be mindful that vessel ID is really a surrogate for fishing master. Hence, we would also want to be able to have some information on

change in fishing master by vessel for this to be particularly helpful. JI noted that the historical decline, looked particularly bad with ST windows, the drop in early years was very severe and seemed inconsistent with expectations. He suspected this might suggest clumped up schools.

(In?)Action: It was agreed that while the initial decline was interesting and might repay study it was not currently a pressing problem.

Agenda 3b: Have there been changes to SBT catchability after 2006?

JP presented his paper CPUE2012_02. The data set used was originally analysed by RH and was the subject of a discussion by RH and DB. The motivation for CPUE2012_02 was to inform this discussion with the help of statistical modelling. The effort and catch-at-age data considered are by area, age and year. They were interpreted using a General Linear Model (along the lines of the approach of Shepherd and Nicholson) of this SBT CPUE-at-age data. This was used to investigate changes in catchability with area, age and time. Working with only catch at age per effort data enables a simpler (less black box) view of the data but the simplicity means that some restrictions exist as to what can be asked. JP noted that these problems of interpretation, (which are caused by aliasing between variables), may at times also affect full assessment models but this may be less apparent in more complex models.

JP noted various caveats to this work and possible additions that might be added to a revised paper he would prepare for the ESC. Additionally DB suggested that the large recent spike in recruitment might be due to a “last year effect” and that this could be checked by looking at retrospective patterns to see if a large recruitment in the most recent year was unique or common. JP noted that the error structure used “Ln normal)” was probably not correct and that other error structures might be considered. DB thought this probably not too critical but some possibility of variance increasing with age might be useful. : **CD noted that** currently aging is done by an age-length key and cohort slicing, but Aus. have on the work program to look at incorporating the Morton and Bravington method for length-age conversion, which would deal with the error structure issues. This however might take time.

MC would like to see comparisons of the CPUE as JP has analyzed it - by age and within areas with the CPUE models that we use with assumptions about empty cells, no considerations of age, etc. CD considered this a good point and thought it important to use exploratory methods that allow us to consider both catchability and age selectivity. Perhaps the important point here is to relate the results of this area by area study with the terms we get in our “standard assessment ANOVA model”.

JP noted that the Shepherd Nicholson model he had used assumed no changes had occurred in effort through time and thus the cumZ term in his equations was constant. If as we believe total mortality rate (Z) had declined with time then some of the apparent increase in catchability might result from this term.

Actions: It was agreed that the approach was interesting and that JP would revise his paper for the ESC along the lines suggested in the discussion. Others might also like to try analyzing this interesting data set. CD suggested that RH might wish to return to this problem using the bubble plot approach he had shown for ESC 2011.

Agenda 4a: Concentration Indices

TI had prepared paper CPUE2012_01 for this item. JP provided a brief description on the slide show. In particular the results shown in slide 14 indicated that effort and catch was if anything becoming more concentrated in areas 4, 8 and 9 but becoming less concentrated in areas 5, 6 and 7.

TI considered that the important need would be understanding the reason of such changes. JI suggested that if concentration is a problem, then it may inhibit reliability of CPUE. DB asked if CPUE is comparable through the recent period and thought it would be interesting to compare these concentration results with the year area effects found in the standard ANOVA. JP considered it would be very useful to understand what is driving these changes, for example could it be increasing amounts of by-catch causing the decline in concentration in areas 6 and 7. He asked if TI could perhaps talk to industry experts on trends in fishing practice by area. CD noted the changes in area 4 might result from this area being fished by few boats.

DB considered that some measure of the variance of the estimates (perhaps estimated by jack knife techniques) would be useful. This lead to a discussion of whether we should include sample size in our ANOVA approaches.

Actions: Members are asked to suggest to TI possible further analyses of his results. TI was asked to include these results and any additional analyses suggested by the discussion in his ESC paper.

Agenda 4b: Other causes of changes to CPUE

These had already largely been discussed under agenda 6. DB suggested that tagging results might be another source of information. JP questioned if there would be enough conventional tag returns from the LL fishery to be useful. CD noted that the electronic tagging report of Basson et al would be available to the ESC and was helpful in showing changes in behaviour etc.

Korea said they would be trying to standardise their CPUE and asked for help with this. (JP, TI and NT offered to help) (see also agenda 6).

Agenda 5a: Earlier CPUE models

NTs papers CPUE2012_Info01, CPUE2012_Info02, CPUE2012_Info03, and CPUE2012_Info04 and MC's papers CPUE2012_Info05 and CPUE2012_3 provided the background to the discussions of this agenda item. JP had provided some summary slides from these papers. He noted that there were considerable differences between ST-windows (Low) and Laslett (High) in the most recent years. He suspected that this might result because ST-windows is perhaps more like the variable squares approach while

Laslett it more like the constant squares approach since it extrapolates CPUE over an area to fill in gaps in observations. There was considerable discussion of this interpretation but a consensus emerged that this was a plausible reason for the differences.

DB noted that ST-windows and Laslett used different subsets of data and also different methodologies. He wondered if it would be possible to apply say Laslett's method to the area and times used by ST-windows. CD wondered if the conditioning of Laslett on historic data might perhaps now be causing problems. MC wondered if some of the original assumptions of Laslett would still hold up. JP asked if the areas used by ST-windows were perhaps those with the least increases seen in the ANOVA model.

Actions: NT to consider comparing year trends in CPUE in the ST-Windows areas with other areas-possibly by using the time*area interaction terms from the standard model. MC to consider developing a Laslett type index based only on the ST –windows times and areas to see if the difference with ST–windows result from data choice or methodology.

DB suggested (as a straw man) that we did not need to modify the existing ANOVA method. JP agreed and argued that ensuring the continuing adequacy of the ANOVA model for predicting trend in abundance was our key task. We needed to be continually checking this as carefully as we could. The discussion then moved to components of the ANOVA model. DB was concerned with knowing if some cells of the model are now supported with adequate observations. He wondered if the possibility of some (e.g. area $\frac{1}{4}$ effects) might be treated as random effects. JP noted that area $\frac{1}{4}$ effects represented our belief that fish migrated between areas. He was more concerned with year area effects though he noted that the electronic tagging results had shown that real changes in migratory behaviour do occur. NT noted that the old ANOVA model (on slide 18) used in B-ratio proxy (w0.8) and Geostat proxy (w0.5) method was somewhat different to the Standard ANOVA particularly with respect to the by-catch terms used in the later. DB suggested it would be wise to see how much the by-catch correction influenced results in recent years. JP noted that we had originally intended to compare the standard ANOVA model with other approaches to correcting for by-catch (E.g. the Pope method of using the proportion of zero hauls) and that this comparison should be made.

Actions: TI asked to provide to the ESC estimates of the influence of by-catch corrections on recent year's standard CPUE estimates. TI asked to provide to the ESC a comparative CPUE series based upon the Pope method of by-catch correction.

Agenda 6: Other potential analyses we might attempt for the ESC

The following additional topics were considered.

An ESC/1107/31 type paper:-

It was agreed that it would be helpful to have an updated version of TI's paper ESC/1107/31 at the 2012 ESC.

Action: TI agreed to do this and stated that he would submit an update of operational pattern change since 2006 to the ESC.

Research sets:-

The proposed working group on this topic had not yet occurred. The practicality and utility of groundfish survey like indices based upon research sets for SBT was discussed. One suggestion was that research sets might be conducted as a precursor to the fishing season while vessels were steaming to grounds.. This might provide a groundfish survey type index that would probably be variable but would be unbiased. Another suggestion was to test the Constant Squares Variable squares hypotheses by making research sets in recently unfished areas. It was considered that a design exercise needs to be undertaken to estimate what precision might result from a given commitment. CD noted that a similar design exercise was made for the Eastern Tuna fishery to see the tradeoff between numbers of sets and variance.

Action: Initially CD would circulate the report from the Eastern Tuna Fishery. DB, CD and TS would then consider the likely variance of such an exercise prior to the ESC.

Environmental covariates of CPUE:-

CD had no specific ideas but would make the large report Marinelle Basson is preparing of the electronic tagging work available to the ESC. This considers environmental effects.

JP noted that the yearclass was very autocorrelated and wondered if some environment signal (e.g. ENSO) might correlate with recruitment.

Action CD to make sure Basson report is available to ESC. Members are encouraged to look at potential environmental covariates for CPUE and recruitment.

Other countries CPUE data

JP noted that Indonesian CPUE from the spawning area could fill a difficult gap in our knowledge of trends in the spawning stock biomass of SBT but thought that possibly the close kin analysis would cover this need. CD suggested a request to Indonesia to provide a paper on the multispecies nature of their fishery.

Action: CD would initially make an informal request to Indonesia with follow up from BK/JP if needed.

DB noted that a study of the problems with the Taiwan CPUE series may well shed light on the by-catch problem.

Action: JP would discuss possible analysis with Taiwan.

ZGK informed the group that Korea planned to do CPUE standardization for the first time. He asked if anyone would be able to help with the work? JP, TI and NT agreed to help Korea.

Action: ZGK would provide a plan and time schedule to his collaborators. JP, TI and NT would provide support as needed.

AU, (MC) also available to provide support, if required, for the development of a CPUE index based on longline fishery data from vessels that have fished under the flag of Korea.

Other ideas:

None were proposed at this time.

AoB and Closure

There was no other business. The chair took the opportunity to stress that testing the continuing adequacy of our standard series was the main task of the working group. He looked forward to seeing new analyses along the lines discussed at this meeting. He thanked all the participants and particularly those members who had provided papers. The meeting closed at about 2am BST.

Attachment 1

List of Participants and initials used in text

(Participants that have shared a computer for the meeting are listed on the same line, with the first name being that of the name used for the shared computer in the transcript)

Advisory Panel (3)

John Pope (Chair) JP

Jim Ianelli (main presenter) JI

Ana Parma

Australia (4)

Mark Chambers (MC), Ilona Stobutzki

Campbell Davies (CD), Ann Preece

Additionally Richard Hillary (RH) is mentioned in discussion.

Japan (4)

Tomoyuki Itoh (TI), Osamu Sakai

Hiroyuki Kurota

Norio Takahashi (NT)

Doug Butterworth (DB)

Korea (2)

Zang Geun Kim (ZGK), Sung Il Lee

Secretariat (4)

Simon Morgan (alternate presenter), Robert Kennedy (BK), Shinichi Suzuki, Susie

Iball

New Zealand

Kevin Sullivan (KS) contributed to the discussions by email

Meeting Documents

Document Number	Submitted by	Title
CPUE2012_01	Tomoyuki Itoh	CPUE analysis in intersessional period
CPUE2012_02	John Pope	Using General Linear Models of SBT CPUE-at-age data to investigate changes in catchability with age and time
CPUE2012_03	Mark Chambers	Background to the Laslett Core Area CPUE Index
CPUE2012_Info01	Norio Takahashi	Brief descriptions of VS, CS, and ST windows abundance indices
CPUE2012_Info02	Norio Takahashi	Data and Method used to Calculate B-ratio Proxy (w0.5) and Geostat Proxy (w0.8) CPUE Series
CPUE2012_Info03	Norio Takahashi	Future Use of “ST windows” index calculated by a new method: A proposal
CPUE2012_Info04	Norio Takahashi	Some consideration on Japanese longline CPUE as a potential input to management procedures
CPUE2012_Info05	Mark Chambers	Exploratory analysis of the SBT CPUE data using smoothing splines

Links to other material

The Chair's facilitation Powerpoint presentation, with modifications made by Jim during the meeting in response to discussion.

The informal record of text comments.

The video of the meeting with verbal comments are all available on the private area of the CCSBT web site.

The following free download "VLC" is useful for viewing the video of the web-meeting:
<http://www.videolan.org/vlc/download-windows.html>