Commission for the Conservation of
Southern Bluefin Tuna

みなみまぐろ保存委員会

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Catch Calculations for the Management Procedure
管理手続きのための漁獲量計算

Purpose
目的

To document the method to be used to calculate the catch for the CCSBT management procedure.
CCSBT 管理手続きに使用する漁獲量計算方法を文書化する。

Background
背景

The catch calculation method for historic data used by the management procedure (MP) will be the same as the method used to calculate total catch inputs for the operating model. This paper documents that method.
管理手続きに使用された歴史的データの計算方法とオペレーティングモデルに入力される総漁獲量を計算する方法は同じものになるであろう。このペーパーはこの方法について文書化している。

This paper does not document the following aspects of the catch calculation procedure, which require further discussion:
このペーパーは、以下のさらに議論を要する漁獲量の計算手続きについては文書化していない。

- Whether revisions to historic catch data[1] should be used by the MP, or whether the MP should use the same historic series as that used during MP testing.
  修正された歴史的漁獲データを MP に使用するべきか、又は MP が MP 試験中に使用していたものと同じ歴史的データを使用するべきか。
- What "catch" would be used in different parts of the MP calculations for the years after the MP was implemented (e.g. real catch, MP recommended TAC, adopted TAC). However, where the "real" catch is to be used, it will be calculated in the same manner as specified in this paper.
  MP 実施後の数年間における MP 計算に使用する " 漁獲量 " は何か（例、本当の漁獲、MP の推薦する TAC、合意された TAC）。" 本当の漁獲 " を使用する場合は、このペーパーで指定する方法と同じ方法で計算されるであろう。
- Whether there should be a change in the way the Taiwanese catch is split amongst the LL1 and LL2 fisheries. At present the split is between the target and non-target SBT fisheries using a catch tonnage rule defined by Taiwan.
  LL1 と LL2 に分かれている台湾の漁獲を変更するかどうか。現時点では、台湾によって決められている対象及び非対象漁獲量によって分割されている。

[1] "Historic data" in this context refers to the time series of historic data used during the MP testing process.
ここで言う " 歴史的データ " とは MP 試験中に使用した時系列の歴史的データである。

- Whether mortalities associated with Japan's retained catch for 1995 and 1996 (as provided in the 2005 data exchange) should be included in the catch calculations. At present, these are not included.
  1995 年と 1996 年における日本の保有しているデータの内の死亡量（投棄魚の死亡量）を漁獲計算に含めるかどうか。現時点ではこれらは含まれていない。

The method used to calculate the catch for the operating model was originally agreed at MPWS1. Some fine tuning and clarification of the methods was conducted through intersessional discussion after MPWS1 and a further change in the calculation method was agreed at MPWS2 (re-calculating all inputs to weights).
オペレーティングモデル用の漁獲計算法は第１回 MP ワークショップで合意された。幾つかの細かいチューニング及び計算が第１回 MP ワークショップの後の閉会期間中に実施され、第２回 MP ワークショップにおいてさらなる計算方法の変更が合意された。

The catch calculation method for each fishery is described at Attachment 1. Some changes are recommended in the catch calculation methods used for LL1, but this would not be implemented by the Secretariat unless agreed at the meeting. To avoid complications with changed data, it might be best to defer implementation of this recommendation until the date of the first review of the adopted MP.
各漁業種類における漁獲量計算方法を別紙１に示す。LL1 に使用する計算方法において幾つかの変更を推薦するが、その実施には今会合の合意が必要である。変更に伴う混乱を避けるため、採用された MP をレビューするまでこの変更の実施を延期することが一番いいことかもしれない。

Prepared by the Secretariat
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Table 1: Fishery specific MP catch calculation methods:

All data is converted to a "fishing season" time scale as defined at MPWS1. The season for each fishery is specified in the table below. The "year" is considered to be the year in which the season ended. Therefore, the season Jan 2004-Dec 2004 and Jun 2003-Jul 2004 are both referred to as 2004.

MP Fishery	Components	Fishing Season	Description of calculation method
Australian Surface	Australian surface	Jul-Jun	This is the catch weights for the surface fishery provided by Australia and no further calculations are required. Up to 2002 (i.e. before to July 2002) this is obtained from data that Australia prepared specifically for this purpose[2]. From 2003 (i.e. from July 2002), this is obtain from raised catch data (for gear codes of 'PS', 'BB', or 'SURF') provided by Australia for the annual data exchange[3]
LL1	• Japanese longline (excluding areas 1 & 2) • Australian domestic longline & joint venture • New Zealand charter & domestic • Taiwan targeted longline • Korea • Philippines • Miscellaneous flags	Jan-Dec	These data are first produced in numbers, and then (according to the agreement at MPWS2) are converted to weights. The number of fish for each of the LL1 fishery components is obtained/calculated as follows: • Japan: the number of fish is obtained from the number of fish retained from Japan's raised catch effort data for its commercial and research fishing in all areas except areas 1 and 2. Prior to 1965, this is obtained from data that Japan specifically provided for this purpose[2] and from 1965, this is available from the data provided by Japan for the annual data exchange. • Australia: Prior to 2002, this is obtained from data that Australia prepared specifically for this purpose[2]. From 2002, this is obtained from raised catch data provided by Australia for the annual data exchange[3] (excluding gear codes of 'PS', 'BB', and 'SURF'). • New Zealand: The number of fish is obtained from the raised catch data for New Zealand[3]. The raised catch data for New Zealand is prepared by the Secretariat. The methods used to produce the raised data are described in the documentation provided with the CCSBT Data CD. • Taiwan: The number of fish is obtained from the number of fish that Taiwan continues to provide specifically for this purpose, which is the SBT targeted component of Taiwan's longline catch[4]. • Korea: The number of fish for Korea is calculated by dividing Korea's annual catch in weight[5] by the average weight for Japan's commercial catch in areas 8 and 9 of the same year. The average weight for Japan's commercial catch is determined by using the raised length data for the commercial fleet and applying the equation: W=1.15*0.000002942*L^3.3438 to the mid-point of 2cm length classes (i.e. all length data is first converted to 2cm classes). • Philippines: Where the number of fish caught was not reported (1996-1999 and 2002), the number of fish is calculated from the annual catch weight for the Philippines reported in the global catch table in the same manner as described above for Korea. In other cases the number of fish reported by the Philippines is used[3]. • Miscellaneous: The number of fish for the catch of miscellaneous flags is calculated from the annual catch weight of miscellaneous flags reported in the global catch table. The calculation is conducted in the same manner as described above for

[2] This data is stored in the "MP_OM_STATIC_CATCH_DATA" table that will be provided with future releases of the CCSBT Data CD.
[3] This data is stored in the "RAISED_SBT_CATCH" table that is provided with the CCSBT Data CD.
[4] This data is stored in the "MP_OM_TW_LL1LL2_SPLIT" table that will be provided with future releases of the CCSBT Data CD.
[5] As reported in the global catch table, except for 1993, 1994, and 1998 for which the higher Japanese import statistics reported in the footnote of the global catch table are used.

MP Fishery	Components	Fishing Season	Description of calculation method
			Korea. Once the numbers of fish have been obtained, the total weight of fish for LL1 is calculated by applying the above equation (W=1.15*0.000002942*L^3.3438) to the total catch at length for LL1[6]. <u>*Suggested change in the calculation method*</u> *For all the LL1 fishery components except Japan and Australia (prior to 2002), the necessary catch weight data is provided by the relevant country/fishing entity so the weight data (when available) should be used directly instead of converting numbers to weights (which in some cases requires that weights first be converted to numbers!). If this suggestion were adopted, the numbers data would still be calculated for the purpose of producing the proportions at length for LL1 (required by the OM, not the MP). In calculating the Korean numbers for this purpose, it would be sensible to use the average weights per strata from Korea's catch effort data to convert the raised Korean weights to numbers rather than using Japan's catch at size data (which is the current process).*
LL2	• Taiwan gillnet • Taiwan LL bycatch	Jan-Dec	The weight of fish for each of the LL2 fishery components is obtained as follows: • Gillnet: The weight of fish is as per the global catch by gear table. • Longline bycatch: The weight of fish from 1994 is obtained from the weight of fish that Taiwan continues to provide specifically for this purpose, which is the SBT bycatch component of Taiwan's longline catch[7]. Prior to 1994, this is the entire longline component of Taiwan's catch.
LL3	• Japanese LL in area 2	Jul-Jun	The number of fish is obtained from the number of fish retained in Japan's raised catch effort data for its commercial and research fishing in area 2. Prior to 1966 (i.e. before to July 1965), this is obtained from data that Japan specifically provided for this purpose[2] and from 1966 (i.e from July 1965), this is available from the data provided by Japan for the annual data exchange. The conversion to weights is achieved by applying the equations: • <=130cm: W=0.000015577*L^3.0214; • >130cm: W= 1.15*0.00000018241*L^ 3.9056. to Japan's catch at length for area 2[8].
LL4	• Japanese LL in area 1	Jul-Jun	For Japan, the number of fish is obtained from the number of fish retained in Japan's raised catch effort data for its commercial and

[6] The total catch at length of LL1 can be obtained from the "MP_OM_CALCULATED_CATCH_AT_LENGTH" table that will be provided with future releases of the CCSBT Data CD. The catch at length for each LL1 fishery component is calculated from catch at length data provided by members for their fishery components (with re-scaling to total catches where necessary and using both commercial and research length data for Japan). In cases where catch at length data is not available (Taiwan before 2001, Korea, Philippines and Miscellaneous), the catch at length distribution for Japan in areas 8 and 9 (both commercial and research data) is used as a substitute with re-scaling of the distribution to the catch of these components.
[7] This data is stored in the "MP_OM_TW_LL1LL2_SPLIT" table that will be provided with future releases of the CCSBT Data CD.
[8] Using only the commercial catch at length data.

MP Fishery	Components	Fishing Season	Description of calculation method
	• Indonesian LL		research fishing in area 1. The weight is then obtained by applying the same equations as specified above for LL3 to Japan's raised catch at length for area 1[9]. Prior to 1966 (i.e. before to July 1965), this is obtained from data that Japan specifically provided for this purpose[2] and from 1966 (i.e from July 1965), this is available from the data provided by Japan for the annual data exchange. For Indonesia, the weights prior to 1994 (i.e. to June 1993) are obtained from data that Australia specifically provided for this purpose[2]. From 1994 (i.e. from July 1993), the weights are obtained from monthly weight estimates of the Indonesian catch[10].

[9] Using only the commercial catch at length data, except for 2004 where there is no commercial catch at length data, so the research catch at length is used instead.
[10] These estimates come from CSIRO to the end of 2002 and from IOTC from January 2003 and onwards and the information is available from the "RAISED_SBT_CATCH" table that is provided with the CCSBT Data CD.