



**REPORT OF THE 15th MEETING OF THE
SCIENTIFIC COMMITTEE**

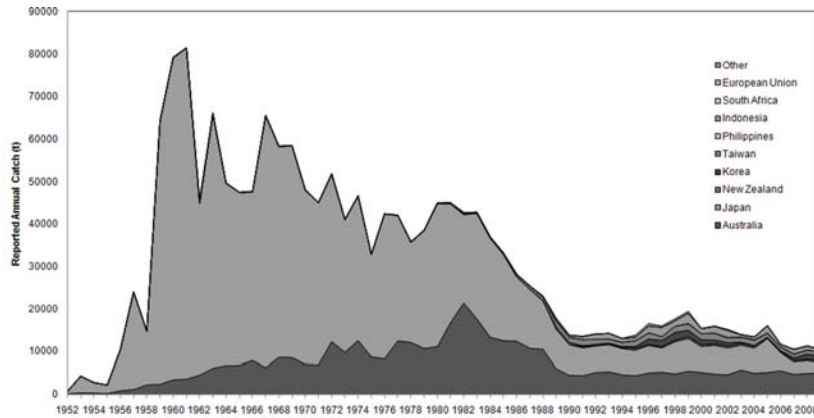
Taipei, 4 - 9 Sep 2010



**Review of SBT Fisheries and
Fisheries Indicators**



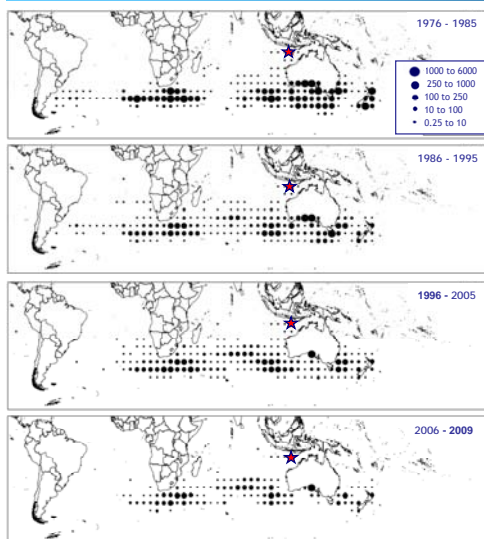
Catches from 1952 to 2009



Reported southern bluefin tuna catches by flag, 1952 to 2009



SBT Catch Distribution Range



Geographical distribution of average annual southern bluefin tuna catches (t) by CCSBT members and cooperating non-members over the periods 1976-1985, 1986-1995, 1996-2005 and 2006-2009 per 5° block by oceanic region. The area marked with a star is an area of significant catch in the breeding ground. Block catches averaging less than 0.25 tons per year are not shown. Note: This figure may be affected by past anomalies in catch.



Trends in juvenile abundance

Aerial Surveys in the Great Australian Bight (GAB)

- The updated estimate of the 2010 scientific aerial survey was above the 2005-10 average. However, this survey fluctuated with no clear trend over 2005-10
- The 2010 estimate of the commercial spotting (SAPUE) index was above the median of the 2002-09 average

Trolling Index in Western Australia

- The 2010 trolling index was below the 2006-09 survey average



Trends in juvenile abundance

Japanese longline CPUE

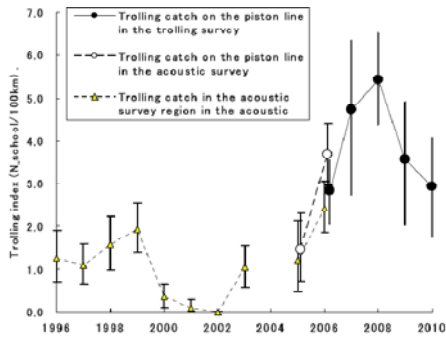
- The level of longline CPUE for age 3 in 2009 was slightly higher than the 2005-09 average

Year class strengths from trolling surveys

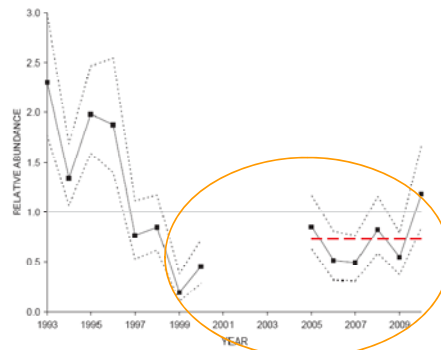
- The trolling indices for the 2005-09 year classes are higher than for the 1999-2002 year classes



Recruitment Indicators



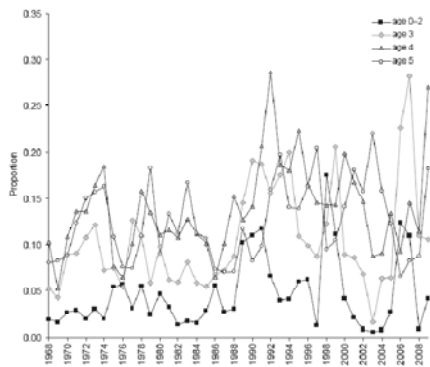
Trends of trolling catch index of age 1 SBT in the Western Australia.



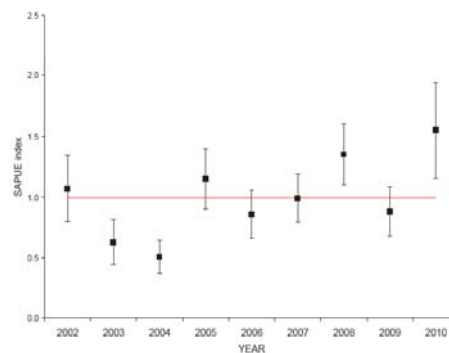
Aerial survey index of relative abundance of juvenile SBT in the Great Australian Bight, Jan to Mar (2010 value represents the 2009-10 fishing season, etc). Dotted lines are 90% confidence intervals. Dashed horizontal line represents the average 2005-09 median value



Recruitment Indicators



Size composition (proportion of total catch) of juvenile SBT caught by Japanese longliners in statistical areas 4-9, months 4-9, where age 0-2<86 cm, 86 cm<age 3<102 cm, 102 cm<age 4<114 cm, 114 cm<age 5<126 cm.



SAPUE index of relative surface abundance of juvenile SBT in the Great Australian Bight, Dec-Mar.



Trends in age 4+ SBT

Overall trends

- Indicators of age 4+ SBT exhibited some upward trends

New Zealand fishery

- CPUE in the domestic fishery increased in 2009 compared with 2008
- CPUE in area 5 for the charter fishery increased in 2009 compared to 2007
- CPUE in area 6 for the charter fishery declined slightly in 2009 from 2008
- Proportion of age 5 SBT increased in both fisheries



Trends in age 4+ SBT

Indonesian spawning ground fishery

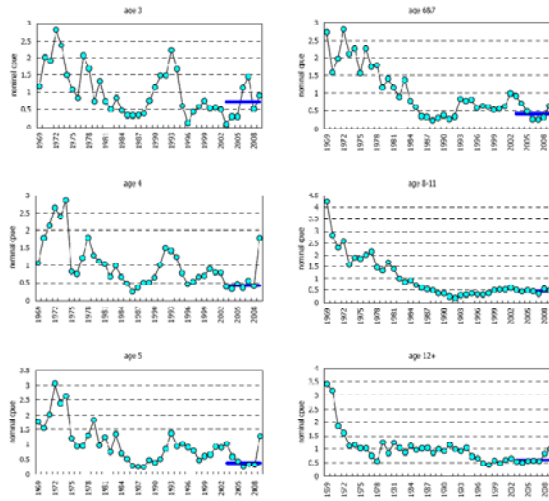
- Median size of SBT caught increased in 2009 from 2008, but decreased in 2010
- Median age of SBT caught increased in 2009 from 2008

Japanese longline fishery

- Standardised CPUE for age classes 4, 5, 6 & 7, 8-11, and 12+ all showed increasing trends in 2007-09, and 2009 index levels were above the 2005-09 average



Spawning Biomass Indicators



Nominal CPUE of Japanese longline fishery by cohorts for age 3,4, and 5, 6&7, 8-11, and 12+.



Assessment of Stock Status



Status of the SBT Stock

- The 2009 ESC meeting reported the status of the SBT stock in 2009 based on the Operating Model (OM)
- “The base case OM and six plausible scenarios all indicated that the spawning stock biomass (SSB) remained at a very low level - typically about 5% or less of SSB_0
- Recruitments during the last two decades were estimated to be well below the levels over 1950-1980
- Recruitments in the 1990s fluctuated at a low level without any overall trend, but recruitments for 2000 to 2002 were poor



Status of the SBT Stock

- The 2003 & 2004 year classes were somewhat stronger, though still below the average level in the 1990s
- Recruitment since 2005 cannot be estimated precisely as yet
- The 2009 ESC recommended a reduction to the TAC to rebuild spawning stock and reduce short term risk of further poor recruitment”
- Based on this recommendation the EC reduced the average annual catch for 2010-2011 by 20% to 9449 t



Status of the SBT Stock

- The 2010 ESC advice on stock status remains unchanged since 2009, i.e. the current spawning stock biomass is very low
- However, since the 2009 assessment there have been several positive signals about the stock, including
 - A reduction in the total reported global catch
 - Confirmation of increases in longline CPUE since 2007
 - Increased scientific aerial survey and SAPUE indices (reflective of potentially improved recruitment in recent years)



Management Advice



2010 Management Recommendations

- If the Management Procedure (MP) is implemented in 2011 with a 1-year lag, the ESC recommends that the current TAC of 9449 t remain for 2012
- If the MP is implemented in 2011 with no lag, the ESC recommends that the MP guide the TAC setting for 2012
- Noting the EC's intent to adopt an MP at its 2010 annual meeting, The ESC recommends that the EC takes steps to ensure accurate future catch and effort reporting



Management Procedure
Development



MP Performance Criteria

Desirable features of an MP are:

- Protect against further reduction of spawning stock in the short and long term
- Keep short-term TAC fluctuations small
- Respond by increasing TACs in the longer term if the stock rebuilds strongly



Evaluation of candidate MPs

- The nine candidate MPs were tuned to six different tuning levels requested at SFMWG2 in April 2010
- Tuning options were defined in terms of the probability of achieving an intermediate rebuilding target = 20% of SSB_0 in 25 or 30 years
- The relative performance of the candidate MPs was also reported against two short-term check points:
 - probability of rebuilding to 10% of SSB_0
 - probability of rebuilding to twice SSB_{2009}



Evaluation of candidate MPs

Tuning option	Tuning Year	$P(SSB_{2035} \geq 0.2 SSB_0)$	Short-term check-point year
1	2035	60%	2022
2	2035	70%	2022
3	2035	90%	2022
4	2040	60%	2025
5	2040	70%	2025
6	2040	90%	2025



Evaluation of candidate MPs

The SFMWG requested MP testing under the following schedule of TAC changes and lags

- First TAC in 2012, then every three years with no lag
- First TAC in 2013, then every three years with one-year lag



Evaluation of candidate MPs

- MPs were compared in terms of the trade-off in the likelihood and magnitude of the reduction of catch (often described as “early pain”), and the risk to the biomass in the short to medium term (often described as “risk”)
- It was agreed that performance be judged initially based on the results of the two pessimistic robustness tests



Evaluation of candidate MPs

- One robustness test chosen was a low recruitment scenario, because this scenario has been seen in the past, and because we are currently at very low biomass levels
- The robustness tests were used to compare MP performance in relation to the risk of reaching low biomass levels
- Comparisons were made using tuning level 5 (which showed more contrast in results), and then checked by examining performance at tuning level 2 (which is more risk averse)



Finalize MP recommendation

- The results for the recommended MPs are provided to the EC for each of the six tuning levels. Performance relative to the SFMWG requested checkpoints are also provided
- The ESC recommends three candidate MPs for consideration at CCSBT 17
- The recommended MPs were selected by comparing the trade-off in catch, and the risk to the biomass in the short to medium term



Finalize MP recommendation

The ESC selected two MPs, which cover two types of performance in terms of reactivity to input data signals:

- 1) a more “reactive” MP, which has on average lower catches in the short term, a lower risk to biomass in the short term, and higher catches in the longer term
- 2) a less “reactive” MP which has higher average catches in the short term, and a higher risk to biomass in the short term



Finalize MP recommendation

- The two MPs were different in terms of model structure; one is a model based MP that uses a target for CPUE and aerial survey to set the TAC, the other is an empirical MP that uses trend in CPUE and aerial survey target to set the TAC
- To show intermediate behaviour between these two MPs a combined procedure was tested, that uses both MPs to produce a TAC. The Commission could use any weighting to combine the two MPs and a 50% weighting for each MP was evaluated in the meeting



Finalize MP recommendation

- The results provided here are for a 1-year lag in implementation of the TAC, which was one option requested at the SFMWG2
- Results for MPs without the lag have not been provided here
- The difference between the two cases has been evaluated and there is only a very small effect for the reference set.
- If the Commission decides that there should not be an implementation lag, the two MPs can be retuned inter-sessionally (using the existing operating model and data) to provide the final MP parameters in 2011



Finalize MP recommendation

- The ESC agreed that MPs should not allow an increase in the catch during the first time period in which the procedure is applied
- The rationale was that:
 - the stock is at or near a historical low level
 - the recent improvement in stock status indicators need to be confirmed by a continuation of the positive trend into the future
 - the most recent estimate of fishing mortality is high compared to the level associated with MSY

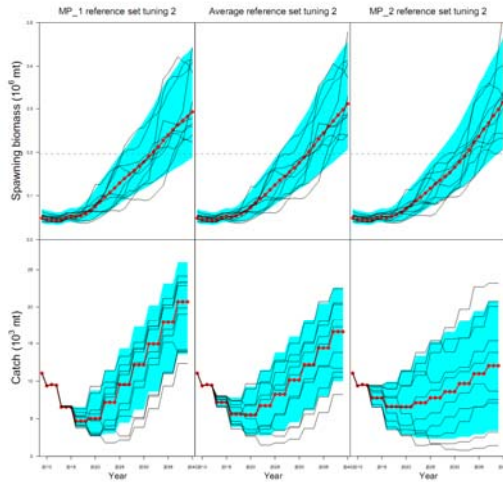


Finalize MP recommendation

- Thus, a TAC constraint ($TAC_{2012-2013} \leq \text{Current TAC}$) was incorporated into all of the MP options recommended to the Commission
- Results are presented for all tuning levels in the ESC report but more detail is provided for tuning levels 5 (70% probability of 0.2 SSB0 by 2040) and 2 (70% probability of 0.2SSB0 by 2035)
- The MPs that have been selected have been named MP1 and MP2, and the combined case based on 50% weighting of these two MPs is called “Average MP”



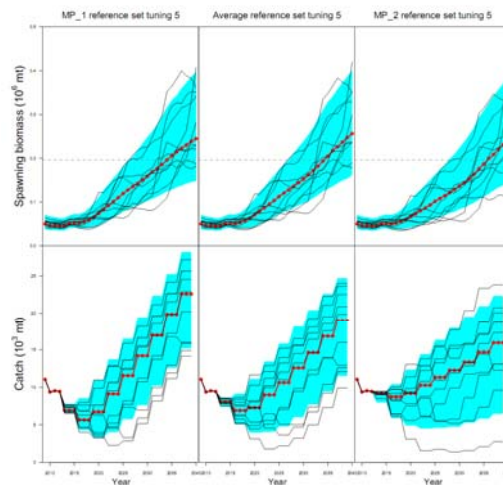
Finalize MP recommendation



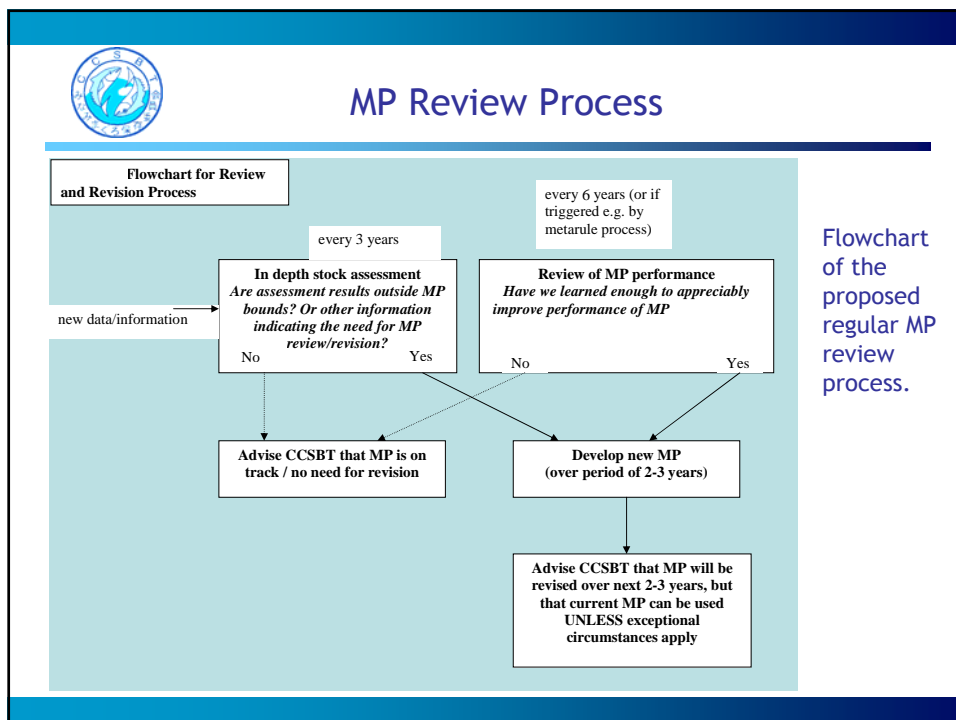
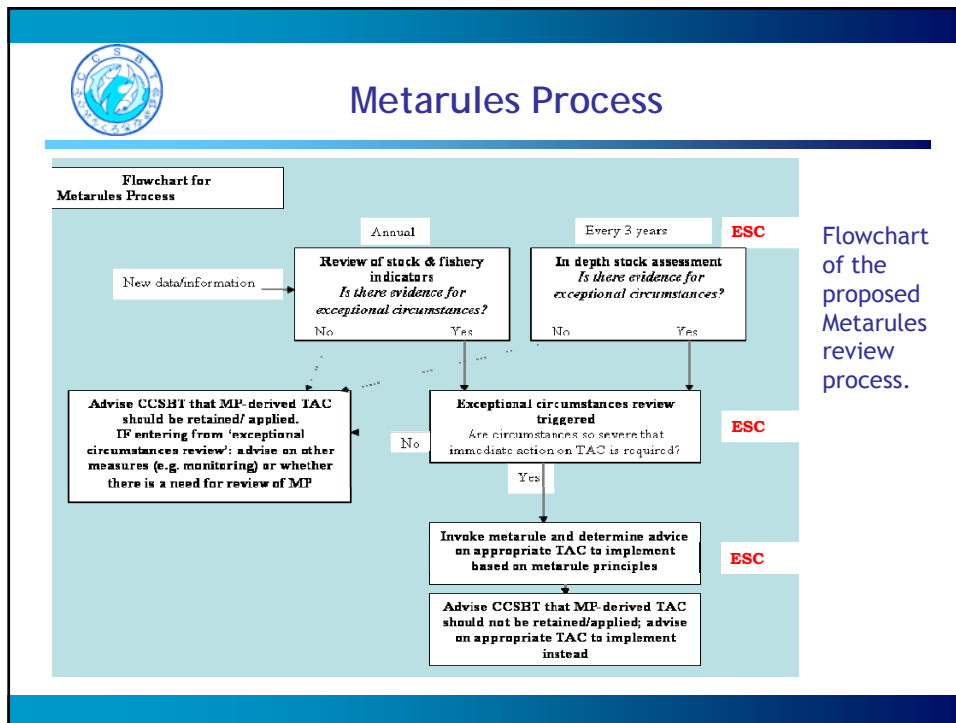
Projected spawning biomass (top row) and catch (bottom row) by MP (columns) for the reference set and **tuning option 2** (70% probability of $0.2SSB_0$ by 2035). The shaded regions represent range between the 10th and 90th percentile of the 2000 simulations and the individual lines represent a sample of the different realizations. The thick bulleted line represents the median from the simulations. The dashed line reflects the median estimate of $0.2SSB_0$.



Finalize MP recommendation



Projected spawning biomass (top row) and catch (bottom row) by MP (columns) for the reference set and **tuning option 5** (70% probability of $0.2SSB_0$ by 2040). The shaded regions represent range between the 10th and 90th percentile of the 2000 simulations and the individual lines represent a sample of the different realizations. The thick bulleted line represents the median from the simulations. The dashed line reflects the median estimate of $0.2SSB_0$.





Review of the 2010 Work Schedule



ESC Workplan for 2011

The proposed workplan has the following elements:

- Continuation of tag recovery efforts, excluding freezer vessels
- Hold a small technical meeting in July 2011 to (1) update the stock assessment; (2) evaluate MSY and surplus production with a rebuilt stock; (3) evaluate new models and procedures; (4) consider new data inputs; (5) run the MP and evaluate projections
- Hold an ESC meeting to evaluate the results from the small technical meeting



2010 -11 Proposed Workplan

Activity	Approximate Period	Resources or approximate budgetary implications
Continuation of tag recovery efforts.	Tag recovery is continuous.	\$27,470 for tag recovery as per draft budget in Attachment E of CCSBT-ESC/1009/05.
Provide SBT Stock Status report to the other tuna RFMOs.	Sep-Nov 10	N/A
Update and verify OM & MP code	Oct-Dec 10	Australia [FG] leading, with advisory input from Australia [RH], Japan [HK] and the MP coordinator
Special Data Exchange to implement usage of the new growth curve	Sep 10 - Jan 11	N/A
Evaluation of re-calculated data based on the new growth curve	Feb - Mar	N/A
Standard Scientific Data Exchange.	Apr - Jul	N/A
Update OM with latest data	Early July (preliminary aerial survey index not available till late June)	Allocate 3 days for MP development work by MP Coordinator during 2011 (not just this update)

¹ These preliminary estimates will be refined in the proposed budget for 2011 that the Secretariat will submit to the Extended Commission



2010 -11 Proposed Workplan (continued)

Activity	Approximate Period	Resources or approximate budgetary implications
Provision of CPUE monitoring series (as specified in the report of the CPUE modelling group)	Jun - Jul	Australia and Japan
Evaluation of trends in CPUE series and interpretation of CPUE results to identify any potential difficulties.	Jun - Jul	Members and JP [allocate 1 day in case results indicate web meeting required]
Intersessional small technical meeting to: <ul style="list-style-type: none"> •Update stock assessment & evaluate stock status with respect to reference points (MSY & spawning biomass per recruit), •Evaluation of new alternative models & procedures, •Consider new abundance estimates (e.g. Close Kin) and ways to incorporate new discard information, •Run MP and evaluate projections, •Discussion of CPUE series evaluation. 	5 days, mid July, Seattle.	1 interpreter; no Secretariat; 15 panel days (AP, JI, JP), 5 consultant days (TB), plus associated expenses and travel days.
Extended Scientific Committee for the 16 th meeting of the Scientific Committee meeting.	7 days (could be less depending on Seattle outcome), Sep 4-10, Bali.	ESC Chair, full panel including consultant, full interpretation and Secretariat involvement.

¹ These preliminary estimates will be refined in the proposed budget for 2011 that the Secretariat will submit to the Extended Commission



END

