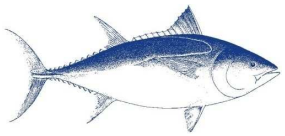
REPORT OF THE 22nd MEETING OF THE SCIENTIFIC COMMITTEE

Yogyakarta, Indonesia 28 Aug - 2 Sep 2017

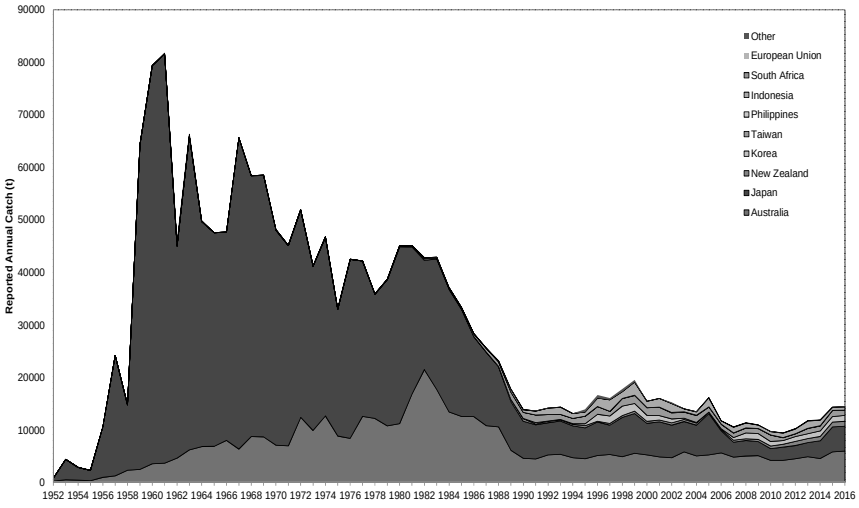


Main topics

- Review of SBT fisheries and fisheries indicators
- Results of Scientific Research Programme
- Stock assessment including Close Kin estimates
- Evaluation of exceptional circumstances
- SBT stock status and management advice
- Development of new MP
- Update of Scientific Workplan

Review of SBT Fisheries and Fisheries Indicators

Reported SBT Global Catches 1952 – 2016



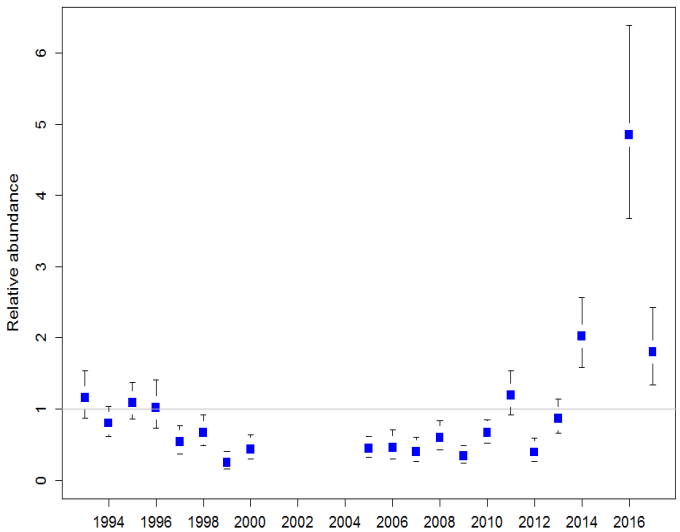
Reported southern bluefin tuna catches by flag, 1952 to 2016

Indicators

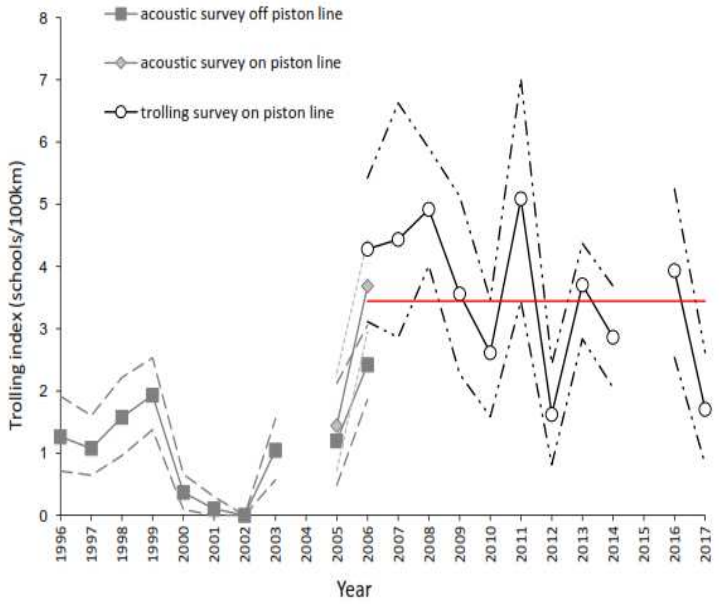
Juvenile indices in the GAB

- Both indicators of juvenile (ages 1-4) abundance (Aerial survey (AS) and trolling) indices decreased in 2017
- 2016 AS index highest on record and 2017 index higher than average
- 2016 trolling survey index below 2006 – 2016 average
- Indicators of age 4+ SBT CPUE for NZ domestic LL fishery increased in 2016

Aerial Survey Indicators



Trolling Survey Indicators

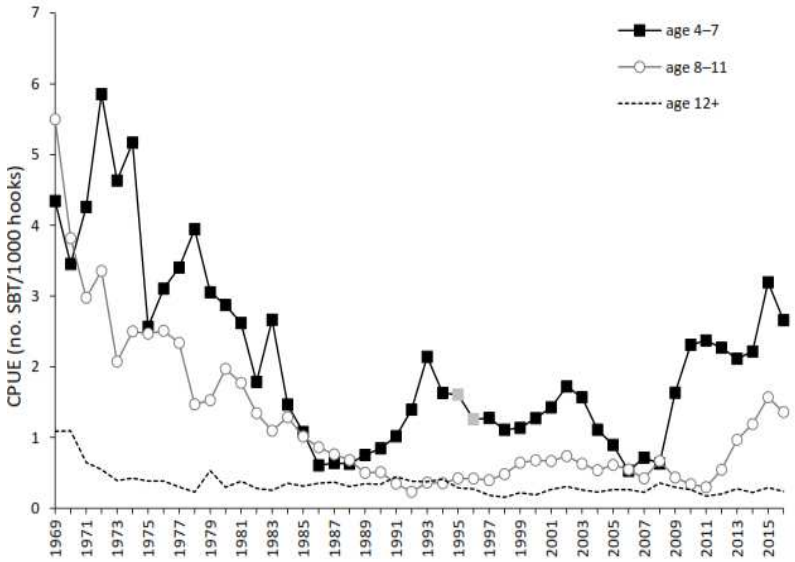


CPUE Indicators

Longline CPUE

- Longline CPUE indices for the Japanese fleet for age 4 to 7 are well above the historically lowest levels in the late 1980s or mid-2000s
- CPUE index for ages 8 – 11 has increased since 2011
- Index for age 12+ has fluctuated at a low level
- Taiwanese CPUE has shown different trends in different geographical areas
- Korean CPUE has increased over recent years

Age 4+Japanese CPUE

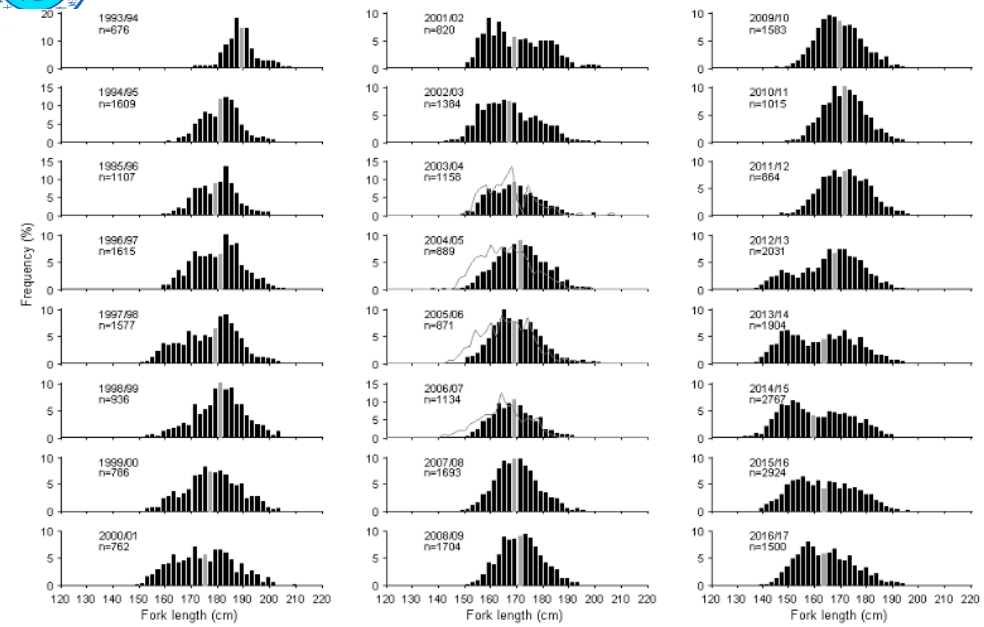


Lengths on the spawning ground

Indonesian length frequencies

- Monitoring of length and age of Indonesian catches on the spawning ground indicate a substantial increase in the frequency of smaller size and younger age classes since 2012
- Information indicates that the unusually small size classes may have been caught away from the spawning ground (areas 2 and 8) and that, if this is the case, these fish be excluded from the monitoring series
- Once this is resolved the spawning ground indicator related to mean estimated age can be reconsidered

Lengths on the spawning ground



Length frequency of SBT caught on the spawning ground by spawning season

Summary of indicators

- There are signs of higher recruitment in recent years
- There are consistent positive trends in longline CPUE
- There are suggestions that relatively strong cohorts are moving through the fishery, although these have not yet contributed to the spawning stock
- ESC noted that increased recruitment is of itself not necessarily indicative of increased spawning stock biomass

Scientific Research Programme

Scientific Research Programme

Gene tagging estimates of juvenile abundance

- A pilot gene tagging programme was conducted during 2016 and 2017
- This programme is on track to produce estimates of 2 year old SBT to replace the AS results beginning in 2018 for incorporation into the new MP

Close-kin genetic estimates of adult abundance

- Close-kin genetic sampling to estimate absolute abundance of adults continued during 2016-17
- Estimates have been included in the stock assessment model and a stand-alone CKMR model will be ready for ESC23

Scientific Research Programme

Farm and Market analyses

- A Small WG was formed to progress dealing with uncertainties associated with the methods used to (1) estimate growth and catch sampling in SBT farming operations and (2) the Japan Markets analyses
- The SWG agreed to continue informal dialogue between members intersessionally
- Members were encouraged by the progress made by the SWG and its consensus building approach

Stock assessment including Close-Kin estimates

Stock assessment incl CK estimates

- The 2017 stock assessment incorporates for the first time the new Half Sibling Pair (HSP) data from the Close Kin Mark-Recapture (CKMR) work and additional Parent Offspring Pair (POP) data that extends the existing POP data used previously
- The ESC agreed to use a new measure of the reproductive population called the Total Reproductive Output (TRO)
- TRO is defined as the total reproductive output of the adult population, reflecting not only fecundity, but also frequency of spawning and spawning success

Stock assessment incl CK estimates

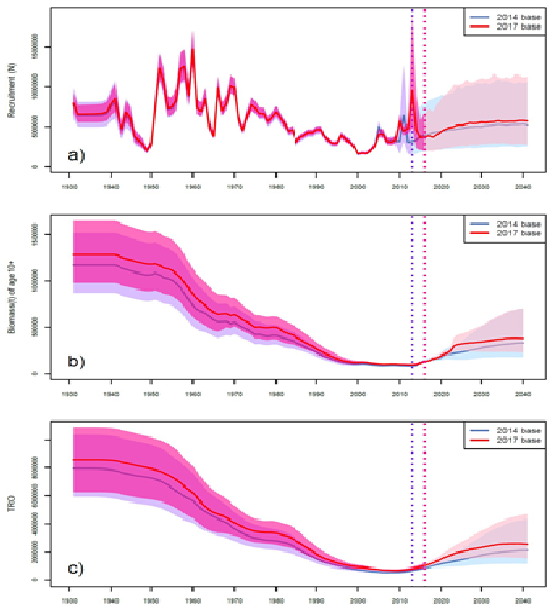
- However, the status of the SBT stock will continue to be reported as SSB, at least in the interim
- Forward projections using the reference set with an updated Operating Model (OM) and the Bali Procedure indicated the interim recovery target of 20% unfished B by 2035 will be achieved with a probability of 91%
- Results across a range of sensitivities are consistent with a faster rebuilding timeframe

Stock assessment incl CK estimates

ESC concluded that:

- The 2017 reference set of OMs provide robust stock assessment advice
- There is a recent increase in adult population size
- Recent recruitment is above the expected level
- Current levels of F suggest that rebuilding will be faster than what was envisaged in 2011
- In all cases the 2011 rebuilding target was met and in some cases exceeded

Stock assessment incl CK estimates



Meta-rules and Exceptional Circumstances

Meta-rules and Exceptional Circumstances

- In 2011 the CCSBT adopted the meta-rule process as the method for dealing with exceptional circumstances in the SBT fishery (ESC 2013)
- The meta-rule process describes:

  (1) the process to determine whether exceptional circumstances exist

  (2) the process for action

  (3) the principles for action

Meta-rules and Exceptional Circumstances

The ESC noted the following items to be considered in the context of exceptional circumstances in 2017:

- Changes in population dynamics as indicated by the updated OMs and recent high recruitments
- The small/young fish in Indonesian size/age data (2012/13 to 2014/15 seasons)
- The potential scale of unaccounted mortalities

Meta-rules and Exceptional Circumstances

Updated estimates of population dynamics

- The full stock assessment in 2017 resulted in a more optimistic outlook in terms of current stock status, recent recruitment trends, and prospects for rebuilding
- Given that the updated estimates of stock rebuilding are positive and do not impact on the operation of the current MP, the ESC concluded that there was no reason to modifiy the current TAC

Meta-rules and Exceptional Circumstances

Indonesian size/age data

- This remains a priority issue to resolve for the monitoring of the spawning stock and conditioning of the OMs for the 2017 assessment
- However, it is not an issue for the operation of the MP because the MP does not use the data directly
- Therefore, ESC concluded there was no reason to take action to modify the 2018-2020 TAC recommendations based on this exceptional circumstance

Meta-rules and Exceptional Circumstances

Unaccounted mortality

- ESC reaffirmed its views from 2016
- ESC considered the “Added Catch” sensitivity used in 2014 could not be ruled out as a plausible scenario for UAM
- ESC noted the potential for substantial levels of unaccounted mortality to have occurred that were not considered in the design of the MP
- ESC also noted that continuing to follow the MP as proposed does lead to continued rebuilding in the short term even if the UAM as formulated is true

Meta-rules and Exceptional Circumstances

Unaccounted mortality (cont.)

- There is no reason to modify the 2018-2020 TAC for this exceptional circumstance
- ESC reiterated the urgent need to quantify all sources of UAM

Overall assessment of Exceptional Circumstances

- Overall, ESC concluded that there was no reason to take action to modify the 2018 TAC or the 2018-2020 TAC recommendations in relation to these three possible Exceptional Circumstances

SBT Stock Status and Management

Stock status in 2017

For the Base Case

- The stock remains at a low level estimated to be 13% of the initial SSB, and below the level to produce maximum sustainable yield (MSY)
- However there has been improvement since the 2011 (5% of initial) and 2014 (9% of initial) stock assessments
- B10+ in 2017 relative to initial is estimated to be 11% which is up from the estimate of 5% in 2011

Summary of stock status from 2017

Maximum Sustainable Yield	33,036t (30,000-36,000)
Reported (2016) Catch	14,445t
Current (2017) Biomass (B10+)	135,171 (123,429-156,676)
Current depletion (current relative to initial)	
• SSB	0.13 (0.11 – 0.17)
• B10+	0.11 (0.09 – 0.13)
SSB (2017) Relative to SSB_{msy}	0.49 (0.38 – 0.69)
Fishing mortality(2017) Relative to F_{msy}	0.50 (0.38-0.66)

Management Recommendations

Recommendations for 2018

- Based on the results of the MP operation for 2018 -2020 in 2016 and the outcome of the review of exceptional circumstances in 2017 the ESC recommended:
  - There is no need to revise the EC's 2016 TAC decision regarding the TAC for 2018
  - The recommended annual TAC for the year 2018 is 17,647.4 t
- The ESC recommends that an allocation of 5.2 t in 2018 be made to cover mortality associated with approved research projects

Management Recommendations

Recommendations for 2018-2020

- The current MP was run to recommend TACs for 2018-2020
- Recommended annual TAC for 2018-2020 is 17,647.4 t
- ESC concluded there is no reason to modify the 2018-2020 TAC recommendation in relation to its review of exceptional circumstances

Development of new MP

Development of new MP

- The EC has approved the development of a new MP
- Results of most recent reconditioning of the OM indicate incremental improvement in stock status since last full stock assessment in 2014
- Preliminary projections indicate substantially higher recent productivity and rate of rebuilding since the Bali Procedure was adopted in 2011 and last full assessment
- These results have implications both for what are considered desirable attributes and behaviour of a new MP and for likely consultation and engagement between ESC, EC, and stakeholders

Development of new MP

In light of this, the ESC recommends extending the development of the new MP by one year to:

- Reduce the uncertainty in the estimates of recent recruitment strengths and productivity
- Allow for sufficient time between technical development of Candidate MPs (CMPs) and ESC review and advice
- Allow for dialogue between the ESC and EC on desirable behaviour and performance measures for CMPs to meet the objectives of a rebuilding strategy and longer term goals for SBT management

Development of new MP

Given that the current projection results with the Bali Procedure indicate that the interim rebuilding target may be reached earlier than anticipated (in the next 1 or 2 TAC blocks) the ESC requests advice from the EC on:

- Objectives beyond the interim rebuilding target
- Desirable behaviour of candidate MPs pre- and post-rebuilding

Development of new MP

The ESC discussed the following issues to consider and review for a new MP:

- Consideration of costs and benefits of alternative rebuilding strategies, including those that favour stock rebuilding over short term catch increase (as described in CCSBT Strategic Plan, Strategy 1)
- Longer term behaviour of the MP with respect to biomass and catch levels
- Continued avoidance of TAC decreases after increases

Development of new MP

- Continued avoidance of SSB falling below some specified minimum level
- Other operational requirements (e.g. maximum and minimum TAC changes)
- The ESC requests that the EC Members give consideration to these matters intersessionally given that specific guidance on these aspects will be requested from the 2018 EC meeting
- The ESC will provide quantitative advice on trade-offs from MP trials conducted in the interim

Development of new MP

- The EC agreed that the MP Approach was preferred approach for accounting for impact of additional catches on MP performance for new MP development
- MP approach:
  - incorporates all historical and assumed future mortality into testing and tuning new MP
  - is robust to levels of catch occurring in the fishery
  - likely to meet the rebuilding objective of the MP, and
  - provides greater certainty and stability to Members on future TACs

Development of new MP

- The ESC agreed to include the UAM1 added catch scenario in the 2017 reference set for the purposes of testing the new MP in 2018
- The UAM1 added catch scenario is now defined as:
  - Unaccounted catch increasing from 0 t in 1990 to 1000 t in 2013, and 1000 t from 2014-16, both for smaller fish and larger fish (a total of 2000t of added catch)
  - Additionally, the UAM1 scenario includes the reference set assumptions regarding surface fishery catches agreed at OMMP8
  - For future projections the added catch was to remain at the same proportion of the TAC as in 2016

Development of new MP

- ESC noted that additional information on Unaccounted Mortality has become available since the original specification of UAM1 which may be used to refine this scenario for MP development
- Members are encouraged to undertake more comprehensive analyses intersessionally and provide specific proposals for revisions to OMMP 9 scheduled for July 2018
- This MP base set will ensure that the MP is robust to uncertainty in total catches at this level

Development of new MP

The main points in the recommended timeline shown on the following table are as follows:

- It allows for an extra year of MP work before the 2021-2023 TAC recommendation is made in 2020 (instead of 2019) to provide for:
  - Adequate time in MP development work and consultation between the ESC and EC
  - Separation of adoption of the new MP and the first TAC recommendation
  - Inclusion of updated data from 2019, especially results from gene tagging estimates of recruitment strength

Development of new MP

- The main consequence of this recommended schedule is the dropping of the one year lag between TAC advice and implementation for the initial TAC from the new MP
- Please note that there is a contingency in 2020 for an extra meeting should it be required
- Also, the ESC noted the desirability of having multiple groups developing and tabling candidate MPs for consideration

Development of new MP

Workplan for MP development and consultation		
2017		
October	CCSBT	Qualitative discussion of rebuilding objectives in the light of the updated projection results.
2018		
June	OMMP9	First presentation of candidate MPs (CMPs) evaluated using 2017 OMs.
September	ESC + 1 day informal OMMP	Evaluation of refined CMPs.
October	EC	Results on CMP performance and trade-offs presented to EC. Consultation with stakeholders. EC confirms or amends broad recovery objectives based on advice from the ESC.
2019		
June/July	OMMP10	Recondition the OM and review initial updated versions of CMPs to develop a limited set to put forward to the ESC.
September	ESC + 1 day informal OMMP	Review and advice on set of CMPs and a session for interaction with stakeholders.
October	EC	Aim to select and adopt MP.
2020		
June	Special ESC/EC meeting	Contingency placeholder in case more time is needed to complete evaluation
September	ESC	Implementation of adopted MP to provide TAC advice for 2021 (i.e., no standard 1-year lag) (note, this MP implementation will include the 2020 data exchange). Updated assessments including projections using adopted MP
October	EC	Agrees TAC for 2021-2023.

Review of the 2018 Work Schedule

ESC Workplan for 2018

The proposed workplan has the following key elements:

- Continuation of gene tagging project
- Continued collection and processing of close-kin samples
- Continued aging of Indonesian otoliths
- Evaluation of fishery indicators and exceptional circumstances
- Development of new MP

2017-18 Proposed Workplan

Activity	Approximate Period	Resources or approximate budgetary implications
Continuation of tag recovery efforts	Tag recovery is continuous	$1,000 for tag rewards on the basis that few recaptures are expected to occur
Provide SBT Stock Status Report to the other tuna RFMOs	Aug – Nov 2017	No additional cost
Proposed SRP activities for 2018: 1. Gene tagging project 2. Continued collection and processing of close-kin samples 3. Close-kin identification and exchange 4. Continued aging of Indonesian otoliths 5. Collect additional maturity samples where required	Jan – Dec 2018	

2017 -18 Proposed Workplan
(continued)

Activity	Approximate Period	Resources or approximate budgetary implications
Routine OMMP code maintenance and development	Jan – Dec 2018	Consultant: 5 days
CPUE webinar to review progress of inter-sessional CPUE work	Jun 2018	Members. Three panel days
Standard Scientific Data Exchange	Apr – Jul 2018	No additional cost
Inter-sessional OMMP meeting	5 day, Jun/Jul 2018	Two panel members, ESC chair, one consultant (+ 3 preparation days)
Informal OMMP technical workshop	1 day, immediately prior to ESC, 27 Aug 2017, Yogyakarta, Indonesia	Two panel members, ESC chair, one consultant (+ 3 preparation days), one Secretariat

2017 -18 Proposed Workplan
(continued)

Activity	Approximate Period	Resources or approximate budgetary implications[1]
Extended Scientific Committee for the 23rd meeting of the Scientific Committee. The meeting will focus on the following: • Regular review of indicators • Evaluation of meta-rules and exceptional circumstances • Review results of SRP activities • New MP development in 2018	3 - 8 Sep 2018, San Sebastian, Spain	ESC Chair, 3 panel, one consultant, full interpretation and 3 Secretariat staff.

END