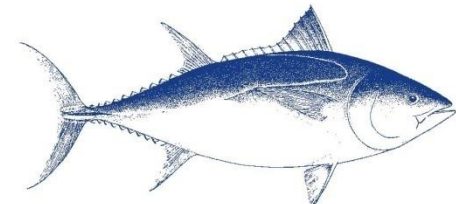




REPORT OF THE 20th MEETING OF THE SCIENTIFIC COMMITTEE

Incheon, South Korea, 1 - 5 Sep 2015





Main topics

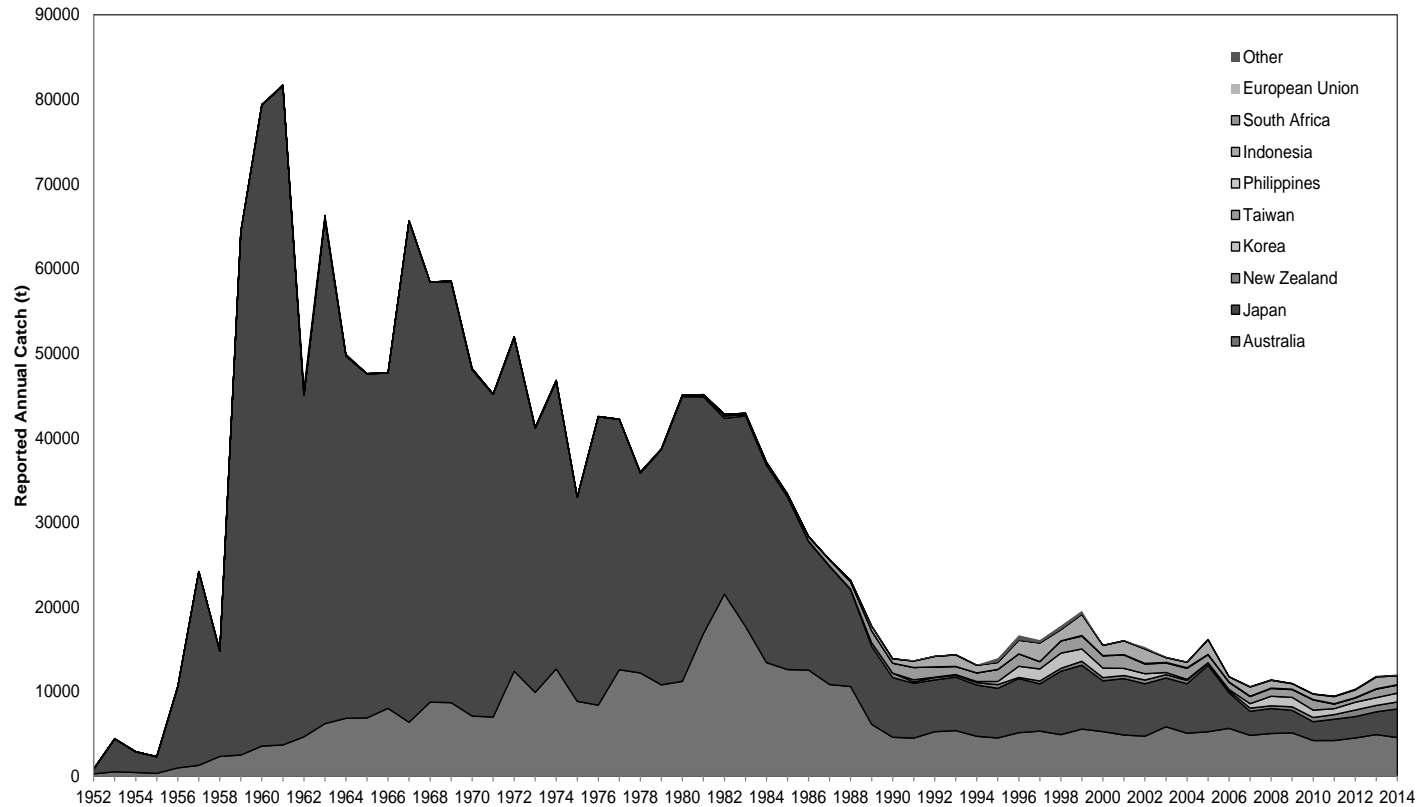
- Review of SBT fisheries and fisheries indicators
- Updated estimation of unaccounted catch mortality
- Evaluation of exceptional circumstances
- SBT stock status and management advice
- Scientific research program for 2016 - 2018
- Response to SFMWG requests



Review of SBT Fisheries and Fisheries Indicators



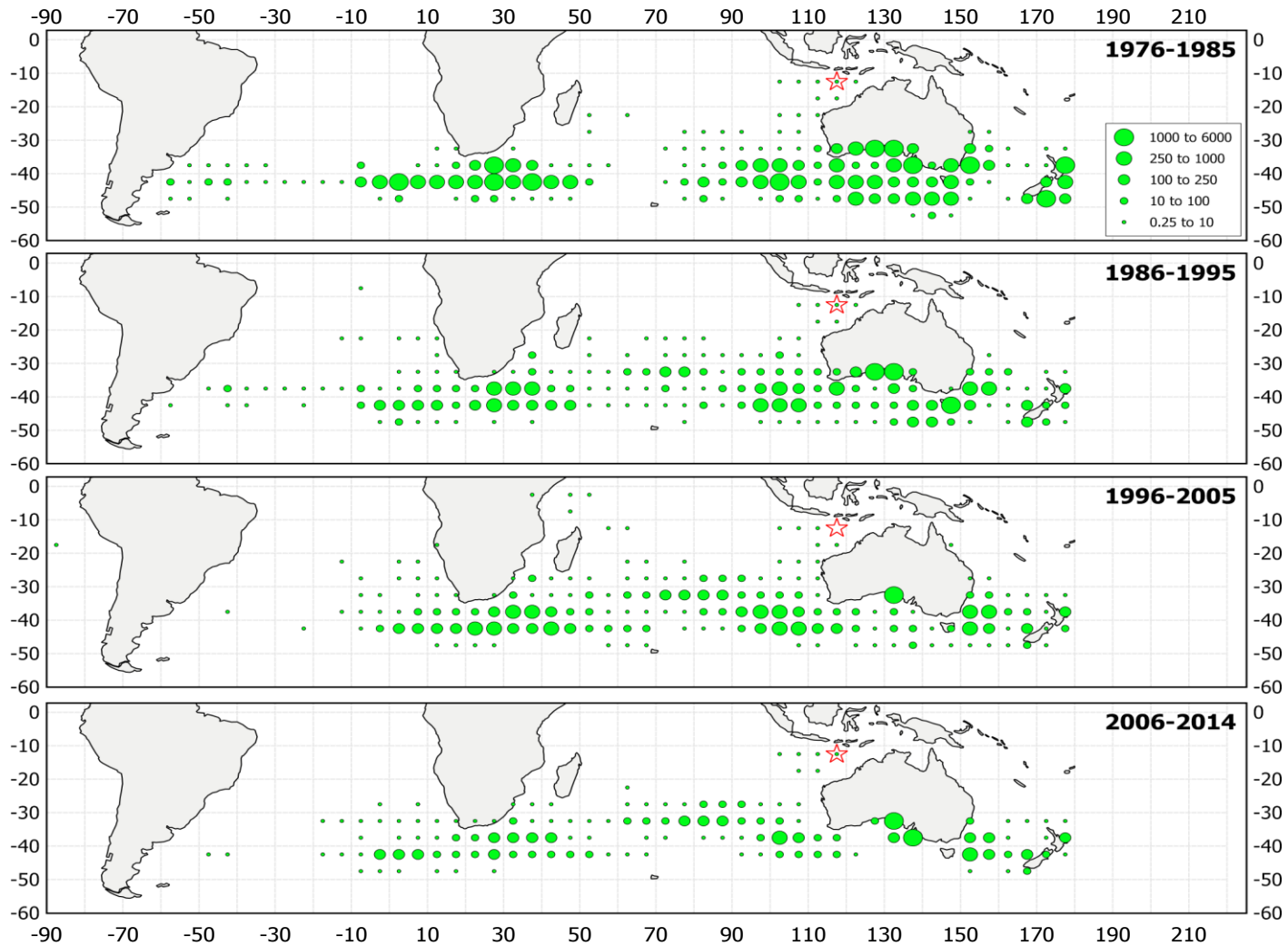
Reported SBT Global Catches 1952 - 2014



Reported southern bluefin tuna catches by flag, 1952 to 2014



SBT Distribution Range 1976 - 2014





Indicators

Juvenile indices in the GAB

- The scientific aerial survey index, commercial SAPUE index, and trolling survey index were not obtained in 2015

Japanese longline CPUE

- Longline CPUE indices for the Japanese fleet for age 5 to 7 are well above the historically lowest levels observed in the mid-2000s
- The index for age 5 shows somewhat decreasing trends in recent years

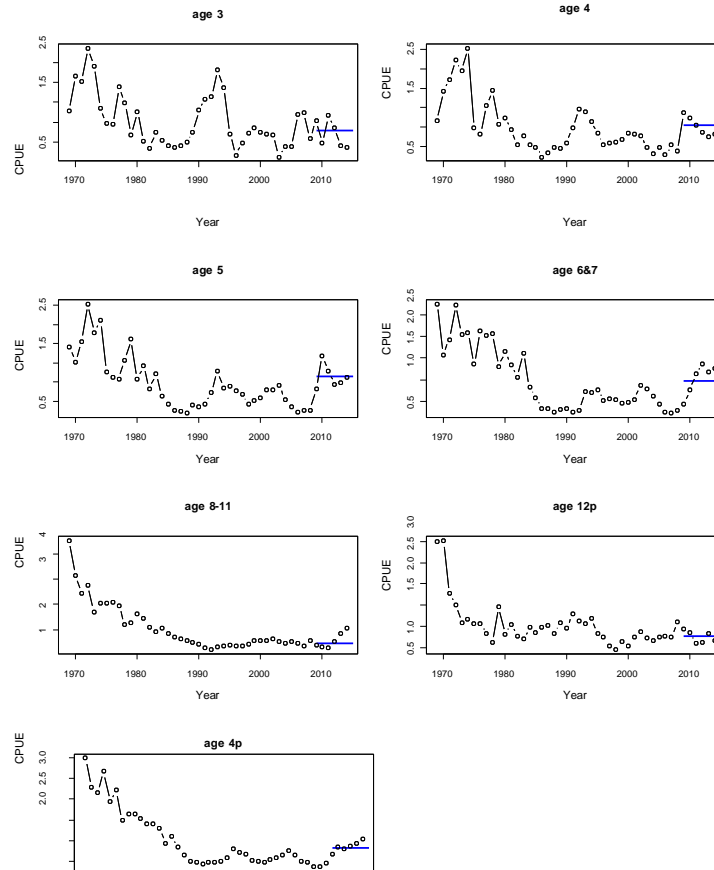


Indicators

- The CPUE index for ages 8-11 have increased gradually in the most recent four years
- The index for age 12+ decreased from 2008 to 2011 and has fluctuated at a low level after that
- Where areas overlapped, Korean CPUE trends were in reasonable agreement with those of Japan



Age 3+ Biomass Indicators



Nominal CPUE of ages 3 through 12+ SBT for Japanese longliners.
Horizontal line is mean of last 5 years.



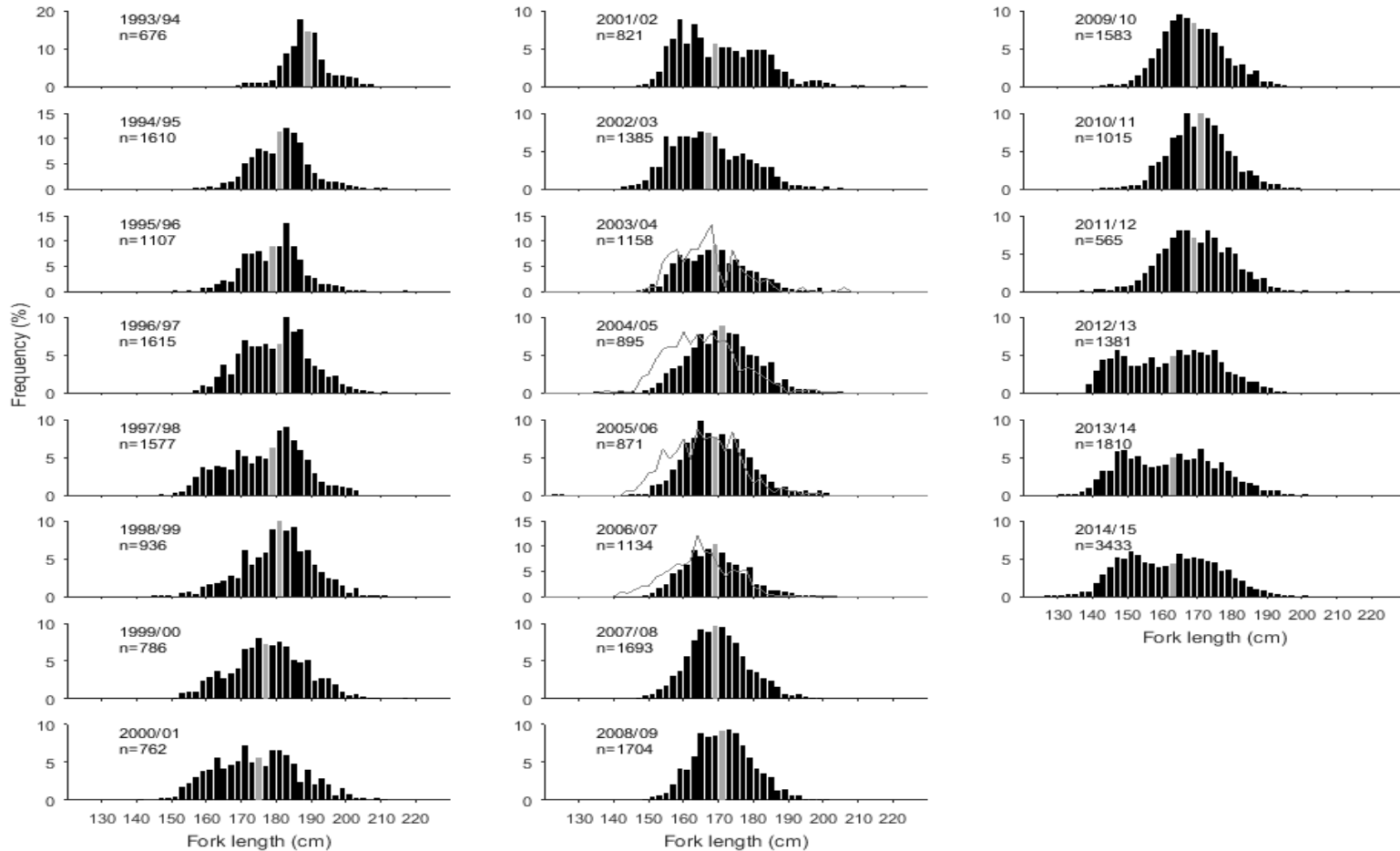
Lengths on the spawning ground

Indonesian length frequencies

- Monitoring of length and age of Indonesian catches on the spawning ground indicate a substantial shift towards smaller and younger size and age classes since 2012
- Information indicates that the unusually small size classes have been caught away from the spawning ground (areas 2 and 8) and that these fish should be excluded from the monitoring series
- Therefore there is no updated trend on the spawning ground indicators at this meeting



Lengths on the spawning ground



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



Summary of indicators

- None of the juvenile indices (AS, SAPUE, Troll) were obtained in 2015
- Japanese longline CPUE
 - Indices for ages 5-7 well above historic lows; age 5 declined in recent years
 - Indices increased in the last four years for the 8 -11 age group
 - Indices decreased for the 12+ age groups from 2008 to 2011 and then remained low
 - Korean CPUE trends were in reasonable agreement with those of Japan in area of overlap
- Mean length of SBT on the spawning ground has declined, but its cause(s) are unknown



Unaccounted catch mortality



Unaccounted catch mortality - 2014

- In 2014 the ESC concluded that current stock status estimates appear to be unaffected by the unaccounted mortality scenarios tested
- There were impacts on the projections and rebuilding performance from the unaccounted mortality scenarios
- If total mortalities are as large as those considered in the added catch scenario (an added 1000t of large fish plus 1000t of small fish) then impacts on the rebuilding plan may be substantial (probability of rebuilding to 20% B_0 by 2035 drops to 49%)
- Unaccounted mortality of large fish impacts on rebuilding early and for small fish the impact is later

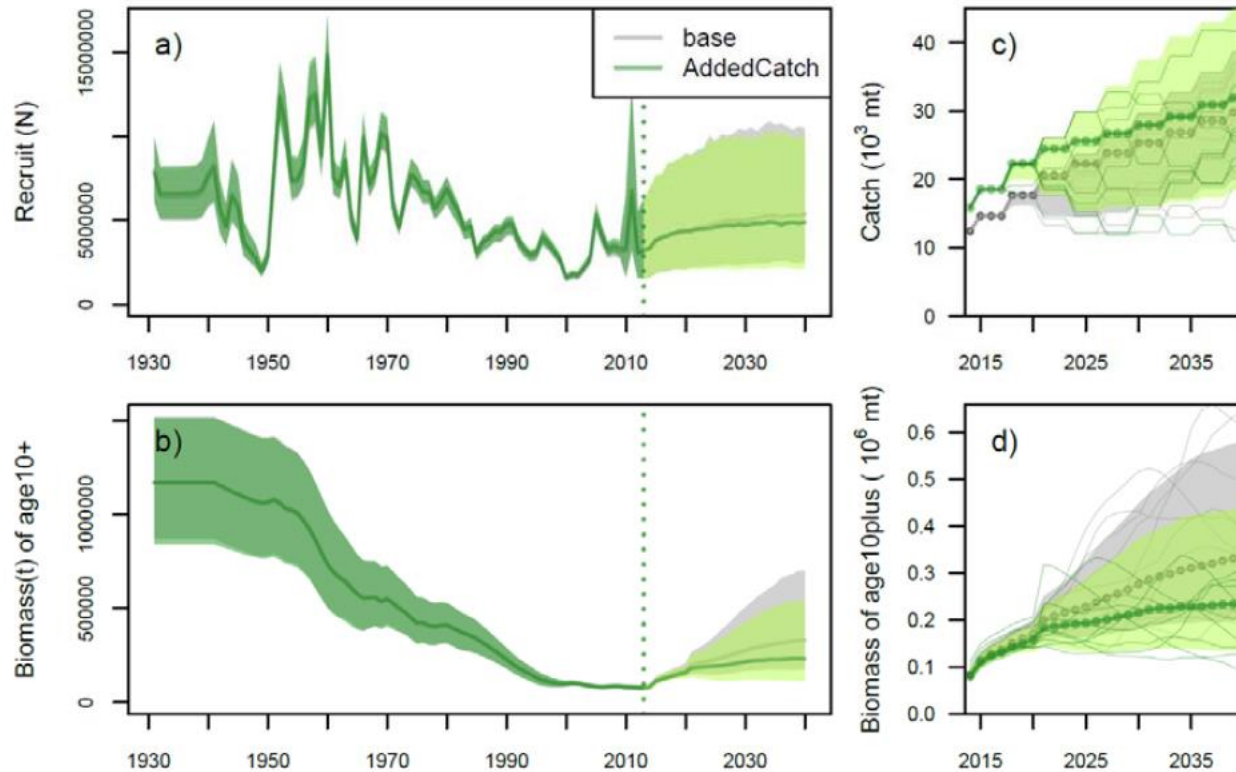


Unaccounted catch mortality - 2014

- The added catch scenario was potentially plausible given the available data, information and anecdotal market reports
- The probability of rebuilding for this scenario was similar to but not worse than the most pessimistic scenario tested in 2011
- Under the projections of the different scenarios the MP appeared to be working to reduce TACs when unaccounted mortality was occurring, but not enough to meet the rebuilding target
- ESC requested that the EC and CC urgently provide detailed information and data to properly assess impacts of unaccounted mortalities



Unaccounted Catch Mortality-2014



Trajectories of a) recruitment, b) biomass of age 10+ fish, c) predicted catch, d) biomass for the “Added Catch” sensitivity scenario.

The green line with the greenish yellow region shows the median and 90% intervals of each scenario. The grey line and region shows the base case result.



Unaccounted catch mortality - 2015

- In 2015, the ESC endorsed the views agreed in 2014 and considered that the “Added Catch” sensitivity used in 2014 remains a plausible scenario for consideration of UAM
- The ESC also considered additional information that had become available since the 2014 meeting
- Non-Member catches in the IOTC and WCPC fisheries were reported to the ESC, based on comparison with bycatch rates by CCSBT Member’s vessels fishing in the same areas using two different methods
- Total catch by Non-Members was estimated to be from 120 to 580 t annually for 2011-13, which represents 0.8% to 4% of the 2015 TAC using the two different approaches



Unaccounted catch mortality - 2015

- It was agreed that given the status of the stock the estimates were not trivial, and that there was a need to investigate why the estimates differed between methods
- The estimates also did not include potential catches in the South Atlantic or Eastern Pacific Oceans
- The ESC agreed to refer the issue back to the CPUE working group for further consideration intersessionally
- When the MP is revised in future the ESC agreed to incorporate all known or reasonably inferred sources of UAM



Exceptional Circumstances



Exceptional Circumstances

- In 2011 the CCSBT also 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



Exceptional Circumstances

The ESC noted the following items to be considered in the context of exceptional circumstances in 2015:

- Longline CPUE
- No 2015 aerial survey
- No other direct estimates of recruitment in 2015
- The scale of unaccounted mortality
- Reported overcatch of the TAC
- The shift in Indonesian size/age data (2013 - 2015)
- No aerial survey after 2016



Exceptional Circumstances

- The ESC draws attention to the fact that decisions as to whether exceptional circumstances exist are only one step in the overall metarule process
- The ESC emphasises that the important outcome from the annual review process is whether these circumstances are such that there is a need to apply a metarule to change the recommended TAC provided by the MP
- In 2015 the ESC evaluated whether there are events, or observations, that are outside the range for which the management procedure was tested and the implications of this for TAC setting



Exceptional Circumstances

- The scope of this evaluation covered input data to the MP (CPUE and aerial survey data), the question of unaccounted mortality, reported catch and future recruitment monitoring
- The ESC agreed that the longline CPUE in 2014 was within the range predicted in the testing of the MP
- However, there was no aerial survey in 2015, or other direct recruitment indices, available to determine if recruitment in 2015 is within the expected bounds
- The absence of an aerial survey in 2015 requires review of the implications for TAC recommendations, because these data are a requirement of the MP



Exceptional Circumstances

- The ESC evaluated the consequences of no aerial survey in 2015 and found that there is virtually no effect on the predicted performance of the MP for the Reference Set
- Provided there is an aerial survey in 2016, and effective recruitment monitoring in the future, the MP can be used to recommend 2018-2020 TACs in 2016
- The review of UAM in 2015 has not changed the perception of ESC on the potential scale of UAM
- The ESC advises the EC to take steps to ensure adherence to its TACs and as a matter of urgency, to take steps to quantify all sources of unaccounted SBT mortality



Exceptional Circumstances

- If substantial levels of unaccounted mortality are confirmed, then there will be a need to retune the MP to achieve the EC's rebuilding objective
- The ESC noted the combination of the individual issues (UAM, over-catch, potential loss of recruitment monitoring) represent a serious concern in terms of the potential risks to the stock and the rebuilding performance of the MP
- The ESC reiterated its previous advice on the priority for completing the Commission's work program for UAM and the importance of the MP to meeting the Commission's objective to rebuild the stock



SBT Assessment and Management



Stock assessment and projections in 2014

For the Base Case

- The stock remains at a very low level estimated to be 9% of the initial SSB, and below the level to produce maximum sustainable yield (MSY)
- However there has been some improvement since the 2011 stock assessment
- B10+ relative to initial is estimated to be 7% which is up from the estimate of 5% in 2011
- Probability of reaching rebuilding target of 20% B_0 by 2035 was 74%



Summary of stock status from 2014

| | |
|---|---------------------------|
| Maximum Sustainable Yield | 33,000t (30,000-36,000) |
| Reported (2013) Catch | 11,726t |
| Current Replacement Yield | 44,600t (35,500 - 53,600) |
| Current (2014) Spawner Biomass (B10+) | 83,000t (75,000 - 96,000) |
| Current depletion (current relative to initial) | |
| • SSB | 0.09 (0.08 - 0.12) |
| • B10+ | 0.07 (0.06 - 0.09) |
| SSB (2014) Relative to SSB_{msy} | 0.38 (0.26 - 0.70) |
| F(2013) Relative to F_{msy} | 0.66 (0.39-1.00) |



Management Recommendations

Recommendations for 2015

- Based on the results of the MP operation for 2015-17 in 2013 and the outcome of the review of exceptional circumstances in 2015 the ESC recommended:
 - There is no need to revise the EC's 2013 TAC decision regarding the TACs for 2016-17
 - The recommended annual TAC for the years 2016-2017 is 14,647.4 t
- The ESC recommends that an allocation of 7.7 t per year be made to cover mortality associated with approved research projects



Scientific Research Program (SRP)



MP Related Research

In considering alternative MP's the ESC agreed the following:

- A fishery-independent index of recruitment was necessary - CPUE not considered reliable due to possible future changes in catchability
- Gene tagging provides the most promising reliable index of juvenile abundance in the future to detect possible recruitment failures
- Interim transitional MP's not considered viable due to high cost of developing both short and long term MP's, and best approach is to transition to new long term MP's as quickly as possible



MP Related Research

- The ESC reconfirmed its preference to continue with the SRP approach developed in 2013-2014 to transition from the currently agreed MP to a modified/new MP if required (ESC19 Report, Attachment 10)
- The main points of the SRP related to the MP are as follows:
 - Continue AS through 2019 to run MP in 2016 and 2019 to set TACs
 - Review current MP in 2017
 - Continue development of GT approach as alternative R index
 - Continue collection of CK data to estimate spawning biomass



MP Related Research

Realising budget constraints the ESC developed 3 lower cost options as follows (details in Tables 6 and 7 of 2015 ESC20 report):

Option A - preferred, highest cost

- 2016 - AS for 2016 MP TAC setting, GT release 1
- 2017 - AS for 2017 assessment & OM for new MP, GT release 2
- 2018 - no AS, GT release 3, 2 GT estimates for 2019 MP TAC



MP Related Research

Option B - 2nd preference, lowest cost

- 2016 - AS for 2016 MP TAC setting, GT release 1
- 2017 - no AS for 2017 assessment & OM , GT release 2
- 2018 - no AS, GT release 3, 2 GT estimates for 2019 MP TAC

Option C - 3rd preference, medium cost

- 2016 - AS for 2016 MP TAC setting, GT release 1
- 2017 - AS for 2017 assessment & OM , no GT release
- 2018 - no AS, GT release 2, 1 GT estimate for 2019 MP TAC



Other Research Priorities

Scientific Research Plan (SRP) re-confirmed in 2015:

1. Close-kin genotyping for SSB
2. Resolution of Indonesian small fish issue
3. Maturity workshop
4. Age-validation workshop
5. Indonesian otolith collection, aging, and archiving



ESC response to SFMWG requests



Response to SFMWG requests

1) The ESC's relative research priorities for 2016 to 2018 inclusive, noting that the research budget is limited

- Research recommendations were formulated by assigning the highest priority to the two elements considered essential for the rebuilding strategy:
 - (i) the continued monitoring of recruitment through a fishery-independent index
 - (ii) the availability of a fully tested MP for TAC-setting
- If the EC decides to continue with the current MP, then it is essential for the AS to continue annually, while an alternative recruitment index is developed to supersede it



Response to SFMWG requests

- In the event that the EC decides not to continue with the aerial survey, the ESC recommends that the transition to a new MP that uses gene tagging as input be brought forward
- In this case, the 2016 AS must occur and the gene tagging should be fast-tracked for 2016
- Gene tagging is recommended as the most cost-effective approach for recruitment monitoring
- It is, therefore, a priority for transitioning to the new MP. The first estimate of recruitment from gene tagging could be available in 2018



Response to SFMWG requests

2) The costs and benefits of continuing with the current MP including conducting the aerial survey from 2017 to 2019; and 3) Any preliminary consideration of alternatives to the current MP approach including an indication of their relative costs and benefits if possible

- The ESC notes that the current MP requires the aerial survey to be conducted from 2017 to 2019 for the TAC-setting in 2019
- Retention of the current MP would provide continuity in the rebuilding strategy and greater certainty of outcomes throughout the transition to a new MP, which will be required in the short-term (3-5 years), given the increasing logistic vulnerability of the aerial survey



Response to SFMWG requests

- In the event that the aerial survey is discontinued and the current MP can no longer be used, three options (A, B and C) were developed for fast-tracking the transition to a new MP
- Their strengths and limitations were considered and the ESC preferred option A to provide overlap between the two indices of recruitment during the transition period.
- Recognizing budget issues, and weighing the relative benefits of the other two options, Option B was preferred over Option C.



Response to SFMWG requests

- If the AS is cancelled after 2016, then the current MP cannot be used to set TACs after 2018-2020 and the ESC expects the EC would request the development of a new MP
- If a new MP is to be developed there would be no need for the scheduled review of the Bali MP in 2017
- There would, however, be the need for a similar scale meeting as part of the development of a new MP



Review of the 2016 Work Schedule



ESC Workplan for 2016

The proposed workplan has the following key elements:

- Scientific aerial survey
- Pilot gene tagging project
- Continued collection and processing of close-kin samples
- Continued aging of Indonesian otoliths
- Evaluation of fishery indicators and exceptional circumstances
- Run the MP to set TACs for 2018-2020
- Specify requirements for Bali MP review or new MP development in 2017



2015-16 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 2015 | No additional cost |
| Proposed SRP activities for 2016: <ol style="list-style-type: none"> 1. Scientific aerial survey 2. Pilot gene tagging project 3. Continued collection and processing of close-kin samples 4. Continued aging of Indonesian otoliths | Jan - Dec 2016 | |



2015 -16 Proposed Workplan (continued)

| Activity | Approximate Period | Resources or approximate budgetary implications |
|---|--|---|
| Routine OMMP code maintenance and development | Jan - Jul 2016 (Data inputs after data exchange) | Australia/Consultant 5 days |
| CPUE webinar to review progress of inter-sessional CPUE work | Apr? 2016 | Japan, Australia, New Zealand, Taiwan, Korea and possibly Indonesia. Three panel days |
| Standard Scientific Data Exchange | Apr - Jul 2016 | No additional cost |
| Technical workshop to evaluate possible changes in the OM structure | 2 days prior to ESC (2-3 Sep 2016) | Three panel members, ESC chair, 2 Secretariat staff |



2015 -16 Proposed Workplan (continued)

| Activity | Approximate Period | Resources or approximate budgetary implications ¹ |
|---|-------------------------------------|---|
| <p>Extended Scientific Committee for the 21st meeting of the Scientific Committee. The meeting will focus on the following:</p> <ul style="list-style-type: none">• Regular review of indicators• Evaluation of application of meta-rules and exceptional circumstances• Review results of SRP activities• Run the MP to set TACs for 2018-2020• Specify requirements for Bali MP review or new MP development in 2017 | 5 - 10 Sep 2016 (Kaohsiung, Taiwan) | ESC Chair, full panel, full interpretation and 3 Secretariat staff. |



END

