Commission for the Conservation of
Southern Bluefin Tuna

みなみまぐろ保存委員会

Report of the Ninth Meeting of the Scientific Committee

13-16 September 2004
Seogwipo City, Jeju, Republic of Korea

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Agenda Item 1. Opening of meeting

1. The independent Chair, Mr Penney, declared the Scientific Committee meeting open and welcomed all participants.
2. Those participants who were not present at the previous Stock Assessment Group meeting were introduced. The list of participants is at **Appendix 1**.
3. The Scientific Committee meeting was adjourned.

Agenda Item 2. Approval of decisions taken by the Extended Scientific Committee

4. The Scientific Committee endorsed all the recommendations made by the Extended Scientific Committee for the Ninth Meeting of the Scientific Committee, which is at **Appendix 2**.

Agenda Item 3. Other business

5. There was no other business.

Agenda Item 4. Adoption of report of meeting

6. The report of the Scientific Committee was adopted.

Agenda Item 5. Closure of meeting

The meeting was closed at 6:25pm, on 16 September 2004.

List of Appendices

Appendix 1

List of Participants
Ninth Meeting of the Scientific Committee
13 - 16 September 2004
Seogwipo City, Jeju, Republic of Korea

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Commission for the Conservation of
Southern Bluefin Tuna

みなみまぐろ保存委員会

Appendix 2

Report of the Extended Scientific Committee for the Ninth Meeting of the Scientific Committee

13-16 September 2004
Seogwipo City, Jeju, Republic of Korea

Report of the Extended Scientific Committee for the

Ninth Meeting of the Scientific Committee

13-16 September 2004

Seogwipo City, Republic of Korea

Agenda Item 1. Opening of meeting

1. The meeting was opened by the appointed Chair of the Scientific Committee and of the Extended Scientific Committee, Mr Penney, who welcomed participants.

1.1 Introduction of participants

2. Participants were introduced at the opening of the Scientific Committee meeting. The list of participants is shown in **Attachment 1**.

1.2 Administrative arrangements

3. There were no new administrative arrangements since the previous meetings.

Agenda Item 2. Appointment of rapporteurs

4. It was agreed that the meeting would be rapporteured by the Chair, panel and Secretariat. Where necessary, members would be asked to submit paragraphs relating to specific comments they have made.

Agenda Item 3. Adoption of agenda and document list

5. The agreed agenda is shown in **Attachment 2**.
6. The Chair outlined his proposal for scheduling meeting discussions and the need to run some small group meetings in parallel with plenary sessions. The meeting agreed with the chair's proposal.
7. The agreed document list is shown in **Attachment 3**. Specific papers relevant to this meeting were identified.

Agenda Item 4. Review of SBT fisheries

4.1 Presentation of national reports

8. Participants presented brief overviews from their National Reports of important characteristics or changes in their fisheries in 2003:

9. CCSBT-ESC/0409/SBT Fisheries-Australia noted that, during the 2002/03 season, Australia caught 5391 t of SBT, including a 15 t towing accident mortality. The 126 t over-catch has been deducted from their 2003/04 allocation. 5375 t of this catch (99%) was made by the purse-seine fishery. There were no changes in purse-seine fishing patterns or areas. Only 16 t were caught by longline off the Australian SE and SW coasts. In response to questions regarding possible signals of recruitment decline, it was noted that surface fishery effort data are difficult to interpret, but that fish appeared to be caught rapidly following a delayed start to the fishing season. There continues to be an absence of fish <120cm in the LL catch. Australia was requested to provide future information that would enable evaluation of changes (such as possible contraction) in extent of the purse-seine fishing area.

10. CCSBT-ESC/0409/SBT Fisheries-Korea reported a steady decline in number of vessels from 19 to 4 vessels since 1998. As a direct result, Korean longline catch has declined to 254 t. Korea highlighted that there was progress in development of its scientific observer program. It was confirmed that catches in the Korean fisheries report were retained catches reported by fishermen in processed weight.

11. CCSBT-ESC/0409/SBT Fisheries-Taiwan noted that weekly catch monitoring systems for the Taiwanese fleet were being improved to include size-frequency data in addition to catch since 2002. This will be cross-checked against trade data. SBT is still only targeted by a few vessels over a short annual season, with most vessels catching SBT as a by-catch. It is therefore difficult to determine SBT targeted effort, and to interpret Taiwanese SBT CPUE trends. Options were being evaluated to improve these estimates. The meeting noted reported Taiwanese SBT catches in areas not considered to be part of the SBT range, such as off the South American coast, raising questions regarding identification of these fish. Considering the likelihood that these were actually Atlantic bluefin tuna, Taiwan was asked to investigate the species identification of fish from these areas. It was noted that past catch and effort datafrom Japan reported SBT catch off the South American coast.

12. CCSBT-ESC/0409/SBT Fisheries-New Zealand presented results of the implementation of improved data grooming and extraction procedures to estimate SBT catch in fisheries other than longline. Most catch is made using longlines with minor troll catches. Catches have not been made using handlines in recent years, due to early closure of their SBT fishery following filling of the quota before the handline season would normally begin. Some slight by-catch is occasionally made in midwater trawls, and the recreational fishery only makes occasional catches. These are all included in New Zealand's catch allocation. In response to questions it was confirmed that SBT targeted effort is based on indications of a single target species on catch returns. The New Zealand competitive quota system and resultant race-to-fish also suggests that CPUE from the fleet of domestic owned and operated vessels may not be a useful measure of SBT abundance. New Zealand was requested to report CPUE trends separately for their domestic and charter longline fisheries at future meetings.

13. CCSBT-ESC/0409/SBT Fisheries-Japan reported on the recent contraction in area fished by the Japanese longline fleet, noting that this had resulted from a combination of factors, including contraction of SBT availability and socio-

economic factors. Differences in CPUE patterns by area was noted for 2002. Fishermen ascribed these to changes in oceanographic conditions which reduced fish availability. However, the nature of these changes is not understood. In response to questions, Japan confirmed that most vessels in Areas 4-9 are targeting SBT, even those vessels with a low SBT catch rate. It was noted that Japanese longline SBT catches are low in a number of areas where effort is deployed, such as the area South of Indonesia and Area 2. This effort is probably targeted at yellowfin and bigeye tunas.

4.2. Secretariat review of catches

14. The Data Manager presented an updated global SBT catch table (CCSBT-ESC/0409/06). It was noted that the Indonesian catch estimate for 2002 had been reduced from 1930 t (as listed in the SC8 report) to 1691 t due to data corrections and changes to the estimation procedure by the IOTC.

15. The global catch table by flag is presented at **Attachment 4**. Global catches by gear are presented at **Attachment 5**.

16. Catches by flag/ocean and gear/ocean were also presented to the meeting as these data are required for the CCSBT SBT stock status report that is being prepared for ICCAT, IOTC and the FAO FIGIS/FIRMS system.

17. It was noted that the ocean specific catch data differed from data in ICCAT's SBT report for 2002 and the data manager recommended that ICCAT should replace its SBT data with that provided from the CCSBT database. It was also noted that the post 1994 Japanese SBT longline data provided to other regional fishery management organisations (RFMO) by Japan originated from a different dataset than that used in the data provision to CCSBT. These differences should be noted when providing the CCSBT data to RFMO's. The overlap in reporting requirements of the IOTC and WCPFC in the range of 140^0-150^0E was noted. This will need to be considered in the future if CCSBT provides reports to WCPFC.

Agenda Item 5. Matters arising from the Report of the Fifth Meeting of the Stock Assessment Group

5.1 Review of fisheries indicators and assessment results

18. The ESC Attachment 7 to the SAG5 report. A revised set of indicators was agreed for use at the 2005 SAG. This list includes the original agreed set of indicators exchanged in 2002 and 2003, proposed additional agreed indicators for evaluation of recruitment indices in 2005, and a large number of additional indicators proposed by ESC participants

19. Critical review of these indicators at SAG6 would constitute much of the assessment process in 2005 (see Section 7.1), and an earlier exchange of indicators would not assist this assessment process. It was therefore considered unnecessary to exchange and review these indicators before the SAG6 meeting.

5.2 Status of the SBT stock

20. The SAG5 meeting produced the following summary of SBT stock status:

- The current assessments suggest the SBT spawning biomass is at a low fraction of its original biomass and well below the 1980 biomass. The stock is estimated to be well below the level that produces maximum sustainable yield. Rebuilding the spawning stock biomass would almost certainly increase sustainable yield and provide security against unforeseen environmental events. Recruitments in the last decade are estimated to be well below the levels in the period 1950-1980. Assessments estimate stable recruitment in the 1990's but very low recruitments in 1999 or 2000 in different assessment models. Analyses of fishery indicators provide evidence of a markedly lower recruitment from 1999-2001. Indicators also show that the Indonesia LL fishery on spawning fish catches fewer older individuals. One plausible interpretation is that the spawning stock has declined in average age and may have declined significantly in abundance. This is in contrast to the assessment models perspective that the spawning stock has been largely stable over the last decade and increased slightly over the last 4 years.
- Projections with 15,000 t annual catch provide highly variable results depending upon assessment assumptions and suggest the stock is more likely to decline with the MP Conditioning Model while the ADAPT model shows roughly equal probability of decline or increase. In comparison to the 2001 assessment, the current stock size and pattern of recruitment in the 1990s are similar. What has changed are the indications of low recruitment from 1999 to 2001 and the indications of changes in the age distribution and possible decline in abundance of the spawning stock in Indonesian waters.
- Given all the evidence, the probability of further stock decline under current catch levels is now judged to be greater than in 2001, when an increase or decline under current catches were considered equally likely.

21. The ESC noted and endorsed all aspects of the SAG5 report on assessments, review of indicators and state of the SBT stock.

22. At the SC8 meeting in 2003, it was agreed that the ESC would assume responsibility for preparing an annual overview report on biology, assessments and management of SBT for submission to other regional fisheries management organizations. The draft CCSBT report to ICCAT, IOTC and the FAO was reviewed and revised (**Attachment 6)**.

5.3 SBT management recommendations

23. The assessments and indicators presented at the 2004 SAG agree that there was at least one year of markedly low recruitment amongst the 1999-2001 year-classes. These support the recruitment concerns outlined in the 2003 SAG report. Moreover the lack of small fish in the longline fisheries and other indicators raised concern that there may have been several years of markedly lower recruitment among those year-

classes. There are also some concerns regarding possible reductions in spawning stock size.

24. These possibly weaker year classes are moving through the surface fishery and are now becoming a size where they should be caught in the long line fisheries. Thus it will be several more years before the impact of low recruitment in these years would be fully felt by the longline fisheries and about 10 more years before these age-classes enter the spawning stock. If reduced recruitment continues into the future, then under current catch levels the stock would certainly decline.

25. However, if the lower recruitment occurs for only a few years, and recruitment then returns towards the level of the mid 1990s, a Management Procedure would likely be able to provide TAC that allows for a reasonable probability of stock rebuilding. The robustness of Management Procedures is being tested against various durations of low recruitment.

26. Based on all the evidence reviewed at the SAG and SC, the probability of further stock decline under current catch levels was judged to be greater than in 2001, when an increase or decline under current catches was considered equally likely.

27. One approach for CCSBT would be to take the following steps

    - Maintain the process towards finalizing scientific advice on MPs at SC 2005. CCSBT 2005 will then be in a position to initiate the process towards the implementation of a Management Procedure. There will be an urgent need for CCSBT to agree Meta-Rules for dealing with low recruitment indicators;
    - Between CCSBT 2004 and SAG/SC 2005 assure the maximum possible monitoring of recruitment trends through analysis of length frequency, tag returns, and retention and targeting patterns in the long line fisheries; tagging, aerial surveys acoustic estimates of juveniles in Australia waters; and direct ageing from otoliths from all fisheries. During this period Meta-Rules to deal with exceptional circumstances, particularly extended periods of poor recruitment, will be developed;
    - At SC 2005 conduct an analysis of the full set of indicators of recruitment and of spawning stock biomass agreed at SC 2004; and

    Depending upon the outcome of the indicators analysis there would be two possibilities:

    - If indicators suggest that recruitment has not markedly declined on an ongoing basis CCSBT could rely upon the basic Management Procedure to govern future TAC changes;
    - If indicators at SAG/SC 2005 suggest an ongoing marked reduction in recruitment, then the MP Meta-Rule being developed would need to be invoked and CCSBT 2005 would need to consider TAC reductions as soon as possible. Such TAC reductions would likely be substantial and the size of reduction would be designed to arrest stock decline and lead to rebuilding. The probability of arresting stock decline and of rebuilding from different levels of TAC reductions would be evaluated using the MP conditioning models; and

28. Over and above the steps outlined in paragraph 27 there also remains the possibility for CCSBT to implement a TAC reduction as soon as possible. Given the uncertainty in recruitment trends the SC cannot at this point advise on what level of TAC reduction would provide for specified probabilities of rebuilding. However, any TAC reduction would increase the probability of stock recovery under all possible recruitment scenarios

5.4 SBT management objectives

29. CCSBT-ESC/0409/35, which was also discussed at SAG5, contains a summary of views on alternative management objectives, including issues related to MSY, implementation of an MP and management targets based on comparison of projections under current catch and no catch.

30. CCSBT-ESC/0409/22 considers a number of approaches that can be used to define rebuilding objectives. The attention of the Commission is drawn to these various options, which include:

- Empirical / historical factors, such as SSB in 1980;
- Depletion level of spawner biomass as a ratio of some reference level;
- Recruitment trends relative to some desired recruitment level;
- Productivity of the stock (e.g. in relation to B_{MSY}); and
- Biomass relative to maximum possible re-building within a specified timeframe.

31. The ESC noted the practical difficulties experienced in estimating absolute levels of e.g. spawner biomass, determining levels of B_{MSY} or interpreting recent recruitment trends. It was noted that performance measures being evaluated during the MP development process would provide information to assist in measuring performance in relation to these various rebuilding objective options, with the exception of the last option. However, this could be evaluated by comparing (1) projections under constant catch, or (2) management procedures and zero catch. The review process at the final MP4 workshop, and in preparation for SAG6, should therefore provide performance indicators to assist managers to evaluate MP performance against any of these rebuilding objective options.

32. With specific regard to performance relative to MSY, the Extended Scientific Committee was requested by CCSBT 10 to investigate and report on levels of uncertainty in determining B_{MSY}, and how effectively candidate MPs deal with this uncertainty and manage towards B_{MSY}. It was noted that the MP process would help to inform SC10 to advise the Commission on this question.

Agenda Item 6. Management procedure

6.1 Evaluation of results of the updating of the operating model and testing of the chosen MPs.

33. Dr Ana Parma of the Advisory Panel reported to the meeting on progress made during the extensive technical working group discussions held throughout the SAG5 and ESC9 meetings on updating of the MP operating model and a process for selecting a new reference set and robustness trials for the final phase of MP evaluation.

34. This process had started inter-sessionally with evaluation of the performance of the original reference set, updated with new data. This "mechanical update" did not provide an adequate representation of the fishery, and work was initiated to try and resolve a number of identified problems. In particular, substantial work was done to evaluate sensitivity of the model to a number of influential inputs. Key areas of work included:

    - The old OM with updated data favoured possibly unrealistically high values of M, and work was done to ascertain from where the information driving the model on this comes;
    - The shape of the selectivity curve for the Indonesian fishery was cause for concern, and is also related to the high values of M; and
    - The old model with updated data had problems using the MCMC approach for evaluating uncertainty in projections. It was therefore decided to move to a simpler GRID approach, which spans the range in critical parameters (such as steepness, h, and M) and inputs (CPUE). Projections are run for each best fit in the matrix of parameters and inputs.

35. The detailed summary of evaluation work done and specifications for the updated OM and proposed core set of trials and sensitivity tests produced by the technical working group is shown in Attachment 5 of the SAG5 report.

36. Given the limited time for this intensive re-evaluation of the OM, it was not feasible to agree on a new reference set to use for MP evaluation. Instead, a core set of evaluations, together with a number of sensitivity trials, were selected for further MP development. The final revised reference set for final MP evaluation in preparation for SAG6 will be finalised at or before the 2005 MP4 workshop (see MP work plan options under Section 7.2).

Discussion of meta-rules

37. The ESC referred to the discussion on "meta-rules, assessments, and special circumstances" under agenda item 5 in the Report of the Third Meeting of the Management Procedure Workshop. The two major categories of meta-rules that deal with exceptional circumstances were discussed – (i) meta-rules outside the Management Procedure that address exceptional circumstances and that may result in the suspension of the MP while other actions are taken; (ii) meta-rules within the MP. It was agreed that the two categories of meta-rules should be developed in parallel; however if it is not possible to develop both, then priority should be given to defining exceptional circumstances that would result in triggering a meta-rule. It was also agreed that top priority should be given to meta-rules that will address the

issue of a continued reduction in recruitment, although meta-rules that address the issue of declines in spawning stock biomass should also be developed

Agenda Item 7. Workplan issues for 2005

7.1 Requirements/need for stock assessment in 2005

38. The ESC reviewed the fisheries indicators discussed in the fifth meeting of the SAG and contained in Attachment 7 of the SAG5 report.

39. The indicators reviewed included (i) agreed indicators for the 2003 SAG/SC, (ii) suggested additional indicators, and (iii) suggested analyses. The ESC divided these indicators and analyses into three separate categories – (i) agreed indicators to be developed and presented to the SAG in 2005, including indicators required for monitoring recruitment trends, (ii) additional optional indicators, and (iii) additional desirable analyses. The updated list of agreed and optional indicators and analyses for use in 2005 are shown at **Attachment 7**.

40. Regarding the assessment process for 2005, it was recommended that this would comprise two components:

- Critical evaluation of the indicators at **Attachment 7**, particularly the agreed indicators at the SAG6 meeting.
- Evaluation of results and projections of the final MP evaluation process to be conducted at the MP4 workshop and in preparation for SAG6. These will provide substantial information on projected stock trends under the assumed likely range of uncertainty in stock dynamics.

41. The ESC considered that one more year of data would not provide sufficient new information to resolve uncertainty in the model based assessments with respect to recent trends in recruitment or spawning stock biomass. Thus, it was agreed that the above two components would together constitute an adequate assessment process for 2005, and would allow national scientists to focus efforts on the work required to finalise evaluation of candidate MPs for presentation to CCSBT12.

7.2 Workplan and timetable for management procedure evaluation, including presentation of results to CCSBT 11

42. The OM technical working group developed alternate proposals for a work plan to finalise selection of the updated reference set and robustness trials, update MPs and evaluate MP performance using the updated OM and reference set (Attachment 6 to the SAG5 report).

43. Option A: This is similar to the process conducted during 2004, with two meetings required to finalise the MP evaluation work, these being the proposed MP4 workshop and the 2005 SAG6 meeting. Terms of Reference were developed for these meetings and are shown in SAG5 Attachment 6. These include finalisation of the reference set and robustness trials, development of a process to integrate results,

review and compare performance of candidate MPs and formulate recommendations for review by SAG6.

44. Option B: Under this option an additional "mini-meeting" is proposed before the MP4 workshop, with the Option A terms of reference divided between this mini-meeting and the MP4 workshop. In particular, the mini-meeting would be used to finalise the reference set and robustness trials, so that these are available for MP developers to use in evaluating their MPs before the MP4 workshop. This will be a small, highly technical meeting, involving participation of a few panel members, a programmer and likely up to 2 participants from each member country.

45. In both options, the SAG6 meeting will conduct a final review of the MP evaluations and the process to integrate results, review MP performances and make recommendations on which candidate MPs should be considered by CCSBT12.

46. Regarding the specific benefits of having an additional mini-meeting, the meeting noted the following:

    - Some of the results of testing the MPs would further inform the final evaluations at the MP4 workshop. For example, factors which are found to have little influence on results could be dropped from the reference set. It would therefore be desirable for members to have conducted some MP evaluations using a reference set agreed before the MP4 workshop.
    - The weight assigned to tagging data has been found to have an important effect on results. It is important that this be explored fully before members conduct final evaluations before SAG6. The mini-meeting will provide more time for this to be investigated.
    - The additional meeting will provide insurance against running into similar problems to the MP3 workshop in Busan, where there was not adequate time to test the implications of final changes made to the OM (under the "mechanical update") before members went away to test their MPs.

47. It was emphasized that members must make a commitment to come to the MP4 workshop with analyses that fully address all the key issues covered by a reference set, and with carefully considered proposals on how to modify the core set (interim reference set) at MP4. The mini-meeting would provide the opportunity to ensure that work done before MP4 can be based on trials that adequately represent the likely final reference set.

48. The issues of costs, venue requirements and availability of key personnel all have implications for a suitable venue for a mini-meeting. The Secretariat presented estimated costs for holding a 4 day meeting either in Seattle, Hobart or Canberra, which ranged from AU$72,000 to AU$78,000 (including interpretation) or AU$40,000 without interpretation.

49. After consideration of these options, the ESC expressed a preference for meeting in Seattle, should a mini-meeting be approved by the Commission. Most Advisory Panel members required for the meeting were based there, and adequate computer facilities were available to conduct the reference set evaluations. It was confirmed

that Dr Ianelli of the Advisory Panel would be able to arrange for a suitable venue for maximum 10 - 15 participants at no charge.

7.3 Other workplan issues

50. CCSBT-ESC/0409/45 considered a procedure for obtaining responses from a broad range of fisheries managers and stakeholder representatives to MP options through evaluation of stock and TAC trajectories from a selection of MP runs. A proposal for conducting such feedback at CCSBT11 was agreed by the meeting and is provided at **Attachment 8**. The purpose of this exercise is intended to help managers and stakeholders to gain a better appreciation of the range of performances among MPs across scenarios and to provide MP developers with insights on the range of characteristics that managers and stakeholders consider important in the performance of MPs. The results will not be considered to represent the Commission or Members evaluation of the relative performance for MPs. The results will also not be used by the SC in developing its specific recommendation on a choice of MPs. It was noted that the results will need to be interpreted with caution, as separate examination of individual scenarios does not allow a consideration of overall risk

Agenda Item 8. Implementation of the SRP

8.1 Characterisation of the SBT catch

51. The Data Manager presented paper CCSBT-ESC/0409/07 on characterisation of SBT catch. The paper summarised catch reporting by members in terms of both the types of catch effort and size data that have been submitted and the compliance of submitted data with the fields of information that are required to be provided. While members have provided fairly comprehensive data to the CCSBT, most members have not been able to fully comply with the complete standards at the present time. The Data Manager also advised that catch reporting to the CCSBT accounted for 99.7% of the known SBT catch (as reported in **Attachment 4**), but that an unconfirmed report of a small (5 t) SBT catch by EU vessels had been recently received. The IOTC is looking into this and will advise the Secretariat when further information is available.

52. Korea advised that its 2002 catch and effort data coverage was high but that its 2003 coverage was low due to difficulties in collecting data from fishing vessels. Korea also advised that it was trying to collect as much data as possible.

53. Korea was encouraged to consider the data collection programs of Japan and Taiwan as a possible means for reducing delays in data collection from its distant water fleet.

54. Japan reported that the RTMP data only included SBT targeting vessels for reasons of timely provision of data as non-SBT target vessels had to await their return to port to secure logbooks.

55. The Chair recognised that compliance with all the standards would take time to achieve, but he noted that complete data provision was very important particularly

noting the 2004 assessment outcome, and he encouraged all members to make progress towards full compliance as quickly as possible.

56. Paper CCSBT-ESC/0409/07 also identified two data reporting standards that had not been resolved at SC8 (reporting of species other than SBT and the geographic resolution of reported data) that were to be the subject of further discussion at this meeting.

57. The meeting did not attempt to resolve a standard for the geographical resolution of the data to be reported. Instead, the meeting accepted a previous agreement on this matter that if higher resolution data is required for assessment or detailed analysis, then the countries concerned would provide the necessary resolution of data for those agreed purposes.

58. Considerable discussion occurred in relation to the reporting of species other than SBT. Discussion focused on both the importance of this information for interpreting CPUE trends and changes in fishing practises affecting the SBT catch, and on difficulties that exist in the collection and provision of this information. The key points are summarised as follows:

- Data on the catch of species other than SBT are critical for understanding changes in CPUE and fishing fleet distribution patterns;
- Given the increasing need for submission of such data to the FAO and a number of RFMOs, members should be working towards maintaining complete and up-to-date databases of catches of all species;
- Further discussion will be required at future SC meetings regarding which subset of members' global multispecies databases (i.e. which fleet / area / time strata) will be required for SBT assessments;
- These further discussions should provide the basis for proposals regarding SBT data submission standards in this regard, for consideration by the Commission;
- In the interim, members should collect data on catch and effort for other species, and agree to provide such data if and when an assessment or associated analyses required these data.

8.2 CPUE interpretation and analysis

59. The report of the discussion of the CPUE modelling group is shown in **Attachment 9**. Little additional CPUE work was conducted during 2004, and no specific CPUE related work was proposed for 2005. However, once an MP is adopted, efforts should continue towards developing an agreed CPUE series for use in the MP decision rule and an updated set of CPUE series to be used in future assessments and conditioning of the operating model. It is likely that this will be needed for the first revision of the management procedure, and the report therefore contains a proposal for a specific CPUE working group meeting in 2006 or later.

8.3 Scientific observer program

60. Referring to the national fishery reports (CCSBT-ESC/0409/SBT Fisheries…) of Australia, Korea and the Fishing Entity of Taiwan and CCSBT-ESC/0409/30, members reported on the coverage of their observer programs in the last fishing season.

    - New Zealand reported that 100% of the Japanese charter fleet operations (350 sets and about 30% of the catch) was observed in 2003/04. In the domestic longline fishery, 131 sets were observed. The target of 10% coverage of sets was unlikely to be achieved for this fishery.
    - Australia reported that 13% of the purse seine fishery was observed representing 14 % of the Australian catch. Two tow cage operations (5%) were observed. Some problems were experienced with deployments early in the season, but this would be addressed in the next fishing season.
    - Korea indicated it began to deploy observers in its SBT fleet from 2004.
    - The Fishing Entity of Taiwan reported that two observers were deployed on their Indian Ocean fleet fishing for SBT in 2003, and that coverage of 2% of vessels was achieved. The coverage is expected to increase as the observer program is developed.
    - Japan reported observer coverage of 9% of vessels, 5% of hook numbers and 5% of SBT catch. Japanese observers need to be transported to fishing vessels at sea by support vessels and this results in increased costs, and risk of injury and reduced effective time available for observing activity.

61. From these reports, the Extended Scientific Committee noted that while the observer coverage targets had not been met for the majority of the fleets and catches, progress is being made towards the CCSBT target of 10% scientific observer coverage. It was noted that current observer coverage rates across the global fleet were inadequate to deliver the information listed below and for meeting the SRP objectives for scientific observer programs.

62. It was also recognised that there are significant practical problems in deploying observers on offshore longline vessels. However, members were encouraged to continue their efforts to improve observer coverage towards the levels recommended in the SRP. It was also noted that the agreed Scientific Observer Program standards include a standard format for annual national report sections on members' implementation of observer programs, and members were requested to follow these guidelines in reporting future observer activities.

63. The general types of information that can be generated by observer programs, and the value thereof in management of SBT, have been extensively discussed in developing the SRP and the CCSBT Observer Program Standards. In the light of recent evaluation of CPUE data, indicators and assessments by the SAG5 meeting, the ESC recognised a number of particularly important requirements for improved data from the CCSBT observer program:

    - Direct observation of tag recoveries, and comparative information to be used in assessing tag reporting rates from the observed fishery. These are critical to using tag return data to estimate fishing mortality (F), and deriving estimates of natural

mortality (M) by cohort. These estimates of M for young fish can, in turn, provide estimates of recruitment. These are some of the most important inputs to assessments and the Operating Model to underpin an SBT management procedure.

- Information on targeting, catch rates and environmental / oceanographic conditions during fishing. These are required to understand changes in fishing practices or behaviours in various fleet / area / time strata. In the light of recent substantial changes in fleet fishing patterns there are serious concerns that CPUE trends being used as the basis for stock assessments may be biased unless these factors are understood and integrated into CPUE standardisation.
- Specially trained observers are also in a position to actually tag fish. The technical review of the tagging program noted the need to spread tagging of small SBT over as wide a geographic range as possible to address questions regarding mixing, and to maximise the chance of returns of small fish from longline fisheries to improve estimates of M and F.
- Observers are also the best option for verifying catch-at-size data stratified by area and for providing more accurate estimates of size composition changes in SBT fisheries. In addition, observers are best positioned to collect otoliths stratified by size / area, to allow generation of valid catch-at-age matrices for fishery sectors. Both otolith data and catch at size data are required for direct age estimates of catch-at-age. The SAG and ESC have repeatedly emphasized the importance of moving towards direct ageing, and resultant accurate catch-at-age data are critical components of assessment models and for evaluating the impact of apparent reductions in recruitment in recent years.
- Information on by-catch rates of other species. A number of the longline fleets target a significant amount of effort on other species such as albacore, bigeye or yellowfin tuna, with fleets in some time/area strata only taking SBT as an incidental by-catch. There are strong indications in recent data of shifts in effort to other species, and it is important to know whether this results from reduced SBT abundance, or changes in targeting induced by other (e.g. economic) factors). Failure to correctly identify and incorporate reasons for shifts in effort can again strongly bias CPUE indices for SBT.
- In addition to the specific factors emphasised above in the light of the SAG5 review of indicators and assessments, observers are particularly useful for collecting information on ecologically related species and implementation of avoidance measures (required in terms of FAO International Plans of Action of Seabirds and Sharks), and collection of important biological information on maturity, breeding state, etc.

64. Regarding submission or exchange of actual observer program data, the ESC noted that the original SRP design stated that “The CCSBT Secretariat shall work with observer coordinators in member countries to assure that the data collected becomes part of the CCSBT data base as agreed in CCSBT protocols”.

65. The meeting discussed the need for provision of observer data to the CCSBT from members’ observer programs. It was agreed that the SC10 meeting in 2005 should consider proposals regarding the content and format of observer program data that

should be provided to the CCSBT database on a regular basis. Members were requested to develop proposals inter-sessionally, and bring proposals to the next meeting of the Extended Scientific Committee.

8.4 SBT tagging

66. The ESC noted the close relationship between the CCSBT supported conventional tagging program under the SRP and members' efforts on conventional, archival and pop-up tagging and in this report discussions of all these topics are grouped under this Section.

67. The Executive Secretary Presented paper CCSBT-ESC/0409/08 which review the surface fishery tagging program activities in 2003/04. The main elements of the report were:-

- 10,277 fish were tagged against the target of 15,000;
- Tagging in 2003/2004 was affected by weather conditions, some difficulty in locating fish, availability of the charter vessel and difficulty chumming fish to the surface. Unavailability of the vessel used for tagging due to commercial involvement at the peak of the fishing season also limited tagging time;
- Recovery arrangements were satisfactory at Port Lincoln and Mauritius although arrangements at Cape Town have not been satisfactory;
- A total of 853 of the surface fishery tagged fish had been recovered at the time of drafting this report, and the Secretariat has received details of over 350 additional recaptures since then; and
- Discussions for using staff from the Indonesian catch monitoring team to recover tags from the Indonesian fleet have commenced.

68. For 2005, emphasis would be placed on tag recovery and new publicity and reward material for the program. An independent agent would be sought at Cape Town to assist with tag recovery. This will increase cost slightly and the Extended Scientific Committee supported the draft budget of $692,000.

69. The importance of direct contact with vessels for achieving high recovery rates was noted and it was recommended to continue the current tag return monitoring arrangements in Port Lincoln and Mauritius. The meeting supported the proposal for enhancing tag recovery at Cape Town and the ESC Chair undertook to evaluate options for improving the promotion of tag returns from longline fleets using Cape Town harbour.

70. All members were asked to continue direct and regular contact with their vessels to promote tag returns. Taiwan confirmed that they will continue efforts to arrange for promotion of tag returns from their vessels in Cape Town, and would also continue to use observers to tag SBT on their vessels. It was noted that observers on Taiwanese vessels had already managed to deploy 35 archival tags.

71. The meeting endorsed the need to develop new publicity material and new rewards.

72. With regard to chartering of a vessel for surface fishery tagging in 2005, the Secretariat was requested to investigate options for using a larger vessel which could carry three taggers. This will increase the rate at which fish can be tagged. A larger vessel will also provide an opportunity for training participants from other CCSBT members in this program.

73. The importance of observers in optimising tag recovery and recapture information was discussed and it was agreed that this was a matter of the highest priority.

74. It was noted that the surface fishery tagging activities in 2003/04 had utilised most of the allocated 4 t SRP mortality allowance while tagging some 10,000 fish. It was recommended that the SRP mortality allowance for surface fishery tagging in 2004/05 should be increased to 8 t.

75. Australia presented paper CCSBT-ESC/0409/15 concerning tag seeding in the surface fishery in South Australia. Analysis of tag seeding for the first year has suggested a 65% reporting rate. Data are not complete for the current year. Further work is needed to develop more sophisticated estimation models for the seeding program data.

76. The ESC gave strong endorsement to the tag seeding program in the surface fishery and in particular that seeding should be conducted across the full set of tow cages to the extent possible.

77. Australia presented paper CCSBT-ESC/0409/46, which reported on the tagging program on the east coast of Australia. The main aspects were:-

    - 177 fish were tagged;
    - 23 pop-up tags were deployed;
    - by using short soak times mortality associated by the program was kept at low levels and totalled 4.05 t;
    - the pop-up tags have produced the first inter-ocean record of SBT migration; and
    - low abundance of SBT in the tagging area restricted the number of fish available for tagging.

78. Japan presented paper CCSBT-ESC/0409/37, which reported on the tagging program in the western Indian Ocean. The main points were:

    - 637 SBT were tagged; and
    - 80 archival tags were deployed.

79. Japan advised that it has appointed port liaison officers at Shimizu, Yaizu and Oigawa to assist in publicising of the tagging program and recovery of tags. In addition Japan has produced supplementary publicity material to that of the CCSBT to reinforce to industry the need for tag recovery. A booklet has been prepared for distribution in the Japanese fleet in which details of tag recovery can be recorded. The meeting noted Japan's efforts, particularly the appointment of port liaison officers.

80. Paper CCSBT-ESC/0409/36 provided details of tag recoveries by Japan. At the time of writing 34 tags had been recovered by port liaison officers (4 CCSBT SRP, 3 SRP Japan, 1 EFP, 26 CSIRO/NRIFSF RMP).

81. The second part of CCSBT-ESC/0409/46 presents an overview of the juvenile SBT Global Spatial Dynamics project. This has been designed to be a collaborative project between all participants in SBT fisheries to deploy 150 - 200 archival tags per year for three years, in juvenile SBT across as much of the SBT distribution range as possible. There is currently active collaboration between Australia, Taiwan and New Zealand in use of observers to deploy archival tags. Observers in these fisheries have been trained to deploy archival tags. Tags were released under this project in Western Australia the GAB, New Zealand and on the high seas, the latter in collaboration with observers on Taiwanese and New Zealand longline vessels.

82. CCSBT-ESC/0409/18 presented an initial proposal for a framework for collaboration / cooperation between all members in deploying archival tags across the SBT distribution range. CCSBT-ESC/0409/36 also proposed a plan based on review of current tagging program. The Secretariat was requested to bring this proposal to the attention of members and request feedback on their views regarding options for collaboration towards the concept of a joint collaborative project. Further consideration would need to be given to options at future SC meetings.

83. New Zealand reported on the tagging program being conducted in the New Zealand fishery. Implementation difficulties and the scarcity of small SBT meant that only four of the 50 archival tags were deployed off New Zealand vessels in 2003/04 under the collaborative tagging program.

84. The meeting noted that not all of the archival and pop-up tags being released have CCSBT contact details. It was noted that this might introduce biases into recovery data. Universal usage of CCSBT labelling and reporting arrangements was encouraged, noting that tagging data had implications for sub-stock structure and how assessments are done.

Technical Review of Tagging Program

85. The SC8 meeting recommended that a technical group be convened to review aspects of the tagging program. This technical group met outside the SAG5 meeting, and the *Report of the Technical Review of the Tagging Program* is shown in **Attachment 10**. This report makes a number of recommendations for improvement to the CCSBT tagging program, and proposes priorities for implementing these improvements. The ESC endorsed the report and recommendations of the technical review group.

8.5 Direct ageing

86. Members reported on progress with collection and reading of otoliths as agreed at the last meeting of the Extended Scientific Committee.

- Australia reported that 565 otoliths had been collected from its surface fishery in 2003 (CCSBT-ESC/0409/13). A large number of historically collected otoliths have been read, but those otoliths collected in recent seasons have not yet been read.
- Australia reported 1,503 otoliths had been collected in the Indonesian fishery in 2003 and 500 of these have been read. The age composition analysis is reported in paper CCSBT-ESC/0409/12.
- Korea indicated no otoliths were collected last year but collections have commenced in the current fishing season.
- The Fishing Entity of Taiwan advised that otoliths had been collected from 102 SBT in 2003 and 200 were targeted in 2004. The ageing analysis of the otoliths collected in 2003 is provided in CCSBT-ESC/0409/47.
- New Zealand indicated 1133 pairs of otoliths were collected in 2003/04 but none have been read to date.
- Japan collected 500 otoliths in 2003 (CCSBT-ESC/0409/SBT Fisheries-Japan). Priority has been given to re-reading otoliths collected in the past in accordance with the agreed CCSBT otolith interpretation standards. When this task is completed, reading of the 2003 otoliths will commence.

87. Members agreed that reading and analysis of the otoliths collected was a priority to provide direct ageing data for assessments, and were encouraged to move towards annual interpretation of collected otoliths as a regular input to indicators and assessments.

88. The SC8 meeting had also requested members to conduct analyses to indicate whether the proposed otolith collection strata (by fishery, time or area) could be refined or improved in any way. Australia reported on a paper[1] analysing age-at-length for the Japanese longline fishery. Results indicated no significant differences in age-at-length over the fishery, and therefore there may be no need to further divide the Japanese fishery otolith collection into finer strata. It was confirmed that the Taiwanese longline fishery must be retained as separate strata for otolith collection purposes, to provide specific catch-at-age data.

89. It was agreed that data from reading of otoliths should be exchanged before the next Extended Scientific Committee meeting allow all members to conduct analyses related to otolith sampling requirements. In this context all members were encouraged to read the otoliths they have collected in order to meet the commitment made at SC8.

[1] Gunn, J.S., Farley, J. and Hearn, W. (2003). Catch-at-age; age at first spawning; historical changes in growth; and natural mortality of SBT: An integrated study of key uncertainties in the population biology and dynamics of SBT based on direct age estimates from otoliths. FRDC Project 97/111 Final Report. 91pp.

8.6 Other SRP components

90. Papers CCSBT-ESC/0409/18, CCSBT-ESC/0409/39, CCSBT-ESC/0409/40, CCSBT-ESC/0409/46 and CCSBT-ESC/0409/Info 06 contained information relating to other components of the SRP, particularly related to recruitment monitoring survey work.

91. CCSBT-ESC/0409/39 provided results of the Japanese spawning ground longline survey, which has been conducted for the past three years. Due to funding constraints Japan intended to terminate this work.

92. Papers CCSBT-ESC/0409/Info-06 and CCSBT-ESC/0409/46 contain proposals for surveys under the joint Australian-Japanese Recruitment Monitoring Program (RMP) in Australian waters. The Japanese component consists of a reduced scale acoustic survey and feasibility study of alternative survey design, and the Australian component an aerial spotting survey, for age 2 - 4 SBT in the GAB.

93. Similar RMP surveys have been conducted since 1988. Both acoustic and aerial surveys have encountered difficulties in logistics, calibration and data interpretation in the past. Core issues relate to the assumptions regarding the proportion of SBT entering the survey areas each year. The inability to estimate abundance of individual cohorts in the GAB as they form mixed schools, calibration of spotters or acoustic systems and ground-truthing of survey estimates. Past meetings of the SAG and SC have therefore been cautious in utilising recruitment trends from these surveys. However, the similarity between these recruitment indices and other recent indicators or assessment results has provided increased confidence in the recruitment survey results.

94. Proponents of the aerial survey noted that most of the past problems had been extensively addressed, and the sources of uncertainty in underlying assumptions and survey design were now well understood. It now appears to be feasible to implement an aerial survey with expected CVs of 20% - 30%. Availability of recruitment indices with these CVs would contribute to a substantial advance in SBT assessments.

95. Japan advised that the acoustic survey would likely provide a qualitative indicator and a useful early warning signal regarding recruitment of one year old SBT.

96. CCSBT-ESC/0409/40 informed the review workshop of the recruitment monitoring program, noting that we should now be in a position to move out of the research phase of these surveys towards routine monitoring of SBT recruitment.

97. The ESC noted past SAG advice that reliable indicators of recruitment would be highly valuable inputs to the SBT assessment process. Survey design and results of proposed survey work needs to be reviewed, and the ESC supported the proposal for a Recruitment Monitoring Review Workshop to be held in December 2004. An invitation to the workshop is open to all members of the CCSBT.

98. Given the re-assurances regarding survey design and review, the ESC supported the proposed recruitment monitoring surveys. Considering the strong indications of reduced SBT recruitment in recent years, and the potential implications of this for

SBT management, the ESC further agreed that recruitment monitoring should be elevated in priority within the SRP, and should be considered to be one of the highest priority SRP research components.

Agenda Item 9. Development of the CCSBT database

99. The Data Manager presented paper CCSBT-ESC/0409/09 which described the current status of the database, participation on FAO's FIGIS/FIRMS system and options for providing access to CCSBT data.

9.1 Status of the CCSBT database

100. It was noted that the database contained seven data modules, four of which (catch and effort, catch at size, raised catch, and tag / recapture) were provided with the CCSBT data CD that was sent to members in April 2004. The Data Manager advised that with the exception of recent tag recapture data from the surface fishery, the database is up to date with data received having been entered or loaded onto the database.

9.2 Participation in FAO's FIGIS/ FIRMS system

101. The meeting was informed of the data that the CCSBT needed to provide to the FIGIS/FIRMS system. The Secretariat advised that it intended to provide the required information using the same preparation procedures as it used to prepare the SBT catch by ocean data presented in Section 4.2. There were no objections to this proposal.

102. It was noted that production of the catch weight data in the strata required by FAO required significant data preparation (including conversion of numbers to weights and raising of weights) and that as a consequence the data might differ from data that have been provided by members to FAO and other RFMO's in the past[2]. It was recommended that when providing data to FIGIS/FIRMS, it should be mentioned that the data are from the CCSBT database and because of the raising procedures adopted by the CCSBT, they may differ from data sets that have been submitted by individual members.

9.3 Options for providing access to CCSBT data

103. The SC8 meeting noted the possibility of providing access to CCSBT data through annual data reports. This particular avenue for providing access to CCSBT data has not been progressed, but the present meeting agreed that other initiatives by the

[2] In the case of Japan's longline fishery, such differences will also arise because for all years since 1995, Japan has provided different data to CCSBT than it has to other RFMO's.

CCSBT for providing access to its data were providing sufficient data for the public at the present time. These initiatives include:

- Publication of selected trade information scheme data on the CCSBT web site;
- Publication of national catch effort and size data on the CCSBT web site (to happen in late 2004);
- Provision of data and reports to the FAO's FIGIS/FIRMS system; and
- Preparation of an annual SBT stock status report for other RFMO's.

104. It was agreed that before publishing national catch and effort data on the CCSBT web site, the Secretariat would seek comment from members in relation to the descriptions that will be provided for the national catch effort datasets.

Agenda Item 10. Data exchange

10.1 Review of data exchange in 2004

105. The Data Manager presented Section 1 of paper CCSBT-ESC/0409/10 which reviewed problems that occurred in the data exchange during 2004. The main problems included:

- Late submission of data;
- Submission of incorrect data and subsequent confusion regarding the latest versions of data when corrected data were submitted;
- Delays in determining which historical data to use for the assessment and update of the operating model; and
- Some incomplete data being provided.

106. Paper CCSBT-ESC/0409/10 also presented some recommendations for future data exchanges that were agreed by the meeting, these were:

- The Secretariat would place a file on the private area of the web site which clearly indicated the data provision requirements of each member and whether or not the data have been provided;
- For the data exchange, the latest version of each dataset provided would be placed on the private area of the web site. If necessary, password protected files would be used for datasets that were considered particularly sensitive;
- A detailed description should be provided of any revised historical data that are provided in the future. In addition, any revisions to historical data (except a routine update of the most recent year of data and very minor corrections to older data) would not be used until discussed at the next SAG/SC unless there was specific agreement to the contrary; and
- All data provision requirements need to be fully specified so that there is no uncertainty in the data provision requirements or about how the data need to be generated.

107. The meeting expressed concern at the delays in the data exchange and stressed the importance of members meeting the required deadlines. Additional recommendations that arose during discussion included:

- That the timing of future data submission should be reconsidered in light of problems that most members appear to be having in relation to the specified deadlines; and
- A full data exchange should be conducted each year regardless of whether a full stock assessment is to be conducted. This should result in a more automated process and help to overcome problems that occur in stock assessment / OM update years when additional data would otherwise be required.

10.2 Requirements of data exchange in 2005

108. A working group met to advise on the data exchange requirements for 2005. The agreed requirements are at **Attachment 11**. These requirements reflect this meeting's recommendation that a full data exchange should be conducted each year regardless of whether a full stock assessment is to be conducted.

109. The working group also considered that there would be value in holding a two day data review workshop to revise and properly document the data preparation practices adopted by the CCSBT. However, given the workload for 2005, it was felt that such a workshop could not be held before 2006.

Agenda Item 11. Monitoring of Indonesian catch

110. The ESC noted that CCSBT10 had specifically requested advice from the ESC8 regarding the importance of the Indonesian catch monitoring program, the use made of results of this monitoring and the scientific requirements regarding continuation of such monitoring. It was noted that this request had been made as a consequence of planned termination of direct Australian funding for this monitoring at the end of 2004, and indications that the IOTC/OFCF will decrease or terminate IOTC/OFCF funding for monitoring once initial development and implementation of the IOTC/OFCF monitoring program in Indonesia is completed in mid-2005.

111. Papers CCSBT-ESC/0409/11 and CCSBT-ESC/0409/12 provide information on the sampling activities and results of recent monitoring of Indonesian catch. Eleven years of continuous monitoring of the Indonesian fishery have provided the CCSBT with an invaluable source of information on the impact of the Indonesian fishery on the SBT stock and the changes in the size and age composition of the spawning stock.

112. The meeting agreed that the data resulting from this monitoring program were essential to understanding the impact of the Indonesian fishery on the SBT spawning ground, and providing assessment inputs on the adult (spawner) component of the stock. Sampling at Indonesian ports was also providing the main source of otoliths for determination of age-at-length and age composition of the adult stock.

113. The ESC noted that various shortcomings remained in data collected from Indonesian fisheries, and that improvements were required to facilitate separation of changes in catches from changes in CPUE indices. Australia noted that there is an ACIAR funded program under development by CSIRO and RIMF to evaluate additional observer records that may provide insights into these CPUE changes. The various current monitoring and data collection activities provide different data:

- The IOTC / RIMF / CSIRO / OFCF program is adequate for providing catch and size data.
- The IOTC program does not collect otoliths, but these have been collected by CSIRO / RIMF.
- Neither of these current activities provides adequate information on changes in fleet dynamics and fishing patterns to understand the relationship between recent changes in catch and CPUE.

114. It was recognised that Indonesia does have the capacity to continue these activities, in terms of trained and experienced port samplers. However, there are serious concerns that monitoring will not continue or may produce inadequate data if external funding sources are withdrawn. The ESC specifically considered the importance of Indonesian monitoring data to the SBT assessment and management process, and what would be lost to the process if monitoring were to discontinue. The table below summarizes the key outputs from the monitoring and their role in SBT stock assessments:

115. Regarding the evaluation of what CCSBT would lose if the Indonesian monitoring were to be discontinued, or downgraded, the ESC noted that the major impacts of this would be:

- As the vast majority (>95%) of catch taken by CCSBT members is of sub adult fish, the CCSBT would have no reliable information on the size and age composition of the SBT spawning stock with which to gauge the impact of current and future management measures on the spawning stock composition;
- There would be limited or no information on removals from the spawning stock by the Indonesian fishery. Catch levels in this fishery over the last ten years have been between 300-2500 t. At the estimated current spawning stock biomass this level of fluctuation in removals has the potential to appreciably affect the accuracy of stock assessments;
- The CCSBT would have limited ability to validate the catch by Indonesia against any quota agreed as a national allocation;
- Lack of monitoring would prevent assessment of changes in operations of the Indonesian fleet and foreign fleets operating under the Indonesian flag;
- Lack of information on age structure of the SBT catch as a direct input into the stock assessment would induce increase uncertainty in estimated recent changes in the spawning stock and predictions about impact of future catches;
- Lack of data for estimating the age at maturity and relative spawning potential and possible changes in these over time;

- A break in the continuity of size/age monitoring would significantly compromise the tracking of cohorts recently recruited into the spawning stock, cohorts that will likely be the principal source of recruits into the future (representation of the 70's and 80's cohorts is very low); and
- Termination of this program would result in loss of accumulated experience and infrastructure in Indonesia necessary for collecting this information.

116. The ESC therefore considers the continuation of monitoring activities in Indonesia is an essential element of the CCSBT SRP catch characterisation.

117. Regarding responsibility for such monitoring, the ESC noted the importance of collecting information on all tuna species in the Indonesian fishery, particularly in the light of recent Indonesian SBT catch declines and indications of shifts in targeting to yellowfin or bigeye.

Agenda Item 12. Consideration of the 5th ERSWG Report

118. The meeting considered the report of the 5th meeting of the CCSBT Ecologically Related Species (ERS) Working Group. The Chair noted the similarity in debates taking place at the ERS WG and the SC regarding data requirements for addressing the respective terms of reference of these groups, and problems associated with providing by-catch data. In particular, there is increasing awareness of the need for data on other species by-catch to understand important issues related to fleet behaviour patterns, and their effects on SBT management.

119. The ESC acknowledged the good work of the ERS Working Group, and endorsed the report of the group.

Agenda Item 13. Overview, time schedule and budgetary implications of proposed 2005 research activities

120. The meeting considered a timetable and budgets for research activities in 2005. The agreed timetable and budget, including options for managing further work on the development of the management procedure are provided below:

Activity	Approximate Period	Budgetary Implications
Report to other RFMO's	November 2004	N/A
Surface fishery tagging program	Dec 2004 – March 2005	$592,000
Secretariat coordination of the tagging program		$100,000
MP Option A (see SAG5, Attachment 6): Extended 4th Management Procedure Workshop	8 days, Apr 2005 ?	$300,000
MP Option B (see SAG5, Attachment 6): Small technical workshop to determine reference set and robustness trials for the MP operating model (assuming no interpretation and no Secretariat support)[3] MP Option B (see SAG5, Attachment 6): 4th Management Procedure Workshop	4 days, Early February 2005 6 days, end May 2005 ?	$40,000 $232,000
Management Procedure consultation options: - Feedback by member scientists. - Append one day to MP4 workshop. - Append one day to SC10 meeting. - Append one day to CCSBT12.	1 day, some time after MP4 workshop	Cost dependent on consultation option chosen
Data exchange	April and May 2005	N/A
6th Stock Assessment Group Meeting.	First week in September 2005	$197,000
10th Scientific Committee Meeting.	Second week in September 2005	$131,000
Presentation of ESC report to Extended Commission at CCSBT12	Third week in Oct 2005	N/A

[3] The Extended Scientific Committee agreed that members must bring proposals and analyses to this meeting so that the meeting can conclude the reference set and robustness trials. If this task is not completed the work of the management procedure workshop to evaluate the management procedures will be compromised and possibly affect the capacity of the Extended Scientific Committee to make final recommendations to the Extended Commission at CCSBT12.

Agenda Item 14. Other matters

121. The total SRP mortality allowance requested to support tagging activities under the SRP was 50 tons, consisting of the following requests:

- 8 t was requested for the CCSBT surface fishery tagging;
- Australia requested 15 t for archival and pop-up tagging activities on the Australian east coast, and 12 t for tagging under the juvenile SBT Global Spatial Dynamics program. (Incidental mortality during observer tagging on Taiwanese vessels is included in this latter amount);
- New Zealand requested 5 t SRP mortality allowance for tagging activities in the New Zealand fishery; and
- Japan requested 10 t SRP mortality allowance for longline tagging on the high seas.

122. Japan requested a 1 t Research Mortality Allowance (RMA) for their acoustic survey program.

123. The Executive Secretary noted that he would be preparing a paper for CCSBT11 explaining the diversity of the use of mortality allowances across the various tagging operations.

Agenda Item 15. Adoption of meeting report

124. The report was adopted.

Agenda Item 16. Close of meeting

125. The Chair noted the substantial workload that had been dealt with during the SAG5 and SC9 meetings. This had resulted in a particularly heavy workload on Dr Ana Parma and the MP consultant. The members of the advisory panel and Vivian Haist were thanked for their efforts in dealing with this work load. The Chair requested that all members make every effort to participate energetically in the expected large amount of work of be done at the MP4 and SAG6 meetings in 2005.

126. The ESC noted that much of this work had resulted from the need to essentially run a management procedure workshop together with the SAG/SC meetings. The resultant requirement for protracted technical working groups had substantially reduced the time available for plenary debate of important scientific issues. This should be avoided at future meetings.

127. Members thanked Korea for hosting the meeting.

128. The meeting closed at 6:20pm on 16 September 2004.

List of Attachments

Attachment

Attachment 1

List of Participants
Extended Scientific Committee for Ninth Meeting of the Scientific Committee
13 - 16 September 2004
Seogwipo City, Jeju, Republic of Korea

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Attachment 2

Agenda
Extended Scientific Committee for Ninth Meeting of the Scientific Committee
13 - 16 September 2004
Seogwipo City, Jeju, Republic of Korea

1. Opening
   - 1.1 Introduction of Participants
   - 1.2 Administrative Arrangements

2. Appointment of Rapporteurs

3. Adoption of Agenda and Document List

4. Review of SBT Fisheries

5. Matters Arising from the Report of the 5th Stock Assessment Group Meeting
   - 5.1 Review of Fisheries Indicators and Assessment Results
   - 5.2 Status of the SBT Stock
   - 5.3 SBT Management Recommendations
   - 5.4 SBT Management Objectives

6. Management Procedure
   - 6.1 Evaluation of Results of the Updating of the Operating Model and Testing of the Chosen MPs.

7. Workplan Issues for 2005
   - 7.1 Requirements/need for Stock Assessment in 2005
   - 7.2 Workplan and Timetable for Management Procedure Evaluation, Including Presentation of Results to CCSBT11
   - 7.3 Other Workplan Issues

8. Implementation of the SRP
   - 8.1 Characterization of SBT Catch
   - 8.2 CPUE Interpretation and Analysis
   - 8.3 Scientific Observer Program
   - 8.4 SBT Tagging Program
   - 8.5 Direct Ageing
   - 8.6 Other SRP Components

9. Development of the CCSBT Database
   - 9.1 Status of the CCSBT database
   - 9.2 Participation in FAO's FIRMS/FIGIS System
   - 9.3 Options for Providing Access to CCSBT Data

10. Data Exchange
   - 10.1 Review of Data Exchange in 2004
   - 10.2 Requirements for Data Exchange in 2005.

11. Monitoring of Indonesian Catch

12. Consideration of the 5th ERSWG Report

13. Overview, time schedule and budgetary implications of proposed 2005 research. activities.

14. Other Matters

15. Adoption of Meeting Report

16. Close of Meeting

Attachment 3

List of Documents
Fifth Meeting of the Stock Assessment Group and
Extended Scientific Committee for the Ninth Meeting of the Scientific Committee

(CCSBT-ESC/0409/)

01. Draft Agenda of 5th SAG
02. List of Participants of 5th SAG
03. Draft Agenda of the Extended SC for 9th SC
04. List of Participants of the Extended SC for 9th SC
05. List of Documents－The Extended SC for 9thSC&5th SAG
06. (Secretariat) 4. Review of SBT Fisheries
07. (Secretariat) 8.1. Characterization of SBT Catch
08. (Secretariat) 8.4. SBT Tagging Program
09. (Secretariat) 9. Development of the CCSBT Database
10. (Secretariat) 10. Data Exchange
11. (Australia) The catch of SBT by the Indonesian longline fishery operating out of Benoa, Bali in 2003.: R. Andamari, D. Retnowati, T.L.O. Davis, M. Herrera, F. Poisson and C.H. Proctor.
12. (Australia) Update on the length and age distribution of SBT in the Indonesian longline catch on the spawning ground.: Farley, J.H. and Davis, T.L.O.
13. (Australia) An update on Australian Otolith Collection Activities: 2003/04.: Stanley, C. & Polacheck, T.
14. (Australia) Review of Methods for Estimating Tag Reporting Rates and Their Applicability to SBT Longline Fisheries.: Tom Polacheck, Paige Eveson and Geoff Laslett.
15. (Australia) Update on Tag Seeding Activities and Preliminary estimates of reporting rate from the Australian surface fishery based on tag seeding experiments.: Tom Polacheck and Clive Stanley.
16. (Australia) Exploring trade-offs in experimental design of a 2-fishery integrated tag-recapture and catch model for estimating mortality rates and abundance.: Paige Eveson, Tom Polacheck and Geoff Laslett.
17. (Australia) An evaluation of abundance estimates from tagging programs when tag returns are only available from one component of a multi-component fishery: an example based on the 1990’s southern bluefin tuna tagging program.: Tom Polacheck, Paige Eveson and Geoff Laslett.
18. (Australia) A Proposal for Multi-lateral Co-ordination and Co-Operation in Electronic Tag Deployment under the CCSBT Scientific Research Programme.: T.

Polacheck, J. Gunn and A. Hobday

19. (Australia) Aerial survey indices of abundance: comparison of estimates from line transect and “unit of spotting effort” survey approach.: Farley, J., Bestley, S. Campbell, S. and Hartmann, K.
20. (Australia) Trends in catch, effort and nominal catch rates in the Japanese longline fishery for SBT – 2004 update.: Hartog, J., T. Polacheck and S. Cooper.
21. (Australia) Fishery indicators for the SBT stock 2003/04.: T. Polacheck, D. Kolody, M. Basson, J. Gunn.
22. (Australia) Further consideration of issues related to setting rebuilding objectives for southern bluefin tuna in the context of management procedures.: M. Basson and T. Polacheck.
23. (Australia) Assessment and projections of SBT stock assessment and summary of agreed stock status reference points.: M. Basson, D. Kolody, T. Polacheck, A. Preece, J. Hartog.
24. (Australia) Implications for management procedure evaluation: the mechanical update and further exploration of the operating model.: M. Basson, T. Polacheck, D. Kolody, A. Preece, J. Hartog.
25. (Australia) Examples of management procedure behaviour changes in response to operating model updating.: D. Kolody, J. Hartog.
26. (Australia) Preparation of Australia's Catch and Effort Data Submission to the CCSBT Stock Assessment Group and Management Procedure Workshop 2004.: Hobsbawn, P.I., Sahlqvist, P.C., McLoughlin, K.J.
27. (Australia) Data post-processing for input to the 2004 stock assessment and comparison of the 2001 and 2004 assessment datasets.: A. Preece, S. Cooper, J. Hartog.
28. (Australia) The need for an aerial survey to provide a fishery independent index of recruitment for SBT.: A. Hobday, J. Gunn, T. Polacheck, M.V. Bravington.
29. (Japan) Tuning of the D&M Management Procedure under the Panel’s Updated Operating Models.: Doug Butterworth and Mitsuyo Mori
30. (Japan) Observer Program Report.: T. Itoh, K. Miayuchi.
31. (Japan) Preparation of Japanese catch/effort and size data and CPUE series for 2004 stock assessment and mechanical update of Operating Model.: S. Tsuji, N. Takahashi, M. Nagasaka, T. Itoh.
32. (Japan) Update of ADAPT VPA and projection in 2004.: K. Hiramatsu, S. Tsuji.
33. (Japan) Update of length-based VAP in 2004.: H. Kurota, N. Takahashi.
34. (Japan) Summary of fisheries indicators in 2004.: S. Tsuji, T. Itoh, N. Takahashi.
35. (Japan) Consideration on alternative Management Objectives for the CCSBT.: S. Tsuji.
36. (Japan) Review of the current CCSBT Tagging Program and potential improvements.: N. Takahashi, S. Tsuji, H. Kurota.

37. (Japan) Report of 2003/2004 results and proposal for 2004/2005 activities on CCSBT tagging by Japan.: T. Itoh, N. Takahashi, S. Tsuji.
38. (Japan) Report of 2003/2004 activities using the Research Mortality Allowance (RMA) and application for 2004/2005 RMA.: H. Taguchi
39. (Japan) Results of SBT spawning area surveys.: T. Itoh, H. Kurota, A. Hirai.
40. (Japan) Draft proposal of Recruitment Monitoring Program Review Workshop.; S. Tsuji, J. Gunn.
41. (Secretariat) Record of discussion leading to a change in decision on data to be used in the 2004 Assessment.
42. (Advisory Panel) Report from Panel Meeting Held at NOAA Alaska Fisheries Laboratory, Seattle, 20-23 July 2004 (to be prepared by Panel).
43. (Japan) Attempt for multiple imputation of SBT-CPUE using new statistical method.: Hiroshi SHONO.
44. (Japan) Behaviors of the HK5 management procedure under the updated operating models.: Hiroyuki KUROTA.
45. (Japan) Proposed procedure of selecting agreeable Management Procedure and results of feasibility experiment.: S.Tsuji, T.Kouya, K.Miyauchi
46. (Australia) Report on Australia's SRP Tagging Activities in 2003/2004 and Plans for 2004/2005.: Tom Polacheck, John Gunn, Thor Carter and Jay Hender.
47. (Taiwan) A short report on the collection and reading of otoliths collected from Taiwanese longline vessels.: Jen-Chieh Shiao and Wann-Nian Tzeng.

(CCSBT-ESC/0409/SBT Fisheries)

Australia	Australia's 2002-03 Southern Bluefin Tuna Fishing Season.: Hobsbawn, P.I., Findlay, J.D., McLoughlin, K.J. and Curran, D.
Japan	Review of Japanese SBT Fisheries in 2003.: Itoh, T. and Miyauchi, K.
Fishing Entity of Taiwan	Review of Taiwanese SBT Fishery of 2002/2003
New Zealand	The New Zealand Southern Bluefin Tuna Fishery in 2003.: Kendrick. T. and Murray, T.
Republic of Korea	Korean SBT Longline Fishery.: Moon, D., Koh, J. and Kim, S.

(CCSBT-ESC/0409/Info)

01. (Secretariat) CCSBT Report to ICCAT (to be prepared at SC9)
02. (Australia) An approach for assessing the compatibility between a stock assessment and fishery independent indices of juvenile abundance.: M. Bravington, W.N. Venables, P. Toscas

03. (Australia) Extracts from SESAME: a simulation-estimation stock assessment model evaluation project focused on large pelagic species.: Kolody, D.S., P.C. Jumppanen, D.G.Ricard, J.R. Hartog, A.L. Preece, T. Polacheck.

05. (Japan) Report of the 2003 Shoyo-maru cruise – SBT spawning ground survey.: NRIFSF

06. (Japan) Cruise proposal for the 2004/2005 SBT Acoustic Monitoring Survey of the Recruitment Monitoring Program.: NRIFSF, JFA.

(CCSBT-ESC/0409/Rep)

01. Report of Tagging Program Workshop (October 2001)

02. Report of the First Meeting of Management Procedure Workshop (March 2002)

03. Report of the CPUE Modeling Workshop (March 2002)

04. Report of Direct Age Estimation Workshop (June 2002)

05. Report of the Third Stock Assessment Group Meeting (September 2002)

06. Report of the Seventh Meeting of the Scientific Committee (September 2002)

07. Report of the Ninth Annual Commission Meeting (October 2002)

08. Report of the Second Meeting of the Management Procedure Workshop (April 2003)

09. Report of the Indonesian Catch Monitoring Review Workshop (April 2003)

10. Report of the Fourth Meeting of the Stock Assessment Group (August 2003)

11. Report of the Eight Meeting of the Scientific Committee (September 2003)

12. Report of the Tenth Annual Meeting of the Commission (October 2003)

13. Report of the Fifth Meeting of the Ecologically Related Species Working Group (February 2004)

14. Report of the Third Meeting of the Management Procedure Workshop (April 2004)

15. Report of the Special Meeting of the Commission (April 2004)

Global Catch by Flag

Catches are presented as whole weights in tonnes. Numbers in **bold** font differ from those in Attachment D of the SC8 Report. ***All 2003 figures are to be considered preliminary.***

Calendar Year	Australia	Japan	New Zealand	Korea*	Taiwan	Philippines	Indo.	Misc	Total (excludes 'other')	Other
1952	264	565	0	0	0	0	0	0	829	
1953	509	3,890	0	0	0	0	0	0	4,399	
1954	424	2,447	0	0	0	0	0	0	2,871	
1955	322	1,964	0	0	0	0	0	0	2,286	
1956	964	9,603	0	0	0	0	0	0	10,567	
1957	1,264	22,908	0	0	0	0	0	0	24,172	
1958	2,322	12,462	0	0	0	0	0	0	14,784	
1959	2,486	61,892	0	0	0	0	0	0	64,378	
1960	3,545	75,826	0	0	0	0	0	0	79,371	
1961	3,678	77,927	0	0	0	0	0	0	81,605	
1962	4,636	40,397	0	0	0	0	0	0	45,033	
1963	6,199	59,724	0	0	0	0	0	0	65,923	
1964	6,832	42,838	0	0	0	0	0	0	49,670	
1965	6,876	40,689	0	0	0	0	0	0	47,565	
1966	8,008	39,644	0	0	0	0	0	0	47,652	
1967	6,357	59,281	0	0	0	0	0	0	65,638	
1968	8,737	49,657	0	0	0	0	0	0	58,394	
1969	8,679	49,769	0	0	80	0	0	0	58,528	
1970	7,097	40,929	0	0	130	0	0	0	48,156	
1971	6,969	38,149	0	0	30	0	0	0	45,148	
1972	12,397	39,458	0	0	70	0	0	0	51,925	
1973	9,890	31,225	0	0	90	0	0	0	41,205	
1974	12,672	34,005	0	0	100	0	0	0	46,777	
1975	8,833	24,134	0	0	15	0	0	0	32,982	
1976	8,383	34,099	0	0	15	0	12	0	42,509	
1977	12,569	29,600	0	0	5	0	4	0	42,178	
1978	12,190	23,632	0	0	80	0	6	0	35,908	
1979	10,783	27,828	0	0	53	0	5	4	38,673	
1980	11,195	33,653	130	0	64	0	5	7	45,054	
1981	16,843	27,981	173	0	92	0	1	14	45,104	
1982	21,501	20,789	305	0	182	0	2	9	42,788	
1983	17,695	24,881	132	0	161	0	5	7	42,881	
1984	13,411	23,328	93	0	244	0	11	3	37,090	
1985	12,589	20,396	94	0	241	0	3	2	33,325	
1986	12,531	15,182	82	0	514	0	7	3	28,319	
1987	10,821	13,964	59	0	710	0	14	7	25,575	
1988	10,591	11,422	94	0	856	0	180	2	23,145	
1989	6,118	9,222	437	0	1,395	0	568	103	17,843	
1990	4,586	7,056	529	0	1,177	0	517	4	13,870	
1991	4,489	6,477	164	246	1,460	0	759	97	**13,691**	
1992	5,248	6,121	279	41	1,222	0	1,232	73	14,217	
1993	5,373	6,318	217	92	958	0	1,370	17	14,344	
1994	4,700	6,063	277	137	1,020	0	904	54	13,154	
1995	4,508	5,867	436	365	1,431	0	829	201	13,637	
1996	5,128	6,392	139	1,320	1,467	0	**1,614**	295	16,356	
1997	5,316	5,588	334	1,424	872	0	2,210	333	**16,076**	
1998	**4,897**	7,500	337	1,796	1,446	**5**	1,324	**471**	17,776	
1999	5,552	7,554	461	1,462	1,513	**80**	2,504	**403**	19,529	
2000	5,257	6,000	380	1,135	1,448	**17**	1,203	**31**	15,472	
2001	4,853	6,674	358	845	1,580	**43**	1,632	**41**	**16,026**	4
2002	4,711	6,192	450	746	1,137	**82**	**1,691**	**203**	**15,212**	17
2003	*5,822*	*5,762*	*389*	*254*	*1,128*	*68*	*555*	*45*	*14,024*	*17*

Philippines: The Philippines became a cooperating non member of CCSBT during 2004, so its catch is now specifically identified (in previous years this was incorporated in the "Misc" category). In addition, catch figures provided by the Philippines are now used for the Philippines catch from 2000 instead of Japanese import statistics. This has resulted in an increase in overall catch of approximately 24, 19 and 16 tonnes for 2001, 2002 and 2003 respectively over previously used figures.

Misc: SBT catch other than those listed (obtained from Japanese import statistics). For 2003, this comprises China (~40t) and South Africa (~5t).

Other: Mortality of SBT from other sources that have not been included in country figures. This includes mortality that occurred during research programs including the CCSBT Scientific Research Program. This information has yet to be compiled for years prior to 2001.

*: Japanese Import Statistics for 1993, 1994, and 1998 are higher than these official statistics and are: 117, 147, and 1897 respectively. Assessments would normaly used the higher of these values.

Attachment 5

Global Catch by Gear

Catches are presented as whole weights in tonnes. **All 2003 figures are to be *considered preliminary.***

Catches from Indonesia and the "Misc" category of countries were assigned to the longline fishery. Catches from other line fisheries not listed below (such as "minor line") were also assigned to the longline fishery.

		Surface Fisheries				
Calendar Year	Longline	Purse Seine	Pole and Line	Trol	Handline	Gill Net
1952	565	264			0	0
1953	3,890	509			0	0
1954	2,447	424			0	0
1955	1,964	322			0	0
1956	9,603	964			0	0
1957	22,908	1,264			0	0
1958	12,462	2,322			0	0
1959	61,892	2,486			0	0
1960	75,826	3,545			0	0
1961	77,927	3,678			0	0
1962	40,397	4,636			0	0
1963	59,724	6,199			0	0
1964	42,838	6,832			0	0
1965	40,689	6,876			0	0
1966	39,644	8,008			0	0
1967	59,281	6,357			0	0
1968	49,657	8,737			0	0
1969	49,849	8,679			0	0
1970	41,059	7,097			0	0
1971	38,179	6,969			0	0
1972	39,528	12,397			0	0
1973	31,315	9,890			0	0
1974	34,105	12,672			0	0
1975	24,149	8,833	0	0	0	0
1976	34,126	3,155	5,228	0	0	0
1977	29,609	1,550	11,019	0	0	0
1978	23,718	3,577	8,613	0	0	0
1979	27,890	2,097	8,686	0	0	0
1980	33,729	2,036	9,159	0	130	0
1981	28,088	6,752	10,091	0	173	0
1982	20,971	6,831	14,670	0	305	11
1983	25,042	5,872	11,823	0	132	12
1984	23,586	4,444	8,967	0	93	0
1985	20,575	5,179	7,410	0	94	67
1986	15,625	6,376	6,155	0	82	81
1987	14,609	5,411	5,409	0	59	87
1988	12,227	2,820	7,770	0	94	234
1989	11,950	1,626	3,807	31	109	319
1990	8,968	2,511	1,803	21	263	305
1991	10,692	1,034	1,823	1	35	107
1992	12,467	22	1,673	4	48	3
1993	12,770	536	1,018	0	20	0
1994	11,036	1,269	844	0	4	0
1995	10,979	1,840	795	8	15	0
1996	11,564	3,121	1,659	3	8	0
1997	11,200	2,998	1,843	31	5	0
1998	13,537	3,584	640	13	2	0
1999	14,177	5,325	22	3	2	0
2000	10,339	5,132	0	1	0	0
2001	11,259	4,767	0	0	0	0
2002	10,528	4,683	0	1	0	0
2003	8,237	5,787	0	0	0	0

Attachment 6

REPORT ON BIOLOGY, STOCK STATUS AND MANAGEMENT OF SOUTHERN BLUEFIN TUNA

A stock assessment and review of fisheries indicators was conducted by the CCSBT Stock Assessment Group during 2004, results of which are summarized below. This report also updates description of fisheries and state of stock, and provides fishery and catch information

1. Biology

Southern bluefin tuna (*Thunnus maccoyii*) are found throughout the southern hemisphere, mainly in waters between 30° and 50° S, but only rarely in the eastern Pacific. The only known breeding area is in the Indian Ocean, south-east of Java, Indonesia. Spawning takes place from September to April in warm waters south of Java and juvenile SBT migrate south down the west coast of Australia. During the summer months (December-April), they tend to congregate near the surface in the coastal waters off the southern coast of Australia and spend their winters in deeper, temperate oceanic waters. Results from recaptured conventional and archival tags show that young SBT migrate seasonally between the south coast of Australia and the central Indian Ocean. After age 5, SBT are seldom found in nearshore surface waters, and extend their distribution over the southern circumpolar area throughout the Pacific, Indian and Atlantic Oceans.

SBT can attain a length of over 2 m and a weight of over 200 kg. Direct ageing using otoliths indicates that a significant number of fish bigger than 160 cm are older than 25 years, and the maximum age obtained from otolith readings has been 42 years. Analysis of tag returns and otoliths indicate that , in comparison with the 1960s, growth rate has increased since about 1980 as the stock has been reduced.. There is some uncertainty about the size and age when SBT mature, but available data indicate that SBT do not mature younger than 8 years (155cm fork length). SBT exhibit age-specific natural mortality, with M being higher for young fish and lower for old fish.

Given that SBT have only one known spawning ground, and that no morphological differences have been found between fish from different areas, SBT are considered to constitute a single stock for management purposes.

2. Description of Fisheries

Historically, the SBT stock has been exploited by Australian and Japanese fisheries for more than 50 years, with total catches peaking at 81,605 t in 1961 (Figure 1). The current (2003) total catch is about 14,024 t (preliminary data), continuing a declining trend in total catches from a recent peak of 19,529 t in 1999, 16,026 t in 2001 and 15,212 t in 2002. Over the period 1952 - 2003, 79% of the catch has been made by longline and 21% using surface gears, primarily purse-seine and pole&line (Figure 1). The proportion of catch made by surface

fishery peaked at 50% in 1982, dropped to 11-12 % in 1992 and 1993 and increased again to average 30% since 1996. (Table 1 and Figure 1). The Japanese longline fishery (taking older fish) recorded its peak catch of 77,927 t in 1961 and the Australian surface fishery catches of young fish peaked at 21,501 t in 1982 (Figure 3). New Zealand, Fishing Entity of Taiwan and Indonesia have also exploited southern bluefin tuna since the 1970s - 1980s, and Korea started a fishery in 1991.

73% of the SBT catch has been made in the Indian Ocean, 21% in the Pacific Ocean and 6% in the Atlantic Ocean (Figure 2). The Atlantic Ocean catch has varied widely between 400 and 8,200 t since 1968 (Table 1 and Figure 2), averaging about 1,000 t over the past two decades, and reflecting shifts in longline effort between the Atlantic and Indian Oceans. Fishing in the Atlantic occurs primarily off the southern tip of South Africa (Figure 4).

3. Summary of Stock Status

SBT assessments were updated at the 5th meeting of the CCSBT Stock Assessment Group in Korea in 2004. Current assessments suggest the SBT spawning biomass is at a low fraction of its original biomass, and well below the 1980 biomass. The stock is estimated to be well below the level that produces maximum sustainable yield. Rebuilding the spawning stock biomass would almost certainly increase sustainable yield and provide security against unforeseen environmental events.

Recruitments in the last decade are estimated to be well below the levels over the period 1950-1980. Assessments estimate stable recruitment in the 1990's but very low recruitments in 1999 or 2000. Analyses of fishery indicators provide evidence of a markedly lower recruitment from 1999-2001. Indicators also show that the Indonesia LL fishery on spawning fish catches fewer older individuals. One plausible interpretation is that the spawning stock has declined in average age and may have declined significantly in abundance. This is in contrast to assessment model results that the spawning stock has been largely stable over the last decade and increased slightly over the last 4 years.

Projections with 15,000 t annual catch provide highly variable results depending upon assessment assumptions and suggest the stock is more likely to decline with the CCSBT MP Conditioning Model (an integrated statistical assessment model used in testing management procedures), while ADAPT shows roughly equal probability of decline or increase. Given all the evidence, the probability of further stock decline under current catch levels is now judged to be greater than in 2001, when an increase or decline under current catches were considered equally likely.

4. Current Management Measures

SBT have been managed by means of quota limits agreed at tri-partite meetings between Australia, Japan and New Zealand from 1985 through to the establishment of the CCSBT in 1994. The global quota was reduced several times after the initial level of 38,650 t for the 1984 - 1985 season. The combined quota for these three countries was maintained at

11,750t from the 1989 -1990 through to 2002-2003. Following increase in membership of the CCSBT (Korea, and the Fishing Entity of Taiwan joined in 2001 and 2002 respectively), the CCSBT agreed to the following national catch limits for 2003-2004:

Japan	6,065 tons
Australia	5,265 tons
Republic of Korea	1,140 tons
Fishing Entity of Taiwan	1,140 tons
New Zealand	420 tons
Total	14,030 tons

An additional catch limit of 900 tonnes has also been implemented for cooperating non-members, including 50 tons for the Philippines (which was recently admitted as a cooperating non-member) and 800 tonnes for Indonesia.

The CCSBT has also implemented a Trade Information Scheme (TIS) for SBT. This requires all members of the CCSBT to ensure that all imports of SBT are be accompanied by a completed CCSBT TIS Document, endorsed by an authorised competent authority in the exporting country, and including details of the name of fishing vessel, gear type, area of catch, dates, etc. Shipments not accompanied by this form must be denied entry by the member countries. Completed forms are lodged with the CCSBT Secretariat and are used to maintain a database for monitoring catches and trade. As markets for SBT are now developing outside CCSBT member countries, the TIS scheme was recently amended to require the document to be issued for all exports, and to include the country of destination,

At its annual meeting in October 2003, the CCSBT agreed to establish a list of vessels over 24 metres in length which are approved to fish for SBT, to be completed by 1 July 2004. The list will include vessels from CCSBT members and cooperating non-members. Members and cooperating non-members are required to refuse the import of SBT caught by large scale fishing vessels not on the list.

SOUTHERN BLUEFIN TUNA SUMMARY (global stock)		
Maximum Sustainable Yield	Not estimated	
Current (2002) Yield	14,024 t (preliminary)	
Current Replacement Yield	Less than 16,000 t	
Relative Biomass	SSB_{2004}/SSB_{1980}	0.14 - 0.59
	SSB_{2004} / SSB_{K}	0.03 - 0.14
Current Management Measures	Global quota of 14,030 t (Australia, Chinese-Taipei, Korea, Japan, and New Zealand)	
	900 t provision for cooperating non-members	

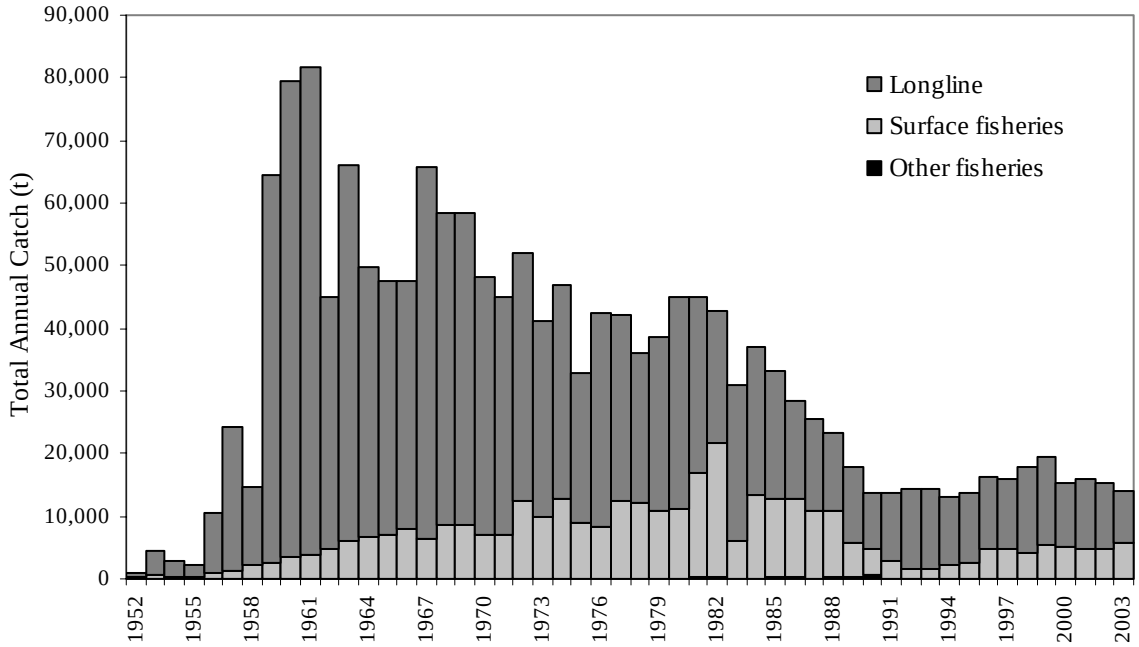

Figure 1. Global southern bluefin tuna catches by fishing gear (t), 1952 to 2003.

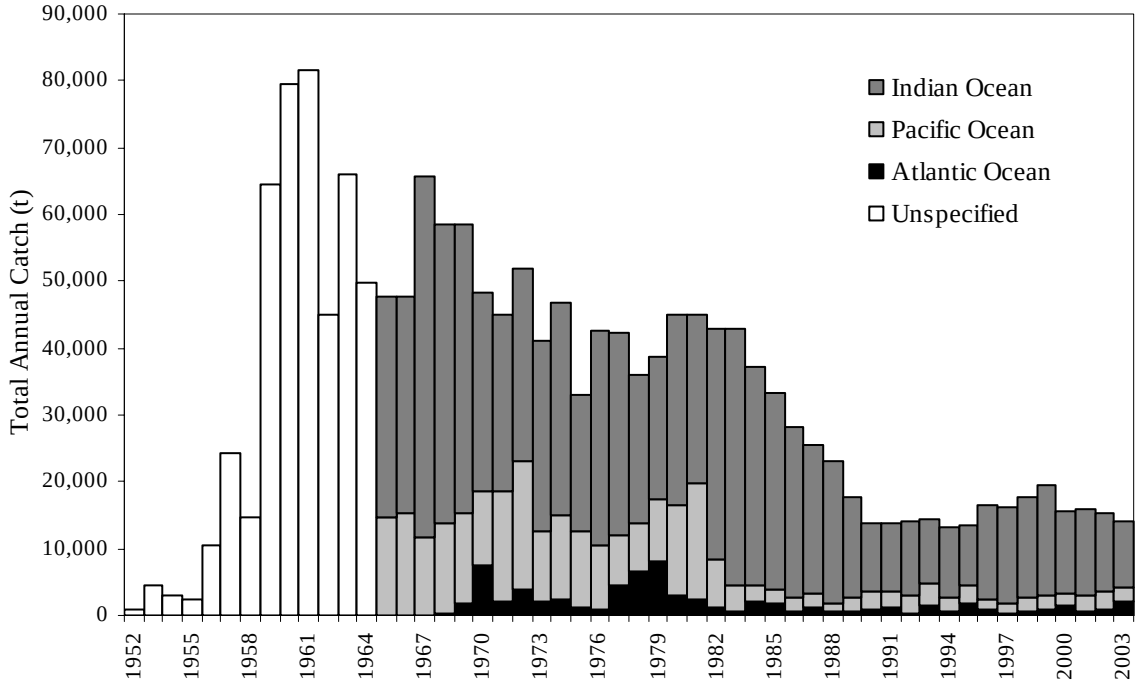

Figure 2. Southern bluefin tuna catches by ocean (t), 1952 to 2003.

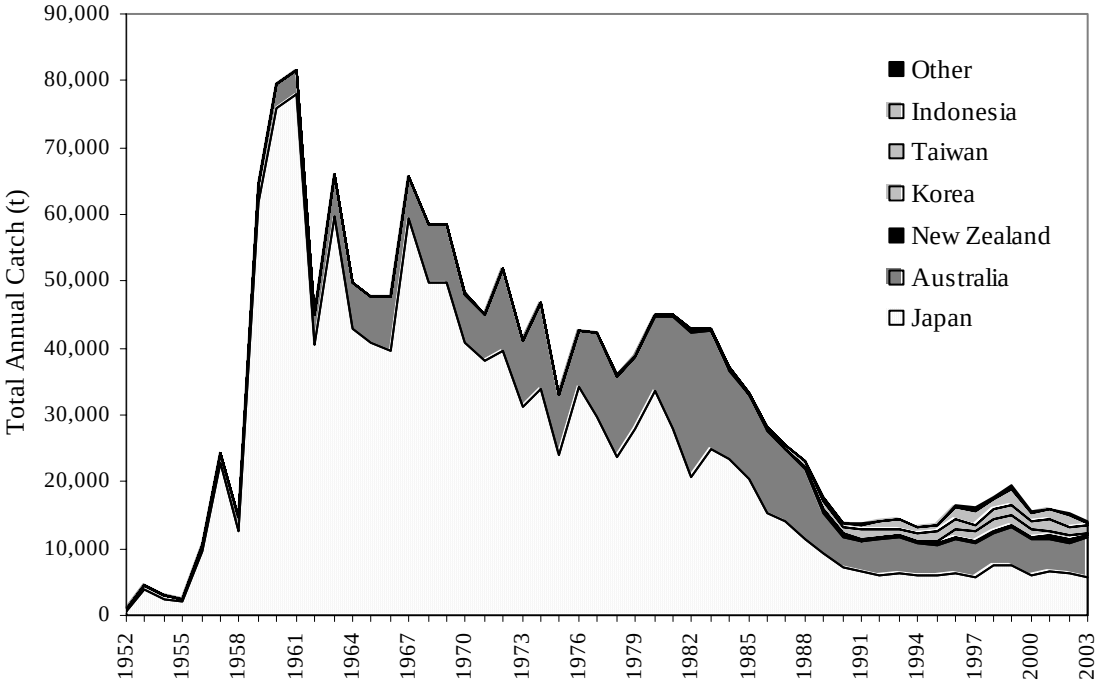

Figure 3. Total annual southern bluefin tuna catch (t) by flag, 1952 - 2003.

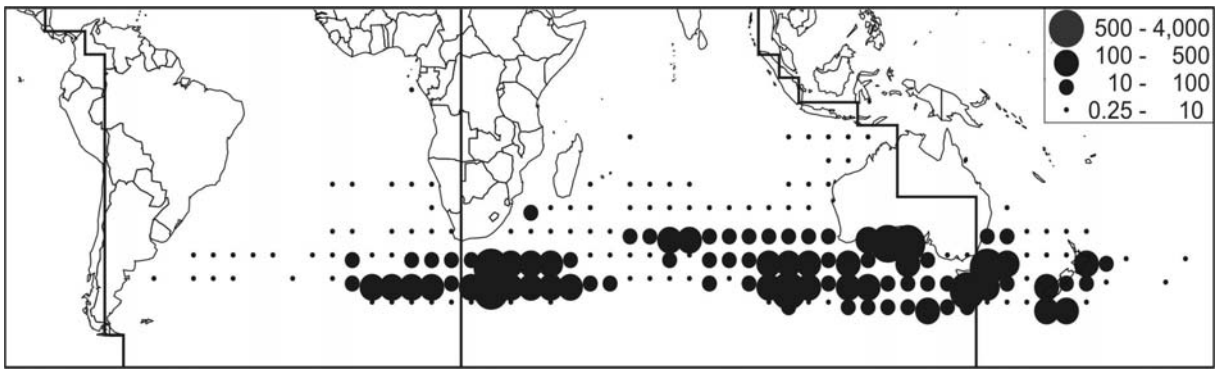

Figure 4. Geographical distribution of average annual southern bluefin tuna catches (t) by CCSBT members from 1983 to 2003 per 5° block by oceanic region. Block catches of less than 0.25 tons are not shown. Oceanic region divisions used in dividing the data for Figure 2 are shown.

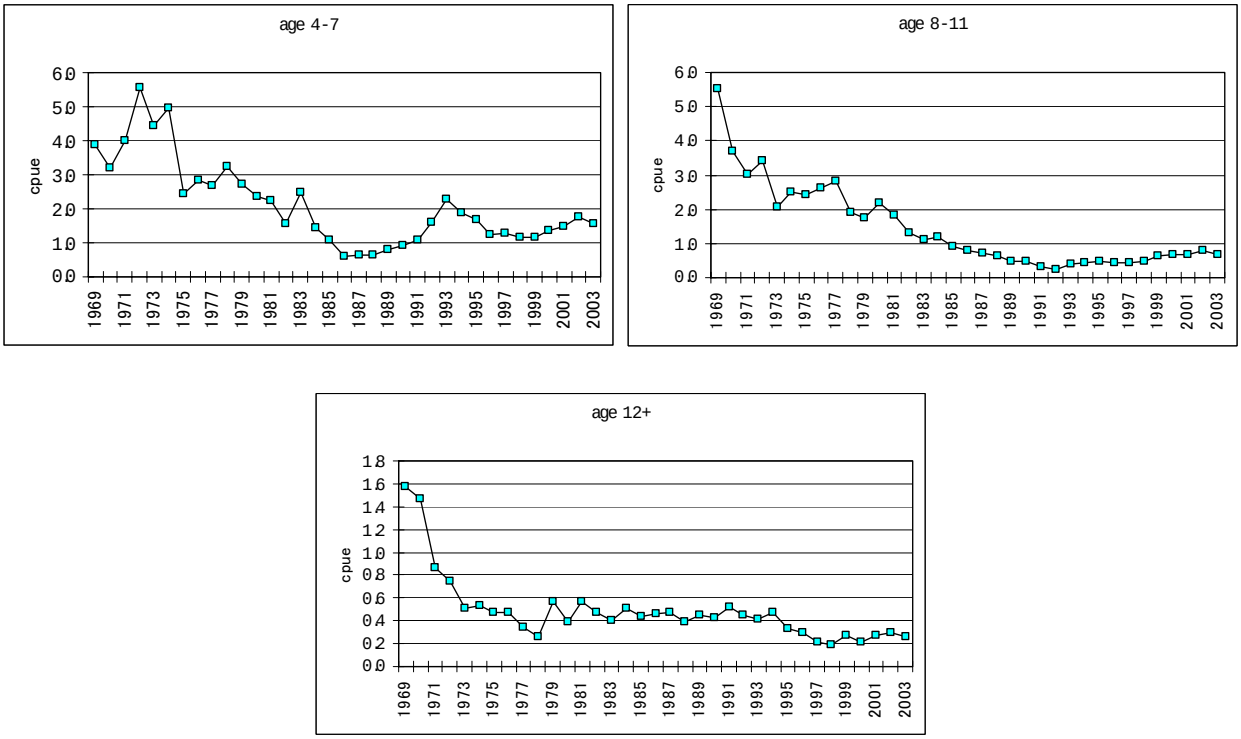

Figure 5. Trends in nominal catch rates of juvenile (age 4-7), maturing (age 8 - 11) and mature (age 12+) SBT (numbers per 1000 hooks) caught by Japanese longliners operating in CCSBT statistical areas 4-9 in months 4-9.

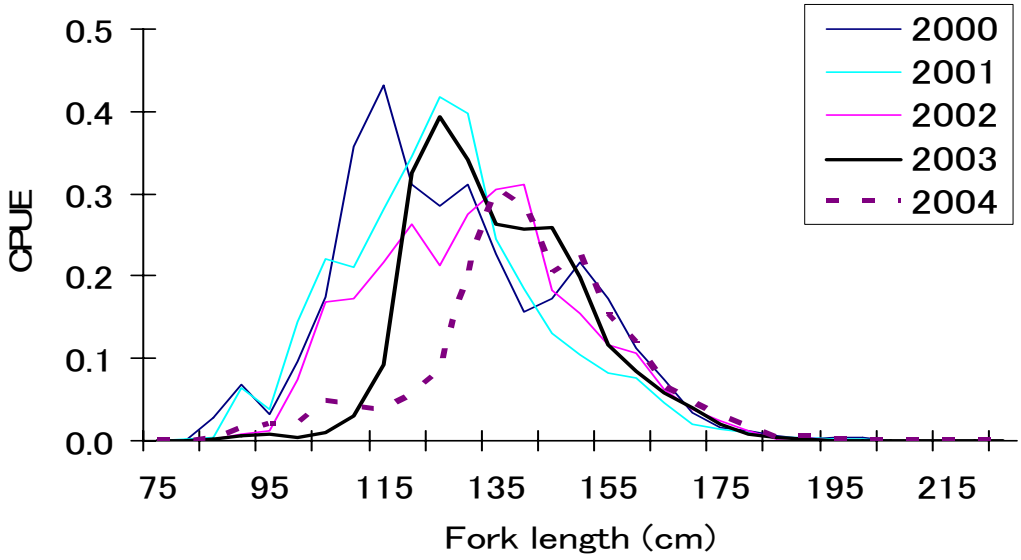

Figure 6. Changes in size composition of nominal CPUE in June in CCSBT Statistical area 4 from Japanese Real Time Monitoring Program data from 2000-2004.

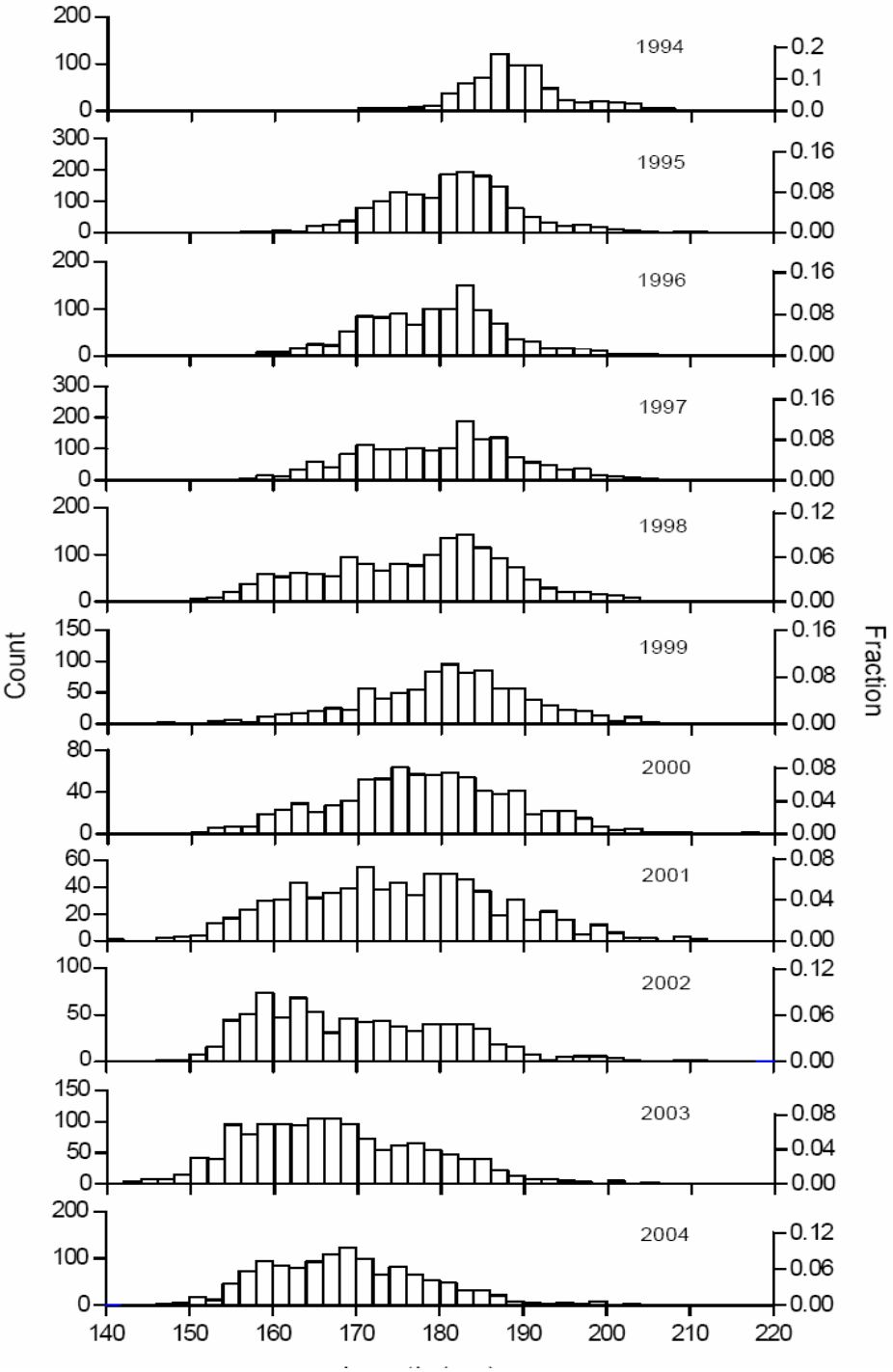

Figure 7. Length frequency (in 2 cm intervals) of Indonesian SBT catches during the spawning season (July 1 of the previous year to June 30 of the given year).

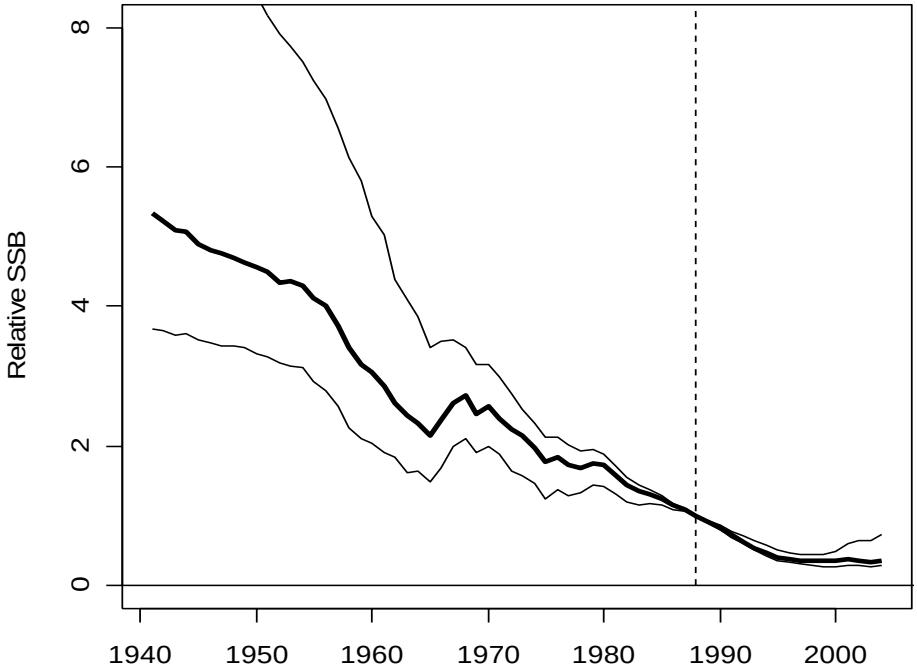

Figure 8. SBT biomass trends (5th, Median and 95th percentiles) from one of the assessments presented at the CCSBT 5th Stock Assessment Group meeting (based on the CCSBT MP Conditioning Model), expressed relative to 1988 (indicated by the dashed line).

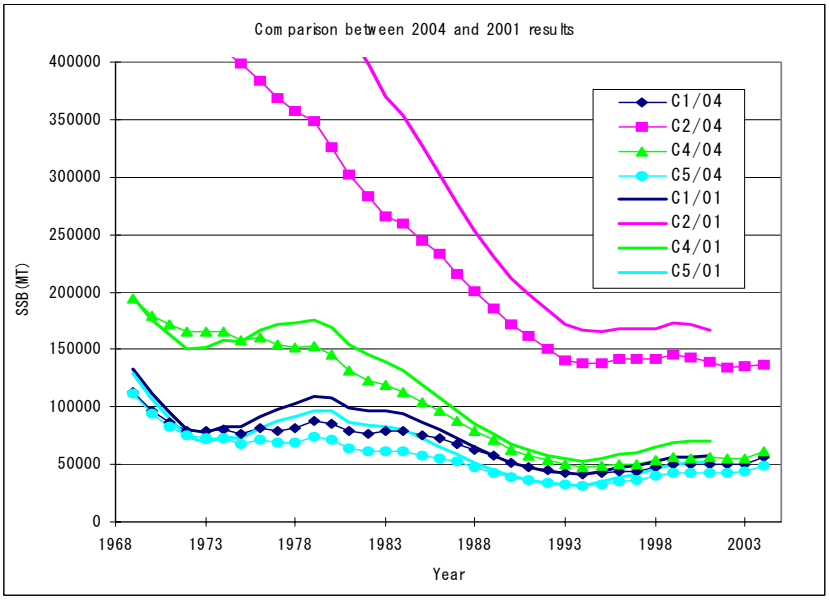

Figure 9: SBT spawner biomass trajectories from another of the assessments presented at the CCSBT 5th Stock Assessment Group meeting (ADAPT VPA) estimates of SSB for different assessment year (2004 and 2001) and plus group options (C1, C2, C4, and C5). (2004 results with markers and 2001 results without markers.)

Attachment 7

Indicators and Analyses for 2005

Agreed indicators to be developed and presented to the SAG in 2005, including for monitoring recruitment trends

1. CPUE indices (nominal, i.e. number of fish per 1000 hooks)
2. CPUE by cohort for Japanese longline
3. Total catch in surface fishery and estimated age composition
4. Total Indonesian catch by month and % of Indonesian LL catch that is SBT
5. Indonesian age composition
6. Estimate of total global catch of SBT
7. Acoustic estimates of age 1 off Western Australia
8. Aerial spotting data in Great Australian Bight
9. Tag returns
10. Length frequency by fleet/area/time
11. Tagging data and estimates of fishing mortality
12. Standardised CPUE
13. Catch rate trends by area
14. Proportion of fish less than 110 and 120 cm by fleet / area / time

Additional desirable indicators

1. Age composition of catch (otolith aged)
2. Information of fishermen's experience and knowledge
3. Number of squares fished by fleet, including zero catches
4. Indonesian CPUE from observer data
5. Growth rates

6. Price of fish by size class/grade
7. Weight/length changes over time and area from Japanese fishery
8. Distribution of juvenile fish around Australia

Additional desirable analyses

1. Lorenz curves and GINI coefficients for analysis of distributional data
2. Cluster analysis of major fishing grounds
3. Reproductive potential from biological samples

Attachment 8

Proposed Exercise to Provide Feedback from Commissioners and Stakeholders on the Preferred Behaviors of MPs.

The Scientific Committee selected four Management Procedure candidates based on difference in performance characteristics; e.g. early pain .vs. late pain, stability .vs. frequent feed-back behaviours, and model-based .vs. empirical CPUE-based. In order to finalize a Management Procedure to be implemented no later than the CCSBT13, it is critical to initiate communication on the preferred nature of candidate MP between MP developers and the Commissioners and industries. Although further work will still be needed in finalizing OM to evaluate the performance of MPs, the SC considered that the general features of the performance of the four selected MPs would likely remain the same regardless the final selection of OMs. The SC accordingly asked that the following tasks be carried out and responses provided to the Secretariat by the end of November by participants in the CCSBT 11 and other relevant stake holders:

Specification of tasks:

1. Examine 20 selected worm plots extracted from the outcome of MP3WS in Busan.
2. For each plot, provide the rank among four MPs in terms of relative performance. Here, two or more MPs can be received the same rank when they show similar performances.
3. Do not put any identification.
4. Ordering and scores should are required to be provided by individual managers and stakeholders from each member (i.e. each participant should provide their own response rather than a delegation response).

The purpose of this exercise is intended to help managers and stakeholders to gain a better appreciation of the range of performances among MPs across scenarios and to provide MP developers with insights on the range of characteristics that managers and stakeholders consider important in the performance of MPs. The results will not be considered to represent the Commission or Members evaluation of the relative performance for MPs. The results will also not be used by the SC in developing its specific recommendation on a choice of MPs. It was noted that the results will need to be interpreted with caution, as separate examination of individual scenarios does not allow a consideration of overall risk.

The details of the implementation will be agreed through e-mail correspondence.

Attachment 9

Report of the CPUE Modelling Group

The CPUE steering group met briefly in the margins of ESC9 to discuss paper CCSBT-ESC/0409/43 and to discuss the work plan.

Paper CCSBT-ESC/0409/43 described attempts at predicting CPUE in the non-fished area using the multiple imputation method. Three types of CPUE analyses (described below) were carried out using the Japanese longline fisheries data for southern bluefin tuna (5x5 degree square/monthly basis).

1) Estimation of the missing CPUE in the core-area using the propensity score method were performed and compared with EFP data. The fit of predicted CPUEs to EFP data was not so good. However, the EFP was not necessarily adequate as the correct data because these data are rather different from the corresponding logbook data.
2) A reliability check on the interpolated CPUE was performed by "n-fold cross-validation" using the same data as those utilised in the CPUE standardisation by GLM. The accuracy was not good because of some extreme outliers.
3) Preliminary statistical analyses with a view to predict CPUE in the non-fished area were made by the propensity score method. The results show the year trend of the abundance index by the multiple imputation method is rather different from those in constant squares(CS) and variable squares (VS) by GLM.

It was noted in discussion that these results were rather more like the constant than the variable squares CPUE series and that those years with high CPUEs seemed to be biased downward while years with low CPUEs tended to be biased upward relative to the constant squares results. It was thought this might be because predictions were not able to predict zeros when the stock was low and not able to predict extreme high values when the stock was high.

The work plan discussed last year had been allowed to slip for a year due to the necessary priority that member had to give to MP work during 2004. It was agreed that the median of the CPUE series would be used for implementation in the first years of any adopted MP. However, assuming a MP is adopted there is likely to be a need to develop an agreed CPUE measure for the first review and this will need greater priority once scientific inputs to MP have been completed.

It was also noted that the number of rectangles fished by the Japanese longline fleet had decreased in recent years and some concern was raised that all CPUE series and particularly those based upon core areas might be affected by these changes. The CPUE modelling group would thus welcome papers that examine the reliability of CPUE indices, particularly those based upon the core area approach. It would also welcome papers suggesting alternative analyses that might circumvent problems created by the reduced area coverage of the fishery.

Another problem noted was that a number of sampled rectangles had rather low effort. It would be helpful for an analysis to be madeof how many of these rectangles were sampled in an independent fashion and how many were fished just over the boundary of a more heavily fished rectangle.

The possibility of using habitat-based standardisation was also suggested. This would involve using oceanographic data to stratify the ocean into strata preferred by SBT in order that CPUE could be related to distribution areas whose area (and also possibly volume) might change from year to year. Papers on this approach would be welcome. It was noted that even if it proved impossible to perform such standardisation over the whole CPUE time series (due to lack of detailed oceanographic data in earlier years), it might be possible to get some idea of the amount of inter-annual variation that oceanographic changes might produce in CPUE series.

Other future work plans would remain as described at the 8th ESC as follows (with the italicised addition).

"Future work plans call for a definitive CPUE series for use by 2009. As discussed last year this will require a small WG to work towards a consensual decision on the best CPUE series to use at sometime after the Management Procedures work has been completed (i.e. in 2005 or later). This will require approaches to the analysis of Japanese LL data in a fashion which allows agreed CPUE standardisation models to be run and their diagnostics to be collectively examined in a fashion which respects requirements for the confidentiality of data. To forward this plan all members are requested to review past documents relating to CPUE modelling to avoid duplicate requests. All members are requested to reflect on and discuss intersessionally which new analyses need to be made. Japanese members of the CPUE steering group are requested to explore suitable procedures by which a working group could conduct collective modelling of CPUE while respecting the need to maintain confidentiality of sensitive data. They are requested to report on possible procedures to the 2004 SAG. Ideally various concomitant variables might be included in the analysis as well as data on SBT and a short list of these should be prepared by discussion. Japanese Industry perceptions of how their fishing behaviour may have changed through time in ways that may have modified the CPUE of SBT would be greatly valued by the working group *and papers on this subject would be most welcomed at the 2005 SAG*."

Attachment 10

Report of the Technical Review of the Tagging Program

Terms of Reference

The 8th Meeting of the CCSBT Scientific Committee noted that "*the current levels of observer coverage in the Japanese, Korean and Taiwanese longline fisheries are not high enough to provide useful estimates of fishing mortality rates in the longline fisheries*" (SC8 Report, Sep 2003). As a result, the SC8 meeting recommended that a technical group be convened in 2004 to review aspects of the tagging program. The proposed terms of reference for the review were to:

- Evaluate the level of precision of mortality and abundance estimates that the current tagging program will be likely to provide at current levels of observer coverage and anticipated (given current efforts directed to increasing) recovery rates.
- Evaluate the levels of observer coverage and recovery rates that would be required for the tagging program to provide acceptable levels of precision in key mortality and abundance estimates and how these are influenced by model assumptions.
- Consider alternative methods, other than increasing observer coverage, for improving the estimate of reporting rates.
- Evaluate the value and limitations of a tagging program based on tag recoveries obtained from only the surface fishery.

A technical working group was convened during the SAG5 and SC9 meetings under the Chairmanship of Prof Ray Hilborn of the Advisory Panel to review these issues.

Tagging Program Objectives

The original objectives of the SBT Tagging Program, as documented in the Report of the CCSBT Tagging Workshop (October 2001) are:

- To provide age-specific estimates of fishing mortality (F) and natural mortality (M), with associated estimates of uncertainty, for as many SBT cohorts as possible.
- To provide additional information on SBT migration and distribution patterns which may be useful in elucidating mixing rates of tagged fish.
- To provide direct estimates of growth rates of tagged and recaptured fish.

Report of the Technical Review

An overview of the CCSBT tagging program activities (tag deployment and recovery) during 2004 was tabled by the Secretariat (CCSBT-ESC/0409/08). Australia tabled papers on methods for estimating tag reporting rates (CCSBT-ESC/0409/14), tag seeding and reporting rates in the Australian surface fishery (CCSBT-ESC/0409/15), experimental design of a two fishery integrated tag-recapture model (CCSBT-ESC/0409/16), evaluation of abundance estimates when tag returns are only available from one component of a multi-component

fishery (CCSBT-ESC/0409/17) and a proposal for multilateral electronic tag deployment (CCSBT-ESC/0409/18). Japan tabled papers on review and improvement of the tagging program ((CCSBT-ESC/0409/36) and a report on 2003/2004 tagging results and proposed 2004/2005 tagging activities (CCSBT-ESC/0409/37).

- **Precision of mortality and abundance estimates at current observer coverage levels**

The CCSBT Scientific Research Program specifications note that a conventional tagging program could provide important information on natural and fishing mortality rates, relatively independent from other abundance indices, to improve the ability to estimate changes in stock size, particularly under conditions of population recovery. To provide good estimates of recovery and reporting rates, this tagging program should be linked to appropriate observer coverage (Extract from the SRP, Attachment D of the SC5 Report, 2000). The SRP proposal and the subsequent CCSBT Tagging Workshop (2001) recognized that future trend indicators (estimates of F, and possibly M) will be a critical component of any feedback rule to facilitate setting of TACs under a SBT Management Procedure (Report of the Tagging Workshop, Oct 2001).. Any longer-term tagging program should focus on qualifying and decreasing uncertainty in such estimates of F and M.

The CCSBT Tagging Workshop also noted that inadequate estimation of uncertainty in tag reporting rates would substantially degrade the value of mortality estimates, and that it is essential to know whether tag return data contain any inherent biases resulting from, for example, differential reporting from different areas, or different sizes. The tagging workshop recommended that, in the short term, every effort should be made to work rapidly towards 10% observer coverage level, particularly for fleets that catch substantial quantities of juvenile (2 - 4 year old) fish. However, it was noted that higher levels of observer coverage would contribute substantially to both reliable estimates of non-reporting rates, to improved return of tags and to more accurate and precise estimates of the catch at age data. (It was noted that there are also other options for improving the level of actual tag returns.)

The technical group confirmed the conclusion of the 8th Meeting of the CCSBT Scientific Committee that the current levels of tagging, recovery rate and observer coverage are not high enough to provide useful estimates of fishing mortality rates from the longline fisheries.

- **Required levels of observer coverage and recovery rates to provide acceptable precision in estimates of F and M**

Following consideration of information presented at this meeting (CCSBT-ESC/0409/16), the technical group agreed that longline observer coverage rates of the order of 30% would provide acceptable estimates (in the order of 20% CV)of longline caught tag reporting rates, natural mortality rates, juvenile abundance and total fishing mortality rates for young fish (ages 1 to 4), if randomly distributed across fishing operations. It was recognised that this sort of level of observer coverage, if well distributed across fishing areas, should also provide good information to estimate mixing rates of tagged fish as well as other important information for improving the stock assessment and analysis of fishery indicators. However, the group recognised problems with the feasibility and potential costs of high observer coverage levels.

The practical problems in achieving 30% longline observer coverage, particularly random across operations, has repeatedly been noted. Observer deployments can usually only be randomly distributed across vessels (trips). It was noted that observer coverage levels distributed by vessel may need to be even higher if there are substantial differences in longline fishing patterns or practices by different vessels in different areas.

Other advantages of higher observer coverage levels were also noted. Reliable mortality estimates from tagging data also require reliable estimates of the size / age distribution of the catch from each fishery component including collection of otoliths. Observers can help to ensure that such data are collected precisely and accurately. Provided observers are trained to tag fish, high levels of observer coverage would also provide a cost-effective mechanism (compared to charter vessels) for spreading tag deployments to areas where pole and line tagging of juveniles is not feasible. This would reduce concerns related to possible non-mixing of tags.

Estimates of fishing mortality trends in the surface fishery are largely unaffected by the level of observer coverage in the longline fishery, provided accurate estimates of surface fishery reporting rates and good data on catch-at-age by fishery exist, and as long as the proportion of the juvenile SBT stock available to the surface fishery remains relatively constant across years. There are concerns regarding whether this is a reasonable assumption.

As a result of the nature of the surface fishery, observers in the surface fishery do not provide any data for estimating reporting rates. However, the current tag seeding program should provide a reliable method for obtaining reporting rates from the surface fishery. The technical group recognized the importance of continuing the current surface fishery tagging activities and the expansion of tag seeding to all surface catches, to provide reliable estimates of surface fishery reporting rates.

- **Alternative methods for estimating reporting rates**

Paper CCSBT-ESC/0409/14 reviewed the range of alternatives to observers for estimating reporting rates in longline fisheries. Alternatives include high reward tags, tag seeding, automatic tag detection systems (for cryptic tags), extrapolation from surface fisheries and model-based approaches. The technical group concluded that there was currently no alternative to observer programs to get estimates of reporting rates from longline fisheries.

The group noted that future improvements in automatic detection systems for cryptic tags could make this a feasible future alternative, if tagging is to be used as part of a long term monitoring strategy, provided potential problems related to food safety regulations can be overcome. In addition, this approach would require a firm commitment by industry to collaborate with efforts to implement detection systems (e.g. access to sampling locations and placement of tag detection devices). The group also noted that genetic "tags" are a form of cryptic tags that might also be a feasible future option. However, the requirements regarding distribution of "releases" over cohorts and area, and ensuring high recovery rates, would still apply to these methods.

Over the short to medium term, the group concluded that adequate observer coverage provides the most feasible approach for estimating reporting rates of conventional tags in SBT longline fisheries.

- **Value and limitations of recoveries from only the surface fishery**

CCSBT-ESC/0409/17 provides an approach for obtaining abundance estimates from the conventional tagging program if tag return data, reliable reporting rates and catch at age data are only available from the surface fishery. Also CCSBT-ESC/0409/36 provides preliminary estimates of surface fishery F. Tag returns from only the surface fishery can provide estimates of juvenile abundance and fishery-specific exploitation trends, but require assumptions about mixing rates which are difficult to verify. If the assumption of complete mixing is made, such data can provide estimates of abundance and exploitation rate.

If mixing is incomplete then tag return data only from the surface fishery can still provide estimates of relative trends, but only if the mixing patterns (e.g. the proportion of fish returning the GAB) are relatively stable across years. Results from SBT tagging in the 1990s suggest relatively high and consistent mixing rates (CCSBT-ESC/0409/17), with returns from West Australia and the GAB being fairly consistent by fishing year. Tag returns from the current program also indicate rapid migration of fish to and from the South African region. However, results also raise concerns regarding mixing of young fish, with a higher proportion of age 1 releases (particularly from West Australia) having been recaptured in the GAB compared to age 2 releases.

Other Issues

The group noted that archival tagging and pop-up tags were highly valuable in helping to address the second objective of the Tagging Program, migration patterns and mixing rates, and could provide further information on SBT spatial structuring or possible sub-stock structure. However, regarding provision of information on mortality, archival tagging was subject to the same requirements as conventional tagging (tag number, tag distribution by cohort and area and estimation of tag recovery rates). Given the relatively low numbers of tags deployed, archival tagging would not contribute substantially to mortality estimation.

Although both archival and conventional tagging data suggest that mixing among juveniles does occur throughout the extent of current SBT fisheries, tag returns and recent archival data suggest that mixing may not be complete across the full SBT range (CCSBT-ESC/0409/36). Indications of incomplete mixing raise concerns regarding the validity of analyses that make mixing assumptions. The technical group noted that, without estimates of reporting rates from longline fisheries, it is not possible to quantitatively test and correct for these mixing assumptions.

The group noted that the most appropriate way to address incomplete mixing is to spread tag deployments throughout the range of the juvenile stock, ideally in proportion to abundance in different areas. This would allow for the direct estimation of mixing rates, together with the estimates of mortality rates and abundances. However, acceptable estimates of reporting rates will still be required.

Priorities

The group recognised the following priorities for improving the tagging program:

- Continued tagging in the surface fishery remained the highest priority. This provides an indicator of relative fishing mortality rates (F) of juvenile fish, and therefore of recruitment. Given the current concerns regarding possible low recruitments, tagging indicators of relative surface fishery exploitation rates are highly valuable.
- Estimates of M are highly important in SBT assessments and in the management procedure operating model. Unbiased estimation of M for small fish requires estimation of mortality rates of small fish in longline fisheries. The technical group agreed that observer coverage of at least 30% would be required from longline fisheries to achieve report rate estimates with reasonable levels of precision
- In addition, efforts to maximise tag recovery rates must continue.
- Extending tagging of juvenile fish to the widest geographic range possible is important to address concerns regarding estimation of mixing rates. However, estimates of reporting rate are essential if return data are to be used for anything other than qualitative migration patterns.
- Regarding extending conventional tagging to older age classes, it was noted that there are difficulties with tagging adequate numbers of large fish, and determining ages of tagged large fish, to provide estimates of M for older cohorts. Tagging young fish over a wider geographic range remains more important than increased conventional tagging of larger fish.
- Archival and pop-up tagging are probably the most useful way of addressing migration patterns, mixing rates and stock structure of larger fish. It was noted that pop-up tags, in particular, do not require observer coverage in order to provide their data.
- Longer-term options for improving both recovery and reporting rates may include cryptic / passively detected tags.

Attachment 11

Data Exchange Requirements for 2005

The following table shows the data that is to be provided during 2005 and the dates and responsibilities for the data provision.

Catch effort and size data should be provided in the identical format as it was provided in 2004. If the format of the data provided by a member is changed, then the new format and some test data in that format must be provided to the Secretariat by 31 January 2005 to allow development of the necessary data loading routines.

Data listed in the following table should be provided for the complete 2004 calendar year plus any other year for which the data has changed. If changes to historic data are more than a routine update of the 2003 data or very minor corrections to older data, then the changed data will not be used until discussed at the next SAG/SC meeting (unless there was specific agreement to the contrary). Changes to past data (apart from a routine update of 2003 data) must be accompanied by a detailed description of the changes.

Type of Data to provide[1]	**Data Provider(s)**	**Due Date**	**Description of data to provide**
CCSBT Data CD	Secretariat	31 Jan 05	An update of the data (catch effort, catch at size, raised catch and tag-recapture) on the data CD to incorporate data provided in the 2004 data exchange and any additional data (e.g. tag/recapture) received since that time. ***The Secretariat will provided additional updates of the tag-recapture data during 2005 on request from individual members.***
Total catch by Fleet	all members	30 Apr 05	Raised total catch (weight and number) and number of boats fishing by fleet and gear. These data need to be provided for both the calendar year and the quota year.
Mortality allowance (RMA and SRP) usage	all members	30 Apr 05	The mortality allowance (kilograms) that was used in the 2004 calendar year. Data is to be separated by RMA and SRP mortality allowance. If possible, data should also be separated by month and location.
SBT import statistics	Japan	30 Apr 05	Weight of SBT imported into Japan by country, fresh/frozen and month. These import statistics are used in estimating the catches of non-member countries.
Catch and Effort	all members (& Secretariat)	30 Apr 05[2]	Catch (in numbers and weight) and effort data is to be provided as either shot by shot or as aggregated data (New Zealand provides fine scale shot by shot data which is aggregated and distributed by the Secretariat). The maximum level of aggregation is by year, month, fleet, gear, and 5x5 degree (longline fishery) or 1x1 degree for surface fishery. A template showing the required information is provided in Attachment B of CCSBT/ESC/0409/10.

[1] The text "**For OM**" means that this data is used for updating the Management Procedure Operating Model.
[2] There may be a delay of 1 or 2 working days for the Secretariat to aggregate and distribute fine scale shot by shot data that it receives from New Zealand.

Non-retained catches for 1995 and 1996	Japan (Australia)	30 Apr 05	The following data concerning non retained catches will be provided by year, month, and 5*5 degree for the Japanese longline fishery: • Number of SBT reported to JFA as being non-retained; • Raised number of non-retained SBT taking into consideration vessels and periods in which there was no reporting of non-retained SBT; • Estimated size frequency of non-retained SBT after raising; • An agreed mortality rate for estimating the number of retained SBT that died (***CSIRO to locate the agreed percentages***)
RTMP catch and effort data	Japan	30 Apr 05	The catch and effort data from the real time monitoring program should be provided in the same format as the standard logbook data is provided.
NZ joint venture catch and effort data at 1*1 spatial resolution	Secretariat	30 Apr 05[3]	Aggregated New Zealand catch and effort data, to 1*1 degrees of resolution instead of 5*5 degrees. The Secretariat will produce and provide these data to Japan only for use in the $W_{0.5}$ and $W_{0.8}$ CPUE indices produced by Japan. ***Other members may request approval from New Zealand to be provided with access to these data for necessary analyses.***
Raised catch data for AU, NZ and KR catches	Australia, New Zealand, Korea	30 Apr 05	Aggregated raised catch data should be provided at a similar resolution as the catch and effort data. Japan and Taiwan do not need to provide anything here because they provide raised catch and effort data.
Total catch per fishery each year from 1952 to 2004. **For OM**	Secretariat (Taiwan)	31 May 05	The Secretariat will use the various data sets provided above together with previously agreed calculation methods to produce the necessary total catch by fishery data required by the operating model. In producing these data sets, it will be assumed that all of Taiwan's catch will be attributed to the LL2 fishery. Taiwan will need to confirm this, and if the assumption is not valid for 2004, Taiwan will need to update the rule of thumb for separating the target and non-target SBT fisheries in 2004.
Raised Size Data	Australia, Taiwan, Japan, New Zealand	30 Apr 05	Raised size composition data should be provided using the CCSBT agreed method at an aggregation of year, month, fleet, gear, and 5x5 degree for longline and 1x1 degree for other fisheries. Data should be provided in the finest possible size classes (1 cm). A template showing the required information was provided in Attachment C of CCSBT/ESC/0409/10. ***Australia and Japan will provide advisory support on raising and substitution to New Zealand and Taiwan respectively. New Zealand should provide a complete historic time series of raised size data and Taiwan should provide raised data back to 2002***. *It is recommended that New Zealand and Taiwan commence preparing these data during 2004 to avoid any unexpected problems closer to the date for the data exchange.*
Raw Size Data	Korea	30 Apr 05	Raw size frequency data should be provided by Korea instead of raised size data because Korea does not yet have a suitable sample size to produce raised sized data. *However, Korea is encouraged to improve its sample sizes of size frequency data in the future.*
RTMP size data	Japan	30 Apr 05	The size data from the real time monitoring program should be provided in the same format as the standard size data is provided.

[3] There may be a delay of 1 or 2 working days after the Secretariat receives New Zealand's catch effort data before the Secretariat is able to produce and distribute the 1*1 resolution data.

Catch-at-length (2 cm bins) for LL1, LL2, LL3, and Japan spawning ground fisheries. **For OM**	Secretariat (Taiwan)	31 May 05	The Secretariat will use the various catch at size data sets provided above to produce the necessary length frequency data required by the operating model. In producing these data sets, it will be assumed that all of Taiwan's catch will be attributed to the LL2 fishery. Taiwan will need to confirm this, and if the assumption is not valid for 2004, Taiwan will need to provide an update of length frequency data for the LL2 fishery in 2004.
Catch at age data	Australia, Taiwan, Japan, New Zealand	14 May 05	Catch at age (from catch at size) data by fleet, 5*5 degree, and month to be provided by each member for their longline fisheries. ***Australia and Japan will provide advisory support on catch at age calculations to New Zealand and Taiwan respectively***. ***New Zealand should provide a complete historic time series of catch at age data and Taiwan should provide this data back to 2002.*** *As with the catch at size data, it is recommended that New Zealand and Taiwan commence preparing these data during 2004.*
Catch-at-age (ages 0 – 30) for Australia surface and Indonesia spawning ground fisheries. **For OM**	Australia	31 May 05	These data will be provided to June 2004 in the same format as provided for the initial management procedure data exchange.
CPUE input data	Australia, Japan	31 May 05	Catch (number of SBT and number of SBT in each age class using proportional aging) and effort (sets and hooks) data[4] by year, month, and 5*5 lat/long for use in CPUE analysis. ***For 2005, this data will be produced by both Australia and Japan. However, it is considered appropriate for the Secretariat to take over this role at some stage in the future (maybe 2006).*** *In 2004, minor differences were discovered in the proportional aging data produced by Australia and Japan. It is possible that this was due to the time of month used in these calculations and it is recommended that Australia and Japan investigate this possibility for the differences during 2004.*
CPUE series. **For OM**	Australia / Japan	31 May 05	5 CPUE series are to be provided for ages 4+, as specified below: • Nominal (Australia) • Laslett Core Area (Australia) • B-Ratio proxy (W0.5) (Japan) • Geostat proxy (W0.8) (Japan) • ST Windows (Japan) The operating model uses the median of these series.
Total Indonesian catch by month and % of Indonesian LL catch that is SBT	IOTC/ Secretariat	30 Apr 05	The Secretariat is to liaise with the IOTC to obtain the required data for 2004.
Indonesian LL SBT age and size composition	Australia	30 Apr 05	Annual estimates of both the age and size composition is to be generated by spawning season (July to June) rather than calendar year. Estimates will be shown for the seasons from 1994/95 to 2003/04.
Acoustic index of age 1 SBT off Western Australia	Japan	31 May 05	Estimates from the 2004/05 season sampling.

[4] Data restricted to months April to September, SBT statistical areas 4-9, and the Japanese, Australian joint venture and New Zealand joint venture fleets.

Aerial survey index	Australia	31 Jul 05	Estimates from the 2004/05 fishing season.
Tag return summary data	Secretariat	30 Apr 05	Updated summary of the number tagged and recaptured per month and season.
Tag releases / recoveries and reporting rates. **For OM**	Australia	31 May 05	The RMP tag/recapture data for the period 1991-1997 will be updated for any changed/new data in the database.
Direct ageing data	All members	30 Apr 05	Direct age estimates from otolith collections for the 2002 calendar year (see paragraph 95 of the 2003 ESC report). Suggested format for each otolith is: Flag, Year, Month, Lat, Long, Length, Otolith ID, Age estimate, Comments.
Mean length-at-age by year and season, and CV of length-at-age	-	-	There are no plans for updating these data for the 2005 data exchange. This item has only been included in this table as a reminder that discussion still needs to be held between members on the need for updating these data.