

Thirteenth Meeting of the STANDING COMMITTEE ON TUNA AND BILLFISH

Noumea, New Caledonia

5 – 12 July 2000

EXECUTIVE SUMMARY

1. The 13th meeting of the Standing Committee on Tuna and Billfish was held from Wednesday 5th July to Wednesday 12th July in Noumea, New Caledonia, at the invitation of the Secretariat of the Pacific Community. SCTB 13 was attended by participants from American Samoa, Australia, Canada, Cook Islands, Federated States of Micronesia, Fiji, France, French Polynesia, Guam, Japan, Kiribati, Korea, Marshall Islands, New Caledonia, New Zealand, Niue, Northern Marianas, Palau, Papua New Guinea, Samoa, Solomon Islands, Taiwan, Tonga, United States of America, Vanuatu, and Wallis and Futuna. Participants from the Food and Agricultural Organization of the United Nations (FAO), the Forum Fisheries Agency (FFA), the Indian Ocean Tuna Commission (IOTC) and the Inter-American Tropical Tuna Commission (IATTC) also attended.
2. The meeting agenda, working papers presented at the meeting, and list of participants are provided in Appendices 1, 2 and 3, respectively, to the meeting report. The meeting convenes as six working groups – the Statistics Working Group (SWG), the Skipjack Research Group (SRG), the Albacore Research Group (ARG), the Yellowfin Research Group (YRG), the Bigeye Research Group (BRG), and the Billfish and Bycatch Research Group (BBRG). The Bigeye RG and Billfish and Bycatch RG were accorded slight priority in time allocated for deliberations, given existing resource uncertainties.
3. The initial overview of Western and Central Pacific Ocean (WCPO) tuna fisheries noted that the estimated total catch for 1999 for the four main tuna species was 1,716,806 mt, the second highest total catch on record after 1998 (1,893,648 mt). The 1999 catch of skipjack (1,104,121 mt) was slightly down on the record level of the previous year (1,242,45 mt) and as usual dominated the total catch (64%). The yellowfin (393,998 mt) and South Pacific albacore (38,425 mt) catches were also slightly down on the 1998 levels, but the bigeye catch increased (102,295 mt) and was just under the record high taken in 1997 (104,558 mt). National fishery reports provide further details of these catches.
4. Reports on relevant activities of other organizations were received from the Commonwealth Scientific and Industrial Research Organization (Australia), IATTC, Institut de recherche pour le développement (IRD), FAO and the Interim Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean.
5. The objectives of the SCTB Statistics Working Group (SWG) are to coordinate the collection, compilation and dissemination of tuna fisheries data. In regard to the coordination of data collection, the SWG held a session prior to the main SCTB meeting to review the catch and effort logsheets developed by the SPC/FFA Tuna Fishery Data Collection Forms Committee, which are widely used in the region. In the future, the SWG will review other logsheets, including those of the Japanese fleets, through a small group of participants that will report their findings to future meetings of the SCTB.
6. During the main SCTB meeting, the SWG Coordinator reported on the status of data collection, compilation and dissemination. Data that are compiled by the OFP on behalf of the SCTB include annual catch estimates, catch and effort data, length data, and other types of data. Progress in data compilation was achieved, although estimates of annual catches of bigeye and yellowfin by the Japanese longline fleet during 1950–1961 have not yet been provided; estimates of the annual catches in recent years in Indonesia and the Philippines have not been provided; and problems remain with the longline and purse-seine catch and effort data provided by Japan and Korea. It was reported that revised catch and effort data covering the Taiwanese distant-water longline fleet would be provided in the near future.

7. It was reported that the level of coverage of longline catches in the WCPO during 1991–1999 by observer data held by the OFP is only 0.15 percent. It was noted that observer coverage must be increased in order to better estimate the catches of non-target species, including sharks and rays, marine reptiles, marine mammals and birds.

8. Other subjects discussed by the SWG included the evaluation of observer and port sampling programmes; factors for converting processed weights to whole weights; predation of longline-caught fish by marine mammals and sharks; the compilation of annual catch estimates for small-scale fisheries (whether commercial, artisanal, subsistence or recreational); the availability of information on illegal, unreported and unregulated (IUU) fishing; the availability of VMS data; definitions of GRT; the placement of SPC observers aboard Australian longliners; the application of regression trees to estimates of purse-seine catches of bigeye and yellowfin; and the compilation of information on longline gear attributes and operations.

9. The five Research Groups considered regional fishery developments, advances in research, stock assessment and research coordination and planning for those species or species groups, with the BBRG concentrating efforts this year on swordfish. Summary statements on these matters are appended for each research group. The BRG held an informal workshop prior to SCTB plenary, to review the application of the MULTIFAN-CL model to Pacific-wide bigeye. Also, a meeting to consider the use of oceanographic data in pelagic fisheries research was held prior to the SCTB plenary.

10. The meeting was also provided with an update of the ongoing MHLC process, to develop an arrangement for the conservation and management of highly migratory fish stocks in the WCPO and scheduled for completion in August 2000 (Convention and Commission). It then discussed the implications for SCTB in terms of the provision of scientific advice to the proposed Commission. It was decided that a small group, under the direction of the new SCTB Chairman, would consider how SCTB might make the transition to a Scientific Committee in the new MHLC Interim Conference.

11. The 13th SCTB meeting saw, for the first time, application of the MULTIFAN-CL length-based assessment model to all four target tuna species in the WCPO and to North Pacific blue shark. In response to a need for SCTB to receive technical advice regarding the application of this and similar methods, the meeting decided to establish a Methods Working Group. The terms of reference for this Working Group were agreed and are given below following the Species Research Group summary statements.

12. Recognising tagging as a key source of information for stock assessment work, the meeting decided to explore convening a tagging workshop in early 2001, the dates and venue to be decided. The objectives of the workshop will be to scope the tagging objectives, prioritize methodology and logistics for mounting large-scale tagging projects for the four target tuna species.

13. The meeting thanked outgoing Chairman Dr. Ziro Suzuki for his sterling service over the past two years and Dr. Tony Lewis for his role as interim Skipjack Research Group Coordinator for the past three years. The new SCTB Chairman and Working Group and Research Group Coordinators for the next two years are as follows:

SCTB Chairman:	Mr. Bernard Thoulag
Statistics WG Coordinator:	Mr. Tim Lawson
Methods WG Coordinator:	Dr. John Sibert
Skipjack RG Coordinator:	Dr. Gary Sakagawa
Yellowfin RG Coordinator:	Dr. Robert Campbell
Bigeye RG Coordinator:	Mr. Naozumi Miyabe
Albacore RG Coordinator:	Dr. Talbot Murray
Billfish and By-Catch RG Coordinator:	Mr. Peter Ward

14. The venue for 14th SCTB meeting to be held during the period June-July 2001 was not confirmed, but would be communicated to participants at a later date. The meeting closed on Wednesday 12 June at 1730 hrs.

SKIPJACK RESEARCH GROUP (SRG) - SUMMARY STATEMENT

Skipjack contribute two thirds of the WCPO catch of the four main tuna species. The best available estimates indicate that the 1999 skipjack catch in the WCPO was approximately 1.1 million tonnes (slightly less than the record 1998 catch), with purse seine fleets providing the majority of this catch (71%). Available indicators (purse seine, pole-and-line) show variable catch rates over time in the fishery. A new analysis of purse seine CPUE for Japanese vessels has shown a declining trend in standardized CPUE for unassociated school sets since the 1980s but an increasing trend for log and FAD-associated sets. In the latter case, the recent switch away from natural log sets to mainly drifting FAD sets make associated-set CPUE difficult to interpret as an index of abundance at this time.

Ongoing fisheries oceanography studies have continued to provide a better understanding of environmental influences on fluctuations seen in skipjack availability and productivity in the WCPO. These studies suggest positive impact of *El Niño* conditions on skipjack recruitment, particularly when followed rapidly by *La Niña* conditions, as occurred in 1998.

Tag-based assessments from the early 1990s found regional exploitation levels of skipjack to be low to moderate at catch levels similar to those in recent years. The preliminary results of a MULTIFAN-CL analysis for skipjack were consistent with the tag-based assessment, but in addition indicated that fishing mortality may have increased significantly since the early 1990s, particularly in the tropical region west of 165°E. Nevertheless, the overall estimates of fishing mortality-at-age were still considerably smaller than the corresponding estimates of natural mortality-at-age. It is stressed that these are preliminary results from an analysis still under development. The analysis will be refined in the coming year by the inclusion of additional tagging and fisheries data from the North Pacific.

Given the importance of skipjack to the fisheries in this region, there is an urgent need (i) to improve the statistical coverage of the fisheries, which remains poor in some areas (e.g. Indonesia, Philippines); (ii) to develop fishery indicators, such as standardized CPUE, for use in stock assessments; (iii) to better document and understand the use and impacts (ecological and biological) of new technology (such as remotely monitored FADs) in the purse seine fishery; (iv) to continue the development of the MULTIFAN-CL-based assessment (and in particular to extend the geographical scope of the analysis to include the northern portion of the stock); and (v) to continue to develop an understanding of processes affecting stock productivity and recruitment. Given the likely continued reliance on tagging data as a quasi-fishery-independent source of information on skipjack (and other tuna) stock dynamics, consideration now needs to be given to a new large-scale tuna tagging programme in the WCPO.

ALBACORE RESEARCH GROUP (ARG) – SUMMARY STATEMENT

Albacore caught in the South Pacific constitute a single stock. Longline, primarily catching adults, accounts for the majority of albacore catches (89%) in the South Pacific with trolling catching the remainder (11%). Albacore catch, estimated at 38,425 tonnes in 1999, was slightly less than in 1998 when catches reached the 10-year peak of nearly 41,000 tonnes. In 1999 longline catches were 33,969 tonnes and troll catches 4,431 tonnes. Longline catches of several South Pacific island States and territories exceed 2,000 tonnes, contributing substantially to the total albacore catch. The combined albacore longline catch in 1999 by Fiji, French Polynesia and Samoa was slightly lower than 1998 in all three areas. This catch, more than 11,000 tonnes, constitutes 29% of all longline catches of albacore in the South Pacific. Catches in Samoa have rapidly increased from 560 tonnes in 1994 to over 4,000 tonnes in 1998, but declined in 1999 to 3,400 tonnes. Longline albacore catches also declined for vessels in American Samoa over the same time period. Slight declines in catches were also reported for Canadian and USA troll vessels fishing the SCTZ in the 1998/99 season relative to 1997/98. Troll caught albacore in the New Zealand EEZ declined by about half over the same period, in this latter case low prices were given as an explanation by the fishing industry, rather than low availability.

There has not been any dedicated field research on albacore since the OFP research programme in 1991/92. Biological data on albacore is regularly collected, however, in observer and port sampling programmes in the region, although some of these data have not been compiled. Length frequency data from port sampling is a critical input to the length-based age-structured stock assessment model (MULTIFAN-CL). This model has been extended to cover the period 1961-98, incorporate tag recovery information, and the Samoan longline fishery. Results from this model are strongly influenced by a small number of tags recovered (135 recoveries) and hence are highly uncertain. Results, however, suggest a decline in biomass from 1961 to 1989/90 (about 50%) followed by an increase which continues to 1998. These results are regarded as highly uncertain due to the influence of the tagging data and the lack of information on tag reporting rates. An alternative stock production model examined stock sustainability from a theoretical perspective. The results of this model were also considered to be highly uncertain and several key parameter estimates were unrealistic and there was no basis for confirming results, including by reference to similar species. A new attempt to incorporate environmental factors (with appropriate time lags) in modeling biomass suggest a possible link between recruitment and ENSO events. This approach requires further work to confirm this interpretation.

A number of areas requiring further work before the next SCTB meeting were identified, these include: incorporate data from additional fleets; review the adequacy of observer coverage; conduct an economic analysis in relation to changes in effort; analyse longline data to determine if retention practises have changed in some fleets; analyse depth of longline sets in relation to albacore size; develop further extensions to the MULTIFAN-CL model; develop procedures for standardising CPUE; evaluate the need for a further tagging programme; and evaluate the use of reference points in assessing stock status.

There was no information presented to suggest a change in interpretation of stock status of South Pacific albacore. Although model results are considered highly uncertain, exploitation rates appear to be moderate and current catches are likely to be sustainable.

YELLOWFIN RESEARCH GROUP (YRG) – SUMMARY STATEMENT

The yellowfin tuna catch for the western and central Pacific Ocean (WCPO) has increased since the 1980's, when the purse seine fishery began its significant expansion in the WCPO. Since 1990, the catch has varied between 320,000 mt in 1996 and 457,000 mt in 1997. The majority (55%) of this catch is produced by purse seiners.

In 1999, poor market conditions for purse seine caught fish resulted in reduced purse seine fishing effort and catch. In addition, the 1999 longline yellowfin catch of 53,381 was the lowest for nearly 30 years. The overall catch for 1999 fell from 437,000 mt in 1998 to about 400,000 mt, well below the peak of 457,000 mt in 1997.

Catch rates for purse seine fleets continue to be variable and without a clear trend in the available time series of data. However, catch rates for some fleets since about 1997 may have benefited from the increased use of drifting FADs. This fishing innovation is rapidly becoming the preferred technique for most fleets.

Catch rates for longline fleets continue to remain near their historical lows. The trend in the recent data is mixed, with some fleets showing a flat trend and others showing a slightly downward trend since 1988. It is noted that these trends may have been affected by changing fishing practices.

Tag-based assessments from the early 1990s found regional exploitation levels of yellowfin tuna to be low to moderate at catch levels at that time slightly below those in recent years. The updated results of a MULTIFAN-CL analysis for yellowfin tuna continue to be consistent with the tag-based assessment, but in addition indicate that fishing mortality may have increased significantly since the mid 1990s. However, the overall estimates of fishing mortality-at-age remain considerably smaller than the corresponding estimates of natural mortality-at-age. The analysis also indicates that recent recruitment may have declined, which in turn is producing a decline in overall stock biomass. Additional research with the MULTIFAN-CL model will be undertaken to determine the significance of these results in terms of future stock productivity. Assuming that major changes in yellowfin stock productivity have not occurred, it is likely that the WCPO yellowfin tuna stock can sustain the current catch level.

The research priorities for yellowfin include (i) continued improvement in the quality and coverage of catch and effort data and size composition sampling, with particular emphasis on the Philippines and Indonesian domestic fisheries; (ii) continued development and evaluation of the MULTIFAN-CL model for yellowfin tuna; and (iii) continue to collect information on a range of biological information, including age and growth, sex-specific natural mortality and trophic/ecosystem dynamics. As noted in the skipjack summary statement, it is likely that there will be continued reliance on tagging data as a quasi-fishery-independent source of information on yellowfin stock dynamics and alternative techniques for estimating fishing mortality rates for comparison with MULTIFAN-CL results. Therefore, consideration now needs to be given to a new large-scale tuna tagging programme in the WCPO.

BIGEYE RESEARCH GROUP (BRG) – SUMMARY STATEMENT

Although the catch of bigeye for the Pacific Ocean accounts for a relatively small portion (8%) of total tuna catch, its economic value is substantial (approximately US\$1 billion annually). The 1999 total Pacific catch was 181,000 mt, with 102,000 mt and 79,000 mt in the WCPO and EPO, respectively. Both regions recorded increases in bigeye catch (of 10,000 mt and 8,000 mt) in 1999 due to increases in purse seine catches. This increased catch in the WCPO was appeared to be associated with the extensive use of drifting FADs, while the increase in the EPO was due to the improvement in bigeye catch monitoring for the purse seine fishery. It should also noted that the size of bigeye caught by drifting FADs sets in the EPO became much larger in 1999 than in previous years. The overall catch trend in the WCPO has been increasing in recent years, reflecting either higher longline or purse-seine catches depending on year. In the EPO, the surface fishery catch increased markedly to 29,000 mt in 1994 and has been higher than 35,000 mt per year since then. At the same time, the longline catch has declined from its maximum of about 100,000 mt in the mid-1980s to about 36,000 mt in 1998. Overall, EPO catches of bigeye have varied in the range of 60,000–80,000 mt in recent years.

The environmental effects on availability and productivity have been investigated through the fisheries oceanographic studies. Like yellowfin, *El Niño* events may increase bigeye catchability in the west by rising the lower limit of its swimming habitat. At the same time, recruitment could be higher in the east due to the warmer and more suitable environment for spawning and larval survival. Incorporating such information into the stock assessment process may enhance the reality of population models for this species, and therefore this study should be further pursued.

During the past year, collaborative research involving several institutions has been undertaken in order to better assess the status of the bigeye stock. The work has involved the application of an integrated statistical model (MULTIFAN-CL) to Pacific-wide bigeye data for the first time. The preliminary results from the model are promising and are consistent in several respects with the results obtained by the IATTC for the EPO using an independently derived model, although the absolute values of F from the collaborative study were considerably lower. However, further work is required before the MULTIFAN-CL results can be interpreted in a management context. The IATTC analysis for the EPO indicated relatively stable stock biomass in recent years, but the outlook for the stock is uncertain because the most recent recruitment is not precisely estimated.

The Group examined several nominal and standardized CPUE series for the longline fishery. Despite some differences among the standardized CPUE series, they tended to indicate a similar declining trend in recent years. Although these estimates require further refinements, these results raise a concern of possible overfishing and decline in adult biomass, particularly in combination with the record purse seine catch in the WCPO in 1999 and continuing high catches in the EPO.

The Group therefore strongly recommends that current research regarding appropriate stock assessment be continued as a priority. Other research and data collection priorities include (i) acquisition of more detailed catch statistics and size composition data for the fisheries of Philippines and Indonesia; (ii) if possible, refine the methods for estimating bigeye catches in the purse seine fishery; (iii) better document and understand the use and impacts (ecological and biological) of new technology (such as drifting FADs) in the purse seine fishery; and (iv) refine the estimates of bigeye vertical distribution in relation to temperature and other variables (for use in habitat models) using the most recent archival and sonic tagging data. In addition to these short-term research items, the Group foreshadowed a longer term need for additional large-scale tagging to provide information on bigeye movement, natural mortality and exploitation rates to support future stock assessment analyses.

BILLFISH AND BYCATCH RESEARCH GROUP (BBRG) SUMMARY STATEMENT

Unlike the species-specific research groups, the BBRG reviewed information on a diverse range of species and issues. While research on catch and effort statistics, biology, population dynamics and assessments of the main billfish species was reviewed, the impacts of commercial fishing on bycatch species such as turtles, sharks and seabirds were also considered. The BBRG also reviewed the activities on billfish and bycatch issues of both the I-ATTC and the ISC.

Following on from the information on billfish species presented at SCTB12, new data on the catch of these species in the WCPO was reviewed. This was assisted by the catch of these species now being included in the National Fishery Reports presented to the SCTB. During 1999, the total commercial catch of billfish was estimated to be around 32,000 tonnes (consisting of 16,700 t of swordfish, 10,300 t of blue marlin, 4,200 t of striped marlin and 1,000 t of black marlin). Nearly all of this catch is taken by longliners. Catch statistics on billfish caught (and released) by recreational fisheries throughout the WCPO were also compiled and reviewed for the first time. The catch of billfish in these fisheries is estimated to be around 3-5 percent of the commercial catch of these species, with black marlin being the largest catch component. Assessment of the status of blue marlin in the Pacific indicates that present catches are below maximum sustainable yield. However, this work is preliminary and many gaps in the information required for the development of quantitative stock assessments on all billfish species still persist. Major gaps include information on age and growth, mixing rates and natural mortality, together with an understanding of the influence of targeting practices and changes in oceanographic conditions on catch rates. Consequently, the status of billfish stocks in the WCPO remains uncertain.

A more comprehensive review of the fisheries catching swordfish in the WCPO was undertaken. There has been a 50 percent increase in the catch of swordfish in the WCPO during the 1990s, a rapid increase in the catch in the south-west Pacific in recent years (mainly due to developments in the Australian fishery), and there exists potential for further developments in other countries. Overfishing of this species in other oceans has also been acknowledged. New research on stock structure postulates three stocks in the Pacific (one in the northwest, one in the southeast and another in the southwest) and will necessitate a sub-regional management approach. Quantitative stock assessments have yet to be completed, and the present status of swordfish stocks in the WCPO remains uncertain. However, a number of research projects are presently underway to increase our understanding of the biology and population dynamics of swordfish. Indicators of possible overfishing, based on information gathered from similar fisheries in other oceans, should be identified and monitored.

The BBRG also reviewed information relating to the status of the blue shark stock in the northern Pacific. The results indicate that the stock is increasing after a large decline during the 1980s, though this work remains preliminary as many uncertainties remain both in the data and biology of this species.

Research on the incidental catch of turtles and seabirds in the Hawaiian longline fishery was also reviewed. The BBRG took particular note of the recent U.S. court-related actions in this fishery on the issue of turtle bycatch. The BBRG expressed concern that fisheries are being singled out and possibly closed when the threat from fisheries to sea turtle populations are relatively small in comparison with those from other human activities, especially those that result in the degradation and loss of eggs and nesting sites. The BBRG highlighted the complexity of fishery interactions where highly migratory

species, protected species, and a range of impacting activities are involved. Fishery bycatch species often have a wide distribution. Furthermore, seabird and turtle populations, because of their land associations, are often impacted by a wide range of non-fishing activities. As management decisions applied to a fishery can generate large economic and social impacts it is important to ensure that they achieve the desired resource sustainability outcome. The BBRG noted that the full impact of all human activities should be taken into account in assessing the effect of fishing on these populations. Consideration should span the range of scientific information available, including species population parameters, the range of the fishery and non-fishery impacts, and bycatch mitigation measures in place.

Finally, the BBRG reviewed the research relating to billfish and bycatch. While noting the range of ongoing research, the collection of data needed in support of stock assessment, particularly observer data for which coverage in recent years has been less than one percent for almost all fleets, was seen as a priority. To this end, a better understanding of catch (both present and historical and for all commercial, artisanal and recreational fisheries) was seen a high priority issue, particularly for bycatch species. Research on understanding the biology of these species (age and growth, reproduction and movement) is also required. The need for collaborative international research on many of these issues was identified and strongly encouraged.

METHODS WORKING GROUP DRAFT TERMS OF REFERENCE

The Methods Working Group will coordinate research and make recommendations to the SCTB plenary on technical questions related to stock assessment methodology that may arise from time to time. The initial terms of reference for the Working Group include the following:

1. Develop criteria for evaluating the performance of stock assessment methods applicable to the tuna fisheries of the western and central Pacific Ocean tuna fishery.
2. Investigate the statistical properties and performance of selected stock assessment methods using simulation analysis and other appropriate methods and, on the basis of studies undertaken, make recommendations to SCTB regarding the most appropriate methods to be used for the assessment of target tuna stocks and important by-catch species of the western and central Pacific Ocean tuna fishery.
3. Provide ongoing review of the application of stock assessment models to the various species of interest and, where necessary, make recommendations to SCTB regarding enhancements to the models to improve their performance or to address deficiencies with respect to specific applications.
4. Coordinate research to determine appropriate biological reference points for target tuna stocks and important by-catch species of the western and central Pacific Ocean tuna fishery and make recommendations to SCTB on the basis of this research.
5. Advise SCTB on appropriate methods of formulating scientific advice for management.
6. Advise SCTB on methods that might be used to monitor and assess the ecosystem impacts of tuna fishing in the western and central Pacific Ocean.