SCTB17 Working Paper

SWG–6

INFORMATION REGARDING ANTICIPATED DATA-RELATED TASKS FOR THE WCPFC SCIENTIFIC COMMITTEE

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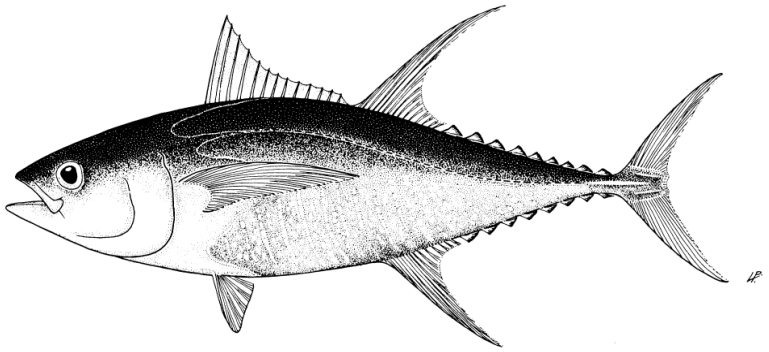

Oceanic Fisheries Programme
Secretariat of the Pacific Community
Noumea, New Caledonia

July 2004

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INTRODUCTION

With the coming into force of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean on 19 June 2004 and the first meeting of the Western and Central Pacific Fisheries Commission planned for December 2004, it is timely for the SCTB Statistics Working Group to compile information that will be needed by the Commission and its Scientific Committee to deal with the data-related issues that they will soon be facing. This document was prepared for that purpose and will be presented and discussed at a meeting of the Statistics Working Group that will be held on 9 August 2004, during SCTB17. This document and a report of that meeting will then be considered by the Scientific Coordinating Group (SCG) of Preparatory Conference for the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific (PrepCon) at its third meeting, which will be held immediately following SCTB17, from 19 to 21 August 2004.

The information on data-related issues presented herein has been organised according to the tasks that it is anticipated that the Commission and its Scientific Committee will have to address. The information is based on the experience that the SCTB has accumulated during its seventeen years of existence and references are made to relevant text from SCTB reports and other documents. The relevant text is either presented in the appendices or links to the documents are provided in the list of references.

1. DRAFT THE TERMS OF REFERENCE OF THE STATISTICS WORKING GROUP

The Commission will almost certainly establish a working group within the Scientific Committee to deal with data-related issues under Article 11(6) of the Convention:

> *The Commission may establish other such subsidiary groups as it deems necessary for the exercise of its functions, including working groups for the purpose of examining technical issues relating to particular species or stocks and reporting thereon to the Commission.*

Drafting the terms of reference of a statistics working group established by the Commission, or otherwise determining its functions, will be an early task.

The terms of reference or functions of a statistics working group established by the Commission should take into account those of the SCTB Statistics Working Group. The SCTB Statistics Working Group was established as a result of Recommendation 1 of SCTB10 (Nadi, Fiji, 16–18 June 1997), which sought to "*modify the terms of reference of SCTB in order to provide a more efficient and effective forum for scientific debate and a vehicle for research/data coordination and collaboration in which all participants will be equal partners*". Recommendation 1 was endorsed by the Thirty-Seventh South Pacific Conference in October 1997, and the Statistics Working Group (and research groups for albacore, bigeye, skipjack, yellowfin, and billfish and bycatch) met for the first time at SCTB11 (Honolulu, Hawaii, United States of America, 28 May – 6 June 1998).

The new terms of reference that took effect at SCTB11 are as follows (Anon. 1998):

1. *Coordinate fisheries data collection, compilation and dissemination according to agreed principles and procedures;*

2. *Review research on the biology, ecology, environment and fisheries for tunas and associated species in the western and central Pacific Ocean;*

3. *Identify research needs and provide a means of coordination, including the fostering of collaborative research, to most efficiently and effectively meet those needs;*

4. *Review information pertaining to the status of stocks of tunas and associated species in the western and central Pacific Ocean, and to produce statements on stock status where appropriate;*

5. *Provide opinion on various scientific issues related to data, research and stock assessment of western and central Pacific Ocean tuna fisheries.*

Terms of reference were not established separately for the SCTB Statistics Working Group (nor for the species research groups); rather, they were embodied in the first and fifth terms of reference of SCTB. In any case, the key element is that the function of the SCTB Statistics Working Group is to coordinate the collection, compilation and dissemination of fisheries data.

When the terms of reference above were drafted, the meaning of the words 'data collection, compilation and dissemination' was intended to be precise. The 'collection of data' refers to the use of forms to record various types of data (e.g., logsheets to record catch and effort data for individual vessels, observer data collection forms, port sampling forms, etc.). The 'compilation of data' refers to the provision of these forms (either hardcopy or their electronic equivalent) to national or international agencies; in the case of the SCTB, the agency has been SPC. The 'dissemination of data' refers to the release of data by the agency that has compiled the data (in the case of SCTB, SPC) to the users of the data.

This terminology was also used in the Convention; in Article 13 (Scientific services), we have:

> *In carrying out their work, the scientific experts may undertake the collection, compilation and dissemination of fisheries data according to agreed principles and procedures established by the Commission, including procedures and policies relating to the confidentiality, disclosure and publication of data.*

In addition to taking into account the functions of the SCTB Statistics Working Group, the terms of reference or functions of a statistics working group established by the Commission must be consistent with those of the Scientific Committee. In this regard, the Convention states in Article 12 (Functions of the Scientific Committee) that:

> *The functions of the Committee shall be to (a) recommend to the Commission a research plan, including specific issues and items to be addressed by the scientific experts or by other organizations or individuals, as appropriate, and identify data needs and coordinate activities that meet those needs; (b)* …

The statistics working group function of coordinating data collection, compilation and dissemination is thus consistent with the functions of the Scientific Committee.

The activities of the SCTB Statistics Working Group in regard to coordinating the collection, compilation and dissemination of data were specified at SCTB11 (Anon. 1998):

> *It was proposed that the coordination of data collection by the SWG could be accomplished through (1) periodic reviews of all data collection forms in use, in order to ensure that they include a minimum standard of data; (2) periodic reviews of the level of coverage by logsheet and landings data for each of the fleets, in order to ensure that a minimum level of coverage is being achieved; (3) periodic reviews of the level of accuracy and reliability of the logsheet*

data, in order to ensure that the logsheet data have been subject to a minimum level of verification; and (4) the establishment of a regional sampling design for port sampling and observer programmes.

The coordination of the compilation of data by the SWG could be accomplished through (1) specifying the data items that should be compiled for each type of data and (2) reviewing the data that have been compiled on an annual basis, for each type of data.

Coordination of the dissemination of data by the SWG could be accomplished by (1) establishing policies for the dissemination of data and (2) reviewing the instances of the dissemination of data on an annual basis.

As can be seen from these activities, the data-related issues that have so far been discussed in the context of the Commission – e.g., those concerning data standards, the provision of data to the Commission, confidentiality and the dissemination of data, etc. – are covered under the general function of 'coordinating the collection, compilation and dissemination of data'. The SCTB Statistics Working Group has, in fact, provided much of the groundwork that can be used by the Commission in accomplishing the data-related tasks discussed herein.

2. DRAFT A RESOLUTION ON THE SCIENTIFIC DATA TO BE PROVIDED BY MEMBERS OF THE COMMISSION UNDER ARTICLE 23 OF THE CONVENTION

Article 23 (Obligations of members of the Commission) of the Convention, states that:

Each member of the Commission shall:

(a) provide annually to the Commission statistical, biological and other data and information in accordance with Annex I of the Agreement and, in addition, such data and information as the Commission may require;

(b) provide to the Commission in the manner and at such intervals as may be required by the Commission, information concerning its fishing activities in the convention Area, including fishing areas and fishing vessels in order to facilitate the compilation of reliable catch and effort statistics; …

'Annex I of the Agreement' refers to the annex on 'Standard Requirements for the Collection and Sharing of Data' in the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks[1]. Annex I is presented in Appendix I below.

An early task of the Commission will be to draft a resolution, or otherwise establish a policy, concerning the scientific data to be provided by members under Article 23. The current position of the Preparatory Conference in regard to the provision of scientific data is summarised in the report of the meeting of Working Group II (Scientific Structure and Provision of Interim Scientific

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[1] Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks: http://www.un.org/depts/los/convention_agreements/texts/fish_stocks_agreement/conf164_37.htm

Advice) at the fifth session of Preparatory Conference for the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific (29 September – 3 October 2003, Rarotonga, Cook Islands) [2]:

> *Data needs*
>
> *WG.II recognized that accurate stock assessment depends on accurate data collected at an operational level i.e. longline and purse-seine sets, and pole and line and troll by day fished. Such data are a long-term data requirement of the Commission. WG.II therefore recommended that operational level data be collected by all fleets and be made available to the Commission for stock assessment and other scientific analyses, with appropriate arrangements for data security and confidentiality.*
>
> *Estimates of annual catches are an essential element of fisheries data. WG.II recommends that annual catches by species, gear and fleet in the Convention area be reported by flag states and coastal states.*
>
> *Size composition (length and/or weight frequency) data are also essential for stock assessment. WG.II recommends that size composition data should be collected, at the operational level (described above) where practical, according to a statistically sound sampling design to ensure that the data are representative of the fishery…*
>
> *WG.II recognized the unique characteristics of the WCPO fisheries, that the pathways for data communication may be complex, and that coastal states play a critical role in regional data collection. WG.II recommends flexibility be maintained in establishing data reporting requirements for the Commission and that coastal states and flag states cooperate in ensuring that the Commission receive data in a timely fashion…*

A resolution on the provision of scientific data to the Commission must take the above into account, together with Annex I of the Agreement.

It should be noted that operational catch and effort data, estimates of annual catch statistics and size composition data are only a subset of the types of scientific data that are required for stock assessment and other analyses. The full range of types of data that are currently being used for tuna fisheries research conducted by the SPC Oceanic Fisheries Programme is discussed in Lawson et al. (2002) and also includes unloadings data; observer and port sampling species composition data; numbers of vessels active by size class; observer catch data for non-target species and discards of tuna; vessel and gear attributes; tag release and recapture data; oceanographic and meteorological data; genetic data; otolith ring counts; stomach contents data; and isotopic N15/C14 data. Compilation of some of these types of data could be done by the Commission, while others could be done independently of the Commission by the scientific experts engaged under Article 13 (Scientific services) of the Convention.

Article 6 (Data verification) of Annex I of the Agreement states that "*States or, as appropriate, subregional or regional fisheries management organizations or arrangements should establish mechanisms for verifying fishery data, such as: (a) position verification through vessel monitoring systems; (b) scientific observer programmes to monitor catch, effort, catch composition (target and*

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[2] Summary report by the Chair of Working Group II to the fifth session of the Preparatory Conference, WCPFC/PrepCon/32: http://www.ocean-affairs.com/ – PrepCon – Conference Documents – Conference Papers

non-target) and other details of fishing operations; (c) vessel trip, landing and transshipment reports; and (d) port sampling". It is suggested below that the issue of data verification be considered under Task #9, 'Establish procedures for evaluating the quality of the scientific data compiled by the Commission'. However, the verification of data could also be included as an element of a resolution on the provision of scientific data to the Commission.

3. DRAFT A RESOLUTION ON THE PRINCIPLES AND PROCEDURES FOR THE DISSEMINATION OF SCIENTIFIC DATA BY THE COMMISSION

Reference is made to "*agreed principles and procedures established by the Commission, including procedures and policies relating to the confidentiality, disclosure and publication of data*" in Article 13 (Scientific services) of the Convention (quoted above) and reference is made to procedures for the dissemination of observer data in Article 28 (Regional observer programme) . Another early task of the Commission will be to draft a resolution, or otherwise establish a policy, concerning the principles and procedures for the dissemination of scientific data compiled by the Commission.

A policy concerning the dissemination of data reflects concerns about their confidentiality. SPC has managed highly confidential data, including operation catch and effort data covering all potential members of the Commission, for over 20 years. The basic principle of SPC's policy regarding the dissemination of data is that the data compiled by SPC are released to users of the data only if the sources of the data – which include SPC member governments and territories, non-SPC member governments, and private companies – have authorised the release of their data. In this way, the sources of the data maintain full control over the use of their data and do not give up their 'ownership' of the data when providing it to SPC.

SPC's policy regarding the dissemination of data were adopted by SCTB in the procedures for the dissemination of data that were established by the SCTB Statistics Working Group at SCTB11. The procedures for the dissemination of catch and effort data are as follows (see Anon. 1998):

> *Catch and effort data grouped by 5° longitude by 5° latitude by month for longline and 1° longitude by 1° latitude by month for surface fisheries, for all fishing nations combined, are considered to be in the public domain.*
>
> *Catch and effort data grouped by 5° longitude by 5° latitude by month for longline and 1° longitude by 1° latitude by month for surface fisheries, stratified by fishing nation, are available for release at the discretion of the SPC Oceanic Fisheries Programme, for those sources of data which have so authorised the OFP. For those sources of data that have not authorised the OFP to release data at its discretion, authorisation for the release of data must be obtained from the sources of the data.*
>
> *Catch and effort data grouped at a finer level of time-area stratification may be released with authorisation from the sources of the data.*
>
> *Catch and effort data are released for research purposes only, and to individuals who can be trusted to use the data responsibly. The person requesting the data is required to provide a description of the research project. The data are released only for use in the specified research project and the data must be destroyed upon completion of the research project. However, catch and effort data may be released for long-term usage for research purposes, such that the data need not be destroyed, with authorisation from the sources of the data.*

The person requesting the data will be asked to provide a report of the results of the research project to the OFP, for subsequent forwarding to the sources of the data.

While all releases of data must be authorised by the sources, these procedures still allow SPC to disseminate data extremely quickly upon receipt of a request. Most of the sources of data held by SPC have, in fact, authorised the OFP to release data grouped by time-area strata at its discretion. SPC can therefore respond to most requests by releasing data within a matter of hours. On the other hand, the dissemination of data for which the OFP has not received authorisation to release at its discretion can take up to a year, depending on the complexity of the request.

If the Commission wishes to adopt similar procedures for the dissemination of data, it should revise the procedures listed above and substitute 'the Commission' for 'the SPC Oceanic Fisheries Programme'. The Commission should then undertake to obtain from its members the authorisation to release aggregated data at its discretion. However, in order to ensure the timely dissemination of data, the Commission should delegate the authority to release data at the Commission's discretion to the data managers (i.e., the OFP during the transitional period).

The estimates of annual catches that are compiled by the OFP are in the public domain. The annual catch estimates are available on the SPC/OFP website and are published in the SPC Tuna Fishery Yearbook.

The sources of the catch and effort data held by SPC have agreed that catch and effort data grouped by 5° longitude by 5° latitude by month for longline and 1° longitude by 1° latitude by month for surface fisheries, for all fishing nations combined, are in the public domain and these data are also available on the SPC/OFP website. However, this criteria for public domain catch and effort data is restrictive in that data stratified by fishing nation are not considered to be in the public domain. Other regional fisheries bodies, such as the International Commission for the Conservation of Atlantic Tunas, consider that catch and effort data grouped by time-area and stratified by fishing nation are in the public domain, and such data are available on the ICCAT website. In the interest of making data more easily available for research on tuna fisheries in the region, it would be useful for the WCPFC to adopt the same criteria as ICCAT for public domain data.

The Scientific Committee's draft resolution or policy concerning the dissemination of data should refer to all types of scientific data compiled by the Commission. The procedures followed by SPC regarding the release of other types of data, in addition to catch and effort data, are also based on the principle that all releases of data must be authorised by the sources.

4. ADVISE THE COMMISSION REGARDING THE CONTENTS OF AN ANNUAL REPORT ON THE STATUS OF THE COLLECTION, COMPILATION AND DISSEMINATION OF DATA TO BE PROVIDED BY THE COMMISSION'S DATA MANAGERS

The Scientific Committee may wish to advise the Commission regarding the contents of an annual report on the status of the collection, compilation and dissemination of data that will be requested of the Commission's data managers.

Various reports concerning the status of data have been produced by the SCTB Statistics Working Group and the OFP. A working paper entitled "Status of Data Collection, Compilation and Dissemination" has been presented by the Coordinator of the SCTB Statistics Working Group at

meetings of the SCTB for several years (e.g., Lawson 2003a). At SCTB16 (Mooloolaba, Queensland, Australia, 9–16 July 2003), this working paper contained the following information:

- A summary of activities undertaken concerning the collection of tuna fisheries data, e.g., a review of catch and effort logsheets used by the Republic of Korea.

- A summary of activities undertaken concerning the compilation of data, which consisted of (a) a review of data compiled for each fleet, covering estimates of annual catches, catch and effort data, length data and observer data, and referring to the most recent years for which data had been provided, the date on which the most recent data were provided, problems (if any) with the compiled data, and missing data; and (b) tables of coverage rates for catch and effort data, unloadings data, port sampling data and observer data, for each fleet.

- A summary of activities undertaken concerning the dissemination of data, which consisted of (a) a histogram summarising releases of data by the OFP over the past six years – showing the number of releases of public domain data via the OFP website, the number of releases of data other than via the website, and the number of releases of statistics and other information – and (b) a description of each release of data or other information, including the name of the person to whom data or other information were released, their affiliation, a description of the data or information that were requested, the purpose for which the data or information were requested, and the date upon which the data or information were released.

Working papers summarising the availability of data for the SCTB species research groups have also been presented at past meetings of the SCTB. For SCTB17, a single information paper for all species was prepared (Williams 2004). The paper contained a summary of the main gaps and other problems with the data compiled by the OFP, and histograms showing the coverage of catch and effort data and size composition data held by the OFP for each fleet, for albacore in the South Pacific and bigeye, skipjack and yellowfin in the WCPO.

The OFP has also prepared a catalogue of the data held by the OFP, which is updated on an annual basis and posted on the OFP website[3]. The data catalogue gives detailed information regarding catch and effort data, tag release and recaptures, size composition data, unloadings data, observer data and oceanographic and climatological data held by the OFP. For the catch and effort data and size composition data, detailed information are presented on the years, fleets and species covered, the sources of the data and the number of records.

The information concerning gaps in the data that have been presented in the reports mentioned above have not been presented in a comprehensive manner. Appendix II presents a draft list of data gaps that have been categorised into several types of data gap.

The Scientific Committee may wish to further document the timeliness of the provision of data through summary tables. An example of a table that could be used in this regard, for estimates of annual catches, is presented in Appendix III. Similar tables could be developed for operational catch and effort data, size composition data and other types of data.

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[3] SPC Oceanic Fisheries Programme, Data Catalogue: http://www.spc.int/OceanFish/Docs/Statistics/datacat/datacat.htm

5. MONITOR THE STATUS OF DATA COLLECTION IN THE PHILIPPINES AND THE PACIFIC OCEAN WATERS OF INDONESIA

The lack of accurate catch statistics, effort data, and species composition and size composition data for the Philippines and the Pacific Ocean waters of Indonesia has been responsible for much of the uncertainty in the stock assessments for bigeye and yellowfin in the Western and Central Pacific Ocean. As the most important gap in the data required by the Commission, it merits special attention by the Scientific Committee and is therefore listed here as a separate task.

At PrepCon V (29 September – 3 October 2003, Rarotonga, Cook Islands), Working Group II (Scientific Structure and Provision of Interim Scientific Advice) received a proposal from the SCG for characterising the catches of highly migratory species in the Philippines and the Pacific Ocean waters of Indonesia. Working Group II confirmed the importance of obtaining catch data from Indonesia and Philippines and recommended that, in cooperation with Indonesia and the Philippines, the proposal be further developed, and as a high priority that participants in the PrepCon further consider how they might assist this initiative, through services or financial support.

The proposal was subsequently developed by the OFP (Anon. 2003a) and presented to PrepCon VI (19–23 April 2004, Bali, Indonesia). Funding for the proposal was contributed by Chinese Taipei and the United States of America, and Australia subsequently agreed to fund one component of the proposal and, at the time of writing (July 2004), was considering funding a second component. The contributions were not sufficient to implement the full proposal, however, and a steering committee was established to allocate the available funds and, in the future, to monitor the status of project activities and developments in regard to project funding. The report of the first meeting of the Indonesia and Philippines Data Collection Steering Committee, which was held on 21 April 2004, immediately following the first session of Working Group II at PrepCon VI, is presented in Appendix IV.

At the first meeting of the Steering Committee, it was decided to allocate the available funds to project activities in the Philippines. The first of those activities – a review of the tuna fisheries and monitoring systems that is comprised of two components: (a) the compilation of information on the historical development and the current status of tuna fisheries in the Philippines, and (b) a review of the current monitoring systems, with recommendations for improvements – commenced on 8 July 2004 with the start of a 24-day visit to the Philippines by Dr Antony Lewis, a consultant funded by the Australian Centre for International Agricultural Research through SPC. Future activities for the Philippines include a planning workshop to be held in Manila in October 2004 to consider the review of the tuna fisheries and monitoring, and to plan the strengthening of port sampling that will be implemented subsequent to the planning meeting. Project activities for Indonesia will commence when sufficient funding becomes available.

It is suggested that the task of monitoring the status of data collection in the Philippines and the Pacific Ocean waters of Indonesia be accomplished by the Scientific Committee through the Indonesia and Philippines Data Collection Steering Committee.

6. DEVELOP A STRATEGY FOR IMPROVING THE CAPACITY OF MEMBERS TO MEET THE DATA REQUIREMENTS OF THE COMMISSION

Reference is made in the Convention to assistance to developing states in regard to data collection in Article 30 (Recognition of the special requirements of developing States), which states that:

> *Cooperation with developing States, and territories and possessions, for the purposes set out in this article may include the provision of financial assistance, assistance relating to human resources development, technical assistance, transfer of technology, including through joint venture arrangements, and advisory and consultative services. Such assistance shall, inter alia, be directed towards:*
>
> *(a) improved conservation and management of highly migratory fish stocks through collection, reporting, verification, exchange and analysis of fisheries data and related information; …*

In considering the issue of long-term data requirements of the Commission, PrepCon Working Group II requested the OFP to compile information on the current capacity and capacity needs of Pacific island countries and territories to fulfil their likely scientific data collection and reporting obligations. The report (Anon. 2004a) discusses the data collection responsibilities of members of the Commission and the current status of Pacific island countries and territories to meet those responsibilities.

Subsequent to the presentation of the OFP report at PrepCon V, a more comprehensive needs assessment of Forum Fisheries Agency member countries has been undertaken in 2004 as part of a new project being funded by the Global Environment Facility. The design work for the GEF project titled 'Oceanic Fisheries Management: Implementation of the Strategic Action programme of the Pacific Island Developing States' – the SAP II Project – involves national missions to visit Pacific island countries to improve understanding of the WCPF Convention, assess the impact of the Convention at the national level, and identify assistance needed for implementation of the Convention. One of the key areas of the project is monitoring, which includes assistance for coordination of scientific monitoring at the regional level and for enhancing national monitoring programmes, such as observer programmes, port sampling programmes and the collection and analysis of observer data. The indicative budget for the project – which also includes components on law, policy, compliance and stock assessment – is USD 8.5 million over five years, starting in 2005.

In addition to monitoring the status of data collection in the Philippines and Indonesia in particular (see Task #5), the Scientific Committee may wish to consider developing a general strategy for improving the capacity of members to meet the data requirements of the Commission. Such a strategy should take into account (a) the scientific data to be provided by members of the Commission (see Task #2); (b) the data gaps identified by the Commission's data managers (see Task #4 and Appendix II); (c) the data collection responsibilities of members of the Commission and the current status of members to meet those responsibilities, as described in Anon. (2004a); and (d) future developments of the SAP II Project.

In developing a general strategy for improving the capacity of members to meet the data requirements of the Commission, the Scientific Committee should not be restricted to consideration only of developing States and territories.

7. ESTABLISH STANDARDS FOR THE COLLECTION OF SCIENTIFIC DATA, INCLUDING OPERATIONAL CATCH AND EFFORT DATA, PORT SAMPLING DATA AND OBSERVER DATA

One of the primary data-related functions of the Scientific Committee will be to establish standards for the collection of tuna fisheries data by its members, including operational catch and effort data, port sampling data and observer data.

The SCTB Statistics Working Group established minimum standards for the collection of operational catch and effort data at SCTB12 (Anon. 1999); the standards are presented below in Appendix V. The minimum standards were then used as the basis for reviews of the catch and effort logsheets in use in the region. Logsheets developed by the New Zealand Ministry of Fisheries and the Australian Fisheries Management Authority were reviewed at SCTB12; the reviews are presented in Appendices 6 and 7 in Anon. (1999). Logsheets developed by the SPC/FFA Tuna Fishery Data Collection Forms Committee (DCC), which are widely used in the region, were reviewed at SCTB13 (Appendix 5 in Anon. 2000); the DCC forms were subsequently revised in December 2002 (Anon. 2003b). Japanese logsheets were reviewed at SCTB14 (Appendix 5 in Anon. 2002); Taiwanese logsheets were reviewed at SCTB15 (Appendix 4 in Anon. 2003c); and Korean logsheets were reviewed at SCTB16 (Appendix 8 in Anon. 2003d).

It should be noted that the SCTB Statistics Working Group did not consider establishing standard catch and effort logsheets for use by all fleets operating in the WCPO, since this would have been impractical given the different requirements of the fishing nations. While the logsheets developed by the DCC satisfy the requirements of most SPC and FFA member countries and territories, certain countries record much more detailed information on their logsheets than is recorded on the DCC logsheets. Instead of establishing standard logsheets, the SCTB Statistics Working Group established minimum standards that were used to determine whether that the various logsheets used in the region were adequate.

In establishing standards for the collection of catch and effort data, the Scientific Committee should refer to the standards established by the SCTB Statistics Working Group. The Scientific Committee should also establish standards for the collection of port sampling data and observer data, including minimum standards for data collection forms and sampling protocols for collecting data on the size composition and the species composition of the catch.

The Scientific Committee should also consider determining target coverage rates for the collection of catch and effort data, port sampling data and observer data, for scientific purposes. Actual target coverage rates will take both scientific and compliance purposes into account, and thus should be set in conjunction with the Technical and Compliance Committee.

Data standards, sampling protocols and target coverage rates are discussed further under Tasks #8 and #9.

8. ADVISE THE COMMISSION REGARDING THE SCIENTIFIC ASPECTS OF THE REGIONAL OBSERVER PROGRAMME TO BE DEVELOPED UNDER ARTICLE 28 OF THE CONVENTION

Article 28 (Regional observer programme) of the Convention states that "*the Commission shall develop a regional observer programme to collect verified catch data, other scientific data and additional information related to the fishery from the Convention Area and to monitor the implementation of the conservation and management measures adopted by the Commission*".

The Scientific Committee may be asked by the Commission to advise regarding the scientific aspects of the regional observer programme. In the interest of harmonising national and regional observer programmes, the Scientific Committee may also wish to make recommendations concerning the scientific aspects of national observer programmes. Scientific aspects of observer programmes that should be considered include standards for data collection, sampling protocols and target coverage rates.

Regarding standards for data collection, the objective should not be to establish standard observer data collection forms, given the differences in the requirements of the existing national observer programmes. Rather, it should be to establish minimum standards that can be used to determine whether the data collection forms that are in use in the region are adequate for the common objectives of an observer programme, such as monitoring the catches of target and non-target species and the collection of data on the size composition data and the species composition of the catch. The information recorded on the observer forms developed by the SPC/FFA Tuna Fisheries Data Collection Committee, which are the most widely used observer forms in the region, may be a useful starting point. The reports of the meetings of the DCC (e.g., Anon. 2003b) contain copies of all data collections forms maintained by the DCC, including the observer forms.

Regarding sampling protocols for the collection of data on the size composition and the species composition of the catch, the most widely-used protocols in the WCPO are those of the observer programmes for which technical support is provided by SPC and FFA (i.e., the national programmes of the Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Kiribati, Marshall Islands, New Caledonia, Palau, Papua New Guinea, Solomon Islands and Tonga, and the regional observer programme under the US Treaty). For offshore longliners, the sampling protocol is to record the species and length of all fish from all sets during a trip. For purse seiners, the sampling protocol is to measure the species and length of five fish that are randomly selected from each brail of each set during a trip. These sampling protocols should be compared to sampling protocols used in other observer programmes, both in the region and worldwide.

Regarding target coverage rates, the SCTB Statistics Working Group considered this aspect of observer programmes at SCTB16 (see Appendix 5 in Anon. 2003d) and concluded that "*each of the studies showed that the establishment of coverage rates depends on the species for which estimates of catches were required and the level of the coefficient of variation of the estimates that is considered acceptable*". In particular, a study on observer coverage rates for offshore longline fleets targeting South Pacific albacore (Lawson 2003b) concluded that "*the observer coverage rate that should be applied will depend on the species of interest and the coefficient of variation (i.e., the 'reliability' or the 'confidence') of the estimates that is required. If the objective is to monitor all species and if cost or the availability of observers are not limiting factors, then 100% coverage is appropriate. If 100% coverage is not possible, then coverage of 20% may be an appropriate compromise, given that further increases in coverage result in smaller incremental improvements in the reliability of the estimates*." Similar conclusions were drawn from a study on offshore longliners targeting bigeye and yellowfin in tropical waters (Lawson 2004). Further analyses of coverage rates

should be directed towards the purse-seine fleets, for which considerable observer data are available. Unfortunately, the observer data that are currently available for the distant-water longline fleets in the WCPO are insufficient for such analyses.

9. ESTABLISH PROCEDURES FOR EVALUATING THE QUALITY OF THE SCIENTIFIC DATA COMPILED BY THE COMMISSION

Various aspects of data quality have been considered in the tasks discussed above, such as the verification of fisheries data, the establishment of data standards, sampling protocols and target coverage rates. Each of the these can be considered as specific components of a general policy on data quality.

Strategies for evaluating and managing data quality have been developed by several regional organisations and a review of these strategies and related issues has recently been conducted by the Food and Agriculture Organization of the United Nations (Evans 2003). In addition to the verification of data, data standards, sampling protocols and coverage rates, other issues that are relevant to data quality include the timeliness of data submission, the documentation of methods of data collection and data processing, the development of data quality indicators, the cost-effectiveness of data collection, the accessibility of statistical information, the coherence of data obtained from multiple sources, etc.

In this regard, the Coordinating Working Party on Fishery Statistics plans to develop general guidelines for quality assurance of fishery data collection systems (Anon. 2004b) in the context of the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries (Anon. 2003e).

The Scientific Committee may wish to establish procedures for evaluating the various aspects of data quality, which together could be considered the Commission's policy on data quality. Such procedures and policy should take into account those developed by other regional organisations and the general guidelines that will be developed by the Coordinating Working Party on Fishery Statistics.

10. HARMONISE DATA COLLECTION STANDARDS FOR THE WESTERN AND CENTRAL PACIFIC OCEAN AND THE EASTERN PACIFIC OCEAN IN COLLABORATION WITH THE INTER-AMERICAN TROPICAL TUNA COMMISSION

At SCTB16, it was noted (Anon. 2003d) that:

> *For many years, the IATTC Secretariat has participated in the SCTB Statistics Working Group. Recognizing that (1) there are currently differences in some of the data collection standards considered minimum by the IATTC and the SCTB (e.g., the recording of the end of set time for a purse seine set, which is used by the IATTC in search time models of purse seine fishing effort, but which is not a minimum standard for SCTB); (2) that many the participants in fisheries in the WCPO and the EPO are the same, and that some will be members of both the IATTC and the anticipated WCPF Commission; and (3) wishing to minimize differences in the data requested while at the same time ensuring data requirements for fisheries are met, it is requested that the SCTB establish a formal contact with the head of the Statistics Department, Tuna/Billfish Section, of the IATTC with the objective of identifying differences*

in standards that are developed and established by the Director of the IATTC and standards that have been established by the SCTB, so that efforts may be made to develop and adopt, where possible, a single Pacific-wide data standard for collection of minimum statistics and information from fisheries directed at and harvesting tunas and tuna-like species.

Subsequent to SCTB16, the coordinator of the SCTB Statistics Working Group and the head of the Statistics Department, Tuna/Billfish Section, of the IATTC began liaising in this regard.

The Scientific Committee may wish to continue liaising with IATTC in order to harmonise data collection standards for the WCPO and the EPO.

11. ESTABLISH AN AGREEMENT ON THE EXCHANGE OF TUNA FISHERIES DATA BETWEEN THE INTER-AMERICAN TROPICAL TUNA COMMISSION AND THE COMMISSION

In March 2003, an Agreement on the Exchange of Tuna Fisheries Data Between IATTC and SPC was reached. The IATTC-SPC Agreement concerns the exchange of operational data for the WCPO and the EPO. The text is presented in Appendix VI.

At the time of writing (July 2004), the following sources of operational data for the EPO held by the OFP had authorised the release of their data to IATTC: Cook Islands, French Polynesia, Kiribati, Marshall Islands, Papua New Guinea, Solomon Islands, Vanuatu and the Forum Fisheries Agency. No responses to requests for authorisation that were sent by email on 28 November 2003 and 19 March 2004 have been received from the Federated States of Micronesia and Fiji.

The Scientific Committee may wish to recommend that the Commission adopt the IATTC-SPC Agreement, in conjunction with IATTC, such that operational data are exchanged by IATTC and the Commission. The SPC Oceanic Fisheries Programme, which will manage the Commission's data during the transitional period, will then exchange data with IATTC on the Commission's behalf.

12. HARMONISE THE PROCEDURES FOR THE COMPILATION AND DISSEMINATION OF DATA BY THE COMMISSION AND THE INTERIM SCIENTIFIC COMMITTEE FOR TUNA AND TUNA-LIKE SPECIES IN THE NORTH PACIFIC OCEAN

The procedures currently followed by the OFP for the dissemination of data are listed under Task #3 above. The basic principle underlying the procedures is that all releases of non-public domain data must be authorised by the sources of the data.

The procedures for the dissemination of data by the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean[4] (see Appendix VII) are similar, in that ISC members – Canada, Chinese Taipei, Japan, Korea Rep, Mexico, People's Republic Of China and the United States of America – have authorised the ISC data manager to release non-public domain data to scientists of ISC working groups that are nationals of ISC members that have also contributed data, and that all other releases of data must be authorised by the source of the data.

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[4] Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean: http://isc.ac.affrc.go.jp/

However, if the Commission adopts procedures for the dissemination of data that are similar to those currently followed by the OFP and if the ISC requests data from the Commission, then the potential exists for the Commission's data to be released to scientists of ISC working groups without authorisation from the Commission's sources of data. The Scientific Committee may therefore wish to recommend to the Commission that all releases of data to the ISC (or its successor committee) be done in accordance with the Commission's procedures for the dissemination of data, such that all releases of the Commission's data by the ISC data manager must be authorised by the Commission's sources of data.

13. RECOMMEND THAT THE COMMISSION BECOME A MEMBER OF THE COORDINATING WORKING PARTY ON FISHERY STATISTICS

The Coordinating Working Party on Fishery Statistics (CWP) has as its purpose to (i) keep under continuous review the requirements for fishery statistics for research, policy-making and management, (ii) agree standard concepts, definitions, classifications and methodologies for the collection and collation of fishery statistics, and (iii) make proposals for the coordination and streamlining of statistical activities amongst relevant intergovernmental organizations (Anon. 1995). Members of the CWP are regional or global organisations that have an interest in fishery statistics. The Food and Agriculture Organization of the United Nations is the secretariat of the CWP; however, the CWP is not a FAO body.

The CWP was established through Resolution 23/59 of the Tenth Session of the FAO Conference in 1959 to improve and simplify the collection and reporting of fishery statistics in the North Atlantic area. However, the CWP was reconstituted in 1995 to extend its geographic mandate beyond the Atlantic and better respond to the increasing demands for reliable fishery statistics, such as those resulting from the 1995 UN Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, as well as the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas and the Code of Conduct for Responsible Fisheries. The current statutes and rules of procedure of the CWP are presented in Anon. (1995).

SPC's participation at meetings of the CWP began with the Fifteenth Session in Dartmouth, Canada in July 1992, when it attended as an observer at the invitation of FAO. SPC has participated in all subsequent sessions: Madrid in July 1995, Hobart in March 1997, Luxembourg in July 1999, Noumea in July 2001 and the Seychelles in January 2003. Following the modification of the CWP statutes in 1995, SPC became the first non-Atlantic member of the CWP at the Seventeenth Session in March 1997, and hosted and chaired the Nineteenth Session in July 2001. The thirteen current members of the CWP are listed below:

- Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- Commission for the Conservation of Southern Bluefin Tuna (CCSBT)
- Food and Agriculture Organization of the United Nations (FAO)
- Indian Ocean Tuna Commission (IOTC)
- Inter-American Tropical Tuna Commission (IATTC)
- International Commission for the Conservation of Atlantic Tunas (ICCAT)
- International Council for the Exploration of the Sea (ICES)

- International Whaling Commission (IWC)
- North Atlantic Salmon Conservation Organization (NASCO)
- Northwest Atlantic Fisheries Organization (NAFO)
- Organisation for Economic Cooperation and Development (OECD)
- Secretariat of the Pacific Community (SPC)
- Statistical Office of the European Communities (EU/Eurostat)

The Southeast Asian Fisheries Development Centre (SEAFDEC) applied for membership in June 2004 and is expected to become the fourteenth member of the CWP at the Twenty-first Session, which will be held in Copenhagen in March 2005.

The Scientific Committee may wish to recommend that the Commission become a member of the CWP in order to represent its members in regard to regional and global issues concerning fishery statistics. CWP Rule of Procedure #14 (New participating organisations) states that "*an intergovernmental organization having competence in fishery statistics may become a participating organization of the Working Party if it is so decided by a two thirds majority of the participating organizations, provided that three months notice of the proposed admission had been given to all participating organizations*". Participants at the Sixteenth Session of the CWP agreed that applications should be handled intersessionally by correspondence and suggested that, in order to facilitate evaluation of applications, applicant organisations should provide information on the objectives of the organisation, their involvement in fishery statistics collection, compilation and publication and the composition of their governing body.

Should the Commission become a member of the CWP, SPC will continue to be a member of the CWP in its own right because of its competence in statistics concerning the coastal and oceanic fisheries of its member countries and territories.

14. RECOMMEND THAT THE COMMISSION BECOME A PARTNER IN THE FISHERIES RESOURCES MONITORING SYSTEM

The Fishery Resources Monitoring System (FIRMS) is a partnership that draws together international organisations, regional fishery bodies and national scientific institutes within a formal agreement to share information on status and trends of fishery resources. FIRMS is an important step in achieving the overall objective of the FAO Strategy for Improving Information on Status and Trends of Capture Fisheries (Anon. 2003e), which was approved by the FAO Committee on Fisheries on 28 February 2003.

The current FIRMS partners are the Commission for the Conservation of Southern Bluefin Tuna, the Food and Agriculture Organization of the United Nations, the Inter-American Tropical Tuna Commission, the Indian Ocean Tuna Commission, the International Commission for the Conservation of Atlantic Tunas and the International Council for the Exploration of the Sea. SPC and five other international organisations attended the First Session of the FIRMS Steering Committee (Rome, Italy, 2–5 February 2004) as observers.

Becoming a partner would require the Commission to enter an agreement to provide information on the status and trends of fisheries on the FIRMS website. As a partner, the Commission would join a global initiative to make status and trends information readily available on what will become the authoritative internet site for information about the status and trend of fisheries, and in doing so

would be contributing to the implementation of the FAO Strategy. The Commission may also benefit from the publishing and dissemination tools developed as part of FIRMS by FAO, which is the FIRMS Partnership Secretariat.

An invitation for the Commission to become a FIRMS partner was extended to the Interim Secretariat by the chairman of the FIRMS Steering Committee in March 2004, and a copy of a model of a partnership agreement was attached to the invitation. The Scientific Committee may wish to recommend that the Commission become a FIRMS partner.

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APPENDIX I

STANDARD REQUIREMENTS FOR THE COLLECTION AND SHARING OF DATA

Annex I of the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (8 September 1995)

Article 1

General principles

1. The timely collection, compilation and analysis of data are fundamental to the effective conservation and management of straddling fish stocks and highly migratory fish stocks. To this end, data from fisheries for these stocks on the high seas and those in areas under national jurisdiction are required and should be collected and compiled in such a way as to enable statistically meaningful analysis for the purposes of fishery resource conservation and management. These data include catch and fishing effort statistics and other fishery-related information, such as vessel-related and other data for standardizing fishing effort. Data collected should also include information on non-target and associated or dependent species. All data should be verified to ensure accuracy. Confidentiality of non-aggregated data shall be maintained. The dissemination of such data shall be subject to the terms on which they have been provided.

2. Assistance, including training as well as financial and technical assistance, shall be provided to developing States in order to build capacity in the field of conservation and management of living marine resources. Assistance should focus on enhancing capacity to implement data collection and verification, observer programmes, data analysis and research projects supporting stock assessments. The fullest possible involvement of developing State scientists and managers in conservation and management of straddling fish stocks and highly migratory fish stocks should be promoted.

Article 2

Principles of data collection, compilation and exchange

The following general principles should be considered in defining the parameters for collection, compilation and exchange of data from fishing operations for straddling fish stocks and highly migratory fish stocks:

(a) States should ensure that data are collected from vessels flying their flag on fishing activities according to the operational characteristics of each fishing method (e.g., each individual tow for trawl, each set for long-line and purse-seine, each school fished for pole-and-line and each day fished for troll) and in sufficient detail to facilitate effective stock assessment;

(b) States should ensure that fishery data are verified through an appropriate system;

(c) States should compile fishery-related and other supporting scientific data and provide them in an agreed format and in a timely manner to the relevant subregional or regional fisheries management organization or arrangement where one exists. Otherwise, States should cooperate to exchange data either directly or through such other cooperative mechanisms as may be agreed among them;

(d) States should agree, within the framework of subregional or regional fisheries management organizations or arrangements, or otherwise, on the specification of data and the format in which they are to be provided, in accordance with this Annex and taking into account the nature of the stocks and the fisheries for those stocks in the region. Such organizations or arrangements should request non-members or non-participants to provide data concerning relevant fishing activities by vessels flying their flag;

(e) such organizations or arrangements shall compile data and make them available in a timely manner and in an agreed format to all interested States under the terms and conditions established by the organization or arrangement; and

(f) scientists of the flag State and from the relevant subregional or regional fisheries management organization or arrangement should analyse the data separately or jointly, as appropriate.

Article 3

Basic fishery data

1. States shall collect and make available to the relevant subregional or regional fisheries management organization or arrangement the following types of data in sufficient detail to facilitate effective stock assessment in accordance with agreed procedures:

(a) time series of catch and effort statistics by fishery and fleet;

(b) total catch in number, nominal weight, or both, by species (both target and non-target) as is appropriate to each fishery. [Nominal weight is defined by the Food and Agriculture Organization of the United Nations as the live-weight equivalent of the landings];

(c) discard statistics, including estimates where necessary, reported as number or nominal weight by species, as is appropriate to each fishery;

(d) effort statistics appropriate to each fishing method; and

(e) fishing location, date and time fished and other statistics on fishing operations as appropriate.

2. States shall also collect where appropriate and provide to the relevant subregional or regional fisheries management organization or arrangement information to support stock assessment, including:

(a) composition of the catch according to length, weight and sex;

(b) other biological information supporting stock assessments, such as information on age, growth, recruitment, distribution and stock identity; and

(c) other relevant research, including surveys of abundance, biomass surveys, hydro-acoustic surveys, research on environmental factors affecting stock abundance, and oceanographic and ecological studies.

Article 4

Vessel data and information

1. States should collect the following types of vessel-related data for standardizing fleet composition and vessel fishing power and for converting between different measures of effort in the analysis of catch and effort data:

(a) vessel identification, flag and port of registry;

(b) vessel type;

(c) vessel specifications (e.g., material of construction, date built, registered length, gross registered tonnage, power of main engines, hold capacity and catch storage methods); and

(d) fishing gear description (e.g., types, gear specifications and quantity).

2. The flag State will collect the following information:

(a) navigation and position fixing aids;

(b) communication equipment and international radio call sign; and

(c) crew size.

Article 5

Reporting

A State shall ensure that vessels flying its flag send to its national fisheries administration and, where agreed, to the relevant subregional or regional fisheries management organization or arrangement, logbook data on catch and effort, including data on fishing operations on the high seas, at sufficiently frequent intervals to meet national requirements and regional and international obligations. Such data shall be transmitted, where necessary, by radio, telex, facsimile or satellite transmission or by other means.

Article 6

Data verification

States or, as appropriate, subregional or regional fisheries management organizations or arrangements should establish mechanisms for verifying fishery data, such as:

(a) position verification through vessel monitoring systems;

(b) scientific observer programmes to monitor catch, effort, catch composition (target and non-target) and other details of fishing operations;

(c) vessel trip, landing and transshipment reports; and

(d) port sampling.

Article 7

Data exchange

1. Data collected by flag States must be shared with other flag States and relevant coastal States through appropriate subregional or regional fisheries management organizations or arrangements. Such organizations or arrangements shall compile data and make them available in a timely manner and in an agreed format to all interested States under the terms and conditions established by the organization or arrangement, while maintaining confidentiality of non-aggregated data, and should, to the extent feasible, develop database systems which provide efficient access to data.

2. At the global level, collection and dissemination of data should be effected through the Food and Agriculture Organization of the United Nations. Where a subregional or regional fisheries management organization or arrangement does not exist, that organization may also do the same at the subregional or regional level by arrangement with the States concerned.

APPENDIX II

DRAFT LIST OF GAPS IN TUNA FISHERY DATA FOR THE WESTERN AND CENTRAL PACIFIC CONVENTION AREA HELD BY THE SPC OCEANIC FISHERIES PROGRAMME

INTRODUCTION

The Secretariat of the Pacific Community (SPC) has compiled tuna fisheries data for the Western and Central Pacific Ocean since 1977. Initially, tagging data and associated size and biological data were collected by the Skipjack Survey and Assessment Programme (1977–1981). Catch and effort data, aggregated by time-area strata, covering primarily the distant-water tuna fleets of Chinese Taipei, Japan and Korea, were compiled by the Skipjack Programme and used to analyse the tagging data. SPC began compiling operational catch and effort data, which were provided by SPC member countries and territories, in 1982, with the commencement of the Tuna and Billfish Assessment Programme. Other types of data – including port sampling data, observer data and unloadings data – have been compiled by SPC since the early 1990s, through the Oceanic Fisheries Programme (OFP).

While the data currently held by the OFP are extensive, there are important gaps. Some data sets have been compiled by fishing nations, but not provided to SPC (e.g., operational catch and effort data covering the distant-water tuna fleets of Chinese Taipei, Japan and Korea). Others have been compiled by SPC, but are known to be unreliable (e.g., operational catch and effort data covering the purse-seine fleets of Chinese Taipei and Korea prior to 1993). The data compiled by SPC cover the period from 1950 onwards; data covering the period prior to 1950 may exist (e.g., Japanese coastal and offshore/distant-water fleets), but they have not been identified and compiled. Some data are provided to SPC after a delay (e.g., annual catch estimates for Japanese longline and pole-and-line fleets) and constitute temporary data gaps, while other data have never been collected (e.g., size data covering the tuna fisheries of Indonesia and the Philippines prior to 1980) and constitute permanent data gaps.

This appendix documents the gaps in the data currently held by the OFP covering the Western and Central Pacific Convention Area. The missing sets of data are listed according to the type of data and the type of gap. Missing data sets that can potentially be rescued are highlighted.

At the time of writing (July 2004), this list of data gaps was still in draft form and is presented here as an example of how data gaps might be summarised for the Scientific Committee of the Commission.

ANNUAL CATCH ESTIMATES

I. Annual Catch Estimates Provided by the Fishing Nation, But Not Stratified by Gear Type and/or Species

Indonesian industrial and artisanal fleets and Philippines commercial and municipal fleets

Estimates of annual catches for the domestic fleets of Indonesia and the Philippines have been provided on a timely basis; however, annual catch estimates in recent years (1992–2002 for Indonesia and 1997–2002 for the Philippines) have not been broken down by gear type and estimates of annual bigeye and yellowfin catches for all years have been reported as a combined catch of 'tuna'.

II. Untimely Provision of Annual Catch Estimates by the Fishing Nation

Japanese longline and pole-and-line fleets

In recent years, estimates of the annual catches of the target tuna species have been provided to SPC within six months following the end of the calendar year for all fleets, except those covering the longline and pole-and-line fleets, both coastal and offshore / distant-water, of Japan.

III. Annual Catch Estimates Not Provided by the Fishing Nation and Determined by SPC With Unknown Accuracy

Tonga longline, 1996–2000

Catches for 1996–2000 were determined assuming each vessel caught an average of 100 tonnes per annum and applying the average species composition determined from logsheet data held by the OFP for 1993–2001.

IV. Annual Catch Estimates Neither Provided by the Fishing Nation Nor Determined by SPC

Vietnamese longline fleet

No annual catch estimates covering the recently-developed Vietnamese longline fleet have been provided by Vietnam or determined by SPC. No information is available regarding the current status of tuna fisheries statistics at the Fisheries Information Centre of the Ministry of Fisheries. Catch and effort data have been compiled for several years through the DANIDA-funded Fisheries Sector Programme Support, under the Strengthening of the Fisheries Administration component, in collaboration with the Minstry of Fisheries and the Hai Phong Research Institute of Marine Fisheries; however, this information has not been provided to SPC.

CATCH AND EFFORT DATA

I. Status of Collection and Compilation Unknown

Japanese offshore and distant-water longliners prior to 1952

In the period after the World War I, pole-and-line was the dominant gear type; however, by 1926, almost all Japanese longliners were converted to engine power, which resulted in an expansion of the fishing grounds (Matsuda & Ouchi 1984). In 1932, the Japanese government conducted the first tuna longline mothership operation in the area from the Nicobar Islands to Timor. By 1939, there were 72 longliners catching yellowfin, bigeye and swordfish in the tropical and sub-tropical waters of the WCPO. Longlining ceased in 1942, recommenced after World War II, and expanded rapidly when restrictions on vessel movements were lifted in 1952. The status of the collection and compilation of operational catch and effort data for Japanese offshore and distant-water longliners prior to 1952 is unknown.

Japanese offshore and distant-water pole-and-line vessels prior to 1952

Offshore tuna fishing in the WCPO was developed by the Japanese during the Meiji Era, 1868–1912 (Matsuda & Ouchi 1984). Prior to World War I, traditional tuna fisheries had gradually expanded from coastal to offshore areas and then to distant waters. The expansion of skipjack pole-and-line fishing accelerated during the 1920s with the construction of katsuobushi processing plants on Saipan, Chuuk, Pohnpei and Koror. The highest catch of skipjack prior to World War II was recorded as 28,688 tonnes in 1937. In 1940, 128 vessels were licensed. By 1942, bases for Japanese pole-and-line vessels had been established on several islands in the Japanese trusteeship established at the end of World War I. The fishing grounds expanded to almost all areas under the trusteeship and to Papua New Guinea, Solomon Islands and Southeast Asia. Japanese fishing vessels came under government control in 1942 and as a result of World War II, 60% of the vessels were lost. Pole-and-line fishing recommenced after the war and expanded when restrictions on vessel movements were lifted in 1952. The status of the collection and compilation of operational catch and effort data for Japanese offshore and distant-water pole-and-line vessels prior to 1952 is unknown.

Japanese coastal longline, pole-and-line and purse-seine fleets

Korean distant-water longliners prior to 1975

Chinese Taipei offshore and distant-water longliners prior to 1967

Operational data covering the industrial and artisanal fleets of Indonesia and the commercial and municipal fleets of the Philippines

Investigation into the status of the collection and availability of operational data in Indonesia and the Philippines has been proposed in Anon. (2003).

Operational data covering Chinese Taipei purse seiners, 1983–1992, and Korean purse seiners, 1980–1993

Lawson (1994) showed that operational data provided to coastal states covering Chinese Taipei purse seiners during 1980–1993 and Korean purse seiners during 1983–1993 were mis-reported. No information is currently available regarding the status and availability of accurately reported operational data for these fleets and periods.

Operational data covering Chinese fleets: longline, from 1988 onwards; and purse-seine, from 2001 onwards.

The status of data compilation by the Chinese government is unknown. However, data for the longline fleet based in SPC member countries and the purse-seine fleet have been provided to SPC by SPC members.

II. Operational or Trip Data Compiled by Fishing Nations, But Not Provided to SPC

American Samoa troll and handline, from 1982 onwards.

Data have been collected by the Department of Marine and Wildlife Resources through the Commercial Catch Monitoring System from 1982 to 1985 and through the Offshore Creel Survey System since October 1985; these data were requested by SPC in June 2002.

Canadian troll (South Pacific albacore), from 1987 (?) onwards.

Data have been collected by the Department of Fisheries and Oceans; these data were requested by SPC in August 2003.

Chinese Taipei fleets: distant-water longline, from 1967 onwards; offshore longline, from 1987 onwards; and purse-seine, from 1983 onwards.

Data for the offshore longline fleet based in SPC member countries and the purse-seine fleet, covering both the EEZs of SPC member countries and territories and the high seas, have been provided to SPC by SPC members. No data covering the offshore longline fleet based in Chinese Taipei have been provided.

Guam troll and handline, from 1982 onwards.

The Division of Aquatic and Wildlife Resources, in collaboration with the National Marine Fisheries Service and the Guam Fishermen's Co-op, has collected commercial landing invoices, which include catch and effort data, since 1982; these data were requested by in June 2002.

Japanese offshore and distant-water fleets: longline, from 1952 onwards; pole-and-line, from 1972 onwards; and purse seine, from 1967 onwards.

Data covering the EEZs of SPC member countries and territories have been provided to SPC by SPC members.

Korean distant-water fleets: longline, from 1975 onwards; and purse-seine, from 1980 onwards.

Data for the purse-seine fleet, covering both the EEZs of SPC member countries and territories and the high seas, have been provided to SPC by SPC members.

Northern Marianas troll, from 1982 onwards.

The Division of Fish and Wildlife, in collaboration with the National Marine Fisheries Service, has collected fish dealer invoices since 1982; these catch per trip data were requestedby SPC in June 2002.

United States (POFI) longline surveys in the 1950s

III. Untimely Compilation of Operational Data by Fishing Nations, Then Aggregated Data Provided to SPC

Japanese distant-water longline and pole-and-line fleets.

Korean distant-water longline fleet.

Chinese Taipei distant-water longline fleet.

IV. Aggregated Data Provided to SPC by Fishing Nation, But Inaccurately Raised

Aggregated data covering Chinese Taipei distant-water longliners, 1967–1993

The catch and effort data aggregated by 5° longitude, 5° latitude and month, covering Chinese Taipei distant-water longliners during 1967–1993, which have been provided by Chinese Taipei to SPC, were derived from operational data that were raised on the basis of independent estimates of total effort. For 1967–1987, estimates of total effort were determined from radio reports, while for 1988–1993, they were based on estimates of the number of vessels fishing in the Pacific, which in turn were determined from departure reports provided to the Kaohsiung Fisheries Administration. Lawson (1997) compared the aggregated data to landings data and showed that the aggregated data for 1966–1977 are positively biased, while the aggregated data for 1978–1979 and 1981–1987 are negatively biased. SPC has converted the aggregated data for 1967–1993 such that they have been raised on the basis of landings data, rather than effort data. The aggregated data provided for 1994 onwards have been raised by Chinese Taipei on the basis of landings.

V. Operational Data Compiled by Coastal States and Provided to SPC, But With Low Coverage Due to Non-Reporting and/or Mis-Reporting

Operational data covering the following fleets and time periods: Fiji longline, 1993–2001; Papua New Guinea longline, 1991–1997; Tonga longline, 1990–2000

For 2001, the most recent year for which all or most data have been compiled, the OFP holds catch and effort logsheet data covering 44.3% of the catch of target species in the WCPO. These data cover catches taken by the domestic fleets of SPC member countries and territories, catches by distant-water fleets fishing with the EEZs of SPC members, and catches of certain distant-water fleets on the high seas (such as the purse-seine fleets of Korea and Chinese Taipei, but not their distant-water longline fleets or any Japanese fleets). Excluding the domestic fisheries of Indonesia and the Philippines, for which no catch and effort data have been collected, and the coastal fisheries of Japan, the coverage by logsheet data held by the OFP is 64.3%.

Operational data covering Chinese Taipei purse seiners, 1983–1993

Lawson (1994) showed that the coverage of operational data provided to coastal states covering Chinese Taipei purse seiners during 1980–1993 is 37 per cent. The low coverage during 1983–1991 may be due to strong negative bias in catches reported on logsheets, which, in turn, may have been due to sets not being reported and to a strong negative bias in the catch per successful set. Since the ban on transshipment at sea in June 1993, and possibly beginning in 1992, the operational data provided to coastal states have been unbiased for the majority of trips.

Operational data covering Korean purse seiners, 1980–1993

Lawson (1994) showed that the coverage of operational data provided to coastal states covering Korean purse seiners during 1980–1993 is 25 per cent. The low coverage during 1983–1991 may be due to the non-provision of logsheets covering the activities within EEZs, and to strong negative bias in catches reported on logsheets by certain vessels. The negative bias may have been due to sets not being reported and to the reporting of successful sets as unsuccessful. Since the ban on transshipment at sea in June 1993, the operational data provided to coastal states have been unbiased, on average.

SIZE COMPOSITION DATA

I. No Port Sampling Data Collected by Port State

Purse-seine fleets unloading in Thailand

Coastal fleets of Japan

Indonesian industrial and artisanal fleets

A port sampling programme for the Pacific Ocean waters of Indonesia have been proposed in Anon. (2003) and will be established depending on the availability of funding.

Vietnamese longline fleet

II. Low Coverage by Port Sampling Data

Philippines commercial and municipal fleets

Port sampling was conducted in the Philippines by the FAO/UNDP Indo-Pacific Tuna Programme from 1978 to 1992 and by the Landed Catch and Effort Monitoring Programme of the Tuna Research Project of the Bureau of Fisheries and Aquatic Resources during 1993–1994. Further port sampling was conducted by BFAR during 1996–1997. Since 1997, port sampling in the Philippines have been conducted under the National Stock Assessment Project. NSAP sampling covered more than 200 landing centres in 2002; however, sampling has been reduced considerably since August 2002 due to funding constraints. Increased port sampling has been proposed in Anon. (2003) and will be established depending on the availability of funding.

II. Port Sampling Data Compiled by Port State, But Not Provided to SPC

Chinese Taipei offshore longliners sampled in Chinese Taipei

Korean purse seiners sampled in Korea

OBSERVER DATA

I. Not Covered by Observer Data

Indonesian industrial and artisanal fleets and Philippines commercial and municipal fleets

Observer programmes for the Pacific Ocean waters of Indonesia and the Philippines have been proposed in Anon. (2003) and will be established depending on the availability of funding.

Vietnamese longline fleet

II. Low Coverage by Observer Data

All fleets except United States purse-seiners and United States longliners based in Hawaii.

Observer data are the primary source of data used to estimate the catches of the highly migratory species covered by the WCPF Convention, other than the target tuna species. However, observer coverage in the WCPO is currently (2001) 0.5% for longline and 6.4% for purse seine (2.8% excluding the US purse-seine fleet). Most offshore longline fleets and purse-seine fleets fishing in tropical waters are covered by observers, although at a low level of coverage. Distant-water longline fleets, however, are not currently being covered by observers.

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APPENDIX III

EXAMPLE OF A TABLE SUMMARISING THE TIMELINESS OF THE PROVISION OF TUNA FISHERIES DATA TO THE SPC OCEANIC FISHERIES PROGRAMME

Table 1. Provision of estimates of catches during 2003 by fishing country, territory or entity. Blank cells signify that no estimates were available at the time of writing. Numbers refer to notes following the table.

COUNTRY / TERRITORY / ENTITY	2003
Australia	30 Apr 2004
Canada	
China	
Cook Islands	2
Federated States of Micronesia	1
Fiji Islands	21 Jul 2004
French Polynesia	29 May 2004
Indonesia	27 Apr 2004
Japan	3
Kiribati	1
Republic of Korea	7 Jul 2004
Marshall Islands	1
New Caledonia	16 Mar 2004
New Zealand	23 Jul 2004
Palau	1
Papua New Guinea	4
Philippines	17 May 2004
Samoa	5
Solomon Islands	
Spain	
Chinese Taipei	21 Apr 2004
Tonga	1
United States	21 May 2004
Vanuatu	1

Notes for Table 1:

1 Catches were estimated from data held by the OFP on 15 July 2004.

2 Catch estimates were taken from "Cook Islands Longline Catch Summary 2003", Ministry of Marine Resources, March 2004, which was obtained by SPC on 6 July 2004.

3 Longline and purse-seine catches were taken from a SCTB17 national fisheries report; no estimates of pole-and-line catches were submitted.

4 Catch estimates were taken from a draft SCTB17 national fisheries report, which was obtained by SPC on 2 July 2004.

5 Catch estimates were taken from a draft SCTB17 national fisheries report, which was obtained by SPC on 18 July 2004.

APPENDIX IV

REPORT OF THE FIRST MEETING OF THE INDONESIA AND PHILIPPINES DATA COLLECTION STEERING COMMITTEE

The first meeting of the Indonesia and Philippines Data Collection Steering Committee was held on Wednesday, 21 April 2004, in Bali, Indonesia, immediately following the first session of Working Group II at PrepCon VI, and was attended by participants from Chinese Taipei (Chung-Hai Kwoh, Chi-Lu Sun), Indonesia (Subhat Nurhakim, Purwanto, Purwito), the Philippines (Stan Swerdloff), the United States of America (Ray Clarke, Charles Karnella) and the SPC Oceanic Fisheries Programme (Tim Lawson), and the chairman of Working Group II (John Kalish). Mr Lawson was elected chairman of the Steering Committee.

During the first session of Working Group II at PrepCon VI, Mr Lawson presented a "Proposal for Monitoring the Catches of Highly Migratory Species in the Philippines and the Pacific Ocean Waters of Indonesia". Prior to PrepCon VI, Chinese Taipei contributed USD 20,000 towards the proposal and at PrepCon VI, the United States indicated that it would contribute USD 60,000. However, the total amount budgeted in the proposal for port sampling in Indonesia and the Philippines for a two-year period is USD 292,000. The Steering Committee therefore considered how to allocate the USD 80,000 that are currently available, while bearing in mind that other potential donors (European Community, France, Japan, Korea and New Zealand) have indicated that they may also contribute to the proposal at a later date.

It was noted that, under the proposal, a review of the tuna fisheries and the current statistical systems in the Philippines and eastern Indonesia will be conducted prior to port sampling and that Australia has under consideration the funding of the review for eastern Indonesia. (Australia has also funded a review and port sampling for western Indonesia that has been implemented in recent years in collaboration with Indonesia, Japan and the Indian Ocean Tuna Commission.) Australia has also indicated that it would fund the review for the Philippines, but only if funds were available from other sources to conduct follow-up activities, such as the port sampling.

It was also noted that the cost of port sampling during the first year in the Philippines, where a port sampling programme has already been established but which is operating at a very low level of coverage due to the lack of funds, is USD 66,000, whereas the cost of the first year of port sampling in eastern Indonesia, where a programme has yet to be established, will cost USD 87,000.

It was therefore agreed that the USD 80,000 that are currently available should be allocated to the Philippines. The participants were optimistic that additional funds will soon be contributed to allow port sampling in eastern Indonesia. It was hoped that funds will be contributed in time to commence the port sampling immediately following the review of the tuna fisheries and the current statistical system in eastern Indonesia, which may be completed by late 2004.

The relationship between the activities that will be conducted under the PrepCon proposal and the regular tuna fishery statistical programmes of the governments of Indonesia and the Philippines was discussed. It was noted that unlike previous tuna fishery sampling programmes that have occurred in both countries, the sampling under the current proposal will be conducted and supervised entirely by government staff, with expatriate involvement only in the review of sampling programmes and some data analysis. The activities that will be conducted under the PrepCon proposal will therefore be completely integrated into the regular statistical programmes of Indonesia and the Philippines.

It was agreed that the next meeting of the Steering Committee should take place in conjunction with the first meeting of the Commission, which is tentatively scheduled for early December 2004. The status of project activities and developments in regard to project funding will be considered.

APPENDIX V

MINIMUM STANDARDS FOR TUNA FISHERY CATCH AND EFFORT LOGSHEETS

The following standards for tuna fishery catch and effort logsheets were determined at the SCTB Statistics Working Group Session on Data Collection Forms, held from 14 to 15 June 1999 in Papeete, French Polynesia, during the Twelfth Meeting of the Standing Committee on Tuna and Billfish.

The minimum standards are considered in the context of scientific research and the monitoring of catch and effort, and not in other contexts, such as management or surveillance. Hence, the minimum standards to be considered are not an exclusive set of data items to be included on logsheets. Other data items may be required for other purposes, but these are not considered here.

The data items are classified into two groups: "essential" and "desirable". For the purposes here, "essential" data items are those that make up the set of minimum standards for the logsheet, while "desirable" data items are those not included in the minimum standard, but which may nevertheless be useful. The identification of a data item as either "essential" or "desirable" will be subjective, but the following approach may be appropriate.

"Essential" data items could be thought of as those which are the minimum necessary for (i) monitoring trends in catch and effort in tuna fisheries in the WCPO and (ii) assessing the stocks of tunas. In contrast, "desirable" data items could be considered as those in whose absence monitoring and assessment could still be carried out. Under these guidelines, the number of "essential" data items will be relatively small, while the number of "desirable" data items may be large.

VESSEL IDENTIFICATION

All gear types

The following items were considered to be *essential*:

Name of the vessel, country of registration, registration number: The registration number is the number assigned to the vessel in the country where the vessel is flagged. Each country has standard formats for registration numbers, which may include codes concerning the port of registration and the size class of the vessel. The SWG also considered the vessel's Lloyds registration number; however, it was felt that it would not be suitable since (a) it is usually difficult to obtain and (b) many smaller vessels are not registered with Lloyds.

The following items were considered to be *desirable*:

International radio callsign, fishing permit or license number: The fishing permit or license number is the number assigned by the government of the country or territory in whose waters the vessel is fishing. The permit or license number is unique to each vessel and can be used for the purposes of vessel identification. It was noted that for purposes of vessel identification, the vessel name, country of registration and the international radio call sign could be considered equivalent to the vessel name, country of registration and the registration number.

Name of the fishing company that owns the vessel and name of the agent that represents the vessel in the port of unloading: These items may be useful in obtaining corrections or additional information concerning the data recorded on the logsheets.

VESSEL, GEAR AND TRIP ATTRIBUTES

All gear types

The following items were considered to be *essential*:

Port of departure, date of departure, port of unloading, date of arrival in port of unloading: These items can be used to cross-check the period covered by logsheet data and the period covered by landings data, such that landings data can be used to verify logsheet data.

The following items were considered to be desirable:

Time of departure, time of arrival: These items can be used to cross-check the period covered by logsheet data.

Longline

The following items were considered to be *essential*:

Gross registered tonnage: Monitoring of catch and effort is sometimes done separately for coastal, offshore and distant-water longline fleets. Vessel size is an important criterion in determining whether the vessel operates in coastal, offshore or distant-water areas. The SWG noted that GRT is calculated differently between nations. The SWG considered that a vessel's length could be considered equivalent to GRT, although it noted that length measurements are often subject to the similar problems of lack of standardisation.

Number of hooks between floats or number of hooks per basket: This measure is a proxy for average hook depth and, hence, is important in determining the effective effort for a given species. Actual baskets are rarely used nowadays; therefore "hooks between floats" may be preferred. The number of hooks between floats may vary within and between sets and so it was considered that more detail should be provided. However, (a) the number of hooks between floats reported for a given trip has been shown to be significant in determining effective effort, even though lacking in detail, and (b) it is perhaps more appropriate to obtain greater detail through observer programmes, rather than on logsheets completed by the crew.

The following items were considered to be *desirable*:

Length of mainline, number of floats or baskets, length of float line, length of branch line: These items can be used to determine the depth of hooks and, hence, effective effort.

Number of hooks per branch line, number of hooks per float: These items can be used to monitor fishing effort and targeting of sharks.

Mainline material, branchline material, presence of line shooter, engine power, rated speed of vessel, name of the captain or fishing master, reel capacity, number of reels, storage capacity: These items are related to fishing effort.

Storage method: Methods used to store the catch (i.e. ice, refrigerated sea water, air coil frozen, air blast frozen, brine frozen) can be used to determine whether the vessel operates in coastal, offshore or distant-water areas and, hence, can be useful for monitoring catch and effort.

Primary target species: This information can be used to interpret catches and catch rates and, hence, can be useful for monitoring catch and effort.

Pole-and-Line

The following item is proposed as *essential*:

Gross registered tonnage: See l*ongline* above.

The following items were considered to be *desirable*:

Number of crew, number of automatic poling devices, bait capacity, engine power, rated speed of vessel, presence of bird radar, name of the captain or fishing master, bait species, size of bait, number of poles, storage method: These items are related to fishing effort.

Purse Seine

The following item is proposed as *essential*:

Gross registered tonnage: See l*ongline* above.

The following items were considered to be *desirable*:

Net length, net depth, storage capacity, presence of helicopter, vessel engine power, skiff engine power, rated speed of vessel, name of the captain or fishing master: These items are related to fishing effort. (Additional information for vessels that engage in group seine operation may be needed; however, this was not considered.)

Amount of fish onboard at start of trip, amount of fish onboard after unloading: These items can be used to verify logsheet data with landings data.

Troll

The following item is proposed as *essential*:

Gross registered tonnage: See l*ongline* above.

The following items were considered to be *desirable*:

Number of lines, engine power, rated speed of vessel, storage capacity, source of sea surface temperature data, name of the captain, number of skiffs: These items are related to fishing effort. Sources of sea surface temperature data can include onboard thermometers; weather fax; and real-time satellite transmission

LONGLINE SETS

The following items were considered to be *essential*:

Date of set, time of set, position of set: The date and set time can be local time, ship's time or GMT/UTC, but must be consistent. The set time should refer to the start of setting the longline. The set position should be in at least minutes of latitude and longitude. The use of codes for areas depicted on maps of the fishing grounds, rather than the position in latitude and longitude, may also

be appropriate for some fleets. The set position can refer to the start of set, the end of set, or the average position, but should be consistent.

Number of hooks set: This item is a measure of fishing effort.

Number of fish caught per set, by species, total weight or average weight of fish caught per set, by species: The instructions should indicate whether whole weights or processed weights should be used, and for which species, and should be in accordance with the usual practice by the fleet. For example, bigeye and yellowfin are usually gilled and gutted, while albacore are kept whole. All target species and major non-target, associated or dependent (NAD) species, should be recorded. The catch of fish that are discarded dead or in poor condition should also be recorded, in addition to all fish that are retained.

The following items were considered to be *desirable*:

Catch and discards of minor non-target, associated or dependent (NAD) species: These items will allow the estimation of total removals.

Activity: This item can be used to verify the completeness of the data. It should be recorded for each set and for days on which no sets were made. For days on which no sets were made, the date and noon position should also be recorded. Activities can include, for example, “a set”; “no fishing due to gear breakdown”; “no fishing due to bad weather”; “in transit”; “in port”, etc.

End of set position, start of haul position, end of haul position (in addition to start of set position): These items can be used to correlate catch rates with oceanographic and bathymetric conditions.

End of set time, start of haul time, end of haul time (in addition to start of set time): These items can be used to determine soak times.

Bait species, use of dead or live bait: These items may affect catch rates.

Sea surface temperature and other oceanographic parameters: These items may affect catch rates.

POLE-AND-LINE DAYS FISHED

The following items were considered to be *essential*:

Activity: This item should be recorded for each day fished or searched and for days on which no fishing or searching took place. This item can be used to distinguish between days on which searching took place, but no fish were caught, and days on which no fishing or searching took place, and to verify the completeness of the data. Activities can include, for example, “a day fishing or searching with bait onboard”; “no fishing due to collecting bait”; “no fishing due to gear breakdown”; “no fishing due to bad weather”; “in transit”; “in port”, etc.

Date, noon position: The date and noon position must be recorded for all days. The noon position should be in at least minutes of latitude and longitude.

Weight of fish caught per day, by species: All target species and major non-target, associated or dependent (NAD) species, should be recorded. The catch of fish that are discarded dead or in poor condition should also be recorded, in addition to all fish that are retained.

The following items were considered to be *desirable*:

Catch and discards of minor non-target, associated or dependent (NAD) species: These items will allow the estimation of total removals.

Amount of bait onboard, hours fished or searched, sighting method: These items are related to fishing effort.

Average weight of fish caught per day, by species: This item may be informative in the absence of sampling by observers or port samplers.

School association: The species composition of the catch and the size of individuals is related to the type of association. All common types of school association should be recorded with specific codes, while uncommon types of association should be recorded with a code for "other" together with instructions to explain the "other" association on the logsheet. Common types of school association may include "drifting log, debris or dead animal"; "drifting raft, FAD or payao"; "anchored raft, FAD or payao"; "live whale or whale shark"; and "free-swimming" or "unassociated" schools.

PURSE-SEINE SETS

The following items were considered to be *essential*:

Activity: This item should be recorded for each set and for days on which no sets were made. This item can be used to distinguish between days on which searching took place, but no fish were caught, and days on which no fishing or searching took place, and to verify the completeness of the data. Activities can include, for example, "a set"; "a day searched, but no sets made"; "no fishing due to gear breakdown"; "no fishing due to bad weather"; "in transit"; "in port", etc.

Date, position of set or noon position, time of set: If a set is made, then the date and position must refer to the set. If searching occurs, but no sets are made, then the date and noon position must be recorded. The date and set time can be local time, ship's time or UTC, but must be consistent. The set time should refer to the time that the skiff was put in the water. The set position should be in at least minutes of latitude and longitude.

School association: The species composition of the catch and the size of individuals is related to the type of association. All common types of school association should be recorded with specific codes, while uncommon types of association should be recorded with a code for "other" together with instructions to explain the "other" association on the logsheet. Common types of school association may include "drifting log, debris or dead animal"; "drifting raft, FAD or payao"; "anchored raft, FAD or payao"; "live whale or whale shark"; and "free-swimming" or "unassociated" schools.

Weight of fish caught per set, by species: All target species and major non-target, associated or dependent (NAD) species, should be recorded. The catch of fish that are discarded dead or in poor condition should also be recorded, in addition to all fish that are retained.

The following items were considered to be *desirable*:

Catch and discards of minor non-target, associated or dependent (NAD) species: These items will allow the estimation of total removals.

Well numbers: This item can be used by port samplers to select wells to sample. Port samplers prefer to sample wells containing fish from sets for which the date, position and school association are similar.

Average weight of fish caught per set, by species: This item may be informative in the absence of sampling by observers or port samplers.

Sea surface temperature and other oceanographic and meteorological measures, such as depth of the thermocline, and wind speed or Beaufort wind scale. These items can affect effort and catch rates.

TROLL DAYS FISHED

The following items were considered to be *essential*:

Activity: This item should be recorded for each day fished and for days on which no fishing took place. This item can be used to distinguish between days fished on which no fish were caught and days not fished, and to verify the completeness of the data. Activities can include, for example, "a day fished"; "no fishing due to gear breakdown"; "no fishing due to bad weather"; "in transit"; "in port", etc.

Date, noon position: The date and noon position must be recorded for all days. The noon position should be in at least minutes of latitude and longitude.

Number of fish caught per day and average weight, by species: All target species and major non-target, associated or dependent (NAD) species, should be recorded. The catch of fish that are discarded dead or in poor condition should also be recorded, in addition to all fish that are retained.

The following items were considered to be *desirable*.

Catch and discards of minor non-target, associated or dependent (NAD) species: These items will allow the estimation of total removals.

Number of lines trolled by vessel, number of lines trolled by skiffs, hours fished: These items can be used to measure fishing effort.

School association: The species composition of the catch and the size of individuals is related to the type of association. All common types of school association should be recorded with specific codes, while uncommon types of association should be recorded with a code for "other" together with instructions to explain the "other" association on the logsheet. Common types of school association may include "drifting log, debris or dead animal"; "drifting raft, FAD or payao"; "anchored raft, FAD or payao"; "live whale or whale shark"; and "free-swimming" or "unassociated" schools.

Sea surface temperature, sea condition, wind speed and other meteorological conditions: These items can affect catch rates.

APPENDIX VI

AGREEMENT ON THE EXCHANGE OF TUNA FISHERIES DATA BETWEEN IATTC AND SPC

The Inter-American Tropical Tuna Commission (IATTC) and the Oceanic Fisheries Programme of the Secretariat of the Pacific Community (SPC), subject to fulfilling their internal requirements regarding data confidentiality, agree to the following conditions for exchange and release of data from fisheries which capture tunas and tuna-like species.

1. Operational Data

1.1 IATTC and SPC will exchange operational-level tuna fisheries data (e.g. data covering sets by longline and purse seine gear and days fished by pole-and-line and troll gear) on at least an annual basis. These data shall include logsheet, logbook, observer, landings and port sampling data.

1.2 IATTC will provide to SPC data for trips with fishing effort west of 150°W (WCPO).

1.3 SPC will provide to IATTC data for trips with fishing effort east of 150°W (EPO).

2. Aggregated Data

2.1 IATTC and SPC will exchange data on catch and fishing effort for individual flag-States of fishing vessels by gear type aggregated by time and area on an annual basis.

2.2 Data for longline gear shall be aggregated by 5° latitude by 5° longitude by month. Data for surface gear shall be aggregated by 1° latitude by 1° longitude by month. Purse-seine data shall also be aggregated by set type within the time-area strata.

2.3 Data raised to represent total catch and effort are preferred. If the data are raised, then information concerning the method that was used to raise the data will also be exchanged.

2.4 IATTC will provide data covering the EPO.

2.5 SPC will provide data covering the WCPO.

3. Other Data

These data will be exchanged between IATTC and SPC on an ad hoc basis.

4. Release of Data Obtained by this Agreement

4.1 Operational Data

4.1.1 The IATTC and the SPC each agree to neither release these data to a third party nor publish these data, unless they have been aggregated by time-area strata together with other data held in their data files.

4.1.2 The time-area stratification for the inclusion of operational data in a data release to a third party, or for publication of the data, shall be at least 1° latitude by 1° longitude by month for data from surface gear types, and 5° latitude by 5° longitude by month for longline gear.

4.1.3 Data published or released for non-scientific purposes will be aggregated for all flag-States combined within time-area strata.

4.2 Aggregated Data

Neither the IATTC or the SPC will release these data to a third party without prior authorization of the data provider.

4.3 Other Data

Conditions for release or publication of these data are to be determined at the time of exchange.

Agreed on 26 March 2003.

APPENDIX VII

DATA REPORTING AND EXCHANGE REQUIREMENTS AND PROTOCOL OF THE INTERIM SCIENTIFIC COMMITTEE FOR TUNA AND TUNA-LIKE SPECIES IN THE NORTH PACIFIC OCEAN

DATA REPORTING AND EXCHANGE

The minimum data required for ISC fishery monitoring and resource assessment fall into three categories: Category I: total annual catch (round weight by species) total annual effort (active vessels by fishery); Category II: catch-effort (summary of logbook data); Category III: biological data, (size composition, length or weight frequencies, sex information).

CATEGORY I (Total annual catch and total annual effort):

Total annual catch in metric tons (round weight) should be reported by gear, species and country for fisheries in the North Pacific (north of the equator). When established, data should be reported by subarea (see Section 2). If round weight is estimated from processed weight, the conversion procedure is to be noted.

Total nominal effort in numbers of active vessels fishing should be reported by fishery, gear and size category for fisheries in the North Pacific. As with catch, reporting should be done by subarea of the North Pacific. However, if effort cannot be reported by subarea or even for the North Pacific, effort should be reported for a larger area and noted. Vessel size categories to be used in reporting effort are:

Vessels Size Category	
Longline	1. Distant-water and 2. offshore (Chinese-Taipei) 1. Distant-water, 2. offshore, and 3. coastal (Japan)
Purse seine	1. large (>260 cubic meter capacity; ~300 mt) 2. small (<260 cubic meter capacity; ~300 mt) 1. distant-water and 2. offshore (Japan)
Harpo Troll, gill net, etc.	aggregated by type

CATEGORY II (Catch-effort):

Catch and effort (logbook) data should be reported by country, gear type, and month. The resolution is as follows:

Gear	By Month	Catch	Effort	Region
Longline	5x5 deg.	no. or wt	hooks (all species recorded)	entire Pacific
Purse seine	1x1 deg.*	wt.	days fishing (include searching)	entire Pacific
Troll	1x1 deg.	no.	days fishing (include searching)	North Pacific
Gill net	1x1 deg.	no.	tans or net-days	North Pacific
Harpoon	1x1 deg.	no.	days fishing	North Pacific
Handline	1x1 deg.	no.	no lines	North Pacific
Pole and line	1x1 deg.	no.	no poles/successful days	North Pacific
Other	1x1 deg.	no. or wt. as needed		North Pacific

*5x5 degree data if 1x1 is not practicable

CATEGORY III (Biological data):

Size composition (length or weight frequencies) and sex data (for swordfish, striped and blue marlins) should be reported by gear type and with the same area resolution as required for Category II data. However, coarser area resolution may be substituted if this requirement can not be applied. Reporting of length-frequencies should be with intervals of 1 or 2 cm. After standard measurements are established (see Section 2, above), both standard measurement and the actual sampling measurement unit should be reported.

All size composition data should include notes on collection method, e.g. port sampled, observer sampled, fisherman sampled, etc. Accuracy of measurement should also be reported (e.g. to the nearest cm, next larger cm, nearest kg, etc.).

DATA ACCESS AND AVAILABILITY

The participants agreed that some extracts from ISC database, that do not contain proprietary information, should be made available to the general public. Category I data aggregated over the entire North Pacific will be considered public domain (PD) data. The PD data will include the caveat that some discards are not reported in the catch statistics provided. Data provided for use and held by the ISC in whatever form remains the property of the individual contributors[1]. Release of these data to the general public may be governed by policies of the contributor.

However, raw Category I data as well as Category II and Category III data contain proprietary information and, therefore, shall be made available to contributors only and to scientists of ISC working groups. Japan will be responsible for managing the central data depository and will designate a control person. When a request for non-PD data is received from a member of the general public, the data manager will notify and seek approval and conditions from the contributors of the specific data requested prior to release. A record of all requests received from the general public and the disposition of the request will be maintained and reported at each meeting of the ISC Plenary.

Requests for non-PD data by contributors for purposes other than ISC stock assessment activities will be handled by the control person, following the same procedures delineated in the previous paragraph.

While there is consensus among all contributors regarding the data access rules, outlined above, there is concern that these rules may be changed at some point in the future without the consent of all contributors. It was recommended that the rules not be changed without consensus of all contributors.

[1] As used here and throughout this report, “Contributors” are all ISC participants who have provided data to ISC for inclusion in its database.

Adopted ISC4, February 4, 2004