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SCIENTIFIC DATA AVAILABLE TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

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1. INTRODUCTION

Recommendations from the Scientific Committee (SC) entitled "*Scientific Data to be Provided to the Commission*" and "*Standards for the Provision of Operational Catch and Effort Data to the Commission*" (Anon. 2005a, Annex VII) were accepted by the Western and Central Pacific Fisheries Commission (WCPFC) at its second session in December 2005 (Anon. 2005b, par. 25).

In the past year, the "*Standards for the Provision of Operational Catch and Effort Data to the Commission*" have been incorporated as ANNEX 1 of "*Scientific Data to be Provided to the Commission*[1]" which was further refined and subsequently adopted at the Fourth Regular Session of the Commission, Tumon, Guam, USA, 2-7 December 2007.

As specified in the recommendations for the provision of data, the SPC Oceanic Fisheries Programme (OFP), which has been engaged by the Commission to provide scientific services (including the collection, compilation and dissemination of fisheries data) under Article 13 of the Convention, has compiled annual catch estimates, operational (logsheet or logbook) catch and effort data, aggregated catch and effort data, and size composition data on behalf of the Commission. In conducting scientific research and analyses in support of the work of the Commission, the OFP has also compiled other types of data, such as reports of unloadings, observer data, port sampling data, tagging data, oceanographic data and various types of biological data.

While the catch and effort data and size composition data currently available are extensive, there are important gaps. The purpose of this paper is to review recent developments concerning the compilation of data by the OFP, on behalf of the Commission, particularly in regard to the important data gaps, and to present information on the coverage of data held by the OFP.

Detailed quantitative information on the catch and effort data, size composition data, tagging data, unloadings data and observer data held by the OFP is presented in the OFP Data Catalogue, which can be viewed at http://www.spc.int/oceanfish/Html/Statistics/DataCat/DATACAT.htm.

An indication of the coverage of aggregate catch and effort data, operational logsheet (catch and effort) data, unloadings data, port sampling data and observer data held by the OFP can also be viewed at http://www.spc.int/oceanfish/Html/Statistics/Coverage/index.asp. It is expected that this facility will be transferred to the Commission's web site at some stage in the future.

[1] Can be viewed at http://www.wcpfc.int/pdf/Scientific Data to be Provided to the Commission (as revised by WCPFC4).pdf

2. RECENT DEVELOPMENTS IN RESOLVING DATA GAPS

The following summarises the major recent developments concerning the data gaps reported at SC1 (Williams and Lawson, 2005), SC2 (OFP, 2006) and SC3 (OFP, 2007) :

- The breakdown of catch estimates by gear type for the Philippines domestic fisheries is one of the most significant gaps in the provision of data to the WCPFC, and the First Philippines/WCPFC Tuna Statistics Review Meeting, held in Manila (2–3 June 2008) was convened to specifically review the problems associated with this data gap. The meeting was attended by government agencies and private companies that are involved in the domestic tuna fisheries, which included the Bureau of Agricultural Statistics (BAS), the Bureau of Fisheries and Aquatic Resources (BFAR), Philippines Fisheries Development Authority (PFDA) and various representatives of the fishing industry. The meeting reviewed tuna catch estimates that had been provided from different sources, including the estimates derived by the OFP from the data collected under the BFAR National Stock Assessment Project (NSAP) and BAS surveys. The meeting participants were able to agree on tuna catch estimates for the domestic "large-fish" handline, the ringnet and purse seine fisheries, but expressed concern on the current yellowfin and bigeye catch estimates from the municipal fisheries. It is expected that this form of review meeting will be established as an annual event until the uncertainly in the annual catch estimates provided for the Philippines domestic fisheries can be resolved. The report of this meeting can be viewed at http://www.wcpfc.int/ipdcp/pdf/PHTUNSTAT-1-Report.pdf .

- The Second Eastern Indonesia Tuna Fishery Data Collection Workshop (EITFDC-2) was held in Jakarta, Indonesia (29 May 2008) with the aim of reviewing the technical aspects of port sampling data collection before commencing field activities to ensure the WCPFC requirements for data collection are satisfied. It is expected that similar workshops will be conducted on an annual basis during the establishment of data collection systems in the Eastern Indonesia Tuna Fishery. The report of this workshop can be viewed at http://www.wcpfc.int/ipdcp/pdf/EITFDC-2-Report.pdf .

- Aggregated catch and effort data for the Chinese-Taipei domestic longline fleet, covering years 2004-2006 have been provided by Chinese Taipei in recent years. [However, aggregate catch and effort data for years previous to 2004 have yet to be provided].

- Comprehensive operational (logsheet) catch and effort data for the Vanuatu distant-water longline fleet for 2005–2007 have been provided by Vanuatu. These data have been used to distinguish logsheet data from vessels that were thought to be reporting under other flags (e.g. Chinese Taipei and Belize).

- Size composition data provided by Chinese Taipei (2005-2007) and Korea (2007) for their distant-water longline fleets now satisfy the criteria specified in the guidelines for the provision of scientific data to the WCPFC.

- Certain stock assessments require aggregate longline catch and effort data that cover the extent of the stock for that species[2]. In the case of bigeye tuna, stock assessments cover the Pacific Ocean and therefore the provision of aggregated longline data is required to cover the Pacific Ocean. In the case of south Pacific Albacore, stock assessments cover the Pacific Ocean, south of the equator. In the past year, Japan and Korea have provided updates to their aggregate longline catch and effort data which now cover the entire Pacific Ocean making these data invaluable for stock assessments.

- The WCPFC Executive Director sent out a circular on data-related issues to Cooperating Commission Members (CCMs), Cooperating Non-members (CNMs) and Participating Territories on March 14, 2008. In regards to the provision of historical data to the WCPFC, the circular requested that -

[2] The provision of distant-water longline data covering the whole Pacific was a change in the guidelines on the Provision on Scientific Data to the Commission that was approved at WCPFC4 in December 2007.

- *"… all CCMs agree that **all aggregated catch and effort data and size data** provided to the OFP prior to December 2005 … have also been provided to the Commission. …. if, for some reason, a CCM does not want its aggregated catch and effort data and size data provided to the OFP prior to December 2005 to be considered as also having been made available to the Commission, then please advise me in writing."*
- *"…in regard to **operational catch and effort data**, please advise me if operational catch and effort data provided to the OFP prior to December 2005 should be considered as also having been provided to the Commission. Unless such authorization is given to me, these data will **not** be considered as having also been provided to the Commission."*

With respect to the provision of aggregate data above, no CCM advised the Commission that their historical aggregated data provided to the OFP should not be considered as also having been provided to the Commission.

At the time of writing this paper, authorization that considered operational catch and effort which was provided to the OFP prior to December 2005 to also have been provided to the Commission had been received from :

- New Zealand, covering their domestic tuna fisheries
- Forum Fisheries Agency (FFA), who manage the US purse-seine operational catch/effort data, covered under the US Multi-lateral Purse Seine treaty, 1988–2007

3. STATUS OF DATA GAPS

3.1 A system to review the provisions of scientific data to the WCPFC and highlight data gaps

The Third Regular Meeting of the Scientific Committee Meeting (SC3) directed the WCPFC Secretariat to provide a prototype system to review Data Gaps (Anon, 2007, Annex K, para. 29); that is,

> "*...within the next 12 months the Secretariat deploys on the WCPFC website a prototype computer programme that would allow gaps in data to be easily identified...*"

During past year, a prototype system was developed to register the details of provisions of scientific data to the WCPFC and produce summarized tables of the provisions, thereby providing a mechanism for identifying data gaps. The component of the prototype system developed to disseminate the summarized tables on the provisions of data is now available on the WCPFC web site at the following URL :

http://www.spc.int/oceanfish/html/wcpfc/statistics/StatProv.asp

At this stage, the prototype system on the WCPFC web site has two components :

1. A component to view “summaries of Provisions of Historical Data to the WCPFC by ENTITY”
2. A component to view information on “recent provisions of data to the WCPFC by DATA TYPE”

The main intention of this facility is to …

- Provide the WCPFC Secretariat, the Scientific Committee and data managers with a broad indication of the status of data collected and provided to the WCPFC (i.e. identify data gaps);
- Provide CCMs with a concise summary of what data have/have not been provided to the WCPFC, and any deficiencies with the data provided;
- Serve as a reference for WCPFC Secretariat and data managers when following up with CCMs on any outstanding issues with respect to the collection/provision of data to the WCPFC. (identify data gaps which may prompt 'data rescues', for example);
- Provide the users (e.g. researchers) with a concise summary of what data are available and inform them of any problems that are apparent in data provided.

The database system which has been developed to store the “data gap” information also caters for the storage of more detailed notes on the quality, sources and coverage of the data provided to the WCPFC, and this information will probably be made available via this web page at some stage in the future. It is also envisaged that the WCPFC will add a facility on the web site to show the coverage of aggregate data, operational data and size data in tabular and graphic format at some stage in the future.

3.2 The main data gaps related to Stock assessment of target tunas

The following are considered the main data gaps in the aggregated catch and effort, and size composition data, used in stock assessments for the target tuna species:

- Chinese-Taipei domestic longline fleet

- Except for the provision of aggregated catch and effort data covering 2004–2006, there are no operational or aggregated catch and effort data, nor size composition data, available.

- Indonesian tuna fisheries

- Total catch estimates for the period prior to 1970 are missing.
- Estimates of annual catches have not been stratified by gear type for the period from 1991 onwards.
- Estimates of annual catches of ‘yellowfin’ covering the period from 1970 to 2004 also include bigeye.
- No operational or aggregated catch and effort data, nor size composition data, are available.

- For the period from 1970 to 2004, large annual catches have been reported for 'unclassified' gear types; information is required regarding the types of gear types included in 'unclassified' and the size composition of catches taken by 'unclassified' gear types.
- In the past, annual catch estimates provided by Indonesia were not stratified by gear type and bigeye was included in the catch estimate for 'yellowfin'. Estimates of catches for 2005–2007 were provided for yellowfin and bigeye separately, and catch estimates for all species combined were provided by gear type. The proportion caught by gear type appears to have changed considerably from 1990, previously the most recent year for which the catch by gear type was available (OFP, 2006). The estimate for 2005–2007 was reported separately by Indonesia, while the estimate for 2004 was estimated by the OFP from the annual catch of 'yellowfin plus bigeye', and a limited amount of sampling data; the large increase is probably a statistical artifact which needs to be resolved.

- Japanese coastal longline fleet

- There are no operational or aggregated catch and effort data, nor size composition data available.

- Japanese pole-and-line fleet

- No operational or aggregated catch and effort data, nor size composition data, are available for the period prior to 1972.

- Philippines tuna fisheries

- Total catch estimates for the period prior to 1970 are missing.
- No operational or aggregated catch and effort data are available.
- Only limited size composition and species composition data are available for the period prior to the National Stock Assessment Programme, which commenced in 1997.
- For the period from 1970 to 2007, significant annual catches have been reported for 'unclassified' gear types; information is required regarding the types of gear types included in 'unclassified' and the size composition of catches taken by 'unclassified' gear types. The catches of 'unclassified' gear types have been mostly allocated to the municipal 'hook-and-line' fishery, but catches in some regions appear to be unrealistically high for yellowfin and bigeye tuna (Anon., 2008b).

- Vietnamese tuna fisheries

- There are no annual catch estimates, operational or aggregated catch and effort data, nor size composition data currently available, other than anecdotal information on catches (e.g., Lewis 2005).

- Historical coverage rates

- For several fleets, particularly those of the small Pacific island countries, better estimates of historical coverage rates of logsheet and unloadings data are required to improve annual catch estimates and aggregated catch and effort data. In this regard, the identification and rescue of historical data is required.

- Nationality of the catch

- There have been difficulties in certain circumstances in assigning the nationality to the catch to one entity or another. While it is acknowledged that catches should normally be assigned to the country of the flag flown by the fishing vessel, there are sometimes circumstances where this may not be appropriate. The Coordinating Working Party on Fishery Statistics (CWP), convened by FAO, have listed some situations in which difficulties in assigning a nationality might exist The CWP also provides guidelines for how the nationality of the catch might be assigned in certain situations where it might not be appropriate for the nationality of the catch to be equivalent to the flag flown by the fishing vessel (see http://www.fao.org/fishery/cwp/handbook/C). In the WCPFC fisheries, there are a number of situations where the assignment of the nationality of the catch is not straightforward, for example :
    - Foreign-flagged vessels domestically-based in Pacific Island countries, including domestic charter arrangements
    - Vanuatu-flagged purse seine vessels fishing under the FSM Arrangement under the "home party" of Papua New Guinea

- The consistent assignment of "fishing nation" in all types of scientific data has a number of important implications within the SC and other areas of the Commission's work. The establishment of clear guidelines for assigning the nationality of the catch for the benefit of the WCPFC secretariat, data

managers and CCMs is therefore strongly recommended. These guidelines should include instructions for the assignment of nationality of the catch in historical data.

- Sub-fleets within fleets

- In some instances, there is a clear distinction between groups of vessels fishing under the same nationality. This situation arises from clear differences in, for example, the species targeted, the method of operation and/or the area fished. The stock assessment work needs to distinguish between these "fisheries" and the way this has been done in the past is to assign "sub-fleets" within fleets. An example of this situation is the distinction between the distant-water Chinese Taipei longline fleet with the "offshore" Chinese-Taipei longline fleet based in Micronesian ports. These fleets do not overlap in area of operation (i.e. fishing area), have different methods of operation and therefore require differentiation in stock assessments. The process of differentiation has been successfully done for some fleets, but there remains some work to do for others, for example, the differentiation of the Chinese "offshore" longline fleet and the Chinese "distant-water" longline fleet in annual catch estimates, aggregate catch/effort data and size data will require more information to be provided by the respective CCM.

- Operational catch and effort data

- Operational catch and effort data are not available for Japanese fleets outside the EEZs of FFA member countries, the Korean distant-water longline fleet and Chinese and Chinese Taipei distant-water longliners that target bigeye and yellowfin. (Operational catch and effort data for Chinese and Chinese Taipei distant-water longliners targeting albacore are compiled by port samplers in Pago Pago, American Samoa and Levuka, Fiji). Operational catch and effort data, together with fine-scale oceanographic data that may affect catch rates, are required for the development of indices of abundance. Operational catch and effort data are also required to determine the spatial distribution of the catch in relation to EEZs, the high seas areas and other management-related areas.

- Aggregate catch and effort data

- Certain stock assessments require aggregate catch and effort data that cover the extent of the stock for that species[3]. In the case of bigeye tuna, for example, stock assessments cover the Pacific Ocean and therefore the provision of aggregated longline data is required to cover the Pacific Ocean. In the case of south Pacific Albacore, stock assessments cover the Pacific Ocean, south of the equator. The following lists the vessel nations and years where aggregate longline catch/effort data does not cover the Pacific Ocean :
    - Chinese distant-water longline fleet for all years;
    - Chinese Taipei distant-water longline fleet for years 2002, 2004-2006;
    - Korean distant-water longline fleet for years 1998–1999

- In some instances, the aggregated catch and effort data provided represent low coverage of activities and may therefore be biased spatially and/or towards activities that target one particular tuna species over another. For example, this is the case with the most recent year (2007) of aggregate longline data provided by Chinese Taipei and Korea.
- In some instances, it is not possible to reconcile the aggregate longline catch data with annual catch estimates. For example, this is the case with the aggregated catch/effort data covering the Japanese distant-water longline fleet, where catch is provided in numbers of fish only.
- In some instances, the unit of catch provided in the aggregate longline catch data is not suitable for use in stock assessments. For example, the aggregated catch data provided for the distant-water Chinese longline fleet are in units of "kilograms" only, and the stock assessments require the catch to be in "numbers of fish" by species.

- Species composition data for purse seiners

- Species composition data collected by observers and port samplers are needed to improve estimates of the catches of yellowfin and bigeye for purse-seine fleets, other than vessels fishing under the United States Treaty and the FSM Arrangement.

[3] The provision of distant-water longline data covering the whole Pacific was a change in the guidelines on the Provision on Scientific Data to the Commission that was approved at WCPFC4 in December 2007.

- Size composition data for longliners

- Size composition data are not available for Vanuatu and Chinese distant-water longline fleets targeting bigeye and yellowfin in the eastern tropical areas of the WCPFC Statistical Area.

3.3 The main data gaps related to Ecosystem approach to fisheries

Data gaps related to the implementation of an ecosystem approach to fisheries include the following:

- The coverage of catch data for non-target species, including species of special interest (marine reptiles, marine mammals and sea birds), collected by observers needs to be increased for most longline and purse-seine fleets, and particularly the distant-water longline fleets, for which observer coverage has been negligible. Exceptions to the need for increased coverage are the longline fleets of New Zealand, Papua New Guinea and the United States (based in Hawaii), the purse seine fleet of Papua New Guinea and purse seiners fishing under the United States Treaty and the FSM Arrangement. Coverage of the Australian longline fleet is currently being increased.
- Biological data covering non-target species are lacking; the types of data required include length and weight, length and age at maturity, longevity, growth rate, fecundity, habitat use (vertical and horizontal range), and trophic interactions.
- Other gaps include quality-controlled ocean bathymetry data, especially regarding seamount definitions and locations, oceanographic data products resolving mesoscale features relevant to fisheries, and acoustic data for the validation of models of mid-trophic components of oceanic ecosystems.

4. RECENT PROVISIONS OF SCIENTIFIC DATA TO THE WCPFC

Under the policy for the provision of data to the Commission, annual catch estimates and aggregated catch and effort data must be provided by 30 April 2008 (see "Reporting obligations" at the following web page http://www.spc.int/oceanfish/html/wcpfc/statistics/StatProv.asp).

4.1 Annual Catch Estimates

Tables 1 and 2 list the dates on which catch estimates for 2006 and 2007, respectively, were provided, and include notes on the data that have been provided, highlighting gaps or problems in the data provided.

Annual catch estimates for 2006 have yet to be provided by two countries (which are seeking application for Cooperating Non-member (CNM) status), and for 2007 annual catch estimates were not provided for certain gears by one CCM (Japan), and four countries seeking CNM status. There were only 4 out of 30 entities (13%), listed in Table 1, that provided 2006 annual catch estimates prior to the 30 April 2007 deadline, and 13 out of 30 entities (43%) that had provided 2006 annual catch estimates by 15 May 2007. In contrast, 18 out of 30 entities (60%) provided 2007 annual catch estimates prior to the 30 April 2008 deadline, with 22 out of 30 entities (73%) having provided estimates by 15 May 2008, which is a clear improvement in the provision of annual catch estimates.

4.2 Aggregate Catch/Effort data

Tables 3, 4 and 5 list the dates on which aggregated catch and effort data were provided for 2005, 2006 and 2007, respectively, and include notes on the data that have been provided, highlighting gaps or problems in the data provided. The notes in the right-hand columns of each table may refer to instances where the data provided do not satisfy criteria specified in the guidelines for the provision of Scientific Data to the WCPFC.

Pacific-island countries provide operational catch/effort (logsheet) data [which are aggregated by the OFP] on a regular basis and their provisions of aggregate catch/effort data have therefore been flagged as being provided on the deadline (30 April) since they are available at that time.

In general, the timeliness of the provision of aggregate catch/effort data has improved over time, but there remain certain important gaps in the data provided.

Table 1. Provision of 2006 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	see NOTES
Australia	LL, PS	30 Apr 2007	
Belize	LL	15 May 2007	
Canada	TR	9 May 2007	
China	LL, PS	13 Aug 2007	(2)
Cook Islands	LL, TR	7 Jun 2007	
Ecuador	PS	23 Aug 2007	
El Salvador	PS	15 Oct 2007	(4)
Federated States of Micronesia	LL, PS	6 Jun 2007	
Fiji Islands	LL, PL	1 May 2007	
French Polynesia	LL	1 May 2007	
Indonesia	LL, PS, OT	12 Jun 2007	
Japan	PS	24 May 2007	
Japan	LL, PL	5 Jun 2008	
Kiribati	PS	17 Jul 2007	
Republic of Korea	LL, PS	1 May 2007	
Marshall Islands	PS	4 Jul 2007	
New Caledonia	LL	14 Mar 2007	
New Zealand	LL, PS, TR, PL	2 May 2007	
Niue	LL	13 Aug 2007	(2)
Palau	LL	1 May 2007	
Panama	PS		
Papua New Guinea	LL, PS	11 Jul 2007	
Philippines	PS, HL, RN, OT	11 April 2008	(3), (6), (7), (8)
Samoa	LL	1 May 2007	
Senegal	LL		
Solomon Islands	LL, PS, PL	21 May 2007	
Spain	LL, PS	6 Jun 2007	
Chinese Taipei	LL, PS	30 Apr 2007	
Tonga	LL	28 Jun 2007	
United States	LL, PS, TR, PL	30 Apr 2007 7 Jun 2008	
Vanuatu	LL, PS	6 Jun 2007	

NOTES

1 Catches were estimated by the OFP while assisting with the preparation of the national fisheries report.
2 Catch estimates were taken from the national fisheries report presented at the meeting of the Scientific Committee.
3 Total annual catches were provided by SPECIES, but not broken down by GEAR.
4 Total annual catches can be determined by aggregating operational data that were provided on this date.
5 Marlin catch estimate not provided to the species level.
6 Coverage of data used to determine estimates not provided
7 Type(s) of data used to determine estimates not provided
8 Methods used to determine estimates not provided
9 Fleet(s) inactive for this calendar year
10 Breakdown of active vessels by GRT size class not provided
11 Swordfish catch estimates only provided

Table 2. Provision of 2007 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	see NOTES
Australia	LL, PS, PL, HL	29 Apr 2008	
Belize	LL	30 Apr 2008	
Canada	TR	29 Apr 2008	
China	LL, PS	10 Jun 2008	(5)
Cook Islands	LL	30 Apr 2008	(10)
Ecuador	PS		
El Salvador	PS		
Federated States of Micronesia	LL, PS	13 Jun 2008	(10), (13)
Fiji Islands	LL, PL	2 May 2008	
French Polynesia	LL	30 Apr 2008	
Indonesia	LL, PS, OT	2 May 2008	(3), (6), (7), (8)
Japan	PS	5 Jun 2008	
	LL, PL		
Kiribati	PS, AR	29 Apr 2008	
Republic of Korea	LL, PS	29 Apr 2008	
Marshall Islands	LL, PS	24 Apr 2008	
New Caledonia	LL	5 Mar 2008	(5)
New Zealand	LL, PS, TR, PL	24 Apr 2008	
Niue	LL	6 May 2006	
Palau	LL, PL	24 Apr 2008	(9)
Panama	PS		
Papua New Guinea	LL, PS	30 Apr 2008 6 May 2008	
Philippines	PS, HL, RN, OT	11 April 2008	(3), (6), (7), (8)
Samoa	LL	24 Apr 2008	(10)
Senegal	LL		
Solomon Islands	LL, PS, PL	29 Apr 2008	
Spain	LL	13 May 2008	(6), (7), (8), (11)
	PS	13 May 2008	
Chinese Taipei	LL, PS	30 Apr 2008	
Tonga	LL	11 Apr 2008	
United States	LL, PS, TR, PL	7 Jun 2008	(10)
Vanuatu	LL, PS	28 Apr 2008	

NOTES

1 Catches were estimated by the OFP while assisting with the preparation of the national fisheries report.
2 Catch estimates were taken from the national fisheries report presented at the meeting of the Scientific Committee.
3 Total annual catches were provided by SPECIES, but not broken down by GEAR.
4 Total annual catches can be determined by aggregating operational data that were provided on this date.
5 Marlin catch estimate not provided to the species level.
6 Coverage of data used to determine estimates not provided
7 Type(s) of data used to determine estimates not provided
8 Methods used to determine estimates not provided
9 Fleet(s) inactive for this calendar year
10 Breakdown of active vessels by GRT size class not provided
11 Swordfish catch estimates only provided
12 National legislation (or policy) requires that time/area strata comprising data for less than three vessels can not be disseminated.
13 Billfish catch estimates not provided for the longline gear

Table 3. Provision of 2005 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	see NOTES
BELIZE	Longline		
CANADA	Troll		
CHINA	Longline	28 Jul 2006	(1), (12), (14)
	Purse seine	28 Jul 2006	(6), (8), (9), (15)
EL SALVADOR	Purse seine		
ECUADOR	Purse seine		
EU (SPAIN)	Longline, distant-water	1 Dec 2006	(3), (12)
JAPAN	Longline	24 May 2007 9 Jun 2007 5 Jun 2008	(2), (10)
	Pole and line	24 May 2007 5 Jun 2008	
	Purse seine	9 Mar 2006, 10 Jul 2006, 16 Apr 2007, 24 Apr 2007, 5 Jun 2008	
REPUBLIC OF KOREA	Longline	28 Apr 2006 14 Jan 2008	(12)
	Purse seine	14 Jan 2008	(5), (6), (15)
CHINESE TAIPEI	Longline, distant-water	1 May 2006, 30 Apr 2007 30 Apr 2008	(12)
	Longline, offshore, west of 150E	30 Apr 2007 30 Apr 2008	(12)
	Purse seine	1 May 2006	(5), (6), (15)
SENEGAL	Longline	13 Sep 2006, 12 Mar 2008	(1), (7), (12), (16)
UNITED STATES OF AMERICA	Longline - American Samoa	22 Aug 2006 7 Jun 2008	(11)
	Longline - Hawaii	22 Aug 2006 7 Jun 2008	(11)
	Troll - North Pacific	30 Apr 2007	(11)
	Troll - South Pacific	30 Apr 2007	(11)

NOTES

1 The catch data are in units of weight (kgs or metric tonnes) only, rather than both numbers of fish and weight.
2 The catch data are in units of numbers of fish only, rather than both numbers of fish and kilograms.
3 The catch data are for swordfish only.
4 The unit of effort is "days on which a set was made", rather than "days fished or searched".
5 The unit of effort is "sets" rather than "days fished or searched".
6 The catch/effort data are not stratified by the required categories of school association
7 The units of effort are unknown, or non-standard
8 No effort data provided
9 The data are aggregated by 5°x5° instead of 1°x1°
10 Unraised data stratified by 5°x5°, month and hooks between floats were also provided.
11 National legislation (or policy) requires that time/area strata comprising data for less than three vessels can not be disseminated.
12 The 5°x5°month Longline catch and effort data are not stratified by "Hooks between Floats"
13 Coverage of data provided is less than 50%
14 No breakdown of Billfish species catch provided
15 The estimation of bigeye in the reported yellowfin-plus-bigeye catch has not been undertaken in these data
16 The spatial aggregation is non-standard (must be 5°x5° for Longline; 1°x1° for surface fisheries)
17 Aggregate data not provided, but have been generated from annual catch estimates and operational data submitted to the WCPFC.
18 Data have not been "raised" to represent total catch and effort
19 Species composition of main tuna species catch does correspond to annual catch estimates
20 Aggregate data not provided, but have been generated from annual catch estimates and operational data made available to the SPC by their member countries.

Table 4. Provision of 2006 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	see NOTES
Australia	LL, PL, PS, TR	20 Apr 2007	(17)
Belize	LL		
Canada	TR	9 May 2007	(2)
China	LL (DWFN)	16 Aug 2007	(1), (12), (14), (18)
	LL (offshore)	16 Aug 2007	(1), (12), (14) (18)
	PS	16 Aug 2007	(6), (8), (9), (15) (18)
Chinese Taipei	LL (DWFN)	30 Apr 2007 30 Apr 2008	(12), (18)
	LL (offshore, west of 150E)	30 Apr 2008	(12), (18)
	PS	30 Apr 2007	(6), (15), (18)
Cook Islands	LL	30 Apr 2007	(20)
Ecuador	PS		
El Salvador	PS		
Federated States of Micronesia	LL, PS	30 Apr 2007	(20)
Fiji Islands	LL, PL	30 Apr 2007	(20)
French Polynesia	LL	30 Apr 2007	(20)
Indonesia	LL, PS, OT		
Japan	LL	5 Jun 2008	(2), (10)
	PL	5 Jun 2008	
	PS	5 Mar 2007 16 Apr 2007 24 Apr 2007 5 Jun 2008	
Kiribati	PS	30 Apr 2007	(20)
Marshall Islands	LL, PS	30 Apr 2007	(20)
New Caledonia	LL	14 Mar 2007	(20)
New Zealand	LL, PL, HL, PS	2 May 2007	(17)
Niue	LL	30 Apr 2007	(20)
Palau	LL, PL	30 Apr 2007	(20)
Panama	PS		
Papua New Guinea	LL, PS	30 Apr 2007	(20)
Philippines	PS, HL, RN, OT		
Republic of Korea	LL	16 Aug 2007 29 Apr 2008	(12), (18)
	PS	16 Aug 2007	(5), (6), (15), (18)
Samoa	LL	30 Apr 2007	(13), (20)
Senegal	LL	12 Mar 2008	(1), (7), (12), (16)
Solomon Islands	LL, PS	30 Apr 2007	(20)
	PL		
Spain	LL	02 Oct 2007 20 Dec 2007	(3), (12)
	PS		
Tonga	LL	30 Apr 2007	(20)
United States	LL (American Samoa)	30 Apr 2007 7 Jun 2008	(11)
	LL (Hawaii)	30 Apr 2007 7 Jun 2008	(11)
	PS (Treaty)	30 Apr 2007	(17)
	TR (North Pacific)	30 Apr 2007 7 Jun 2008	(11)
	TR (South Pacific)	30 Apr 2007 7 Jun 2008	(11)
Vanuatu	LL, PS	30 Apr 2007	(20)

NOTES

1 The catch data are in units of weight (kgs or metric tonnes) only, rather than both numbers of fish and weight.
2 The catch data are in units of numbers of fish only, rather than both numbers of fish and kilograms.
3 The catch data are for swordfish only.
4 The unit of effort is "days on which a set was made", rather than "days fished or searched".
5 The unit of effort is "sets" rather than "days fished or searched".
6 The catch/effort data are not stratified by the required categories of school association
7 The units of effort are unknown, or non-standard
8 No effort data provided
9 The data are aggregated by 5°x5° instead of 1°x1°
10 Unraised data stratified by 5°x5°, month and hooks between floats were also provided.
11 National legislation (or policy) requires that time/area strata comprising data for less than three vessels can not be disseminated.
12 The 5°x5°month Longline catch and effort data are not stratified by "Hooks between Floats"
13 Coverage of data provided is less than 50%
14 No breakdown of Billfish species catch provided
15 The estimation of bigeye in the reported yellowfin-plus-bigeye catch has not been undertaken in these data
16 The spatial aggregation is non-standard (must be 5°x5° for Longline; 1°x1° for surface fisheries)
17 Aggregate data not provided, but have been generated from annual catch estimates and operational data submitted to the WCPFC.
18 Data have not been "raised" to represent total catch and effort
19 Species composition of main tuna species catch does correspond to annual catch estimates
20 Aggregate data not provided, but have been generated from annual catch estimates and operational data made available to the SPC by their member countries.

Table 5. Provision of 2007 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	see NOTES
Australia	LL, PL, PS, TR	29 Apr 2008	(17)
Belize	LL	30 Apr 2008	(12)
Canada	TR	24 Apr 2008	(11)
China	LL (DWFN)	10 Jun 2008	(1), (12), (14), (18)
	LL (offshore)	10 Jun 2008	(1), (12), (14) (18)
	PS		
Chinese Taipei	LL (DWFN)	30 Apr 2008	(12), (13), (18)
	LL (offshore, west of 150E)		
	PS	30 Apr 2008	(6), (15), (18)
Cook Islands	LL	30 Apr 2008	(20)
Ecuador	PS		
El Salvador	PS		
Federated States of Micronesia	LL, PS	30 Apr 2008	(20)
Fiji Islands	LL, PL	30 Apr 2008	(20)
French Polynesia	LL	10 Apr 2008	(20)
Indonesia	LL, PS, OT		
Japan	LL		
	PL		
	PS	5 Jun 2008	
Kiribati	PS	30 Apr 2008	(20)
Marshall Islands	LL, PS	30 Apr 2008	(20)
New Caledonia	LL	18 Mar 2008	(20)
New Zealand	LL, PL, HL, PS	16 Apr 2008	(17)
Niue	LL		
Palau	LL, PL	30 Apr 2008	(20)
Panama	PS		
Papua New Guinea	LL, PS	30 Apr 2008	(20)
Philippines	PS, HL, RN, OT		
Republic of Korea	LL	29 Apr 2008	(12), (13), (18)
	PS	29 Apr 2008	(5), (6), (15), (18)
Samoa	LL	30 Apr 2008	(20)
Senegal	LL	12 Mar 2008	(1), (7), (12), (16)
Solomon Islands	LL, PS	30 Apr 2008	(20)
	PL		
Spain	LL		
	PS	13 May 2008	
Tonga	LL	30 Apr 2008	(20)
United States	LL (American Samoa)	7 Jun 2008	(11)
	LL (Hawaii)	7 Jun 2008	(11)
	PS (Treaty)	30 Apr 2008	(17)
	TR (North Pacific)	7 Jun 2008	(11)
	TR (South Pacific)	7 Jun 2008	(11)
Vanuatu	LL, PS	30 Apr 2008	(11)

NOTES

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5. COVERAGE RATES

Figure 1 presents coverage rates since 1970 for operational (logsheet) catch and effort data, port sampling data and observer data for all gear types combined. The coverage rates for logsheet catch and effort data refer to catch and effort data for individual fishing operations (longline sets, pole-and-line days fished or searched, purse-seine sets and troll days fished) that are held by the OFP. Coverage rates for observer data refer to the catch of target tunas that was observed. Coverage rates for port sampling data refer to the catch of target tunas from longliner trips that were sampled and the catch of target tunas from purse-seine sets that were sampled.

Figure 2 presents coverage rates for available aggregate and operational catch and effort data by fleet for the longline fishery covering recent years (2000–2006). Figure 3 presents coverage rates for available aggregate and operational catch and effort data by fleet for the purse-seine fishery covering recent years (2000–2006).

Figure 4 presents coverage rates for available size composition data by fleet for the longline fishery covering recent years (2000–2006). Figure 5 presents coverage rates for available size composition data by fleet for the purse-seine fishery covering recent years (2000–2006).

Coverage rates for recent years may increase as additional data are compiled.

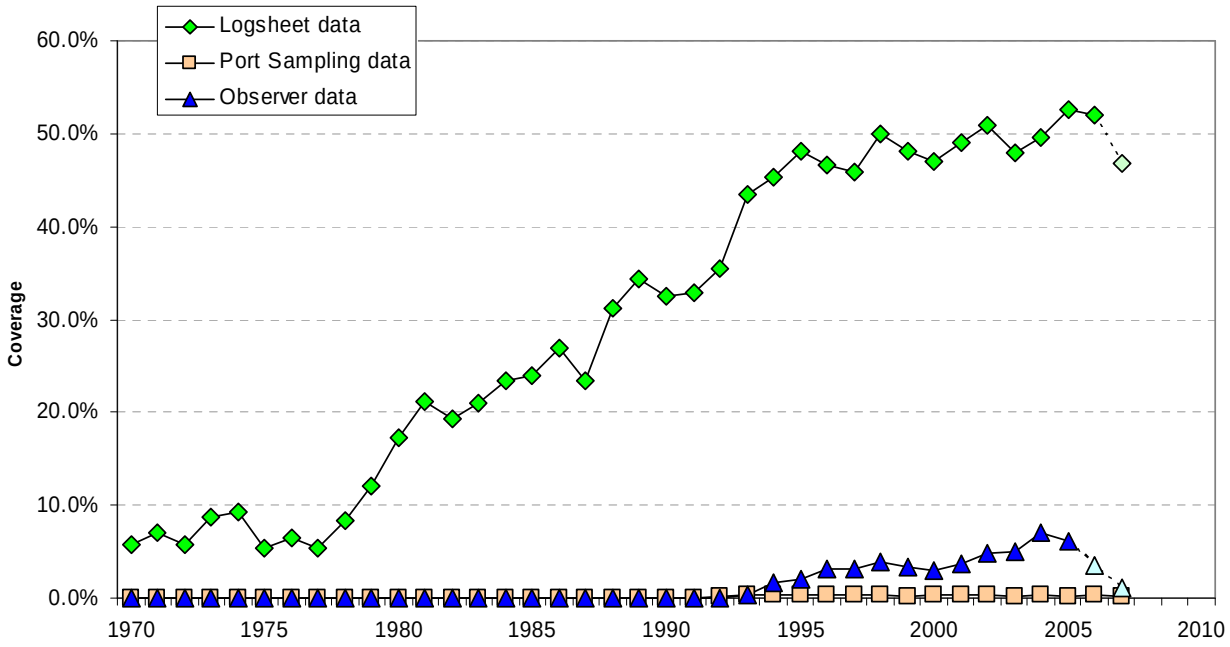

Figure 1. Coverage of tuna fisheries in the WCPFC Statistical Area by operational (logsheet) catch and effort data, port sampling data and observer data compiled by the OFP

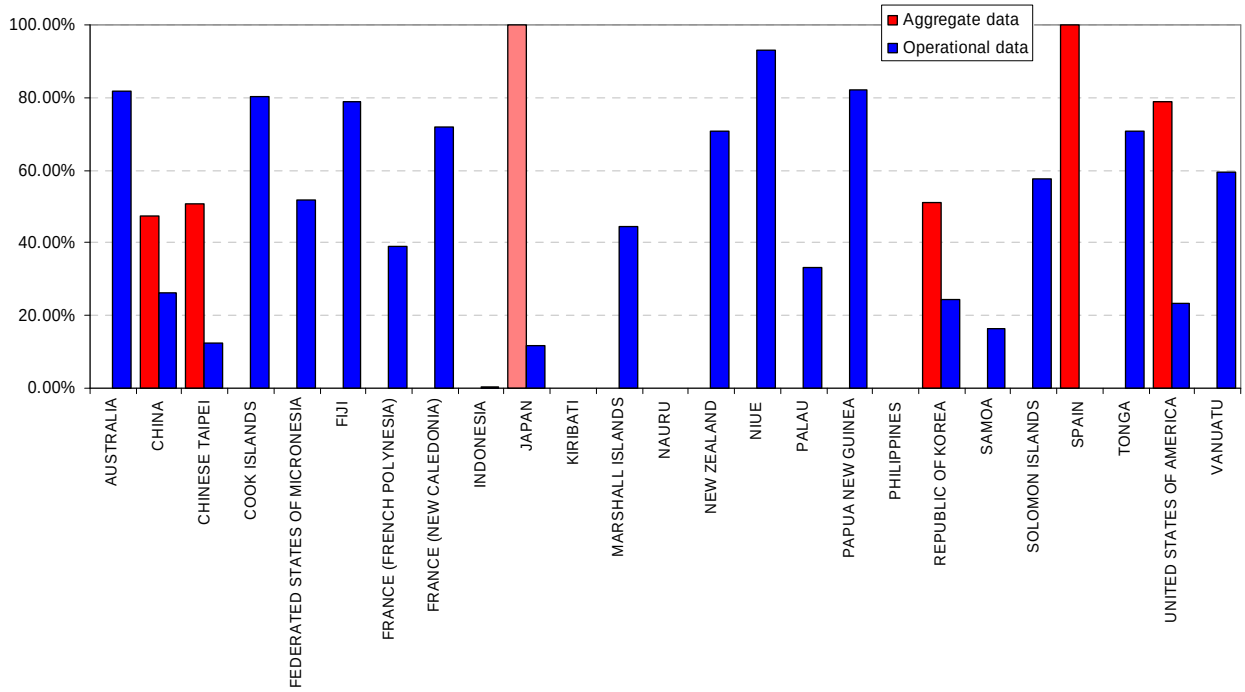

Figure 2. Coverage of available (i) aggregate and (ii) operational (logsheet) data, by fleet, in the WCPFC Convention Area LONGLINE FISHERY, 2000–2006

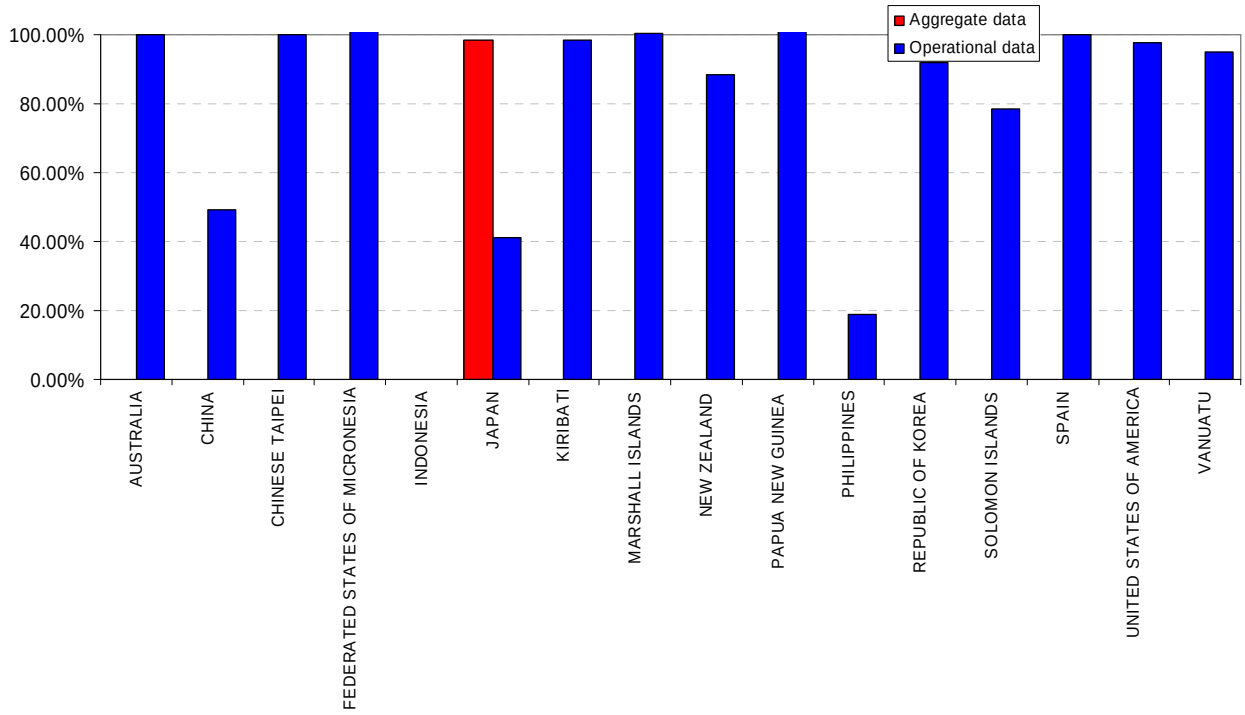

Figure 3. Coverage of available (i) aggregate and (ii) operational (logsheet) data, by fleet, in the WCPFC Convention Area PURSE-SEINE FISHERY, 2000–2006

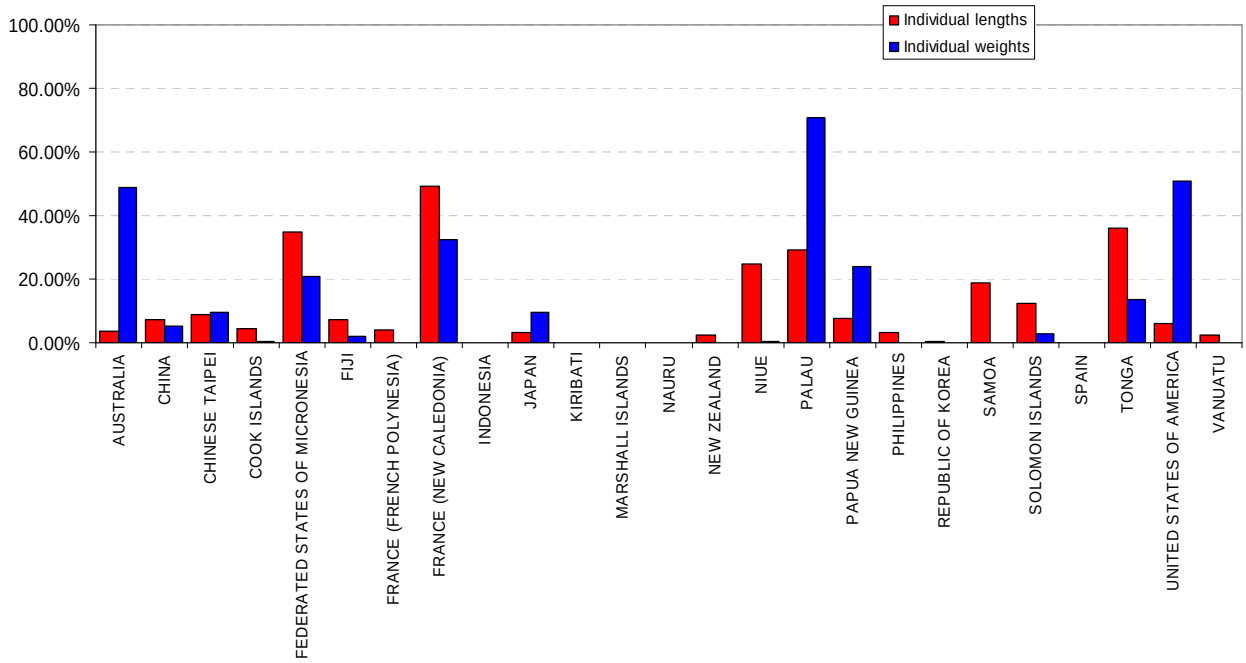

Figure 4. Coverage of available size composition data, by fleet, in the WCPFC Convention Area LONGLINE FISHERY, 2000–2006

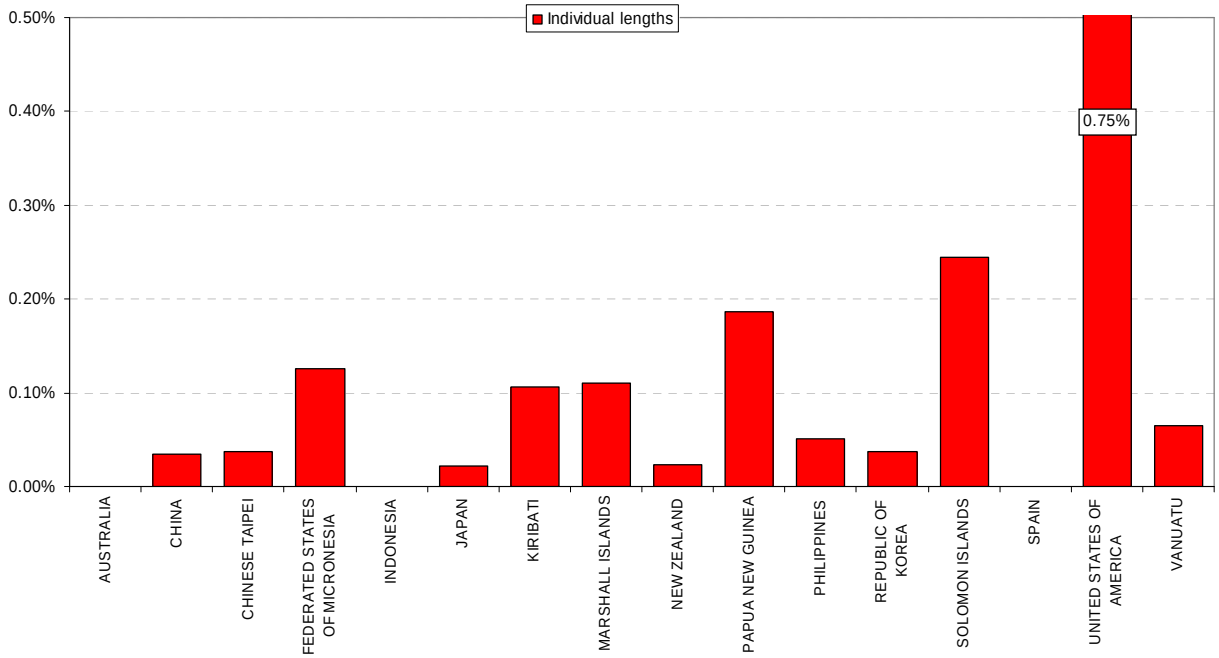

Figure 5. Coverage of available size composition data, by fleet, in the WCPFC Convention Area PURSE-SEINE FISHERY, 2000–2006

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