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SCIENTIFIC DATA AVAILABLE TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

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ABSTRACT

This paper reports on the major developments over the past year with regard to filling gaps in the provision of scientific data to the Commission.

All CCMs with fleets active in the WCPFC Convention Area have now provided 2012 annual catch estimates. Estimates for the key shark species (which is in accordance with the change in the requirements to include the key shark species catches) continue to improve and coastal states have begun using the new extended longline logsheets which has the provision for reporting shark at the species level.

In general, the timeliness of the provision of aggregate catch/effort data continues to improve with nearly all CCMs providing data by the deadline of 30th April 2013. The quality of aggregate data provided has also improved with a reduction in the number of notes assigned to the aggregate data in recent years. A new structure of notes has been provided for the 2012 data provisions with the separation of (i) data gaps notes from (ii) general notes providing more background on the data provided. Operational data for the the American Samoa longline fleet (2007-2012) was provided for the first time, and catch estimates for one new fleet were provided for the first time (Portugal longline). Japan provided aggregated longline catch in weight data for the first time which facilitate the reconciliation with their annual catch estimates.

The main data gaps listed in the paper are:

- The non-submission of Annual Catch Estimates by EEZ/high seas for several key fleets (Section 2.4);
- The implications of non-submission of OPERATIONAL data for several key fleets (Section 2.5);
- The non-submission of number of vessels in the aggregate data for several key fleets (Section 2.7);
- The need for improvement in the submission of catch estimates for the key shark species and reporting of discard estimates;

Further progress was made with the attribution of catch under the latest WCPFC charter notification scheme (CMM 2012-05) and this paper describes the procedures used by the WCPFC Data Service Provider to attribute catch and ensure that double-counting of catches for chartered vessels is not occurring.

The paper deals with three specific requests directed to the Statistic Working Group for SC9 (see Section 3):

- Information on the tropical tuna catch and effort for gears other than purse seine and longline for discussions on CMM 2012-01;
- Scientific data requirements for Whale Shark (the new key shark species to be added);
- Available information on Sailfish.

The Western Pacific East Asia Oceanic Fisheries Management Project (WPEA OFM) which provides support to the Philippines, Indonesia and Vietnam with respect to establishing tuna fishery data collection and management systems has now terminated, but there are positive that the next project will commence in 2014. There remains significant work to improve the coverage and quality of logsheet, port sampling and observer data, and the reliability of annual catch estimates for certain gears. For Indonesia, the main data gaps continue to be the lack of aggregate catch/effort data and the uncertainty of the estimates for their artisanal tuna fisheries. For the Philippines, the main data gap is the reliability of the historical estimates for their small-scale artisanal hook-and-line fisheries. For Vietnam, the main data gap is the complete lack of historical annual catch estimates prior to 2000.

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1. INTRODUCTION

1. The obligations for provision of scientific data to the Commission are set out in 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 adopted by the Western and Central Pacific Fisheries Commission (WCPFC) at its second session in December 2005 (Anon. 2005b, par. 25). 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*" which was further refined and subsequently adopted at the Fourth Regular Session of the Commission, Tumon, Guam, USA, 2-7 December 2007 (Anon, 2007). The most recent revisions (covering the inclusion of catch estimates of key shark species and specifying the size class intervals for size data) were adopted at the Seventh Regular Session of the Commission (WCPFC7), Honolulu, Hawaii, 6–10 December 2011 (Anon. 2011), and the Ninth Regular Session of the Commission (WCPFC9), Manila, Philippines, Hawaii, 6–10 December 2012 (Anon. 2012), respectively, and can be found at http://www.wcpfc.int/guidelines-procedures-and-regulations, or more specifically at http://www.wcpfc.int/node/602.

2. 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.

3. 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 these important data gaps, and to present information on the coverage of scientific data held by the WCPFC.

4. A system to review the provisions of scientific data to the WCPFC and highlight data gaps on the Commission's web site was developed prior to SC4 (refer to http://www.wcpfc.int/statprov). This system serves to provide the following functions:

- 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 Commission members and co-operating non-members (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.

5. CCMs have been encouraged to use this tool to ensure their data provisions have been registered with the Commission and review where data provisions are outstanding.

6. The WCPFC Data Catalogue has been updated on the WCPFC web site (http://www.wcpfc.int/wcpfc-data-catalogue) to cover the 2012 data provisions. This facility provides a description of the WCPFC data holdings by gear, species and data type (annual catch estimates, aggregate catch and effort data, operational catch/effort data and aggregated size data). The WCPFC Data Catalogue will continue to be enhanced in the coming years, as required. 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/en/ofpsection/data-management/wcpfc/213/146-wcpo-tuna-fishery-data-coverage. It is expected that the data coverage facility will be enhanced and transferred to the Commission's web site at some stage in the future.

2. STATUS OF DATA GAPS

7. Data gaps and other issues related to the provision of data have been reported at SC1 (Williams and Lawson, 2005), SC2 (OFP, 2006), SC3 (OFP, 2007), SC4 (OFP, 2008), SC5 (OFP, 2009), SC6 (Williams, 2010), SC7 (Williams, 2011) and SC8 (Williams, 2012).

8. The following sections describe the most important current gaps in the WCPFC scientific data holdings. These sections are carried over from previous versions of this paper until the data gap issue is considered to be resolved. The text in *blue italics* reflects the recent work and/or developments to resolve the respective data gaps.

2.1 Major data gaps for key fleets

2.1.1 Philippines tuna fishery data

9. The absence of a breakdown of catch estimates by gear type, and the lack of operational logsheet data for the Philippines domestic fisheries have been amongst the most significant gaps in the provision of data to the WCPFC, specifically,

- Total catch estimates for the period prior to 1970 are missing.
- There is a general lack of operational and aggregated catch and effort data.
- Only limited size composition and species composition data are available for the period prior to the National Stock Assessment Programme (NSAP), which commenced in 1997.
- The estimates from the municipal fisheries, particularly the small-fish hook-and-line fishery are considered unreliable with catches in some regions unrealistically high for yellowfin and bigeye tuna.

10. During the past year, the WCPFC Secretariat and the SPC/OFP continued to work with their Philippine counterparts to improve the data available from these fisheries. The UNDP/GEF-funded West Pacific East Asia Oceanic Fisheries Management (WPEA-OFP[2]) project, which is supporting this work, terminated in 2012, but additional bridging funds allowed work to continue with an expectation that a second WPEA project would be approved and commence in 2014. Significant developments in resolving data gaps in the Philippines' domestic fisheries over the past year include:

- *The sixth Philippines Annual Catch Estimates Review Workshop (Anon, 2013b) was convened and attended by important stakeholders with knowledge and information on the tuna fisheries in the Philippines (government, industry and NGOs). Further progress was made this year on producing more reliable estimates for the municipal hook-and-line fishery, although more work in this area is required.*
- *The fourth review of the species composition and size data collected under the National Stock Assessment Project (NSAP) was conducted in a workshop held in Davao City in May 2013 (Anon, 2013a). These data provide fundamental information for tuna stock assessments and for the annual catch estimation process and the workshop confirmed that problems identified in previous workshops had been resolved.*
- *The collection of operational logsheet data from the domestic purse seine fishery continues to progress with comprehensive data now available for 2008-2012.*
- *The Philippines national observer programme continues to collect important data from the domestic purse seine fishery and the fishery active in the high seas pocket since October 2012, the latter of which are classified as ROP data. These data will provide fundamental information on the fishery which feed into the annual catch estimates and stock assessment processes.*

11. The most important data gaps for Philippines remain:

[2] Refer to http://www.wcpfc.int/doc/2009/wpea-ofm-project-document; significant co-financing is included with this project in supporting the work in Indonesia, Philippines and Vietnam

i. Improving logsheet coverage for the purse seine vessels fishing in the Philippines EEZ;
ii. More reliable estimates for the small-scale municipal gears;
iii. Provision of estimates and data for the distant-water Philippine longline vessels.

2.1.2 Indonesian tuna fishery data

12. The absence of a breakdown of annual catch estimates by gear type, and the lack of operational logsheet and size data for the Indonesian domestic fisheries are amongst the most significant gaps in the provision of data to the WCPFC, specifically:

- 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 1991–1999.
- Estimates of annual catches of 'yellowfin' covering the period from 1970 to 1999 also include bigeye.
- There is a general lack of operational and aggregated catch and effort, and size composition data.
- For the period from 1970 to 1999, large annual catches have been reported for 'unclassified' gear types; information is required regarding the gear types included in 'unclassified', and the size composition of catches taken by 'unclassified' gear types.

13. During the past year, with the assistance provided through the WPEA-OFM project, the WCPFC Secretariat and the SPC/OFP continued to work with their Indonesian counterparts to improve the data available from these fisheries. Significant developments in the past year include:

- *The third WPEA/Indonesia port sampling data review workshop was conducted in Bitung, North Sulawesi during November 2012 (see Anon, 2012b). This workshop was convened to review the data collection by enumerators based in Bitung and Kendari ports during 2012 and plan for extending the port sampling to Sorong during 2013. The workshop noted the consolidation of systems for collecting and processing size data, which were subsequently made available to the WCPFC in April 2013;*
- *The fourth Indonesia/WPCFC Area Annual Catch Estimates Review Workshop (Anon, 2013c) was conducted in Bogor, Indonesia in June 2013. Participants included the Directorate General of Capture Fisheries and the Research Center for Capture Fisheries and Marine Resources. Estimates by SPECIES and GEAR were compiled for all provinces for the first time in preparation for this meeting. The meeting also noted the increase in the provision of logbook data although these data have yet to be compiled and provided to the WCPFC. Reliable estimates were provided for some gears, although estimates for the small-scale artisanal fisheries were acknowledged to be uncertain and should be the focus of directed work in the future.*

14. The most important data gaps for Indonesia remain:

i. the lack of an adequate review of annual catch estimates prior to 2000;
ii. more reliable estimates for the small-scale artisanal gears;
iii. Compilation and submission of aggregate and operational catch/effort data for recent years since the logbooks became mandatory in the Indonesian domestic tuna fisheries (2011-2012).

2.1.3 Vietnamese tuna fishery data

15. The lack of annual catch estimates and other data used for stock assessments in the Vietnamese domestic fisheries is acknowledged to be an important gap in the provision of data to the WCPFC, specifically,

- 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).

16. During the past year the WCPFC Secretariat and the SPC/OFP continued to work with their Vietnamese counterparts to improve the data available from these fisheries. Significant developments in the past year, include:

- *The fourth Vietnam Tuna Data Collection workshop (Anon, 2012c) was convened and attended by important stakeholders with knowledge and information on the tuna fisheries in Vietnam in November 2012. The workshop primarily reviewed the longline (observer, logsheets and port sampling data) and purse seine/gillnet data (landings) that had been collected to date and provided recommendations for improving data collection. The workshop included a review of the data collected to date (i.e. the outcomes of the data audit), considered the change from longline to handline and the ramifications for data collection, and considered expanding WPEA data collection systems to other provinces. This workshop reviewed, for the first time, the landings and port sampling data collected from the gillnet and purse seine fisheries.*
- *The second Vietnam Tuna Fisheries Annual Catch Estimates Workshop (Anon, 2013d) was convened and attended by important stakeholders with knowledge and information on the tuna fisheries in Vietnam, in April 2013. This workshop included an in-depth review of the new Handline fishery and changes to data collection protocols, the production of 2012 annual catch estimates by GEAR and SPECIES, and for the first time, inclusion of tuna catch estimates compiled from the non-WPEA provinces.*
- *For the first time, the annual catch estimates for Vietnam have been disaggregated by time and area, and added to the WCPFC aggregate databases. In the longer term, aggregate data should be sourced from logbook data, but at least provisional versions of the Vietnamese catches will now be accounted for in the aggregate data.*

17. The most important data gaps for Vietnam remain:

i. the construction of historical annual catch estimates for each of the domestic Vietnamese fisheries prior to 2000;
ii. the compilation and provision of aggregate and operational catch/effort data from the longline fishery from logbooks collected since 2011;
iii. the establishment of logbook data collection for the purse seine and gillnet fisheries.

2.1.4 Other fleets

18. Gaps in the provision of historical data for key fleets have been noted in previous papers. In several cases, no specific fishery data were collected during the period mentioned, so data cannot be provided to the WCPFC. However, there may be other information available to construct an historical time series through specific studies.

– There are no operational (logsheet), aggregated catch and effort, nor size data available for years prior to 2004 for the **Chinese-Taipei domestic offshore (STLL) longline** fleet;
- There are no operational or aggregated catch and effort data, nor size composition data, available for the **Japanese Coastal fleet**;
- There are no operational or aggregated catch and effort data, nor size composition data, available for the period prior to 1972 for the **Japanese pole-and-line fleet.**

19. Developments during the past year include:

– *For the first time, the annual catch estimates for the Japanese Coastal fleets have been disaggregated by time and area, and added to the WCPFC aggregate databases. These catches are significant and the SPC/OFP hope to liaise with the Japanese scientists in the coming year to review the methodology for disaggregating the annual catch estimates into aggregate data to ensure they are as representative as possible in the absence of logbook data.*

2.2 Coverage rates

20. Data provided by CCMs which do not represent full coverage may be listed as a data gap, for example:

- 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 are required.

21. Section 5 of this paper provides a description of the coverage of the scientific data available for the WCPFC stock assessments. Recent developments in the area of data coverage include:

- *Vessel Monitoring System (VMS) data, aggregated to the trip level, continue to be refined for determining and improving coverage and have been used with great effect to improve data coverage for years since 2009, inclusive.*

2.3 Nationality of the catch

22. 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. With the establishment of a WCPFC Conservation Management Measure (CMM) on chartering (the latest being CMM 2012-05 – see http://www.wcpfc.int/doc/CMM-2012-05/Conservation-and-Management-Measure-Charter-Notification-Scheme), procedures for the assignment of catch data to national entities have been developed but require further refinement to cater for all cases of charter situations. These procedures are required to ensure that "double-counting" of catch and effort data provided by both the flag and chartering entities does not occur.

23. The current procedures used by the WCPFC data service provider for the assignment of "fishing nation" to the scientific data are as follows:

- The assignment of 'fishing nation' for the FSM Arrangement (FSMA) purse-seine vessels has been based on the FSMA 'home party' principle since the mid-1990s and this assignment has continued through the WCPFC process;
- The assignment of 'charter nation' for Philippine-flagged vessels, based in PNG and managed by PNG-associated companies, to PNG predates the WCPFC and this assignment has continued through the WCPFC process;
- The assignment of 'fishing nation' for other vessels will only be considered through the CMM 2012-05 charter notification scheme, in particular Paras. 2 and 3.
- Once a charter notification has been reviewed, approved and published by the WCPFC Secretariat, the WCPFC data service provider will attribute the catch and effort of the flag state to the chartering nation, as long as the following CRITERIA have been satisfied for each year of the charter:
  i. The flag state has removed, or has identified, the catch/effort for the chartered vessels in their annual catch estimates, aggregate, operational and size data;
  ii. The charter nation have corresponding annual catch estimates, aggregate, operational and size data for their charter vessels;
  iii. There is consistency between the data removed/identified by the flag state and the data compiled by the charter nation.
- If these criteria have been met, then the attribution of catch/effort to the charter nation is undertaken. For the year of the charter, ALL of the catch/effort for the charter vessel is attributed to the chartering nation for the duration of the charter. If more than one nation notifies the WCFPC with the charter of a particular vessel, then it is the nation that first advises the WCPFC with the charter notification that will be listed as chartering that vessel;
- If these criteria have not been met, then it is not possible to undertake the attribution of catch/effort to the charter nation without the risk of "double-counting" occurring and catch/effort remains attributed to the flag state.

- If the attribution of catch/effort to the charter nation is not possible, then the charter notification will remain listed and acknowledged until such time as these criteria are satisfied through some resolution process.

24. Developments during the past year include:

- *SPC continues to maintain the CHARTER database table which contains the information contained in the charter notifications submitted by Coastal states to the WCPFC under the requirements of the CMM on Charter Notification Scheme (CMM 2012-05). This database is used to assign the charter nation in the catch and effort data.*
- *The attribution of catch for vessels identified under the WCPFC Charter notification scheme (as outlined in WCPFC, 2012) has been undertaken in the WCPFC data.*
- *The charter notification provided to the WCPFC from the Solomon Island covering their charter vessels for 2012 is currently pending advice from the flag-states on removing the catch/effort from their data representing the chartered vessels nominated by the Solomon Islands. At this stage, the attribution of catch/effort to the charter nation cannot be undertaken.*

25. Outstanding issues in this area include,

- For years prior to 2012, Chinese Taipei and other relevant flag states are requested to exclude the catch/effort for their flagged vessels which are listed in the WCPFC Charter notifications from the data (annual catch estimates, aggregate and operational data) they submit to the WCPFC. These CCMs should confirm or otherwise whether this has been done.

2.4 Annual catch estimates by EEZ

26. Section 4 of the *Scientific Data to be provided to the Commission* (i.e. Catch and effort data aggregated by time period and geographic area) indicates that -

> *"If the coverage rate of the operational catch and effort data that are provided to the Commission is less than 100%, then catch and effort data that have been raised to represent the total catch and effort shall also be aggregated by periods of year and areas of national jurisdiction and high seas within the WCPFC Statistical Area."*

27. Several CCMs have not provided operational catch and effort data, so they are obliged under this requirement of the data provision rules to provide catch (by species) and effort data aggregated by YEAR and EEZ/High seas areas to the WCPFC. The CCMs that do not yet provide operational data are therefore required to provide these aggregate data (China, Japan, Republic of Korea and Chinese Taipei), as is listed in Table 5 and reiterate in Section 4.2 below.

2.5 Operational catch and effort data

28. Coastal states (which are members of the SPC and FFA) collect operational catch and effort data through bilateral access agreements with foreign fleets fishing in their waters; these data are processed and held by the SPC on behalf of the coastal states. Operational catch and effort data are not available outside the EEZs of FFA member countries for Japanese fleets, the Korean distant-water longline fleet, and the Chinese and Chinese Taipei distant-water longline fleets 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).

29. 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 used in WCPFC stock assessments. 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.

30. Significant progress has been made with the provision of historical operational data over the past few years (see Section 4.3 below and Tables 7 and 8). Significant developments during the past year include:

- *Provision of operational data for the EU Spanish longline fleet for 2004-2012;*
- *Provision of operational data for the EU Spanish purse seine fleet for 2001-2012*
- *Provision of operational data for the American Samoa longline fleet for 2007-2012*

31. There are now only four CCMs with non-domestic fleets operating throughout the WCPFC area which have yet to notify of their intent to provide operational catch/effort data to the WCPFC. In this respect, the Seventh Regular Session of the Commission (Anon., 2011) requested CCMs with issues in providing data to submit a draft plan of how impairments to the provision of data can be resolved. To date, there have not been any plans submitted by the CCMs yet to provide operational catch and effort data.

> *"Para. 173: WCPFC7 acknowledged the importance of providing complete and accurate data in a timely way and urged CCMs to improve the provision of data to the Commission. WCPFC7 requested that CCMs that have issues in providing accurate and complete data in a timely manner should identify those issues clearly to the Commission. At TCC7 CCMs should provide a draft plan of how impairments to the provision of data will be dealt with as rapidly as possible. CCMs are encouraged to assist others as they are able to do so and the Commission should continue to evaluate methods to assist in this matter."*

32. For the countries yet to provide operational data, there have been some positive developments in arranging for the WCPFC scientific service providers access to operational data for the work of the Commission through visits to their country (e.g. an SPC scientist has visited Japan to conduct studies on CPUE standarisation). However, these opportunities are time-limited, incur additional costs, and do not provide the necessary access or time required to satisfy the wide range of Commission work that can only be achieved with substantially more access to the operational data.

33. In relation to the issues regarding the provision of operational data, the report of WCPFC9 (Anon., 2012a) indicated

> *136. Data provision shortfalls by other CCMs were noted and SC and TCC were requested to provide a paper to WCPFC10 on the implications for the Commission's science, monitoring and compliance functions due to the ongoing failure by several major fleets to provide operational data.*

34. The implications of the ongoing failure in the provision of operational data for the Commission's science include the following:

- There are many instances in the Commission's work where a breakdown of catch/effort by areas of national jurisdiction and HIGH SEAS is required and this is not possible without operational data. Currently, for example, estimates of EEZs and the HIGH SEAS catch/effort are constrained by the lack of operational data;
- The absence of operational data has made it difficult to ensure that double-counting is not occurring when attributing catches from flag states to charter nations;
- Several studies using fine-scale operational data have identified important trends that are not evident in the aggregate data but need to be considered in the assessments (e.g. Hoyle et al., 2010). Better access to operational data would potentially provide a better understanding of historical trends that are currently not taken into account in the assessments using aggregate data; for example, obtaining a better understanding of declines in longline bigeye tuna CPUE which are not apparent without access to operational data;
- Fine-scale models, such as the SEAPODYM model, can only use operational level data as the fishery-dependent data input. Currently, the outputs of SEAPODYM models are constrained by the lack of operational data.

2.6 Aggregate catch and effort data

35. 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.

This data gap has been resolved through the data exchange Memorandum of Cooperation (MOC) with IATTC (see http://www.wcpfc.int/node/2684*). In June 2012, historical aggregate longline data for the Eastern Pacific Ocean (EPO) were provided and the WCPFC now holds aggregate longline data for the main longline fleets for the Pacific Ocean for a period of 1950-2011.*

36. Outstanding issues in this area include:

- In some instances, the aggregated catch and effort data provided to the WCPFC for the most recent year of activities (e.g. 2012) have not been raised and/or represent incomplete coverage of activities, particularly for the latter months of the year. Confirmation that coverage is complete and uniform for all months of the most recent year is important to ensure it is taken into account within the stock assessment projections.
- In some instances, it is not possible to reconcile the aggregate longline catch data with annual catch estimates.

  In April 2013, Japan provided catch in weight by species in their longline aggregate data provision covering years 2010-2012, for the first time. It is hoped that catch in weight can also be provided for their aggregate longline data prior to 2010.

- 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 for 2003-2007 are in units of "kilograms" only, and the stock assessments require the catch to be in "numbers of fish" by species.
  - The catch in the EU Spanish longline operational data (2004-2012) which is used to generate their aggregate data is in "kilograms" only.
- There have been improvements in the provision of aggregate data for the key shark species, but instances where (i) some shark species catches are not provided, and/or (ii) shark species catches are much lower than expected (i.e. under-reported) are two of the main gaps apparent in this area.
- While annual catch estimates by EEZ/high seas are classified as 'aggregate data', the issues involving the provision of this type of data are specifically dealt with in Section 2.4.

2.7 Number of vessels in the aggregate data

37. The compilation of public domain catch and effort data has been hampered by the lack of key effort information (number of vessels) in the aggregate data provided by CCMs. In acknowledging the difficulties in filtering aggregate data in order to adhere to the Commission's rules for the dissemination of public domain data (see Para. 9 of the rules), WCPFC6 agreed to the following recommendation put forward by the Ad Hoc Task Group for Data (AHTG–Data) :

"188. WCPFC6 agreed, as advised by the AHTG–Data and recommended by TCC5, that the Commission amend its Procedures and Standards for Scientific Data to be Provided to the Commission to include in Section 4 (Catch and effort data aggregated by time period and geographic area) the following new paragraph:

[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.

CCMs are to provide, to the extent possible, the number of individual vessels per stratum and area covered by their operational data with the aggregated catch and effort data they submit to the Commission."

38. CCMs that provide operational logsheet data to the Commission, or the SPC-member countries that provide operational logsheet data to the SPC, are **not** required to provide this additional information since the WCPFC Data Managers (SPC) can undertake the work of filtering out the strata representing the activities of less than 3 vessels in the process of aggregating the operational data.

39. The current status of the provision of "number of individual vessels per stratum" for those CCMs that only provide aggregate data is as follows:

- Chinese Taipei have provided information on the number of vessels per stratum in their provision of aggregate data for their distant-water (DWLL) and offshore (STLL) longline fleets for each since since 2007 (i.e. 2007-2012). This information will therefore allow the production of a public domain version of their aggregate data for these years only but not the entire time series of their aggregate data.
- The USA has filtered their aggregated longline data to remove strata which represent the activities of less than 3 vessels because this is a requirement in their national legislation. The aggregate data they provide to the WCPFC are therefore considered to be in the public domain.
- Japan has yet to provide information on the number of vessels per stratum with their aggregate longline data.
- China has yet to provide information on the number of vessels per stratum with their aggregate longline data.
- Korea has yet to provide information on the number of vessels per stratum with their aggregate longline data.

40. At this stage, there is insufficient information provided to change the current method of compiling the WCPFC public domain data[4] (see http://www.wcpfc.int/science-and-scientific-data-functions/public-domain-data).

41. The current WCFPC public domain data are essentially useless and non-representative since too many cells have been removed as a result of applying the three-vessel rule. A potential solution is for the Commission to consider requesting CCMs to advise whether they require the aggregate data for their fleets to be filtered according to the 'three-vessel rule', or not. The original intent of the WCPFC public domain data was to provide CCMs with access to all of the WCPFC aggregate data and this initiative would then allow a more useful version of the WCPFC public domain databases to be made available.

2.8 Species composition data for purse seiners

42. Species composition data collected by observers and port samplers are needed to improve estimates of the catches of skipjack, yellowfin and bigeye tuna for purse-seine fleets. This issue is being addressed through:

(i) the establishment of 100% observer coverage in the purse-seine fishery since January 2010;
(ii) the gradual establishment of observer spill sampling through the WCPFC Project 60; and
(iii) initiatives related to the collection of landings data and cannery receipts.

43. The collection of paired "spill" and "grab" samples by observers is an important WCPFC project which is fundamental for the estimation of size selectivity bias in grab samples of the purse-seine species and size composition. A description of the estimation of selectivity bias and the use of grab samples corrected for selectivity bias to adjust catch and length data can be found in Lawson (2010, 2011a, 2012 and 2013), and

[4] It is noted that an analysis provided in SC5 ST WP-5 showed that even if the number of vessels per stratum is provided, aggregate catch and effort data for individual flags that have been filtered for less than three vessels will not be accurate. See http://www.wcpfc.int/doc/st-wp-08/timothy-lawson-and-peter-williams-status-public-domain-catch-and-effort-data-held-weste

Lawson & Lasi (2012 and 2013). The WCPFC annual catch estimates and aggregate data have been adjusted to reflect best estimates of skipjack, yellowfin and bigeye tuna in the WCPFC purse seine fishery based on these analyses.

3. REVIEW OF DATA ISSUES/REQUESTS

44. This section deals with a broad range of issues and requests related to WCPFC Scientific data which have been raised in the past year and have been deemed appropriate to deal with in this paper. The following sub-sections deals with each specific issue/request.

3.1 Compilation of catch and effort from "Other" gears

45. A recommendation from last year's SC meeting report (para. 96) and a request within CMM 2012-01 (para. 29) refers to the need for information from fisheries other than purse seine and longline (referred to in the context of CMM 2012-01 as "Other" fisheries) to inform discussions on appropriate management measures. The specific text for respective requests appears below:

> *96. SC8 recommended that a) because no reports for "Other Commercial Tuna Fisheries Fishing for Bigeye and Yellowfin Tuna" were received, in accordance with para. 39 of CMM 2008-01, the issue be forwarded to TCC8 for consideration; and b) Agenda Item 3.2.1 be removed from future SC agendas, and be addressed in the Data Gaps Report.*
>
> *29. To assist the Commission in the further development of provisions to manage the catch of bigeye, yellowfin, and skipjack tunas the Scientific and Technical and Compliance Committees during their meetings in 2013 will provide advice to the Commission on which fisheries should be included in this effort and what information is needed to develop appropriate management measures for those fisheries.*

46. In response to these requests, Table 1 provides a breakdown of average annual tropical tuna catch by gear, flag and species for recent years for the "Other" gears, including basic information on area fished and an indication of the availability of effort data aggregated by time/area.

3.2 Scientific data for Whale shark

47. In December 2012, WCPFC9 adopted, *inter alia*, the SC8 recommendation to list the whale shark (*Rhincodon typus*) as a key shark species (SC8 Summary Report, para. 395). Whale shark encounter data have been collected for several years in relation to the purse sine fishery, but there has yet to be full consideration of what "scientific data" would need to be collected for the Commission's work in managing this species with respect to the WCPFC Fisheries. As such, the following provides some areas for consideration/discussion prior to updating the "*Scientific Data to be Provided to the Commission*" to include whale shark, as one of the key shark species :

- Whale shark encounters in the purse seine fishery are currently reported on logbooks as by-catch and as a specific tuna school-type association. Is there any further information required from logbook-reporting ?
- Detailed information on whale shark encounters in the purse seine fishery are recorded by observers in a manner consistent with (but much more detailed than) the logbook-reporting. The information recorded also includes important data on the condition and fate of the animal. Is there any further information on whale shark encounters required from observer-reporting ?
- Size data for the other key shark species are collected by observers and are fundamental to stock assessments. Collecting size data from whale shark encounters is currently not possible for a number of reasons (the main reason related to the large size of the animal). There have been some suggestions related to collecting morphometric information (i.e. in place of total length measurements) and using devices to facilitate the measurement of large animals. The initial question is whether the collection of size data is required or not.
- Are there any other useful and feasible scientific data that can be collected on whale shark (which will subsequently be listed in the "*Scientific Data to be Provided to the Commission*") ?

3.3 Available information on Sailfish

48. SC8 tasked the Scientific Services Provider to undertake a review of data holdings for (Indo-Pacific) Sailfish (*Istiophorus platypterus*) in order to inform discussions at SC9 regarding the necessary budget for undertaking further analyses. Sailfish has been added to the WCPFC Data Inventory and a detailed breakdown of the available data holdings can be found at http://www.wcpfc.int/wcpfc-data-catalogue.

4. RECENT PROVISIONS OF SCIENTIFIC DATA TO THE WCPFC

49. 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 of the following year (see "Reporting obligations" at the following web page http://www.wcpfc.int/statprov).

4.1 Annual Catch Estimates

50. Tables 2 and 3 list the dates on which catch estimates for 2011 and 2012, respectively, were provided, and include notes on the data that have been provided, mainly highlighting gaps or problems in those data. A new structure of notes has been provided for the review of 2012 data provisions with the separation of notes related to data gaps from general notes on the data provided.

51. Annual catch estimates for 2011 have now been provided by all CCMs. Annual catch estimates for 2012 have now been provided by all CCMs. Annual catch estimates for one new fleet (Portugal) was provided for 2012 activities.

52. For 2011 annual catch estimates, there were 28 out of 33 CCM fleets (85%) that had provided estimates by the 30 April 2012 deadline last year. For the 2012 annual catch estimates, only two CCM fleets (Spanish and Portuguese longline) had not provided estimates for their fleets within a week of the deadline, but these were provided before the end of May 2013. Provisional estimates were provided by Indonesia and Philippines prior to the 30th April 2013 deadline, and were updated following annual catch estimates workshops held in June and May, respectively.

53. The quality of estimates provided continues to improve with a reduction in the number of data-gap notes assigned to the annual catch estimates for 2012 compared to 2011 estimates; the main gaps in the annual catch estimates relates to the provision of:

- Estimates for key shark species, and
- Estimates of discards.

4.2 Aggregate Catch/Effort data

54. Tables 4 and 5 list the dates on which aggregated catch and effort data were provided for 2011 and 2012, respectively, and include notes on the data that have been provided (see Table 6), highlighting gaps or problems in those data. The notes in the right-hand column 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. A new structure of notes has been provided for the review of 2012 data provisions with the separation of notes related to data gaps from general notes on the data provided.

55. 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 2013) since they were available at that time.

56. Notable issues in aggregate catch/effort data that have been resolved in the past year include:

- Japan has provided the catch in weight by species in their longline aggregate data provision for the first time. This provision covers years 2010-2012 and resolves a significant data gap in reconciling

their aggregate data with their annual catch estimates. It is hoped that catch in weight can also be provided for their aggregate longline data prior to 2010;

57. The notable gaps in the provision of 2011 and 2012 aggregate data include:

- It is not clear whether incomplete aggregate longline data for the latter months of 2012 (i.e. the most recent year) have been provided for some fleets, which will have ramifications for use in the stock assessments;
- Catches for shark species improved but catches for some species were not provided by a number of longline fleets, or the coverage of the catch is considered clearly lower than expected. Catches of shark species for the Pacific Island fleets will be estimated from available observer data in the future, noting that a number of coastal states are now implementing the new, extended longline logbooks which require foreign and domestic fleets fishing in their waters to report catches of shark to the species level;
- Several fleets (e.g. China, Japan, Korea and Chinese Taipei) do not provide operational data, in which case, the "*Scientific Data to be Provided to the Commission*" requires the provision of aggregate data for the "Annual catch estimates by areas of national jurisdiction (EEZs) and high seas" which have not been provided for these fleets;
- 2012 aggregate catch and effort data for key domestic fleets from Indonesian (longline, purse seine and pole-and-line) and Vietnam (longline) were not provided at the time of submitting this paper. However, logsheet data have been collected from these fleets, so aggregated data are expected to be submitted once data processing has been completed.

58. In general, the timeliness of the provision of aggregate catch/effort data continues to improve with nearly all CCMs providing data by the deadline of 30th April 2013. The quality of aggregate data provided continues to improve with a reduction in the number of notes assigned to the aggregate data in recent years.

4.3 Historical operational catch/effort data

59. Table 6 shows the schedule for the submissions of 2012 operational catch and effort to the WCFPC and Table 7 summarises the authorizations and notifications for the release of historical operational data to the WCPFC. As at July 2013, the status of the provisions of historical operational data to the WCPFC is as follows:

- Historical operational data for the Asian tuna fleets (primarily China, Japan, Korea and Chinese Taipei) are the main data gaps;
- Authorization for the release to the WCPFC of historical operational catch and effort for their national fleets, held by the SPC-OFP on behalf of their member countries, has been received from **ALL** SPC member countries;
- Operational purse-seine logsheet data have been provided by the Philippines (for 2004 activities) and Japan (for 2001–2004 activities) in relation to CMM 2008-01. For Japan, the provision of these data was in accordance with paragraphs 15 and 16 of CMM 2008-01;
- Operational catch and effort data have been provided for the EU Spanish purse seine fleet for 2001–2012;
- Operational catch and effort data for the EU Spanish longline fleet for the period 2004-2012 have been provided;
- Operational catch and effort data for the US Hawaiian Longline fleet have now been provided for 2007-2011; Data prior to 2007 and for 2012 remain outstanding.
- Operational catch and effort data for the American Samoa longline fleet have now been provided for 2007-2012; Data for 2005 and 2006 remain outstanding.
- Operational catch and effort data for the Philippines domestic purse seine fleet covering years since 2005 are expected to be authorized for release to the WCPFC;
- Operational catch and effort data for the Vietnamese domestic longline fleet are expected to be authorized for release to the WCPFC;

- Operational catch and effort data for the Indonesian domestic longline and purse-seine fleets are expected to be authorized for release to the WCPFC;

60. Significant progress continues to be made in the provision of historical operational catch and effort data to the WCPFC and it is hoped that the outstanding operational catch and effort data can be provided by relevant CCMs in the near future.

4.4 Regional Observer Programme (ROP) data

61. The SPC/OFP has been processing observer data on behalf of their member countries for more than 15 years and the Seventh Regular Session of the Commission (6–10 December 2011) approved the continuation of this work in respect of the Regional Observer Programme (ROP) data in the short-medium term (Anon., 2011). Williams et al. (2013) describes the recent developments, future work and initiatives with respect to ROP data management; this paper also shows the current coverage of available, processed observer data.

62. Authorisations/notifications to provide ROP data to the Commission have now been received from all major observer service providers (see Table 8). In the past year, the backlog in the provision of ROP data to SPC has improved and some of the issues related to rejected data resolved. SPC is also undertaking trials in observer E-Reporting which has the potential for efficiency gains in the timeliness and quality of observer data (see Schneiter and Williams, 2013).

63. Significant provisions of ROP data in the past year include –

- Provision of data for sixteen (16) ROP observer trips on-board Chinese Taipei longline vessels by Chinese Taipei;
- Provision of data for 222 ROP observer trips on-board US longline vessels by the USA (activities outside of the HW EEZ);

64. The Philippines have deployed observers on the vessels permitted to fish in HSP1 under the extended CMM 2011-01 and now under CMM 2012-01. These data are ROP data and are expected to be provided to the WCPFC in the coming months.

4.5 Transmission of scientific data to the WCPFC Secretariat

65. The WCPFC scientific data, comprising the historical time series of annual catch estimates, aggregate catch/effort data, size data, and the operational (logsheet) and ROP data (authorized for release) continues to be provided to the WCPFC Secretariat on a regular quarterly basis. Over the past twelve months, the latest versions of each data type have been sent to the WCPFC Secretariat in August 2012, December 2012, March 2012 and April 2012. Since May 2012, the WCPFC Scientific data are updated on a monthly basis and made accessible for download by the WCPFC Secretariat at any time via a secure FTP area.

66. In addition to the provision of data, the WCPFC Secretariat has been the provided with the following services over the past year:

- Further training on the Catch and Effort database Query System (CES) and the Observer TUBs Viewer system (systems used to extract summarized tables, graphs and maps of the WCPFC annual catch estimates, aggregate catch/effort and operational data and ROP data) to WCPFC Secretariat staff during visits in February and March 2013;
- The provision of the CES database system with the WCPFC data updates (in August 2012, December 2013, February 2013).
- The provision of the ROP database, as new SQL SERVER structures, was established on the designated WCFPC ROP data network server in March 2013. SPC manages the secure upload of ROP data to the designated WCPFC ROP data servers on a regular basis. Several new reports were

developed for WCPFC staff use in querying the ROP database which is resident on the WCPFC network server.

5. COVERAGE RATES

67. Figures 1 and 2 present the coverage rates since 2000 for operational (logsheet) catch and effort data, unloadings data and observer data for the tropical purse seine and longline fisheries, respectively[5]. The coverage rates for operational data refer to the target tuna catches from individual fishing operations reported on logbooks that are held by the OFP. Coverage rates for observer data refer to the catch of target tunas that were reported by observers. Coverage rates for unloadings data refers to the landings of target tuna catch that were monitored and reported.

68. Figure 3 shows coverage rates for available aggregate and operational catch and effort data by fleet for the longline fishery covering recent years (2000–2012). Figure 4 shows coverage rates for available aggregate and operational catch and effort data by fleet for the purse-seine fishery covering recent years (2000–2012).

69. Figure 5 shows coverage rates for available size composition data by fleet for the longline fishery covering recent years (2000–2012). Figure 6 shows coverage rates for available size composition data by fleet for the purse-seine fishery covering recent years (2000–2012).

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

[5] Refer to http://www.wcpfc.int/coverage-rates-tuna-fishery-data for an explanation of how coverage is determined.

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TABLES

Table 1. Annual average tuna catch for "OTHER" gears, by gear, flag and species, 2008-2012

GEAR	FLAG	Average Annual catch (MT)			Notes	Availability of EFFORT data
		SKJ	YFT	BET		
GILLNET	JAPAN	320	20	5		NO
	VIETNAM	13,760	964	593		NO
HANDLINE (LARGE-FISH)	INDONESIA	0	5,749	313		NO
	PHILIPPINES	126	11,964	397		NO
	USA	10	314	246	Within EEZs of US States and territrtories	NO
HOOK-AND-LINE (SMALL-FISH)	PHILIPPINES	19,840	28,594	1,606	Mostly within archipelagic waters	NO
POLE-AND-LINE	FIJI	86	9	0	Within EEZ	NO
	FRENCH POLYNESIA	557	78	0	Within EEZ	NO
	INDONESIA	123,539	23,172	4,739	Mostly within archipelagic waters	NO
	JAPAN	74,497	4,102	1,842		YES
	KIRIBATI	85	6	5	Within EEZ	NO
	SOLOMON ISLANDS	2,190	494	0	In and around domestic archipelagic waters.	YES
	USA	101	8	0	Within EEZs of US States and territrtories	NO
RINGNET	PHILIPPINES	23,792	6,480	413	Mostly within archipelagic waters	NO
TROLL	JAPAN	3,167	2,626	138		NO
	NAURU	0	4	0	Within territorial seas boundary	SOME
	NEW ZEALAND	9	0	0		YES
	TOKELAU	29	22	0	Within territorial seas boundary	SOME
	TUVALU	857	345	0	Within territorial seas boundary	SOME
	USA	393	511	106	Within EEZs of US States and territrtories	NO
UNCLASSIFIED / UNSPECIFIED / OTHER	AUSTRALIA	0	3	6	Within EEZ	NO
	FRENCH POLYNESIA	603	483	0	Within EEZ	NO
	INDONESIA	88,575	32,115	2,432	Mostly within archipelagic waters	NO
	JAPAN	719	480	109	Within EEZ	NO
	KIRIBATI	8,398	4,489	0	Within territorial seas boundary	SOME
	NEW ZEALAND	1	0	0	Within EEZ	NO
	PHILIPPINES	1,821	1,224	88	Mostly within archipelagic waters	NO

Table 2. Provision of 2011 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	see NOTES
Australia	LL, PS, PL, HL,TR	30 Apr 2012	
Belize	LL	2 May 2012	(19)
Canada	TR	29 Apr 2012	
China	LL, PS	30 Apr 2012	(19)
Cook Islands	LL, TR	30 Apr 2012	(17)
Ecuador	PS	9 May 2012	
El Salvador	PS	26 Apr 2012	
Federated States of Micronesia	LL, PS	27 Apr 2012	(17)
Fiji Islands	LL, PL	27 Apr 2012	(17)
French Polynesia	LL, PL, OT	27 Apr 2012	(17)
Indonesia	LL, PS, OT	25 Jul 2012	(18)
Japan	PS	28 Apr 2012	
	LL, PL, TR, OT	28 Apr 2012	(19)
Kiribati	PS, OT	27 Apr 2012	
Republic of Korea	LL, PS	27 Apr 2012	(19)
Marshall Islands	LL, PS	27 Apr 2012	(17)
New Caledonia	LL	25 Apr 2012	(17)
New Zealand	LL, PS, TR, PL	30 Apr 2012	
Niue	LL	30 Apr 2012	(9)
Palau	LL, PL	30 Apr 2012	(9)
Papua New Guinea	LL, PS	13 Apr 2012	(17)
Philippines	PS, HL, RN, OT	30 Apr 2012 18 May 2012	(15)
Samoa	LL	27 Apr 2012	(17)
Senegal	LL	30 Apr 2012	(9)
Solomon Islands	LL	27 Apr 2012	(15)
	PS, PL	27 Apr 2012	(17)
Spain	LL	5 Jul 2012	
	PS	3 May 2012	
Chinese Taipei	LL, PS	30 Apr 2012	
Tokelau	OT	27 Apr 2012	
Tonga	LL	10 Apr 2012	(17)
Tuvalu	LL, PS	27 Apr 2012	(17)
United States	LL, PS, TR, PL	28 Apr 2012	(19)
Vanuatu	LL, PS	27 Apr 2012	(17)
Vietnam	LL	27 Apr 2012	(18)
	GN, PS	27 Apr 2012	
Wallis and Futuna	LL	21 Jun 2012	

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 in the WCPFC Convention Area
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
14 Estimates of all main tuna species not provided
15 Provisional estimates provided
16 Estimates exclude archipelagic waters catches
17 Estimates of shark species NOT provided but can potentially be estimated from available observer data
18 Estimates of shark catch by species have NOT been provided
19 Estimates of shark catch provided, but not for all KEY species taken by this fleet

Table 3. Provision of 2012 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	DATA-GAP Notes	General NOTES
Australia	LL, PS, PL, HL,TR	30 Apr 2013		G, H
Belize	LL	1 May 2013	12, 13	
Canada	TR	14 Mar 2013		
China	LL, PS	28 Apr 2013	12, 13	
Cook Islands	LL, TR	19 Apr 2013		F, G, H
Ecuador	PS	26 Apr 2013 8 Jun 2013		F
El Salvador	PS	23 Apr 2013		
Federated States of Micronesia	LL, PS	19 Apr 2013		F, G, H
Fiji Islands	LL, PL	19 Apr 2013		F, G, H
French Polynesia	LL, PL, OT	26 Apr 2013		G, H
Indonesia	LL, PS, OT	30 Apr 2013 20 Jun 2013	11, 13	F
Japan	PS	27 Apr 2013	13	
	LL, PL, TR, OT	27 Apr 2013	12, 13	
Kiribati	LL, PS, OT	19 Apr 2013		G
Republic of Korea	LL, PS	30 Apr 2013		H
Marshall Islands	LL, PS	19 Apr 2013		F, G, H
New Caledonia	LL	19 Apr 2013		G, H
New Zealand	LL, PS, TR, PL	30 Apr 2013		G, H
Niue	LL	19 Apr 2013		D
Palau	LL, PL	19 Apr 2013		D
Papua New Guinea	LL, PS	19 Apr 2013		G, H
Philippines	PS, HL, RN, OT	19 Apr 2013 20 May 2013	13	F
Portugal	LL	25 May 2013	13	F
Samoa	LL	19 Apr 2013		G, H
Senegal	LL	30 Apr 2013		D
Solomon Islands	LL	19 Apr 2013		F, H
	PS, PL	19 Apr 2013		H
Spain	LL	18 May 2013	13, 14	
	PS	30 Apr 2013	13	
Chinese Taipei	LL, PS	30 Apr 2013		
Tokelau	OT	19 Apr 2013		
Tonga	LL	19 Apr 2013		G, H
Tuvalu	LL, PS	19 Apr 2013		G, H
United States	LL, PS, TR, PL	29 Apr 2013		G, H
Vanuatu	LL, PS	19 Apr 2013		G, H
Vietnam	LL	5 Apr 2013	11,13	
	GN, PS	5 Apr 2013	13	
Wallis and Futuna	LL	19 Apr 2013		D

DATA-GAP NOTES

1	Total annual catches were provided by SPECIES, but not broken down by GEAR.
2	Marlin catch estimate not provided to the species level.
3	Coverage of data used to determine estimates not provided
4	Type(s) of data used to determine estimates not provided
5	Methods used to determine estimates not provided
6	Breakdown of active vessels by GRT size class not provided
7	Swordfish catch estimates only provided
8	Billfish catch estimates not provided for the longline gear
9	Estimates of all main tuna species not provided
10	Estimates exclude archipelagic waters catches
11	Estimates of shark catch by species have NOT been provided
12	Estimates of shark catch by SPECIES provided, but not for all KEY species taken by this fleet
13	Estimates of DISCARDs not provided
14	Estimates of ALBACORE, SWORDFISH and STRIPED MARLIN for the South Pacific Ocean have NOT been provided

GENERAL NOTES

A	Catches were estimated by the SPC/OFP while assisting with the preparation of the national fisheries report.
B	Catch estimates were taken from the national fisheries report presented at the meeting of the Scientific Committee.
C	Total annual catches can be determined by aggregating operational data that were provided on this date.
D	Fleet(s) inactive for this calendar year in the WCPFC Convention Area
E	National legislation (or policy) requires that time/area strata comprising data for less than three vessels can not be disseminated.
F	Provisional estimates initially provided
G	Estimates of all KEY shark species have been provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data or OBSERVER data provisions
H	Estimates of DISCARDs provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data or OBSERVER data provisions

Table 4. Provision of 2011 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	see NOTES
Australia	LL, PL, PS, TR	30 Apr 2012	(17), (25)
Belize	LL	2 May 2012	
Canada	TR	29 Apr 2012	
China	LL (DWFN)	30 Apr 2012	(12), (25)
	LL (offshore)	30 Apr 2012	(12)
	PS	30 Apr 2012	(6), (8), (9), (15)
Chinese Taipei	LL (DWFN)	30 Apr 2012	(10), (24), (25)
	LL (small)	30 Apr 2012	(13), (23), (24), (25)
	PS	30 Apr 2012	(15)
Cook Islands	LL, TR	30 Apr 2012	(20)
Ecuador	PS	9 May 2012	(17)
El Salvador	PS	26 Apr 2012	(17)
Federated States of Micronesia	LL, PS	30 Apr 2012	(20)
Fiji Islands	LL, PL	30 Apr 2012	(20)
French Polynesia	LL	30 Apr 2012	(20)
Indonesia	LL, PS, OT		
Japan	LL	28 Apr 2012	(2), (10), (25)
	PL	28 Apr 2012	
	PS	28 Apr 2012	
Kiribati	PS	30 Apr 2012	(20)
Marshall Islands	LL, PS	30 Apr 2012	(20)
New Caledonia	LL	25 Apr 2012	(20)
New Zealand	LL, PL, HL, PS	30 Apr 2012	(17), (25)
Niue	LL	30 Apr 2012	(20)
Palau	LL, PL	30 Apr 2012	(21)
Papua New Guinea	LL, PS	30 Apr 2012	(20)
Philippines	PS, HL		
	RN, OT		
Republic of Korea	LL	27 Apr 2012	(25)
	PS	27 Apr 2012	(4), (15)
Samoa	LL	30 Apr 2012	(20)
Senegal	LL	30 Apr 2012	(21)
Solomon Islands	LL	30 Jun 2012	(20)
	PL, PS	30 Apr 2012	(20)
Spain	LL	5 Jul 2012	(3), (12)
	PS	3 May 2012	
Tonga	LL	30 Apr 2012	(20)
Tuvalu	LL, PS	30 Apr 2012	(20)
United States	LL (American Samoa)	28 Apr 2012	(11), (25)
	LL (Hawaii)	28 Apr 2012	(11), (25)
	PS (Treaty)	28 Apr 2012	(17)
	TR (North Pacific)	28 Apr 2012	(11)
	TR (South Pacific)	28 Apr 2012	(11)
Vanuatu	LL, PS	30 Apr 2012	(20)
Vietnam	LL, GN, PS		
Wallis and Futuna	LL		

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/or 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.
21 This fleet was inactive in the WCPFC Convention Area.
22 Distant-water longline fleet data do not cover the entire Pacific Ocean (required for stock assessments of certain species)
23 Represents a combination of data provided by the flag state (for domestically-based vessels) and coastal states
24 Vessel numbers per Month and Area provided.
25 Catches of shark by species provided
26 Aggregate data provided for the WCPO area (Pacific Ocean west of 150°W) and not the WCPFC Convention Area
27 Catches of shark by species provided, but coverage of these catches is very low

Table 5. Provision of 2012 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	DATA-GAP Notes	General NOTES
Australia	LL, PL, PS, TR	30 Apr 2013		C,I
Belize	LL	1 May 2013	18, 19	
Canada	TR	14 Mar 2013		
China	LL (DWFN)	28 Apr 2013	10, 18, 19, 20, 22	F
	LL (offshore)	28 Apr 2013	10, 18, 19, 20	F
	PS	28 Apr 2013	6, 8, 9, 13, 19	D
Chinese Taipei	LL (DWFN)	30 Apr 2013	19, 22	A, F, H, I
	LL (small)	30 Apr 2013	19	A, F, H, I
	PS	30 Apr 2013	13, 19	
Cook Islands	LL, TR	30 Apr 2013		J, I
Ecuador	PS	8 Jun 2013		C
El Salvador	PS	23 Apr 2013		C
Federated States of Micronesia	LL, PS	30 Apr 2013	21	J
Fiji Islands	LL, PL	30 Apr 2013	21	J
French Polynesia	LL	30 Apr 2013		J
Indonesia	LL, PS, OT			
Japan	LL	27 Apr 2013	18, 19, 20, 22	A, F
	PL	27 Apr 2013	19, 20	
	PS	27 Apr 2013	19, 20	
Kiribati	LL, PS	30 Apr 2013	21	J
Marshall Islands	LL, PS	30 Apr 2013	21	J
New Caledonia	LL	30 Apr 2013		J
New Zealand	LL, PL, HL, PS	30 Apr 2013		C,I
Niue	LL	5 Mar 2013		E
Palau	LL, PL	30 Apr 2013		E
Papua New Guinea	LL, PS	30 Apr 2013		J, I
Philippines	PS, HL			
	RN, OT			
Portugal	LL	25 May 2013	1, 8, 10, 12, 18, 22	
Republic of Korea	LL	30 Apr 2013	18, 19, 20, 22	A, F
	PS	30 Apr 2013	4, 13, 19	
Samoa	LL	30 Apr 2013	21	J
Senegal	LL	30 Apr 2013		E
Solomon Islands	LL			K
	PL, PS	30 Apr 2013	18	J
Spain	LL	18 May 2013	1, 8, 10, 22	C, F
	PS	30 Apr 2013		C
Tonga	LL	30 Apr 2013		J
Tuvalu	LL, PS	30 Apr 2013	21	J
United States	LL (American Samoa)	29 Apr 2013		B, I
	LL (Hawaii)	29 Apr 2013		B, I
	PS (Treaty)	30 Apr 2013		J
	TR (North Pacific)	29 Apr 2013		B
	TR (South Pacific)	29 Apr 2013		B
Vanuatu	LL, PS	30 Apr 2013	21	J
Vietnam	LL, GN, PS			
Wallis and Futuna	LL	30 Apr 2013		E

DATA-GAP 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 The 5°x5°/month Longline catch and effort data are not stratified by "Hooks between Floats"
11 Coverage of data provided is less than 50%
12 No breakdown of Billfish species catch provided
13 The estimation of bigeye in the reported yellowfin-plus-bigeye catch has not been undertaken in these data
14 The spatial aggregation is non-standard (must be 5°x5° for Longline; 1°x1° for surface fisheries)
15 Data have not been "raised" to represent total catch and effort
16 Species composition of main tuna species catch does correspond to annual catch estimates
17 Aggregate data provided for the WCPO area (Pacific Ocean west of 150°W) and not the WCPFC Convention Area
18 Catches of KEY shark species have been provided, but (i) not all KEY SPECIES COVERED, and/or (ii) COVERAGE of shark species catches is considered LOW.
19 Annual Catch and Effort estimates by areas of national jurisdiction (EEZs) and High Seas have NOT BEEN PROVIDED.
20 Vessel numbers by YEAR, MONTH and AREA used to filter public domain data have NOT BEEN PROVIDED
21 Catches of KEY shark species have not been provided, but can potentially be estimated from observer data.
22 Aggregate Catch/Effort data for ALBACORE, SWORDFISH and STRIPED MARLIN for the south Pacific Ocean east of the WCPFC Area have NOT been provided

GENERAL NOTES

A Unraised data stratified by 5°x5°, month and hooks between floats were also provided
B National legislation (or policy) requires that time/area strata comprising data for less than three vessels can not be
C Aggregate data not provided, but have been generated from Operational data submitted to the WCPFC.
D Aggregate data not provided or incomplete, but have been generated from annual catch estimates and operational data made available by the Coastal States.
E This fleet was inactive in the WCPFC Convention Area.
F Distant-water longline fleet data do not cover the entire Pacific Ocean (required for stock assessments of certain species)
G Represents a combination of data provided by the flag state (for domestically-based vessels) and coastal states
H Vessel numbers per Month and Area provided.
I Catches of KEY shark species provided in their AGGREGATE data
J Aggregate data have been generated from annual catch estimates and operational data made available to the SPC by their member countries through national bilateral agreements or subregional arrangements (e.g. the US Multilateral Purse Seine treaty managed by FFA).
K Pending resolution of attribution of catches according to CHARTER arrangements

Table 6. Provision of 2012 Operational catch and effort data to the WCPFC

FLAG STATE / ENTITY	GEAR(s)	Date Submitted	DATA-GAP Notes	General NOTES
Australia	LL, PL, PS, TR	30 Apr 2013		E
Belize	LL			
Canada	TR			
China	LL, PS			
Cook Islands	LL, TR	30 Apr 2013	9	C, E
Ecuador	PS	8 Jun 2013		
El Salvador	PS	23 Apr 2013		
Federated States of Micronesia	LL, PS	30 Apr 2013	8	C
Fiji Islands	LL, PL	30 Apr 2013	8	C
French Polynesia	LL	30 Apr 2013	9	C
	PL			
	TR			
Indonesia	LL, PS, OT			
Japan	PS			
Japan	LL, PL			
Kiribati	LL, PS	30 Apr 2013	8	C
Republic of Korea	LL, PS			
Marshall Islands	LL, PS	30 Apr 2013	8	C
New Caledonia	LL	30 Apr 2013	9	C, E
New Zealand	LL, PL, HL, PS	30 Apr 2013		E
Niue	LL	5 Mar 2013		A
Palau	LL, PL	30 Apr 2013		A
Papua New Guinea	LL, PS	30 Apr 2013	9	C, E
Philippines	PS, HL, RN, OT			
Portugal	LL			
Samoa	LL	30 Apr 2013	9	C
Senegal	LL	30 Apr 2013		A
Solomon Islands	LL, PS, PL	30 Apr 2013	8	C
Spain	LL (Source: IEO)	18 May 2013	1, 2, 4, 7, 9	
	PS	30 Apr 2013		
Chinese Taipei	LL, PS			
Tonga	LL	30 Apr 2013	8	C
Tuvalu	LL, PS	30 Apr 2013	8	C
United States	LL (American Samoa)	29 Apr 2013		E
	LL (Hawaii)			
	PL			
	TR	29 Apr 2013		
	PS	30 Apr 2013		C
Vanuatu	LL, PS	30 Apr 2013	8	C
Vietnam	LL, PS, GN			
Wallis and Futuna	LL	30 Apr 2013		A

DATA-GAP NOTES

1 For LONGLINE GEAR - "Branchlines between floats" not provided
2 For LONGLINE GEAR - "Hooks per set" not provided
3 "Activity" not provided
4 "Time of set" not provided
5 For PURSE SEINE GEAR - categories of "School Association" were not provided
6 Coverage of data provided is less than 50%
7 Discard information not included
8 Catches of KEY shark species have not been provided.
9 Catches of KEY shark species have been provided, but (i) not all KEY SPECIES COVERED, and/or (ii) COVERAGE of shark species catches is considered LOW.

GENERAL NOTES

A No activity in the WCPFC Convention Area during this year
B Operational Logsheet data provided by FFA on behalf of their member countries on a regular basis
C Operational Logsheet data provided to SPC by their member countries on a regular basis
D Operational Logsheet data provided to SPC by their member countries on a regular basis, but authorisation to pass on to WCPFC yet to be provided.
E Catches of shark by species have been provided

Table 7. Provision of historical operational catch/effort data to the WCPFC

	Flag State Data (Convention Area)			Coastal State Data (EEZ only)		
ENTITY	GEAR(s)	Date of Notification	Provided by	GEAR(s) / FLEET(s)	Date of Notification	NOTES
Australia	LL, PL, PS, TR	16 Apr 2008	SPC-OFP	ALL	16 Apr 2008 12 Aug 2009	SPC authorised to release all data, including data provided to SPC prior to 2005
Belize	LL		No	Not Applicable		
Canada	TR		No	Not Applicable		
China	LL, PS		No			
Cook Islands	LL	10 Jun 2009	SPC-OFP			SPC authorised to release
Ecuador	PS	30 Apr 2010	Ecuador	Not Applicable		Provided to WCPFC (for 2010-2011 only)
El Salvador	PS	15 Oct 2007	El Salvador	Not Applicable		Provided to WCPFC
Federated States of Micronesia	LL, PS	13 Jan 2010	SPC-OFP			SPC authorised to release
Fiji Islands	LL, PL	22 Jun 2009	SPC-OFP			SPC authorised to release
French Polynesia	LL, PL, TR	1 Jul 2010	SPC-OFP			SPC authorised to release
Indonesia	LL, PS, OT	*01 May 2009*	Indonesia (Partial)	Not Applicable		Indonesian Data rescue project
Japan	PS	*17 Apr 2009*	Japan **(Partial)**	Not Applicable		(1) [2001-2004 only]
Japan	LL, PL		No	Not Applicable		
Kiribati	PS, LL	11 Oct 2010	SPC-OFP			SPC authorised to release
Republic of Korea	LL, PS		No	Not Applicable		
Marshall Islands	LL, PS	9 Jul 2009	SPC-OFP			SPC authorised to release
Nauru	LL	19 Aug 2009	SPC-OFP	ALL	19 Aug 2009	SPC authorised to release
New Caledonia	LL	2 Aug 2010	SPC-OFP	Not Applicable		SPC authorised to release
New Zealand	LL, PL, HL, PS	20 March 2008	SPC-OFP	ALL	20 March 2008	SPC authorised to release
Niue	LL	3 Sep 2009	SPC-OFP			SPC-OFP
Palau	LL, PL	28 Feb 2011	SPC-OFP			SPC-OFP
Papua New Guinea	LL, PS	10 Dec 2010	SPC-OFP			SPC authorised to release
Philippines	PS	*01 Dec 2008*	Philippines (Partial)	Not Applicable		(1) [2004 only]
	HL, RN, OT		No	Not Applicable		
Samoa	LL	15 Nov 2010	SPC-OFP			
Senegal	LL	21 Nov 2008	Senegal	Not Applicable		Provided to WCPFC (2007-2008)
Solomon Islands	LL, PS, PL	4 Dec 2010	SPC-OFP			SPC authorised to release
Spain	LL	23 March 2012	**EU**	Not Applicable		Provided to WCPFC (2004-2010)
	PS	*7 Jul 2011*	EU **(Partial)**	Not Applicable		Provided to WCPFC (2010-2011 only)
Chinese Taipei	LL, PS		No	Not Applicable		
Tonga	LL	11 Jan 2011	SPC-OFP			SPC authorised to release
Tuvalu	PS	9 Mar 2011	SPC-OFP			SPC authorised to release
United States	LL	27 Aug 2011	NMFS--NOAA (Partial)	Not Applicable		(2) Data provided since enactment of the WCPFC Implementation Act (January 17, 2007)
United States	TR, PL		No	Not Applicable		
United States	PS	30 Apr 2008	FFA / SPC-OFP	Not Applicable		US Multilateral treaty only (since 1988)
Vanuatu	LL, PS	22 Dec 2008	SPC-OFP			SPC authorised to release
Vietnam	LL, PS, GN					

NOTES

1 Flag state data provided in accordance with paragraph 15 and 16 of Conservation and Management Measure for Bigeye and Yellowfin Tuna in the Western and Central Pacific Ocean (CMM 2008-1).

2 Under advice of NOAA General Counsel, NMFS is disclosing to the WCPFC U.S. longline fleet data (Hawaii-based longline fishery) following enactment of the WCPFC Implementation Act (January 17, 2007), consistent with Section 506(d) of the Act and implementing regulations under 50 CFR § 600.220.

Table 8. Status of ROP data provisions to the WCPFC

	ROP Data Provisions			
OBSERVER PROGRAMME	GEAR(s) covered	Date of Notification	Data to be provided by	NOTES
Australia	LL	22 Nov 2010	SPC/OFP	Provided on behalf of Australia; **data from 15 Feb 2008 onwards**
China	*LL, PS*		—	
Cook Islands	LL	29 Sep 2010	SPC/OFP	Provided on behalf of Cook Islands (MMR)
Federated States of Micronesia	LL, PS	17 Jun 2010	SPC/OFP	Provided on behalf of FSM (NORMA)
Fiji Islands	LL	30 Nov 2010	SPC/OFP	Provided on behalf of Fiji Fisheries
French Polynesia	LL	30 Nov 2010	SPC/OFP	Provided on behalf of French Polynesia
FSM Arrangement (FFA)	PS	May 2011	FFA (SPC)	Provided on behalf of PNA
Indonesia	*LL, PS*		—	
Japan	*PS, LL, PL*		—	
Kiribati	PS, LL	11 Oct 2010	SPC/OFP	Provided on behalf of Kiribati Fisheries
Republic of Korea	*LL, PS*		—	
Marshall Islands	LL, PS	24 Nov 2010	SPC/OFP	Provided on behalf of Rep. Of Marshall Islands
Nauru	LL, PS	7 Jul 2010	SPC/OFP	Provided on behalf of Nauru Fisheries
New Caledonia	LL	12 Jan 2011	SPC/OFP	Provided on behalf of New Caledonia
New Zealand	LL	*1 Jan 2009*	MAF/NZ	Provided with annual data submission
Niue	LL	3 Mar 2011	SPC/OFP	Provided on behalf of New Caledonia
Palau	LL, PS	8 Mar 2011	SPC/OFP	Provided on behalf of Palau
Papua New Guinea	LL, PS	2 Jun 2010	SPC/OFP	Provided on behalf of PNG/NFA
Philippines	PS		BFAR, Philippines	30 May 2011 --- Processed data for 2010 observer trips provided to SPC. Data represent non-ROP trips.
Samoa	LL		—	No observer data collected as yet.
Solomon Islands	LL, PS, PL	24 Sep 2010	SPC/OFP	Provided on behalf of Solomon Is. Fisheries
Chinese Taipei	*LL, PS*	*11 July 2011*	Fisheries Agency, Council of Agriculture	Data for LONGLINE ROP-defined trips provided regularly (covers 2010-2011 at this stage)
Tonga	LL	12 Jan 2011	SPC/OFP	Provided on behalf of Tonga Fisheries
Tuvalu	PS	9 Mar 2011	SPC/OFP	Provided on behalf of Tuvalu Fisheries
United States	LL	*1 Sep 2010*	NMFS	ROP trip data regularly provided to WCPFC; does not include the provision of HW LL data provided to SPC prior to 2010.
US Multilateral Treaty (FFA)	PS	May 2011	FFA (SPC)	Provided on behalf of Parties to US MLT
Vanuatu	LL, PS	30 Nov 2010	—	Provided on behalf of Vanuatu Fisheries
Vietnam	LL, PS, GN	*10 June 2011*	DECAFIREP, Ministry of Fisheries	Hard-copy data for 12 trips sent to SPC for processing. Data represent non-ROP trips.

NOTES

1 Table assumes that observer trips collecting ROP-defined data conducted by China, Indonesia, Japan, Korea, Philippines and Chinese Taipei are to be included.

FIGURES

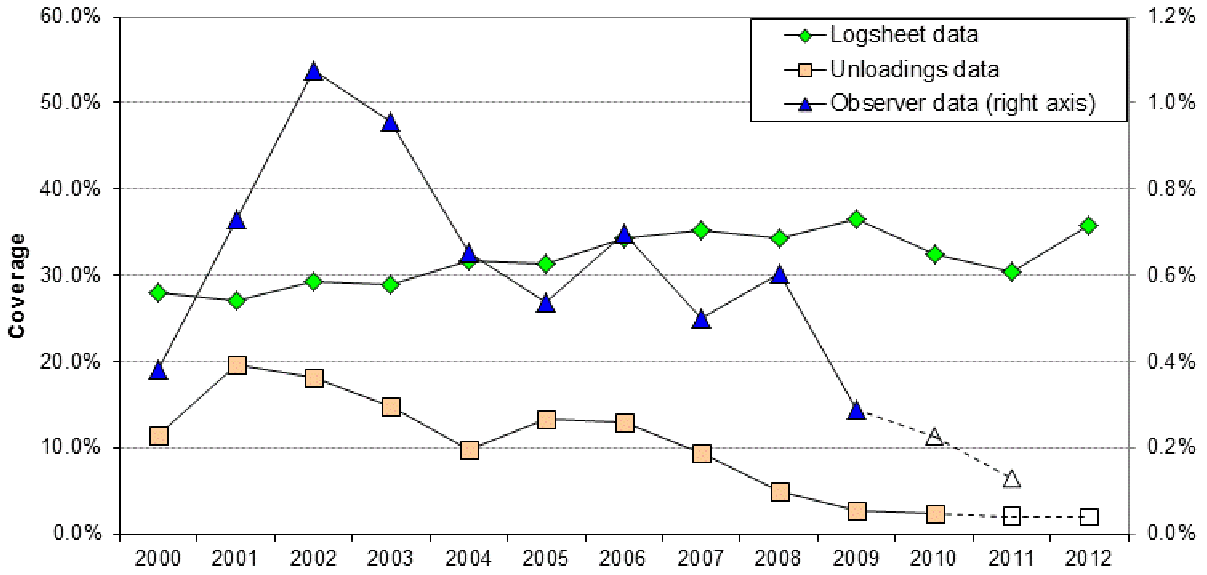

Figure 1. Annual trends in the coverage of WCPO LONGLINE data
Data held by SPC/OFP, some of which are provided to the WCFPC; 2011 and 2012 data are provisional

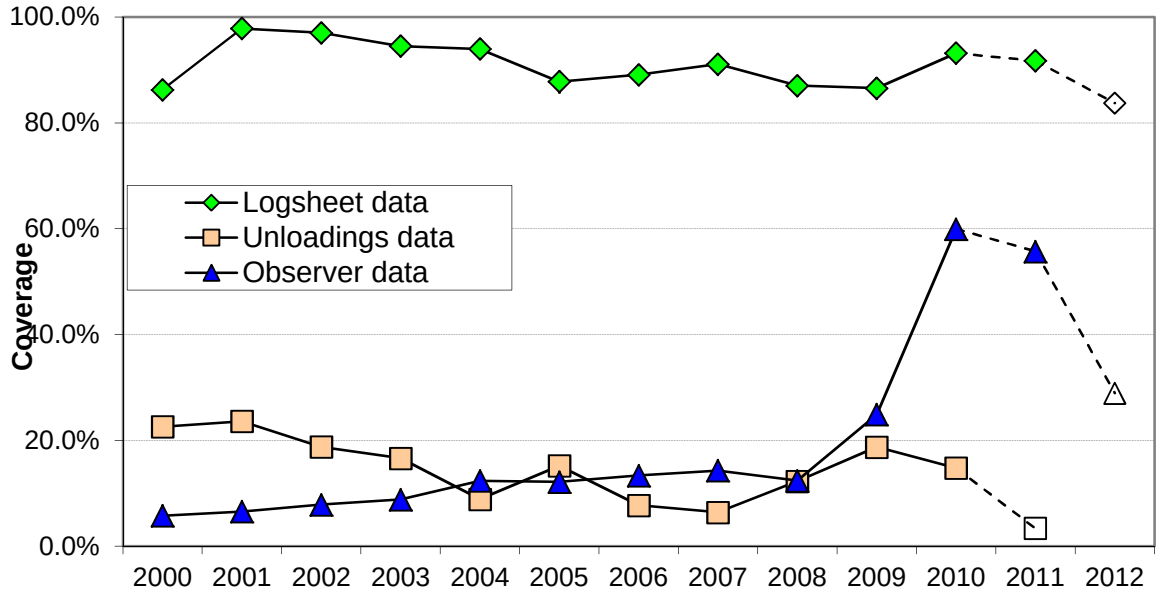

Figure 2. Annual trends in the coverage of tropical WCPO PURSE SEINE
Purse seine tropical fishery: 20°N-20°S, excludes the domestic fisheries of Indonesia and Philippines
Data held by SPC/OFP, some of which are provided to the WCFPC; 2011 and 2012 data are provisional

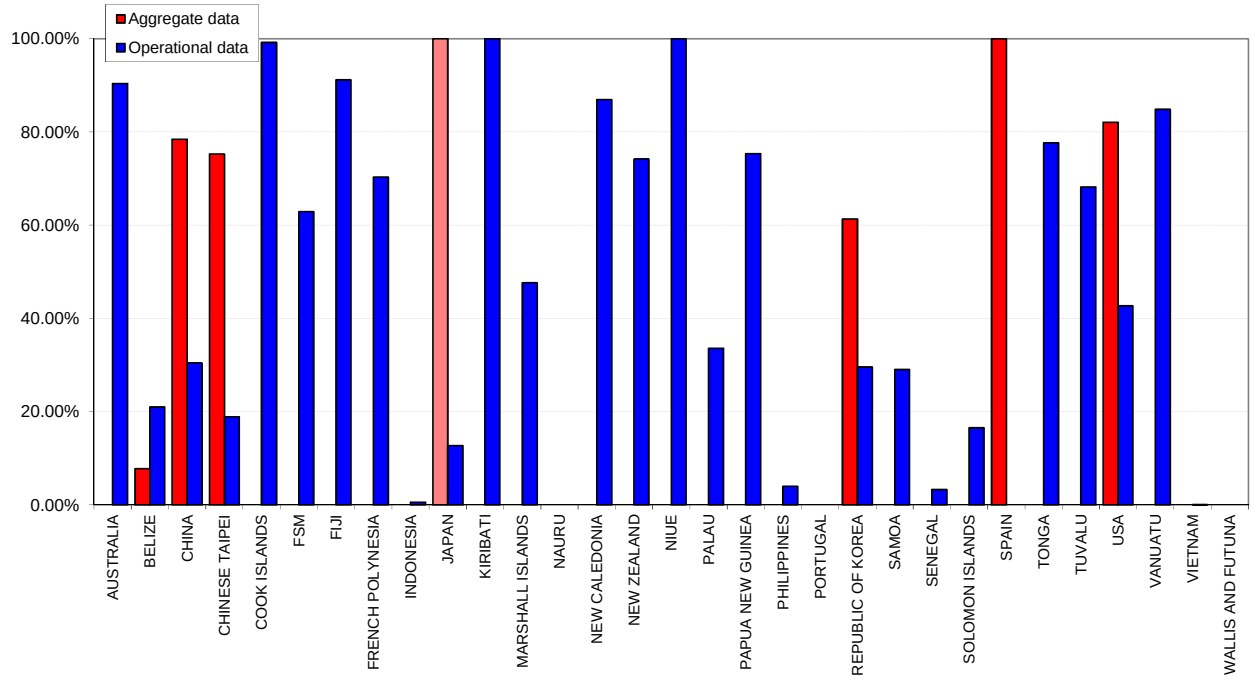

Figure 3. Coverage of (i) aggregate and (ii) operational catch/effort data by fleet from the LONGLINE FISHERY

Aggregate data provided to the WCPFC;
Operational data held by SPC/OFP, some of which are provided to the WCFPC; covers 2000–2012

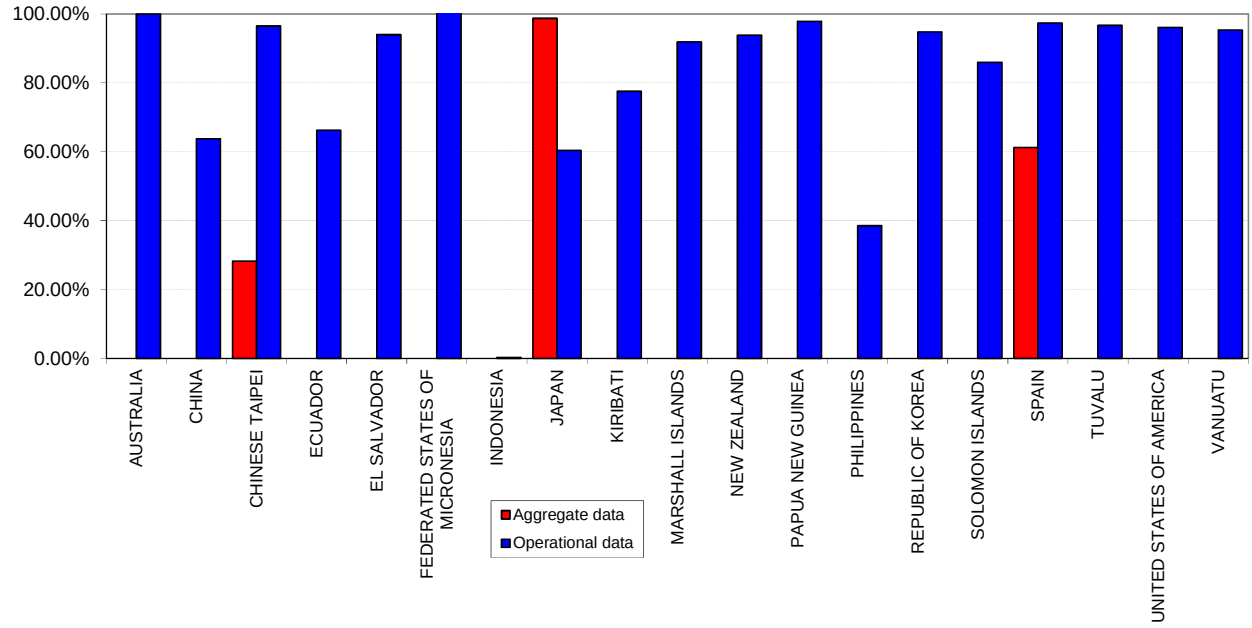

Figure 4. Coverage of (i) aggregate and (ii) operational catch/effort data by fleet from the PURSE-SEINE FISHERY

Aggregate data provided to the WCPFC;
operational data held by SPC/OFP, some of which are provided to the WCFPC; covers 2000–2012

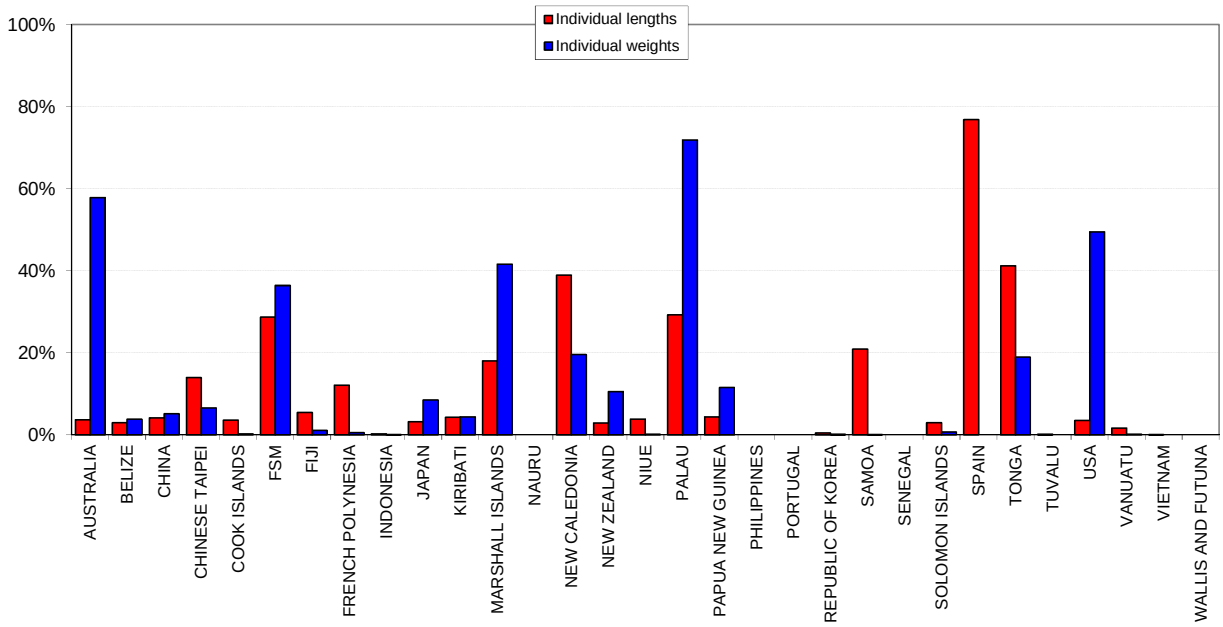

Figure 5. Coverage of size composition data by fleet from the LONGLINE FISHERY
Data provided to the WCPFC; covers 2000–2012

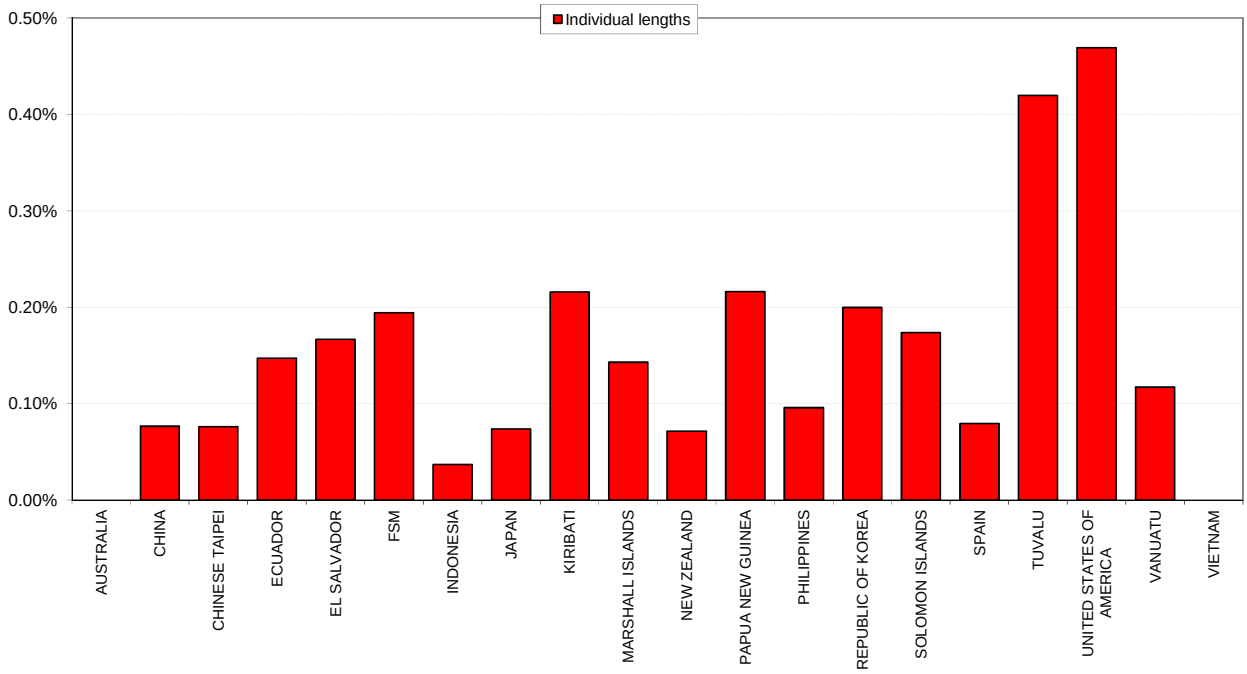

Figure 6. Coverage of size composition data by fleet from the PURSE-SEINE FISHERY
Data provided to the WCPFC; covers 2000–2012