TECHNICAL AND COMPLIANCE COMMITTEE

Thirteenth Regular Session

27 September – 3 October 2017

Pohnpei, Federated States of Micronesia

SCIENTIFIC DATA AVAILABLE TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

WCPFC-TCC13-2017-IP04

12 September 2017

This paper is a revision 1 of the **WCPFC-SC13-2017/ST-WP01**

SCIENTIFIC COMMITTEE
THIRTEENTH REGULAR SESSION

Rarotonga, Cook Islands
9–17 August 2017

SCIENTIFIC DATA AVAILABLE TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

WCPFC-SC13-2017/ST WP-1 (rev 1.)

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Revision 1.

- Update Table 5 to adjust the coverage of French Polynesia longline operational data

[1] Oceanic Fisheries Programme (OFP), Pacific Community (SPC), Noumea, New Caledonia.

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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.

The review of gaps in 2015 and 2016 scientific data provisions includes the assignment of a tier-scoring evaluation level. There have not been any significant developments in some categories of the main data gaps over the past two years and readers have therefore been referred to the relevant sections in past data-gap papers. Recent developments include sections on:

- the latest provisions of operational data and remaining gaps
- issues with key shark species reporting
- annual estimates of discards/releases
- a presentation of the coefficients of variance for longline caught species based on observer data are provided.

All CCMs with fleets active in the WCPFC Convention Area provided 2016 annual catch estimates by deadline of the 30th April 2017, a significant achievement. The issues previously reported in annual catch estimates have further reduced and the lack of any estimates for key shark species remains the main gap for certain CCMs.

The timeliness of the provision of aggregate catch/effort data continues to improve and for the first time, all CCMs provided their 2016 data by the deadline of 30th April 2017. The quality of aggregate data provided also continues to improve with a reduction in the number of data-gap notes assigned to the aggregate data in recent years. The issues that remain include the reporting of key shark species catches for some CCMs and the reporting of longline catch in number for one CCM.

The main developments in the resolution of operational data gaps over the past year were the provision of 2016 operational data for the Indonesia tuna fleets (longline, pole-and-line and purse seine) for the first time and the provision of operational data for the Chinese Taipei longline fleet with advice that their domestic legal constraints which prevented them from submitting in the past have been resolved. The continued provision of operational data for the Japanese, Chinese and Korean tuna fleets is also noteworthy.

The paper solicits SC13 feedback in three areas:

- SC13 is invited to consider establishing a project with a targeted approach to addressing the current gaps in conversion factor data;
- There has been a recent significant increase in data generated from E-Monitoring trials and SC13 is invited to consider how these data should be dealt with in the WCPFC context, specifically in regards to ROP longline coverage;
- SC13 is invited to consider and comment on the plan to enhance the set of WCPFC public domain data available on the WCPFC web site, with the assurance that the WCPFC rules for public domain data will be applied.

The UNDP-funded Sustainable Management of Highly Migratory Fish Stocks in the West Pacific and East Asian Seas (WPEA–SM) project terminates this year, with a new WPEA project supported by New Zealand scheduled to commence later this year. These projects contribute WCPFC technical assistance to the Philippines, Indonesia and Vietnam to, *inter alia*, improve monitoring and data management of their domestic fisheries. There has been good progress in the collection and provision of data from each of these countries in recent years and the paper also lists some of the challenges that remain.

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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) documentation "*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) which 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*" were 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 latest version can be found on the WCPFC web site here. The main revisions to this document since it was first adopted include:

- The inclusion of catch estimates of key shark species and specifying the size class intervals for size data), which were adopted at the Seventh Regular Session of the Commission (WCPFC7), Honolulu, Hawaii, 6–10 December 2011 (Anon. 2011), the Ninth Regular Session of the Commission (WCPFC9), Manila, Philippines, 6–10 December 2012 (Anon. 2012) and the Tenth Regular Session of the Commission (WCPFC10), Cairns, Australia 2–6 December 2013 (Anon. 2013)
- The change to require estimates of discards/releases for the key WCPFC species to be submitted as a member country obligation, which was adopted at the Thirteenth Regular Session of the Commission (WCPFC13), Denarau Island, Fiji, 5–9 December 2016 (Anon. 2016).

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, effort 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.

4. The WCPFC Data Catalogue has been updated on the WCPFC web site (http://www.wcpfc.int/wcpfc-data-catalogue-0) to cover the 2016 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).

5. The Tenth Meeting of the Technical and Compliance Committee of the WCPFC (TCC10 – Pohnpei, Sept. 2014) reviewed a request to consider a tiered-scoring system to better reflect the magnitude and severity of the implications of the lack of scientific data provisions, and directed the SPC to produce an outline of how this system might work. A paper by SPC on a proposed tier-scoring system was considered at WCPFC11 and the SPC was directed by WCPFC11 (Anon, 2014b) to consider this system for the data gaps paper prepared for SC11 (see Williams, 2015). Subsequent SC and TCC meetings (SC11, SC12, TCC11 and TCC12) noted the usefulness of the tier-scoring evaluation for the submission of scientific data and recommended this process continue, acknowledging there may be further refinements as required.

6. The ANNEX of this paper briefly outlines the methodology for undertaking the tier-scoring evaluation of the scientific data submissions by CCMs, which has been included in the tables of this paper.

2. STATUS OF DATA GAPS

7. Data gaps and other issues related to the provision of data have been reported at each Scientific Committee meeting since the first in 2005 [the first data gaps paper for SC1 (Williams and Lawson, 2005) and the most recent data gaps paper for SC12 (Williams, 2016)].

8. The following sections describe the most important current gaps in the WCPFC scientific data holdings. The text in *blue italics* reflects the recent work and/or developments to resolve the respective data gaps.

9. Readers are referred to previous versions of this paper and other papers for more detail on important categories of data gaps where there have not been any significant developments over the past year. These sections will continue to be referenced in future versions of this paper when there are significant developments and until they are resolved. Please refer to the following issues:

- Major data gaps for key fleets (Williams, 2014 – Section 2.1.4)
  - Chinese Taipei STLL fleet prior to 2004
  - Japanese pole-and-line fleet prior to 1972
  - Japanese Coastal longline fleet prior to 1994
- Coverage rates (Williams, 2014 – Section 2.2)
- Nationality of the catch (Williams, 2014 – Section 2.3)
- Aggregate catch and effort data (Williams, 2014 – Section 2.6)
- Species composition data for purse seiners (Williams, 2014 – Section 2.8; Hampton & Williams, 2017; Peatman et al., 2017)
- Annual catch estimates by EEZ (Williams, 2015 – Section 2.3)
- Number of vessels in the aggregate data (Williams, 2015 – Section 2.4)

2.1 Major data gaps for key fleets

2.1.1 Philippines tuna fishery data

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 the Philippines domestic fisheries. The UNDP-funded Sustainable Management of Highly Migratory Fish Stocks in the West Pacific and East Asian Seas (WPEA–SM[2]) project has provided support for this work since 2015 after the first WPEA-OFM[3] project terminated (in 2014). The main activities related to data collected in the Philippines' domestic fisheries over the past year include:

- *The Tenth Philippines Annual Catch Estimates Review Workshop and the Eighth National Stock Assessment Project (NSAP) data review workshop were convened and attended by important stakeholders with knowledge and information on the tuna fisheries in the Philippines (government, industry and NGOs). The outcomes of this workshop included a better correlation of catch estimates produced from the workshop and the estimates provided by the Philippines Statistical Authority (PSA).*
- *The Philippines government committed funds to significantly increase the monitoring of landings from their domestic tuna fisheries in 2014–2016, with full coverage of tuna-landing sites in several regions.*
- *The coverage of logbook and observer data collected for the component of the Philippines domestic purse seine fleet fishing in the High Seas Pocket #1 continued to be 100% for 2016 (as in previous years). E-Reported logbook data were again provided for this fishery covering 2016 activities.*

11. The Philippines have enhanced the monitoring of their complex and diverse domestic fisheries significantly over the past 5–10 years, with most of the important data gaps now resolved. However, areas that need further attention in the future include:

[2] Refer to http://www.wcpfc.int/doc/wpea-sm-project-document
[3] Refer to http://www.wcpfc.int/doc/2009/wpea-ofm-project-document

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. A better understanding of the extent of catches from the handline fisheries targeting large yellowfin tuna in some regions.

2.1.2 Indonesian tuna fishery data

12. Prior to the WPEA–OFM and WPEA–SM projects, the absence of a breakdown of annual catch estimates by gear type, the lack of operational logsheet and size data for the Indonesian domestic fisheries were amongst the most significant gaps in the provision of data to the WCPFC, but these projects have assisted Indonesia make significant progress in resolving at least two of these data gaps: the regular submission of size data and the provision of annual catch estimates by gear and species.

13. During the past year, 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 Eighth Indonesia/WCPFC Area Annual Catch Estimates Review Workshop was conducted in Bogor, Indonesia in June 2017, and the Fifth Indonesia/WCPFC Port Sampling data review workshop was held in Bitung in March 2017. These workshops ensured the continued progress in data coverage and quality from the Indonesian tuna fisheries. For example, the time series for size data collected, processed and available is now 7 years.*
- *The implementation of national logbook data collection system continues to progress with logbooks for 5,477 trips submitted to the government covering 133 ports. For the first time, logbook data for 2016 were submitted to the WCFPC representing nearly 2,000 trips for longline, pole-and-line and purse seine vessels and totaling nearly 7,000 t. of skipjack, yellowfin and bigeye tuna. Further data quality control is required by the Sub Directorate Monitoring and Analysis, Directorate of Fisheries Resources Management, for example comparing positions on logbooks with VMS data, and revisions to these data will be forthcoming.*
- *84 observer trips were conducted in the WCPFC Area of the Indonesian EEZ during 2016 and it is understood that data consistent with the WCPFC ROP standards were collected, but have yet to be provided to the WCPFC.*

14. The most important areas for progress with catch estimates and data within Indonesia include:

i. The need for more comprehensive review and consolidation of data from all potential sources in the catch estimation process (including industry and NGO data) which would help, *inter alia*, explain the trends in catches by gear;
ii. Compilation and submission of available aggregate and operational catch/effort data for recent years since the logbooks became mandatory in the Indonesian domestic tuna fisheries (2011-2015), although this is acknowledged as a long term goal with assistance provided through the WPEA projects.

2.1.3 Vietnamese tuna fishery data

15. Prior to the WPEA–OFM and the WPEA-SM projects, there were no annual catch estimates, no operational and no aggregated catch and effort data available from Vietnam tuna fisheries, other than anecdotal information on catches (e.g. Lewis, 2005). Since the establishment of the two WPEA projects, there has been considerable progress in Vietnam to establish data collection and management systems for their tuna fisheries and it has ultimately resulted in the submission of, *inter alia*, annual catch estimates to the WCPFC over the past four years.

16. Significant developments in the past year include:

- *The Sixth Vietnam Annual catch estimates workshop was conducted in June 2017 with a focus on reviewing data collected in the Vietnam tuna fisheries over recent years and the production of estimates for 2016 for their three tuna fisheries (longline/handline, gillnet and purse seine). The participants of the workshop included Ministry of Fisheries staff and representatives of each of the nine provinces where tuna are landed and agreed that the estimates produced for 2016 were the most reliable to date.*
- *The coverage of operational logbook data continues to improve, especially the handline fishery which had 33% (3,527 trips) coverage for 2016. The provision of logbooks from the purse seine and gillnet fisheries started in 2015 and in 2016 was at 10% (around 900 trips each).*
- *The WPEA/WCPFC data collection protocols are now established in eight of the nine provinces where tuna are landed in Vietnam and these data were used in the 2016 annual catch estimation process.*
- *The WCPFC audit/review of 2016 data found that most data are of an acceptable quality, with the sampling data of one gear at one landing site the only major issue identified.*

17. Significant progress has been made in a short period but there remain several challenges for Vietnam in the monitoring and data management areas, including:

i. a review of data collection forms to consider, *inter alia*, inclusion of the WCPFC key shark species where relevant;
ii. the continuation of the good progress with the coverage of logbook and port sampling data collection for their longline, purse seine and gillnet fisheries;
iii. the compilation and provision of aggregate and operational catch/effort data from the longline fishery from logbooks collected since 2011;
iv. a sustainable observer programme.

2.2 Operational catch and effort data

18. Significant progress has been made with the provision of historical operational data over the past few years (see Section 3.3 below and Tables 5 and 6 in this paper, and previous versions of this paper). Significant developments over the past two years include:

- *Provision of operational data for the Japan Longline, Pole-and-line and Purse seine fleets for 2015 and 2016. These operational data have been provided according to CMM 2014-1, paragraphs 56-60 and cover the WCFPC Area south of 20°N (100% coverage), with aggregated data (year, month, 1°x1°) provided for these gears for the WCPFC Area north of 20°N;*
- *Provision of operational data (100% coverage) for the Korean Longline and Purse seine fleets for 2014, 2015 and 2016. Significantly, the logbook data for recent years have been collected through an E-Reporting initiative established by Korea*
- *An improvement in the coverage of operational data for the China Longline fleet. In 2015, the coverage was only 15%, but for 2016 it is now at 90%.*
- *Provision of operational data for the Indonesia longline, purse seine and pole-and-line fleets. Coverage is relatively low at this stage, but this submission and the increasing coverage of logbook data in recent years is a very positive development which should be commended.*
- *Provision of 2016 logbook data for the Chinese Taipei longline fleet, for the first time. Coverage is currently very low, but Chinese Taipei has advised that of January 2017, their domestic constraint has been lifted so logbook data can be provided in the future – this is another very positive development.*

19. The operational catch and effort data submitted for the China, Indonesia, Japan, Korea and Chinese Taipei fleets in recent years are by far the most significant developments in resolving operational data gaps since the establishment of the Commission. The intent in providing these data is very positive and we look forward to the provision of historical operational data for these fleets in the future (to resolve the gap in historical data provision).

20. For the countries yet to provide **historical** operational data to the WCPFC, the recent initiative whereby the WCPFC scientific service providers had access to operational data in a collaborative study (see OFP, 2015a

and OFP, 2015b) was acknowledged as a good interim arrangement until such time as the complete historical data can be provided on a permanent basis to satisfy the wide range of Commission work, noting that this submission is a member country reporting obligation. In the short term, therefore, an extension of this arrangement to access all historical data needs to be formalized as soon as possible to ensure this important work can continue.

2.3 Key shark species

21. The requirement to submit annual catch estimates, aggregate and operational catch data for key shark species has now been in force for several years and the quality and coverage of data continues to improve as the implementation of logbooks catering for this level of reporting is well advanced and CCMs are better equipped at collecting and managing these data. Williams (2016) lists some of the procedural matters related to the compilation of shark catch estimates which continue to progress. Section 2.5 of this paper also raises the issue of inadequate longline observer coverage to estimate the catches of key shark species where the logbook reporting of these catches are inadequate.

22. Improvements to the shark reporting and data gap assessment processes for key shark species were suggested in Clarke et al. (2015), and while the proposals were acknowledged to be useful, they did not result in a subsequent SC11 recommendation.

23. However, further enhancements to the shark reporting and data gap assessment processes can be considered over the longer term, dependent on direction from the SC and available resources to undertake the additional work. This work might include, for example, a separate Data and Statistics Theme information paper providing a more detailed review of the data submissions that were outlined in some of the proposals in Clarke et al. (2015), but also extending to other key species. Alternatively, SC may decide that a more detailed review of data available for science is best included in the respective key species stock assessment papers.

2.4 Estimates of Discards/Releases

24. Suggested updates to the "*Scientific Data to be Provided to the Commission*" were reviewed by SC12 and TCC12, and adopted at WCPFC13 (Anon. 2016). Amongst the changes was the requirement for flag states to submit estimates of discards/releases for the key WCPFC species (this submission was previously non-binding). This submission will be a mandatory requirement for the 2017 calendar data submissions onwards, although a number of CCMs submitted 2016 estimates of discards/releases this year, which was encouraging.

25. As the technical service provider, the compilation and use of the estimates of discards/releases has raised the following points for discussion and consideration:

- Estimates of discards/releases are to be reported in metric tons, which is practical in the purse seine fishery for the tuna and certain bycatch species, but there may need to be consideration for also providing estimates of discard/release in number of individuals, where relevant, particularly for the longline fishery. The inclusion of discard/release in number would also be consistent with the reporting requirements in the WCPFC Conservation Management Measures (CMMs) for certain key shark species, for example;
- SPC expects that any 'live' release will be included in the estimates of discard/release, since these instances represent an interaction with the gear. Ideally, differentiation between live and dead release should be provided in the estimates where possible to better quantify 'total removals' from the stock concerned.

2.5 Longline Observer Coverage

26. In relation to longline observer coverage rates and the estimation of species catches using longline observer data, SC12 recommended that

The Scientific Services Provider calculate annual coefficients of variation (CVs) for various taxa collected from longline observer data for 2013, 2014 and 2015, and present this information to SC13.

27. In response to this recommendation, Tables 9 and 10 provide an annual breakdown of the coefficients of variance, mean and standard deviations of longline catch per unit of effort (CPUE) for selected species for the period 2013–2015 covering the WCPFC areas (i) 10°S–20°N (tropical) and (ii) south of 10°S (subtropical Albacore). Two units of CPUE have been presented (i) number of individuals per 1,000 hooks at the trip level and (ii) number of individuals per 1,000 hooks at the set level. These summaries have been sourced from Regional Observer Programme (ROP) data collected from the WCPFC longline fisheries.

28. Lawson (2004) showed *inter alia,*

- The value of the coefficients of variation depend strongly on the level of CPUE, with smaller coefficients of variation for higher levels of CPUE.
- The shape of the relationship between the coefficients of variation and the longline observer coverage rate is similar among species, with a steep decline in the coefficients of variation from 1 percent coverage to about 20–30% coverage, followed by a gradual decline to a coefficient of variation of zero at 100% coverage.
- If a coefficient of variation (CV) of 0.10 (or a CV of 10% – which is approximately equivalent to a 95% confidence interval of plus or minus 20%) is an acceptable level of reliability for estimates of CPUE and, hence, catches (assuming fishing effort is known without error), then, for the target species, a moderate level of coverage is required, while for extremely rare species, full coverage will be required. For example, the required longline observer coverage rate increases from 6% for bigeye tuna to 100% for leatherback turtles.
- If financial or other constraints limit the level of observer coverage, then the fact that the reliability of estimates of CPUE improves less rapidly with increasing coverage, once coverage rates of 20–30% are achieved, will be an important consideration in setting the coverage rate.

29. Taking the outcomes of Lawson (2004) into account and the information presented in Tables 9 and 10, the current level of longline observer coverage is clearly not sufficient to obtain reliable estimates of CPUE used to estimate catches in the WCPFC longline fisheries (for species not adequately reported on logbooks).

2.6 Data to determine Length-Weight and Weight-Weight Conversion factors

30. Length-weight and weight-weight conversion factors are used in the preparation of data used in the stock assessments of the key WCPFC species. These conversion factors have been determined from the collection of highly accurate measurements of the length and the whole weight obtained from individual fish, and often extends to the collection of other morphometric information. The unloading process of longline vessels presents an ideal opportunity to obtain this type of information, but it only covers the main commercial species and even so, does not usually cover the whole weight measurement. The main gap in providing better estimates for conversion factors is the data for the key shark species and other bycatch species of interest.

31. SC13 is invited to consider establishing a project with a targeted approach to addressing the current gaps in conversion factor data.

3. RECENT PROVISIONS OF SCIENTIFIC DATA TO THE WCPFC

32. 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 "7. Time periods covered and schedule for the provision of data" at https://www.wcpfc.int/system/files/Att%20G_Revised%20SciData%20decision.pdf).

33. As noted in the introduction, the tables of data submission presented herein include a column with a "tier-scoring evaluation score" which will be referred to under the WCPFC compliance monitoring process and reviewed at TCC13 (September 2017).

3.1 Annual Catch Estimates

34. Tables 1 and 2 list the dates on which catch estimates for 2015 and 2016, respectively, were provided, and include notes on the data that have been provided, mainly highlighting gaps or problems in those data (4th column), general notes on the data provided (5th column), and an indicator for the tier-scoring evaluation level (6th column).

35. Annual catch estimates for 2015 and 2016 have been provided by all CCMs with fleets active in those years.

36. In 2015, twenty-six (26) out of the twenty-nine (29) active CCM fleets (93%) had provided annual catch estimates by the deadline (30 April 2016), while for the 2016 submission, all CCMs provided annual catch estimates by the deadline (30 April 2017). Indonesia, Philippines and Vietnam typically schedule their annual catch estimates review workshops (e.g. in May/June 2017 for 2016 data) which is after the submission deadline but it was encouraging to receive provisional 2016 estimates from these countries prior to the 30th April deadline this year. Revisions to annual catch estimates were also received from other CCMs prior to July 2017, and we expect further revisions to be included in the WCFPC Part 1 Annual Reports.

37. The quality of estimates provided continues to improve with further reduction in the number of data-gap notes. For the 2016 estimates, the remaining data gap is the lack of estimates of any key shark species for the Vietnamese domestic fisheries, although it is acknowledged that the establishment of tuna fisheries data collection systems in this country is in its infancy.

3.2 Aggregate Catch/Effort data

38. Tables 3 and 4 list the dates on which aggregated catch and effort data were provided for 2015 and 2016, respectively. The notes in the 4th column of the table refer to instances where the data provided do not satisfy criteria specified in the guidelines for the provision of Scientific Data to the WCPFC, general notes on the data are provided in the 5th column (these notes are not data gap issues but are informative) and an indicator for the tier-scoring evaluation level in the 6th column.

39. 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 2017) since they were available at that time.

40. Notable issues in aggregate catch/effort data that have been resolved in recent years include:

- *China are now providing operational catch/effort data which has automatically resolved several issues in their aggregate catch/effort data submission;*
- *The continued improvement with the inclusion of key shark species catches in the aggregate data submissions;*
- *The EU-Portugal longline fleet is now providing catch in number in their operational data, automatically satisfying this requirement in their aggregate catch/effort data submission.*
- *Indonesia provided operational catch/effort data for 2016 and with landings data collected through the WPEA project, a more reliable version of aggregate data can be generated for their fleets.*

41. The main gap in the provision of 2015 aggregate catch/effort data is for the commercial domestic Indonesian (longline, purse seine and pole-and-line) fleets. Logsheet data for these fleets had been collected but we understand that there needs to be some resolution on domestic constraints and issues with data quality before these can be provided. For 2016 (Table 4), aggregate catch/effort data are now available from all CCM fleets for the first time.

42. The timeliness of the provision of aggregate catch/effort data continues to improve with all CCMs providing data by the deadline of 30th April 2017. 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. For 2016, the remaining issues include:

- Under- and non-reported key shark species catches;
- Lack of catch in number from the EU-Spain longline fleet which is sourced from their operational catch/effort data submissions (although catch in number was provided for one observer trip conducted on an EU-Spain longline vessel in 2016);

3.3 Operational catch/effort data

43. Tables 5 and 6 show the schedule for the submissions of 2015 and 2016 operational catch and effort data to the WCFPC, respectively. The difficulties in implementing logbook programs for small-scale fisheries is acknowledged and indicated in these tables. The gaps in the 2016 data submissions include:

- Lack of operational data for the Chinese Taipei fleets (although see next paragraph)
- The low coverage in the data provided for the Indonesia, Chinese Taipei and Vietnam fleets
- The lack of catch in number information for the EU-Spain longline fleet (although catch in number was provided for one observer trip conducted on an EU-Spain longline vessel in 2016)

44. Good progress continues to be made in resolving data gaps in the provision of operational catch and effort data to the WCPFC, particularly with the submission of operational data for recent years from China, Japan and Korea. As mentioned in Section 2.2, the most significant developments with 2016 data submissions have been:

- The provision, for the first time, of operational catch/effort data for Indonesia fleets
- Advice from Chinese Taipei that the domestic constraints that have previously prevented them from submitting operational data have been recently resolved and some operational longline catch/effort data were provided this year

45. The provision of **historical** operational data for the Asian tuna fleets (China, Indonesia, Japan, Korea and Chinese Taipei) remain the main data gaps and it is hoped that these data can be provided in the near future.

46. As reported in previous years, nearly all CCMs have now modified data collection systems and are including a breakdown of the catch (and where relevant, the release) of the key shark species in their operational data submissions.

3.4 Size data

47. Table 7 shows the schedule for the submissions of 2016 size data to the WCFPC. The notes in the 4th column of the table refer to instances where the data provided do not satisfy criteria specified in the guidelines for the provision of Scientific Data to the WCPFC, general notes on the data are provided in the 5th column (these notes are not data gap issues but are informative), and an indicator for the tier-scoring evaluation level in the 6th column. The only gap in the provision of 2016 size data relates to where a CCM has not provided size data for their fleet even though size data have been made available for the fleet by Coastal states.

3.5 Overall scientific data submission evaluation

48. Table 8 provides an overall evaluation of each CCM's submission of scientific data to the WCPFC by consolidating the tier-scoring evaluations for each data type (see ANNEX for further information), as requested by TCC11:

> ***Para. 388. TCC11 recommends that WCPFC12 tasks SPC to further refine the tier scoring system to provide, among other things, an indicator of compliance of CCMs as a whole with provision of scientific data.***

49. For the submission of 2016 data, 29 of the 34 CCMs/entities (85%; an improvement on 74% for 2015 data) were evaluated as completely satisfying (100%) the **binding** requirements for the provision of scientific data to the WCPFC. The nine (5) CCMs that did not achieve 100% were at least at 75% or greater, which is an improvement on 2015 data submissions.

3.6 Regional Observer Programme (ROP) data

50. The SPC/OFP has been processing observer data on behalf of their member countries for close to 20 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., 2012). Williams et al. (2017a) describes the recent developments, future work and initiatives with respect to ROP data management and it also includes tables indicating the current coverage of available observer data.

51. The backlog in the provision of ROP data to SPC for processing continues to improve. SPC continues to collaborate with a number of stakeholders (e.g. national fisheries authorities, FFA and the fishing industry) in undertaking trials in observer E-Reporting and E-Monitoring which has the potential for efficiency gains in the timeliness and quality of observer data (see Hosken et al., 2017).

52. The significant increase in the number of E-Monitoring trials[4], which are producing useful observer data, has raised the question as to how these data can be considered in the WCPFC context, specifically in regards to ROP longline coverage. Draft longline process standards have been produced (Hosken et al., 2016) and these standards could be reviewed, enhanced and then used to gauge whether an E-Monitoring system is generating data according to WCPFC requirements.

53. SC13 is invited to consider how data generated from E-Monitoring should be dealt with in the WCPFC context, specifically in regards to ROP longline coverage.

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

- *A total of twenty-three (23) national and sub-regional observer programmes have contributed 2016 observer data to date;*
- *Continuation of the comprehensive data submissions for 2016 from the Pacific Island observer providers, which essentially contributes nearly all of ROP purse seine data (at 100% coverage requirement). The only other ROP purse seine data at this stage is for the Philippines HSP1 activities, provided through the Philippines National observer programme (these data also represent 100% observer coverage);*
- *Provision of longline observer trips for Japanese longline vessels covering 2016 (provided by Japan for the first time in 2017);*
- *Provisions of 2016 observer data from national observer programmes in China, Hawaii, American Samoa, New Zealand and Chinese Taipei (continuing the submissions for previous year by these CCMs.*

4. DISSEMINATION OF DATA

[4] In the past 1–2 years, observer data for around 100 trips have been generated from the E-Monitoring trials.

4.1 Bycatch Data Exchange Protocol (BDEP)

55. The report of SC11 (Para. 669 of Anon,. 2015a) recommended:

> *...that SPC, with help from ABNJ Tuna Project:*
>
> - *develop a process to populate the [BDEP] template; and*
> - *provide the first BDEP template (for 2013-2015) to SC12 for review with ROP data subject to the WCPFC data rules.*

56. In response to this recommendation, a working paper (Williams et al., 2016b) was prepared and presented at SC12, and SC12 subsequently recommended the following option for the 2016/2017 work plan:

> ***A. Basic, no-cost (reprioritise other DM tasks). Continue trial in 2017-18 (1), publish on web (2), with any issues addressed in the generic data gaps paper.***

57. An update to the SC12 paper (with an update of BDEP data as an EXCEL file attachment) has been prepared for SC13 (Williams et al., 2017b) in response to the SC12 recommendation. A draft web page for downloading the latest version of the BDEP data has also been developed and will soon be available on the WCPFC web site.

58. In addition to the work done under option A above, some tasks listed under option B were also accomplished during the past year, for example, the issue with identifying vessels in the observer data of some CCMs was resolved.

4.2 Enhancing the set of WCPFC public domain data

59. During the past year, SPC (as the Commission's technical service provider) has been requested (through the WCPFC Secretariat) to provide versions of aggregated data that would satisfy the conditions for WCPFC public domain data, but are at a different level of aggregation to the public domain data available on the WCPFC web site. The following are examples of requests for WCPFC public domain data :

- Aggregated catch/effort data, stratified by year, month, 10° latitude bands and flag, with the WCPFC three-vessel rule applied;
- Aggregated catch/effort data, stratified by year, 5°x5° latitude/longitude cells and flag, with the WCPFC three-vessel rule applied.

60. SC13 is invited to consider and comment on the plan to enhance the set of WCPFC public domain data available on the WCPFC web site, with the assurance that the WCPFC rules for public domain data will be applied.

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ANNEX – Notes on tier-scoring evaluation system

WCPFC11 agreed to adopt the proposal to assign a tier-scoring evaluation system for the provision of scientific data to the WCPFC which clearly distinguishes between the three levels described below.[5] The tier-scoring system developed by the WCPFC science/data service provider (SPC/OFP) is a systematic process used to evaluate scientific data submissions against the requirements in the "Scientific Data to be Provided to the Commission[6]", which attempts to provide some measure of the significance of data gaps to the scientific work of the Commission.

The tier-scoring approach ranges from "LEVEL I" which indicates the most severe gap with little or no submission of data which has by far the greatest impacts on the scientific work of the Commission , and that "LEVEL III" would indicate fully satisfying the requirements for data submission.

I. No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II. Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. Within this level, further distinction on the level of data submission could be made by considering the number of missing data fields in the data provided (for example, a status of FOUR data gaps is considered more serious than a status of ONE data gap).
III. Data have been provided, there are no gaps in the (minimum standard) data fields provided and the coverage of data is sufficient to be used for undertaking the scientific work of the Commission.

It should be noted that the tier-score evaluation should not be considered a final compliance evaluation by the Commission on data gaps. However, it is recognized that the tier-score evaluation is expected to be amongst the advice and information that will be available to the TCC for its review of compliance with "Scientific data to be Provided to the Commission" decision through the WCPFC Compliance Monitoring process.

The methodology for determining the tier-scoring evaluation score listed in relevant columns of TABLES in this paper are as follows:

1. Where data have not been provided by a CCM, then a CATEGORY I level is assigned.
2. Where data provided by a CCM is deemed complete, without any gaps in (minimum standard) data fields provided, then a CATEGORY III level is assigned.
3. Where data provided by a CCM is deemed incomplete due to some fields missing, a CATEGORY II level is assigned, and the following procedures are used:
    a. The table below lists the total number of key attributes required in the submission of each type of scientific data.

KEY Attributes in each Scientific data type for TIER-SCORING EVALUATION					
Annual catch estimates	Aggregate catch/effort data - PS/PL	Aggregate catch/effort data - LL	Operational catch/effort data - PS/PL	Operational catch/effort data - LL	Size Data
26	26	42	28	47	9

    b. For each submission of data, the number of data field gaps are summed and subtracted from the total number of required data fields (by data type and gear) to produce a tier-scored percentage index for category II. For example, if a CCM submitted aggregate longline catch/effort data but did not include the catches of two key shark species (catch in weight and number = four data field gaps), then the tier-scored percentage index would be (42-4)/42 = 90%, and the assignment would be CATEGORY II (90%).

[5] WCPFC11 adopted the tier scoring system for evaluating compliance with the provision of scientific data to the Commission, on the understanding that TCC will keep looking at the process of refining the CMR. The tiered scoring system would be sent to the SC for its consideration.

[6] http://www.wcpfc.int/doc/data-01/scientific-data-be-provided-commission-revised-wcpfc4-6-7-and-9 is the basis of the evaluation of submissions of 2016 scientific data, but the latest version adopted at WCPFC13 (https://www.wcpfc.int/system/files/Att%20G_Revised%20SciData%20decision.pdf) will be used for submissions of 2017 scientific data, onwards.

4. The required coverage of OPERATIONAL DATA is 100% and the coverage for each CCM submission has been listed in a dedicated column for COVERAGE in Tables 5 and 6. The guidelines for the submission of scientific data indicate in section "4. Catch and effort data aggregated by time period and geographic area" 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 aggregated by time period and geographic area that have been raised to represent the total catch and effort shall be provided.*
>
> *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.*

The guidelines also indicate that "*It is also recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels...*"

Instances where coverage of operational data is less than 100%, but (i) annual catch/effort estimates by geographic area have been made available and together with the operational level catch and effort data that has been submitted, is sufficient to allow the scientific work of the Commission to be undertaken, or (ii) the fleets in question are acknowledged to be "artisanal" in nature, have been distinctly highlighted in Tables 5 and 6.

As recommended by TCC11 (Anon, 2015b; Para. 388), this paper attempts to provide an overall evaluation of scientific data to the WCPFC in Table 8. This evaluation only considered **binding** requirements from the "Scientific data to be provided to the Commission", and did not consider (i) coverage of data types and (ii) other non-binding requirements listed in this document. This approach is consistent with how TCC reviews and uses the tier-scored evaluation information. The method for determining the overall evaluation was to take the average evaluation of each data type submission (without weighting). In each case, the evaluation level 'III' scored 100%, the evaluation level 'I' scored 0% and the evaluation level 'II' used the respective score (%) assigned in that data type. Where a CCM had a separate evaluation by gear(s) within a particular data type, then the average evaluation across all gears for that CCM and data type was determined and used.

TABLES

Table 1. Provision of 2015 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	DATA-GAP Notes	General NOTES	TIER-SCORING EVALUATION LEVEL
Australia	LL, PS, PL, HL,TR	28 Apr 2016		G, H	III
Belize	LL	30 Apr 2016		D	III
Canada	TR	29 Apr 2016			III
China	LL, PS	30 Apr 2016			III
Cook Islands	LL, TR	27 Apr 2016		F, G, H	III
Ecuador	PS	09 Jun 2016			III
El Salvador	PS	26 Apr 2016			III
Federated States of Micronesia	LL, PS	27 Apr 2016		F, G, H	III
Fiji Islands	LL, PL	27 Apr 2016		F, G, H	III
French Polynesia	LL, PL, OT	27 Apr 2016		G, H	III
Indonesia	LL	30 Jun 2016	6, 11	F	II (65%)
	PS, PL, HL, TR, OT	30 Jun 2016	6	F, J	II (96%)
Japan	PS, LL	29 Apr 2016		C, K	III
	PL, TR, OT	29 Apr 2016			III
Kiribati	LL, PS, OT	27 Apr 2016		G, H	III
Republic of Korea	LL, PS	30 Apr 2016		H	III
Marshall Islands	LL, PS	27 Apr 2016		F, G, H	III
New Caledonia	LL	27 Apr 2016		G, H	III
New Zealand	LL, PS, TR, PL	29 Apr 2016		G, H	III
Niue	LL	27 Apr 2016		D	III
Palau	LL, PL	27 Apr 2016		D	III
Papua New Guinea	LL, PS	27 Apr 2016		G, H	III
Philippines	PS	27 Apr 2016		F, G, H	III
	LL	27 Apr 2016		D	III
	HL, RN, OT	27 Apr 2016		F, J	III
EU-Portugal	LL	30 Apr 2016		F	III
Samoa	LL	27 Apr 2016		G, H	III
Senegal	LL	30 Apr 2016		D	III
Solomon Islands	LL	27 Apr 2016		F, H	III
	PS, PL	27 Apr 2016		H	III
EU-Spain	LL	30 Apr 2016			III
	PS	30 Apr 2016			III
Chinese Taipei	LL, PS	30 Apr 2016			III
Tokelau	OT	27 Apr 2016			III
Tonga	LL	27 Apr 2016		G, H	III
Tuvalu	LL, PS, OT	27 Apr 2016		G, H	III
United States	LL, PS, TR, HL, PL	29 Apr 2016		G, H	III
Vanuatu	LL, PS	27 Apr 2016		G, H	III
Vietnam	LL	24 Jun 2016	6, 11	J	II (65%)
	GN, PS	24 Jun 2016	6, 11	J	II (65%)
Wallis and Futuna	LL	27 Apr 2016		D	III

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 SHOULD BE provided (non-binding)
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, and final estimates provided prior to SC12.
G	Estimates of all KEY shark species have been provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data and/or OBSERVER data provisions
H	Estimates of DISCARDs provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data or OBSERVER data provisions
I	Pending resolution of attribution of catches according to CHARTER arrangements
J	No Discards reported - advised that full retention is assumed in these fisheries (except for protected species).
K	Estimates of DISCARDs SHOULD be provided (non-binding)

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the data provided and the coverage of data is according to the requirements.

Table 2. Provision of 2016 annual catches estimates to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Date submitted	DATA-GAP Notes	General NOTES	TIER-SCORING EVALUATION LEVEL
Australia	LL, PS, PL, HL,TR	29 Apr 2017		G, H	III
Belize	LL	30 Apr 2017		D	III
Canada	TR	24 Apr 2017			III
China	LL, PS	30 Apr 2017			III
Cook Islands	LL, TR	28 Apr 2017		F, G, H	III
Ecuador	PS	29 Apr 2017			III
El Salvador	PS	29 Apr 2017			III
European Union	LL, PS	29 Apr 2017		F	III
Federated States of Micronesia	LL, PS	28 Apr 2017		F, G, H	III
Fiji Islands	LL, PL	28 Apr 2017		F, G, H	III
French Polynesia	LL, PL, OT	28 Apr 2017		G, H	III
Indonesia	LL	28 Apr 2017		F	III
	PS, PL, HL, TR, OT	28 Apr 2017		F, J	III
Japan	PS, LL	30 Apr 2017		C, K	III
	PL, TR, OT	30 Apr 2017			III
Kiribati	LL, PS, OT	28 Apr 2017		G, H	III
Republic of Korea	LL, PS	30 Apr 2017		H	III
Marshall Islands	LL, PS	28 Apr 2017		F, G, H	III
New Caledonia	LL	28 Apr 2017		G, H	III
New Zealand	LL, PS, TR, PL	28 Apr 2017		G, H	III
Niue	LL	28 Apr 2017		D	III
Palau	LL, PL	28 Apr 2017		D	III
Papua New Guinea	LL, PS	28 Apr 2017		G, H	III
Philippines	PS	28 Apr 2017		F, G, H	III
	LL	28 Apr 2017		D	III
	HL, RN, OT	28 Apr 2017		F, J	III
Samoa	LL	28 Apr 2017		G, H	III
Senegal	LL	30 Apr 2017		D	III
Solomon Islands	LL	28 Apr 2017		D	III
	PS, PL	28 Apr 2017		H	III
Chinese Taipei	LL, PS	28 Apr 2017			III
Tokelau	OT	28 Apr 2017			III
Tonga	LL	28 Apr 2017		G, H	III
Tuvalu	LL, PS, OT	28 Apr 2017		G, H	III
United States	LL, PS, TR, HL, PL	28 Apr 2017		G, H	III
Vanuatu	LL, PS	28 Apr 2017		G, H	III
Vietnam	LL/HL	28 Apr 2017	11	J, L	II (92%)
	GN, PS	28 Apr 2017	11	J, L	II (92%)
Wallis and Futuna	LL	28 Apr 2017		D	III

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 SHOULD BE provided (non-binding)
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, and final estimates provided prior to SC13.
G	Estimates of all KEY shark species have been provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data and/or OBSERVER data provisions
H	Estimates of DISCARDs provided in AGGREGATE catch/effort data, OPERATIONAL catch/effort data or OBSERVER data provisions
I	Pending resolution of attribution of catches according to CHARTER arrangements
J	No Discards reported - advised that full retention is assumed in these fisheries (except for protected species).
K	Estimates of DISCARDs SHOULD be provided (non-binding)
L	Breakdown of vessels by GRT not provided but brekdown by HP provided and an understanding that most vessels are < 50 GRT

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the data provided and the coverage of data is according to the requirements.

Table 3. Provision of 2015 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	DATA-GAP Notes	General NOTES	TIER-SCORING EVALUATION LEVEL
Australia	LL, PL, PS, TR	28 Apr 2016		C,I	III
Belize	LL	30 Apr 2016		E	III
Canada	TR	29 Apr 2016			III
China	LL (DWFN)	30 Apr 2016		P	III
	PS	30 Apr 2016		P	III
Cook Islands	LL, TR	30 Apr 2016		J, I, O	III
Ecuador	PS	09 Jun 2016		C	III
El Salvador	PS	26 Apr 2016		C	III
Federated States of Micronesia	LL, PS	30 Apr 2016		J, O	III
Fiji Islands	LL, PL	30 Apr 2016		J, O	III
French Polynesia	LL	30 Apr 2016		J, O	III
Indonesia	LL, PS, PL			Q	I
	HL, TR, GN, OT			N, Q	I
Japan	LL	29 Apr 2016		A, F,H, I, L, R	III
	PL	29 Apr 2016		L	III
	PS	29 Apr 2016		L	III
Kiribati	LL, PS	30 Apr 2016		J, O	III
Marshall Islands	LL, PS	30 Apr 2016		J, O	III
New Caledonia	LL	30 Apr 2016		J, I, O	III
New Zealand	LL, PL, HL, PS	29 Apr 2016		C,I	III
Niue	LL	30 Apr 2016		E	III
Palau	LL, PL	30 Apr 2016		E	III
Papua New Guinea	LL, PS	30 Apr 2016		J, I, O	III
Philippines	PS	30 Apr 2016		M, Q	III
	LL	30 Apr 2016		E	III
	HL, RN, OT	30 Apr 2016		M, N, Q	III
EU-Portugal	LL	30 Apr 2016		C, F, P	III
Republic of Korea	LL	30 Apr 2016		P	III
	PS	30 Apr 2016		P	III
Samoa	LL	30 Apr 2016		J, I, O	III
Senegal	LL	30 Apr 2016		E	III
Solomon Islands	LL	30 Apr 2016		J, K, O	III
	PL, PS	30 Apr 2016		J	III
EU-Spain	LL	30 Apr 2016	1	C, F, P, R	II (98%)
	PS	30 Apr 2016		C	III
Chinese Taipei	LL (DWFN)	30 Apr 2016		H, I, L	III
	LL (small)	30 Apr 2016		H, I, L	III
	PS	30 Apr 2016		L	III
Tonga	LL	30 Apr 2016		J, I, O	III
Tuvalu	LL, PS	30 Apr 2016		J, O	III
United States	LL (American Samoa)	29 Apr 2016		B, I	III
	LL (Hawaii)	29 Apr 2016		B, I	III
	PS (Treaty)	29 Apr 2016		J	III
	TR (North Pacific)	29 Apr 2016		B	III
	TR (South Pacific)	29 Apr 2016		B	III
Vanuatu	LL, PS	30 Apr 2016		J, O	III
Vietnam	LL	30 Apr 2016	23	M, Q, S	II (83%)
	PS, GN	30 Apr 2016	23	M, Q, S	II (73%)
Wallis and Futuna	LL	30 Apr 2016		E, O	III

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 MAY ALSO be provided (non-binding)
23	Catches of KEY shark species have not been provided.
24	Effort in SETS by SET TYPE not provided for PURSE SEINE data

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 disseminated.
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
L	Annual Catch and Effort estimates by areas of national jurisdiction (EEZs) and High Seas HAVE BEEN PROVIDED.
M	Aggregate data not provided, but have been generated from Annual catch estimates and operational data provided to SPC directly for stock assessments.
N	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."
O	Logsheet forms used by this fleet cover the collection of each of the KEY SHARK species and these logsheet data have been aggregated and provided to the WCPFC.
P	OPERATIONAL catch/effort data also provided and satisfies the requirements stipulated under AGGREGATE data.
Q	Flag State advised that there is full retention in their fishery (except for protected species which must be released), so no DISCARDS
R	Aggregate Catch/Effort data for ALBACORE, SWORDFISH and STRIPED MARLIN for the south Pacific Ocean east of the WCPFC Area MAY ALSO be provided (non-binding)
S	Coverage of data provided is less than 50% (non-binding)

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the data provided and the coverage of data is according to the requirements.

Table 4. Provision of 2016 Aggregated catch and effort data to the WCPFC

COUNTRY / ENTITY	GEAR TYPE	Date Submitted	DATA-GAP Notes	General NOTES	TIER-SCORING EVALUATION LEVEL
Australia	LL, PL, PS, TR	29 Apr 2017		C,I	III
Belize	LL	30 Apr 2017		E	III
Canada	TR	24 Apr 2017			III
China	LL (DWFN)	30 Apr 2017		P	III
	PS	30 Apr 2017		P	III
Cook Islands	LL, TR	28 Apr 2017		J, I, O	III
Ecuador	PS	29 Apr 2017		C	III
El Salvador	PS	29 Apr 2017		C	III
European Union	LL	28 Apr 2017	1	C, F, P, R	II (98%)
	PS	28 Apr 2017		C	III
Federated States of Micronesia	LL, PS	28 Apr 2017		J, O	III
Fiji Islands	LL, PL	28 Apr 2017		J, O	III
French Polynesia	LL	28 Apr 2017		J, O	III
Indonesia	LL, PS, PL	28 Apr 2017	18	Q, O, S, T	II (50%)
	HL, TR, GN, OT	28 Apr 2017		N, Q	III
Japan	LL	30 Apr 2017		A, F,H, I, L, R	III
	PL	30 Apr 2017		L	III
	PS	30 Apr 2017		L	III
Kiribati	LL, PS	28 Apr 2017		J, O	III
Marshall Islands	LL, PS	28 Apr 2017		J, O	III
New Caledonia	LL	28 Apr 2017		J, I, O	III
New Zealand	LL, PL, HL, PS	28 Apr 2017		C,I	III
Niue	LL	28 Apr 2017		E	III
Palau	LL, PL	28 Apr 2017		E	III
Papua New Guinea	LL, PS	28 Apr 2017		J, I, O	III
Philippines	PS	28 Apr 2017		M, Q	III
	LL	28 Apr 2017		E	III
	HL, RN, OT	28 Apr 2017		M, N, Q	III
Republic of Korea	LL	30 Apr 2017		P	III
	PS	30 Apr 2017		P	III
Samoa	LL	28 Apr 2017		J, I, O	III
Senegal	LL	30 Apr 2016		E	III
Solomon Islands	LL	28 Apr 2017		E	III
	PL, PS	28 Apr 2017		J	III
Chinese Taipei	LL (DWFN)	28 Apr 2017		H, I, L	III
	LL (small)	28 Apr 2017		H, I, L	III
	PS	28 Apr 2017		L	III
Tonga	LL	28 Apr 2017		J, I, O	III
Tuvalu	LL, PS	28 Apr 2017		J, O	III
United States	LL (American Samoa)	28 Apr 2017		B, I	III
	LL (Hawaii)	28 Apr 2017		B, I	III
	PS (Treaty)	28 Apr 2017		J	III
	TR (North Pacific)	28 Apr 2017		B	III
	TR (South Pacific)	28 Apr 2017		B	III
Vanuatu	LL, PS	28 Apr 2017		J, O	III
Vietnam	LL/HL	28 Apr 2017	23	M, Q, S	II (83%)
	PS, GN	28 Apr 2017	23	M, Q, S	II (73%)
Wallis and Futuna	LL	28 Apr 2017		E, O	III

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 MAY ALSO be provided (non-binding)
23	Catches of KEY shark species have not been provided.
24	Effort in SETS by SET TYPE not provided for PURSE SEINE data

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 disseminated.
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
L	Annual Catch and Effort estimates by areas of national jurisdiction (EEZs) and High Seas HAVE BEEN PROVIDED.
M	Aggregate data not provided, but have been generated from Annual catch estimates and operational data provided to SPC directly for stock assessments.
N	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."
O	Logsheet forms used by this fleet cover the collection of each of the KEY SHARK species and these logsheet data have been aggregated and provided to the WCPFC.
P	OPERATIONAL catch/effort data also provided and satisfies the requirements stipulated under AGGREGATE data.
Q	Flag State advised that there is full retention in their fishery (except for protected species which must be released), so no DISCARDS
R	Aggregate Catch/Effort data for ALBACORE, SWORDFISH and STRIPED MARLIN for the south Pacific Ocean east of the WCPFC Area MAY ALSO be provided (non-binding)
S	Coverage of data provided is less than 50% (non-binding)
T	Aggregate data not provided, but can be estimated from Operational data submitted to the WCPFC and landings data collected under the WPEA project.

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the data provided and the coverage of data is according to the requirements.

Table 5. Provision of 2015 Operational catch and effort data to the WCPFC

					TIER-SCORING EVALUATION LEVEL	
FLAG STATE / ENTITY	GEAR(s)	Date Submitted	DATA-GAP Notes	General NOTES	KEY ATTRIBUTES	COVERAGE
Australia	LL, PL, PS, TR	28 Apr 2016		E	III	100%
Belize	LL	30 Apr 2016		A	III	N/A
Canada	TR			A	III	N/A
China	LL	30 Apr 2016	6	I	III	< 40% *
	PS	30 Apr 2016			III	100%
Cook Islands	LL, TR	30 Apr 2016		C, J	III	100%
Ecuador	PS	09 Jun 2016	11	F	III	73% *
El Salvador	PS	26 Apr 2016			III	100%
Federated States of Micronesia	LL	30 Apr 2016	11	C, J, F	III	71% *
	PS			C, J	III	100%
Fiji Islands	LL, PL	30 Apr 2016		C, J	III	100%
French Polynesia	LL	30 Apr 2016	11	C, J, F	III	100%
	PL			G	III	#
	TR			G	III	#
Indonesia	LL, PS, PL			K	I	0%
	HL, TR, GN, OT			G, K	III	#
Japan	PS, PL	29 Apr 2016		E, M	III	100%
	LL	29 Apr 2016		E, M	III	100%
Kiribati	LL	30 Apr 2016	6	C, J, F	III	< 40% *
	PS		11	C, J, F	III	61% *
Republic of Korea	LL, PS	30 Apr 2016		E	III	100%
Marshall Islands	LL	30 Apr 2016		C, J	III	100%
	PS			C, J	III	100%
New Caledonia	LL	30 Apr 2016		C, J	III	100%
New Zealand	LL	29 Apr 2016	11	E, F	III	65% *
	PL, TR, PS			E	III	100%
Niue	LL	30 Apr 2016		A	III	N/A
Palau	LL, PL	30 Apr 2016		A	III	N/A
Papua New Guinea	LL	30 Apr 2016	11	C, J, F	III	75% *
	PS		11	C, J, F	III	75% *
Philippines	PS	30 Apr 2016		J, K	III	100%
	LL	30 Apr 2016		A	III	N/A
	HL, RN, OT			G, K	III	#
EU-Portugal	LL	30 Apr 2016		E	III	100%
Samoa	LL	30 Apr 2016		C, J	III	100%
Senegal	LL	30 Apr 2016		A	III	100%
Solomon Islands	LL	30 Apr 2016	6	C, J, F	III	< 40% *
	PS		11	C, J, F	III	85% *
	PL			C, J	III	100%
EU-Spain	LL	30 Apr 2016	10	E	II (87%)	100%
	PS	30 Apr 2016			III	100%
Chinese Taipei	LL, PS			F	I	0%
Tonga	LL	30 Apr 2016		C, J	III	100%
Tuvalu	LL, PS	30 Apr 2016		C, J	III	100%
United States	LL (American Samoa)	29 Apr 2016	11	E, F	III	92% *
	LL (CNMI)	29 Apr 2016		E	III	100%
	LL (Hawaii)	29 Apr 2016		E	III	100%
	PL, HL, TR (trop)			G	III	#
	PS, TR (ALB)	29 Apr 2016		B	III	100%
Vanuatu	LL	30 Apr 2016	11	C, J, F	III	100%
	PS	30 Apr 2016		C, J	III	100%
Vietnam	LL	30 Apr 2016	6, 8	G, H, K, F	II (85%)	< 20%
	PS, GN	30 Apr 2016	6, 8	G, H, K, F	II (75%)	< 20%
Wallis and Futuna	LL	30 Apr 2016		A	III	N/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 < 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.
10	The catch data are in units of weight (kgs or metric tonnes) only, rather than both numbers of fish and weight.
11	Coverage of data data provided is > 50% but < 100%

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 KEY shark species have been provided
F	Coverage of operational data is not 100%, but Annual Catch and Effort estimates by areas of national jurisdiction (EEZs) and High Seas ARE AVAILABLE.
G	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."
H	Operational Logsheet data provided to SPC for analyses related to stock assessments.
I	Operational Logsheet data also provided to SPC by their member countries which are coastal states where this FLAG STATE fleet is based
J	Logsheet forms used by this fleet cover the collection of each of the KEY SHARK species.
K	Flag State advised that there is full retention in their fishery, so no DISCARDS.
L	2014 historical operational longline data were provided to SPC for a collaborative study in accordance to the agreement with respective CCMs (see SC10 report-Attachment F and OFP [2016a] and OFP [2016b].
M	Operational data provided to the WCPFC for the WCPFC Area south of 20°N and aggregate 1°x1° year/month data provided for WCPFC Area north of 20°N

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the (minimum standard) data fields provided and the coverage of data is sufficient to be used for undertaking the scientific work of the Commission.

COVERAGE

Coverage has been determined from VMS trip coverage where possible. Where VMS data are incomplete or not available, coverage has been deteremined in some cases by comparing the total target tuna catch from operational data for that gear to the total target tuna catch from ANNUAL CATCH ESTIMATES.

*	Instances where coverage of operational data is less than 100%, but annual catch/effort estimates by geographic area have been made available and together with the operational level catch and effort data that has been submitted, is sufficient to allow the scientific work of the Commission to be undertaken
#	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."

Table 6. Provision of 2016 Operational catch and effort data to the WCPFC

					TIER-SCORING EVALUATION LEVEL	
FLAG STATE / ENTITY	GEAR(s)	Date Submitted	DATA-GAP Notes	General NOTES	KEY ATTRIBUTES	COVERAGE
Australia	LL, PL, PS, TR	29 Apr 2017		E	III	100%
Belize	LL	30 Apr 2017		A	III	N/A
Canada	TR			A	III	N/A
China	LL	30 Apr 2017	11	I	III	90%
	PS	30 Apr 2017			III	100%
Cook Islands	LL	30 Apr 2017	11	C, J	III	85% *
Ecuador	PS	29 Apr 2017	11	F	III	60% *
El Salvador	PS	29 Apr 2017			III	100%
European Union	LL	29 Apr 2017	10	E	II (87%)	100%
	PS				III	100%
Federated States of Micronesia	LL	30 Apr 2017	11	C, J, F	III	55% *
	PS			C, J	III	85% *
Fiji Islands	LL, PL	30 Apr 2017		C, J	III	100%
French Polynesia	LL	30 Apr 2017		C, J, F	III	100%
	PL			G	III	#
	TR			G	III	#
Indonesia	LL, PS, PL	28 Apr 2017	1,2,4,5,9,10	K	II (72%)	< 20%
	HL, TR, GN, OT			G, K	III	#
Japan	PS, PL	30 Apr 2017		E, M	III	100%
	LL	30 Apr 2017		E, M	III	100%
Kiribati	LL	30 Apr 2017	11	C, J, F	III	50% *
	PS		11	C, J, F	III	72% *
Republic of Korea	LL, PS	30 Apr 2017		E	III	100%
Marshall Islands	LL	30 Apr 2017		C, J	III	100%
	PS			C, J	III	100%
New Caledonia	LL	30 Apr 2017		C, J	III	100%
New Zealand	LL	28 Apr 2017	11	E, F	III	92% *
	PL, TR, PS			E	III	100%
Niue	LL	30 Apr 2017		A	III	N/A
Palau	LL, PL	30 Apr 2017		A	III	N/A
Papua New Guinea	LL	30 Apr 2017		C, J, F	III	100%
	PS		11	C, J, F	III	75% *
Philippines	PS	28 Apr 2017		J, K	III	100%
	LL	28 Apr 2017		A	III	N/A
	HL, RN, OT			G, K	III	#
Samoa	LL	30 Apr 2017		C, J	III	100%
Senegal	LL	30 Apr 2017		A	III	100%
Solomon Islands	LL	30 Apr 2017		A	III	N/A
	PS		11	C, J, F	III	85% *
	PL			C, J	III	100%
Chinese Taipei	LL	28 Apr 2017	6	E, F	III	< 10%
	PS			F	I	0%
Tonga	LL	30 Apr 2017		C, J	III	100%
Tuvalu	LL, PS	30 Apr 2017		C, J	III	100%
United States	LL (American Samoa)	28 Apr 2017	11	E, F	III	95% *
	LL (CNMI, GUAM)	28 Apr 2017		E	III	100%
	LL (Hawaii)	28 Apr 2017		E	III	100%
	PL, HL, TR (trop)			G	III	#
	PS, TR (ALB)	28 Apr 2017		B	III	100%
Vanuatu	LL	30 Apr 2017	11	C, J, F	III	100%
	PS	30 Apr 2017		C, J	III	100%
Vietnam	LL/HL	28 Apr 2017	6, 8	G, H, K, F	II (85%)	33%
	PS, GN	28 Apr 2017	6, 8	G, H, K, F	II (75%)	< 20%
Wallis and Futuna	LL	30 Apr 2017		A	III	N/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 < 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.
10	The catch data are in units of weight (kgs or metric tonnes) only, rather than both numbers of fish and weight.
11	Coverage of data data provided is > 50% but < 100%

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 KEY shark species have been provided
F	Coverage of operational data is not 100%, but Annual Catch and Effort estimates by areas of national jurisdiction (EEZs) and High Seas ARE AVAILABLE.
G	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."
H	Operational Logsheet data provided to SPC for analyses related to stock assessments.
I	Operational Logsheet data also provided to SPC by their member countries which are coastal states where this FLAG STATE fleet is based
J	Logsheet forms used by this fleet cover the collection of each of the KEY SHARK species.
K	Flag State advised that there is full retention in their fishery, so no DISCARDS.
L	2014 historical operational longline data were provided to SPC for a collaborative study in accordance to the agreement with respective CCMs (see SC10 report-Attachment F and OFP [2016a] and OFP [2016b].
M	Operational data provided to the WCPFC for the WCPFC Area south of 20°N and aggregate 1°x1° year/month data provided for WCPFC Area north of 20°N

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the (minimum standard) data fields provided and the coverage of data is sufficient to be used for undertaking the scientific work of the Commission.

COVERAGE

Coverage has been determined from VMS trip coverage where possible. Where VMS data are incomplete or not available, coverage has been deteremined in some cases by comparing the total target tuna catch from operational data for that gear to the total target tuna catch from ANNUAL CATCH ESTIMATES.

*	Instances where coverage of operational data is less than 100%, but annual catch/effort estimates by geographic area have been made available and together with the operational level catch and effort data that has been submitted, is sufficient to allow the scientific work of the Commission to be undertaken
#	"It is recognized that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels."

Table 7. Provision of 2016 Size data to the WCPFC

FLAG STATE / ENTITY	GEAR(s)	Date Submitted	DATA-GAP Notes	General NOTES	TIER-SCORING EVALUATION LEVEL
Australia	LL	29 Apr 2017		B, C	III
	PL, PS, TR			J	III
Belize	LL	30 Apr 2017		G	III
Canada	TR	29 Apr 2017		G	III
China	LL	30 Apr 2017		A, H	III
	PS	30 Apr 2017		A, H	III
Cook Islands	LL	30 Apr 2017		A, H, K	III
Ecuador	PS		8	H	I
El Salvador	PS	29 Apr 2017		H	III
European Union	LL	22 May 2017		L	III
	PS	30 Apr 2017		H	III
Federated States of Micronesia	LL, PS	30 Apr 2017		A, H, I, K	III
Fiji Islands	LL, PL	30 Apr 2017		A, H, K	III
French Polynesia	LL	30 Apr 2017		A, H, K	III
	PL, TR			J	III
Indonesia	LL, PS, OT	30 Mar 2017		A, K	III
Japan	PS	30 Apr 2017		A, H	III
	LL, PL	30 Apr 2017		A, H, I	III
Kiribati	LL	30 Apr 2017		A, H, K	III
	PS	30 Apr 2017		A, H	III
Republic of Korea	LL, PS	30 Apr 2017		A, H	III
Marshall Islands	LL, PS	30 Apr 2017		A, H, K	III
New Caledonia	LL	30 Apr 2017		A, H, K	III
New Zealand	LL, PL, PS, TR	28 Apr 2017		A, H	III
Niue	LL	30 Apr 2017		G	III
Palau	LL, PL	30 Apr 2017		G	III
Papua New Guinea	LL, PS	30 Apr 2017		A, H	III
Philippines	PS, HL, RN, OT	30 Apr 2017		A, H, K	III
	LL	30 Apr 2017		G	III
Samoa	LL	30 Apr 2017		A, H, K	III
Senegal	LL	30 Apr 2017		G	III
Solomon Islands	LL, PS, PL	30 Apr 2017		A, H	III
Chinese Taipei	LL	28 Apr 2017		A, H, I	III
	PS	28 Apr 2017		A, H, I	III
Tonga	LL	30 Apr 2017		A, H, K	III
Tuvalu	LL	30 Apr 2017		A, H	III
	PS	30 Apr 2017		A, H	III
United States	LL (American Samoa)	28 Apr 2017		B, E, F	III
	LL (Hawaii)	28 Apr 2017		B, E, F	III
	HL	28 Apr 2017		B, E, F	III
	TR	28 Apr 2017		A	III
	PS	30 Apr 2017		A, H, K	III
Vanuatu	LL, PS	30 Apr 2017		A, H, I, K	III
Vietnam	LL	30 Apr 2017		A, K	III
	PS, GN	30 Apr 2017		A, K	III
Wallis and Futuna	LL	30 Apr 2017		G	III

DATA-GAP NOTES

1	Temporal stratification at the YEAR level has been provided only
2	Spatial stratification is larger than 10° latitude x 20° longitude
3	There is no breakdown by SCHOOL ASSOCIATION in PURSE SEINE samples provided by the FLAG STATE
4	The data were not stratified by latitide/longitude
5	LENGTH INTERVAL in data provided does not comply to WCPFC Requirements
6	WEIGHT INTERVAL in data provided does not comply to WCPFC Requirements
7	No SIZE data provided by the FLAG STATE
8	No SIZE data provided by the FLAG STATE, but SIZE data provided for this fleet by COASTAL STATES

GENERAL NOTES

A	LENGTH DATA PROVIDED and LENGTH INTERVALS comply with the WCPFC Requirements where data provided (Skipjack tuna – 1cm, Albacore tuna – 1cm, Yellow fin tuna – ideally 1cm, but not more than 2 cm, Bigeye tuna – ideally 1cm, but not more than 2 cm, Billfish – ideally 1cm, but not more than 5 cm)
B	WEIGHT DATA PROVIDED and WEIGHT INTERVALS comply with WCFPC requirements (1kgs)
C	Weights are gilled-and-gutted (kilograms)
D	Weights are gilled-and-gutted-and-tailed (kilograms)
E	Weights are gilled-and-gutted (pounds)
F	Broad areas which can be equated to 10° latitude x 20° longitude blocks were provided
G	No activity by this fleet in the WCPFC Convention Area
H	Includes data provided through the WCPFC Regional Observer Programme (ROP) data
I	Includes data collected through PORT SAMPLING by COASTAL STATES and provided to SPC on a regular basis.
J	Acknowledged to be small-scale/insignificant fisheries
K	Includes data collected through PORT SAMPLING by FLAG STATE
L	Swordfish target fishery with swordfish size data provided at 5cm intervals.

TIER-SCORING EVALUATION LEVEL

I	No data are provided, or data have been provided but they have been evaluated as 'unusable' (instances where none of the data provided can be used in assessments). This level of data gap is the most severe and has by far the greatest impacts on the scientific work of the Commission.
II	Data have been provided, most of which can be used for the scientific work of the Commission, but (i) there are one or several (minimum-standard) data fields not provided and/or (ii) the coverage of the data is not according to the requirements. In these cases, some of the scientific work of the Commission cannot be undertaken. The % value assigned in this category represents the estimated proportion of the key attribute data provided compared to the full set of key attribute data required as stipulated in the the WCPFC data submission guidelines.
III	Data have been provided, there are no gaps in the data provided and the coverage of data is according to the requirements.

Table 8. Overall evaluation for the provision of 2016 scientific data to the WCPFC

COUNTRY / TERRITORY / ENTITY	GEAR(s)	Annual Catch estimates	Aggregate CATCH/EFFORT data	Operational CATCH/EFFORT data	SIZE data	OVERALL Science Data
Australia	LL, PS, PL, HL,TR	100%	100%	100%	100%	100%
Belize	LL	100%	100%	100%	100%	100%
Canada	TR	100%	100%	100%	100%	100%
China	LL, PS	100%	100%	100%	100%	100%
Cook Islands	LL, TR	100%	100%	100%	100%	100%
Ecuador	PS	100%	100%	100%	0%	75%
El Salvador	PS	100%	100%	100%	100%	100%
European Union	LL, PS	100%	99%	94%	100%	98%
Federated States of Micronesia	LL, PS	100%	100%	100%	100%	100%
Fiji Islands	LL, PL	100%	100%	100%	100%	100%
French Polynesia	LL, PL, OT	100%	100%	100%	100%	100%
Indonesia	LL, PS, PL, HL, TR, OT	100%	50%	72%	100%	81%
Japan	PS, LL, PL, TR, OT	100%	100%	100%	100%	100%
Kiribati	LL, PS, OT	100%	100%	100%	100%	100%
Republic of Korea	LL, PS	100%	100%	100%	100%	100%
Marshall Islands	LL, PS	100%	100%	100%	100%	100%
New Caledonia	LL	100%	100%	100%	100%	100%
New Zealand	LL, PS, TR, PL	100%	100%	100%	100%	100%
Niue	LL	100%	100%	100%	100%	100%
Palau	LL, PL	100%	100%	100%	100%	100%
Papua New Guinea	LL, PS	100%	100%	100%	100%	100%
Philippines	PS, LL, HL, RN, OT	100%	100%	100%	100%	100%
Samoa	LL	100%	100%	100%	100%	100%
Senegal	LL	100%	100%	100%	100%	100%
Solomon Islands	LL, PS, PL	100%	100%	100%	100%	100%
Chinese Taipei	LL, PS	100%	100%	0%	100%	75%
Tokelau	OT	100%	100%	100%	100%	100%
Tonga	LL	100%	100%	100%	100%	100%
Tuvalu	LL, PS, OT	100%	100%	100%	100%	100%
United States	LL, PS, TR, HL, PL	100%	100%	100%	100%	100%
Vanuatu	LL, PS	100%	100%	100%	100%	100%
Vietnam	LL, GN, PS	92%	78%	80%	100%	88%
Wallis and Futuna	LL	100%	100%	100%	100%	100%

Table 9. Average CPUE (numbers per 1,000 hooks) per trip and CPUE standard deviation for selected species caught by longline, by year for 2013-2015, for the WCPFC Area 10°S–30°N (top) and south 10°S (bottom)

SPECIES	WCPFC Area : 10°S-30°N			CPUE (no. / 1,000 hooks) per trip					
	2013			2014			2015		
	N = 311			N = 284			N = 229		
	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV
Albacore Tuna	1.10717	3.34979	3.03	0.61447	2.16977	3.53	0.73332	2.55438	3.48
Bigeye Tuna	3.80063	2.88293	0.76	4.50652	3.57137	0.79	4.92499	3.25021	0.66
Yellowfin Tuna	1.11561	2.08873	1.87	1.24058	3.04967	2.46	1.42958	2.83620	1.98
Blue Marlin	0.12404	0.21165	1.71	0.15352	0.20813	1.36	0.15509	0.21310	1.37
Swordfish	0.38344	1.16202	3.03	0.82122	2.82734	3.44	0.54919	2.11960	3.86
Striped Marlin	0.20873	0.28074	1.34	0.25724	0.28072	1.09	0.23559	0.25465	1.08
Blue Shark	0.75306	4.79131	6.36	0.59366	4.56333	7.69	0.11141	0.47473	4.26
Silky Shark	0.03991	0.13016	3.26	0.03365	0.07643	2.27	0.03924	0.07453	1.90
Oceanic White-tip Shark	1.00134	0.97885	0.98	1.55603	1.78970	1.15	1.88236	2.10934	1.12
Green Turtle	0.00079	0.00527	6.67	0.00102	0.00589	5.75	0.00250	0.02557	10.22
Leatherback Turtle	0.00119	0.00753	6.33	0.00167	0.00975	5.85	0.00020	0.00145	7.23
Petrels and Puffins	0.00000	0.00000	0.00	0.00000	0.00000	0.00	0.00178	0.02381	13.40

SPECIES	WCPFC Area : South of 10°S			CPUE (no. / 1,000 hooks) per trip					
	2013			2014			2015		
	N = 264			N = 256			N = 233		
	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV
Albacore Tuna	7.73496	7.31539	0.95	9.56386	9.12858	0.95	8.12892	6.37614	0.78
Bigeye Tuna	0.99200	1.50803	1.52	1.10114	1.54293	1.40	0.99767	1.55614	1.56
Yellowfin Tuna	1.95490	2.16908	1.11	3.39413	3.56500	1.05	3.34796	2.69174	0.80
Blue Marlin	0.10243	0.15975	1.56	0.12239	0.16913	1.38	0.09691	0.18657	1.93
Swordfish	0.29137	0.95867	3.29	0.24914	1.15739	4.65	0.16730	0.68335	4.08
Striped Marlin	0.09305	0.21657	2.33	0.09132	0.13439	1.47	0.05677	0.09816	1.73
Blue Shark	0.19184	1.41613	7.38	0.05151	0.11633	2.26	0.04276	0.10534	2.46
Silky Shark	0.04602	0.11467	2.49	0.03767	0.09046	2.40	0.03392	0.08579	2.53
Oceanic White-tip Shark	1.61557	10.26396	6.35	1.46067	8.33634	5.71	1.23772	6.06905	4.90
Green Turtle	0.00281	0.01268	4.51	0.00095	0.00671	7.04	0.00184	0.01220	6.63
Leatherback Turtle	0.00079	0.00546	6.90	0.00033	0.00371	11.31	0.00078	0.00740	9.53
Petrels and Puffins	0.00074	0.01206	16.26	0.00134	0.00866	6.48	0.00070	0.00759	10.80

Table 10. Average CPUE (numbers per 1,000 hooks) <u>per set</u> and CPUE standard deviation for selected species caught by longline, by year for 2013-2015, for the WCPFC Area 10°S–30°N (top) and south 10°S (bottom)

SPECIES	WCPFC Area : 10°S-30°N			CPUE (no. / 1,000 hooks) per set					
	2013			2014			2015		
	N = 7532			N = 6107			N = 3909		
	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV
Albacore Tuna	1.17007	4.25064	3.63	0.59539	4.28569	7.20	1.11295	4.36774	3.92
Bigeye Tuna	2.83492	6.55519	2.31	4.21389	9.84517	2.34	7.20504	46.26625	6.42
Yellowfin Tuna	1.49289	4.25911	2.85	1.94154	6.47400	3.33	6.69085	86.43739	12.92
Blue Marlin	0.20477	0.74165	3.62	0.19051	0.39753	2.09	0.42146	8.20099	19.46
Swordfish	0.37122	1.44300	3.89	0.75781	2.83715	3.74	0.68844	2.73495	3.97
Striped Marlin	0.15914	2.89905	18.22	0.18651	0.90519	4.85	0.28163	2.30986	8.20
Blue Shark	1.38058	8.84656	6.41	1.53700	9.28356	6.04	0.35629	3.78508	10.62
Silky Shark	0.04649	0.40586	8.73	0.03672	0.26237	7.14	0.04272	0.18278	4.28
Oceanic White-tip Shark	0.64171	1.11691	1.74	1.13484	2.08687	1.84	1.50042	2.76041	1.84
Green Turtle	0.00182	0.04117	22.63	0.00716	0.40084	55.98	0.00524	0.07441	14.21
Leatherback Turtle	0.00105	0.02480	23.69	0.00130	0.03290	25.23	0.01278	0.72525	56.77
Petrels and Puffins	0.00000	0.00000	0.00	0.00000	0.00000	0.00	0.00374	0.13168	35.18

SPECIES	WCPFC Area : South of 10°S			CPUE (no. / 1,000 hooks) per set					
	2013			2014			2015		
	N = 5483			N = 4974			N = 3319		
	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV	AVERAGE	STD DEV	CV
Albacore Tuna	8.47110	9.87132	1.17	10.32705	45.68712	4.42	8.93417	13.99626	1.57
Bigeye Tuna	0.82205	1.60099	1.95	0.96080	1.75684	1.83	1.07011	2.30027	2.15
Yellowfin Tuna	1.56750	3.61166	2.30	3.21042	42.59478	13.27	3.29245	6.18630	1.88
Blue Marlin	0.08619	0.25499	2.96	0.10648	0.28015	2.63	0.12424	0.32870	2.65
Swordfish	0.31005	1.66667	5.38	0.35012	2.48631	7.10	0.26399	1.25713	4.76
Striped Marlin	0.06850	0.25525	3.73	0.09508	1.20092	12.63	0.08929	0.74344	8.33
Blue Shark	0.15849	1.76180	11.12	0.06021	0.31565	5.24	0.04512	0.19772	4.38
Silky Shark	0.04103	0.48876	11.91	0.03206	0.16779	5.23	0.03754	0.18673	4.97
Oceanic White-tip Shark	1.70409	11.32040	6.64	2.35377	13.61844	5.79	2.24178	9.94756	4.44
Green Turtle	0.00193	0.03780	19.55	0.00067	0.01819	27.35	0.00087	0.02009	23.09
Leatherback Turtle	0.00106	0.03212	30.27	0.00014	0.00716	50.40	0.00063	0.01883	29.84
Petrels and Puffins	0.00050	0.01899	38.13	0.00089	0.02123	23.89	0.00101	0.02691	26.59