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STATUS OF OBSERVER DATA MANAGEMENT

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1. Introduction

Observer data management encompasses a number of activities that ensure the data collected by observers are made available for the work of the WCPFC in a form that is both representative and of acceptable quality. The underlying activity involved in Observer Data Management is the entry of the observer data into a standardised database system, but it also covers the many other activities described in Williams (2011) and Williams and Cole (2012).

The SPC/OFP has been processing observer data on behalf of their member countries for more than 15 years and the Seventh Regular Session of the Commission (6–10 December 2010) approved the continuation of this work in respect of the Regional Observer Programme (ROP) data in the short-medium term (Anon., 2010a, Anon., 2010b). The Ninth Regular Session of the Commission (2–6 December 2012; Anon., 2012) reconfirmed the Commission's support for ROP data processing with its inclusion in the indicative budget for the period 2013-2015.

The Pacific Island Forum Fisheries Agency (FFA) also processes observer data[2] for the US Multilateral Purse seine Treaty and these data are regularly incorporated into the ROP data submitted to the WCPFC. WCPFC members other than Pacific Island countries have also contributed to the ROP Database including Australia, Chinese Taipei, New Zealand and the USA.

The majority of the observer data processed by the SPC are ROP-defined purse seine trips[3] which are currently designated as the highest priority for processing. The WCPFC requirement for 5% observer coverage in the longline fishery was established in 2012 but as yet has not been assigned priority with respect to the purse seine observer data processing.

The SPC/OFP also processes non-ROP observer data that are, *inter alia*, of importance to the scientific work of the WCPFC and so have been included in the description of observer data management and data summaries, presented in this paper.

This paper serves to provide an update on the status of ROP data management at SPC/OFP over the past twelve months, covering the following:

- Human resources involved in observer data management at SPC/OFP
- Status of observer data entry and issues
- Achievements over the past 12 months
- Future expectations

The SC is encouraged to review the information in this paper and provide suggestions for enhancements for future WCPFC meetings, as required.

2. Human Resources for managing observer data

Over the past twelve months, the team dedicated to managing observer data has continued to stabilise, supported by the project funds provided under the WCPFC ROP Data Management project, the New Zealand-funded 'Pacific Economic Growth Observer Programme' and the New Caledonia government. The current team comprises:

[2] SPC enters the length frequency data (PS-4 forms) for these observer programmes.
[3] ROP trips do not include that part of an observer trip conducted on a vessel fishing in their home waters (waters of national jurisdiction).

- Two (2) technical staff overseeing observer data management at SPC Noumea
  - Observer Data Manager
  - Observer Data Audit Officer

- Twelve (12) observer Data Entry staff
  - One observer data registry officer at SPC Noumea;
  - Eight (8) data entry staff at SPC Noumea;
  - Four (4) data entry staff at WCPFC Secretariat offices in Pohnpei;

Staff movements over the past year include,

- The two data entry staff located at SPC Pohnpei moved to the WCPFC Secretariat offices in February 2013 and two additional staff were recruited to bring the total number of staff established at the WCPFC Secretariat to four (4). These staff members are dedicated to entering the FSM NORMA ROP data and are supported locally by WCPFC Secretariat staff but with SPC responsible for the ongoing provision of technical advice and support.
- Recruitment of two new full-time staff at SPC Noumea in June 2013 to replace staff members who resigned in late 2012/early 2013;
- Resignation of the Observer Data Manager (effective August 2013). Recruitment started in July 2013 with an expectation of having the replacement available by November 2013. The Observer Data Manager has been responsible for developing a *state-of-the-art* version of the observer database system and his resignation will leave a significant hole in the team which will hopefully be filled before the end of 2013.

In addition to the cadre of staff dedicated to observer data management, there are several other SPC/OFP staff involved in this area, including:

- Fishery Monitoring Section staff in the observer support unit (3), who are regularly called on for their knowledge and expertise in resolving issues identified in the observer data during data entry;
- Head of OFP Data Management Section, who works with the Observer data manager on strategy, priorities related to observer data management, human resources issues, preparation of ROP data for inclusion in stock assessments and related analytical work, and responding to requests for ROP data summaries from the WCPFC Secretariat;
- SPC core (non-ROP) data entry staff members have contributed, at no expense to WCPFC, approximately eight person-months during 2012 in reducing the backlog in processing ROP data.
- Fishery Monitoring Section staff who organize the printing and distribution of observer workbooks to SPC member observer programmes who are providers to the ROP.
- Fishery Monitoring and Data Management Section staff, who are involved in the provision of scanners and associated software in the offices of fisheries administrations for the electronic provision of scanned observer work books to SPC/OFP.
- OFP staff on duty travel and Pacific Island participants at regional meetings, who are used as 'mules' to ensure scanned data are brought back to SPC/OFP for processing.

SPC staff visited WCPFC offices in February 2013 to assist in the recruitment of data entry staff and help plan the establishment of the observer database system within the offices of the WCPFC. SPC staff also visited WCPFC in March 2013 to install the new observer database system and provide training to the data entry staff.

The New Zealand-funded 'Pacific Economic Growth Observer Programme' terminates in May 2014 which means the end of funding support for the two technical staff (Observer Data Manager and Observer Data Audit Officer). To reflect the full costs of the ROP data management programme, and

that funding from New Zealand will terminate in May 2014, the indicative budget for 2014 and 2015 should continue to include provision for these positions as part of the WCPFC ROP data management.

With the forecasted move to Observer E-Reporting, the Observer Data Manager position will remain a critical position for overseeing the management and dissemination of ROP data, and should therefore be strongly supported for the long term with a more permanent funding base.

3. Status of Observer data entry and issues

Table 1 shows the status of observer data entered by SPC as at 10th July 2013 and Table 2 provides an indication of the available purse-seine observer data processed by fleet. Table 3 provides an indication of the longline observer data submitted to SPC by fleet, and the approximate coverage of the data provided.

The summaries of observer data provisions presented herein are currently constrained by a number of factors, including:

i. **Accurate information on the complete number of vessel trips by gear and flag in the WCPFC Convention Area.** This information is used as the 'base' with which to determine observer coverage. For purse seine, VMS data provides the best source of information to determine vessel trips by gear and flag, but there are several issues in using VMS data for the longline gear as a basis for determining coverage, the main issue being how to deal with transhipments at sea and accessibility of complete VMS data. Ideally, the full provision of operational data would be the best source of information to determine vessel trips for the purpose of determining coverage.

ii. **Accurate information on the actual number of observer trips by observer programme, gear and flag.** At this stage, we have accurate information on the observer data received, but do not have complete information on the actual observer trips undertaken which would provide a means of better determining coverage and where we should be focussing efforts to obtain the data. Some progress has been made in the past year (see "regional observer trip list database" in Section 4 below), but there remains some work to do.

iii. **Assignment of an ROP trip in the unprocessed data.** The assignment of a trip as an ROP or a non-ROP trip (or part of a trip as ROP) can only be determined after the data have been processed since it depends on where the fishing activity occurred.

iv. **Distinction between fleets.** The breakdown of the major longline fleets (i.e. China, Chinese Taipei and Japan) into the smaller-vessel offshore versus the larger-vessel distant-water fleets, as per the annual catch estimates, has not been undertaken at this stage;

3.1 Purse seine

Observer data for an estimated 95% (1,489 trips) of observer purse seine trips conducted (but excluding those rejected by the observer programme) during 2010 have been received at SPC at the time of writing this paper. SPC has also received observer data for an estimated 90% (1,391 trips) of purse seine trips undertaken in 2011, and an estimated 69% (1,103 trips) of trips undertaken in 2012 have been received (not considering those rejected by the observer programme).

SPC has insisted that the observer trip data rejected by the observer programmes still be submitted to ensure all observer trip data are available, and that the problems encountered can be reviewed and referred to in future training, debriefing and data quality control procedures.

A total of 91% (1,277 trips) of the observer data received at SPC for 2010 observer activities have now been entered (excluding the trips awaiting resolution at SPC). A total of 88% (1,114 trips) of observer data received at SPC for 2011 activities have now been entered (excluding the trips awaiting resolution at SPC). A total of 52% (547 trips) of observer data received at SPC for 2012 activities have now been entered (excluding the trips awaiting resolution at SPC).

The 'problematic' trip data held at SPC awaiting resolution are mainly due to (i) incomplete or poor quality scanned data submissions, or (ii) issues in the data which result in the trip being set aside pending further information/review all of which prevent the trip data being entered. More stringent procedures, new scanning software and equipment have resulted in an improvement in the quality of scans (and less problems) over the past year. For the data received at SPC, more than half the problematic data reported last year for 2010 have now been resolved. That is, only 6% (78 trips) of those received for 2010 activities are still awaiting rescans of data, 8% (125 trips) of those received for 2011, and 3% (46 trips) of those received in 2012 have problems that need to be resolved before the data are ready for entry.

The breakdown of processed purse-seine observer data by fleet (Table 2) shows that the coverage for the main purse seine fleets is generally better than 80% of data received for 2010 and 2011, but priority in processing 2012 observer data for the following major fleets could be improved to provide more representative information (Chinese Taipei, PNG, Philippines and Korea).

3.2 Longline

The available information on longline observer data (Table 3) is provisional and is constrained by the several issues, some of which are listed above. At this stage, it is only been possible to present longline observer summaries of data PROVIDED to SPC, and not the longline observer trips CONDUCTED due to the lack of information.

Nonetheless, as this is the first time it has been presented, Table 3 shows that some domestic-based longline fleets (not bound by ROP coverage rates) are achieving coverage better than 5%, but that some of the major longline fleets will require a significant number of observer trips to achieve the ROP target coverage of 5%.

3.3 Future improvements to summaries of observer data

The current summaries (Tables 1-3) fall short of providing an indication of observer coverage, particularly for the longline gear. The following are some suggestions for improving the information which is aimed at providing more summaries in the future:

i. **The mandatory requirement to provide the following essential information (i.e. vessel, flag, departure date, return date, observer programme) for the observer trips CONDUCTED by the observer provider as soon as possible after the trip has been conducted.** For those countries supported by SPC, the addition of observer code and trip number would also be required. This information, if complete, would ensure more accurate summaries of observer coverage can be provided;
ii. A decision on how to define and treat the longline trips which terminate with a transhipment at sea;
iii. For longline trips, a review of VMS data to determine whether it is possible to define an ROP trip before the observer data have been processed.

4. Achievements over the past twelve months

The work related to observer data achieved over the past twelve months includes,

- The new web-based observer database system (TUBs) has been used to process purse-seine observer data at SPC offices since January 2013. This system continues to be enhanced to support the latest version of data entry forms, new reports and initial work to support the integration with the new Information Management Systems (IMS) established throughout the region.
- The latest web-based TUBs Observer database system replaced the old TUBs system installed in the offices of Papua New Guinea National Fisheries Authority (NFA) during a visit in the 4th quarter 2012 with training provided. An audit of the data entered by PNG/NFA will be conducted in late 2013.
- The latest web-based TUBs Observer system was also installed in the offices of Solomon Islands Fisheries (Ministry of Fisheries and Marine Resources) and at the Forum Fisheries Agency (FFA), where it is used to process observer data collected from trips on US purse seine vessels.
- The observer data quality control system was enhanced over the past year, including the following work:
    - Continued auditing of data migrated from FOXPRO system to the new TUBS SQLServer based system;
    - Brief audit on Solomon Islands TUBS data which was on a trial basis and will be extended to FMOB, PGOB and FFA data;
    - Provision of observer data quality reports to some of the member countries for observer performance appraisal and training purposes;
    - Liaise with FFA to incorporate Observer Debriefing Database System into their regional IMS portal;
    - Ongoing management of the observer trips master list for data tracking and reporting purposes especially observer data coverage.
- The Observer Debriefing Database System was enhanced during the past twelve months and is now integrated into the Regional and national IMS systems installed at FFA and in several Pacific Islands countries. This system will be used by Observer Debriefers to, *inter alia*, enter the observer debriefing form data and provide reports highlighting problem areas which will in turn inform the process of enhancing data collection forms and identify key areas for re-training.
- The regional observer trip list database has been enhanced and populated with ALL purse seine trips conducted for some observer providers (regardless of whether data have been provided or not), but there is still some work to do to get the complete list from other observer providers. This database is used to estimate the amount of data not yet provided and identifying trips where data have been rejected by the national programme.

Another significant development over the past twelve months was the deployment of the FFA-developed Observer Placement Management System (OPM) by FFA technical staff into the offices of several of their member countries; this system is designed to facilitate the placement of observers from national and subregional observer programmes and centralise the base observer trip information in one area.

5. Future expectations

The data entry staff required to enter the significant increase in observer data collected throughout the region since January 2010 is now at full complement. The backlog of purse-seine observer data entry has improved but will need additional staff to completely remove it. There is also a backlog in the provision and processing of observer data from the longline fishery due to increase activity with the implementation of 5% observer coverage and the higher priority assigned to the processing of purse seine observer data.

The TUBs Observer database will continue to be deployed in the offices of Pacific Island member countries in the next few years with the burden for data processing at SPC and the WCPFC offices reducing over time.

SPC is currently conducting E-Reporting trials with FSM NORMA (and in conjunction with the I^2FISH group) which will continue and expand to other countries in the coming years. The trial involves three observers entering their observer data on-board purse-seine vessels using the TUBs Database system installed on laptops. For more information on this initiative, see http://www.spc.int/oceanfish/en/ofpsection/data-management/spc-members/e-reporting.

Potential E-Reporting and E-Monitoring solutions for observer data collection will continue to be trialled and large-scale implementation in the purse seine fishery, for example, could occur within the next few years. This development is envisaged to result in a change from the provision of support for on-shore data processing to the provision of training and technical support to observer programmes for the on-board TUBs system, and post-trip data management and quality control (auditing).

SPC will continue to work closely with the WCPFC Secretariat over the coming year on the following areas:

- The collaborative study on E-Reporting and E-Monitoring which aims to provide the most appropriate framework to improve, *inter alia*, observer data collection and management in the future;
- Continued support for the WCFPC ROP data entry;
- Continued provision of ROP data to the WCPFC on a regular basis;
- Satisfying WCPFC requirements for ROP data reports mainly aligned to their requirements for CMM monitoring.

SPC will also continue to work with the Pacific Islands Forum Fisheries Agency (FFA) and the PNA office to improve efficiencies in observer data management, particularly since the TUBs system has now been adopted as the regional standard in FFA/PNA member countries.

6. References

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Tables

Table 1. Summary of the provision and processing of Purse seine Observer data

YEAR	1. Estimated TRIPS undertaken	2. TRIPS Rejected by country	3. TRIPS available for data entry	4. TRIPS received at SPC		5. TRIPS entered at SPC			6. Problems awaiting resolution at SPC			7. TRIPS not yet sent by Obsv. Progs.	
				Trips	%	Trips	% of total available trips	% of trips received without problems	Trips	% of total available trips	% of received	Trips	% of total
2010	1,865	299	1,566	1,489	95%	1,277	82%	91%	78	5%	6%	77	5%
2011	1,951	403	1,548	1,391	90%	1,114	72%	88%	125	8%	11%	157	10%
2012	1,814	226	1,588	1,103	69%	547	34%	52%	46	3%	8%	485	31%

Notes

1. Estimated trips determined from VMS data. These trips exclude the Philippines and Indonesian domestic fisheries, purse seine trips undertaken completely outside the tropical waters (20°N-20°S).
2. In some instances, trips identified in the VMS data where no fishing actually took place (e.g. returning to home port in Asia for annual maintenance) may have been included in the "Estimated" trips.
3. There remain some trips which do not yet have the length frequency data received/entered (PS-4 forms).
4. "Trips rejected by country" for 2012 may include trips which have not been provided.

Table 2. Summary of Purse seine Observer data received at SPC, by year and flag

2010 Observer Trips			
Flag	Trip data RECEIVED at SPC without problems	Trip data ENTERED at SPC	%
China	58	52	90%
Chinese Taipei	172	139	81%
Ecuador	16	16	100%
El Salvador	6	6	100%
FSM	37	37	100%
Japan	211	154	73%
Kiribati	15	15	100%
Marshall Is.	59	53	90%
New Zealand	4	4	100%
PNG	222	209	94%
Philippines	82	80	98%
Korea	217	202	93%
Solomon Islands	4	4	100%
Spain	16	16	100%
Tuvalu	11	11	100%
USA	256	255	100%
Vanuatu	25	24	96%
Total	1,411	1,277	91%

2011 Observer Trips			
Flag	Trip data RECEIVED at SPC without problems	Trip data ENTERED at SPC	%
China	47	38	81%
Chinese Taipei	161	125	78%
Ecuador	17	17	100%
El Salvador	6	6	100%
FSM	41	37	90%
Japan	150	129	86%
Kiribati	22	22	100%
Marshall Is.	65	58	89%
New Zealand	6	5	83%
PNG	219	200	91%
Philippines	116	91	78%
Korea	151	128	85%
Solomon Islands	12	7	58%
Spain	4	4	100%
Tuvalu	2	2	100%
USA	226	225	100%
Vanuatu	21	20	95%
Total	1,266	1,114	88%

2012 Observer Trips			
Flag	Trip data RECEIVED at SPC without problems	Trip data ENTERED at SPC	%
China	33	19	58%
Chinese Taipei	137	64	47%
Ecuador	5	5	100%
El Salvador	0	0	0%
FSM	29	29	100%
Japan	134	70	52%
Kiribati	28	21	75%
Marshall Is.	45	25	56%
New Zealand	4	3	75%
PNG	225	71	32%
Philippines	96	32	33%
Korea	126	50	40%
Solomon Islands	27	9	33%
Spain	2	0	0%
Tuvalu	5	5	100%
USA	148	139	94%
Vanuatu	14	5	36%
Total	1,058	547	52%

Notes

1. Complete, accurate indication of purse seine OBSERVER trips CONDUCTED by FLAG is currently not possible.

Table 2. Summary of Longline Observer data received at SPC, by year and flag

Flag	2011 OBSERVER DATA						2012 OBSERVER DATA					
	Estimated ROP TRIPS			Estimated non-ROP TRIPS			Estimated ROP TRIPS			Estimated non-ROP TRIPS		
	Total Estimated	RECEIVED at SPC	%	Total Estimated	RECEIVED at SPC	%	Total Estimated	RECEIVED at SPC	%	Total Estimated	RECEIVED at SPC	%
Australia				442	0	0%				438	0	0%
Belize	6	0	0%				2	0	0%			
Cook Islands				170	15	9%				98	2	2%
China	1252	1	0%				1429	4	0%			
Chinese Taipei	1563	38	2%				1481	22	1%			
Fiji				919	29	3%				824	3	0%
FSM				253	0	0%				280	7	3%
Indonesia	9	0	0%				16	0	0%			
Japan	905	5	1%				873	5	1%			
Kiribati				18	1	6%				19	0	0%
Korea	230	2	1%				254	5	2%			
Marshall Islands				56	0	0%				62	0	0%
New Caledonia				340	22	6%				324	22	7%
New Zealand				276	17	6%				263	15	6%
French Polynesia				600	34	6%				665	41	6%
PNG				100	8	8%				107	8	7%
Philippines	6	0	0%				3	0	0%			
Samoa				102	1	1%				161	0	0%
Spain	18	0	0%				19	0	0%			
Tonga				67	0	0%				30	2	7%
Tuvalu				20	0	0%				35	0	0%
USA	*??*	*0*	*??*	*??*	*??*	*??*	*222*	222	100%	*??*	*0*	*??*
Vanuatu				289	37	13%				406	3	1%
Vietnam				*??*	14	*??*				*??*	0	*??*
	3,989	46	1%	3,210	164	5%	4,299	258	6%	3,274	103	3%

Notes

1. Estimated trips determined from VMS and raised logbook data and represent the best information at hand. It assumes that a trip is defined as the time between a port departure and port return. This definition does NOT take into account transhipment at sea which would normally terminate a trip (it is not possible to determine this definition of a trip at this stage).
2. At this stage, the "Estimated non-ROP trips" assume that the domestic fleet listed fishes exclusively within their waters of national jurisdiction. This may not be the case in some instances and will be refined in future versions of this table.
3. Estimates of some trips (e.g. US and Vietnam trips in their waters of national jurisdiction) are currently not available.
4. Some domestic fleets fishing entirely in their national waters have not been listed in this table (e.g. the Japanese Coastal, the Indonesian domestic) since (i) estimates trips are not available and (ii) these trips would not be defined as ROP trips.