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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).

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 Pacific Island Forum Fisheries Agency (FFA) also processes observer data² for the US Multilateral Purse seine Treaty and the FSM Arrangement and these data are regularly incorporated into the ROP data submitted to the WCPFC.

The majority of the observer data processed by the SPC are ROP-defined purse seine trips³ which are currently designated as the highest priority for 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
- Current issues with observer data management
- Initiatives for distributing observer data processing
- 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 stabilised with continued project funds provided under the WCPFC ROP Data Management project, the New Zealand-funded 'Pacific Economic Growth Observer Programme' and the New Caledonian government. The current team comprises:

- Two (2) technical staff overseeing observer data management
 - Observer Data Manager
 - Observer Data Audit Officer
- Twelve (12) observer Data Entry staff
 - One observer data registry officer at SPC Noumea;
 - Nine (9) data entry staff at SPC Noumea;
 - Two (2) data entry staff at SPC Pohnpei;

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).

Staff movements over the past year include,

- Recruitment of two new staff at SPC Pohnpei, following the resignations of the staff originally employed in June 2011;
- Recruitment of two new full-time staff at SPC Noumea in March/April 2012 to replace one staff member who resigned in December 2011, and another whose contract was not renewed in April 2012;
- Recruitment of one staff at SPC Noumea on a short-term contract from February-May 2012;
- Commencement of one volunteer data entry staff at SPC Noumea for a period of three months (July-September 2012).

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 2011 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 observer data entry staff are required to successfully complete selected modules (1-2 weeks training) of the PIRFO observer training course to understand the tuna fisheries and the data collected by observers. The four new data entry recruits at SPC Noumea undertook the course in early 2012. Over the past six months, the new data entry staff based at SPC Pohnpei have undertaken basic training in observer work provided by the WCPFC Secretariat Observer Coordinator and the OFP Observer Training Officer based in Pohnpei.

After an initial familiarisation period and training, the newly recruited data entry staff members have attained the target rate of data entry assigned to cover the rate of incoming data.

In May 2012, an informal decision was made to relocate the ROP data entry staff from SPC Pohnpei offices to the WCPFC Secretariat offices. Pending formal approval by the Commission at the December 2012 regular session, this move would occur on January 1st 2013 with the current staff members moving from SPC contracts to WCFPC contracts and the expectation of recruiting a further two staff members at some stage during early 2013. SPC will facilitate the move in collaboration with the WCPFC Secretariat which will include the installation of the new data entry software and training.

3. Status of Observer data entry and issues

Table 1 shows the status of observer data entered by SPC as at 10th July 2012. Tables 2 and 3 provide an indication of the breakdown of observer data processed by observer programme and by purse seine fleet, respectively. Figure 1 provides a visual impression of the amount of observer data collected and processed in the tropical WCPFC purse seine fishery in one year under the CMM requirements for 100% observer coverage.

Observer data for an estimated 79% (1,367 trips) of all observer purse seine trips conducted during 2010 have been received at SPC at the time of writing this paper. Observer data for an estimated 56% (1,009 trips) of trips undertaken in 2011 have also been received. For the data received at SPC, 12% (167 trips) of those received for 2010 activities, and 8% (77 trips) of those received for 2011, have problems that need to be resolved before the data are ready for entry.

A total of 97% (1,160 trips) of the observer data received at SPC for 2010 observer activities have now been entered (excluding the problematic trips). A total of 62% (575 trips) of observer data received at SPC for 2011 activities have now been entered (excluding the problematic trips).

The 'problematic' trip data held at SPC are mainly due to incomplete or poor quality scanned data submissions which prevent the trip data being entered. Most of these problems are being resolved with the distribution of new scanning software, a user manual, a secure FTP site that automatically transfer scanned data overnight to SPC and more stringent procedures for managing the scanning process. A process of identifying the need to rescan observer trip data has been implemented at SPC and resubmissions of the scanned data are requested from national programmes and the trip data entry can continue once the new scans have been received.

It is understood that some of the data not yet submitted to SPC (23% for 2010 and 41% for 2011) have been rejected by the national programme for one reason or another (incomplete or bad quality). The extent of the rejected trips is not yet known, and SPC is working with national and sub-regional observer programmes to document the extent of data rejected by the observer programme, including recommendations for the provision of these data to SPC, even if they are not to be entered.

4. Achievements over the past twelve months

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

- Since January 2012, the new Observer database system (TUBs) has been used to process ROP observer data at SPC offices. 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 TUBs Observer database system was installed in the offices of Papua New Guinea National Fisheries Authority (NFA) in May 2012 with training provided. Trial data entry is currently being undertaken, with expectation of 1-2 follow-up visits in the second half of 2012, including a visit to audit the data entered by PNG/NFA;
- A new observer reporting system, TUBS Viewer, was developed. This system is web-based and provides summary reports of observer data which will be made available to the WCPFC Secretariat and national and subregional observer programmes in the coming year;
- A new observer data quality control system was implemented at SPC in March 2012. This system operates like an electronic "help-desk" and facilitates the resolution of issues that

arise during the data entry process and also the compilation and reporting of problem categories which are subsequently reviewed by the observer debriefing and training staff to identify areas that need more focus in training.

- A new Observer Debriefing Database System was developed and established during the past twelve months. 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.
- A global observer trip list database was established. This database is planned to contain all of the trips conducted throughout the region, regardless of whether data have been provided or not. This database will assist in estimating the amount of data not yet provided and identifying trips where data have been rejected by the national programme.

5. Initiatives for distributing observer data processing

In addition to increasing resources for processing observer data over the past two years and six months (refer to Section 2 above), the following initiatives for trialling the distribution of observer data processing were undertaken in the past twelve months:

- The SPC-developed TUBs Observer database system has now been installed on a trial basis in the Marshall Islands (2010), the Philippines Bureau of Fisheries and Aquatic Resources (BFAR) (2011) and in the offices of PNG/NFA (2012). The latest version of TUBs is now stable and will potentially be available for additional trial sites in country fisheries offices in the coming year. At this stage, the schedule for installation is Fiji (late 2012/early 2013) and Cook Islands (late 2012/early 2013). The quality and coverage of data entered will be closely monitored in all TUBs sites over the coming year;
- The initiative to trial on-board observer data entry which commenced in 2011 with a trip by an FSM NORMA observer will continue in late 2012. The availability of “tablets” that support the WINDOWS operating system will mean that the TUBs observer database management system will be potentially operational with minimal modifications. The TUBs system will ensure the necessary level of data quality with referential integrity and validation checks already established in the system. It is expected that cosmetic changes to the screens to suit the tablet will be required to make the system easier to use. It is envisaged that later versions of “TUBs for tablets” should consider the integration with GPS units to automatically generate position and date/time data for storage in the databases.
- Another initiative currently being trialled is the use of voice recognition software to record the length frequency data collected by observers. This type of initiative is well established in other domains, such as on-line banking, stocktaking /inventory applications. In a very short time, SPC has developed an application to suit the recording of purse seine observer length frequency data using voice recognition. The benefits of this type of data collection include:
 - “Hands-free” – it allows the observer / port sampler to measure fish without having put down callipers and write on a form;
 - More efficient – Observer length data collection and entry are currently the most time-consuming due to the volume of data involved;
 - Off-the-shelf equipment (i.e. no need to develop customised hardware/equipment)
 - Software easy to develop, customise and maintain (e.g. easy to implement validation checks)
 - Flexible – different combinations of voice and audio feedback for validation can be used;
 - Always have voice recording as a backup which can be linked to the digitised data (Debriefing and data quality issue)

6. Future expectations

The data entry staff required to enter the significant increase in observer data collected throughout the region since January 2010 is near full complement with the addition of two additional staff at WCPFC Secretariat expected in early 2013. Some of the backlog of observer data entry will continue to be addressed through the core SPC data entry staff (i.e. those staff not recruited for ROP data entry) where possible. At this stage, the additional data entry burden that the implementation of 5% observer coverage in the longline fishery (January 2013) will bring has not yet been factored in.

SPC data management staff, including those not dedicated to observer data management, will continue to investigate options for distributing observer data entry in the coming years to the extent that resources (human and financial) are available, noting that on-site support in national programmes, comprising an experienced observer coordinator and technical database person, is an essential requirement for these initiatives.

With the gradual installation of the TUBs Observer database in the offices of Pacific Island member countries in the next 3-4 years, the burden for data processing at SPC will reduce, although work in areas such as training, the data quality control and importing data into the main ROP database is expected to significantly increase. The potential implementation of electronic recording of observer data in the coming years will also reduce the burden on data processing at SPC, although resources (e.g. funding and human resources) for recurrent equipment costs, ongoing training and technical support will be substantial and should not be underestimated.

It is hoped that the problems in scanning and transmitting observer data to SPC/OFP and the WCPFC Secretariat (ROP data only) will continue to improve over the coming year.

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

- Continued provision of ROP data on a regular basis and training in accessing the ROP data using current Observer Trip Viewer tool;
- Meeting with WCPFC Secretariat to get their requirements for building a comprehensive reporting system for ROP data, mainly aligned to their requirements for CMM monitoring;
- Facilitate the move of Pohnpei ROP data entry staff from SPC Pohnpei to WCPFC Secretariat offices, including training, and the recruitment of additional staff;

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, including the potential adoption of the TUBs system as the regional standard.

7. References

- Anonymous. 2010a. Report of the Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Anonymous. 2010b. Annual Report to the Commission – Regional Observer Programme. Meeting Document WCPFC7-2010/26. Seventh Regular Session of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC7). 7–11 December 2010, Honolulu, Hawaii, USA. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Williams, P.G. 2011. Status of Observer data management. Information Paper SC7 ST IP–6. Seventh Regular Session of the WCPFC Scientific Committee (SC7), 9–17 August 2011, Pohnpei, FSM. Oceanic Fisheries Programme, Secretariat of the Pacific Community, Noumea, New Caledonia.

Tables and Figures

Table 1. Purse seine ROP Observer data

| YEAR | Estimated trips undertaken | Data received at SPC | | Data entered at SPC | | | Problems awaiting resolution at SPC ² | | | Data not yet sent from Obsv. Progs. | |
|------|----------------------------|----------------------|-----|---------------------|----------------------------|--------------------------------|--|----------------------------|---------------|-------------------------------------|------------|
| | | Trips | % | Trips | % of total estimated trips | % of received without problems | Trips | % of total estimated trips | % of received | Trips | % of total |
| 2010 | 1,739 | 1,367 | 79% | 1,160 | 67% | 97% | 167 | 10% | 12% | 372 | 21% |
| 2011 | 1,810 | 1,009 | 56% | 575 | 32% | 62% | 77 | 4% | 8% | 801 | 44% |

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) and trips by fleets completely in their waters of national jurisdiction (i.e. non-ROP trips).
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).

Table 2. Provisional purse-seine observer trips undertaken in 2010 (left) and 2011 (right), by major observer programme

| 2010 Observer Trips | | | | | | 2011 Observer Trips | | | | | |
|---------------------|------------------------------|---------------------------|------------|----------------------------|------------|---------------------|------------------------------|---------------------------|------------|----------------------------|------------|
| Observer Programme | (Estimated) Trips undertaken | Trip data received at SPC | % | Trip data not yet received | % | Observer Programme | (Estimated) Trips undertaken | Trip data received at SPC | % | Trip data not yet received | % |
| FSM | 373 | 206 | 55% | 167 | 45% | FSM | 355 | 145 | 41% | 210 | 59% |
| Kiribati | 200 | 109 | 55% | 91 | 46% | Kiribati | 150 | 44 | 29% | 106 | 71% |
| RMI | 82 | 59 | 72% | 23 | 28% | RMI | 80 | 21 | 26% | 59 | 74% |
| Nauru | 6 | 6 | 100% | 0 | 0% | Nauru | 5 | 5 | 100% | 0 | 0% |
| PNG | 387 | 385 | 99% | 2 | 1% | PNG | 642 | 370 | 58% | 272 | 42% |
| Solomons | 233 | 187 | 80% | 46 | 20% | Solomons | 160 | 89 | 56% | 71 | 44% |
| US MLT | 274 | 238 | 87% | 36 | 13% | US MLT | 238 | 189 | 79% | 49 | 21% |
| FSM Arr. | 184 | 177 | 96% | 7 | 4% | FSM Arr. | 180 | 146 | 81% | 34 | 19% |
| Total | 1,739 | 1,367 | 79% | 372 | 21% | Total | 1,810 | 1,009 | 56% | 801 | 44% |

Notes

1. Estimated trips includes non-ROP trips
2. Values in red are approximate number of trips determined from anecdotal information.
3. Most of the US MLT and FSM Arrangement data for 2011 have only been received recently and have not yet been imported into the main database.
4. Some of the FSM Arrangement trips may be counted in the national programme trips and the FSM Arrangement trips may not account for those FSM Arrangement vessels covered under the Regional Arrangement (RA) between RMI and FSM, for example.

Table 3. Estimated purse-seine vessel trips and trip data received at SPC, by flag, for 2010 (left) and 2011 (right)

| 2010 Observer Trips | | | |
|---------------------|-----------------|---------------------------|------------|
| Flag | Estimated Trips | Trip data received at SPC | % |
| China | 76 | 47 | 62% |
| Chinese Taipei | 276 | 160 | 58% |
| Ecuador | 43 | 11 | 26% |
| El Salvador | 10 | 6 | 60% |
| FSM | 47 | 37 | 79% |
| Japan | 269 | 204 | 76% |
| Kiribati | 23 | 18 | 78% |
| Korea | 302 | 225 | 75% |
| Marshall Is. | 66 | 39 | 59% |
| New Zealand | 25 | 3 | 12% |
| PNG | 250 | 245 | 98% |
| Philippines | 90 | 86 | 96% |
| Solomon Islands | 21 | 4 | 19% |
| Spain | 25 | 15 | 60% |
| Tuvalu | 12 | 12 | 100% |
| USA | 274 | 239 | 87% |
| Vanuatu | 21 | 16 | 76% |
| Total | 1,830 | 1,367 | 75% |

| 2011 Observer Trips | | | |
|---------------------|-----------------|---------------------------|------------|
| Flag | Estimated Trips | Trip data received at SPC | % |
| China | 80 | 41 | 51% |
| Chinese Taipei | 260 | 113 | 43% |
| Ecuador | 51 | 13 | 25% |
| El Salvador | 16 | 7 | 44% |
| FSM | 55 | 33 | 60% |
| Japan | 272 | 121 | 44% |
| Kiribati | 56 | 12 | 21% |
| Korea | 264 | 117 | 44% |
| Marshall Is. | 93 | 64 | 69% |
| New Zealand | 23 | 1 | 4% |
| PNG | 196 | 186 | 95% |
| Philippines | 105 | 97 | 92% |
| Solomon Islands | 25 | 5 | 20% |
| Spain | 32 | 0 | 0% |
| Tuvalu | 6 | 1 | 17% |
| USA | 248 | 189 | 76% |
| Vanuatu | 28 | 9 | 32% |
| Total | 1,810 | 1,009 | 56% |

Notes

1. "Estimated trips" are provisional and based on the best combination of available logsheet and VMS data for the WCPFC Convention Area. These values exclude the domestic fisheries of the Philippines and Indonesia and domestic fleets based exclusively in PNG and the Solomon Islands waters.
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. Comparison of 2010 trips above and Tables 1 and 2 suggest there were some vessel trips without an observer. Further investigation is required.
4. "Obs. Trips" represent the observer data provided to SPC as at 15th July 2012, although a number of these trips are not yet be processed (see Tables 1 and 2).



Figure 1. The amount of purse seine observer data collected in the tropical WCPFC fishery in one year under the CMM requirements for 100% observer coverage.