



# Report on the First Tuna Data Workshop (TDW-1)

23<sup>rd</sup> – 27<sup>th</sup> October 2006  
SPC Headquarters  
Noumea  
New Caledonia



## **In Memorandum**

This report is dedicated to Barre Karre.  
*(Former Licensing and Information Executive Manager,  
PNG).*

We recognise the positive contributions Barre made  
to this workshop, especially in the final session,  
'Workshop Recommendations'.

Barre passed away in January 2007.  
May he rest in Peace.

Report on the First Tuna Data Workshop

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*With special appreciation to the staff at SPC who played a major role in the background administration of the workshop especially Kay Parry, Helene Ixeko, Sylvie Sirot, Stephanie Chuvand, Christine Nguyen, Sonja Savea and Nathalie Lenormand.*

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# 1. Background

## 1.1 Introduction

The Oceanic Fisheries Programme (OFP) of the Secretariat of the Pacific Community (SPC) hosted the First Tuna Data Workshop (TDW-1) for National Tuna Data Coordinators from Pacific Island Countries and Territories, at SPC headquarters in Noumea, New Caledonia, 23<sup>rd</sup>–27<sup>th</sup> of October 2006. The following sections provide background information to explain why there was a need for such a workshop. Subsequent sections will outline the workshop design, content and outcomes.

## 1.2 The Oceanic Fisheries Management Project

The Scientific Assessment and Monitoring Enhancement Component is one element of the Global Environment Facility's (GEF) much larger Oceanic Fisheries Management Project (OFMP). That project is funded by GEF with the United Nations Development Fund assuming the role of Implementing Agency. The project is being executed by the Fisheries Forum Agency (FFA) in partnership with the SPC and the International Union for the Conservation of Nature (IUCN).

The OFMP has two overarching objectives:

1. **Information and Knowledge** – to improve the understanding of the transboundary oceanic fish resources and related features of the Western and Central Pacific Ocean (WCPO) Warm Pool Large Marine Ecosystem; and
2. **Governance** – to create regional institutional arrangements, and reform, realign and strengthen national arrangements for the conservation and management of transboundary oceanic fishery resources.

The OFMP was instigated through the combined initiative of 15 governments within the WCPO region (Figure 1); Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu and Vanuatu.

Component 1, the Scientific Assessment and Monitoring Enhancement Component is aimed at providing improved scientific information and knowledge on the oceanic transboundary fish stocks and related ecosystem aspects of the Western Tropical Pacific Warm Pool Large Marine Ecosystem and at strengthening the national capacities of the Pacific Small Island Developing States (SIDS) in these areas.

For a long time, these countries (along with other Pacific Island Countries and Territories - PICTs) have recognized that they are collectively the custodians of one of the largest marine ecosystems in the world (the warm pool large marine ecosystem – LME – Figure 1b), within which resides the world's largest tuna resource. Approximately one half of the world's total tuna catch is taken from this region, with catches consistently increasing over the past three decades (Figure 1c) and surpassing 2 million tonnes per annum in recent years.

For some time these countries have had concerns over the sustainability of this resource which represents one of the only significant natural resources in the region and which is one of the most economically important resources for these countries. Most PICTs are characterised as developing countries with limited resources and for some, tuna fishing access fees constitute as much as 40% of total government revenue. The long term economic and social aspirations of many of these countries rely heavily on the long term sustainability of the tuna resource.



**Figure 1 – The Western and Central Pacific Fisheries Commission Convention Area and the approximate EEZ boundaries of Pacific Island Countries and Territories.**

### **1.3 Data-reporting Obligations to the WCPFC**

The main impetus for convening the First Tuna Data Workshop (TDW-1) relates to the establishment of the Western Central Pacific Fisheries Commission (WCPFC) in 2003 and the obligation for members and cooperating non-members of the Commission (CCMs) to provide tuna fishery data on annual basis, as specified in the Convention (FFA, 2004).

References to Tuna Fishery data provisions in respect of the Commission include:

- Appendix VII (of this report) contains the data-related provisions extracted from the WCPFC Convention (FFA, 2004).
- Recommendations SC1–ST–1 and SC1–ST–2 in Annex 7 of Anon (2005a) describes the details of scientific data to be provided to the Commission, at this stage. It should be noted that the details of provision of several types of data to the Commission have yet to be considered. These data include, Observer data, Port sampling data, Unloadings data and Gear and Vessel attributes data;
- Attachment D of Anon (2005b) provides guidelines for annual reporting to the Commission’s Scientific Committee (SC) and the Technical and Compliance Committee (TCC).

## 2. Objectives

Sub-component 1.1 ‘Fishery Monitoring, Coordination and Enhancement’ of the GEF project was designed to improve and develop Pacific SIDS ability to monitor the scientific aspects of their oceanic fisheries activities. While many of these countries do have monitoring programmes in place, not all are currently able to provide data in the quantity and quality required by the Commission.

A major objective of this GEF sub-component is to establish a data template which when properly adhered to by countries will ensure they meet their monitoring objectives. It is expected that this data template will evolve over time, along with the Commission data requirements and therefore there will be a continuous need to inform, distribute, up-date and gain feedback from countries regarding this data template. This will be done through workshops, in-country visits and short attachments at SPC. TDW-1 was the first workshop with these ideals in mind.

Specific objectives of the workshop were identified as -

- Describe Tuna Fishery Data Collection, Management and Dissemination systems
- “Share experiences” in the collection, management and dissemination of tuna fishery data
- Introduce the concept of the “Regional Template” on Data Collection, Management and Dissemination
- Establish the “National Procedures” document on Data Collection, Management and Dissemination

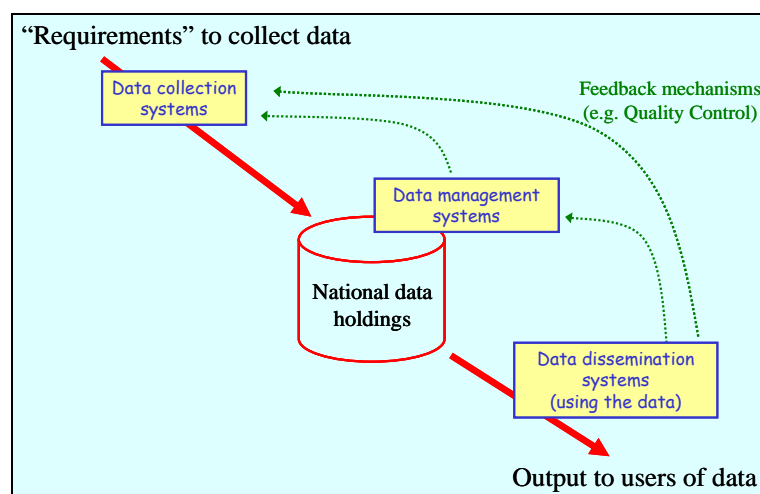


Figure 2. Simplistic diagram showing the relationships between Data collection, management and dissemination systems

## 3. Workshop Design

### 3.1 Regional Tuna Data Template Document and National Procedures Document

The ‘Regional Tuna Data Template Document’ broadly outlines the best practices for establishing and maintaining procedures which will support in-country tuna data

systems. The document includes specific guidelines to help countries put together a 'National Tuna Data Procedures Document' through which they can show that they have both reflected on and put in place each of the components of a comprehensive tuna data system. These national documents will furthermore serve as resource material for statistics staff who wish to improve their understanding about their countries tuna data system as well as their individual tasks and responsibilities to the system. The 'National Tuna Data Coordinator' from each country will be the main author of these national documents; however SPC will also contribute to the document during in-country visits and attachment training. The workshop was an opportunity to inaugurate these documents. Also, a number of the exercises were carried out in a manner so that the outputs could feed straight into certain sections of the 'National Tuna Data Procedures Documents'.

### **3.2 Workshop Structure**

One of the main problems faced in designing the workshop was in catering for the different levels of experience and diversity in work background amongst the participants. Some participants were new-comers to tuna fisheries while others had a number of years experience and therefore possessed a greater depth of knowledge that could be drawn on during the workshop. There was also the need to present the basic concepts used in tuna fishery data collection, management and dissemination systems and this could only be done with formal presentations.

The workshop was therefore structured along the following lines, bearing in mind the need to satisfy the objectives of the workshop –

- Each session was introduced with a presentation covering the main points of the topic for that session. Where relevant, the theory and main requirements with respect to that topic were covered in the presentation, with examples taken from experiences in the region's tuna fishery data systems. Presentations were put together to ensure they did not exceed 30 minutes and therefore avoid the one-way involvement of facilitators;
- After most presentations, there was a short period allocated for questions/comments in plenary;
- After some presentations, participants were asked to break-out into one of five groups to undertake an exercise related to the session. The aim of the group sessions was not only to complete the exercise, but by discussing experiences within each country, participants were able to learn what was happening elsewhere in the region, relate problems in their own country with what was happening elsewhere, and gain an appreciation of how other countries dealt with these problems. The exercises were designed so that the outcomes could be formalized for dissemination, but also, the discussion provided improved knowledge to participants. The facilitators moved around the groups to ensure the objectives of the exercise were clear and they also provided background/experiences from a regional point of view. The make-up of the groups was undertaken prior to the meeting and was done in such a way that experienced participants were mixed with in-experienced participants and participants with similar fisheries (e.g. purse seine fisheries) were grouped together. After most group sessions, the workshop would briefly reconvene in plenary to discuss the main outcomes of the discussions.

- In addition to the group sessions, after most presentations, participants were required to undertake an individual (country) exercise, designed so that the results would feed directly into the National Procedures Documents.
- Three sessions (two afternoons and one morning) were set aside for participants to update the National Procedures Documents with information provided in the Regional Template, presentations and from the exercises.
- A CD containing the workshop documents (including the Regional Template Document), the workshop presentations and exercises, and the regional standard data collection forms was provided to each participant at the close of the meeting.

## 4. Workshop Content

The workshop was structured into sessions dealing the “WHY”, “WHAT” and “HOW” of tuna fishery data collection, best practices in managing data, and finally, an introduction to disseminating tuna fishery data. The detail of presentations made and exercises undertaken in each session are available in several MS Powerpoint (PPT) and MS Word files on CDs provided to each participant. The agenda of the Workshop can be found in Appendix I and the list of participants can be found in Appendix II. The consolidated outcomes of key exercises undertaken by participants have been included in APPENDICES III–V.

The following sections provide a brief summary of each session, including the significant issues raised during discussions.

### 4.1 Why Collect Data ?

This session dealt with the reasons for collecting tuna fishery data and was addressed by two main presentations on the following topics :

- Data obligations to the WCPFC
  - [TDW-1 (P2.1) Data obligations to the WCPFC.ppt]
  - [TDW-1 (P2.1b) Data obligations to the WCPFC.ppt]
- Data requirements at the National Level
  - [TDW-1 (P2.4) National data req.ppt]

In describing the obligations to the WCPFC and the national requirements for data, there were two additional presentations on the role of both the OFP and FFA in regional data collection, management and dissemination [TDW-1 (P2.2) OFP role in data.ppt and TDW-1 (P2.3) FFA role in data.ppt, respectively].

Participants were asked to break into their groups to consider and discuss (“share experiences”) the national requirements for collecting tuna fishery data in their countries, and then specify any other reasons for collecting data in their countries that were not listed in the presentation. Appendix III contains the list of reasons for collecting data from a national point of view – reasons highlighted in “red” represent the additions suggested by participants after group discussions.



Participants were also asked to conduct two exercises on an individual country basis – (i) rank the top ten reasons for collecting data, according to their understanding of national requirements, and (ii) complete a worksheet relating ‘National Legislation’ (Marine Acts, etc.) to tuna data requirements in their country. The output of the second exercise would feed directly into their respective national tuna fishery data procedures document.

The consolidated result of the top ten ranking of reasons for collecting data (at the national level) appear in the right-hand column of the table in Appendix III. In discussion prior to the ranking exercise, it was noted that the ranking may be different depending on the different work focuses within each country. However, the consolidated ranking produced from this exercise was generally considered to be what would be expected.

## 4.2 Types of Data collected

This session provided an overview of the types of data collected in tuna fisheries throughout the region, and was addressed by three presentations on the following topics :

- The type and function of tuna data collected throughout the region
  - [TDW-1 (P3.1) Types of data.ppt]
- The role of the SPC/FFA Data Collection Committee (DCC)
  - [TDW-1 (P3.2) Role of the DCC.ppt]
- Minimum data standards – WCPFC function

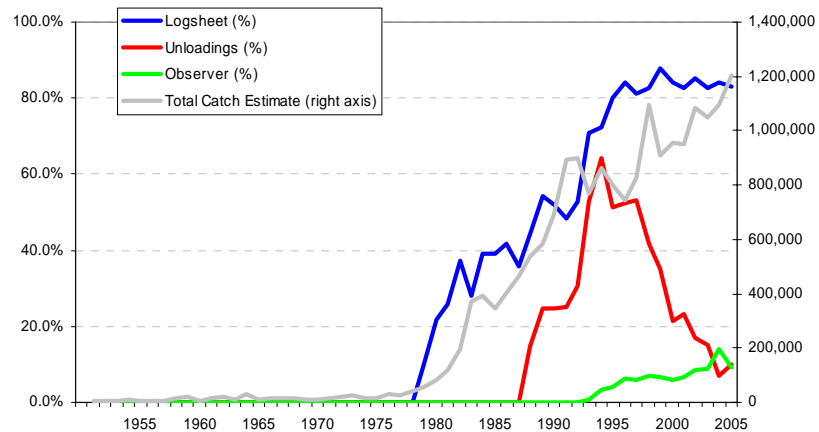
The main characteristics for each data type collected, brief mention of the protocol and the required coverage of each data type were briefly described in the first presentation. In summing up the first presentation, two slides showing the current level of coverage of the main tuna fishery data types were presented (Figures 3 and 4). The main concerns with respect to data collection at this point are –

- The coverage of Unloadings data in both the purse seine and longline fisheries are poor;
- The coverage of Logsheet data for the longline fishery is low, mainly due to the poor coverage of distant-water vessels fishing on the high seas.

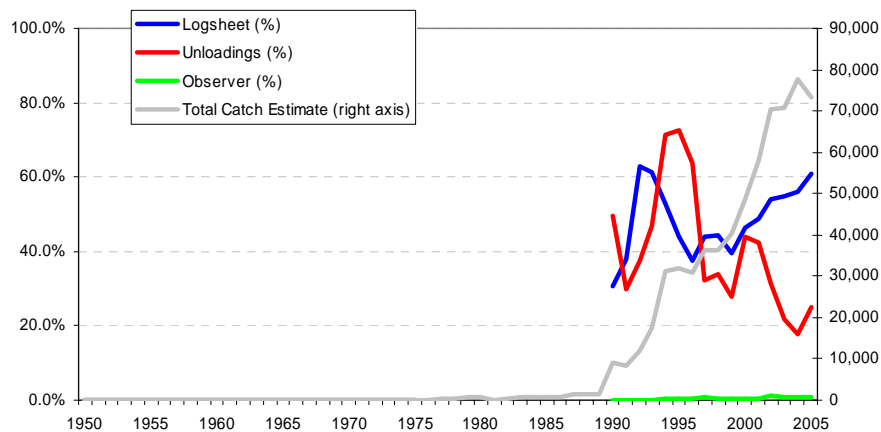
Participants were asked to break into their groups to consider and discuss (“share experiences”) the types of data collected in their countries and whether there were other types of data collected that should be included.

In a subsequent discussion in plenary, it was noted that logsheets tended to be completed by captains while on-board vessels in the purse-seine fishery, but that logsheets for some longline vessels were completed on return to port by fishing company staff, which sometimes resulted in transcription problems and this was difficult to verify. This situation was an example of the need for appropriate instructions, stressing the obligations on fishing companies in stipulating exactly how, and who, should fill out logsheets in the tuna fisheries throughout the region.

Participants were asked (individually) to test their knowledge through an exercise handout asking specific questions on the two main types of data collection (logsheets and unloadings) in their country. The output from this exercise was then to be incorporated into their respective National Procedures document.



**Figure 3. Estimated annual coverage of data provided for the tropical WCPO purse seine fishery**



**Figure 4. Estimated annual coverage of data provided for offshore and domestic longline fisheries based in Pacific Island countries**

### 4.3 How data are collected

This session provided an overview of how data are collected in tuna fisheries throughout the region, and was addressed by three presentations on the following topics :

- Considerations in tuna data collection systems
  - [TDW-1 (P4.1) Considerations in data collection.ppt]
- Problems in collecting data
  - [TDW-1 (P4.2.1) Problems in data collection.ppt]
- Potential solutions to the problems in collecting data
  - [TDW-1 (P4.2.2) Solutions to problems in data collection.ppt]

#### 4.3.1 Considerations in tuna data collection systems

It was recognized that there are comprehensive resource material and training courses available for some types of data collection (port sampling and observers), and that these are generally covered by dedicated regional workshops and specific in-country training. However, it was also recognized that some work is probably required to develop more training and resource material for other types of data, specifically those compiled by the fishing companies (e.g. logsheets and unloadings data).

A checklist to ensure the systematic establishment (or review) of tuna fishery data collection systems was suggested. The following should be covered in the design or review of any tuna fishery data collection system. (① - indicates items suggested for inclusion in conditions for fishing access) :

1. Obligations for collecting the data ①
2. Functions of data to be collected are described
3. Protocols/methods for collection are described ① submission
4. Reference to data collection forms to be used ①
5. Required "Coverage" of the data ①
6. Resources and training required are available (e.g. where does funding come from)
7. Schedule for the provision of the data ①
8. Consequences for non-compliance in collection and provision of data ①
9. Contact points for the data ①
  - ❑ Who records the data
  - ❑ Who provides the data (e.g. Fishing Company representative)
  - ❑ Who receives the data (Fisheries Division staff member)
  - ❑ The respective liaison points in regards to problems with data
  - ❑ Procedures for liaison with respect to problems with data ①
10. Quality Control Procedures (in the data collection system; e.g. audit/reviews)
11. Feedback mechanisms from data management (mechanisms/procedures for data management staff to liaise with data collection staff – for e.g. on data quality issues)
12. Data security issues in data collection (addressing both Fisheries Division and Fishing Companies concerns)
13. Mechanism for integrating/sharing data collection systems with other countries

In group discussions after the presentation, Participants were asked to consider any other items that should be included on the checklist (these have been highlighted in red above). Participants were also asked to consider the items marked for inclusion in the conditions for fishing access, and consider what problems they envisaged in applying the checklist to their data collection systems.

As a further exercise that would lead to completing relevant sections in their National procedures documents, Participants were asked to individually review their country's legal provisions for data collection and indicate whether items (in the checklist) have been adequately covered or not.

### 4.3.2 Problems in data collection systems

Specific problems encountered in tuna fishery data collection systems were listed under the following categories :

- Problems inherent in the type of data collected
- Logistical problems
- Competency problems
- Compliance problems
- Resource problems (Human, Financial and Equipment)
- Management Problems**

In breakout group discussions, Participants were asked to discuss (“share experiences”) on the problems in data collection in their country, using the problems listed in the presentation as a guide. They were asked to suggest other problems experienced in their country that were not in the list proposed in the presentation, or elaborate further on problems listed in the presentation.

Appendix IV contains a table of the problems (by category) encountered in collecting data from a national point of view – the problems highlighted in “red” represent the additions suggested by participants after the group discussions. It was noted that the list of problems compiled may not be complete, since all of the region’s data collection community was not represented at this workshop. However, the group felt that the list covered the main problems experienced in the region at the moment, and provided a useful reference in conveying the difficulties faced in their work to relevant third parties.

Participants were asked (individually) to rank the top ten problems in data collection systems in their country, and the consolidated result appears in the right-hand column of the table in Appendix IV. The most significant problems at the moment are –

- Poor reporting by fishing vessels, for reasons related to either the lack of compliance or competency on behalf of the fishing vessel
- Lack of human resources within national fisheries offices to undertake the necessary data collection and management work
- Logistical problems in obtaining data collected outside their country (e.g. data collected in ports in other countries)

### 4.3.3 Solutions to Problems in data collection systems

In this session, participants were asked to consider any potential solutions for each problem identified in the previous session (see Section 4.3.2) in their respective breakout groups. This session in particular generated considerable discussion and was very informative, according to participants.

The facilitators of the workshop compiled a composite list of potential solutions to each problem listed from the deliberations of the groups. The list of solutions for each problem was provided to participants and has been included in the report of the workshop (Appendix V). It was acknowledged that the list of potential solutions was

not necessarily complete, but the list, as it stood, would still be very useful as a reference and guide to updating the National Procedures document and to resolving problems in data collection throughout the region.

#### 4.4 Best Practices in Managing data

This session provided an overview of data management in tuna fisheries throughout the region and was addressed by four presentations on the following topics :

- Why “Data Management” is important
  - [TDW-1 (P5.1) Why data mgmt important.ppt]
- Components of Managing data
  - [TDW-1 (P5.2) Components of Mgmt of data.ppt]
- Data Quality Systems
  - [TDW-1 (P5.3) Data Quality Systems.ppt]
- Coverage of Data
  - [TDW-1 (P5.4) Coverage of data.ppt]

The first presentation provided a general definition of Data Management and why Data Management is important. The presentation introduced the concept of “Best Practice”, described each component of “Best Practice”, and the consequences of “Best Practice” in Data Management.

The second presentation provided a description of each component that should be included in a Tuna Fishery Data Management System –

- Data Registry System
- Data (hard-copy) Filing System
- Integrated Database System
- Data Quality Control
- Data Archiving system
- Data Security

Participants were asked to (individually) cross-check each component with what exists in their country’s data management system – where components do not currently exist, they were asked to describe why it would be difficult to implement, if it could not be introduced in the coming year. The output from this exercise was then to be included in the National Procedures Documents.

The third presentation provided an introduction to Data Quality Systems. It listed the reasons why Data Quality Control is important and covered what would be expected in Quality Control procedures in the data collection systems used by (i) Fishing Companies and (ii) Fisheries Division staff. The presentation also covered the Quality Control procedures that should be expected in the Data Management Systems of fisheries offices in the region.

As with the previous exercise, Participants were asked to (individually) cross-check the Quality Control procedures for data collection and management (suggested in the presentation) with what exists in their country’s systems – where procedures do not currently exist, they were asked to describe why it would be difficult to implement, if

it could not be introduced in the coming year. The output from this exercise was then to be included in the National Procedures Documents.

The fourth presentation provided an introduction to Data Coverage. The presentation explained what is meant by “Coverage” and why is it important to know what the coverage of data is. It introduced the concept of “Base” data used to determine “coverage”, described some of the problems experienced in determining coverage and the pros and cons of several methods available to determine coverage.

It was recommended that countries consider establishing a “Base” data that will (unconditionally) represents 100% coverage of fishing activity, and that the “Annual Fishing Trip and Port Visit Log” has been designed to specifically determine coverage of other types of data. It was noted that Vessel Monitoring System (VMS) data, once fully implemented throughout the range of regional tuna fisheries, will also provide an invaluable source for determining coverage.

With respect to coverage, Participants were asked to (individually) undertake an exercise covering the following:

- ❑ Provide an approximate level of coverage for each data type collected in their country, and indicate whether it matched the recommended levels for coverage;
- ❑ Indicate what are the current hindrances to increasing the levels of coverage in their country;
- ❑ Indicate the ways where they could improve on the levels of coverage;
- ❑ Indicate other methods of determining coverage not mentioned in the presentation;
- ❑ Indicate the “Base” data collection (with respect to coverage) they use, or would consider implementing to determine coverage; (bearing in mind the resources required and potential problems in doing so, and what compliance measures need to be introduced to collect these data)

As with the other exercises in this session, the output was then to be included in the National Procedures Documents.

#### **4.5 Dissemination of data**

This session provided an introduction to the dissemination of data in tuna fisheries throughout the region and was addressed by two presentations on the following topics:

- ❑ Data Dissemination Management
  - [TDW-1 (P6.1) Dissemination mgmt.ppt]
- ❑ Tools to facilitate the dissemination of data
  - [TDW-1 (P6.2) Tools of dissemination.ppt]

The first presentation provided a general definition of data dissemination and listed the major outputs from tuna fishery data (the “requirements” for data dissemination). The presentation suggested a means of managing the data dissemination process through the establishment of a “schedule/plan” for data dissemination. It described the importance of a schedule/plan as “Best practice”, the components required in a schedule/plan, the categories (or types) of dissemination you might find for tuna fishery data and provided a basic example of what a schedule/plan might look like.

The components required in a dissemination schedule/plan were identified as –

- Categorisation for each type of dissemination (e.g. reports – see below)
- Details of the data to be disseminated
- Whether or not authorisation to disseminate is required
- Deadlines for data processing
- Procedures for producing the disseminated data
- Who prepares the disseminated data (responsibility)
- Date when the disseminated data are required
- Who receives the disseminated data
- Procedures for filing and recording each instance of dissemination

It was acknowledged that the list of categories for dissemination proposed at this stage may not be complete, but should satisfy most countries requirements –

- Briefs for Fishing Access Negotiations
- Annual provision of data to the WCPFC (SC and TCC)
- Annual Fisheries Division Reports
- Fishing Industry reports
- Data for Regional Stock Assessments
- Data for Regional Compliance Coordination
- Reports for other government departments
- Reports / Data for ad hoc requests
- Reports to review performance of data collection staff
- Quarterly Fisheries Newsletters
- Quarterly Advisory Committee briefs
- Reports to the Economics Department

In the exercise following the presentation, Participants were asked to (individually) cross-check each category for dissemination of data relevant to their country. In the coming year, it is hoped that countries will begin to fill in the details of components in each dissemination category in their National Procedures Document.

A presentation was made on the “tools” available to countries for preparing data in a form to disseminate. The reasons why tools are needed were listed, and then tools that have been developed by the OFP over the years to facilitate the preparation of data for dissemination, were described.

It was noted that “Data Dissemination” was not covered to the extent necessary at this workshop since it is important to ensure the data collection and management systems are functioning well before meaningful information can be produced in data dissemination systems. In this regard, “Data Dissemination” will be the main focus of the next workshop.

## **5. Recommendations from the Workshop**

The wrap-up session of the workshop presented the opportunity for participants to put forward any recommendations for future work and highlight significant issues with respect to tuna data. The following were recommendations proposed by participants:

- 1. The workshop provided an excellent mechanism for sharing experiences on problems, and providing solutions related to tuna fishery data systems, and that this type of workshop had not previously been catered for. It was hoped that the opportunity for this type of discussion would continue in some form in the future;*
- 2. The workshop recognized the importance of having representatives from distant-water fishing nations involved in this process and recommended they be invited to future workshops;*
- 3. The next workshop should include the “auditing” of data systems as a major focus;*
- 4. The next workshop should include a session where each country makes a presentation, which would include a description of their data collection and management systems, a list of the problems they have experienced in their data collection and management systems, and an update on the status of their National Procedures document. (The Workshop conveners should propose a standard reporting format);*
- 5. Wherever possible, strong emphasis on providing the necessary management support in enforcing licensing conditions should be communicated both regionally and nationally;*
- 6. There were concerns on whether countries could adequately cover the required level of human resources for the increasing regional data collection and management requirements, and these concerns should be formally communicated both regionally and nationally.*

Several other suggestions for topics at the next workshop were suggested in the questionnaire (see APPENDIX VI).

## **6. Assessment of Workshop**

The workshop did not aim to assess the performance of each participant but hoped to gain a basic indication by informally evaluating the participants understanding of the principles presented during the week, the general involvement of participants in group and plenary discussions, and the progress made on the National Procedures document.

A questionnaire was also designed to obtain an indication of the usefulness of the workshop through feedback from the participants on their assessment of key objectives (the results are in Appendix VI). Based on the results of the questionnaire, the informal comments from participants and observations from the facilitators, the workshop accomplished its objectives. The participants attending the meeting had a wide level of experience, but all indicated that they could take something away from the workshop. The facilitators noted that all participants were keen to be involved and



there wasn't any absenteeism throughout the week. Also, significantly, there weren't any negative responses to the questionnaire. The length of the workshop (4.5 days) was considered appropriate as participants worked hard and by the end of the week had, in the opinion of the facilitators, reached the point where further work might have proved disadvantageous.

Some time was spent in the selection of members from each group to ensure there was a good mix of experience and in-experience, but also that similar and contrasting experiences would be present. The group discussions proved to be very successful, and in some instances the facilitators let discussions proceed longer than planned when critical issues were being discussed.

Taking into account the feedback from participants and a review of the workshop by facilitators, the following points should be considered for future workshops:

- Ideally, the timing of the next workshop (TDW-2) should be in the first quarter of 2008. This provides a sufficient gap between TDW-1, and corresponds to the period when preparation of annual catch estimates for the 2007 calendar year is undertaken, which could be the subject of a session at TDW-2.
- Consideration could also be given to holding TDW-2 back-to-back with the next Data Collection Committee (DCC-7) meeting.
- Beyond TDW-2, there may be a need to find a mechanism for countries to convene to "share experiences" in problems encountered in data collection and what steps are needed to resolve them.
- There should be consideration of using the OFP's web site to provide material describing generic tuna fishery data collection, management and dissemination systems, and to also document current issues in data collection, management and dissemination throughout the region. For example, the material presented at TDW-1 should be made available on the web site, including text to indicate that any use of this material is cited as being sourced from the OFP;
- The group sessions proved to be very useful and should be repeated in the future;
- Consider having better resource material available (perhaps producing the resource material from TDW-1 as a formal document/manual).

## **7. References**

Forum Fisheries Agency (FFA). (2004). Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.

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## APPENDICES

### Appendix I – Workshop Agenda

#### FIRST TUNA DATA WORKSHOP (TDW-1)

23-27 October 2006  
Noumea, New Caledonia

#### PROVISIONAL AGENDA



#### AGENDA ITEM 1 OPENING OF THE WORKSHOP

- 1.1 Welcome address
- 1.2 Adoption of agenda
- 1.3 Workshop arrangements
- 1.4 Purpose of the Workshop and expected outputs

#### AGENDA ITEM 2 WHY DO WE NEED TO COLLECT DATA?

- 2.1 Data obligations to the WCPFC
- 2.2 OFP's role in regional data collection, management and dissemination
- 2.3 FFA's role in regional data collection, management and dissemination
- 2.4 Data requirements at the National Level

#### AGENDA ITEM 3 TYPES OF DATA COLLECTED

- 3.1 The type and function of tuna data collected throughout the region
- 3.2 The role of the SPC/FFA Data Collection Committee (DCC)
- 3.3 Minimum data standards – WCPFC function

#### AGENDA ITEM 4 HOW DATA ARE COLLECTED

- 4.1 Considerations in tuna data collection systems
- 4.2 Problems in collecting data
  - 4.2.1 *Problems in collecting data*
  - 4.2.2 *Potential solutions to the problems in collecting data*

#### AGENDA ITEM 5 BEST PRACTICES IN MANAGING DATA

- 5.1 Why "Data Management" is important
- 5.2 Components of Managing data
- 5.3 Data Quality Systems
- 5.4 Coverage of Data

#### AGENDA ITEM 6 DISSEMINATING DATA

- 6.1 Data Dissemination Management
- 6.2 Tools to facilitate the dissemination of data

#### AGENDA ITEM 7 CLOSE OF MEETING

## Appendix II – Workshop Participants List

### FIRST TUNA DATA WORKSHOP (TDW-1)

23-27 October 2006  
Noumea, New Caledonia

### LIST OF PARTICIPANTS

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## Appendix III – List of reasons to collect data and the composite ranking of the TOP 10 most important reasons to collect Tuna Data

Management of the National Tuna Fishery	RANK
1. Provide an accurate historical perspective of the fishery	5
2. Aid decision-making to ensure the maximum sustainable exploitation of their fishery	1
3. Establish appropriate management measures	2
4. Account for access to the fishery	
5. Inform and advise stakeholders in the fishery	8
6. Provides input to local EAFM	
7. Helps in the development of the local Tuna Management Plan	
8. Ensures regional data obligations are met	7
9. Determines human and equipment resource needs	
10. Account for recreational and subsistence activity	

Monitoring, Control and Surveillance	RANK
1. Identify IUU fishing	
2. Ensure licensed vessels are not fishing in restricted areas	
3. Ensure vessels are compliant with respect to regulations set out in the conditions of licensing	5
4. Cross-validation of different types of data to ensure compliance	
5. Identify undesirable fishing practices	
6. Cooperation amongst member countries with respect to MCS	
7. Adequate procedures to cover MCS	

Resource Monitoring	RANK
1. Monitor trends in catches and catch rates	3
2. Monitor trends in areas fished	9
3. Monitor trends in species composition of the catch	10
4. Monitor trends in catch of species of special interest	
5. Monitor changes in local biomass (through analyses)	
6. Monitor changes in fishing practices and the effectiveness of the fishing gear	
7. Monitor trends in local consumption	

Economic and Social Considerations	RANK
1. Determine appropriate access fee levels (e.g. license fees)	
2. Determine feasibility of establishing/expanding the national fishing fleet	4
3. Monitor trends in value of the catch (market prices)	
4. Determine the minimum economic criteria necessary for a fishing vessel to enter the domestic fishery	
5. Determine the economic returns (e.g. value of the catch) from the fishery for National GDP purposes	
6. Determine whether there needs to be infrastructure changes (e.g. expansion of port facilities, air/sea freight, processing plants, etc.)	
7. Determine Environmental Impacts	
8. Local employment benefits (i.e. crewing lists)	
9. Social impacts (i.e. civil disorder, economic benefits)	
10. Determine economic impacts of whale depredation on small-scale longline fleets	
11. Compilation of information to attract investors to the fishery	
12. Inform the public / raise awareness with the public (e.g. students)	

**Appendix IV – List of problems encountered in Tuna Fishery Data Collection and the composite ranking of the TOP 10 most important problems.**

	<b>Problem</b>	<b>RANK</b>
LG	There has never been any intention to collect some categories of data (...although it would be important and useful to do so)	
LG	Obtaining support (from senior/junior staff) within the Fisheries Division for data collection	
LG	Problems for field staff in having access to fish to sample - <ul style="list-style-type: none"> <li>o legal problems preventing port samplers from interrupting the unloading process</li> <li>o fish packed and unloaded in crates</li> <li>o physically getting sampling staff to vessel unloading in bay/lagoon</li> <li>o the unloading process is too fast to allow sampling</li> <li>o Vessel too small to consider embarking an observer</li> </ul>	<b>6</b>
LG	Getting observers to/from ports in other countries for embarkation / disembarkation	
LG	Submission of data procedures difficult to adhere to (i.e. offices closed when vessel arrives)	
LG	Equipment failure (VMS, Fax machine, etc.)	
LG	Occupational Health and Safety (OHS) issues that may prevent field staff from performing their duties	
LG	Data Collection from vessels that are unloading in ports of other countries	<b>4=</b>
CT	Non-reporting, mis-reporting and under-reporting (Vessel/fishing company).	<b>3</b>
CT	Field staff have not adhered to instructions for collecting data	
CT	Problems in the provision of data (data have been collected but have not been correctly provided for data management/dissemination - i.e. the data have been lost due to poor procedures)	
CT	Writing on data collection forms is illegible	
CT	Language barrier	
CT	Fishers lack education / feedback (i.e. species ID guides)	
CT	Confidence of data collectors to carry out their duties	
CP	Non-reporting, mis-reporting and under-reporting by fishing vessels	<b>1</b>
CP	Poor legislation makes compliance difficult	<b>8</b>
CP	Difficulty getting cooperation from fishing company/vessel with respect to the work required by port samplers, observers and inspectors	
CP	Tardy provision of data	<b>9</b>



	<b>Problem</b>	<b>RANK</b>
CP	Vessel captain, crew and fishing company are not aware of their responsibilities with respect to data collection	
CP	There is little or no liaison possible with the fishing company/vessel with respect to data collection	
CP	No follow-up attempted for non-compliance with data collection	<b>7</b>
CP	Lack of understanding of international/regional obligations	
RS	Inadequate number of staff to cover data collection duties	<b>2</b>
RS	Inadequate number of staff to cover data management duties	<b>4=</b>
RS	Inadequate funds to cover operational costs of data collection and management	
RS	High volume of data means it is impractical to process data (cost-benefit)	
RS	Field equipment are not available	
RS	Computers or software are not available	
RS	Data collection forms not available or the wrong version	
RS	Data collection staff are not adequately trained	
RS	Over-worked staff, due to taking on additional duties	<b>10</b>
RS	Inadequate pool of candidates to select from (in recruitment process)	
RS	Retention of skilled staff	
RS	Inadequate opportunities for training/up-skilling	
RS	Lack of data collection and management procedures / manuals	
MG	Political interference	
MG	Lack of good leadership	
MG	Lack of consideration for compensation for over-time	
MG	Inappropriate or incorrect matching of staff to job profile (i.e. inappropriate recruitment process)	
MG	Inappropriate work ethics (e.g. accepting bribes)	
MG	Lack of internal coordination/cooperation (for example, between a provincial office and the central office)	

## Appendix V – A list of potential solutions to problems in Tuna Data Collection

Logistical Problems (S4.2.1)	Potential Solutions (S4.2.2)
<p>1. There has never been any intention to collect some categories of data (...although it would be important and useful to do so)</p>	<ul style="list-style-type: none"> <li>• Review relevancy of data collection by incorporating it into some sort of data collection documentation</li> <li>• Highlight the need for data collection as a regional and international obligation</li> <li>• Liaise with relevant agencies/companies to arrange for data sharing (fill in gaps)</li> <li>• For historical data, may come in handy at a later date</li> <li>• Review DCC meeting report to keep up to date with data collection issues.</li> <li>• Consider whether to collect, based on obligations and utility to individual country</li> </ul>
<p>2. Obtaining support (from senior/junior staff) within the Fisheries Division for data collection</p>	<ul style="list-style-type: none"> <li>• Staff recruitment could be an option</li> <li>• Staff collaboration and team work at all levels</li> <li>• Meet with relevant staff to explain importance of data collection work</li> <li>• Highlight the need for data collection as a regional obligation and an international obligation</li> <li>• Use regional resources (regional experts, training aids, etc.) to highlight the importance of data collection work</li> <li>• Provide incentives i.e promotion, increased salary, awards, etc.</li> <li>• Acquire staff who are willing to collect data.</li> <li>• Staff awareness on the importance of data collection</li> <li>• Communication skills are necessary to obtain buy-in by staff, need to incorporate them into the process such as in-house training, workshops, and TRAVEL OPPORTUNITIES</li> <li>• Regular feedback to staff on data coverage targets and achievements</li> <li>• Increase operational funding</li> <li>• Permit to agree to port sampling activities</li> <li>• Review institutional structure and job profiles, to include sufficient resources and responsibilities for the task at hand</li> </ul>
<p>3. Problems for field staff in having access to fish to sample -</p> <ul style="list-style-type: none"> <li>❑ legal problems preventing port samplers from interrupting the unloading process</li> </ul>	<ul style="list-style-type: none"> <li>• Modify/improve Regulations !</li> <li>• Incorporate into agreements.. need to ensure that your access agreement and your laws are in line so they don't contradict</li> <li>• Ensure problem is properly documented and brought to the attention of senior staff immediately before/when access agreement is up for renewal.</li> <li>• <b>Modify sampling process and educate unloadings agents / vessel owners (for crew) in the benefits of teamwork to overcome unloading hiccups (speed process)</b></li> <li>• Take advantage of the development of Port State standards and procedures by the Commission to review and suggest solutions</li> </ul>
<ul style="list-style-type: none"> <li>❑ fish packed and unloaded in crates</li> </ul>	<ul style="list-style-type: none"> <li>• Observer data can be refereed to or have the observers on board to incorporate fish sampling on board before processing and packing.</li> <li>• Work in pairs while placing fish on a table (but additional problem of handling of fish</li> <li>• Identify bottle neck in the unloading process.</li> <li>• Take a hard stance... don't certify it</li> </ul>

Logistical Problems (S4.2.1)	Potential Solutions (S4.2.2)
	<ul style="list-style-type: none"> <li>• Comply with our regulations</li> <li>• Request advice from SPC or other agencies who have experience in setting up sampling programmes.</li> </ul>
<ul style="list-style-type: none"> <li>❑ physically getting sampling staff to vessel unloading in bay/lagoon</li> </ul>	<ul style="list-style-type: none"> <li>• Change venue of sampling - for e.g. in Niue, it is possible to sample fish at Niue Fish Processing Factory and not at the wharf</li> <li>• Use observers to collect samples</li> <li>• Restrict unloadings only to a designated port.</li> <li>• Develop infrastructure to encourage unloadings in port.</li> <li>• Buy a boat!</li> <li>• <b>Develop regulations to put onus on companies to ensure samplers get to vessel before unloading/transshipping can start</b></li> </ul>
<ul style="list-style-type: none"> <li>❑ the unloading process is too fast to allow sampling</li> </ul>	<ul style="list-style-type: none"> <li>• Consider using random sub-sampling instead of sampling the entire catch</li> <li>• Try and encourage unloadings by species</li> <li>• Request advice from SPC or other agencies who have experience in setting up sampling programmes.</li> <li>• Enact and enforce regulations to allow sampling</li> <li>• <b>Use two samplers instead of one</b></li> <li>• <b>Educate unloading staff in speed advantages of teamwork</b></li> </ul>
<ul style="list-style-type: none"> <li>❑ Vessel too small to consider embarking an observer</li> </ul>	<ul style="list-style-type: none"> <li>• Consider using another type of data collection (e.g. port sampling)</li> <li>• Leave one crew onshore (the cook) and add the observer</li> <li>• Use electronic (video / VMS ) monitoring</li> <li>• Length Requirements on size of vessel</li> </ul>
<p>4. Getting observers to/from ports in other countries for embarkation / disembarkation</p>	<ul style="list-style-type: none"> <li>• Set up formal arrangement with other countries with respect to using national observers in their country</li> <li>• Develop MOUs between PICTs</li> <li>• Inform vessels that they need to adhere to the agreements to wait for observers</li> <li>• Cater for these situations in access agreements</li> <li>• Need to ensure that the other country ensures that the vessel remains..</li> <li>• Observer arrangement between different countries needs to be in place</li> <li>• Penalties if a country lets a boat leave</li> <li>• <b>Regional Corporation with good network.</b></li> <li>• <b>Designated ports for observer embarkation, outside of which, if vessel wants to fish it must pay full costs of travel, accommodation, observer salaries and ample extra penalty traveling allowances</b></li> <li>• <b>Good forward planning</b></li> <li>• Investigate the applicability of cooperation through the Niue Treaty, in particular through Niue Subsidiary Agreements as a means to facilitate cooperative agreements between your country and other countries</li> <li>• Watch the development of the Commission Regional Observer Programme that will have to grapple with this interjurisdictional issue, as well as the Commissions port State procedures and regulations that are under development</li> </ul>
<p>7. Submission of data procedures difficult to adhere to (i.e. offices closed when vessel arrives)</p>	<ul style="list-style-type: none"> <li>• Enforce unloading within government working hours</li> <li>• Suggest using the postal system to provide data - <b>not ideal usually</b></li> <li>• Restrict the period of authorized unloadings - <b>not ideal BUT perhaps along the lines of outside of this</b></li> </ul>

Logistical Problems (S4.2.1)	Potential Solutions (S4.2.2)
	<p><b>period vessel must provide penalty fee sufficient to attract suitable sampling staff to make themselves available outside of designated hours</b></p> <ul style="list-style-type: none"> <li>• Announce in advance (eg 12h) the schedules of the unloadings</li> <li>• Increase the personnel if the cost is not prohibitory</li> <li>• Review and improve data procedures.</li> <li>• Fax/email copies and mail the originals</li> <li>• This is a problem with the company not informing the government of an incoming boat. Perhaps a solution would be not to certify the catch.</li> <li>• Increase the time-frame for the submission of the data</li> <li>• <b>Design regulations to suit</b></li> </ul>
<p>8. Equipment failure (VMS, Fax machine, etc.)</p>	<ul style="list-style-type: none"> <li>• Power back up systems</li> <li>• Regular back ups of data bases</li> <li>• Impose a requirement to undertake regular maintenance review of the equipment by an authorised company (modify the regulation accordingly)</li> <li>• Ensure support services are in place</li> <li>• Have back up systems in place</li> <li>• Require that they report every 30 minutes, or in an agreed upon timely fashion, if VMS isn't working</li> <li>• <b>Design regulations to suit</b></li> </ul>
<p>9. Occupational Health and Safety (OHS) issues that may prevent field staff from performing their duties</p>	<ul style="list-style-type: none"> <li>• Introduce required OHS procedures/documentation if not already in place.</li> <li>• Work with relevant government services to ensure OHS issues are catered for in the work place of fisheries field staff</li> <li>• Follow-up by the inspection according to national OHS legislation</li> <li>• Liaise with relevant agencies e.g. Ports Authority, Marine Safety Authority to ensure health and safety of licensed vessels. <b>Teamwork.</b></li> <li>• Assign staff appropriate for the job. Need to ensure that the vessel adheres to standard safety standards.</li> <li>• Need to ensure that the environment the observer is put on is fine... there are some observers that may get threats</li> <li>• <b>Insurance cover and backup officer</b></li> <li>• <b>Importance for crews as well as sampling staff</b></li> </ul>
<p>10. Data Collection from vessels that are unloading in ports of other countries</p>	<ul style="list-style-type: none"> <li>• Establish an arrangement for data sharing under bilateral/multilateral agreements</li> <li>• Networking amongst other coastal states (member countries) to ensure data sharing</li> <li>• Use the RFMOs (e.g. WCPFC, FFA, SPC) to facilitate data sharing</li> <li>• Develop MOUs between respective countries</li> <li>• Investigate the applicability of cooperation through the Niue Treaty, in particular through Niue Subsidiary Agreements as a means to facilitate cooperative agreements between your country and other countries</li> <li>• Watch the development of the Commission Regional Observer Programme that will have to grapple with this interjurisdictional issue, as well as the Commissions port State procedures and regulations</li> <li>• The Commission is also considering arrangements to facilitate the sharing of data between members of the Commission - if adopted, in theory a country should be able to get access to all data relating to their flag vessels, relating to vessels unloading in their ports, relating to vessels operating in areas under their national jurisdiction whether legal or IUU.</li> </ul>

Logistical Problems (S4.2.1)	Potential Solutions (S4.2.2)
	VMS information could also potentially be shared between members of the Commission through this mechanism

Competency Problems (S4.2.1)	Potential Solutions (S4.2.2)
1. Non-reporting, mis-reporting and under-reporting (Vessel/fishing company).	<ul style="list-style-type: none"> <li>• Inform them of consequences incurred and enforce the regulations that govern the provision of accurate reporting.</li> <li>• Training</li> <li>• Improve enforcement procedures e.g. fines, penalties.</li> <li>• Provide more awareness initially. If that doesn't work, perhaps fine them or suspend their license.</li> <li>• <b>Better liaison / teamwork between data collection and enforcement staff</b></li> <li>• Consequences of non-compliance with reporting requirements should be a condition of the license, and text to this effect should be included as part of the documentation that a vessel is required to have on board at all times and to furnish on request (see FFA MTCs)</li> <li>• Consider having workshop sessions for industry on an annual basis (or two years) to provide information arising from the data that they supply (national and regional); to reinforce why data is important; to revisit where coverage and quality of data is at - to work collaboratively with industry to improve systems and address problems</li> </ul>
2. Field staff have not adhered to instructions for collecting data	<ul style="list-style-type: none"> <li>• Induction training</li> <li>• Ongoing training</li> <li>• Disciplinary action if needed</li> <li>• Carry out refresher courses.</li> <li>• Carry out staff appraisals</li> <li>• Restructuring and reassignment of staff</li> <li>• Provide regular feedback on the quality of their data</li> <li>• <b>Effective supervision</b></li> <li>• <b>Replacement if incapable for doing his/her job</b></li> <li>• <b>Piecework and/or significant portion of income in form of bonus for good data</b></li> </ul>
3. Problems in the provision of data (data have been collected but have not been correctly provided for data management/dissemination - i.e. the data have been lost due to poor procedures)	<ul style="list-style-type: none"> <li>• Basic training to undertake data management, processing, and creation of database</li> <li>• Data collected by Fishing Companies/Vessels : Data quality control (coverage) will show where data have not been provided</li> <li>• A Data Registry system will show where data have been received but not processed.</li> <li>• Review/Provide data collection and management procedures, if none are in place.</li> <li>• Review data collection system with staff regularly.</li> <li>• If problem is with the fishers, report may have to be sent back to be rewritten for clarity.</li> <li>• <b>Good management and organization.</b></li> <li>• <b>More funds to increase staff with proper training for the management and dissemination of data</b></li> <li>• <b>Improve procedures - receipts (accountability) for data along the chain - penalties for non-adherence</b></li> <li>• Back-ups and procedures for securing and storing</li> </ul>

Competency Problems (S4.2.1)	Potential Solutions (S4.2.2)
	data when they are received through to entry, verification and long-term storage
4. Writing on data collection forms is illegible	<ul style="list-style-type: none"> <li>• Liaison with Fishing Companies/Vessels, reminding them of their obligation to provide quality data (condition of licensing)</li> <li>• Seek clarification from captains/agents/companies.</li> <li>• Provide guidelines/procedures if none are in place.</li> <li>• Provide training where necessary</li> <li>• Do not accept illegible forms; give them back to the fisher immediately if submitted by hand.</li> <li>• <b>Immediate action (i.e. unloading forms not filled properly)</b></li> </ul>
5. Language barrier	<ul style="list-style-type: none"> <li>• Liaison with Fishing Companies/Vessels, reminding them of their obligation to provide quality data (condition of license)</li> <li>• Impose a qualification minimum for the agents</li> <li>• Provide translated data collection forms, instructions and training aids</li> <li>• Provisions in licensing conditions for English speaking crew onboard.</li> <li>• Agents and companies to have interpreters.</li> <li>• <b>Company to make known to the Captain the terms and regulations (license and reporting of data)</b></li> </ul>
6. Fishers lack education / feedback (i.e. species ID guides)	<ul style="list-style-type: none"> <li>• Providing Fishing Companies with a list of training resources available to ensure the provision of quality data.</li> <li>• <b>Example data collection forms (filled out)</b></li> <li>• Request training resources from regional agencies to facilitate the work in national agencies to collect quality data from fishing companies</li> <li>• <b>Fisheries officers issue manuals to company and explain to captains the use of ID Guide.</b></li> <li>• <b>Observers participate in educating the captains</b></li> </ul>
7. Confidence of data collectors to carry out their duties	<ul style="list-style-type: none"> <li>• Improve confidence through training courses</li> <li>• Improve confidence through industry liaison (informing industry of their responsibilities with respect to allowing field staff to collect data)</li> <li>• Improve confidence by providing necessary legislation to allow field staff to perform their duties</li> <li>• Restructuring and reassignment of staff</li> <li>• <b>More training attachments and practical workshops</b></li> <li>• Managers ensuring that they give their support to data collectors</li> </ul>

Compliance Problems (S4.2.1)	Potential Solutions (S4.2.2)
1. Non-reporting, mis-reporting and under-reporting by fishing vessels	<ul style="list-style-type: none"> <li>• Establish and implement enforcement procedures i.e. fines, license suspension that specifically deal with these problems</li> <li>• Strict vetting process of license applications, non-renewable of licenses.</li> <li>• Cancel their license</li> <li>• Bring the vessel's attention to the fact that you have evidence that they are mis-reporting etc.</li> <li>• <b>Assess reporting and if not complying refer to</b></li> </ul>

Compliance Problems (S4.2.1)	Potential Solutions (S4.2.2)
	<p><b>enforcement</b></p> <ul style="list-style-type: none"> <li>• <b>Stiff penalties - well advertised and adhered to so that consequences not treated lightly</b></li> <li>• Consequences of non-compliance with reporting requirements should be a condition of the license, and text to this effect should be included as part of the documentation that a vessel is required to have on board at all times and to furnish on request (see FFA MTCs)</li> <li>• Consider having workshop sessions for industry on an annual basis (or two years) to provide information arising from the data that they supply (national and regional); to reinforce why data is important; to revisit where coverage and quality of data is at - to work collaboratively with industry to improve systems and address problems</li> </ul>
<p>2. Poor legislation makes compliance difficult</p>	<ul style="list-style-type: none"> <li>• Review legislation with support from ministers and directors concerned (FFA can assist in this regard)</li> <li>• Improve the legislation to guarantee the authority of the agents of collection and to impose the obligation</li> <li>• Amend legislations, regulations and policies.</li> <li>• Ensure there is a staff meeting immediately prior to all fishing access agreements. Include one member of the data collection and management section</li> <li>• <b>Need to amend the legislation so it becomes specific to a case</b></li> <li>• <b>Ensure data collection <u>procedures</u> are easily enforceable</b></li> </ul>
<p>3. Difficulty getting cooperation from fishing company/vessel with respect to the work required by port samplers, observers and inspectors</p>	<ul style="list-style-type: none"> <li>• Establish good working relationship (through liaison)</li> <li>• Make this noted under their licensing terms and conditions and make no hesitation in enforcing penalties</li> <li>• Consider having workshop sessions for industry on an annual basis (or two years) to provide information arising from the data that they supply (national and regional); to reinforce why data is important; to revisit where coverage and quality of data is at - to work collaboratively with industry to improve systems and address problems</li> </ul>
<p>4. Tardy provision of data</p>	<ul style="list-style-type: none"> <li>• Ensure there are clear schedules for the provision of each type of data (as a condition of license)</li> <li>• Enforce the regulations or penalties which address this</li> <li>• Educate industry on necessity of data collection</li> <li>• Document the dates of provision of data (from the data registry system) and make the company aware of the problem either before or during access agreements.</li> <li>• <b>Consult and enforce compliance with respect to data collection</b></li> </ul>
<p>5. Vessel captain, crew and fishing company are not aware of their responsibilities with respect to data collection</p>	<ul style="list-style-type: none"> <li>• Make them aware of their responsibility via meetings with fisheries liaison staff and said company</li> <li>• Training</li> <li>• Enhance awareness on importance of data and</li> </ul>

Compliance Problems (S4.2.1)	Potential Solutions (S4.2.2)
	<p>how data can be used to aid fishing practices</p> <ul style="list-style-type: none"> <li>• Provide resource material</li> <li>• <b>Ensure fishing companies fulfil their responsibilities to comply to the terms of the fishing agreement.</b></li> <li>• <b>Don't believe this excuse easily</b></li> </ul>
<p>6. There is little or no liaison possible with the fishing company/vessel with respect to data collection</p>	<ul style="list-style-type: none"> <li>• With senior fisheries division presence, approach the fishing company to establish a good basis for liaison (regular meetings, etc.)</li> <li>• Inform and explain to the fishing company the requirement for quality data</li> <li>• Use industry association as communication links.</li> <li>• Establish link upon renewal of license</li> <li>• Have regular stakeholder meetings for exchange of ideas.</li> </ul>
<p>7. No follow-up attempted for non-compliance with data collection</p>	<ul style="list-style-type: none"> <li>• Try and address the issue as soon as it arises</li> <li>• Establish procedures to ensure there are mechanisms to ensure regular follow-up</li> <li>• Assign responsibilities to specific staff members with respect to checking and liaising with fishing companies with respect to non-compliance</li> <li>• Provide training to fisheries division staff, where necessary</li> <li>• Modify procedures to make control effective</li> <li>• Improve in-house policies, procedures and management</li> <li>• Internal problems - need to stress awareness and importance of compliance.</li> <li>• <b>In-house issue (address at management level)</b></li> <li>• <b>More in-house teamwork awareness training</b></li> </ul>
<p>8. Lack of understanding of international/regional obligations</p>	<ul style="list-style-type: none"> <li>• Notify people concerned</li> <li>• Inform them of their obligations, responsibilities</li> <li>• Training</li> <li>• Ask SPC and FFA to visit all countries to make them more aware if this is a continual problem</li> <li>• On a country level, need to stress awareness and data obligations.</li> <li>• Provide resource material</li> </ul>

Resource Problems (S4.2.1)	Potential Solutions (S4.2.2)
<p>1. Inadequate number of staff to cover data collection duties</p>	<ul style="list-style-type: none"> <li>• Staff recruitment (more staff)</li> <li>• Reduce data coverage, if it does not impact on the requirements of the data to be collected</li> <li>• If the need for the data is important, inform the users and senior staff of the problem (they should then act to resolve it).</li> <li>• Seek funds</li> <li>• Delegate duties out to other staff</li> <li>• Consider "multi-skilling" by cross-training with other agencies to provide staff available to do the necessary work</li> <li>• Put more onus for data collection and submission on industry. Staff should be used more for the receipt and management of data (excludes sampling data)</li> </ul>



Resource Problems (S4.2.1)	Potential Solutions (S4.2.2)
2. Inadequate number of staff to cover data management duties	<ul style="list-style-type: none"> <li>• Staff recruitment (more staff)</li> <li>• If the need for the data is important, inform the users and senior staff of the problem (they should then act to resolve it).</li> <li>• Seek funds</li> <li>• Consider "multi-skilling" by cross-training with other agencies to provide staff available to do the necessary work</li> <li>• Build cost of managing data into license fees.</li> <li>• <b>Consider use of 3<sup>rd</sup> party (e.g.: OFP) for some data management services</b></li> </ul>
3. Inadequate funds to cover operational costs of data collection and management	<ul style="list-style-type: none"> <li>• Find alternative sources of funding</li> <li>• Regular audit checks to identify fund mismanagement</li> <li>• Consider cost cutting <b>BUT don't deprofessionalise these staff in the process</b></li> <li>• Develop proposal clearly stating the need for data collection/management (with possible assistance from regional agencies)</li> <li>• Seek funding from external sources e.g. RFMOs / <b>WCPFC</b></li> <li>• Propose redirection of license fees to the dept from the financial agency</li> <li>• Build cost of managing data into license fees.</li> <li>• <b>Specific data collection and management fees for sole use in this work</b></li> </ul>
4. High volume of data means it is impractical to process data (cost-benefit)	<ul style="list-style-type: none"> <li>• Outsource data processing and management (e.g. regional agencies - SPC)</li> <li>• Target the more important requirements in data and reduce collection where necessary</li> <li>• Review and improve data management practices</li> <li>• Hire more staff</li> <li>• Seek funds - both international and regional</li> <li>• Review the use of ORC(?) software</li> <li>• Seek more possible funding</li> <li>• Justify at management level the importance and need of recruiting additional staff</li> <li>• <b>Harmonise data management processes (regionally) where this may help - e.g.: common database with universal support</b></li> </ul>
5. Field equipment are not available	<ul style="list-style-type: none"> <li>• Liaise with regional agencies with respect to availability of equipment</li> <li>• Create proposals for funding assistance.</li> <li>• Seek funds</li> <li>• Build cost of field equipment into license fee</li> </ul>
6. Computers or software are not available	<ul style="list-style-type: none"> <li>• Develop a proposal clearly stating the need and expected use of the equipment (Create proposals for funding assistance)</li> <li>• Seek funding (e.g. internal funding sources, US MLT PDF, WCPFC (in particular the Japanese Trust Fund and Special Requirements Fund activities), regional agencies such as SPC and FFA.)</li> </ul>
7. Data collection forms not available or the wrong version	<ul style="list-style-type: none"> <li>• Regularly liaise with regional agencies (SPC) with respect to the version of the forms</li> <li>• Have a schedule for follow-up</li> <li>• Keep up-to-date with the DCC Meeting Reports</li> </ul>
8. Data collection staff are not adequately trained	<ul style="list-style-type: none"> <li>• Inform senior staff of the need for training (tied to quality data)</li> <li>• Liaise with regional agencies with respect to the provision of training and training resources</li> <li>• Impose minimum qualifications</li> <li>• Training and training resources</li> </ul>

Resource Problems (S4.2.1)	Potential Solutions (S4.2.2)
9. Over-worked staff, due to taking on additional duties	<ul style="list-style-type: none"> <li>• Inform senior staff of the problem</li> <li>• Inform regional agencies of the problem (where relevant)</li> <li>• Seek funds</li> <li>• Provide incentives - bonuses, longer leave days, etc.</li> <li>• Hire more staff</li> <li>• Consider delegating some duties of the "over-worked" staff to other staff.</li> <li>• Establish a comfortable vessel - staff ratio</li> <li>• <b>Educate senior staff on importance of data so that these data staff resources remain at high priority in their budgeting and management decisions</b></li> </ul>
10. Inadequate pool of candidates to select from (in recruitment process)	<ul style="list-style-type: none"> <li>• Widen recruitment coverage</li> <li>• Recruit from other member countries</li> <li>• Hire best candidate (that may not be qualified) then train them/provide them with educational opportunities to be qualified for the job.</li> <li>• <b>Ensure selection criteria are appropriate, then select carefully</b></li> <li>• <b>If appropriate staff remain hard to get then consider longer and more comprehensive than usual training</b></li> </ul>
11. Retention of skilled staff	<ul style="list-style-type: none"> <li>• Inform senior staff</li> <li>• Improve incentives (increase pay, bonuses, travel opportunities, educational opportunities, <b>promotion opportunities</b>, etc.)</li> <li>• Training and education of other staff members</li> </ul>
12. Inadequate opportunities for training/up-skilling	<ul style="list-style-type: none"> <li>• Consider assistance provided by regional agencies (RFMOs)</li> <li>• Take advantage of workshops of SPC/FFA, etc. if local opportunities are not available.</li> </ul>
13. Lack of data collection and management procedures / manuals	<ul style="list-style-type: none"> <li>• Inform senior staff of problem</li> <li>• Formal proposal to regional agencies (RFMOs)</li> <li>• Develop training procedures/ manuals</li> <li>• The outcome of the workshop will provide the procedures manual</li> <li>• <b>SPC to provide</b></li> </ul>

Management Problems (S4.2.1)	Potential Solutions (S4.2.2)
1. Political interference	<ul style="list-style-type: none"> <li>• Develop policies, regulations, and legislations</li> <li>• Develop regulations/conditions to minimize the possibilities of political interference (e.g. automatic cancellation of the license if data provision obligations are not respected)</li> <li>• Provide awareness to those in power that their impact of interference is interfering with the mission of the organization.</li> <li>• <b>Take to Commission to back up process (in international circumstances)</b></li> <li>• <b>Transparency of activities to voting public wherever possible</b></li> <li>• <b>Promotion of importance of these activities to voting public</b></li> </ul>
2. Lack of good leadership	<ul style="list-style-type: none"> <li>• Training and development of staff</li> <li>• Performance measures</li> <li>• Provide awareness to your leader that their actions may not be having a positive effect with the mission of the organization.</li> </ul>

Management Problems (S4.2.1)	Potential Solutions (S4.2.2)
3. Lack of consideration for compensation for overtime	<ul style="list-style-type: none"> <li>• Review and improve</li> <li>• Reduce overtime hours by developing overtime policies e.g. shift work, time off</li> <li>• Identify additional funds</li> <li>• Consider compensation. This ensures a better working and more dedicated staff.</li> <li>• Put the onus on industry to submit data during working hours.</li> <li>• Fund adequate numbers of sampling staff through licensing fees.</li> <li>• <b>Consider piecework payments</b></li> </ul>
4. Inappropriate or incorrect matching of staff to job profile (i.e. inappropriate recruitment process)	<ul style="list-style-type: none"> <li>• Staff performance reviews</li> <li>• Improve screening procedures in recruitment.</li> <li>• Human resource development</li> <li>• Identify the competences required and impose a minimal qualification at the time of recruitment</li> <li>• Provide staff the opportunity to move to a more appropriate job.</li> <li>• Identify the skills the staff member has and suggest to them or through management a job change.</li> </ul>
5. Inappropriate work ethics (e.g. accepting bribes)	<ul style="list-style-type: none"> <li>• Promote transparent and accountable regimes.</li> <li>• Independent audits for all systems e.g. on licensing.</li> <li>• For serious offences like bribes, suspension or firing may be necessary. For less serious offences, counseling and monitoring may be options to consider.</li> <li>• <b>In-house issue (management to look into)</b></li> <li>• <b>Hardline taken necessary to set examples; i.e.: no tolerance</b></li> </ul>
6. Lack of internal coordination/cooperation (for example, between a provincial office and the central office, or between customs, ports authority, maritime surveillance and fisheries department)	<ul style="list-style-type: none"> <li>• Enhance communication between all parties.</li> <li>• Improve coordination and cooperative efforts with regular meetings.</li> <li>• Provide more awareness to parties involves (documentation, workshops, etc.).</li> <li>• <b>Strong understanding/cooperation between central and provincial office responsibilities must be clearly defined</b></li> <li>• Take advantage of consideration of Port State procedures being considered by the Commission</li> <li>• Talk to your superiors about ways to facilitate the greater involvement of people working in other agencies in regional and subregional opportunities eg maritime surveillance officers attending TCC meetings, customs being involved in providing advice for port state procedure developments</li> </ul>

## Appendix VI – Assessment of the Workshop by Participants

In order to get an indication of the usefulness of the workshop through feedback from the participants on their assessment of key objectives, a questionnaire was prepared and distributed at the end of the workshop. The results from the questionnaire also provide ideas for future work with member countries and how we can improve the content and structure of future workshops. There was no requirement to identify name or country on the questionnaire, keeping it anonymous and therefore stimulating frank responses.

The questionnaire contained 10 statements requiring a response in one of the following categories : **1-Strongly agree; 2-Agree; 3-Uncertain; 4-Disagree; 5-Strongly disagree**. Participants were also asked to include any comments and/or suggestions for each question. There were two additional questions that required comments only. The following Table contains a summary of the responses from 19 countries completing the questionnaire (one participant had to leave Noumea early due to connecting flights).

STATEMENT	Questionnaire category					COMMENTS / SUGGESTIONS
	1	2	3	4	5	
1. The overall structure of WORKSHOP was useful	14	5	–	–	–	<input type="checkbox"/> <i>Straightforward, simple, easy to understand; all sessions thoroughly covered</i> <input type="checkbox"/> <i>Not exactly relevant to our local office work, but the concept can be adapted and used in our work</i> <input type="checkbox"/> <i>Good for different skill levels amongst participants</i> <input type="checkbox"/> <i>Well structured</i> <input type="checkbox"/> <i>Very useful as questions, presentations and exercises help a lot in producing the national procedures manual</i> <input type="checkbox"/> <i>.. helps to convey importance of data collection and dissemination to the WCPFC</i>
2. The time allocated to the components of the workshop was appropriate	9	9	1	–	–	<input type="checkbox"/> <i>.. more time for discussion ...</i>
3. The workshop conveyed the message intended (i.e. it met with my understanding of what was to be achieved)	13	5	1	–	–	<input type="checkbox"/> <i>Excellent coverage (Interactive group discussion sessions) !</i> <input type="checkbox"/> <i>Loud and clear – very good</i> <input type="checkbox"/> <i>Very well conveyed</i> <input type="checkbox"/> <i>Agree... assistance from the more experienced participants was helpful also</i> <input type="checkbox"/> <i>.. more of this kind of worksup can improve our knowledge on the importance of data collection ...</i>
4. The Group Discussions Sessions were useful	10	7	2	–	–	<input type="checkbox"/> <i>Excellent. Group discussions facilitate the participation of different countries – sharing experiences was a wonderful opportunity</i> <input type="checkbox"/> <i>Good to hear about the different situations in member countries. Good placement (allocation) of group participants – similar situations</i> <input type="checkbox"/> <i>We learn from each other's problems and</i>

STATEMENT	Questionnaire category					COMMENTS / SUGGESTIONS
	1	2	3	4	5	
						<p><i>suggest solutions</i></p> <input type="checkbox"/> <i>Agree, but more time would be good ...</i>
5. The Exercises provided were useful	9	10	–	–	–	<input type="checkbox"/> <i>Specific exercises covers the presentations</i> <input type="checkbox"/> <i>Very useful – assisting in drafting the respective sections of procedures document</i> <input type="checkbox"/> <i>Most exercises were useful mostly in terms of compliance, enforcement</i>
6. I/We learnt as much as intended from the workshop	12	7	–	–	–	<input type="checkbox"/> <i>.. more, in some circumstances ...</i>
7. I/We intend to apply some of the points highlighted and taken from the workshop back at the office	10	5	4	–	–	<input type="checkbox"/> <i>We will certainly do – arrange for an [in-house] meeting to initiate this...</i> <input type="checkbox"/> <i>... will have this document available for implementation...</i> <input type="checkbox"/> <i>We will try to apply all of them</i>
8. I/We will pass on what was learnt to others ( <i>e.g. through, for example, in-house training</i> )	12	7	–	–	–	<input type="checkbox"/> <i>We will certainly do – arrange for an [in-house] meeting to initiate this...</i> <input type="checkbox"/> <i>No problem in passing on work experiences but will do so for enhancement of others skills and knowledge</i>
9. I/We will use the presentations on the CD ( <i>will you need other training material ? – specify in the comments column</i> )	11	7	1	–	–	<input type="checkbox"/> <i>We will certainly do – arrange for an [in-house] meeting to initiate this...</i> <input type="checkbox"/> <i>... especially for completion of national procedures document – no other materials required ...</i>
10. The Concept of the National Procedures document and the Regional Template is a very good idea...	19	–	–	–	–	<input type="checkbox"/> <i>We will certainly do – arrange for an [in-house] meeting to initiate this...</i> <input type="checkbox"/> <i>Very good in getting undocumented procedures ‘documented’</i> <input type="checkbox"/> <i>A great way to get data collection procedures formulated in-country</i> <input type="checkbox"/> <i>It becomes a catalyst to improve data management/collection procedures in country, and improve the skills of those who manage the data</i> <input type="checkbox"/> <i>Excellent document !! I think this can be used [applied] as a local document for any fisheries data collected</i>

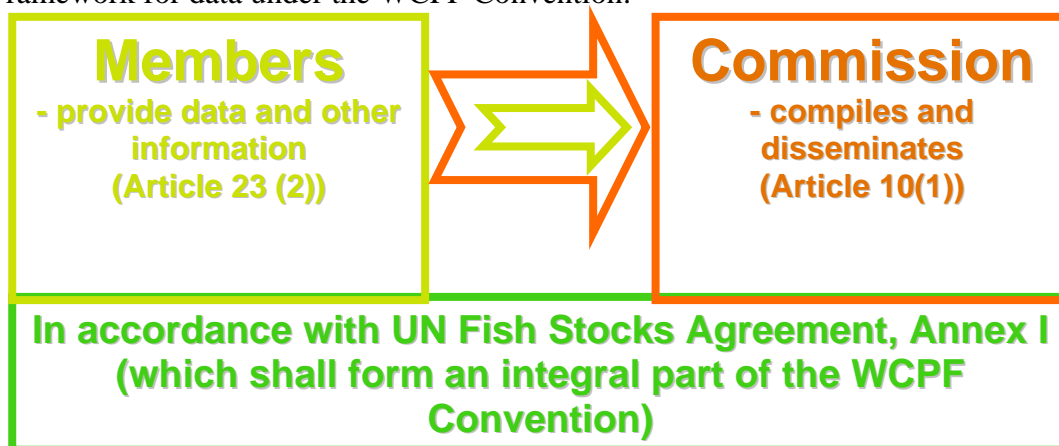
STATEMENT	COMMENTS
<p>What do you think the topic of the next workshop should focus on ?</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Data Quality – being able to identify incorrect data. Problem/Solution work strategies ...</i></li> <li><input type="checkbox"/> <i>Follow-up on procedures development and implementation, looking further into Commission requirements</i></li> <li><input type="checkbox"/> <i>Data dissemination procedures as indicated. Exchange of ideas and problems in data collection systems by presentations from individual countries in future meetings as suggested by Samoa</i></li> <li><input type="checkbox"/> <i>Data checking, analysis, verification</i></li> <li><input type="checkbox"/> <i>Include enhancing cooperation amongst countries</i></li> <li><input type="checkbox"/> <i>In-house training/attachment in TUFMAN; software training (including statistical analysis)' dissemination data training</i></li> <li><input type="checkbox"/> <i>Dissemination; Confidentiality/Security</i></li> <li><input type="checkbox"/> <i>Development standards for data collection systems; demonstration of TUFMAN</i></li> <li><input type="checkbox"/> <i>How to tell the quality of data collection</i></li> <li><input type="checkbox"/> <i>Check the implementation of the solutions/methods [to problems in data collection] identified in this workshop; encourage feedback from participants (in line with this point)</i></li> <li><input type="checkbox"/> <i>Review progress on points raised in this workshop</i></li> <li><input type="checkbox"/> <i>Presentation of National Procedures document by countries</i></li> <li><input type="checkbox"/> <i>Training of personnel on using TUFMAN software</i></li> <li><input type="checkbox"/> <i>Problems on data collection at the National level and possible solutions</i></li> <li><input type="checkbox"/> <i>Complete the National templates and implement the programme, then in the 2<sup>nd</sup> workshop, participants will report on the problems in the implementation</i></li> </ul>
<p>Any other comments ?</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Excellent workshop. Not too overloaded so exercises can be worked on and discussions</i></li> <li><input type="checkbox"/> <i>A job very successfully done, from planning through to conducting the workshop, Well done !</i></li> <li><input type="checkbox"/> <i>TDW-1 Coordinators must keep a close check to ensure the procedures documents get implemented as we have a strong feeling that most of the issues discussed here may not be changed due to the way things are currently happening</i></li> <li><input type="checkbox"/> <i>Very good, enjoyed the workshop. Need a follow-up workshop and need further financial assistance</i></li> <li><input type="checkbox"/> <i>Very useful, clearly highlighted the importance of data collection, management and dissemination of information. This will assist a lot in the organization of my duties and staff. Best if two participants from member countries attend the workshop in the future.</i></li> <li><input type="checkbox"/> <i>The workshop overall was very successful as to its relevancy in developing the procedures document required for the collection of data in my country</i></li> <li><input type="checkbox"/> <i>Consider that more detailed workshop documents to be sent to member countries prior to the meeting</i></li> <li><input type="checkbox"/> <i>Thank you very much for your hard effort and hopefully there will be another workshop in the coming year</i></li> <li><input type="checkbox"/> <i>Increase country presentations and participation in discussions; follow-up workshops; cheaper hotel rates ...</i></li> <li><input type="checkbox"/> <i>Very useful and hope another will be held in the future ...</i></li> <li><input type="checkbox"/> <i>.. this workshop made me very aware of problems throughout the Pacific and hopefully some solutions that we discussed, I can use. I'll probably use the template provided and ideas presented as a local territory document ..</i></li> </ul>

## Appendix VII - Data-related provisions of the WCPF Convention

General principle for conservation and management of highly migratory fish stocks

Article 5 (i): *In order to conserve and manage highly migratory fish stocks in the Convention Area in their entirety, the members of the Commission shall, ...collect and share, in a timely manner, complete and accurate data concerning fishing activities on, inter alia, vessel position, catch of target and non-target species and fishing effort, as well as information from national and international research programmes;*

Framework for data under the WCPF Convention:



Members obligations in respect of data

Article 23 (2) *Each member shall...*

- a) *provide annually to the Commission statistical, biological and other data and information in accordance with Annex I of the [UN Fish Stocks] Agreement and, in addition, such data and information as the Commission may require;*
- b) *provide to the Commission in the manner and at such intervals as may be required by the Commission, information concerning its fishing activities in the Convention Area, including fishing areas and fishing vessels in order to facilitate the compilation of reliable catch and effort statistics;*
- c) *provide to the Commission at such intervals as may be required information on steps taken to implement the conservation and management measures adopted by the Commission.*

(3) *The members of the Commission shall keep the Commission informed of the measures they have adopted for the conservation and management of highly migratory fish stocks in areas within the Convention Area under their national jurisdiction. The Commission shall circulate periodically such information to all members.*

(4) *Each member of the Commission shall keep the Commission informed of the measures it has adopted for regulating the activities of fishing vessels flying its flag which fish in the Convention Area. The Commission shall circulate periodically such information to all members.*

Functions of the Commission in respect of data:

Article 10(1):

- d) *adopt standards for collection, verification and for the timely exchange and reporting of data on fisheries for highly migratory fish stocks in the Convention Area in accordance with Annex I of the [UN Fish Stocks] Agreement, which shall form an integral part of this Convention;*
- e) *compile and disseminate accurate and complete statistical data to ensure that the best scientific information is available, while maintaining confidentiality, where appropriate;*

Justification for the role of SPC-OFP as data contractor to the Commission:

Article 13

1. *The Commission, taking into account any recommendation of the Scientific Committee, may engage the services of scientific experts to provide information and advice on the fishery resources covered by this Convention and related matters that may be relevant to the conservation and management of those resources. The Commission may enter into administrative and financial arrangements to utilize scientific services for this purpose. In this regard, and in order to carry out its functions in a cost-effective manner, the Commission shall, to the greatest extent possible, utilize the services of existing regional organizations and shall consult, as appropriate, with any other fisheries management, technical or scientific organization with expertise in matters related to the work of the Commission.*

3. In carrying out their work, the scientific experts may:

(a) *undertake the collection, compilation and dissemination of fisheries data according to agreed principles and procedures established by the Commission, including procedures and policies relating to the confidentiality, disclosure and publication of data;*

UN Fish Stocks Agreement, Annex I

- Specifies the data to be collected
  - Basic Fishery Data
  - Vessel Data and Information
- Outlines principles to ensure accurate and complete data are obtained  
(see text below)



**AGREEMENT FOR THE IMPLEMENTATION OF THE PROVISIONS OF THE UNITED NATIONS  
CONVENTION ON THE LAW OF THE SEA OF 10 DECEMBER 1982 RELATING TO THE  
CONSERVATION AND MANAGEMENT OF STRADDLING FISH STOCKS AND HIGHLY  
MIGRATORY FISH STOCKS UN FISH STOCKS AGREEMENT)**

**ANNEX I: STANDARD REQUIREMENTS FOR THE COLLECTION AND SHARING OF DATA**

**Article 1**

**General principles**

1. The timely collection, compilation and analysis of data are fundamental to the effective conservation and management of straddling fish stocks and highly migratory fish stocks. To this end, data from fisheries for these stocks on the high seas and those in areas under national jurisdiction are required and should be collected and compiled in such a way as to enable statistically meaningful analysis for the purposes of fishery resource conservation and management.

These data include catch and fishing effort statistics and other fishery-related information, such as vessel-related and other data for standardizing fishing effort. Data collected should also include information on non-target and associated or dependent species. All data should be verified to ensure accuracy. Confidentiality of non-aggregated data shall be maintained. The dissemination of such data shall be subject to the terms on which they have been provided.

2. Assistance, including training as well as financial and technical assistance, shall be provided to developing States in order to build capacity in the field of conservation and management of living marine resources. Assistance should focus on enhancing capacity to implement data collection and verification, observer programmes, data analysis and research projects supporting stock assessments. The fullest possible involvement of developing State scientists and managers in conservation and management of straddling fish stocks and highly migratory fish stocks should be promoted.

**Article 2**

**Principles of data collection, compilation and exchange**

The following general principles should be considered in defining the parameters for collection, compilation and exchange of data from fishing operations for straddling fish stocks and highly migratory fish stocks:

(a) States should ensure that data are collected from vessels flying their flag on fishing activities according to the operational characteristics of each fishing method (e.g., each individual tow for trawl, each set for long-line and purse-seine, each school fished for pole-and-line and each day fished for troll) and in sufficient detail to facilitate effective stock assessment;

(b) States should ensure that fishery data are verified through an appropriate system;

(c) States should compile fishery-related and other supporting scientific data and provide them in an agreed format and in a timely manner to the relevant subregional or regional fisheries management organization or arrangement where one exists. Otherwise, States should cooperate to exchange data either directly or through such other cooperative mechanisms as may be agreed among them;

(d) States should agree, within the framework of subregional or regional fisheries management organizations or arrangements, or otherwise, on the specification of data and the format in which they are to be provided, in accordance with this Annex and taking into account the nature of the stocks and the fisheries for those stocks in the region. Such organizations or arrangements should request non-members or non-participants to provide data concerning relevant fishing activities by vessels flying their flag;

(e) such organizations or arrangements shall compile data and make them available in a timely manner and in an agreed format to all interested States under the terms and conditions established by the organization or arrangement; and

(f) scientists of the flag State and from the relevant subregional or regional fisheries management organization or arrangement should analyse the data separately or jointly, as appropriate.

### **Article 3**

#### **Basic fishery data**

1. States shall collect and make available to the relevant subregional or regional fisheries management organization or arrangement the following types of data in sufficient detail to facilitate effective stock assessment in accordance with agreed procedures:
  - (a) time series of catch and effort statistics by fishery and fleet;
  - (b) total catch in number, nominal weight, or both, by species (both target and non-target) as is appropriate to each fishery. [Nominal weight is defined by the Food and Agriculture Organization of the United Nations as the live-weight equivalent of the landings];
  - (c) discard statistics, including estimates where necessary, reported as number or nominal weight by species, as is appropriate to each fishery;
  - (d) effort statistics appropriate to each fishing method; and
  - (e) fishing location, date and time fished and other statistics on fishing operations as appropriate.
  
2. States shall also collect where appropriate and provide to the relevant subregional or regional fisheries management organization or arrangement information to support stock assessment, including:
  - (a) composition of the catch according to length, weight and sex;
  - (b) other biological information supporting stock assessments, such as information on age, growth, recruitment, distribution and stock identity; and
  - (c) other relevant research, including surveys of abundance, biomass surveys, hydro-acoustic surveys, research on environmental factors affecting stock abundance, and oceanographic and ecological studies.

### **Article 4**

#### **Vessel data and information**

1. States should collect the following types of vessel-related data for standardizing fleet composition and vessel fishing power and for converting between different measures of effort in the analysis of catch and effort data:
  - (a) vessel identification, flag and port of registry;
  - (b) vessel type;
  - (c) vessel specifications (e.g., material of construction, date built, registered length, gross registered tonnage, power of main engines, hold capacity and catch storage methods); and
  - (d) fishing gear description (e.g., types, gear specifications and quantity).
2. The flag State will collect the following information:
  - (a) navigation and position fixing aids;
  - (b) communication equipment and international radio call sign; and
  - (c) crew size.

### **Article 5**

#### **Reporting**

A State shall ensure that vessels flying its flag send to its national fisheries administration and, where agreed, to the relevant subregional or regional fisheries management organization or arrangement, logbook data on catch and effort, including data on fishing operations on the high seas, at sufficiently frequent intervals to meet national requirements and regional and international obligations. Such data shall be transmitted, where necessary, by radio, telex, facsimile or satellite transmission or by other means.

### **Article 6**

#### **Data verification**

- States or, as appropriate, subregional or regional fisheries management organizations or arrangements should establish mechanisms for verifying fishery data, such as:
- (a) position verification through vessel monitoring systems;
  - (b) scientific observer programmes to monitor catch, effort, catch composition (target and non-target) and other details of fishing operations;
  - (c) vessel trip, landing and transshipment reports; and
  - (d) port sampling.

## **Article 7**

### **Data exchange**

1. Data collected by flag States must be shared with other flag States and relevant coastal States through appropriate subregional or regional fisheries management organizations or arrangements. Such organizations or arrangements shall compile data and make them available in a timely manner and in an agreed format to all interested States under the terms and conditions established by the organization or arrangement, while maintaining confidentiality of non-aggregated data, and should, to the extent feasible, develop database systems which provide efficient access to data.

2. At the global level, collection and dissemination of data should be effected through the Food and Agriculture Organization of the United Nations. Where a subregional or regional fisheries management organization or arrangement does not exist, that organization may also do the same at the subregional or regional level by arrangement with the States concerned.