

International Consultations on the Establishment of the
South Pacific Regional Fisheries Management Organisation

SPRFMO Observer Programme Draft Standards : Scientific Component

1. Introduction & Rationale

The recent report on *Recommended Best Practices for Regional Fisheries Management Organizations* (Lodge *et al* 2007), notes that observer programmes have long been regarded as an essential component of fisheries monitoring, control and surveillance (MCS) systems. The 1982 UN LOS Convention recognized the 'placing of observers' on board fishing vessels as one of the conditions for access to EEZs. The role of observer programmes, both national and adopted through RFMOs, in relation to the conservation and management of straddling fish stocks and highly migratory fish stocks is further elaborated in UNFSA, which establishes participation in national, sub-regional and regional observer programmes as a flag State responsibility. The provisions of UNFSA are reinforced by the FAO Code of Conduct, which recommends that states implement observer programmes as integral components of fisheries management and MCS systems.

Lodge *et al* (2007) conclude that RFMO best practices include effective provisions and mechanisms for the collection and reporting of data necessary for the monitoring and management of fishery operations and the status of the resources and ecosystems. In particular, best current practice includes data verification using vessel monitoring systems for the location of fishing effort, and at-sea scientific observer programmes for other data reporting, and particularly to gather information on the impact of the fishery on non-target species and habitats. The implementation of effective at-sea scientific observer programs should therefore be an essential and integral component of any ecosystem-based approach to fisheries management.

In recognition of these international guidelines and obligations, the draft Convention Text for a SPRFMO Agreement makes provision for the establishment of "*an observer programme to collect verified catch data, other scientific data and additional information related to the fishery resources of the Area, and to monitor the implementation of the provisions of this Convention and the conservation and management measures adopted by the Commission.*" Accordingly, data standards adopted at the 3rd SPRFMO meeting held in May 2007 in Reñaca, Chile, make specific provision for implementation of systems to verify collected data, including the implementation of Observer Programmes:

"4. Data Verification

Participants are to ensure that fishery data are verified through an appropriate system. Participants are to develop, implement and improve mechanisms for verifying data, such as:

- (a) Position verification through vessel monitoring systems;*
- (b) Scientific observer programmes to collect verification data on catch, effort, catch composition (target and non-target), discards and other details of fishing operations;*
- (c) Vessel trip, landing and transshipment reports; and*
- (d) Port sampling."*

(SPRFMO Standards for the Collection, Reporting, Verification and Exchange of Data, 2007)

At the SPRFMO meeting in May 2007, the Scientific Working Group endorsed the value of observer programmes, and recognised an urgent need to implement interim scientific

observer programmes. The most important Information which should be collected by such programmes was identified as being:

- Effort data relevant to the fishing method (as per *SPRFMO Draft Standards for Collection, Reporting, Verification and Exchange of Data* Annexes 1, 2 and 3).
- Catch composition data for all species, including retained and discarded by-catches.
- Size-frequency information and otoliths for principal catch species, particularly for jack mackerel.
- Incidental catches and mortalities of associated species.

(Report of the SPRFMO Scientific Working Group, May 2007)

2. Scope

The SPRFMO Observer Programme is intended to cover all high-seas fishing activities, including all fishing methods and all target species, by all participants fishing in the SPRFMO area, during the period of the SPRFMO Interim Measures.

This standard is intended to provide guidelines for participants in SPRFMO fisheries to develop, implement, standardise and improve their national observer programmes for fishing operations by their flag vessels in the SPRFMO area.

Provision is made in the current draft SPRFMO Agreement text for implementation of an Observer Programme “*coordinated by the Secretariat of the Commission*”. It is therefore intended that this standard will be replaced by a similar standard for a SPRFMO Observer Programme to be coordinated by the Secretariat, after establishment of the Commission.

3. Objectives of the SPRFMO Observer Programme

The objectives of the SPRFMO Observer Programme will be:

1. To collect verified vessel, effort and catch data for all fisheries and fished species in the Area, in accordance with these standards.
2. To collect additional biological or other data and information relevant to the management of fishery resources in the Area, as specified in these standards, or as identified from time to time in research programmes developed by the Scientific Working Group.
3. To monitor relevant aspects of the implementation of the provisions of the Interim Measures and future conservation and management measures adopted by the Commission.

4. Responsibility for Observer Programme Operation

In the period of the SPRFMO Interim Measures, participants in fisheries in the SPRFMO area are required to develop, implement, improve and operate observer programmes for their fleets and fisheries in the SPRFMO area in accordance with these standards. During this interim period, responsibility for the operation of the Observer Programme will lie with the participant whose flag is flown on the vessel.

Once the Commission has been formally established, further consideration will be given to options for centralising aspects of the SPRFMO Observer Programme under the coordination of the Secretariat. Responsibilities for observer programme operation may be revised under such a future scheme, including the option for entering into contracts for provision of the

Observer Programme.

5. Levels of Observer Coverage

Observer coverage levels shall be adequate to facilitate robust assessment and quantification of the effects of fishing. Optimal observer coverage levels shall be statistically determined against clear objectives to ensure representative and statistically reliable collection of observer data across fleets, fisheries, species, areas and seasons.

As a target, the SPRFMO Observer Programme will strive to achieve partial observer coverage (as defined by MRAG 2006), with a target observer coverage range of 20% - 30% of individual fishing operations (tows or sets). In addition, observer coverage should be representative of different fleets, vessel-types, fisheries, areas and months.

In order to achieve the required partial observer coverage rates in some vessel / area strata, (e.g. specific vessel-types in certain areas and times), it may be necessary to have higher than 20% - 30% coverage in other strata.

For bottom-fishing operations using mobile fishing gears (such as trawling), and particularly where management measures include some aspect of spatial control (such as closed areas or defined fishing areas), observer coverage levels will need to be high.

Full (100%) observer coverage will be required for effective monitoring of implementation of certain of the Interim Measures, such as measures to ensure that fishing remains within a defined trawl footprint, or to detect any fishing on vulnerable marine ecosystems.

National observer programmes should include some percentage of independent observer coverage (contracted international observers, or observers exchanged between SPRFMO flag states) to provide independent comparison and verification of data collected by various observer programmes.

6. Observer Recruitment and Training

During the period of the Interim Measures, each SPRFMO participant shall be responsible for the recruitment and training of observers for placement on their flagged vessels.

All observers should be independent of the fisheries which they will be observing, and should have no financial or beneficial interests in those fisheries. Observers should have no record of serious criminal offences.

All observers shall receive appropriate training, and have appropriate skills, to be able to collect all the required data and information in accordance with these standards. Members should establish and maintain a structured training programme for the SPRFMO Observer Programme. Manuals should be developed for this purpose, and arrangements made for observer programmes to exchange approaches and experiences to improve data collection.

It is intended that a future SPRFMO Observer Programme coordinated by the Secretariat shall develop standardized training requirements, observer manuals, skill requirements and qualifications for SPRFMO observers.

Exchange of observers between members and recruiting some observers from non-members should be encouraged to improve consistency and transparency in the programme. During the interim period, responsibility for implementing observer exchanges would reside with

members and the exchanges would be organised between relevant members and non-members as appropriate.

7. Requirements and Obligations of the Observed Vessel

All observed vessels must be provided with a document detailing the respective duties and responsibilities of the vessel, and of the observer. A selected vessel must specifically be advised of its responsibility for the safety of the observer while they are on board.

There should preferably be some form of standard agreement between flag states and their vessels detailing the respective rights, obligations, duties and responsibilities of vessel owners, vessel operators / Masters and observers. Such agreements should cover aspects such as those listed below.

Specific obligations and duties of the vessels shall include, but not be limited to:

- Any vessel selected for an observation should be capable of meeting the national or international (as appropriate) requirements for safety, accommodation, sanitary facilities, meals, equipment and communication systems, equivalent to those afforded to an officer.
- Vessel owners / Masters are to make adequate provision for the safe boarding and disembarkation of observers and their equipment, at agreed times and places.
- Observers are to be provided with access to adequate communications equipment for the purposes of reporting data, progress with the observer trip or safety-related information.
- Observers are to be provided with full access to all information, facilities and equipment on board which the Observer may determine is necessary to carry out his or her duties. This includes access to the fish processing and storage facilities for their inspection and measurement; collection of samples; access to vessel records and logs; access to navigation equipment, charts and communications equipment; and access to any other information relating to the data-gathering duties of the observer specified in this standard.

Notwithstanding the above, adequate provision may be made for protecting commercially sensitive vessel-specific processing and marketing information.

8. Information and Data to be Collected

All national observer programmes operated in the SPRFMO Area in accordance with these standards will be required to collect the information detailed in Annex 1 of these standards. This Annex includes recommendations on an appropriate hierarchy of priorities for collection of the various data.

9. Reporting & Data Provision

All SPRFMO participants will be required to provide annual Observer Implementation Reports, as part of National Reports submitted to annual meetings, in accordance with Annex 2 of these standards. These reports shall be adequate to allow the Data & Information Working Group, the Scientific Working Group or the Commission to evaluate the implementation and effectiveness of observer programmes implemented under this standard.

Observer data shall be provided to the SPRFMO Secretariat in a standardised format, to be included in a SPRFMO Observer Database. Specifications and standards for this data

submission will be developed by the SPRFMO Secretariat, once it has been established. These specifications shall include adequate provisions to protect the confidentiality of observer data, similar to the confidentiality provisions in the SPRFMO Data Standards.

10. References

- Lodge, M.W., D. Anderson, T. Løbach, G. Munro, K. Sainsbury & A. Willock, 2007. Recommended Best Practices for Regional Fisheries Management Organizations. Report of an independent panel to develop a model for improved governance by Regional Fisheries Management Organizations. The Royal Institute of International Affairs, Chatham House, London. 141 pp. (ISBN: 978 1 86203 188 3)
- MRAG, 2006. *Observer Programmes: Best Practice, Funding Options and North Sea Case Study*. A report to WWF by Marine Resources Assessment Group. Published by WWF, United Kingdom, 88 pp.

Annex 1

TYPE AND FORMAT OF SCIENTIFIC OBSERVER DATA TO BE COLLECTED

A. Vessel & Observer Data to be Collected for Each Trip

1. Vessel and observer details are to be recorded only once for each observed trip.
2. The following vessel data are to be collected for each observed trip:
 - a) Current vessel flag.
 - b) Name of vessel.
 - c) Name of the Captain.
 - d) Name of the Fishing Master.
 - e) Registration number.
 - f) International radio call sign (if any).
 - g) Lloyd's / IMO number (if allocated).
 - h) Previous Names (if known).
 - i) Port of registry.
 - j) Previous flag (if any).
 - k) Type of vessel.
 - l) Type of fishing method(s).
 - m) Length (m).
 - n) Beam (m).
 - o) Gross register tonnage.
 - p) Power of main engine(s) (kilowatts).
 - q) Hold capacity (cubic metres).
 - r) Record of the equipment on board which may affect fishing power factors (navigational equipment, radar, sonar systems, weather fax or satellite weather receiver, sea-surface temperature image receiver, Doppler current monitor, radio direction finder).
 - s) Total number of crew (all staff, excluding observers).
3. The following observer data are to be collected for each observed trip:
 - a) Observer's name.
 - b) Observer's organisation.
 - c) Date observer embarked (UTC date).
 - d) Port of embarkation.
 - e) Date observer disembarked (UTC date).
 - f) Port of disembarkation.

B. Catch & Effort Data to be Collected for Trawl Fishing Activity

1. Data are to be collected on an un-aggregated (tow by tow) basis for all observed trawls.
2. The following data are to be collected for each observed trawl tow:
 - a) Tow start date.
 - b) Tow start time.
 - c) Tow end date.
 - d) Tow end time.
 - e) Tow start position (Lat/Lon, 1 minute resolution).
 - f) Tow end position (Lat/Lon, 1 minute resolution).
 - g) Intended target species.
 - h) Type of trawl, bottom or mid-water.

- i) Type of trawl, single, double or triple.
- j) Height of net opening.
- k) Width of net opening.
- l) Mesh size of the cod-end net (stretched mesh, mm) and mesh type (diamond, square, etc).
- m) Gear depth (of footrope) at start of fishing.
- n) Bottom (seabed) depth at start of fishing.
- o) Catch of all species retained on board, split by species, in live weight (to the nearest kg).
- p) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
- q) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.
- r) Record of sensitive benthic species in the trawl catch, particularly vulnerable or habitat-forming species such as sponges, sea-fans or corals.

C. Catch & Effort Data to be Collected for Purse Seine Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed purse-seine sets.
2. The following data are to be collected for each observed purse-seine set:
 - a) Total search time before this set, since the last set.
 - b) Set start date.
 - c) Set start time.
 - d) Set end date.
 - e) Set end time.
 - f) Set start position (Lat/Lon, 1 minute resolution).
 - g) Net length (m).
 - h) Net height (m).
 - i) Net mesh size (stretched mesh, mm) and mesh type (diamond, square, etc)
 - j) Intended target species.
 - k) Type of school and association (FAD, debris, seabirds, surface, sonar target).
 - l) Catch of all species retained on board, split by species, in live weight (to the nearest kg).
 - m) Estimate of the amount (weight or volume) of all living marine resources discarded, split by species.
 - n) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

D. Catch & Effort Data to be Collected for Bottom Long Line Fishing Activity

1. Data are to be collected on an un-aggregated (set by set) basis for all observed longline sets.
2. The following fields of data are to be collected for each set:
 - a) Set start date.
 - b) Set start time.
 - c) Set end date.
 - d) Set end time.
 - e) Set start position (Lat/Lon, 1 minute resolution).
 - f) Set end position (Lat/Lon, 1 minute resolution).

- g) Intended target species.
- h) Total length of longline set (km).
- i) Number of hooks for the set.
- j) Bottom (seabed) depth at start of set.
- k) Number of hooks actually observed during the haul.
- l) Catch of all species retained on board, split by species, in live weight (to the nearest kg).
- m) An estimation of the amount (numbers or weight) of living marine resources discarded, split by species
- n) Record of the numbers by species of all marine mammals, seabirds or reptiles caught.

E. Length-Frequency Data to Be Collected

1. Representative and randomly distributed length-frequency data (to the nearest mm, with record of the type of length measurement taken) are to be collected for representative samples of the target species and, time permitting, for other main by-catch species. Total weight of length-frequency samples should be recorded, and observers may be required to also determine sex of measured fish to generate length-frequency data stratified by sex.
2. The numbers of fish to be measured for each species and distribution of samples across area and month strata should be statistically determined, to ensure that samples are properly representative of species distributions and size ranges.

F. Biological Sampling to be Conducted

1. The following biological data are to be collected for representative samples of the main target species and, time permitting, for other main by-catch species contributing to the catch:
 - a) Species
 - b) Length (to the nearest mm), with record of the type of length measurement used.
 - c) Sex (male, female, immature, unsexed)
 - d) Maturity stage (immature, mature, ripe, ripe-running, spent)
2. Representative stratified samples of otoliths are to be collected from the main target species and, time permitting, from other main by-catch species regularly occurring in catches. All otoliths to be collected are to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
3. Where specific trophic relationship projects are being conducted, observers may be requested to also collect stomach samples from certain species. Any such samples collected are also to be labelled with the information listed in 1 above, as well as the date, vessel name, observer name and catch position.
4. Observers may also be required to collect tissue samples as part of specific genetic research programmes implemented by the Scientific Working Group.
5. Observers are to be briefed and provided with written length-frequency and biological sampling protocols and priorities for the above sampling specific to each observer trip.

G. Data to be Collected on Incidental Captures of Protected Species

1. Flag states operating observer programs are to develop, in cooperation with the SPRFMO Scientific Working Group, lists and identification guides of protected species or species of concern (seabirds, marine mammals or marine reptiles) to be monitored by observers,.
2. The following data are to be collected for all protected species caught in fishing operations:
 - a) Species (identified as far as possible, or accompanied by photographs if identification is difficult).
 - b) Count of the number caught per tow or set.
 - c) Life status (vigorous, alive, lethargic, dead) upon release.
 - d) Whole specimens (where possible) for onshore identification. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.

H. Detection of Fishing in Association with Vulnerable Marine Ecosystems

1. The Scientific Working Group is to develop a guideline, species list and identification guide for benthic species (e.g. sponges, sea fans, corals) whose presence in a trawl catch will indicate that fishing occurred in association with a vulnerable marine ecosystem (VME). All observers on trawl vessels are to be provided with copies of this guideline, species list and ID guide.
2. For each observed trawl, the following data are to be collected for all species caught, which appear on the list of vulnerable benthic species:
 - a) Species (identified as far as possible, or accompanied by a photograph where identification is difficult).
 - b) An estimate of the quantity (weight (kg) or volume (m³)) of each listed benthic species caught in the tow.
 - c) An overall estimate of the total quantity (weight (kg) or volume (m³)) of all invertebrate benthic species caught in the tow.
 - d) Where possible, and particularly for new or scarce benthic species which do not appear in ID guides, whole samples should be collected and suitably preserved for identification on shore.

I. Data to be Collected for all Tag Recoveries

1. The following data are to be collected for all recovered fish, seabird, mammal or reptile tags:
 - a) Observer name.
 - b) Vessel name.
 - c) Vessel call sign.
 - d) Vessel flag.
 - e) Collect, label (with all details below) and store the actual tags for later return to the tagging agency.
 - f) Species from which tag recovered.
 - g) Tag colour and type (spaghetti, archival).
 - h) Tag numbers (The tag number is to be provided for all tags when multiple tags were attached to one fish. If only one tag was recorded, a statement is required that specifies whether or not the other tag was missing)

- i) Date and time of capture (UTC).
- j) Location of capture (Lat/Lon, to the nearest 1 minute)
- k) Animal length / size (to the nearest cm) with description of what measurement was taken (such as total length, fork length, etc).
- l) Sex (F=female, M=male, I=indeterminate, D=not examined)
- m) Whether the tags were found during a period of fishing that was being observed (Y/N)
- n) Reward information (e.g. name and address where to send reward)

(It is recognised that some of the data recorded here duplicates data that already exists in the previous categories of information. This is necessary because tag recovery information may be sent separately to other observer data.)

J. Hierarchies for Observer Data Collection

1. Trip-specific or programme-specific observer task priorities may be developed in response to specific research programme requirements, in which case such priorities should be followed by observers.
2. In the absence of trip- or programme-specific priorities, the following generalised priorities should be followed by observers:
 - a) Fishing Operation Information
 - All vessel and tow / set / effort information.
 - b) Monitoring of Catches
 - Record time, proportion of catch (e.g. proportion of trawl landing) or effort (e.g. number of hooks), and total numbers of each species caught.
 - Record numbers or proportions of each species retained or discarded.
 - c) Biological Sampling
 - Length-frequency data for target species.
 - Basic biological data (sex, maturity) for target species.
 - Length-frequency data for main by-catch species.
 - Identification and counts of protected species.
 - Check for presence of tags.
 - Otoliths (and stomach samples, if being collected) for target species.
 - Basic biological data for by-catch species.
 - Biological samples of by-catch species (if being collected)
 - Take photos
3. The monitoring of catches and biological sampling procedures should be prioritised among species groups as follows:

Species	Priority (1 highest)
Primary target species (such as jack mackerel, for pelagic fisheries, and orange roughy for demersal fisheries)	1
Other species typically within top 5 in the fishery (such as blue mackerel for pelagic fisheries, and oreos and alphonsino for demersal fisheries)	2
Protected species	3
All other species	4

The allocation of observer effort among these activities will depend on the type of operation and setting. The size of sub-samples relative to unobserved quantities (e.g. number of hooks examined for species composition relative to the number of hooks set) should be explicitly recorded under the guidance of member country observer programmes.

K. Coding Specifications to be Used for Recording Observer Data

1. Unless otherwise specified for specific data types, observer data are to be collected in accordance with the same coding specifications as specified in Annex 5 of the SPRFMO Data Standards.
2. Coordinated Universal Time (UTC) is to be used to describe times.
3. Degrees and minutes are to be used to describe locations.
4. The following coding schemes are to be used:
 - a) Species are to be described using the FAO 3 letter species codes.
 - b) Fishing methods are to be described using the International Standard Classification of Fishing Gear (ISSCFG - 29 July 1980) codes.
 - c) Types of fishing vessel are to be described using the International Standard Classification of Fishery Vessels (ISSCFV) codes.
5. Metric units of measure are to be used, specifically:
 - a) Kilograms are to be used to describe catch weight.
 - b) Metres are to be used to describe height, width, depth, beam or length.
 - c) Cubic metres are to be used to describe volume.
 - d) Kilowatts are to be used to describe engine power.

Annex 2

FORMAT OF NATIONAL REPORT SECTIONS ON DEVELOPMENT AND IMPLEMENTATION OF SCIENTIFIC OBSERVER PROGRAMMES

Report Components

Annual Observer Programme implementation reports should form a component of annual National Reports submitted by members to the Scientific Working Group. These reports should provide a brief overview of observer programmes conducted in the SPRFMO area. Observer programme reports should include the following sections:

A. Observer Training

An overview of observer training conducted, including:

- Overview of training programme provided to scientific observers.
- Number of observers trained.
- Summary of qualifications / training and years of experience of the observers deployed in SBT fisheries during the past year.

B. Scientific Observer Programme Design and Coverage

Details of the design of the observer programme, including:

- Which fleets, fleet components or fishery components were covered by the programme.
- How vessels were selected to carry observers within the above fleets or components.
- How was observer coverage stratified: By fleets, fisheries components, vessel types, vessel sizes, vessel ages, fishing areas and seasons.

Details of observer coverage of the above fleets, including:

- Components, areas, seasons and proportion of total catches of target species, specifying units used to determine coverage.
- Total number of observer employment days, and number of actual days deployed on observation work.

C. Observer Data Collected

List of observer data collected against the agreed range of data set out in Annex 1, including:

- Effort Data: Amount of effort observed (vessel days, sets, hooks, etc), by area and season and % observed out of total by area and seasons
- Catch Data: Amount of catch observed of target and by-catch species, by area and season, and % observed out of total estimated catch by species, area and seasons
- Length Frequency Data: Number of fish measured per species, by area and season.

- Biological Data: Type and quantity of other biological data or samples (otoliths, sex, maturity, etc) collected per species.
- The size of length-frequency and biological sub-samples relative to unobserved quantities.

D. Tag Return Monitoring

- Number of tags returns observed, by fish size class and area.

E. Problems Experienced

- Summary of problems encountered by observers and observer managers that could affect the SPRFMO Observer Programme Standards and/or each member's national observer programme developed under the SRFMO standards.