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Accord relatif aux Pêches dans le Sud de l'Océan Indien

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Establishment of a framework for scientific observation of SIOFA fisheries (SEC2022-OBS1) – Final Report

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Abstract

The project "SEC2022-OBS1: Establish a framework for scientific observation of SIOFA fisheries" aims to ensure that scientific observers working in SIOFA fisheries operate using a consistent set of standards for observation and measurement.
This report is structured to address the five objectives of the project in a hierarchical sequence that covers the high-level objectives for observer coverage as well as detailed data collection forms and operational requirements for an observer scheme.
A draft Conservation and Management Measure (CMM), based on the existing SIOFA CMM 02 (2023), provides a policy-level framework for a SIOFA Scientific Observer Scheme, and includes the categories of data that should be collected by observers. Detailed sampling requirements should be specified through delegated responsibilities.
The collection of consistent and high-quality scientific data by scientific observers in SIOFA fisheries should be based on standardised data collection processes. We have provided a set of fishery-specific Observer Logbooks in Excel workbooks and an instruction manual that describes how each field in the respective Logbook forms should be completed.

[1] Restricted documents may contain confidential information. Please do not distribute restricted documents in any form without the explicit permission of the SIOFA Secretariat and the data owner(s)/provider(s).
[2] Documents available only to members invited to closed sessions.

We have outlined a set of minimum standards for CCP observer programmes that encompass the complete observer operation and data life cycle. Templates and metrics for the review of both the structural implementation of, and the outcomes from, CCP observer programmes are also provided.
Electronic Monitoring (EM) systems that provide data on timing and location of fishing operations, and counts of individual fish landed in line fisheries, could be introduced in SIOFA and would help to optimise the work of observers and allow more time for biological and ecosystem-related data collection. CCPs that already implement EM systems should be encouraged to report to SIOFA on their experience with relevant data collection and analysis processes.
Recommendations for future work are divided into aspects that are 'structural', insofar as they are policy decisions on the obligations of CCPs for data reporting in SIOFA, and 'scientific', where they related to the detailed description of how those data reporting obligations are met.

Recommendations

The authors have identified the following aspects of potential future work:

Structural

- Specification of the mandatory data requirements from SIOFA fisheries in order to meet the objectives of Article 2 of the Southern Indian Ocean Fisheries Agreement and whether these data should be provided by vessels or by scientific observers.
- Specification of the definition of observer coverage and required levels of coverage in all SIOFA fisheries.
- Agreement on a CMM that creates the policy-level framework for a harmonised observer scheme in SIOFA.
- Develop vessel data reporting Manual for SIOFA fisheries that can be used by all Observers in SIOFA fisheries.

Scientific

- Review and implement observer data collection using a standard set of Observer Logbooks and instructions in SIOFA fisheries.
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- Agree data entry processing and quality assurance metrics to provide feedback to CCPs on data quality and performance.
- Agree detailed biological sampling requirements for primary and secondary species in all SIOFA fisheries.
- Develop an Observer Manual that describes the detailed methods and processes that can be used by all Observers in SIOFA fisheries.

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Establishment of a framework for scientific observation of SIOFA fisheries

Project Code: SEC2022-OBS1

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Executive Summary

The project "SEC2022-OBS1: Establish a framework for scientific observation of SIOFA fisheries" aims to ensure that scientific observers working in SIOFA fisheries operate using a consistent set of standards for observation and measurement.

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A draft Conservation and Management Measure (CMM), based on the existing SIOFA CMM 02 (2023), provides a policy-level framework for a SIOFA Scientific Observer Scheme, and includes the categories of data that should be collected by observers. Detailed sampling requirements should be specified through delegated responsibilities.

The collection of consistent and high-quality scientific data by scientific observers in SIOFA fisheries should be based on standardised data collection processes. We have provided a set of fishery-specific Observer Logbooks in Excel workbooks and an instruction manual that describes how each field in the respective Logbook forms should be completed.

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Recommendations for future work are divided into aspects that are 'structural', insofar as they are policy decisions on the obligations of CCPs for data reporting in SIOFA, and 'scientific', where they related to the detailed description of how those data reporting obligations are met.

Synthèse [1]

Le projet SEC2022-OBS1, Établir un cadre pour l'observation scientifique des pêcheries APSOI, a pour objectif de garantir l'adoption par les observateurs scientifiques travaillant dans les pêcheries de l'APSOI d'un ensemble uniforme de normes d'observation et de mesure.

Ce rapport est structuré de manière à aborder les cinq objectifs du projet dans une séquence hiérarchique destinée à guider les observateurs, ainsi que les formulaires détaillés de saisie des données, et les exigences opérationnelles du programme d'observation.

Une proposition de Mesure de Conservation et de Gestion (MCG), basée sur la MCG APSOI 02 (2023) existante, fournit une politique pour le programme d'observation scientifique de l'APSOI, incluant un "code de conduite" pour les observateurs, une clarification des rôles et responsabilités ainsi que les catégories de données à collecter. Nous recommandons que les mécanismes et les exigences d'échantillonnage soient spécifiés par des responsabilités déléguées, telles que " convenu par le comité scientifique", pour permettre une plus grande flexibilité lors de l'établissement et la révision des priorités d'échantillonnage scientifique.

La collecte de données scientifiques de bonne qualité par les observateurs scientifiques dans les pêcheries APSOI devrait être basée sur des processus de collecte de données standardisés. Sur la base des commentaires des Parties Contractantes et non-Contractantes (PCC) et l'expérience acquise dans l'interprétation des MCG pour les programmes opérationnels de collecte de données par les observateurs, nous avons élaboré des carnets de bord spécifiques à chaque pêcherie dans des classeurs Excel, accompagné d'un manuel d'instructions décrivant la manière dont chaque champ des formulaires doit être rempli et un modèle pour les rapports de croisière de l'observateur.

Afin de garantir que les données collectées par les observateurs dans les pêcheries APSOI répondent à leur objectif, nous avons défini des normes minimales pour les programmes d'observation des PCC, Ces normes englobent l'intégralité du cycle opérationnel et des données des observateurs, avec des critères spécifiques portant sur l'infrastructure, la formation et les performances des programmes d'observation. De plus, des indicateurs sont fournis pour évaluer à la fois la mise en place structurelle et les résultats des programmes d'observation accompagnés de modèles pour la rédaction des rapports et l'évaluation des programmes d'observation de la PCC.

Les systèmes de surveillance électronique (SE) capables de recueillir des informations que les moments et les lieux des activités de pêche ainsi que sur les quantités de poissons débarqués par les pêcheries à la ligne pourraient être pris en compte par l'APSOI et permettraient d'optimiser le travail des observateurs qui pourraient alors se consacrer davantage sur la collecte de données biologiques, et de données liées aux écosystèmes.

Compte tenu des difficultés probables de la mise en œuvre de normes pour l'utilisation des systèmes de surveillance électronique (SE) dans toutes les pêcheries de l'APSOI, une approche plus pragmatique pourrait consister à encourager les pavillons déjà équipés de

[1] Consistent with the contractual arrangements we have provided this French translation of the Executive Summary, while we have made every effort to confirm the technical content of this translation it should be noted that this is not an official SIOFA translation. We are grateful to the Executive Secretary of SIOFA for his assistance in preparing this translation.

système SE à partager avec l'APSOI leurs méthode de collecte et d'analyse des données,
Cela permettrait d'acquérir de l'expérience et de potentiellement considérer ces données comme complémentaires aux données produites par les observateurs.

Les recommandations pour les futurs travaux sont divisées en deux aspects : les aspects « structurels » qui couvrent les décisions politiques concernant les obligations des PCC en matière de communication de données à l'APSOI, et les aspects "scientifiques", qui se concentrent sur une description détaillée de la manière dont ces obligations de communication de données doivent être accomplies.

1. Introduction

The project "SEC2022-OBS1: Establish a framework for scientific observation of SIOFA fisheries" aims to ensure that the scientific observers working in SIOFA fisheries operate using a consistent set of standards for observation and measurement. The project Terms of Reference (Annex 1) comprise 5 objectives that set out the required components of a framework for scientific observation in SIOFA:

1. Objective 1: Analysis of CCPs observers' programmes.
2. Objective 2: Identify synergies for improving scientific observer management and optimising coverage and deployment, with the aim of setting a consistent standard for scientific observation.
3. Objective 3: Describe and recommend potential tools and operational characteristics for electronic observer monitoring on board vessels.
4. Objective 4: Propose potential updates of the SIOFA CMM-02 on Data Standards, focusing on Annex B (Observer Data).
5. Objective 5: Provide a first draft proposal for a new CMM for regulation of scientific observer harmonisation in SIOFA.

Following discussion with the project Advisory Panel, we considered that the objectives in the ToRs are all integral parts of the observer programme and that there is a pragmatic hierarchy that provides a structure for the overall operation of the scheme. In respect of Objective 1 the Advisory Panel agreed that the analysis of CCP Observer Programmes should be based on CCP reports to WHSOP1, feedback from CCPs to a data content questionnaire and through engagement in WS2024-OBS. Undertaking an in-depth review of each CCP Observer programmes, including translation of all training materials and instruction, was deemed not to be required at this time. We have structured the project report to address the five objectives in a sequence that comprises the following elements:

1. **SIOFA data requirements**

   The data required by SIOFA to 'ensure the long-term conservation and sustainable use of fishery resources in the Area', in accordance with Article 2 of the Southern Indian Ocean Fisheries Agreement, creates the basis for the data that should be reported from different fisheries according to their specific management requirements. In addition to defining the required data the source of the data, in particular whether the vessel or the scientific

observer carry the responsibilities for collecting and reporting these data, should be clearly identified.

2. **SIOFA CMM on an observer data programme and associated reporting requirements**. (Objectives 4 and 5)

Conservation and Management Measures (CMMs) set out the obligations of Parties and provide the policy-level framework for a scientific observer scheme. Objectives 4 and 5 have been combined, as the requirement for first draft proposal for a new CMM for regulation of scientific observer harmonisation in SIOFA is based on an observer specific version of SIOFA CMM 01 on Data Standards and includes a revised version of the current Annex B on observer data requirements. The draft CMM includes the CCP 'code of conduct' and requirements for observers, the roles and responsibilities of observers and the categories of data that should be collected by observers.

3. **Description of the data that should be collected**. (Objective 1)

This section provides detailed data collection forms and instructions for the collection of observer data from each fishery. Noting that the 'fisheries' are defined by gear type (e.g. bottom trawl, midwater trawl, demersal longline, pelagic longline, handline) therefore, the fishery specific observer logbooks, and instructions on how the logbooks should be completed, follow the same approach.

4. **Observer Programme operation** (Objective 2)

This section addresses the need to review requirements for observer coverage levels across all SIOFA fisheries given the data-limited nature of those fisheries. In addition to specifying levels of coverage and what data is to be collected there is a need for a consistent approach to the operation of CCP observer programmes in order that they provide comparable data from appropriately trained and qualified observers.

5. **Technology and new sampling methods** (Objective 3)

This objective addresses opportunities for the collection of data using automated processes (electronic monitoring). Review progress in other fisheries/RFMOs where data

derived from electronic monitoring is submitted as part of either catch and effort or observer data reporting.

This structure provides for the high-level objectives for observer coverage and data collection to be established in a single CMM and for greater granularity and specific mechanisms to achieve those objectives to be specified either in Annexes to that CMM or through delegated responsibilities (i.e. where the specific sampling regimes are 'as agreed by the Scientific Committee'). This approach allows for greater flexibility in setting detailed, scientific sampling priorities without the need for re-opening negotiation on a CMM to make specialist, technical changes.

"Harmonisation" is clearly an overarching objective of the development of a framework for scientific observation of SIOFA fisheries, as reflected in the title and the outcomes of the Workshop on Harmonisation of Scientific Observers' Programmes of the Southern Indian Ocean Fisheries Agreement (SIOFA) held in 2021 (WHSOP1 https://siofa.org/meetings/whsop). An essential element of achieving this overall harmonisation is a clear structure for the fishery-specific requirements, and the overall operation of the observer scheme. Addressing the different fishery-specific modalities and data requirements will place an initial emphasis on fishery-specific harmonisation that will provide the building blocks for observer scheme-wide harmonisation.

In addition to the standard set of instructions for what data should be collected in Section 3, there is a need for detailed and consistent instructions on types of measurements to be used, the sample sizes required and aids to ensure consistent identification and nomenclature across all SIOFA fisheries. A comprehensive set of observer instructions in a *SIOFA Scientific Observer Manual* should be an important element in ensuring consistent and harmonised data collection from observers working with different CCP Observer programmes. The development of a *SIOFA Scientific Observer Manual* is outside the scope of the current project but would be a natural progression in SIOFA's scientific observer harmonisation strategy.

Section 1 in the hierarchy is implicit in the various measures, decisions and recommendation of the MoP and we have highlighted where we feel that greater clarification of the requirement, source and purpose of particular data might be beneficial. While we have not

made a specific inventory of the detailed data requirements of SIOFA (as this is beyond the scope of this project) it should be recognised that addressing many aspects of the data collected by scientific observer requires the alignment of reporting standards and codes, as well as the clear linking of fishing events, between the vessel catch and effort data and the observer data. While these two data streams should be collected independently it is essential that they can be accurately linked in order for the observer data to be used in verification and scaling.

Table 1. Summary of the number of observer cruises from which data was provided to SIOFA Secretariat up to May 2023

Gear type and FAO Code	Data provided (n cruises)			
	Observer Cruises	Gear details	Catch data	Fish length
Single boat bottom otter trawls- OTB	22	0	22	3
Bottom trawls (nei) - TB	6	0	6	1
Midwater trawls (nei) - TM	20	6	20	17
Trawls (nei)- TX	11	0	6	1
Drifting longlines - LLD	5	0	5	5
Set longlines -LLS	17	4	17	12
Handlines, hand-or pole- lines - LHP	19	10	19	11
Vertical lines - LVT	3	1	1	2
Dropline ?	1	1	1	0
Longlines (nei) - LL	2	0	2	1
Pots -FPO	1	0	1	1

Source:

As SIOFA fisheries are largely defined by the type of gear used (rather than by target species) this places a particular emphasis on the accurate and consistent use of gear codes in both the vessel and the observer data. The SIOFA Secretariat provided an overview of the data in the observer database since October 2018 (when the provision of observer data became mandatory) in WHSOP1-INFO-11 and concluded that while the provision of fishing operation information is good overall the provision of gear specifications is less complete.

The SIOFA Secretariat provided the consultants with an inventory of completed fields in the observer database up to May 2023 and an update to the analysis presented in WHSOP1-INFO-11 is presented in Table 1. Data from 106 Observer cruises in the database, during which there were 8398 fishing operations conducted, were present in the inventory. Estimating the percentage observer coverage by fishery is complicated by the use of different (or non-specific) gear codes in the vessel catch and effort and observer data. For example, 47% of the reported fishing events in the observer data are for gear codes that are not elsewhere indicated (nei) (Table1), including Bottom trawls (nei) and Trawl and Midwater Trawl (nei). Furthermore, the most frequently reported gear type in the vessel catch and effort data for Longline was *nei*, so it was not possible to distinguish between pelagic or demersal longline totals, reinforcing the need for consistent use of gear codes by all CCPs in all data provided to SIOFA. Overall, the summary in Table 1 supports the conclusion of the SIOFA Secretariat in WHSOP1-INFO-11 that gear reporting is relatively limited whereas reporting of catch information is more consistent. However, we note that there are a number of the gear configuration parameters that are included in the current observer data requirements that might be more appropriately supplied by the vessel, with a subset confirmed by the observer, which might facilitate a more consistent approach to gear descriptions and naming. Reviewing the most appropriate sources of data, and whether the responsibilities for reporting should lie with the vessel or the scientific observer, may help to ensure that there is capacity for observers to collect more of the basic biological data, here we have used the measurement of fish length as an indicator, which was provided on only 52% of cruises (Table 1).

2. SIOFA CMM on an observer data programme and associated reporting requirements. (Objectives 4 and 5)

Objectives 4 and 5 have been combined, as the requirement for a draft proposal for a "new CMM for regulation of scientific observer harmonisation in SIOFA" (Objective 5)" that is based on an observer specific version of SIOFA CMM 02 on Data Standards includes a "potential updates of the current Annex B on observer data requirements" (Objective 4).

This draft CMM aims to provide the policy-level framework for a SIOFA Scientific Observer Scheme. It includes a 'code of conduct' for an observer scheme, clarification of the roles and responsibilities of observers and the categories of data that should be collected by observers. The overall approach was guided by reference to similar institutional arrangements in SPRFMO and CCAMLR.

This draft CMM largely retains the preambular paragraphs in CMM 02 and the potential updates to the current CMM 02 Annex B are presented in Annex C of the draft CMM. The level of specificity of the data collection requirements in Annex C of the draft CMM should be reviewed in the light of data collection priorities and the need for any evaluation of compliance with the different elements of this CMM. For example, if there was to be an evaluation of the completeness of reporting then it will be important to ensure that the CMM does not contain data requirements that cannot be collected independently by a scientific observer. The draft CMM is formatted in the style of a track changed version of SIOFA CMM 02 on Data Standards (inserted text is red underlined, deleted text is red strikethrough and text that has been moved but is otherwise unchanged is green).

CMM XX (2024) Conservation and Management Measure for the implementation of the SIOFA framework for scientific observation of fishing activities in the Agreement Area (Observer Framework)

The Meeting of the Parties to the Southern Indian Ocean Fisheries Agreement;
RECALLING that Article 6(1) (f) of the Southern Indian Ocean Fisheries Agreement (the Agreement) calls on the Meeting of the Parties to develop rules for the collection and verification of scientific and statistical data, as well as for the submission, publication, dissemination and use of such data;

FURTHER RECALLING that Articles 10(1)(c) and 11(3) set out the duties relevant to the collection and provision of data and related processes for Contracting Parties and flag CCPs respectively;

RECOGNISING the importance of developing comprehensive arrangements for data collection, reporting, verification and exchange of scientific observer data to assist the Scientific Committee in performing its functions as outlined in Article 7 of the Agreement;

NOTING the relevance of Articles 10(e) and 14 of the 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 (UNFSA) which call on States to cooperate through regional fisheries management organisations to agree on the standards for the collection, reporting, verification and exchange of data on fisheries for the stocks, and the specifications and format for the data to be provided and to cooperate in their scientific research;

CONSIDERING the provisions set forth in the Resolution on data collection concerning the high seas in the Southern Indian Ocean, adopted by the Conference on the Southern Indian Ocean Fisheries Agreement in the Seychelles from 13-16 July 2004;

NOTING the importance of scientific observer data ~~collection and catch reporting~~ for the purposes of ensuring scientific stock assessment and implementing an ecosystem approach to fisheries management;

NOTING the recommendation by the Third meeting of the Scientific Committee to improve the collection of sharks catch information and the submission of scientific observer data; and

FURTHER NOTING that the Meeting of Parties has adopted policies and procedures for the maintenance of data confidentiality (CMM 2016/03);

ADOPTS the following conservation and management measure (CMM) in accordance with Article 6 of the Agreement:

Application

1. This CMM applies to all Contracting Parties, cooperating non-Contracting Parties and participating fishing entities (CCPs).

2. This CMM prescribes the processes and standards for the collection, reporting, verification, and exchange of scientific observer data ~~related~~ collected in the course of ~~to~~

fishing activities by vessels fishing in the SIOFA Area of Application (the Agreement Area) that are flying the flag of a CCP. These data ~~standards~~ shall assist the Meeting of the Parties to fulfil its objectives under the Agreement insofar as it relates to assessing the state of the fisheries within SIOFA's competence, including the status of target and non-target species and the impact of fishing on the marine environment.

Terminology

3. The following definitions apply to this CMM including its annexes:

a. 'other species of concern' means those species as may be defined by the Scientific Committee from time to time.

b. 'National Report' means the report defined in paragraph-9 of ~~this~~ CMM 2023/02. -

Scientific Observer Data

12. All CCPs shall implement ~~national~~ scientific observer programs that operate in accordance with Annex A to collect ~~from activities undertaken by~~ the following data from vessels flying their flag:

    a. Vessel information, effort and catch data for its fishing activities in the Agreement Area, including target, non-target and associated and dependent species including marine mammals, marine reptiles, seabirds or 'other species of concern';

    b. Biological or other data and information relevant to the management of fishery resources in the Agreement Area, as specified in this CMM, or as identified from time to time by the Scientific Committee or through processes identified by the Meeting of the Parties; and

    c. Relevant scientific information related to the implementation of the provisions of the CMMs adopted by the Meeting of the Parties.

13. The function and tasks of the scientific observer are described in Annex B~~D~~.

14. Pursuant to the level of observer coverage required in CMMs adopted by the Meeting of the Parties, CCPs shall collect observer data in accordance with the relevant sections of Annex C. The data collected in accordance with Annex C may be added to or modified taking into account advice from the Scientific Committee, provided these do not conflict with, or detract from, the activities specified by the Meeting of the Parties. All observer data collected by CCPs shall be reported to the Secretariat by 31 May each year for the previous calendar year.

15. CCPs shall, through their National Report, provide to the Scientific Committee an annual observer programme implementation report which should include summary sections covering: observer training, program design and coverage, type of data collected, and any problems encountered during the previous calendar year.

~~16. CCPs shall, for all observed trips, collect observer data in accordance with the relevant sections of Annex B. All observer data collected by CCPs shall be reported to the Secretariat by 31 May each year for the previous calendar year.~~

Format for data submission

17. ~~By 2023~~ Observer data should be collected and reported, ~~the Scientific Committee shall develop and adopt a template for the observer reports, and a~~ in accordance with the formats

described in this CMM, including its annexes, Observer Logbook templates and the relevant instructions as agreed by the Scientific Committee. ~~for an observer data collection form that may be used by observers in subsequent years~~

Review

~~18. By 2023, the Meeting of the Parties, based on recommendations from the Scientific Committee and the Compliance Committee shall adopt a SIOFA framework for scientific observation clarifying all the aspects related to the role.~~

19. This CMM should be reviewed periodically by the Scientific Committee and the Meeting of the Parties, taking into account new information or data requirements as may be decided.

Annex A. Implementation of the SIOFA framework for scientific observation [New Text]

1. CCPs shall designate adequately qualified scientific observers who shall be familiar with the harvesting and scientific research activities to be observed, the provisions of the Agreement and the CMMs adopted under it and who are adequately educated, trained and capable of carrying out competently the duties of scientific observers as required by the Meeting of Parties.
2. Observers should be contracted via an appropriate CCP statutory body and all renumeration should be disbursed through that body so that there are no direct financial arrangements between the vessel and the observer even in situations where the cost of an observer is borne by the vessel.
3. Scientific observer shall not:
    a. contravene the requirements established in the laws and regulations or violate general rules of behaviour and safety that apply to all vessel personnel, provided such rules do not interfere with the duties of the observer as required by the Meeting of Parties,
    b. inhibit the proper functioning and fishing activities of the vessel,
    c. solicit or accept, directly or indirectly, any gratuity, gift, favour, loan, or anything of monetary value from anyone who conducts fishing or fish processing activities that are regulated by SIOFA, or who has interests that may be substantially affected by the performance or non-performance of the official duties of scientific observers, with the exception of meals, accommodations, or is in addition to any agreed salary arrangements,
4. The owner, Master, agent, and crew of a vessel shall ensure that they cooperate fully with the scientific observers to enable them to carry out the tasks assigned to them including allowing scientific observers access to data, equipment and those operations of the vessel necessary to fulfil their duties as required by the Meeting of Parties without impediment or influence.
5. The owner, Master, agent, and crew of a vessel on which a scientific observer is deployed shall not:
    a. offer a scientific observer, either directly or indirectly, any gratuity, gift, favour, loan, or anything of monetary value that is in addition to any agreed salary arrangements,
    b. prohibit, impede, threaten, or coerce, an observer from/into collecting samples, making observations, or otherwise performing the observer's duties; with or bias the sampling procedure employed by a scientific observer, tamper with, destroy, or discard a scientific observer's collected samples, or effects without the express consent of the observer or the observer employer,
    c. interfere with or prevent the observer from communicating with their employer organisation, including by preventing the scientific observer from having access to the vessel's communication equipment.

Annex B: Role and tasks of the scientific observer

1. The function of scientific observers on board vessels engaged in harvesting of marine living resources is to independently observe and report on the operation of fishing activities in the SIOFA Area.

2. In fulfilling this function, scientific observers will undertake the following tasks:
   a. Record details of vessel operations, including inter alia, time~~s~~, locations and gear used for fishing operations ~~of, searching, fishing, transit etc., and details of hauls~~;
   b. Take biological samples of catches;
   c. Record biological data of species caught;
   d. Record ~~by~~ catch information, such as species, quantity, and other biological data [as specified in Annex ~~B~~C]
   e. Record interactions with seabirds, marine mammals, and marine reptiles
   f. Record information on catch including data relating to processed conversion factors;
   g. Collect and report data on sightings fishing vessels, unmarked fishing gear, and recovery of fishing gear in the SIOFA Area, including vessel type identification, vessel position and activity and gear type;
   h. Collect information on fishing gear loss and waste disposal by the fishing vessels at sea.
   i. Prepare reports of their observations using the observation formats approved by the Scientific Committee for submission to the SIOFA Secretariat. ~~prepare reports of their observations for their respective national authorities;~~

Note: the change in wording in 2a reflects the specification of data collection on fishing activity rather than data on searching time which may not be amenable to collection by an observer. Should searching time be required by SIOFA, consistent with Article 1(g) of the Agreement then this would more appropriately be supplied in vessel-derived data

Annex C

NOTE: The aim of these suggested revisions is to harmonise the terminology and descriptions of observer activities and data collection as part of the "SIOFA framework for scientific observation". We note the discussion in paragraph 36 of SC-08-32:Report of the Workshop on Deepwater Sharks in the Southern Indian Ocean Fisheries Agreement (SIOFA) Area in which the Workshop noted the need to improve the quantity and quality of data collected, as well as its accessibility. In the revisions to Annex B presented there is no intent to make substantive changes to the data that is required to be collected, but to clarify the instructions in order to improve the quality (and by extension quantity) of data collected. The observer logbook forms and instructions provide details on what data should be collected to meet the data requirements of Annex C.

~~Hierarchies~~ Priorities for Observer Data collection

Fishing Operation Information
Report location and duration of all fishing operations. All vessel and tow / set / effort information. Each fishing operation should have a unique identifier that is used in both the vessel catch reporting and the observer data.

Reporting of Catches

Recording of the ~~time~~, number and weight of each species in ~~catch~~ a sample~~d~~ of the catch following the instructions on sample sizes agreed by the Scientific Committee and whether that species was retained or discarded. ~~versus total catch or effort (e.g. number of hooks), and total numbers of each species caught~~
Identification and counts of incidental catches of endangered, threatened and protected (ETP) species seabirds, mammals and, ~~reptiles (e.g.,~~ turtles~~)~~ in ~~catch~~ a sample following the instructions on sample sizes agreed by the Scientific Committee ,
Identification and counts of catches of vulnerable marine ecosystem (VME) indicator taxa in ~~catch~~ a sample following the instructions on sample sizes agreed by the Scientific Committee. ~~sensitive benthic species and vulnerable species~~
~~Record numbers or weights of each species retained or discarded~~

Record instances of depredation, where appropriate

Biological Sampling
Check for presence of tags
~~Length-frequency data for Target species (FAO species code)~~
~~Basic b~~Biological data (length, weight sex, maturity and otolith collection) for Primary and Secondary SIOFA species (as in SC 8 Annex 1 ~~FAO species code~~)
~~Length-frequency data for main by-catch species~~
~~Otoliths (and stomach samples, if being collected) for Target species (FAO species code)~~
Biological data (length, weight sex, maturity ~~Basic biological data~~ for all Main species listed in SC-8 Annex 1) and other by-catch species
Biological samples and photographs of other by-catch species ~~(if being collected)~~
Take photos

Data Collection Requirements ~~Trip~~ Observer Cruise Details ~~Trip Number~~ Name of vessel Current vessel flag CCP (ISO 3-apha)

Cruise details (start and end dates - YYYY.MON.DD) ~~Date report is generated (UTC)~~ ~~Current vessel flag CCP (ISO 3-apha)~~ ~~Name of vessel~~
Observer Details Observer name Observer ~~and ID~~ Nationality (ISO 3-apha) Employing organisation name Contact name in employer organisation (Address/email~~/fax~~) ~~Boarding~~ Embarkation location (UNLOCODE, if applicable or Latitude/Longitude) Embarkation ~~Boarding~~ Date ~~(UTC:YYYY.MON.DD)~~ Disembarkation location (UNLOCODE, if applicable or Latitude/Longitude) Disembarkation date ~~(UTC:YYYY.MON.DD)~~ ~~Time Zone (UTC + -)~~

Gear Details

Longline Description:
Longline Type (FFSSCV)
~~Period in which the gear was used (YYYY.MON.DD)~~
~~Start and end date (YYYY.MON.DD)~~
~~Target Species (FAO species code)~~

Main Line:
Material Diameter (mm)
~~Integrated weight (g/m)~~

Branch Lines:
Material Length (M) Spacing (m)

Hooks
Type (e.g.: J shaped, Circular, etc.)
~~Make~~Manufacturer
Model Number
~~Size (inch)~~
~~Total length (mm)~~
~~Shank (mm)~~ ~~Gape (mm)~~
~~Throat (mm)~~
~~Front length (mm)~~

~~Usual setting position~~
~~Line off bottom (m) (optional for pelagic longline)~~
~~Hooks off bottom (m) (optional for pelagic longline)~~
Method of baiting (manual/automatic)
Automatic baiting equipment (make and model)

Line Weighting

Detail the weight and distance between the line weights for the longline system used
Single (Auto) Line (kg:m)
Double (Spanish) Line (kg:m)
Trotline (vertical droppers/trots attached to a mainline) (kg:m)
Pelagic Longline - Size (g) and distance from hook (m) of weights

~~Hook sinkers~~
~~Size (g)~~
~~Position from hook (mm)~~

Offal dumping position (port, starboard, stern)
Longline setting position (port, starboard, stern)
~~Offal dumping during hauling (never, occasionally, always) Propeller rotation direction (clockwise/anti-clockwise)~~
~~Detail the weight and distance between the line weights for the longline system used~~
~~Single (Auto) Line (kg:m) Double (Spanish) Line (kg:m)~~
~~Trotline (vertical droppers/trots attached to a mainline) (kg:m)~~

General Streamer Line Description
Vessel equipped with a streamer line (y/n)
Number of streamer lines regularly set
Streamer line position (port, starboard, stern)
Streamer line length (m)
Streamer length min/max (m)
Attached height above water (m)
Distance between streamers (m)
Number of streamers
Streamer design (single or paired)
Aerial extent of line (m)
Method used to assess aerial extent
Streamer material
Streamer line diameter (mm)
Streamer colours
Streamer line over bait entry position? (y/n/u)
Distance from stern to bait entry point (m) Towed object (Y/N)
~~Horizontal~~ Vertical distance from bait entry point to streamer line (m)

~~Daily~~ Fishing Operation
Setting ~~**setting**~~ **observations**
Set ~~Number~~ ID (as referenced in catch and effort log)
~~Set Type: Research or Commercial (R/C)~~
Gear ID
~~Longline Type Code (FSSCV)~~
~~Trotline cetacean exclusion device used (Y/N)~~

~~Date of observation (YYYY.MON.DD)~~

Start and End setting for each haul

Date (YYYY.MON.DD)
Time (hh:mm)
Latitude
Longitude
Bottom Depth (m)
Total length of longline set (km)
Total number of hooks ~~for the~~ set

Details of Longline ~~Setting~~Set
~~Main line length (m)~~
~~Number of hooks set~~
~~Number of Baskets/Magazines Set~~
~~Number of hooks per Basket/Magazine~~
~~Percentage hooks baited~~
Distance between branches (m)
~~Distance of hooks off bottom (m) (optional for pelagic longline)~~
Bait species (FAO species code)
Deck lights during setting (On, Off)
Streamer lines used (Yes, No)
Number of streamer lines used
Offal dumping during setting (Yes, No)
Bait entry position (Port, Starboard, Stern)

~~Daily h~~Hauling observations
Set ~~number~~ ID
Start and End hauling for each Set
Date (YYYY.MON.DD)
Time (hh:mm)
Latitude
Longitude
~~Date of observation (YYYY.MON.DD)~~

~~Hauling Information~~
Was Haul observed for fish/invertebrate by-catch (Y/N)
Number of hooks observed for seabird and fish by-catch (tally period)
Offal dumped during hauling (Yes / No)

Gear lost
Number of sections lost
Number of hooks lost that were attached to lost sections of the longline

Number of other hooks lost (excluding hooks attached to lost sections)

Detailed catch composition and biological sampling (tally period)

~~Species~~

Species code (FAO species code)
Total retained catch weight (kg) and total number
Observed number retained with tags

~~Species Discarded~~
Observed number discarded
Observed number discarded dead
Observed number discarded alive
~~Species Lost~~
Observed number lost/dropped off at surface
Observed number cut off at surface alive
Observed number cut off at surface dead

~~Specimen cut off (if possible)~~
~~Yes / No~~
~~For each species caught~~
- ~~Taxa name~~
- ~~Number alive~~
- ~~Number dead or injured~~

Biological Sampling
Species code (FAO species code)
Length (~~mm or~~ cm) and the type of length measurement used.
Skates and rays:
- Maximum disk width shall be measured Sharks
- Appropriate length measurement to be used should be selected for each species. As a default, total length should be measured.

Weight (kg)
Sex (male, female, immature (optional), unsexed (optional))
Maturity stage (optional) and criteria/schedule used (optional)
Gonad weight (g) (optional)
Otoliths

Length Frequency Data
Biological sampling to provide a r~~R~~epresentative ~~and randomly sampled~~ length-frequency data shall be collected for ~~the target~~ all primary and secondary species as defined in SC 8 Annex 1~~(FAO species code)~~ following the instructions on sample agreed by the Scientific Committee.

~~Length data shall be collected and recorded at the most precise level appropriate for the species (cm or mm and whether to the nearest unit or unit below) and the type of measurement used (total length, fork length, or standard length) shall also be recorded.~~

~~Where possible, total weight of length-frequency samples should be recorded, or estimated and the method of estimation recorded~~

~~Where possible, Observers should determine and record sex of measured fish to generate length-frequency data stratified by sex.~~

~~Where possible, representative and randomly sampled length-frequency data should be collected for other main by-catch species~~

Incidental bycatch of ETP seabirds, mammals, turtles or 'other species of concern'
The following data shall be collected for all seabirds, mammals, turtles, and other species of concern caught in fishing operations as much as possible:

- Species (identified taxonomically as far as possible, or accompanied by photographs if identification is difficult) ~~and size~~
- Estimated species abundance around fishing vessel
- Species interactions with fishing gear
- Count of the number of each species caught per tow or set
- Fate of bycatch animal(s) (retained or released/discarded)
- If released, life status (vigorous, alive, lethargic, injured, dead) upon release
- If injured, what was the cause of injury?
- If dead, then collect information or samples for onshore identification in accordance with pre-determined sampling protocols. Where this is not possible, observers may be required to collect sub-samples of identifying parts, as specified in biological sampling protocols.
-

Record the type of interaction (hook/line entanglement/warp strike/net capture/other) if other, describe:

- Sex of each individual for taxa where this is feasible from external observation, e.g. pinnipeds, small cetaceans or *Elasmobranchii* species
- identify any circumstances or actions that may have contributed to the bycatch event? (E.g. tori line tangle, high levels of bait loss)

~~**Tag releases**~~ **Toothfish Tagging**
The following data shall be reported for all tagged toothfish~~, seabird, mammal, or reptile~~
SET ID
Species
Tag type, wording, and colour Tag number
Date and time of tagging
Position (Lat/Lon) of release
~~Species~~
~~Animal~~ Total length
~~Type of length~~
~~Animal sex (F=female, M=male, I=indeterminate, D=not examined)~~
~~Position (Lat/Lon) of release~~
~~Animal status at release (injured/uninjured~~)

Tag Recoveries
The following data shall be collected for all tagged fish, seabird, mammal or reptile recovered. tags if the organism is dead, to be retained, or alive:

- Name of observer or Crew who found the tagged fish
- Name of vessel
- Set or Tow ID
- ~~International radio call sign (if any)~~

- ~~Vessel flag CCP (ISO 3-apha)~~
- Collect, label (with all details below) and store the actual tags for later return to the tagging agency
- Species from which tag recovered
- Tag colour
- Tag wording and type of tag (spaghetti, archival)
- Tag numbers
- Date and time of capture (UTC)
- ~~Location of capture (Lat/Lon, to the nearest 1 minute)~~
- ~~Animal~~ Total length / size (cm or mm) with description of what measurement was taken (such as total length, fork length, etc.)
- Sex (F=female, M=male, I=indeterminate, D=not examined)
- ~~Whether the tags were found during a period of fishing that was being observed (Y/N)~~
-

For Demersal Longline fishing activities ONLY

Interactions with marine mammals

Data is to be collected in accordance with the protocol set out in annex E. For each haul and each species of depredating whales (killer whales *Orcinus orca* and sperm whales *Physeter macrocephalus)*:

- Priority 1 data to be collected include:
1. Presence/absence data: Presence / Absence / Not observed;
2. When presence, photo-identification data: photographs of specific body parts (for killer whales: dorsal fin, saddle patch and eye patches; for sperm whales: tail flukes) visible when whales come to the surface.

- Priority 2 data to be collected include:
1. Estimates of the number of individuals present around the vessel in the vicinity of the fishing gear.

- Priority 3 data to be collected include:
1. Information about whether or not whales interact with the gear;
2. Estimate of the time of arrival of whales in the vicinity of the gear.

Annex E - Protocol for documenting whale interaction in deep-sea demersal longline fisheries remains unchanged from current CMM 02(2023)

3. Description of the data that should be collected. (Objective 1)

Objective 1 focused on scientific data collection by CCPs observers in SIOFA fisheries and on the development of observer data collection forms and observer reports. The role and tasks of scientific observers in SIOFA are articulated in Annex D of CMM 02(2023) and we have taken this, and the requirements identified in Annex B and Annex E of CMM 02(2023) as the starting point for defining the scope of the data fields for inclusion in the Observer Logbooks. Furthermore, as per Para 16 of CMM 02(2023) "*By 2023, the Scientific Committee shall develop and adopt a template for the observer reports, and a template for an observer data collection form that may be used by observers in subsequent years*."

An essential aspect of this part of the project was the engagement with CCPs that are active in SIOFA fisheries. To this end we provided a document with the proposed data fields that was circulated by the SIOFA Secretariat to all CCPs in August 2023. We are grateful to those CCPs who reviewed the proposed data fields to be included in the forms and provided comments relevant to their scientific observer programme and fishing operations (e.g., trawl, line, etc) that helped to clarify the design and content of the Observer Logbooks. Additions, removals and clarifications of fields in the forms are based on CCP feedback and our experience translating the requirements contained in CMMs into operational observer data collection programs. This includes the design of data forms, the use of those forms at-sea and the data quality assurance, data management and analysis of the data that is collected.

In designing the forms that make up the Logbooks it is important to make them as easy as possible for observers to complete them while balancing this with the need to ensure high-quality data is being collected and avoiding the collection of data that is unnecessary or cannot realistically be collected independently by the observer. Throughout this process we have sought to align the style of forms with those used in neighbouring RFMOs and CCAMLR, noting that many scientific observers are also engaged in these fisheries. The design of the logbook forms also includes the use of consistent standards and data quality assurance including:

Fixed format fields - that provide the first level of atomic data checking.

Dropdown menus - that limit the content of the only fields to agreed responses.

Data integrity fields – these are fields that provide confirmation of data quality and linkages, rather than original data values.

The outcome of this approach is the set of fishery-specific Observer Logbooks in Excel

workbooks (Annex 2), that include the data fields that should be completed, and an Instruction Manual (Annex 3) that describes how each field in the respective Logbook forms should be completed. We have also included a draft for an Observer Cruise report (Annex 4) that can be completed by observers to provide additional contact and a narrative (unstructured data) to complement the structured data provided in the Observer Logbooks. While we see value in the complementarity of the cruise report and the logbook data there may need to be further discussion in SIOFA on the extent to which these cruise reports are provided only to National Authorities or shared with the SIOFA Secretariat. The joint experience of the authors in CCAMLR, as an observer, a scientist and secretariat staff has frequently demonstrated the utility of these narrative reports in improving the interpretation and understanding of logbook data.

To ensure continued CCP engagement the observer logbooks, instructions and the draft cruise report were provided as ‘stand-alone’ documents at the SIOFA Workshop on the Harmonisation of Scientific Observers (WS2024-OBS) on 6 and 7 Feb 2024.

4. Observer Programme operation (Objective 2)

Objective 2 seeks to "identify synergies for improving scientific observer management and optimising coverage and deployment, with the aim of setting a consistent standard for scientific observation." Obtaining high-quality and comparable scientific observer data, that is fit for purpose, should be based on a consistent set of standards for data collection and reporting. An important foundation for achieving this objective is to identify a set of minimum standards for observer programmes that encompass the complete observer operation and data life cycle.

Observer coverage

Objective 2 calls for optimising 'coverage and deployment' of observers and a key aspect of this is the consideration of the current fishery-specific requirements for observer coverage that are set out in CMM 01 (2023).

> Paragraph 39 of CMM 01 (2023) (Scientific observer coverage) states:
>
> Each CCP shall ensure that any vessel flying its flag and undertaking bottom fishing in the Agreement Area:
>
> a. using trawl gear has 100 percent scientific observer coverage for the duration of the trip; and
> b. subject to paragraph 45b, using any other bottom fishing gear type has 20 percent scientific observer coverage in any fishing year.
>
> Paragraph 45b, specifies the requirements for 100% observer coverage specified for fishing in a protected area specified in Annex 3 of CMM 01 (2023).
>
> Paragraph 13 of CMM 15 CMM 15 (2023) specifies the requirement to have at least one scientific observer on board and a target level of 25 % of all hooks to be observed, throughout all fishing activities for vessel targeting toothfish in the Del Cano and Williams Ridge management areas.

Paragraph 39 of CMM 01 (2023)only relates to bottom fishing (i.e. fishing with gear that comes into contact with the seabed) and its application is therefore limited to bottom trawling and demersal longline. This means that there are no observer coverage requirements for gear types such as midwater trawl, pelagic longline, handline and buoyed lines; although observers are deployed by CCPs on some vessels in these fisheries.

Harmonising the observer coverage levels across the different fisheries in SIOFA should be

based on the information and scientific data that is needed to support the management of each fishery. Although work is underway to define/meet those requirements, all fisheries in SIOFA currently lack the information on distribution, abundance and demography to allow an estimate of the potential yield of the target species or to the evaluate the potential impacts on non-target and associated or dependent species. In many RFMOs fisheries that have these characteristics are categorised as 'exploratory fisheries' and, in recognition of the data-limited nature of the fishery and need for more data to support the provision of advice on their management, have a requirement for 100% observer coverage (i.e. an observer to be on board for all of the time that the vessel is fishing). Requiring all vessels operating in SIOFA fisheries to have an observer on board for all of the time that they are fishing would be consistent with the status of fisheries in SIOFA, including the need for increased scientific data to evaluate target and non-target species impacts, and would provide the most appropriate harmonisation of observer coverage across all fisheries.

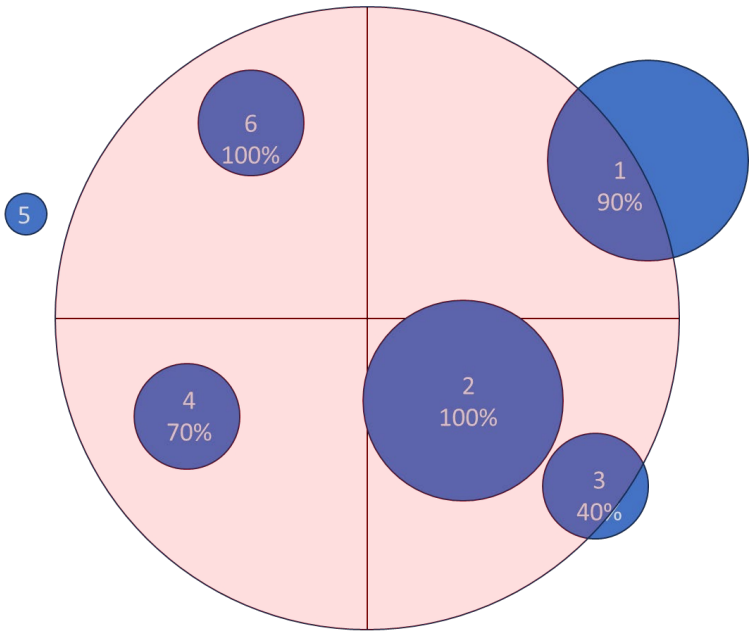

Figure 1. Schematic of the relative alignment of CCP observer programs and the SIOFA scientific observation scheme harmonisation. The scheme, in pink (with quarters representing different fisheries) and individual CCP observer programs represented by the blue circles. The size of the blue circles reflects the scale of the CCP observer programme and the % value reflects the extent to which that programme delivers the required data to the SIOFA scheme. For example, CCP 1 has a large observer programme that collects a wide range of data (that are not requirements for SIOFA) and currently delivers 90% of the data that is required for the SIOFA scheme. CCP 2 has a similar sized programme to CCP 1 and delivers all of the data required for SIOFA. CCP 3 has a smaller observer program that collects some data that is not required by SIOFA and also delivers 40% of the current requirement for SIOFA. CCPs 4 and 6 both have small observer programmes that deliver 70% and 100% respectively of the SIOFA requirements in the respective fisheries. CCP5 has a small observer programme that has yet to be aligned with the SIOFA scheme.

The harmonisation of the SIOFA scientific observation scheme requires all CCP observer programs to be equipped to deliver the data required for a particular fishery. This does not mean

that every aspect of all observer programmes needs to be the same, only that the elements of the programme that intersect with the SIOFA scheme need to have common standards and data collection processes (Figure 1). For example, the observer scheme for CCP 1 in Figure 1 can continue to collect a large amount of data that is outside of the requirements for SIOFA, but it would need to ensure that it follows the agreed processes and procedures to deliver that portion of the data collected that is required by SIOFA.

The specifics of the extent of harmonisation that is required across CCP observer programmes will depend on the observer data collection requirements for the fisheries in which each CCP participates. In essence the success of the harmonisation will be achieved when all CCPs engaged in a particular fishery use observers that have received comparable training and provide data collected using the same standards that satisfying a consistent set of data quality metrics.

Minimum Standards for scientific observation.

An essential foundation for achieving the collection of consistently high-quality observer data is a set of minimum standards for observer programmes that encompass the complete observer deployment, operation and data lifecycle. This lifecycle can be represented as three essential components to guide the establishment of minimum standards for observer programs:

a) Observer program infrastructure:
    - Covering areas such as administrative, financial, and logistical arrangements including IT data management.
b) Training of observers
    - Including programme content, documentation, and procedures.
c) Post-trip evaluation, data submission
    - Processes of submission of data and assessment of data quality.

Observer program infrastructure

Each observer should fulfil well-defined qualification requirements to ensure that all observers are appropriately qualified and familiar with the relevant fishing operations and scientific data collection requirements. All observers should be employed under a contract issued by the CCP observer employer organisation that includes the terms and conditions of employment and remuneration, including the daily rate while onboard the vessel and the allowances for travel to and from the vessel, and requirements in place for data security and confidentiality.

The observer employer organisation, or an approved data management provider, should have an Information Security Management System (ISMS) that includes the

(i) data collection forms and instructions issued to observers,

(ii) processes to ensure the quality, accuracy and validity of data,
(iii) measures that protect data from unauthorized access, loss, corruption, or theft, and
(iv) processes by which data are made available. The ISMS will pay particular attention to the confidentiality and security of data collected by observers on fishing vessels.

All CCP appointed observers, including those appointed through third party observer providers, will be required to comply with data submission processes and confidentiality arrangements in place for all data and information, including fishing locations and fishing techniques, collected during observer deployments. All staff in the observer employer organisation who have access to observer data are also required to comply with confidentiality arrangements in place for all observer-related data and information.

The observer employer organisation should have a named technical coordinator who is the primary point of contact for all administrative and operational aspects of the observer programme.

All observers should be provided with appropriate safety and scientific equipment to allow them to conduct their tasks in safe and scientifically rigorous conditions.

Training of observers

Observer responsibilities

All Observer should be provided with training materials that describe the duties and responsibilities of observers and the vessel's crew onboard vessels fishing in SIOFA. Observers should be provided with the current functions, tasks and scientific priorities approved by MoP and/or the Scientific Committee and explain their importance to SIOFA's sustainable management of fisheries.

Safety at Sea

Observers must receive nationally accredited sea safety training and certification that includes the following components:

- Survival difficulties and factors
- Personal Protective Equipment
- Life rafts and equipment
- Actions prior to abandonment
- In water survival techniques
- Helicopter rescue

- Vital & secondary actions in the life raft
- Righting an upturned life raft
- Use of pyrotechnics

Vessel Operations

Location determination

Observers must be provided with training material to ensure that they can read positions from navigation system found on a vessels bridge, convert the positional data into the format used in the Observer Logbook and record depth data from a standard echo-sounder display.

Fishing methods and gear types

Observers must be provided with diagrams and photographic and/or video material that describe the different gear types used in SIOFA fisheries and the technical specifications (including diagrams and photographic details) of the gear used in the fishery to which they will be deployed.

Mitigation devices

Observers must be provided with material describing the compulsory mitigation methods (including gear modifications) specified in the relevant SIOFA CMMs to avoid or mitigate by-catch to enable them to complete the relevant forms for the fishery to which they will be deployed.

Observer data collection

Fishing effort and catch.

Observers must be provided with training that includes detailed instruction on the parameters to be recorded to describe fishing operations including fishing effort. This should include how to determine the duration of operations, the number hooks set for line fisheries and the fishing depth in trawl fishery. Training should also include details of how to subsample catch for observer sampling, either from line (number of hooks to observe) or trawl (weight of sample to collect).

Primary and secondary species identification

Observers must be provided with training materials for identifying all target, primary and

secondary species caught in SIOFA fisheries including any guides and instructions approved by the Scientific Committee.

Marine mammal and seabird identification

Observers must be provided with training materials for identifying all marine mammal and seabird species likely to interact with SIOFA fisheries including any guides and instructions approved by the Scientific Committee.

Sampling and biological measurements

Observers must be provided with training materials and instruction that include the sampling and measurement fields required to complete the biological data forms in the Observer Logbooks for the relevant fisheries. These should include instruction on basic sampling strategies, measurement methods, determining the sex and the maturity stages of fish and sample sizes for the primary and secondary species. Instruction and practical demonstrations should be provided on taking and preserving samples including extracting, packaging and labelling of otoliths and other material as required.

Conversion factors

Observers must be provided with training on the processing methods, product codes and weighing methods to determine the greenweight and processed weight of different fish species to complete the Conversion Factor form.

Post-trip evaluation and assessment.

Data submission to SIOFA should use the Observer Logbooks as they provide a consistent format for submission will facilitate the use of a standardised data transfer process. This process should include data-quality assurance processes that are fundamental in ensuring that the data collected as part of the observer programme is robust and reliable. The ISMS should include a clear description of the data collection and reporting requirements as well as the process for data receipt, data quality assurance and entry into the SIOFA database. The ISMS should be available to all data providers to facilitate consistent data quality assurance routines that can be implemented prior to submission of the logbook to SIOFA.

All data-quality assurance processes should focus on completeness, consistency and accuracy

and should, at a minimum, include the following elements:

Completeness
Have data been submitted in the expected fields.
Are critical linking data, e.g. SET_ID, present in all forms.

Consistency
Are data in each field in the correct format, e.g. numeric, date, time, text.

Accuracy
Are Dates and Times in the correct chronological order.
Are numerical data values within agreed limits.

Design of the process for evaluation of observer programs

Metrics to assess observer training programs against minimum standards and a process for review and accreditation of observer training programmes.

The aim of the review process should be to provide an objective measure of the extent to which a CPP's observer programmes meet the minimum standards agreed by SIOFA and to guide CCPs in making progress towards meeting those standards. The review process should be based on two main elements that reflect the structural support and administration of the observer programme and the performance outcomes, as reflected in the coverage performance and data quality, of that programme. Placing an emphasis on both the structural implementation and the outcomes from the observer programme is intended to allow a balanced approach to assessing each CCP observer programme in a way that reflects the diversity of CCP observer programs.

Review Metrics

Observer program infrastructure and training.

The review of the program infrastructure and observer training requires the completion of a checklist of essential metrics that are required in order to be able to meet the minimum standards outlined above, these should include the following items:

1. CCP observer employer organisation must:
   a) have well-defined qualification requirements and contract of employment for Observers.
   b) have an Information Security Management System (ISMS) that includes confidentiality and security of data collected by observers.
   c) provide appropriate safety and scientific equipment to the Observer.
   d) have a named technical coordinator/point of contact for their observer programme.

2. All Observers are briefed on the duties and responsibilities of observers and the

vessel's crew onboard vessels fishing in SIOFA and receive nationally accredited sea safety training and certification.

3. All Observers are provided with training to ensure that they can:

   a) read positions from vessel navigation system.
   b) describe the different gear types used in SIOFA fisheries.
   c) describe the compulsory mitigation methods (including gear modifications) specified in the SIOFA CMMs.
   d) identify all target, primary and secondary fish species caught in SIOFA fisheries and all marine mammal and seabird species likely to interact with SIOFA fisheries.
   e) record the parameters required to describe fishing operations and implement the sampling and measurement methods required to collect the fishery-specific biological data.
   f) record the processing methods, product codes and weighing methods to estimate conversion factors.

Observer program outcomes and performance.

4. In the last two fishing seasons:

   a) did the CCP achieve the required level of observer coverage in all fisheries in which it participated ?
   b) did all Observer data submitted to the SIOFA Secretariat achieve above 60%[2] data-quality assurance score for completeness, consistency, and accuracy?

Review and accreditation process

CCP reporting (self-assessment) of their observer programme in respect of the metrics listed above could be included in the CCP annual reports submitted to the MoP. This would allow an objective review of the structure and performance of the various observer programmes and highlight areas where attention may need to be focused to improve harmonisation across programmes. An example reporting template and review checklist that could be implemented by SIOFA as a way forward to initiate an observer programme accreditation scheme are provided in Annex 5.

An accreditation process could be beneficial if it is a mechanism to incentive improvement. However, where there is a mandatory requirement for observers in a fishery, and accreditation is a pre-requisite to the deployment of observers, then achieving agreement on meaningful accreditation standards can be challenging if there is a contingent risk of access to a fishery (i.e.

[2] Note here that the score of 60% is illustrative and would require more comprehensive data review to define an operationally appropriate value.

parties are unlikely to agree to setting the bar too high if it excludes them from a fishery). A stepwise approach to the implementation and harmonisation of the SIOFA observer scheme should provide greater clarity on expectations for CCPs programmes and performance. This improved clarity, allied to reporting on the programme in the CCP annual reports, may provide the basis for a future process for SIOFA to agree the accreditation of observer programmes.

5. Technology and new sampling methods (Objective 3)

Objective 3 seeks to describe and recommend potential tools and operational characteristics for electronic observer monitoring on board vessels. The use of Electronic Monitoring (EM) systems is being trialled in many fisheries around the world as an independent system for documenting fishing activities and catches. The potential for EM to contribute to data collection in fisheries has been discussed in a number of fisheries related organisations and this has also been recognised in SIOFA (e.g. SC-07-INOF 11).

EM systems typically acquire data from a combination of sensors and video cameras with meta-data on time and location. The specific EM configuration and data collection requirements depend upon the data reporting and associated management requirements of individual fisheries. The use of EM systems most frequently involves the collection and post-processing of digital video to support evidence in compliance evaluations or to replicate catch reporting. In many fisheries where EM has been adopted there has been an emphasis on using information from EM systems as a compliance tool to record practices and processes on a vessel, or to retain video footage for use in the event of a potential issue being identified.

Replicating catch data requires digital video to be reviewed by an analyst, in some cases supported by automated image recognition systems, to count the number of target and bycatch fish landed. Time and cost constraints usually mean that this catch data replication is undertaken on a sample (e.g. 20%) of hauls and is largely restricted to line or gillnet fisheries where fish are landed as discrete individuals, rather than in trawl fisheries.

In some fisheries EM systems have been introduced as they are a cheaper alternative to human observers at sea or where there is a capacity limitation on achieving the required level of observer coverage (e.g. in the IOTC). However, this cost reduction may only be relevant where the EM system completely replaces the need for an onboard observer. Where a complete replacement is not practicable the introduction of an EM system can be used to optimise the workload of observers by reducing the need to collect data that can be collected using an EM system.

An important consideration with EM systems is whether they are considered as supplement or cross-validation to improve existing data collection or they are viewed as a replacement for

conventional approaches. In particular for the latter there is the complexity of determining the acceptance criteria that would allow the automated data collection to replace any conventional method; this may be relatively simple for position and vessel activity data (i.e. timing of fishing activity from winch or drum rotation sensors), but may be more challenging for catch data reporting. For example, a key objective of the Australian Fishery Management Authority (AFMA) EM program is to improve the accuracy of vessel logbook reporting of catch numbers per fishing activity for both key retained and discarded species; there is evidence of improvements in catch reporting and onboard processes on vessels that have adopted EM systems.

Opportunities for using electronic monitoring to collect data in SIOFA Observer Logbooks

Based on an initial review of the SIOFA Observer Logbook forms data for the following forms could be collected, either in whole or in part, using currently implementable EM systems:

Observer Details	NO
Gear Details	NO
Fishing Operations	YES
Biological Sampling	NO
Conversion Factors	NO
Observed Catch	YES
VME indicator taxa	YES
ETP Details	YES
Warp strikes	YES
Seabirds	NO
Marine Mammals	NO
Whale Interactions	NO
Tagging	NO
Tag Recapture	NO

We have considered “currently implementable EM systems” to be those that are being used on fishing vessels in other fisheries and receive data from sensors on vessel machinery and digital video, we have not included developmental systems such as automated or AI supported image recognition processes. While the latter clearly provide for development and future enhancement their use as a routine data collection process in multi-lateral commercial fisheries is not yet in place.

In the case of the Fishing Operations form data from vessel position systems and machinery,

such as winches and drums, could be used to collect the start and end times and locations of setting and hauling fishing gear as well as the depths of the bottom and of nets during fishing. In SIOFA the scientific observer data is not the primary source of vessel logbook catch data although the observer data does provide an independent sample of catch data, in the Catch Reporting, that can be used for verification/data quality assurance. This means that the introduction of an EM system to support improvements in vessel logbook catch reporting could replace the role of observers in sampling catch of target, bycatch and ETP species in line fisheries. Similarly, camera coverage of the area around warps may provide a replacement for warp strike data collected by observers in trawl fisheries. As indicated earlier an initial analysis of the reporting of basic biological data, such as fish length, was provided on only 52% of cruises (Table 1), suggesting that increasing the time available for observers to undertake this type of sampling would be beneficial.

It is important to note that the use of EM for vessel logbook catch verification would require considerable post-processing and analysis as well as agreement on the analysis methods and standards to be used. In the case of both the fishery operations and catch data the information submitted to SIOFA would be the same, albeit collected using different mechanisms. Rather than seek to develop a SIOFA-wide EM system across all fisheries is may be more pragmatic to encourage CCPs that already implement EM systems to report to SIOFA on their data collection and analysis processes that would allow experience and to allow those data to be considered equivalent to observer data.

6. Conclusions and Future Work

It is apparent that SIOFA has in place many of the elements required for an operational observer scheme that could be implemented across all fisheries. The harmonisation of these elements would benefit from a clear articulation from SIOFA of the observer coverage levels and data collection requirements in each fishery. Obtaining high-quality and comparable data, collected by scientific observers is essential to understanding the impacts of fishing on key stocks and associated ecosystems. Collection of these data are facilitated by having a standard set of observer logbooks, with clear instructions for how they should be completed, alongside clear guidance to ensure that CCP observer programmes operate according to a common set of standards and performance metrics.

In delivering this project report we have sought to provide the required elements outlined above and to identify aspects of future work required that would contribute to the further harmonisation across fisheries related data collection in SIOFA. The future work outlined can be divided into aspects that are 'structural', i.e. that are policy decisions on the obligations of CCPs for data reporting in SIOFA, and 'scientific', i.e. the detailed description of how those data reporting obligations should be met. Accordingly, we have identified the following aspects of potential future work:

Structural

Specification of the mandatory data requirements from SIOFA fisheries in order to meet the objectives of Article 2 of the Southern Indian Ocean Fisheries Agreement and whether these data should be provided by vessels or by scientific observers.

Specification of the definition of observer coverage and required levels of coverage in all SIOFA fisheries.

Agreement on a CMM that creates the policy-level framework for a harmonised observer scheme in SIOFA.

Develop vessel data reporting Manual for SIOFA fisheries that can be used by all Observers in SIOFA fisheries.

Scientific

Review and implement observer data collection using a standard set of Observer Logbooks and instructions in SIOFA fisheries.

Agree data entry processing and quality assurance metrics to provide feedback to CCPs on data quality and performance.

Agree detailed biological sampling requirements for primary and secondary species in all SIOFA fisheries.

Develop an Observer Manual that describes the detailed methods and processes that can be used by all Observers in SIOFA fisheries.

Acknowledgements

This report was completed under a consultancy contract between SIOFA and Ross Analytics PTY Ltd/Imvelo Blue Environment Consultancy (PTY) Ltd and we acknowledge the funding support from the EU to SIOFA to support this work. This project was funded under EU project 101078892, Support for Ecosystem Approaches to fisheries conservation and management in SIOFA (SIOFA-SEAs).

We thank the SIOFA project Advisory Panel for their support and guidance, all CCP representatives that provided feedback and comments during the WS2024-OBS and the 9th Annual Meeting of the SIOFA Scientific Committee (SC9)

Annex 1. Terms of Reference (TOR) for the establishment of a framework for scientific observation of SIOFA fisheries. Project Code: SEC2022-OBS1

TERMS OF REFERENCE (TOR) FOR THE ESTABLISHMENT OF A FRAMEWORK FOR SCIENTIFIC OBSERVATION OF SIOFA FISHERIES

Project Code: SEC2022-OBS1

1. Introduction

Paragraph 17 of SIOFA CMM 2022/02 (Data standards) states that: "*By 2023, the Meeting of the Parties, based on recommendations from the Scientific Committee and the Compliance Committee shall adopt a SIOFA framework for scientific observation clarifying all the aspects related to the role*".

To achieve this, the SIOFA Scientific Committee recommended an intersessional workshop to initiate discussions on the harmonisation of standards and an evaluation process for CCPs scientific observer programmes (para 70, Sixth Scientific Committee of the Southern Indian Ocean Fisheries Agreement (SIOFA) 2021 – SC6 Report). In addition, the Scientific Committee recommended an intersessional workshop be held holding further discussions on e-monitoring schemes (para 66, Sixth Scientific Committee of the Southern Indian Ocean Fisheries Agreement (SIOFA) 2021).

The Workshop on Harmonisation of Scientific Observers' Programmes of the Southern Indian Ocean Fisheries Agreement (WHSOP) SC-07-INFO-07 took place in 27 October, 3 & 10 November 2021. The Workshop recommended that in order to make operational the harmonisation of scientific observers' the SC should evaluate and agree on data collection forms and minimum standards on CCPs observer programs for scientific data collection.

The Seventh SIOFA SC endorsed the Workplan on the harmonisation of scientific observers' programmes as agreed in the WHSOP and endorsed the recommendation to support the Secretariat on the implementation of the Workplan by hiring a consultant (para 223, Seventh Scientific Committee of the Southern Indian Ocean Fisheries Agreement (SIOFA) 2022 – SC7 Report).

The Ninth Meeting of the Parties endorsed the recommendations in paragraph 223 of the SC7 Report regarding the harmonisation of scientific observers' programmes (para 101, Ninth Meeting of the Parties to the Southern Indian Ocean Fisheries Agreement (SIOFA) 2022 – MoP9 Report).

In 2022, the EU agreed to a 1.5-year funding arrangement to enable SIOFA to commission a series of scientific studies to support the SIOFA/Scientific Committee's Work Plan. These studies are integrated with SIOFA's ongoing and planned scientific studies. This EU funding arrangement is designed to deliver on three strategic scientific components focusing on the SIOFA Area, being one of them the establishment of a framework for scientific observation creating a consistent set of standards for scientific observation of fisheries.

2. Terms of Reference

1

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2. Terms of Reference

This project addresses the requests of the SC and the MoP aiming at developing a harmonised scientific observer programme framework and identifying minimum standards on data collection quality for scientific observers.

2.1 Overall objectives

The project "Establish a framework for scientific observation of SIOFA fisheries" aims to ensure that the scientific observers working in SIOFA fisheries operate using a consistent set of standards for observation and measurement, resulting in high-quality data that will inform scientific advice for conservation and sustainable management of SIOFA fisheries addressing the following five main objectives:

1. **Objective 1: Analysis of CCPs observers' programmes.**

Task 1 will focus on Data collection and minimum standards on CCPs observer programs for scientific data collection and Develop templates for the observer reports, and for an observer data collection form.

Task 1 will follow the WHSOP agreed procedure of action (WHSHOP Workplan) in delivering on the harmonisation of observer data templates:

a) Using the SIOFA CMM 2022/02 (Data standards) Annex B & develop a series of fishery specific data collection forms[1].

b) Circulate[2] those for comment.

c) Amend the forms as needed and get agreement on the finalised forms.

d) Create electronic forms that reflect the agreed forms with all fields linked to the specific fishing set that is being observed.

e) Develop standard reporting formats and codes to populate the forms and hard wire these into the e-forms to ensure the data quality and consistency in reporting across observer programs.

f) Circulate for comment.

g) Amend standard reporting formats as needed.

h) Develop a manual that describes how to collect these data and complete each data field.

i) Circulate those for comment.

j) Amend them as needed.

k) Develop a database that each CCP can use to capture and store the data in country. These data can be submitted annually to the secretariat and housed at the secretariat on a single database.

[1] In addition to CMM 2022/02 (Data Standards), it would be necessary to consider paragraph 5c of SIOFA CMM 2020/01 (Interim Management of Bottom Fishing), which pertains to guidelines for evaluating and approving electronic observer programs for scientific data collection.

[2] The SIOFA Scientific Committee will consider establishing an ad-hoc Working Group on Harmonisation of Scientific Observer Programmes (WG HSOP) for a close follow up of SIOFA Scientific Observer Programmes developments.

2. **Objective 2: Identify synergies for improving scientific observer management and optimising coverage and deployment, with the aim of setting a consistent standard for scientific observation.**

Task 2 will follow the WHSOP agreed procedure of action (WHSOP Workplan) in delivering on:

1) Establish minimum standards for observer programs:
   a) Observer program infrastructure:
      - Covering areas such as administrative, financial, and logistical arrangements including IT data management.
   b) Training of observers
      - Including programme content, documentation, and procedures.
   c) Post-trip evaluation, data submission
      - Processes of submission of data and assessment of data quality.

2) Design of the process for evaluation of observer programs

When developing forms, manuals, codes and metrics, the work should consider existing manuals, forms from SIOFA´S CCPs programs and CMMs requirements.

3. **Objective 3: Describe and recommend potential tools and operational characteristics for electronic observer monitoring on board vessels.**

Task 3 will describe and recommend potential tools and operational characteristics for electronic observer monitoring in main SIOFA fisheries.

4. **Objective 4: Propose potential updates of the SIOFA CMM-02 on Data Standards, focusing on Annex B (Observer Data).**

Task 4 will elaborate, based on the findings, a proposal for updating SIOFA CMMs on Data Standards, focusing on Annex B (Observer Data).

5. **Objective 5: Provide a first draft proposal for a new CMM for regulation of scientific observer harmonisation in SIOFA.**

Task 5 will provide, considering the findings of the project and similar initiatives already implemented in other RFMOs, a first draft proposal for a new CMM for regulation of scientific observer harmonisation in SIOFA.

SIOFA is looking to contract a consultant, or team of consultants, to undertake this project and meet these objectives. The key output of this project will be a report, or reports, that will be considered at the 9th Scientific Committee meeting in 2024.

A SIOFA framework for scientific observation will ensure that the scientific observers working in SIOFA fisheries operate using a consistent set of standards for observation and measurement, resulting in high-quality data.

2.2 Reporting requirements

1. Report No 1 — Data collection forms and minimum standards on CCPs observer programs for scientific data collection.
2. Report No 2 — Templates for the observer reports, and for an observer data collection form.
3. Report No 3 — Draft report on Minimum standards for Observer Programs (Maximum 75 pages).
4. Report No 4 — Final report on Minimum standards for Observer Programs (Maximum 90 pages).
5. Report No 5 — Draft design of the process & framework for evaluation of Observer Programs (Maximum 75 pages).
6. Report No 6 — Final design of the process & framework for evaluation of Observer Programs (English with Executive Summary in French and English - Maximum 90 pages).
7. Report No 7 — Final report on e-monitoring schemes (Maximum 75 pages).
8. Report No 8 — Final report presentation at the 9th SIOFA's Scientific Committee to be held in 2024.

2.3 Confidentiality and distribution of project outcomes

The Consultant shall not release confidential data provided for conducting this study to any persons nor any organisations, other than SIOFA Secretariat. The consultant shall delete all the confidential data after the completion of the contract. Any arrangements for ownership, storage, or disposal of physical samples shall be agreed by SIOFA as a part of the contract.

All Intellectual Property generated as a part of this contract shall become the property of SIOFA unless otherwise excluded in the proposal and agreed by SIOFA in the contract.

All reports and presentations will be reviewed by the SIOFA Secretariat prior to any form of further distribution. The Consultant will revise the report according to comments received from the review process before the report or presentation is accepted as a submission against the requirements in the Terms of Reference.

2.4 Relevant SIOFA information

Report of the Workshop on Harmonisation of Scientific Observers' Programmes of the Southern Indian Ocean Fisheries Agreement (SIOFA), 2021.

3. Workplan and payment schedule

The project should end May 2024 (extensions could be possible, if duly justified, but need to be negotiated). The funds for this project are budgeted under the EU SIOFA-SEAs Grant (Grant Agreement 101078892, https://siofa.org/node/962), for a total allocated budget of 48,000 Euro (including all costs and including any travel related expenses).

The consultant shall follow the timeline described in Table 1 below.

Table 1: Timeline for payments, milestones, and report submission

Milestone	Date	Activities
Initiation of contract	7 April 2023	First instalment payment (30% of the total contract sum)
Delivery of draft report	1 March 2024	Submission of draft report to SC9
Delivery of final report	31 May 2024	Submission of final report and project information to SIOFA. Final instalment payment (70% of the total contract sum) on acceptance of the final report and the submission of project information

4. Submission of applications

The applicants should have appropriate experience and knowledge of developing similar projects. The applicants should submit a proposal to the project coordinator (SIOFA Science Officer - Marco Milardi, marco.milardi@siofa.org) containing the following items:

1. A current CV that summarises the applicant(s) relevant educational background and professional experience.

2. A brief proposal (indicatively 1-2 pages) outlining the proposed methods and analyses, including a description of how the objectives of the ToRs will be achieved.

3. Any proposed exclusions to the intellectual property clause.

4. The proposed consultancy price (including all consultant expenses and project related costs), noting the available budget for this work as laid out in Section 3.

5. Identification of any project risks and associated mitigation and management required to successfully complete the project.

6. A statement that identifies any perceived, potential, or actual conflicts of interest of the applicant(s), including those described in paragraph 4 of the SIOFA recruitment procedure (see Box 1), and

7. Any additional relevant information the applicant(s) wish to submit.

Applications received before 12 AM (9 AM UTC) on Monday the 27th of March 2023, Reunion Island time, will be considered in the following selection process.

5. Evaluation criteria for the selection of candidates

The selection criteria will be developed by an evaluation panel along with at least the SC Chairperson and Vice Chairperson, the Secretariat, the Coordination Manager, and if available the WG Chairs.

The selection grid will include at least the following criteria:

1. Adequate submission of information to allow the panel to evaluate the candidate

2. Evaluation of the proposal from the candidate, including the proposed contract price
3. Ability to undertake and complete the analyses or work required in the ToR
4. The candidate's agreement with confidentiality provisions required for the project
5. Acceptable conflict of interest statement (See Section 9.1)
6. Agreement with the data submission and intellectual property terms required in this ToR, and
7. Financial and resourcing considerations.

6 Conflicts of interest. Paragraph 4 of SIOFA's Recruitment Procedure

To ensure that situations relating to potential and actual conflict of interests are avoided, persons falling into the following categories may not normally be considered for SIOFA consultancy: (i). any person designated as a designated representative or alternate representative of a CCP to the Meeting of Parties (MOP) as per Rule 3.1 of the Rules of Procedure, and to the SC and any other subsidiary bodies of the MOP, as per Rule 21.3 of the Rules of Procedure; (ii). Any person fulfilling the function of Chair or Vice-Chair of the MOP or Chair or Vice-Chair of a SIOFA subsidiary body or working group; (iii). Any person acting as a member of a delegation involved in the SIOFA decision-making process resulting in recommendations and/or approval for the SIOFA work requiring the engagement of a consultant; and
(iv). Individuals who were SIOFA Secretariat staff members at the time when the recommendations and/or approval for the SIOFA works were adopted or who are members of immediate family (e.g., spouse or partner, father, mother, son, daughter, brother, or sister) of any Secretariat staff member or of the persons identified in 4 (i), (ii), and (iii).

10. Contacts

Project Coordinator – SIOFA Science Officer (Marco Milardi, marco.milardi@siofa.org)

Administration – SIOFA Executive Secretary (Thierry Clot, thierry.clot@siofa.org)

Annex 2. Proposed Scientific Observer Logbooks (Excel workbooks).

Supplied as a set of Excel workbooks.

Annex 3. Scientific Observer Logbooks instruction manual.

Introduction

These instructions provide the background and details to assist scientific observers to complete the SIOFA Observer logbook. The Logbooks are made up of series of forms and are prepared as Excel workbooks. These instructions provide a general description of the data requirements along with detailed instructions for each field in the Form.

General comments that apply to the whole logbook are as follows:

- In order to allow automated data quality assurance processes the layout of the forms is locked and data can only be entered into cells with a white background. Many cells have format restrictions applied to ensure that numbers are entered as numeric values and date and times are in the correct format.
- Where the content of a field is one of a series of pre-defined codes these are provided in a drop-down menu. For most fields with drop-down menu it is not possible to enter data that is not in the list of options for that field in the form.
- For the FAO 3-letter species codes the drop-down contains the main species in SIOFA fisheries (as described in SC 8 Annex 1), other codes can be entered and there will be a warning to highlight if a code that is not in the drop-down menu is entered.
- For any field where there is a need to include additional data options that are not in the current list options this should be included in the Cruise Report with as much detail as possible.
- For trawl fisheries each fishing event is given a Tow ID. This should be the same as the ID for that tow provided in the vessel catch data.
- For line fisheries each fishing event is given a Set ID. This should be the same as the ID for that tow provided in the vessel catch data.
- Comments on the data formats specified in CMM 02 Annex C.

  Date and Time – all times should be reported in 24-hour format YYYY-MON-DD hh:mm:ss (for convenience we suggest using separate fields for Dates and Times - but that both retain the same formats)

  SIOFA has agreed to three formats for reporting coordinates Degrees minutes seconds (DD°MM'SS'') or Degrees minute decimal (DD°MM.XX) or Decimal degrees (DD.XXXX).(the data precision is the same for each, if there is no agreement on a single format suggest that they all be converted to DD.XXXX format as part of data submission processing).

Most of the forms are the same for all fisheries while some, such as Gear Details and Fishing Operations, are specific to particular fisheries. There are also some forms that are only used in certain fisheries. All forms have been included in these instructions to provide consistency, allow for ease of review and updating of instructions. Each Logbook has an Introduction page that includes the Logbook version number and a list of the Forms.

Notes (in italics) have been included in this document to highlight where additional consideration by SIOFA is required and also to identify where the data requirements represent a change from those described in CMM 02(2023) Annex B.

The SIOFA list of priority fish species is included in Appendix 1.

Form – Observer Details

This form should be completed once per Observer cruise to record the details of each Observer and the vessel. Here we define a **Vessel Trip** as the entire period between port visits for a vessel and an **Observer Cruise** as the period for which the observer is on the vessel. The form is designed so that it can be completed for either a port-to-port observer cruise or for that part of the vessel trip where fishing took place in the SIOFA area. The vessel details should be requested from the Captain and are included here are to provide a confirmation of the vessel details provided by the flag State. The Observer is not expected to independently confirm any of the vessel details such as the tonnage, engine power and hold capacity.

Vessel Details

The vessel details information can either be verified from the vessel markings (in accordance with FAO best practice) or from the official vessel documents such as the vessel registration documents issued by authorities from the flag state.

Vessel Name - The registered name of the Ship as it appears on the vessel superstructure.

Vessel Flag – Confirm the country of registry of the vessel as it appears on the vessel superstructure.

Vessel callsign - Record the unique registration letters assigned to a vessel they appears on the vessel superstructure.

Vessel IMO - Record the unique (Seven Digits) IMO number of the vessel as it appears on the superstructure.

Vessel Gross Tonnage - The vessel GT as it appears on the vessel information on the bridge.

Engine Power (indicate HP or KW) - The vessel tonnage as it appears on the vessel information on the bridge.

Vessel Type – The ISSCFG code for the type of fishing vessel.

Total Frozen Hold Capacity (m^3) - The vessel freezer capacity as it appears on the vessel information on the bridge.

Vessel Trip Details

NOTE: As the Observer may or may not be able to complete all parts of this part of the form it might be better to put this in the narrative Cruise Report.

Port of departure –the last port visited by the vessel.

Date of departure – The date of departure of the vessel from the last port visited.

Date of Entry into SIOFA -The date that the vessel first entered the SIOFA Agreement Area

Date Start Fishing in SIOFA - The date that the vessel started its first fishing operation in the SIOFA : Area

Date End Fishing in SIOFA - The date that the vessel completed the last fishing operation in the SIOFA Agreement Area

Date of Exit from SIOFA - The date that the vessel exited the SIOFA Agreement Area

Port of landing - The name of the port or location transhipment occurred where the catch from fishing operations in the SIOFA Agreement Area were landed if known.

Date of landing - The date of entry into the port where the catch from fishing operations in the SIOFA Agreement Area were landed.

NOTE: We suggest that the inclusion of Targeted Species and Number of Crew on this form be reviewed.

Observer details

Observer full name - The first name and family name(s)

Nationality – The nationality of the observer as shown on the passport.

Employer Name - The name of the employing organisation that the observer is contracted to for their period in the SIOFA fishery.

Employer address – The postal address of the name of the employing organisation that the observer is contracted to for their period in the SIOFA fishery.

Employer email – The email of the relevant contact person in the employing organisation that the observer is contracted to for their period in the SIOFA fishery.

Employer phone – The telephone number of the relevant contact person in the employing organisation that the observer is contracted to for their period in the SIOFA fishery.

Embarkation location – The location where the observer joined the vessel - either a port or a latitude longitude for a location at-sea

Embarkation date/time – The date that the observer joined the vessel.

Disembarkation location – The location where the observer left the vessel - either a port or a latitude longitude for a location at-sea.

Disembarkation date/time - The date that the observer left the vessel.

Report submitted Date - The date that the Observer Logbook was submitted to the Observer employer.

Catch details

NOTE: As the Observer may or may not be able to complete all parts of this part of the form it might be better to put this in the narrative Cruise Report.

Form – Gear Details

This Form is designed to collect the gear aspects of the fishing gear used by the vessel in order to help in the interpretation of the observer data. Use the form to assign a Gear ID to the different configurations of gear used by the vessel so that these can be referred to in the data that is collected on a per Set/Tow basis.

NOTE: SIOFA should determine the gear information required by SIOFA and whether this should be supplied by the vessel with a subset of fields collected by the observer that can be used to confirm those details. This is particularly important for Trawl gear.

Gear Trawl

Net type - The FAO Standard abbreviation following the International Standard Statistical Classification of Fishing Gear (ISSCFG) (He et al. 2023 Appendix A)

Headrope length (m)- The length of the rope where the top edge of the net and floats are attached (this is sometimes referred to as the headline.)

Groundrope length (m) - The length of the rope where the bottom edge of the net (this is sometimes referred to as the ground gear.)

Bobbin diameter (cm) - The diameter (in cm) of the bobbins if they are attached to the groundrope.

Otterboard to wing length (m) – The distance in metres from the otterboard to the net.

Horizontal opening (m) – The maximum distance between the two sides of the net when the net is fully open.

Vertical opening (m) - The distance from the headrope to the ground rope when the net is fully open.

Codend mesh size (cm) – The distance between opposite knots in the codend mesh when fully stretched.

Codend circumference (m) - The circumference of the first section of the codend

Mesh type - The type of mesh used in the codend (e.g. diamond or square mesh)

Otterboard type - The shape of the otterboard (rectangular or oval) and material (steel, aluminium, wood).

Otterboard weight (kg) - The estimated weight of the otterboard (this may be marked on the otterboard).

Net design - The manufacturer and model number of the Net if available.

Ground rope Bobbins present? Y/N – Are bobbins attached to the ground rope.

Ground rope Bobbins material – The material that the bobbins are made of, typically steel or rubber.

Ground rope Bobbins weight (combined) – The weight (Kg)of all of the Bobbins combined.

By-Catch reduction device present (Y/N) - Yes/No if the net is fitted with any kind of by-catch reduction device. If Yes, please provide details in Cruise Report

Selectivity device present (Y/N) - Yes/No if the net is fitted with any kind of selectivity device. If Yes, please provide details in Cruise Report

NOTE: The details required to describe the By-catch reduction device and Selectivity device should be specified in the Observer Manual.

Gear Line

Line Type - The FAO Standard abbreviation following the International Standard Statistical Classification of Fishing Gear (ISSCFG) (He et al. 2023 Appendix A)

Line Configuration - For LLS gear record the gear configuration (Spanish/Double Line, Drop/Trotline, Autoline)

Mainline Material - the material the mainline is made from.

Mainline Diameter (cm)– The diameter/ width of the mainline in cm.

Branchline Material – The material that the Branch Line is made from.

Branchline Length – The length of the Branch Line in metres.

Snood Material - The material that the snoods are made of (e.g. multifilament, monofilament, steel)

Snood Length (m) – The length of the snood in metres

Line Weight Kg/m -The overall line weighting in kg per metre of line.

Hook Type (J, C) – The shape of the hooks

Hook Manufacturer - The name of the hook manufacturer

Hook Model Name: - The model number of the hooks.

NOTE: The measurement details for the Hook specified in CMM 02 (2023) have been replaced with reporting details of the Manufacturer and model name.

Gear Pot

Gear Material – The material that the pot is made from (e.g. plastic, metal, wood)

Pot Type - The FAO Standard abbreviation following the International Standard Statistical Classification of Fishing Gear (ISSCFG) (He et al. 2023 Appendix A) – Note this is FPO for pots

Mesh Size - The diagonal distance across the mesh in the walls of the pot.

Number of chambers - The number of chambers in the pot.

Port Orientation - The location of the Port (the entrance to the Pot), should be either on the top or the side of the pot.

Port Aperture - The minimum diameter of the Port (the entrance to the Pot)

Escape Port Present (Y/N) - Does the pot have an escape port?

Dimensions of Escape Port - The minimum diameter (cm) of the escape port if present.

Weights attached (Y/N) - Were additional weights attached to the Pot?

Min Weight (kg) - The minimum weight attached to the Pot if attached.

Max Weight (kg) – The maximum weight attached to the Pot if attached.

Gear Mitigation

For description of the required details please refer to CMM 13 (2022) Annex 1.

Streamer line height above water attached (m) - The height above sea-level that the streamer line was attached to the vessel.

Number of streamer lines regularly set – The number of streamer lines that were normally used.

Streamer line position - The position on the vessel where the streamer line was attached (port or starboard)

Streamer line length (m) - The total length of the streamer line in metres.

Streamer Length min (m) - The length of the minimum streamer length in metres.

Streamer length max (m) - The length of the maximum streamer length in metres.

Streamer line distance between streamers (m) - The distance between the attachment points of streamers on the Streamer Line in metres.

Distance of first streamer from attachment point (m) -The distance to the first streamer in metres.

Number of streamers – The total number of streamers attached to the Streamer Line.

Streamer material - The material that the streamers are made from.

Streamer diameter - The width of the streamers.

Streamer colour - The colour of the streamers.

Streamer line aerial extent- The aerial extent of the steamer line.

Towed object present (Y/N) – Is an object attached to the end of the steamer to maintain tension.

Distance from stern to warp entry point (m) - The distance behind the vessel that warps enter the water (for trawl gear only).

Other Mitigation Device – Where other mitigation devices are used put a YES in the Gear Form and provide a full description in the cruise report.

Form – Fishing Operations

This sheet records the fishing operation details for each trawl tow or line set that takes place during an observer cruise. It is important that the identifier for the fishing event matches the identifier used by the vessel when reporting the total catch so that any subsampling carried out by the observer can be scaled-up.

In order to allow data quality checking please fill in the form for all Tows/Sets even if no observations are carried out during that operation.

Line

Set_ID – This should be a consecutive, unique number that matches the Set ID used by the vessel for their catch and effort data forms.

Gear_ID - The ID number of the gear used from the Gear Form

Start setting: Date-time - The time and date when first part of the gear, including the anchors, entered the water.

Start setting: Latitude – The latitude at start of gear setting.

Start setting :Longitude – The longitude at the start of setting.

Start setting: Bottom Depth (m) - The depth at the start setting location (collect from echosounder rather than charts).

End setting: Date-time – The time when final part of the gear, including the location buoys, entered the water.

End setting: Latitude - The latitude at end of gear setting

End setting: Longitude – The longitude at the end of setting

End setting: Bottom Depth (m) – The depth at the end setting location from echosounder (collect from echosounder rather than charts).

Target species – The intended target species for this fishing event. This may be more than one species in some cases “DPX - Demersal percomorphs nei” fisheries.

NOTE: The specification of the reporting of target species should be reviewed by SIOFA.

Setting Observed (Y/N) – Did the observer collect any data during the setting process? [This field is used as a data integrity check.]

Offal dumping during setting (Y/N) – Was offal dumping observed by the observer (should be Yes/No/Not Observed for)?

Main line length (m) - The total length of line set in metres.

Number of hooks set – The total number of hooks set.

Bait species - The FAO code for the bait species used. Where there is a mixture of baits use code separated by // [Note: review use of dropdown for FAO code for mixed baits and whether there is a need to record the % of different baits.)

Deck light used during setting Y/N) - Was deck lighting used during setting?

Number of streamer lines used - How many streamer lines were used at setting.

Bait entry position(m) – The distance in metres from stern where the bait enters the water - use 0 for underwater setting.

Start hauling: Date-time: The time and date when first piece of gear, including the location buoys, is landed on the vessel.

Start hauling: Latitude: The latitude at start of hauling.

Start hauling: Longitude: The longitude at the start of hauling.

End hauling: Date-time: The time when final part of the gear, including the location buoys, is landed on the vessel.

End hauling: Latitude: The latitude at end of gear hauling

End hauling: Longitude: The longitude at the end of hauling

Number of hooks observed for catch - The number of hooks that were observed for catch.

Bird Exclusion device ID - The ID number of the Mitigations design used taken from the Gear Form.

Trawl

Tow_ID – This should be a consecutive, unique number that matches the Set ID used by the vessel for their catch and effort data forms

NET_ID – The appropriate NET_ID from the GEAR form.

Target species – The intended target species for this fishing event. This may be more than one species in some cases “DPX - Demersal percomorphs nei” fisheries.

NOTE: The specification of the reporting of target species should be reviewed by SIOFA.

Gear deployment: Date time – The time and date when the Net entered the water.

Fishing start time – The time the net reached fishing depth.

Fishing start Net Depth – The depth in metres of the net when no more warp is paid out.

Fishing start Bottom Depth(m) – The depth in metres of the bottom at the start of fishing location (from echosounder rather than charts). For bottom fisheries this will be the same as the Fishery start depth.

Fishing-start Latitude – The latitude when the net reached fishing depth.

Fishing start Longitude The longitude when the net reached fishing depth.

Fishing end time – The time when hauling (net retrieval) commences.

Fishing-end Latitude – The latitude when the hauling (net retrieval) commences.

Fishing end Longitude- The longitude when the hauling (net retrieval) commences.

Fishing end Trawl Depth – The depth in metres of the net when the hauling (net retrieval) commences.

Fishing end Bottom Depth – The depth in metres of the bottom when the hauling (net retrieval) commences.

Hauling end date time – The time when hauling (net retrieval) is completed.

Bird scaring streamer line used – The Mitigation Id in the gear form, or 0 where not used.

Bird bafflers used - The Mitigation Id in the gear form, or 0 where not used.

Offal discharged during shooting (Y/N) - Was offal/fishwaste discharged in the period between 15 mins prior to the net entering the water and the start fishing time?

Offal discharged during hauling (Y/N) - Was offal/fishwaste discharged in the period between 15 mins prior to the hauling commencing and the net being brought onto the vessel?

Catch Observation (Y/N) – Was the Tow observed for catch/bycatch?

Sub Sample total weight (kg)- The weight in kg taken for observer sampling, this subsample must be taken before any processing of the catch takes place.

Form – Biological Sampling

This is an important form as it used to record the biological characteristics (e.g. length, weight, sex, etc.) for a representative sample of fish from each fishing operation

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Fish Serial Number – A sequential number that identifies each fish sampled to allow sample linking.

Total Length (cm) - The length in cm from the most anterior part of the snout to the furthest tip of the caudal fin.

Standard Length (cm) - The length from the most anterior part of the snout to the end of the vertebral column.

Snout-Anus Length (cm) - The length from the tip of the snout to the anus.

Pelvic Length The length from the tip of the snout to the end of pelvic fin (on skates only)

Wingspan (cm) – The maximum width of a skate at right angles to the total length

Length method - Record the method used to measure the fish length. This could be either (flexible tape, calliper or board)

Weight (kg)- Record the weight of the intact fish.

Weight method - Record the method used to weigh the fish. (In pelagic longline, where there may be large individual fish caught it may not be possible to weigh individual fish before they are processed).

Sex - The sex of the this fish, should be Male (M) Female (F) or not-determined (U)

Maturity Stage- The he maturity stage of the species (refer to training notes for instructions)

Gonad Weight (kg) - The gonad weight in kg (record the weight in kg even if the actual measurement was made in g.)

Otolith collected (Y/N) – Were otoliths collected from this fish ? (Ensure that the otoliths are labelled with the Set ID and the Fish Serial Number).

Additional sample collected (Y/N) - Were other samples were collected from this fish? (Ensure that any samples are labelled with the Set ID and the Fish Serial Number).

Sample Storage - Description of sample storage material.

Comments

Form - Conversion Factors

Catches are typically reported as a processed weight of fish multiplied by a conversion factor to estimate the original green weight. Observers collect independent data to describe the conversion factors and their variability.

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Processing Code – The three-letter processing code e.g HAG, HAT, FIL

Number - The number of individual fish processed (this can equal 1 for large fish)

Length Type - The type of length measurement e.g. TL, SL, SAL

Min Size (cm) – The length of the smallest fish (this should equal the max size where the number of fish =1)

Max Size (cm) – The length of largest fish (this should equal the min size where the number of fish =1))

Cut Type Code - Record the cut type where the head is removed.

Total Green weight (kg) – The total weight in kg of all fish before processing.

Processed weight (kg) – The total weight in kg of all fish after processing.

Weighing method – The method used to weigh the fish.

Conversion Factor - An automatically calculated field that provides a data quality check

Form –Catch Details

This sheet is used to record the number and weight of all species in the catch, in the subsamples from trawls or the hook observation period for line fisheries. For LLS the sampling unit is the number of hooks observed so there will be fish lost at the surface and cut off at the surface that should be included. For Trawl the sampling unit is simply a subsample of the actual catch. In both cases there is a need to determine whether (and what weight) of the fish are retained or discarded of each species after the Observer has completed their measurements (including the biologicals). For longline it is not possible for observers to observer the catch coming on board and to weigh each fish so the tally period is only the count of fish. -

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Number retained – The number of each species landed on the vessel.

Weight retained (only for TRAWL) - The total weight of each species landed on the vessel.

Number discarded – The number of fish deliberately discarded by the crew (This excludes fish that were damaged as a result of the observer sampling activities)

NOTE: There is a need for clear instructions here for how to determine if fish were discarded or cut-off or lost at surface for LL and then whether trawl fish were discarded after biological sampling.

Weight discarded – The weight (where possible) of fish deliberately discarded by the crew (This excludes fish that were damaged as a result of the observer sampling activities).

Form –VME indicator taxa

This sheet is for recording data on Vulnerable Marine Ecosystem (VME)-indicator taxa that are listed in the SIOFA VME indicator guide. Use a new row for each different VME indicator taxa on a Set/Tow

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Quantity estimate - The estimated quantity of the VME indicator taxa

Quantity unit – The units used to measure the quantity of the VME indicator taxa – Weight (Kg) or Volume (m^3)

Sample taken for ID (Y/N) – Where samples or photograph was taken for Identification?

Form - ETP Details

This form will be used to record the details of all observed incidental catch of endangered, threatened and protects (ETP) species including marine mammals, birds and reptiles.

[Observer instructions must include monitoring net hauling process as some of ETP species might be removed during net hauling period]

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Number caught – The number of this species caught.

Dead: Retained – The number of this species that were landed dead and retained onboard.

Dead: Discarded - The number of this species that were landed dead and not retained onboard

Alive: Released - The number of this species that were landed alive and released alive (any individuals with injuries that have a high likelihood of post-capture mortality or threated their long-term survival should be reported as Dead: Discarded.

Samples Collected (Y/N): Were sample collected? If they were then provide details in the Comments Field

Comments

Form – Warp strikes

This form is for recording interactions of seabirds with the trawl warps.

Tow_ID – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

Mitigation Device - The Mitigation ID from the Gear Form

Mitigation Device – The Mitigation ID from the Gear Form where a second device is used (e.g. where there are Streamer lines and Bird Bafflers)

Start Warp Strikes observation: Date - The date that the observation period started.

Start Warp Strikes observation: Time – The time that the observation period started.

End Warp Strikes observation Date - The date that the observation period ended.

End Warp Strikes observation Time - The time that the observation period started.

FAO Species code - The 3-letter FAO code of the species.

Air Strikes number – The number of bird strikes with the warp where the bird is in the air and hits the water with little to no control of its flight

Water Strikes number – The number of bird strikes the warp where the bird is on sea surface and is partially pulled beneath the surface of the water, but is not fully submerged.

Sinker Strikes - The number of bird strikes the warp where the bird strikes a warp and the entire body is submerged.

Form – Seabirds

This form should be used for all fisheries where the Observer collects information on the number of seabirds around the vessel at a particular time .This can include conducting observations that are not during a Tow or a Set-Haul event. Where observations are done prior to a Tow or Set commencing please use the ID for the next fishing event, and note this in the Comments as this will assist the QC process.

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

Start Observation Date – The date that the observation period started.

Start Observation Time - The time that the observation period started.

End Observation Date - The date that the observation period ended.

End Observation Time - The time that the observation period started.

FAO Species code - The 3-letter FAO code of the species.

Estimated number – The estimated number of birds present on a scale of 1-10, 10-50, 50-100, 100+

Fishwaste discharge (Y/N) – Was fishwaste being discharged during the observation period?

Observed feeding (Y/N) – Was this species observed feeding on fishwaste during the observation period?

Comments

Form – Marine Mammals

This form should be used for all fisheries where the Observer collects information on the number of marine mammals around the vessel at a particular time. This can include conducting observations that are not during a Tow or a Set-Haul event. Where observations are done prior to a Tow or Set commencing please use the ID for the next fishing event and note this in the Comments as this will assist the QC process.

Tow_ID [trawl] Set_ID [line] – the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

Start Observation Date – The date that the observation period started.

Start Observation Time - The time that the observation period started.

End Observation Date - The date that the observation period ended.

End Observation Time - The time that the observation period started.

FAO Species code - The 3-letter FAO code of the species.

Estimated number – The estimated number of birds present on a scale of 1-10, 10-50, 50-100, 100+

Fishwaste discharge (Y/N) – Was fishwaste being discharged during the observation period?

Observed Interacting (Y/N) - Was this species observed interacting with gear or the vessel during the observation period?

Form – Whale Interactions

This Form is for use in collecting the data specified in CMM 02 Annex E to record the presence of depredating killer whales *Orcinus orca* and sperm whales *Physeter macrocephalus* in demersal longline fisheries.

Set_ID– the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species. Note: This form is specifically for killer whale and sperm whale interactions.

Presence - Was the species present, absent or no observations were undertaken

Arrival time (mins) - Duration in minutes long after the first hook was hauled aboard the vessel that the first whale observed.

Photographed (Y/N) – Where photographs were taken?

Minimum number:– The estimated minimum number of whales present around the vessel.

Maximum number:– The estimated maximum number of whales present around the vessel.

Interacted with gear (Y/N) - Did the whale interact with fishing gear? If Y provide comment to describe the nature of the interaction

Comments

Form - Tagging

Toothfish are required to be tagged in SIOFA toothfish fisheries following the CCAMLR tagging protocols.

Tag ID - Assign ID for each tag Type

Tag Type - The Tag Type (e.g T-bar, Dart)

Tag Colour - The tag colour

Tag Wording - The wording on the Tag

Comment

Set_ID– the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Latitude - The latitude at the point of release.

Longitude - The Longitude at the point of release.

Tag1: Tag ID - The Tag ID from the top of the Form

Tag1:Tag Number - The full alpha-numeric sequence on the tag.

Tag2:Tag ID - Record the Tag ID from the top of the Form.

Tag2:Tag Number – The full alpha-numeric sequence on the tag.

Tag3:Tag ID - The Tag ID from the top of the Form.

Tag3:Tag Number - The full alpha-numeric sequence on the tag.

Person Tagging - The Observer ID or a Name (if not the Observer) for the person that tagged the fish.

Total Length (cm) - The length in cm from the most anterior part of the snout to the furthest tip of the tail.

Released Fate - The fate of the fish on release.

Comments

Form – Tag Recapture

All tagged toothfish (and any other species of tagged fish) that are recaptured should be recorded with as much detail as possible. Whenever possible for fish the tag should be retained.

Set_ID– the ID from the Fishing Operation form.

Observer ID – The Observer ID from the Observer Details for the person collecting this data.

FAO Species code - The 3-letter FAO code of the species.

Tag Finder - The Observer ID or a Name (if not the Observer) for the person that found the tagged fish.

Tag1: Tag Type – The Tag Type (e.g T-bar, Dart)

Tag1: Tag Colour – The tag colour

Tag1: Tag Number - The full alpha-numeric sequence on the tag

Tag1: Tag Wording - The wording on the Tag

Tag2: Tag Type – The Tag Type (e.g T-bar, Dart)

Tag2: Tag Colour – The tag colour

Tag2: Tag Number - The full alpha-numeric sequence on the tag

Tag2: Tag Wording - The wording on the Tag

Tag3: Tag Type – The Tag Type (e.g T-bar, Dart)

Tag3: Tag Colour – The tag colour

Tag3: Tag Number - The full alpha-numeric sequence on the tag

Tag3: Tag Wording - The wording on the Tag

Total Length (cm) - The length in cm from the most anterior part of the snout to the furthest tip of the tail.

Weight (kg)- Record the weight of the intact fish.

Weight method - Record the method used to weigh the fish. (In pelagic longline, where there may be large individual fish caught it may not be possible to weigh individual fish before they are processed).

Sex - The sex of the this fish, should be Male (M) Female (F) or not-determined (U)

Maturity Stage- The he maturity stage of the species (refer to training notes for instructions)

Gonad Weight (kg) - The gonad weight in kg (record the weight in kg even if the actual measurement was made in g.)

Otolith collected (Y/N) – Were otoliths collected from this fish ? (Ensure that the otoliths are labelled with the Set ID and the Tag1: Tag Number).

Additional sample collected (Y/N) - Were other samples were collected from this fish? (Ensure that any samples are labelled with the Set ID and the Tag1: Tag Number).

Tag Site Condition - Provide a description of the condition of the skin around the tagging site

Tag photo (include in cruise report) (Y/N) – Was a photograph of the tags and/or the tagged fish included in the cruise report?

Comments

Appendix 3.1. SIOFA Priority species list.

SC 8 paras 206 to 209 provided a series of interim definitions for different categories of catch and agreed species designations (SC8 Annex I) including whether the species was either primary or secondary species according to the following definitions.

> a. Primary species: Species for which management tools and measures should be in place and the achievement of stock management objectives is expected. These species-gear encounters tend to encompass a high proportion of the fished area for that fishery. The Scientific Committee would be expected to undertake relevant biological studies and periodic stock assessments (quantitative, semi-quantitative or qualitative whichever is appropriate) for these species. These species should have SIOFA species specific fisheries summary reports compiled annually in years when no assessment is being undertaken.
>
> b. Secondary species: All other species that comprise 5 per cent or more of the total catch (determined using a 3-5 year average) or, for 'less resilient' species (most sharks etc., based on ERA), 2 per cent or more of the total catch, or otherwise as designated by the Scientific Committee. The Scientific Committee would be expected to undertake periodic evaluations, to assess trends in catch and effort, for these species. Information on trends for these species could be included in a future general fishery summary report.

The MoP endorsed the definitions of primary and secondary species and noted the preliminary categorisation of species in Annex I .

Given the definitions the collection of adequate catch and biological data on of primary and secondary species should be a priority for the work of observers.
As a minimum requirement observers should be able to identify all of the primary species, regardless of the fishery in which they are working and should be able to identify the secondary species listed for the fishery in which they are working.

We have reviewed the list of species provided in and associated codes in SC 8 Annex I and provided some suggestions for minor changes to harmonise the three-alpha codes and nomenclature with those of the FAO. We note that the use of 'species' is consistent with the general description of the "FAO Species codes" although it refers to a range of taxonomic resolution.

SIOFA 3A_CODE	SIOFA name	FAO TAXOCODE	FAO Scientific_name	FAO English_name	Primary/ Secondary	Comment
ALV	Common thresher shark	1060600601	Alopias vulpinus	Thresher		Spelling Diff
ANT	Violet cod	1480203001	Antimora rostrata	Blue antimora	Secondary	Diff English name
ARV	Green jobfish	2280203102	Aristeus varidens	Striped red shrimp		Green Jobfish code is AVR
BAC	Pickhandle barracuda	1771000103	Sphyraena jello	Pickhandle barracuda		
BBY	White-ribbed toadfish	1930100701	Batrichthys albofasciatus	White-ribbed toadfish		
BEO	Crested sculpin	1783700101	Blepsias bilobus	Crested sculpin		
BIL	Billfish*	17503XXXXX	Istiophoridae	Marlins,sailfishes,etc. nei	Secondary	Spelling Diff
BIS	Bigeye scad	1702329101	Selar crumenophthalmus	Bigeye scad	Secondary	
BNS	Smallfin lanternfish	1320802402	Benthosema suborbitale	Smallfin lanternfish		
BOE	Black oreo	1620400701	Allocyttus niger	Black oreo	Secondary	
BOR	Boarfishes nei.	16203XXXXX	Caproidae	Boarfishes nei		
BSF	Black scabbard fish	1750601201	Aphanopus carbo	Black scabbardfish		
BSH	blue shark	1080200401	Prionace glauca	Blue shark		
BTH	Bigeye thresher	1060600603	Alopias superciliosus	Bigeye thresher		
BWA	Bluenose warehou	1760801502	Hyperoglyphe antarctica	Bluenose warehou		
BXD	alfonsino	1610200301	Beryx decadactylus	Alfonsino		
BYR	Sandpaper skate	1100400212	Bathyraja irrasa	Kerguelen sandpaper skate		Spelling Diff
BYS	Splendid alfonsino	1610200302	Beryx splendens	Splendid alfonsino	Primary	
CCF	Pigeye shark	1080201007	Carcharhinus amboinensis	Pigeye shark		
CDL	Cardinal fishes	17096373XX	Epigonus spp	Cardinal fishes nei	Primary	
COM	Spanish mackerel	1750101503	Scomberomorus commerson	Narrow-barred Spanish mackerel		Spelling Diff
COX	Congor eels	14313XXXXX	Congridae	Conger eels, etc. nei		Spelling Diff
CRS	Swimming crabs?	23111004XX	Portunus spp	Portunus swimcrabs nei		
CUT	Scabbard fishes	17506XXXXX	Trichiuridae	Hairtails, scabbardfishes nei		Spelling Diff
CWZ	Carcharhinus sharks nei.	10802010XX	Carcharhinus spp	Carcharhinus sharks nei		
CYO	Portuguese dogfish	1090101601	Centroscymnus coelolepis	Portuguese dogfish	Primary	
DCC	Shortfin scad	1702304303	Decapterus macrosoma	Shortfin scad		

SIOFA 3A_CODE	SIOFA name	FAO TAXOCODE	FAO Scientific_name	FAO English_name	Primary/ Secondary	Comment
DOL	Mahi mahi	1702807101	Coryphaena hippurus	Common dolphinfish		Spelling Diff
EDR	Pelagic armourhead	1705700701	Pseudopentaceros richardsoni	Pelagic armourhead		
EEP	Comet grouper	1700204235	Epinephelus morrhua	Comet grouper		
EMM	Cape bonnetmouth	1703001001	Emmelichthys nitidus	Cape bonnetmouth		
EMN	Marbled coral groper	1700220806	Plectropomus punctatus	Marbled coralgrouper	Secondary	
EPI	Black cardinal fish	1709637301	Epigonus telescopus	Black cardinal fish		
ETA	Deepwater longtail red snapper	1703214002	Etelis carbunculus	Deep-water red snapper		Swap ETC and ETA
ETC	Deepwater red snapper	1703214004	Etelis coruscans	Deepwater longtail red snapper		Swap ETC and ETA
FAL	Silky shark	1080201017	Carcharhinus falciformis	Silky shark		
FIP	Red cornetfish	1510200105	Fistularia petimba	Red cornetfish		
GES	Snake mackerel	1750502001	Gempylus serpens	Snake mackerel		
GRV	macrourids	14806001XX	Macrourus spp	Grenadiers nei	Secondary	Spelling Diff
HYD	Ratfishes nei.	11201004XX	Hydrolagus spp	Ratfishes nei		
KAW	Kawakawa	1750102406	Euthynnus affinis	Kawakawa		
KZJ	Thredfin bream	1703318417	Nemipterus bipunctatus	Delagoa threadfin bream	Primary	Spelling Diff
LAG	Opah	1520100102	Lampris guttatus	Opah		
LEC	Escolar	1750500501	Lepidocybium flavobrunneum	Escolar	Primary	
LHB	Spotcheak emperor	1703817220	Lethrinus rubrioperculatus	Spotcheek emperor		
LHN	Spangled emperor	1703817202	Lethrinus nebulosus	Spangled emperor		
LIB	Brushtooth lizardfish	1311606804	Saurida undosquamis	Brushtooth lizardfish	Primary	
LJB	Two-spot red snapper	1703202742	Lutjanus bohar	Two-spot red snapper	Secondary	
LTQ	Sky emperor	1703817207	Lethrinus mahsena	Sky emperor	Secondary	
LUB	Emperor red snapper	1703202714	Lutjanus sebae	Emperor red snapper	Secondary	
LWA	Goldflag jobfish	1703221708	Pristipomoides auricilla	Goldflag jobfish		
MAK	Mako sharks	10608002XX	Isurus spp	Mako sharks		
MTM	Eagle ray	1080400717	Mustelus mosis	Arabian smooth-hound		Eagle ray code is MYD
NGU	Yellow spotted trevally	1702311408	Carangoides fulvoguttatus	Yellowspotted trevally	Primary	

SIOFA 3A_CODE	SIOFA name	FAO TAXOCODE	FAO Scientific_name	FAO English_name	Primary/ Secondary	Comment
NGX	Carangoides species	17023114XX	Carangoides spp	NA	Primary	
NGY	Bludger	1702311409	Carangoides gymnostethus	Bludger	Primary	
OCS	Oceanic whitetip shark	1080201011	Carcharhinus longimanus	Oceanic whitetip shark		
OEO	Oreos nei.	1705905119	Oreochromis karongae	NA	Secondary	ORD - Orseos Dories nei
OIL	Oilfish	1750500701	Ruvettus pretiosus	Oilfish	Primary	
ONV	Spiky oreo	1620400102	Neocyttus rhomboidalis	Spiky oreo		
ORY	Orange roughy	1610500202	Hoplostethus atlanticus	Orange roughy	Primary	
OXR	Frenchman seabream	1431501001	Xyrias revulsus	NA		
PFM	Crimson jobfish	1703221702	Pristipomoides filamentosus	Crimson jobfish		
PLM	Spotted coral grouper	1700220801	Plectropomus maculatus	Spotted coralgrouper		
PRP	Roudi escolar	1750501701	Promethichthys prometheus	Roudi escolar		
PTH	Pelagic thresher	1060600602	Alopias pelagicus	Pelagic thresher		
RFA	Whiteleg skate	1100400433	Amblyraja taaf	Whiteleg skate		
RGY	Narrowbanded sole	1830302903	Aseraggodes macleayanus	Narrowbanded sole		
RIB	Common mora	1480201001	Mora moro	Common mora		
RMB	Giant manta	1100801013	Mobula birostris	Giant manta		
RMV	Mobula spp.	11008010XX	Mobula spp	Mobula nei		
RUS	Indian scad	1702304308	Decapterus russelli	Indian scad	Primary	
SCO	Scorpion fish	17801XXXXX	Scorpaenidae	Scorpionfishes, redfishes nei		Spelling Diff
SDV	Mustelus species	10804007XX	Mustelus spp	Smooth-hounds nei		Spelling Diff
SEY	Violet warehou	1760800309	Schedophilus velaini	Violet warehou		
SFS	Silver scabbardfish	1750600601	Lepidopus caudatus	Silver scabbardfish		
SKX	skates	199XXXXXXX054	Elasmobranchii	Sharks, rays, skates, etc. nei		
SQU	Squid	32105XXXXX036	Loliginidae, Ommastrephidae	Various squids nei		
SSO	Smooth oreo dory	1620400201	Pseudocyttus maculatus	Smooth oreo dory	Secondary	
SUN	Angel shark	1090300413	Squatina tergocellatoides	Ocellated angelshark		Spelling Diff

SIOFA 3A_CODE	SIOFA name	FAO TAXOCODE	FAO Scientific_name	FAO English_name	Primary/ Secondary	Comment
THR	Thresher sharks	10606006XX	Alopias spp	Thresher sharks nei		
TOP	Toothfish	1709201502	Dissostichus eleginoides	Patagonian toothfish	Primary	Spelling Diff Toothfish spp = TOT
TUN	Tuna *	17501XXXXX043	Thunnini	Tunas nei	Secondary	Spelling Diff
UPM	Goldfin goatfish	1704125102	Upeneus moluccensis	Goldband goatfish	Primary	Spelling Diff
VRL	Yellow edged lyretail	1700255701	Variola louti	Yellow-edged lyretail		
WAH	Wahoo	1750101001	Acanthocybium solandri	Wahoo		
WHA	Hapuku wreckfish	1700505802	Polyprion oxygeneios	Hapuku wreckfish	Primary	
WRF	Wreckfish	1700505801	Polyprion americanus	Wreckfish		
YBS	bigeye barracuda	1771000119	Sphyraena forsteri	Bigeye barracuda	Secondary	
YFT	yellowfin tuna	1750102610	Thunnus albacares	Yellowfin tuna	Secondary	Check IOTC species

Annex 4. Draft SIOFA Scientific Observer Cruise Report.

SIOFA | APSOI
Southern Indian Ocean Fisheries Agreement
Accord relatif aux Pêches dans le Sud de l'Océan Indien

SIOFA Scientific Observer Cruise Report

Observer Name(s)	
Vessel Name	
Vessel Flag	
Cruise Dates (boarding to disembarkation)	From: to:

The cruise report is for use by scientific observers to provide a summary of information from their cruise in a more flexible format than in the logbooks. It is intended to allow observers to provide additional details that are not included in the observer logbook or that assists with the interpretation of the data in the logbook.

VESSEL TRIP SUMMARY

Please provide the details of the vessel trip where available. This is optional and is included here to assist with data quality assurance and reconciliation.

Vessel Trip Information	
Port of Departure	
Date of Departure	
Date of Entry into SIOFA	
Date Start Fishing in SIOFA	
Date End Fishing in SIOFA	
Date of Exit from SIOFA	
Date of Landing	
Port of Landing	
Targeted Species	
Number of Crew	

Port of Landing	
Date of Landing	

OBSERVER CRUISE SUMMARY

Provide a brief outline of the cruise details, areas of fishing, work carried out, including any specific tasks such as extra sampling undertaken, and any challenges encountered in carrying out the role of an Observer.

GEAR DESCRIPTION

Please provide any additional information that you think is helpful to understand the fishing gear used by the vessel, including the reasons for changing gear during the cruise.

LOST FISHING GEAR

Provide details of lost fishing gear, such as length of line lost, floats, bobbins etc.

Gear Type	Date	Latitude	Longitude	Comments (e.g. length of line, number of hooks)

CATCH SUMMARY

Provide an estimate of number and weight for the main species that were on the vessel at the time of embarkation, on entry and exit from SIOFA and at the time of embarkation. This is optional and is included here to assist with data quality assurance and reconciliation.

Vessel Catch History			
Catch on board at embarkation			
Species	Fate	Number	Weight
Catch on board at SIOFA entry			
Species	Fate	Number	Weight
Catch on board at SIOFA Exit			
Species	Fate	Number	Weight

Catch on board at disembarkation			
Species	Fate	Number	Weight

Comments:

PROCESSING CODES AND CONVERSION FACTORS.

Provide a summary of conversion factors used by the vessel and the average of your calculated values for the species. Provide a description of how the factors were calculated in the comments section.

FAO Species Code	Processing Code	Vessel used Conversion Factor	Observer Conversion Factor	Comments

Comments:

BIOLOGICAL SAMPLES

List all the types of samples collected and the location where they are to be stored.

Sample Type / Species	Number of Samples Collected	Contact Name and Address of where the Samples are to be Stored

Additional Sampling

Provide a brief description of any additional sampling tasks undertaken during the cruise.

TAGGING

If applicable please provide a short summary of tagging procedures including details on the methods for landing and handling tagged fish, condition and availability of fish for tagging and any problems encountered. If tagged fish were recaptured, please attach the tag recapture photos in this section.

ETP SPECIES INTERACTIONS WITH VESSEL

Mitigation Devices

Please provide details of any 'Other Mitigation' methods used where this field has been entered in the Gear Worksheet in the Logbook.

Offal Management

Did the vessel have any offal management practices in place to reduce seabird interactions?

ETP species

Please provide specific comments for each interaction, especially related to mortalities, reported in the Logbook, as well as any general comments on any ETP species interactions.

ETP Species Samples Retained

Please provide details of any samples retained from ETP species interactions.

Species	Type of Sample	Number of Samples Collected	Contact Details of where the Samples were Sent

Bird Bands

Provide full details of all banded and marked birds, including band number and colour, band type (metal or plastic), which leg the band is on, species, and status of bird. Take a photo of the banded bird if possible.

MARINE MAMMAL INTERACTIONS WITH VESSEL

Mitigation Measures

Describe any mitigation measures used by the vessel to avoid interactions with marine mammals such as trotline cetacean exclusion devices.

Fish Loss Due to Marine Mammals

Please describe if any fish loss due to marine mammal depredation was directly observed, or attributed to marine mammals and if possible the species involved.

VESSEL SIGHTINGS

Please report data on sightings of fishing vessels, unmarked fishing gear, and recovery of

fishing gear in the SIOFA Area, including vessel type identification, vessel position and activity and gear type.

MARINE DEBRIS AT SEA

Record any marine debris observed while at sea. Where it is possible please attempt to bring the material on board for measurements and safe disposal. Only complete the size and weight columns when material is hauled aboard.

Date	Description	Latitude	Longitude	Hauled Aboard (Y/N)	Size (cm)	Weight (g)	Photograph attached (Y/N)

Comments:

ADDITIONAL INFORMATION

Operational Issues:

Describe any issues that occurred in relation to completing tasks such as access to parts of the vessel, access to information, crew attitudes etc. If any intimidation, bribery or obstruction issues occurred please provide as many details as possible.

Observer Tasks:

Describe any problems associated with completing the sampling tasks required by SIOFA or by your employing organisation.

Observers Logbook:

Were problems encountered with the Observers Logbook(s)? If so, please describe the problems.

Observer Cruise Report

Did the cruise report template provide adequate space to summarise your cruise experience? Are there any sections you would like to see added or removed?

Educational Material

Please provide feedback on the resources that were made available to you, in particular for the identification of fish bycatch, seabirds and marine mammals.

Annex 5. CCP Observer Programme reporting template and review checklist.

The aim of the review process is to provide a structured mechanism with which to measure the extent to which a CPP's observer programmes meet the minimum standards agreed by SIOFA. It is based on two main elements that reflect the structural support and administration of the observer programme and the performance outcomes, as reflected in the coverage achieved and data quality, of that programme. To guide this process a CCPs should provide a self-assessment of their observer programme in which they provide a description of how each of the criteria is addressed (or is to be addressed).

Template for self-reporting.

Observer program infrastructure and training.

1. CCP observer employer organisation must:
   e) have well-defined qualification requirements and contract of employment for Observers.
   f) have an Information Security Management System (ISMS) that includes confidentiality and security of data collected by observers.
   g) provide appropriate safety and scientific equipment to the Observer.
   h) have a named technical coordinator/point of contact for their observer programme.

2. All Observers are briefed on the duties and responsibilities of observers and the vessel's crew onboard vessels fishing in SIOFA and receive nationally accredited sea safety training and certification.

3. All Observers are provided with training to ensure that they can:

   g) read positions from vessel navigation system.
   h) describe the different gear types used in SIOFA fisheries.
   i) describe the compulsory mitigation methods (including gear modifications) specified in the SIOFA CMMs.
   j) identify all target, primary and secondary fish species caught in SIOFA fisheries and all marine mammal and seabird species likely to interact with SIOFA fisheries.
   k) record the parameters required to describe fishing operations and implement the sampling and measurement methods required to collect the fishery-specific biological data.
   l) record the processing methods, product codes and weighing methods to estimate conversion factors.

Observer program outcomes and performance.

4. In the last two fishing seasons:

c) did the CCP achieve the required level of observer coverage in all fisheries in which it participated ?
d) did all Observer data submitted to the SIOFA Secretariat achieve above 60% data-quality assurance score for completeness, consistency, and accuracy?

Provision of the CCP observer programme reports provides the basis for an independent, objective assessment of the structure and performance of each CCP observer programme following the checklist in Appendix 5.1. Undertaking this review will identify where expectations are currently being met and also highlight where development actions may be required to facilitate the CCPs in making progress towards meeting relevant minimum standards.

Appendix 5.1. CCP Observer Programme review checklist.

Criteria	**Meets Expectation**	**Proposed Development Action**
1. Observer Programme Structure		
All observers are appropriately qualified and familiar with the relevant fishing operations and scientific data collection requirements.		
Each observers is employed under a contract issued by the CCP observer employer organisation that includes the terms and conditions of employment and remuneration.		
The observer employer organisation, or an approved data management provider, has an Information Security Management System (ISMS) that includes the		
(i) data collection forms and instructions issued to observers,		
(ii) processes to ensure the quality, accuracy and validity of data,		
(iii) measures that protect data from unauthorized access, loss, corruption, or theft, and		
(iv) processes by which data are made available. The ISMS will pay particular attention to the confidentiality and security of data collected by observers on fishing vessels.		
All observers, including those appointed through third party observer		

Criteria	Meets Expectation	Proposed Development Action
providers, have signed confidentiality arrangements for all of data and information, including fishing locations and fishing techniques, collected during observer deployments.		
All staff in the observer employer organisation who have access to observer data are required to comply with confidentiality arrangements for all observer-related data and information.		
The observer employer organisation has a named technical coordinator who is the primary point of contact for SIOFA on all administrative and operational aspects of the observer programme.		
All observers are provided with the necessary safety and scientific equipment to allow them to conduct their tasks in safe and scientifically rigorous conditions.		
2. *Training of observers*		
All Observer are provided with training that describe the duties and responsibilities of observers and the vessel's crew onboard vessels fishing in SIOFA.		
All observers have received nationally accredited sea safety training and certification that includes the following components:		
• Survival difficulties and factors		
• Personal Protective Equipment		
• Life rafts and equipment		

Criteria	Meets Expectation	Proposed Development Action
• Actions prior to abandonment		
• In water survival techniques		
• Helicopter rescue		
• Vital & secondary actions in the life raft		
• Righting an upturned life raft		
• Use of pyrotechnics		
Observers can read positions from navigation system found on a vessels bridge, convert the positional data into the format used in the Observer Logbook and record depth data from a standard echo-sounder display.		
Observers are familiar with the different gear types used in SIOFA fisheries and the technical specifications (including diagrams and photographic details) of the gear used in the fishery to which they will be deployed.		
Observers are familiar with the compulsory mitigation methods (including gear modifications) specified in the relevant SIOFA CMMs to avoid or mitigate by-catch to enable them to complete the relevant forms for the fishery to which they will be deployed.		
Observers can record all of the parameters that describe fishing operations including fishing effort, including the duration of operations, the number hooks set for line fisheries and the fishing depth in trawl		

Criteria	Meets Expectation	Proposed Development Action
fishery.		
Observers can subsample catch from line (number of hooks to observe) or trawl (weight of sample to collect) and sample the catch.		
Observers can identify all primary and secondary species caught in SIOFA fisheries.		
Observers can identify all marine mammal and seabird species likely to interact with SIOFA fisheries.		
Observers can complete the biological data forms in the Observer Logbooks for the relevant fisheries including the collection of biological samples including extracting, packaging and labelling of otoliths and other material.		
Observers can measure the greenweight and processed weight of different fish species to complete the Conversion Factor form.		
3. *Post-trip evaluation and assessment.*		
Data are submitted to SIOFA using the agreed Observer Logbooks		
A data-quality assurance process is applied to all data to assess for:		
Completeness -All data are submitted in the expected fields and critical linking data, e.g. SET_ID, present in all forms.		

Criteria	Meets Expectation	Proposed Development Action
Consistency – All data in each field in the correct format, e.g. numeric, date, time, text		
Accuracy - All Dates and Times are in the correct chronological order and all numerical values are within range		
Observers are given the opportunity for a confidential, in-person debriefing once they have returned to their home port/place of employment.		