SOUTH EAST ATLANTIC FISHERIES ORGANISATION

Fisheries Observer Manual

PRESENTATION

The objectives of this manual are to provide a reference document for sea-going observers

This Manual should be considered as a living document that will change according to the evolution of the Observer Programmes and is intended to incorporate recommendations from international Regional Fisheries Organisations RFMO's.

The manual content reproduces the content of the following manuals that have been consistently used in the regional training of Observers.

- *SEAFO Observer Manual prepared by Mr C Heinecken for SEAFO observer training held in Swakopmund. 13th to 17th of April 2015 and attended by 12 participants from Namibian.*
- *South West Indian Ocean Fisheries Program (SWIOFP) Observer Manual, compiled from teaching materials used during the SWIOFP Regional Observer Training Course held at the Oceanographic Research Institute, Durban, South Africa, between 16th August and 8th September 2010. The organisers, contributors and authors of the SWIOFP Observer Manual must be credited for the content reproduced here[1].*
- *Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Scheme of International Scientific Observation Scientific Observer's Manual.* https://www.ccamlr.org/en/organisation

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  Capfish Observers

[1] Alice Johnson (WWF - South Africa), Bruce Mann (ORI, Durban), Chris Heinecken (CapFish, Cape Town), Dave Japp (CapFish, Cape Town), Jessica Escobar (ORI, Durban), Jeremy Kiszka (IRD, France), Johan Groeneveld (ORI, Durban), Lisa Mansfield (BirdLife, Cape Town), Melanie Smith (CapFish, Cape Town), Sean Fennessy (ORI, Durban), Teresa Athayde (SeaMore, France).

CONTENTS

LIST OF ABBREVIATIONS

BRD	Bycatch Reduction Device
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CED	Cetacean Exclusion Device
CF	Conversion Factor
CPUE	Catch-per-unit-effort
EEZ	Exclusive Economic Zone
EPIRB	Emergency Position-Indicating Radio Beacon
FAD	Fish Aggregating Device
FAO	Food and Agriculture Organization of the United Nations
GMDSS	Global Maritime Distress Safety Systems
GPS	Global Positioning System
GRT	Gross Registered Tonnage
ICCAT	International Commission for the Conservation of Atlantic Tuna
ITCZ	Intertropical Convergence Zone
IOTC	Indian Ocean Tuna Commission
LOA	Length Overall
MF & HF	Medium Frequency and High Frequency
MSY	Maximum Sustainable Yield
OTC	Observer Training Course
PET Species	Protected, Endangered and Threatened species
RW	Refrigerated Seawater
RFMO	Regional Fisheries Management Organization
SART	Search and Rescue Transponder
SST	Sea Surface Temperature
SWIO	South West Indian Ocean
SEAFO	South East Atlantic Fisheries Organisation
TAC	Total Allowable Catch
TED	Turtle Excluder Device
VHF	Very High Frequency
VMS	Vessel Monitoring System

PART A: OVERVIEW OF THE SOUTH EAST ATLANTIC FISHERIES ORGANISATION

SEAFO is a regional fisheries management organisation in South East Atlantic Ocean comprising of seven contracting parties. The Convention was established in line with the provisions of the United Nations Law of the Sea (UNCLOS -Article 118) and United Nations Fish Stocks Agreement (UNFSA).

(Article 2 of the Convention Text) *"The objective of the Convention is to ensure the long-term conservation and sustainable use of the fishery resources in the Convention Area through the effective implementation of this Convention."*

Economic important SEAFO fish species include high seas sedentary / discrete and straddling species such as Patagonian toothfish, alfonsino, orange roughy, oreo dories, armourhead, sharks, and red crab.

SEAFO employs an ecosystem and precautionary approach to fisheries management when deciding on management and conservation measures (CMMs). The Commission adopts resolutions and recommendations based on scientific advice from the Scientific Committee; and monitoring, control and surveillance (MCS) advice from the Compliance Committee.

The Convention Area extends from the Equator to 50^{o} South Latitude and 20^{o} West longitude to 30^{o} East Longitude. The Convention Area excludes exclusive economic zones of the coastal states in the region (Figure 1).

HISTORICAL REVIEW OF THE DEVELOPMENT OF THE CONVENTION

The initiative to establish a regional fisheries management organisation in the region came from Namibia in 1995 and gained support from coastal states of Angola, South Africa and United Kingdom (on behalf of St. Helena and its dependencies of Tristan da Cunha and Ascension Islands).

The Convention was signed in April 2001 in Windhoek by Angola, the European Community, Iceland, Namibia, Norway, Republic of Korea, South Africa, United Kingdom (on behalf of St. Helena and its dependencies of Tristan da Cunha and Ascension Islands) and the United States of America and entered into force on April 2003

From the date of signatures in 2001, the Ministry of Fisheries and Marine Resources in Namibia acted as an Interim Secretariat. In March 2005 and with the appointment of the staff, the permanent Secretariat was opened in Walvis Bay, Namibia. The SEAFO Secretariat relocated to Swakopmund, Namibia in 2011.

Figure 1: SEAFO Convention area, extending from the Equator to 50 degrees South Latitude and 20 degrees West longitude to 30 degrees East Longitude, excluding the EEZ of coastal States.

CONTRACTING PARTIES

SEAFO currently comprises of seven contracting parties (Table 1). Countries that signed the Convention but are currently contracting parties include Iceland, United Kingdom (on behalf of St. Helena and its dependencies of Tristan da Cunha and Ascension Islands) and the United States of America.

Table 1: Current (2019) Contracting parties to SEAFO

	Angola - Acceded: 07 March 2006
	European Union - Acceded: 08 August 2002
	Japan - Acceded: 10 January 2010
	Rep. of Korea - Acceded: 10 March 2011
	Namibia - Acceded: 26 February 2002
	Norway - Acceded: 12 February 2002
	South Africa - Acceded: 18 June 2008

SEAFO ORGANISATION AND MANAGEMENT BODIES

SEAFO comprises of the Commission, the Scientific Committee, the Compliance Committee and the Standing Committee on Administration and Finance as subsidiary bodies and the Secretariat (**Error! Reference source not found.**).

The Commission may establish other subsidiary bodies from time to time to assist in meeting the objective of the Convention.

Figure 2: SEAFO organisation and management bodies

THE COMMISSION

The Commission was established in terms of Article 6 of the Convention Text that included in detail their functions. Each Contracting Party is a member of the Commission and is entitled to be represented by one representative to the Commission and may be accompanied by alternate representatives and advisors. The Commission meetings are open to observers consistent with Rules of Procedure of the Commission.

Overall the Commission has an oversight responsibility of the Organisation and is the highest decision-making body of the Organisation. Decisions of the Commission on all matters of substance are by consensus. Decisions on other matters are by simple majority of the Parties present (Article 17). There is a limited procedure for notification of non-acceptance of the decision, as a last resort (Article 24). SEAFO has adopted dispute settlement procedures. (Dispute Settlement Procedures).

The Commission cooperates with other regional fisheries management organisations (RFMO) to strengthen global high seas fishery governance and sharing of information. SEAFO is also represented at annual meetings of CCAMLR, ICCAT, NAFO, NAMMCO and NEAFC as an observer, and has a close working relationship with other agencies, including FAO.

Challenges that face the organisation include:

- determining the extent of IUU fishing; and
- gathering baseline information on fisheries and oceanography of the region and also to improve data collection and reporting.

A detailed System of Observation, Inspection, Compliance and Enforcement has been compiled to meet these challenges, the most recent revision was adopted at the commission meeting on 30th November 2017 and enter into Force 5th December 2017. The document includes in Chapter V the requirement for a Scientific Observer Programme whereby:

Article 18 – Scientific observer programme

1 Each Contracting Party shall ensure that all its vessels operating in the Convention Area shall carry scientific observers qualified by the flag State. Flag States shall ensure that the relevant data is transmitted to Executive Secretary in the format specified by the Scientific Committee using the scientific observer forms and report template as provided in the Reporting Forms section on the SEAFO website.

2 Each Contracting Party shall require the submission of this information, in respect of each vessel flying its flag, within 30 days of leaving the Convention Area. The Contracting Party shall provide a copy of the information to the Executive Secretary as soon as possible, taking account of the need to maintain confidentiality of non-aggregated data.

Scientific Committee

The Scientific Committee provides scientific advice on the status of marine resource and on harvesting. Each contracting party is entitled to be represented by one representative in the Scientific Committee Meeting who may be accompanied by alternate representatives and advisors. In performing its functions, the Scientific Committee is obligated to conduct such activities as the Commission may direct and shall consult, cooperate and encourage the collection of:

- study and exchange of information relevant to the living marine resources of the Convention Area;
- establish criteria and methods to be used in determining conservation and management measures;
- assess the status and trends of relevant populations of living marine resources;
- analyse data on the direct and indirect effects of fishing and other human activities on populations of fishery resources;
- assess the potential effects of proposed changes in the methods or levels of fishing and of proposed conservation and management measures; and
- transmit reports and recommendations to the Commission as directed, or on its own initiative, regarding conservation and management measures and research.

In carrying out its functions, the Scientific Committee shall seek to take into consideration the work of other fisheries management organisations, as well as other technical and scientific bodies.

Compliance Committee

The Compliance Committee provides the Commission with information, advice and recommendations on the implementation of, and compliance with, conservation and management measures. The Compliance Committee is one of the organs of the Organisation (Article 9 of the Convention) and was constituted with specific terms of reference by the Commission in 2007. In performing its functions:

- the Compliance Committee shall conduct activities as the Commission may direct;
- coordinate compliance activities undertaken by or on behalf of the Organisation;

- coordinate with the Scientific Committee on matters of common concern; and
- perform such other tasks as directed by the Commission.

Finance and Administration

The Standing Committee on Administration and Finance is responsible for advising the Commission on budgetary and administrative matters of the Organization.

Secretariat

The SEAFO Secretariat is based in Swakopmund, Namibia and is considered the administrative headquarters of the organization. It is headed by the Executive Secretary who is assisted by the Data Manager and Administrative Officer. The primary aim of the Secretariat is to coordinate the activities of the Organisation. These include among inter alia:

- administration of SEAFO's appropriations and budget;
- arrangements of annual and other meetings of the Commission and its subsidiary bodies;
- addresses communication with stakeholders;
- documents proceedings of all meetings;
- oversees preparation, publication and distribution of reports; and
- to promote the Organization.

MANAGEMENT

SEAFO employs an ecosystem and precautionary approach to fisheries management when deciding on management and conservation measures. A comprehensive set of Conservation Measures have been adopted to enforce the objectives of the Convention.

The Commission adopts resolutions and recommendations based on scientific advice from the Scientific Committee; and monitoring, control and surveillance (MCS) advice from the Compliance Committee.

It is the responsibility of each SEAFO Contracting Party to ensure that regulations are being adhered to by vessels of their flag State Contracting Party. Contracting Parties have the obligation to ensure that legal proceedings are being undertaken to mitigate infringements of SEAFOs conservation and enforcement regulations.

Measures adopted by the commission are placed into several broad categories:

- Reporting Obligations
- Recommendation
- IUU List
- Conservation Measure

SCIENCE

SEAFOs primary purpose is to ensure the long-term conservation and sustainable use of all living marine resources in the South East Atlantic Ocean, and to safeguard the environment and marine ecosystems in which the resources occur.

Scientists from Contracting Parties contribute to the assessment of marine resources in the SEAFO Convention Area and provide their scientific advice to the Commission through the Scientific Committee. Information related to the main SEAFO marine living resources (Species summaries) are updated annually, and include:

- catch and effort information as well as additional information relevant to the stocks e.g. spatial and temporal distributions of fishing;
- length-frequency distributions;
- life history parameters and other population information;
- incidental mortality (sea birds, mammals and turtles); and
- by-catch of fish and invertebrates.

Fishing Areas

The SEAFO Convention Area (CA) is a large area with several seamount chains, isolated seamounts, guyots and banks, beyond national jurisdictions. All fishing in SEAFO occurs on or around seamounts (**Error! Reference source not found.**).

The main commercial target species caught in recent years in the SEAFO CA are:

- deep sea red crab (mainly *Chaceon erytheiae*);
- alfonsino (*Beryx splendens*);
- Patagonian toothfish (*Dissostichus eleginoides*); and
- pelagic armourhead/southern boarfish (*Pseudopentaceros richardsoni*).

Fish by-catch is dominated by the blackbelly rosefish (*Helicolenus mouchezi*) in the Valdivia Bank trawl fishery; and macrourid species (*Macrourus sp.*) in the Patagonian toothfish fishery.

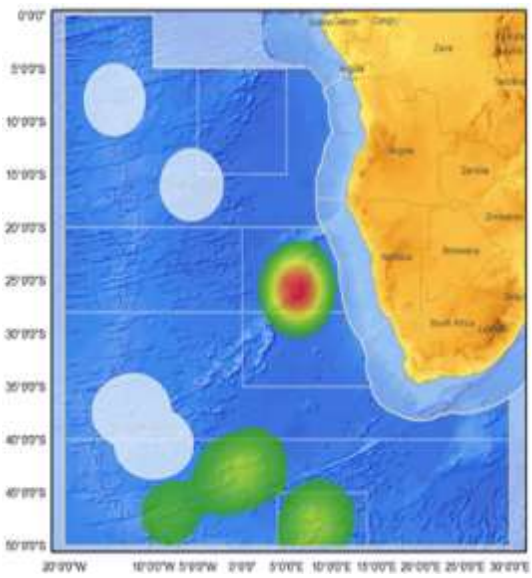


Figure 3: Kernel density plot of fishing effort (number sets, trawls) for 2005 to 2014. Prepared by G. Campanis (Secretariat).

Topography and Oceanography

The prominent topographic features inside the Convention Area include the Walvis Ridge, which extends from around 18°S off the Namibian coast into a south-westerly direction towards the mid-Atlantic ridge; the mid-Atlantic Ridge, at around 15°W that runs through the entire SEAFO region from north to south; and the Agulhas Ridge, which extends from around 35°S south of Cape Town in a south-westerly direction. There are also numerous seamounts, guyots, banks and plateaus in the Convention Area; notably among these are Mount Vema, Valdivia Bank, Discovery seamounts and Meteor seamounts.

Circulation in the South Atlantic may be broadly cyclonic. The northern boundary of the SEAFO CA is bounded by the South Atlantic Equatorial Current that flows westward along the equatorial area.

On the western boundary, the area is characterised by an open end of the South Atlantic gyre.

The eastern boundary consists the Benguela and Angolan Currents along the African continent. The Benguela Current flows in a north to north-westerly direction (~15-35°S) and is a major east boundary upwelling system that is very productive in inshore areas and characterised by cool surface temperatures. The warm Angolan Current flows in a southerly direction along the Angolan coast and meets the Benguela Current roughly around 17-15°S commonly referred to as the Angola/Benguela front. The frontal area is characterised by offshore flow into the SEAFO area that transport primary production.

The warm Agulhas Current flows south of the African continent in a westerly direction where it meets up with the Benguela Current. Warm eddies are formed in this area and transported north-westerly into the SEAFO area.

The southern boundary of the Convention Area is dominated by the Southern Ocean Current, and is also influenced by the Antarctic Convergence Zone.

PART B: OBSERVER BASICS AND PROTOCOLS

SEA BASED OBSERVER PROGRAMMES

Sea Based Observer Programmes include: (

1) Monitoring Control and Surveillance (MCS) that include sea Inspection and control programmes; and

(2) Fisheries programmes (science and compliance) and (3) Scientific programmes.

There are some fundamental differences in the objective and legislative mandate of each of these programmes that include differences in the appointment, training, responsibilities and tasks on-board between compliance officers/inspectors, controllers, fisheries Observers (science and surveillance) and scientific Observers.

SEA BASED INSPECTION AND CONTROL PROGRAMMES (MCS)

Sea based inspection and control programmes have a primary objective to enforce fishery governance and to monitor fisheries from a legal aspect. Inspection programmes are restricted to the reporting on adherence to compliance measures stipulated in licence conditions (e.g.: quotas/species limitation, fishing areas, gear size and usage), while Control programmes collect control data and fisheries data (mainly catch and effort information).

Fisheries Inspectors (also called compliance officers) and *controllers* are appointed by the countries fisheries authorities and have a legal mandate to enforce the fisheries laws of the country.

Inspectors are also referred to as Fishery Control Officers (FCO) and are not therefore defined as Observers herein. Inspectors have the authority to collect evidence and take legal action against a vessel acting in contravention to fishing methods; gear used or landed catches, in terms of its fishing permit conditions issued to it by its flag state. When justified, inspectors may have the power to arrest a vessel at sea and have it return to port. Fishery Control Officers may be deployed onto vessels for the duration of the trip to monitor fishing activities directly and report on adherence to compliance measures stipulated in licence conditions issued by the State. Alternatively, Inspectors may operate independently from a patrol vessel and board and inspect fishing vessels at sea or on land. At-sea inspection includes monitoring gear and catch on-board.

Fisheries Controllers are also appointed by the countries fisheries authorities and are generally "sworn in"[2] . They are deployed onto vessels for the duration of the trip to report on adherence to compliance measures stipulated in licence conditions and also collect fisheries data. *Controllers* generally do not have the power to arrest a vessel at sea and have it return to port.

FISHERIES OBSERVER PROGRAMMES (SCIENCE & COMPLIANCE)

Fisheries Observer programmes have the primary objective to collect fisheries information at sea (mainly catch and effort). Additional tasks often include monitoring and reporting on the environmental impacts of

[2] When someone is sworn in, they make a formal promise to be honest or loyal, either in a law court

the fishery on other marine fauna such as bycatch, seabird, marine mammals and, Endangered, Threatened and Protected (ETP) species.

Fisheries Observers are generally appointed by the countries fisheries authorities, but can also be supplied by private Observer service providers. Fisheries Observers do not have any powers to enforce or arrest. While they may report on compliance issues they have **no legal mandate to enforce these**.

Scientific Observer Programmes

Scientific Observer programmes are restricted to the collection of scientific data required for fisheries management. *Scientific Observers* are generally appointed by research and fisheries management institutes or supplied by independent Observer service providers. A scientific Observer also records catch, bycatch, discards and effort information but in addition, conducts biometric sampling. For example, catch, bycatch, discards composition of species, length-frequency, weight, sex, maturity stage, stomach content and the collection of otoliths and biological samples.

DEFINING "THE OBSERVER"

Scientific (fisheries) observers are independent specialist, deployed on-board commercial fishing vessels in accordance with a mandated regional fisheries observer programme. Within this mandate observers can be used to record unbiased data and report on technical, regulatory, scientific and economic aspects relating to the operational side of the fishing industry. Scientific observers working on fishing vessels during normal operations are in a position to verify and record accurate, *in situ* data on the location, catch composition and gear configuration of fishing operations, and are usually the only independent source of this information.

Scientific observers are not employed in an enforcement role, as their main purpose is to collect accurate data to support effective management of the marine resources, which is to the long-term advantage of the fishing industry. However, as this takes place alongside the standard data collection protocols, the presence of the observer on-board inherently allows recording the level of compliance within the fishery.

Qualifications and prerequisites

Scientific observers working at sea are in a unique position, as they are not affiliated with the vessels personal and are required to work alone often for long periods, without direct supervision or assistance from their controlling organisation. To be successful in this environment, they required a high level of integrity and personal self-motivation and will need the academic qualifications and training to optimally accomplish the detailed tasks and responsibilities assigned to them.

Minimum health and education standards should apply as prerequisites prior to employment and training of observers. Mandatory certification, to be included in the observers training phase and prior to deployment on-board a vessel will include:

- a "Certificate of Medical Fitness" This form must comply to IMO (STCW-F) standards to ensure that the observer is able to endure normal conditions of life at sea and that their health status will not endanger the health and safety of the other people aboard;

- in-date Certificate for Survival Techniques and Occupational Health and Safety at Sea, ($STCW_{2015}$ compliant); and
- evidence of proficiency in literacy in the languages of the programme and numeric competency.

In addition observers are required to:

- have sufficient knowledge and experience to identify species and collect information on different fishing gear configurations;
- have the ability to observe and record accurately data to be collected under the program;
- have the knowledge on how collect and record biological data;
- not be an employee of a fishing vessel company involved in the observed fishery.

Observer providers must ensure that their observers are trained and their certificates of fitness and safety & survival training meet the requirements of foreign vessels on which they may be deployed.

Observer role and missions

Fisheries observers are able to accurately verify and record *in situ* data on the location, composition of catches and configuration of gear during fishing operations. Their role is to collect accurate data for the effective management of marine resources, the aim of which is to ensure the sustainability of the fishing industry. The tasks of the Fisheries Observer are to:

- collect information and data needed to complete the observation forms;
    - nature of the fishing operations;
    - catch composition of fish brought onboard;
    - size composition, sex ratio and reproductive status of target species;
    - by-catch mortality and discard component;
    - general trip details describing the target species, permit holder and areas fished;
    - vessel specifications, fishing and electronic equipment;
    - additional data on oceanography, weather and interactions with seabirds and marine mammals; and
    - record adherence to MarPol regulations;
- enter observation data into NOP database; and
- submit deployment, weekly, preliminary and final trip reports to be sent to their responsible authorities.

To achieve the broad range of tasks assigned to observer a comprehensive understanding of the following subjects is required and should be acquired during a basic training to be followed by the candidates:

- ship layout and terminology;
- meteorology and oceanography;
- positioning and electronic navigational systems (ENS);
- fishing methods and related equipment;
- on-board data collection procedures;
- catch and biological sampling methods;
- identification of commercial and by-catch species;

- fish and crustacean biology;
- understanding of monitoring interactions with other marine fauna;
- marine mammal- and sea bird identification;
- understanding of fisheries management and stock assessment;
- quota allocations and permit conditions;
- international observer protocols; and
- sea survival - *all observers must complete a practical basic survival course to prepare them for emergencies at sea.*

Observer Code of Conduct and Protocols

Code of Conduct

Observers are required to conform to an internationally recognised code of conduct to become certified and should sign an affidavit with their service provider that they understand and will conform to the Code.

Code of conduct requires that:

1) Observers may not participate in any activity which would cause a reasonable person to question the impartiality or objectivity with which the Regional Observer Scheme is administered.
    - Observers may not have direct financial interest in the observed fishery, other than the provision of observer services including, but not limited to, vessels or shore-side facilities involved in the catching or processing of the products of the fishery, companies selling supplies or services to those vessels or shore-side facilities, or companies purchasing raw or processed products from these vessels or shore-side facilities. The interests of a spouse or minor child are considered those of the observer;
    - Observers may not solicit or accept, directly or indirectly, any gratuity, gift, favour, entertainment, loan or anything of monetary value from anyone who conducts activities that are regulated by ICCAT, or who has interests that may be substantially affected by the performance or non-performance of the observers' official duties;
    - Observers may not solicit or accept employment as a crew member or an employee of the vessel or shore-side processor in any fishery while employed as an observer;
    - Observers may not serve as observers on any vessel or at any shore-side facility owned or operated by a person who previously employed the observer in any capacity;
    - A person may not serve as an observer in a fishery during the 3 consecutive months following the last day of his/her employment as a paid crew member or employee in that fishery;
2) Observers may not participate in any activity which could impair the observer's ability to perform his/her duties. This includes, but is not limited to:
    - Engaging in drinking of alcoholic beverages while on duty
    - Engaging in the use or distribution of illegal substances
    - Becoming physically or emotionally involved with vessel personnel

3) Observers may not participate in any activity which could adversely affect the efficient accomplishment of the Scheme's mission.

- Observers must refrain from engaging in any illegal actions according to the laws and regulations of the flag State that exercises jurisdiction over the vessel to which the observer is assigned.
- Observers must avoid any behaviour that could adversely affect the confidence of the public in the integrity of observers;
- Observers must record all scientific data accurately and honestly.
- If the observer chooses to report any suspected violations of regulations relevant to conservation of marine resources or their environment that they observe, it must be done honestly.
- Observers must preserve the confidentiality of the collected data and observations made on board the fishing vessels, in accordance with Resolution 12/02, and shall treat as confidential all information with respect to the fishing operations of the vessel on which they are deployed.

4) Observer involvement in vessel operations

- Observers shall respect the hierarchy and general rules of behaviour which apply to all vessel personnel, provided such rules do not interfere with the duties of the observer under this scheme.
- In all aspects involving vessel operations and safety at sea the observer will fall under the authority of the Captain.
- Scientific observers will have no authority to advice or direct any of the vessel operational activities or have any authority over any of the vessel personnel.
- Scientific observers should have access to all operational areas of the vessel necessary to complete their work including the bridge, navigation and communication equipment. However, the observer should attempt to secure co-operation with officers to ensure that their work does not interfere with normal fishing and operational activities.

Observer Status

The status of the Observer on board the fishing vessels is the same as that of the officers on-board therefore its presence on the bridge and on the work bridges is authorized. Observer actions shall not, however, interrupt or interfere with normal fishing operations and the observer shall abide by the rules and pace of work of the vessel.

Although there is a formal requirement for vessels to accommodate observers, the attitude and conduct of the observer will have a major influence on both their reception on board the fishing vessel, and the results and value of their work. The master of the fishing vessel and crew will quickly asses you by your actions and conduct. If they see they are dealing with a professional they will both respect you and be more willing to voluntary provide assistance.

Observers must always conduct themselves in a courteous, polite and professional manner with all members of the crew, keeping in mind that while you are on-board, you are also a representative of the fisheries authority and in the case of a foreign vessel, a representative of your country.

Naturally, the crew and the captain must respect the functions and culture of the Observer, who must inform his superior of any difficulty he may encounter or any unpleasant behaviour to which he might be subjected. For its part, the Observer must be able to behave correctly in all situations, in particular concerning questions of hierarchy, work and confidentiality, presentation and culture. The Observer must be aware of and sensitive to the cultural practices of crew members. The Observer must bear in mind that he is a guest on board the vessel.

From a legal perspective, there should be a mandate in the flag State licence condition vessels to accommodate observers when requested. However, the observer has no legal authority to dictate the vessels activities other than to advise, observe and report the facts to his supervisory authority.

OBSERVER PROTOCOLS WHILE ON-BOARD

The Observer shall respect the following protocols while on-board.

Hierarchy

- The Observer shall comply with requirements established in the laws and regulations of the flag State that exercises jurisdiction over the vessel to which the observer is assigned;
- The Observers shall respect the hierarchy and general rules of behaviour, which apply to all vessel personnel, provided such rules, do not interfere with the duties of the observer under this programme; and
- In all aspects involving the vessel's operation and safety at sea the observer will fall under the authority of the Captain.

Work and confidentiality

- Unless specified, Scientific Observers are not employed in an enforcement role and their overall function is to collect information to assist in the efficient management of fisheries resources. However, the nature of the work and the information collected will inherently include compliance related data. At no stage the Observer should confront the vessel master or any of the crew about any compliance issues or advise them or provide consent to any operation that may have compliance implications.
- The Observer will have no authority to advise or direct any of the vessels operational activities or have any authority over any of the vessels personnel; and
- The Observers should have access to all operational areas of the vessel necessary to complete their work including the bridge, navigation and communication equipment, however, the observer should attempt to secure co-operation with the officers to ensure that their work does not interfere with the normal fishing and operational activities;
- The Observers shall treat as confidential all information with respect to the fishing operations of the vessel on which they are deployed. All information collected on-board a vessel must be treated in the strictest confidence. In no case shall he make copies of it or report it to any person other than the master of the boat on which he is embarked and the persons in charge of the data collection program. In particular, the Observer shall not share any information [*especially catch*

information from other vessels] and never discuss particulars of other vessels with any of the personal on-board or communicate any information on the position of the vessel or its catches to another vessel or to an observer on board another ship;

- The Observer shall not participate in any activity that could jeopardize the impartiality or objectivity of the Observation program, significantly alter the observer's ability to perform the observer's duties or impair the effective implementation of the Observer's program mission;
- The observer may not solicit or accept, directly or indirectly, any gratuity, gift, favour, loan or other thing that has any monetary value from anyone engaging in activities regulated by the fishery or have interests which may be materially affected by the performance or non-performance of the official duties of the observers;
    - It is a common occurrence for the master of foreign vessels to offer some type of gift to officials when boarding their vessels. This often involves the offer of drinks, including alcoholic beverages. Refusal of these can, in some cases, also be perceived as an insult. Your controlling authority should have clear procedures on how to deal with these occurrences in accordance with their particular customs and culture;
    - *What is a bribe?* Casual offers of small gifts, in certain circumstances can escalate to a serious bribe. Small gifts are often used to soften up the observer and influence them, to under report or mis-report information. In a serious situation an observer may be offered a substantial bribe to not report on a serious infraction to either a countries regulations or binding measures of the RFMO;
    - Due to the isolation of the observer on-board it is difficult for observers to deal with direct confrontation, and they may also place themselves in danger if they are seen to be uncooperative. However, many of these issues can be prevented by the observer portraying a professional attitude from the beginning and having a thorough knowledge of their tasks and the relevant regulations;
    - The observers controlling organisation must keep this in mind when designing in-trip report and possibly include safety codes for emergency situations; and
- It is important to avoid personal involvement in discussions with persons on-board the vessel and avoid expressing personal opinions on fisheries regulations, procedures and policies as these can undermine your authority.

Presentation

Observers are appointed as officers and there are a number of protocols that observers must observe in this respect:

- NEVER wear foul weather or protective clothing on the bridge or in the accommodation [*boots, oil-skins or dirty overalls*];
- Change into clean or appropriate clothing for meals and if you sit at the officers table ask permission before sitting down, [*every time*] and excuse yourself when leaving;
- Always be on time for meals and it you cannot make a formal meal time due to your sampling work then advice the galley of this;

- Keep your accommodation clean and neat at all times and do not leave clothing or any of your personal items lying around as besides this being a safety issue it is not expected of a professional [*irrespective of the conduct of your cabin mate or other crews practices*];
- Keep your work space clean and pack away your computer and papers when you are not working with them;
- When sampling, keep your space tidy and if using any bins or gear then wash and stow these securely when you finished; and
- Never leave any equipment unsecured as lose equipment is quickly damaged and can be a safety hazard to crew and the vessel.

Cultural and Customs

The cultural customs of crews on foreign fishing vessels will vary from country to country and in many instances crews may have been at sea for many months at a time. It is both professional and courteous to respect their customs.

- Observers should observe, learn and follow protocols to communicate and interact with officers and crew. E.g.: When coming up onto the bridge the observer on each occasion [*even if this happens several times a day*], it is professional protocol to first approach the officer on watch and advise them of your presence and your reason for being there, irrespective of the informal nature of the visit or your familiarity with the officers you must follow this protocol;
- The observer must inform himself and respect on-boar ablution and sanitary practices;
- The observer must be sensitive and respect officers and crew practices and customs;
    - a common practice is to remove shoes when entering a wheelhouse or the living quarters on a vessel;
    - do not comment on pets or pictures displayed; and
    - on some vessels a small shrine may be situated on the bridge or in the chart room, do not tamper with these.

ORGANISATION AND SCIENTIFIC RELIABILITY

Fisheries management systems are based on the processing of scientific data that requires reliable and accurate baseline data. These data are generally collected by fisheries research and fisheries management institutes through the fishing logbooks of ships, on-board observation programs and port sampling programs.

Accordingly, the observer should never forget that:

- The accuracy of data collected by fishery observers is of paramount importance to the success of good fisheries management;
- Inadequate or falsified data are at the root of poor fisheries management measures and can have a very serious impact on decisions made by scientists on fisheries management;
- Thus, falsifying data is much more serious than not recording it.

Falsifying data is a dishonest act and instantly impacts on the observers integrity and disqualifies them as an observer

In this manual, detailed explanations are given on the data to be collected. The observer should not hesitate to consult them regularly, especially in case of doubt, in order to ensure the accuracy and reliability of the data.

The observer must fill in the forms himself. He is responsible for the data collected. He should not hesitate to add explanatory notes in comment sections, or the margin or at the foot of the page if necessary. The information must be legible and entered in the corresponding fields on the forms. Do not trust your memory, any information collected must be noted immediately in the forms, on the waterproof pad or on a logbook. This information will then be transposed on the Observer's forms or trip report.

It is important to take the time to review the completed forms at the end of each fishing operation, in order to quickly detect any errors or omissions that could still be corrected (date code etc.). If the observer has forgotten to fill in a field and no longer has access to the information, it is better to note it than leaving the field blank or falsifying data.

The forms must be completed with a pen, if necessary the erroneous information will be scratched and replaced, but they must never be erased or copied because this could lead to errors.

At the end of the day, the data collected on the forms should be entered in an appropriate database. At the end of the trip, all forms completed and the files created must be handed over to the supervisory authority.

PART C: FISHING GEAR USED IN THE SEAFO CONVENTION AREA

DEMERSAL LONGLINE SYSTEMS

Demersal longlining is a passive fishing technique making use of baited hooks to attract and catch fish. The demersal longlines is weighted and set onto or close to the seabed and anchored at each end.

The lengths of demersal longlines can vary greatly with larger commercial longliners setting lines over 30 km long with more than 30 000 hooks in depths over 2000m.

A number of variations exist in demersal longline design, and these include:

- Auto or Single lines
- Double lines (Spanish longline system)
- Trot lines

All longlines are anchored by various means to the seabed with an anchor line leading to the surface buoys for recovery. The surface buoys are usually large plastic (A5) floats with a radio buoy attached to assist in location the buoys.

SINGLE LINE (AUTO) SYSTEM

Currently no vessels operating in the SEAFO CA are deploying single (auto) lines. A single line system consists of a single mainline with snood spaces at 1 to 2 meter intervals that is set on the seabed.

A demersal line is usually made up out of rope or cord that is negatively buoyant. Weights may be attached at intervals along its length to increase its sink rate and hold the line onto the seabed. Modern systems have a lead core integrated into the mainline to increase weight, called integrated weighted lines (or IW lines).

Single line systems can be automated and together with automatic baiting machines a large number of hooks can be set and hauled compared to other systems, and fewer crew are required.

The main limiting factor to single line systems is that they are restricted to relatively flat or soft grounds. If the line gets fouled and breaks, it can be hauled from the opposite end. If both end of the line are broken off the vessel can tow a grab hook to try and recover the line but these attempt are seldom successful.

DOUBLE (SPANISH) LINE SYSTEMS

The double line system uses two lines set in parallel: main line and fishing (bottom) line.

The main line is thicker (18mm to 22mm in diameter) and usually made out of a floating polypropylene rope. There are a number of terms used to describe this rope: main line, floating topline or top rope. The objective of the floating rope is to keep it clear of any obstruction on the seabed.

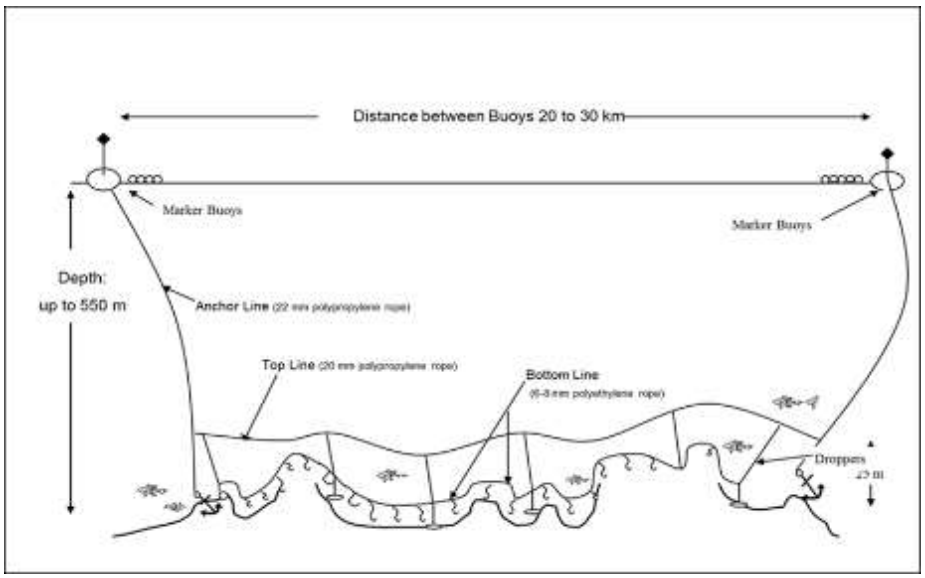
The fishing line has the hooks attached and is weighed down at specific intervals to keep it on or close to the seabed. There are a number of terms that can be used to describe this line, fishing line, bottom line or hook line. The line material can be rope or cord that is either negatively buoyant or floating, and is always thinner than the mainline (6 mm to 8 mm in diameter). The hooks are attached to the fishing line with

snoods that are either a monofilament nylon line (1mm in diameter or 2mm cord 2mm in diameter). The snoods are regularly spaced at intervals ranging from 120cm to 180 cm along the fishing line.

The main line and fishing line are connected by branch lines (droppers) that are attached to the main line at fixed intervals that can range from 25m to 100m depending on the longline setup. The branch lines are usually also a floating polypropylene rope (12mm to 14mm in diameter) and approximately 25m long.

The overall objective of the double line system is that if the fishing line gets snagged on the seabed the vessel can continue hauling on the mainline, breaking off the fishing line and recovering the broken fishing line when hauling up the next branch line.

The advantage of the double line is that it can be set over foul grounds where single lines cannot be used however they cannot easily be automated and are labour intensive, requiring more crew.



TROT LINE SYSTEM

The trotline is a modification of the Spanish (double) line system that uses a floating main line (topline) and has similar branch lines attached at intervals, usually 25m or 50m apart.

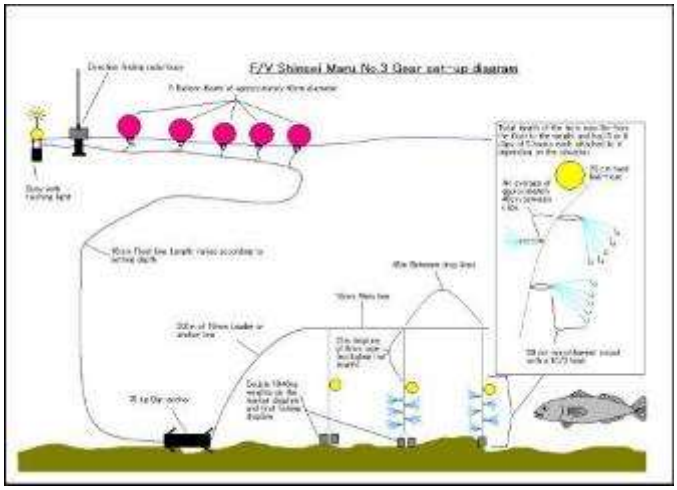


Figure 4: Schematic diagram of the trot line system.

At the end of each branch line a length of hook line is attached with hooks or “trots of hooks’ attached. At the bottom of the hook line a weight is attached to weigh it down. The hooks are therefore set vertically above the seabed. A small high pressure float may be attached above the hook line to tension it vertically. The distance of the hooks off the seabed is determined by the length of the hook line and the spacing of the hooks and normally is not more than 3 to 4 meters. This system can be set over rugged seabed with less chance of being fouled. It is labour intensive and cannot be automated.

The trot line has an advantage in that it allows for the addition of cetacean mitigation device (CED) to prevent marine mammal predation.

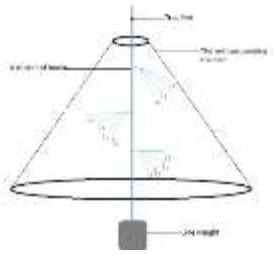


Figure 5: Schematic diagram of a Cetacean Exclusion Device used on trotlines.

DEMERSAL LONGLINE AND TROTLINE GEAR COMPONENTS

Magazines

Single lines are made up into magazines with up to 1000 hooks. The hooks are hooked into a groove on the magazine and as the line is set they slide off the end and pass through an automatic baiting machine where the hooks pick up bait before entering the water. Magazines are connected to each other during the setting process.

Pots (baskets) / cases

For double line systems, sections of bottom line are made up into pots, baskets or cases. A single pot holds several sections of bottom line. Snoods and hooks are attached at fixed intervals (1.2 to 1.8 meters apart). Sections of line are joined together with short "strops" and the branch lines that attach the bottom line to the topline and to weights are attached at these junctions. Pots or baskets fit into each other, and are joined together to make up a continuous line during setting

Figure 6: Pots made up and baited with trotline trots.

Branch lines, (Droppers)

Branch lines which connect top and bottom lines are about 25 meters long, and allow the top-line to float free of the bottom. They are attached while the line is being set.

Stones

"Stones" are weights attached to the bottom line to weigh it down. Originally round stones were tied up in a piece of old netting and attached to the line with a short strop. Many vessels now use concrete weights (4-6 kg) with a strop cast into the cement.

Snoods	Snoods are short lengths of mono-filament nylon (approx. 1 meter long) attached to the bottom line with the hook at the other end. On trot lines several snoods (+/- 4) are attached to a tuna clip () that is clipper onto the downline.

Figure 7: "trot" consisting of a number of hooks attached to a tuna clip used on trot lines.

Anchors & down-lines	The entire line is anchored at each end using anchors or weights. Anchor lines (or down-lines) connect anchors to marker buoys on the surface.

Figure 8: Steel anchor used to anchor end of the longline. Note also concreate weights.

Buoys / balloons	The buoys on the surface are often called "balloons". Normally several buoys are attached to each other.
Dan-buoy / Light-buoy / Radio-buoy	A dan-buoy is a buoy with a pole set through the centre; one end of the pole is weighed and the other has a flag and/or light attached to make it more visible.

LONG-LINE OPERATIONS

Long-lines are typically deployed from the stern and the operation is termed "setting or shooting". Single lines are set from magazines and hooks are automatically baited as the line is set. Typically 3-8 magazines are set at a time. IW lines do not require additional weighting. Normal single lines are weighted with weights clipped onto the line at intervals of approximately 60m.

Double lines are baited by hand prior to setting and top and bottom lines are set in tandem. The pots or cases of bottom line are connected to each other during the setting process and the branch lines or droppers are also connected at fixed intervals.

Trot lines are set in the same way as double lines. Trot sections are attached to droppers during setting.

Most longline systems are hauled back on the starboard side. Top- and bottom lines of double line systems are hauled simultaneously. The fishing lines pass between two narrow rollers when coming onboard and fish are de-hooked against the rollers.

During hauling period, the crew make up the hauled lines onto the magazines or pots ready for the next set (Figure 9).

Figure 9: Cases being made up on a Spanish long line vessel.

CRAB POT LINES

Trap or pot fishing is a passive fishing method in which multiple baited pots are set in strings along an anchored bottom long-line called long-line trap-fishing (Figure 11).

The beehive pots are conical metal frames covered in fishing net with an inlet shoot at the trap entrance on the upper side of the structure and a catch retention bag on its underside (Figure 10). When settled on the seabed the upper side of the trap are roughly 50 cm above the ground ensuring easy access to the entrance of the trap. The trap entrance is baited with a net "bait bag" fixed below the conical entrance that ensures all crabs end up in the bottom of the trap.

The mainline is a continuous floating polypropylene rope 22mm in diameter. The pots are attached to a mainline at approximately 18 m intervals with a rope of approximately 14mm in diameter (Figure 11). On each end of the line (set) is an anchor and a buoy line leading to the surface where it is buoyed off with a series of 2 –"A5" plastic floats. Each end of a set is visible at the surface of the water that allows the vessel to retrieve the line from the opposite end in the event the line on the seabed gets snagged.

One pot line (or set) can consisted of up to 400 or more beehive pots on a line of approximately 7440 meters long, depending on the vessels capabilities.

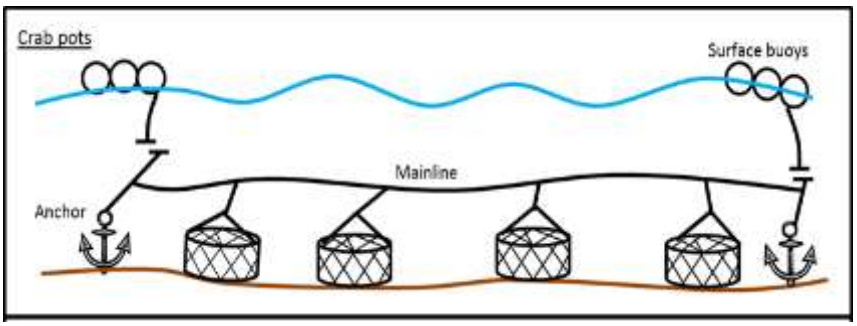


Figure 11: Schematic diagram of crab pot line.

Figure 10: Japanese beehive crab pot.

TRAWL FISHERIES (DEMERSAL AND MID-WATER)

Trawling is an active fishing method that involves towing a net through the water behind a fishing vessel. Demersal trawling targets fish and invertebrates on the seabed. Midwater (or pelagic) trawling targets pelagic fishes in the water column. A range of net designs and configurations exist depending on the target species, fish behaviour and the areas being fished.

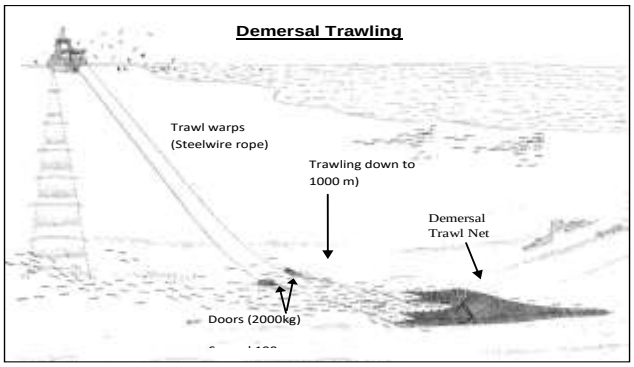


Figure 12: Schematic diagram of a demersal trawl operation.

Trawl systems can be divided into two main categories:

- Conventional trawls that use otter boards or trawl doors to open the net;

- Beam trawls that use a solid beam or frame to maintain the net opening.

Fish are herded into the net opening by the wings while trawling, and they are retained in the codend.

Trawl Gear

Stern Trawler	Deploys and hauls nets over a ramp at the stern of the vessel. Are able to operate in adverse weather and can shoot and haul their fast.
Side Trawler	Deploys and hauls nets over the side.
Beam Trawler	Deploys smaller trawls targeting smaller species such as shrimp or prawns. The net is kept open by a solid frame or beam and no doors are required.
Ramp	Angled ramp at stern of a stern trawler for deploying and hauling the net back onto the trawl deck. The photograph also shows the trawl doors.
Warps	The main cables (steel wire rope) used to tow a trawl.
Warp drums / Trawl winches / Donkey winches	The warps are stored and winched in on the warp-drums, normally one on each side of the trawl deck. Smaller winches on the deck, trawl winches or “donkey winches”, are used to lift and empty the net.
Net drum	The trawl net is generally longer than the trawl deck and to haul it in and store it, it is rolled up onto a net drum.
Gantry	A distinguishing structure on a stern trawler. Forms a high bridge across the trawl deck and is used to haul up the cod end to empty it into the ponds.
Trawl net	The main categories of trawl nets (Figure 13))are:

Bottom trawls (otter trawl): Shaped like a long triangle with the widest part forming the net opening and tapering down to a narrow bag (or "codend"). Towed along the seabed and kept open by two "trawl doors".

Mid-water trawls: Similar to bottom trawls but it is towed in the mid-water, between the surface and seabed. Trawl doors are also used to open the net.

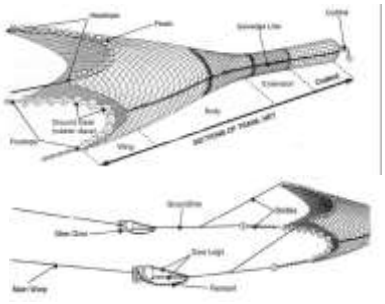
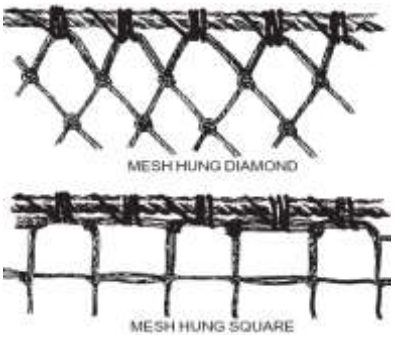


Figure 13: Schematic diagram of midwater (top) and demersal trawl (bottom) nets.

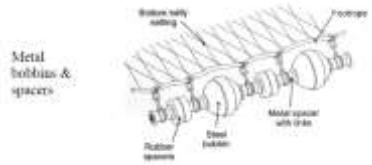
Top-rope	The top-rope is attached to the top of the net opening.
Foot-rope	The foot-rope is attached to the bottom of the net opening.
Trawl buoys	Trawl buoys are attached to the top-rope to raise it off the bottom and assist in opening the net vertically.

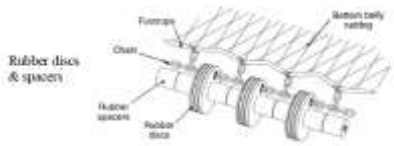
Cod-end: Bag at the end of a trawl net (Figure 13) in which fish collects during a trawl. Usually made up of stronger net material and can be opened at its end to empty out the fish.

Net: Net mesh size and orientation vary according to the target species and net type. Mesh orientation is normally "diamond" shaped or "square". Net mesh sizes and orientation also vary within the construction panels of the net. Square mesh panels may be inset to facilitate small fish escaping out of the net.

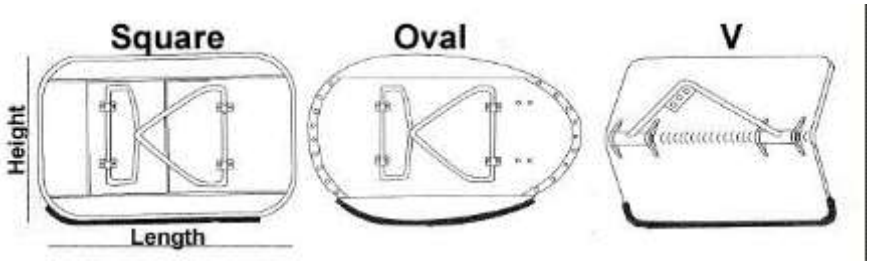


Bobbins / Rubber discs / Rock Hopper Gear: Bobbins are steel balls that are sometimes attached to the foot-rope for trawling over rocky grounds. Rubber discs of the same diameter are placed between the bobbins to make up "Rock Hopper" gear.





Trawl doors



Two trawl doors are attached to the net opening. The orientation of the doors and water pressure from the flow over the doors causes them to move out perpendicular to the forward movement of the vessel, thus opening the net. Several types exist, including Oval, "V" and Square doors. They are heavily reinforced for towing on the seabed. Pelagic trawls use rectangular hydrodynamic pelagic doors that are lighter in construction, as they do not have contact with the seabed.

TRAWL OPERATIONS

Gear deployment:

Deployment commences when the codend is lowered over the stern (or side) of the vessel and released into the water. Vessel speed is increased to create enough drag to pull the remainder of the net into the water. The bridles are connected to the doors that are attached to the main warps or cables. The warps are set out until the trawl reaches the seabed or desired fishing depth for a mid-water trawl. Once the trawl is deployed, the vessel is slowed to a preferred towing speed.

Towing:

While towing the net the captain (or skipper) can manoeuvre the vessel to cover the desired grounds. Warp can be payed out or hauled in to adjust for depth or set the net "harder" or "lighter" on the seabed. Net monitors on the head rope can indicate fish entering into the net and net sensors on the codend can trigger when an optimal amount of fish are caught.

Gear retrieval:

The haul-back begins by winching in the main warps until the doors are at the stern. The pennants are removed from the doors and attached to the net reel transferring the strain from the warps to the net reel and groundline, (sweep wire). The ground line and net are hauled back onto the net reel until the ground gear is on board and the remainder of the net/codend is hoisted aboard (Figure 14).

Figure 14: Codend of midwater trawl being hauled onboard.

The codend is then hoisted up and emptied into the stocker ponds on larger commercial trawlers, or into holding bins on the deck for sorting.

PART D: BIOMETRIC SAMPLING - LENGTH, WEIGHT, SEX & MATURITY AND AGE

The main biometric samplings that are likely to be requested are:

- length measurements;
- weight;
- sex and maturity;

COLLECTION OF SAMPLES

Three factors are taken into account by scientists when setting up sampling strategies for observers:

1) Type of sampling

The type of sampling undertaken could influence the size composition of fish sampled due to gear selectivity (i.e. gill nets versus trawls or line caught fish)

2) Area sampled

Sampling area should be selected to include all parts of the stock (e.g. in some areas there may only be juveniles)

3) Time of sampling

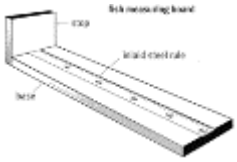
To eliminate seasonal bias to sampling (e.g. fast-growing species may be small in one season but much larger a few months later) sampling should include all seasons.

COLLECTING LENGTH MEASUREMENTS

Length frequency information shows the size structure of a fish population by sex, area and time, and forms the basis for the understanding the dynamics of fish populations. Length frequencies can be converted to age structure using an age-length keys for each species, and show the age of recruitment into a fishery and the size at 50% maturity. They can be used to compare populations occurring in different places (e.g. exploited and unexploited areas) or times (e.g. between years).

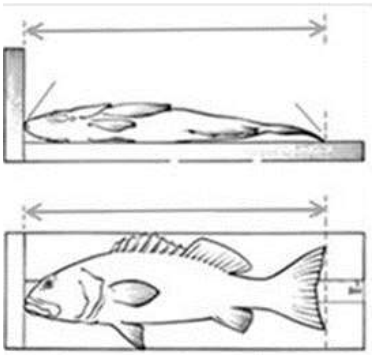
Measuring instruments

Calliper 	Used to measure shellfish (lobsters, crabs, prawns, mussels). Three types are mechanical, digital and automatic acquisition calipers. Large mechanical calipers are used for large fish species such as tuna.
Measuring board	Used to measure fish, small sharks and cephalopods. Consists of a ridged board with a ruler graduated in mm, cm or ½ cm. One end has a stop so that fish can easily be positioned at the zero mark. Electronic measuring boards use mechanical electronic touch sensors to record



measurements on a digital display and directly onto electronic data systems.

Usage 1. Place the fish on the ruler, the anterior end (mouth or nose) in contact with the stop.



2. Place your eye just above the tail of the fish to read the measurement correctly (if the observer moves the head to one side or the other, the angle of observation will cause a measurement error).

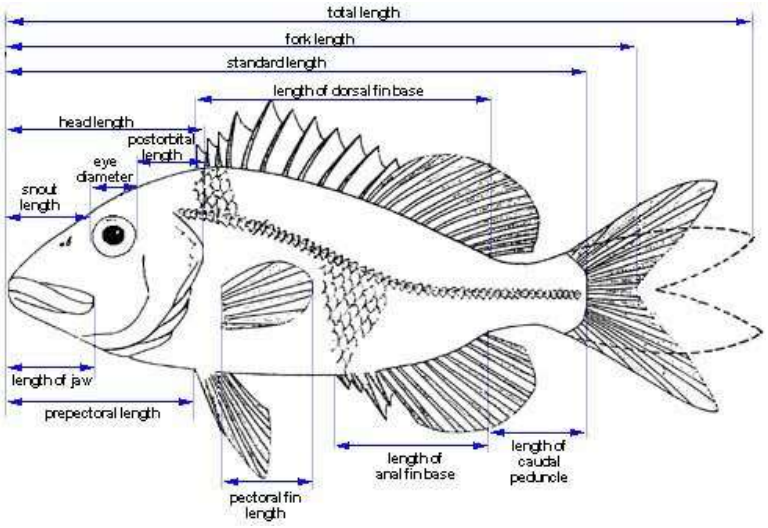
3. Take the most appropriate measure according to the species measured

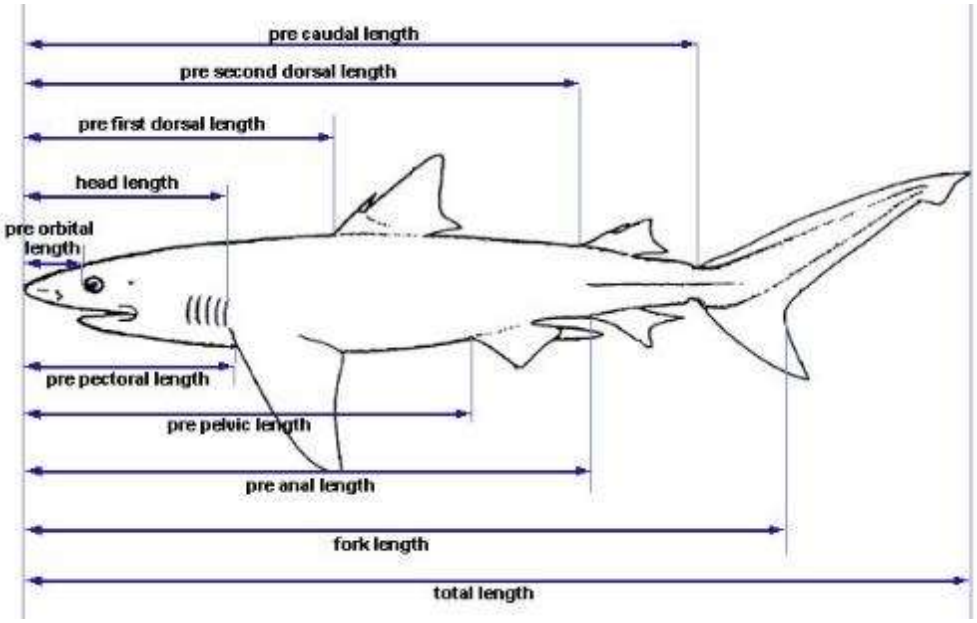
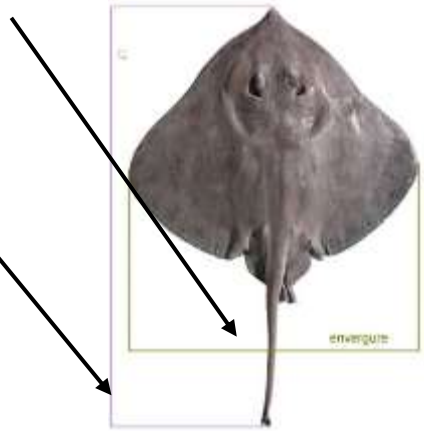
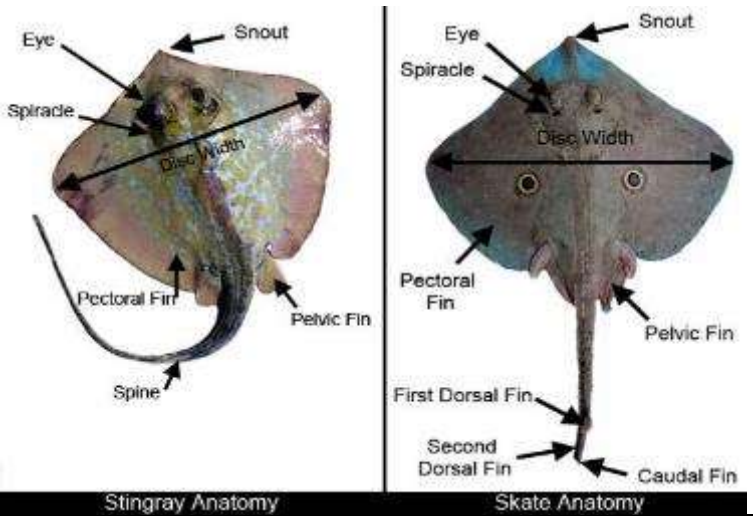
Tape measure

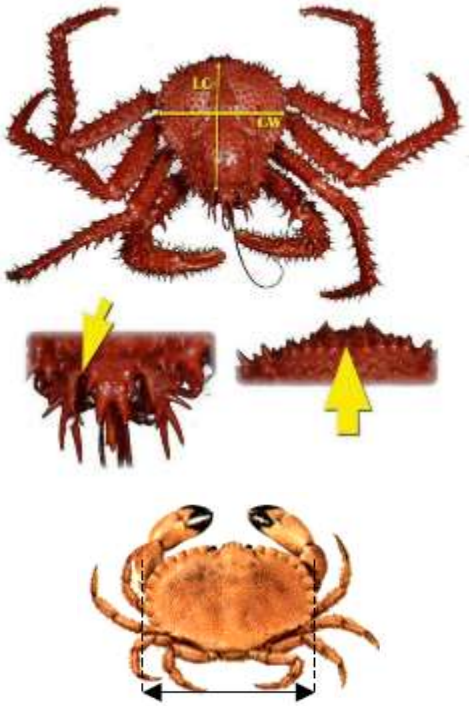
Used to measure curved surfaces, such as turtle curved carapace length or tuna / swordfish curved length.

Reference Measurement

Different reference measurements are used for different faunal groups.

Bony fish	FL = Fork Length (tip of nose to fork in tail) TL = Total Length (tip of nose to extreme end of tail in a straight line) SL = Standard Length (tip of nose to flex in caudal peduncle) 

<u>Sharks</u>	FL = Fork Length (tip of nose to fork in tail) TL = Total Length (tip of nose to extreme end of tail in a straight line) PCL = Pre-caudal Length (tip of nose to pre-caudal notch in sharks – same as SL) 
<u>Rays</u>	DW = Disk Width (wingspan in skates and rays) TL = Total length (Snout to tip of tail)  

Crustaceans	*Crabs* CW = Carapace width (width of the carapace of crabs in the widest part) CL = Carapace length (back of the carapace to notch next to the rostum (horn) *Or front of carapace rostrum* *Depending on species*	
	Lobster (Crayfish) CL = Carapace length (back of the carapace to tip of the rostrum (horn)	

Where both FL and TL are measured, a linear regression between the two lengths can be used to calculate a conversion factor. This is useful where fish are processed at sea. If tails are cut off during processing, a conversion factor from UJL and FL can be used to convert measurements of processed (without tail) fishes to FL.

Units

The unit used (mm, cm) depends on the size of the fish, and the goal is to be precise to 0.5% of the overall length. All measurements to be taken to the lower unit (cm, ½ cm or mm inferior).

Measure to the lower cm : reading 12,9 cm ⇒ note 12 cm

Measure to the lower ½ cm : reading 12,9 cm ⇒ note 12,5 cm

Measure to the lower mm : reading 5,6 mm ⇒ note 5 mm

Collecting Weight Measurements

Fish must be weighed correctly on an accurate scale (check accuracy of your scale using an item of known exact weight). Even so, weighing of fish at sea on small vessels may be difficult.

The length/weight relationships are used to estimate biomass in fisheries where only lengths are measured. It is used in growth equations to express growth in terms of mass, and in yield-per recruit and spawning biomass per recruit assessments.

Measuring instruments

Mechanical scales

Used when there is no access to electronic scales or when the surrounding conditions are unfavorable (i.e. excessive motion because of rough seas; wet measuring area). Must be calibrated before use.

Electronic scales

Used in good working conditions, such as a dry lab. Not usually taken to sea. Electronic motion compensated scales are used on specialised research vessels where accurate weights are required for smaller samples or species (i.e. determining GSI or weighing small crustacean spp.).

Hand scales

Often used by observers at sea. Water proof and covers a variety of weight ranges and levels of precision (i.e. weight range from 1kg to 10kg and precision from 5g to 250g).

Reference Measurement

Normally fish are weighed “in the round” i.e. whole or total weight. This can introduce a bias if the stomach is very full or if the gonads are very large.

In some sampling protocols the stomach is drained of water using a tube inserted down the fish’s throat or a sharpened hollow stainless steel tube inserted through the anus when the fish is hanging on the scale.

Reproductive Biology

a) Determine spawning season/area
b) Gonadal development
c) Size/age at maturity
d) Sex ratio
e) Fecundity
f) Reproductive behaviour

Determination of spawning season/area

To determine a spawning season/area, the Gonad Somatic Index (GSI) is used. GSI = (gonad mass / total fish mass) * 100

Gonad development

Described using both gross anatomical and histological observations (follow development of the gonad from early juvenile to mature adult and from inactive through the reproductive cycle to the spent condition).

Size/age at maturity

Used in fisheries management to set the minimum size limit (i.e. theoretically allows the fish at least one chance to spawn before being recruited into the fishery).

Determination of sex ratio

Proportion of males to females. Gives information on social structure of population, including spawning aggregations, sexual segregation, and migrations. Important for sex changing fish where the populations may be skewed due to over-fishing.

Determination of fecundity (counting the number of eggs)

Total number of eggs carried by mature females (externally by lobsters, crabs and internally by fishes). Mostly, fecundity increases with size. Difficult to determine in sequential spawners (> 1 batch of eggs).

Reproductive behaviour

Based on observations of fish in natural- or captive environments. Can often be inferred from general life history of a species. Include mating behaviour (group vs pair), spawning (pelagic vs demersal), sex change (social structure), migration (resident vs migratory; determine from tagging studies), etc.

GONAD SAMPLING

FISH

To determine the sex of a fish and its stage of sexual maturity. The gonads are located in the ventral part of the fish, are elongate, and often flattened in males but rounded in females. Gonad size and colour varies from male to females and with maturity stage.

To collect fish gonads:

1. Ventrally open the fish by making a cut parallel to the spine slightly forward and above the anus;
2. Move stomach and intestines to the side;
3. Locate the gonads located in the peritoneum (membrane that lines the abdominal wall and surface of viscera);
4. Carefully remove the gonads without damaging them;
5. Determine sex and maturity stage.

To determine the sex of sexually mature fishes is relatively easy because ovaries (in females) are generally tubular (presence of lumen) and granular, while testes (in males) are flat, white, and frequently have nodules. Oocytes of females are sometimes visible to the naked eye. In immature fish, the gonads are filaments and are sometimes very small so that the sex cannot be determined.

To determine maturity stage a scale based on macroscopic criteria is used: it includes gonad size, color, consistency, their vascularization, the presence or absence of oocytes visible to the naked eye in females, and the presence of milt in a cross sectional cut of male gonads.

There are a range of fish maturity scales used by different scientists and for different fisheries. The table below serves as guide.

Gonad staging

Male	Female
I Inactive/virgin Testis small and thin, transparent to greyish-white	I Inactive/virgin Ovaries long and thin, pink in colour, no eggs visible
II Developing Testis show lateral thickening, increase in size, whitish colour, sperm visible if squeezed	II Developing Ovary increases in length and thickness, orange in colour, eggs visible to naked eye
III Ripe Testis large, grey-white with sperm in tissue and sperm duct, becomes pinkish during active spawning	III Ripe Ovary is swollen yellow-orange in colour, translucent eggs visible in the tissue and lumen
IV Spent Testis decreased in size, reddish-grey in colour, no sperm present in tissue but still present in main sperm duct	IV Spent Ovary decreased in size considerably, flaccid with large empty lumen, bloodshot reddish-orange in colour

CRABS

Record sex of the crab discerning between Male (M) and female (F). Note the relative size of the abdomen (Figure 10) with the larger abdomen on the female on which the berry is held.

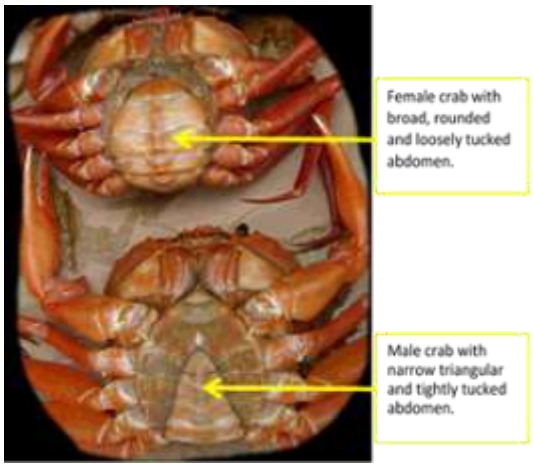


Figure 15: Morphological difference between male and female crabs.

On female crabs record the maturity stage by noting the development and size of the vulvae.

Record: 0 = vulvae closed

1 = vulvae half-opened

2 = vulvae fully opened

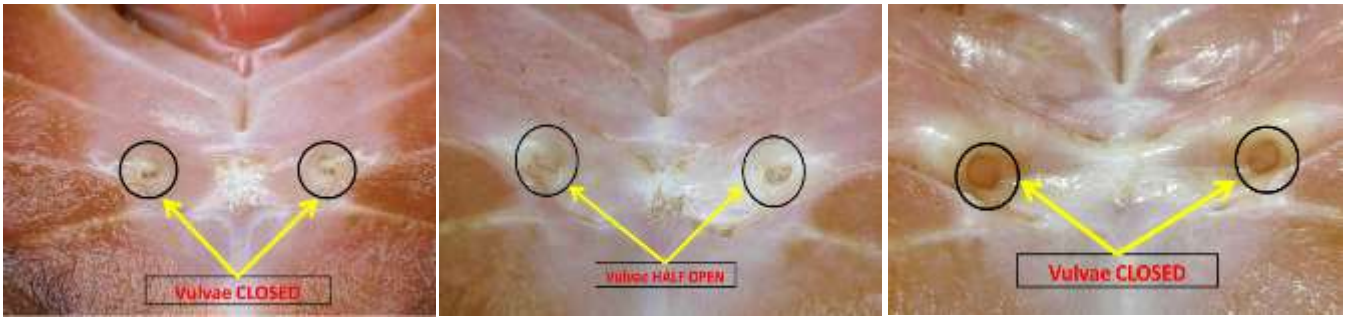


Figure 16: Maturity stages of a female deep sea red crab showing Vulvae closed, half open and fully open.

EGG STAGES OF SPINY LOBSTERS:

The key to staging the berry is noting the colour and visibility of the eye-spot in the eggs.

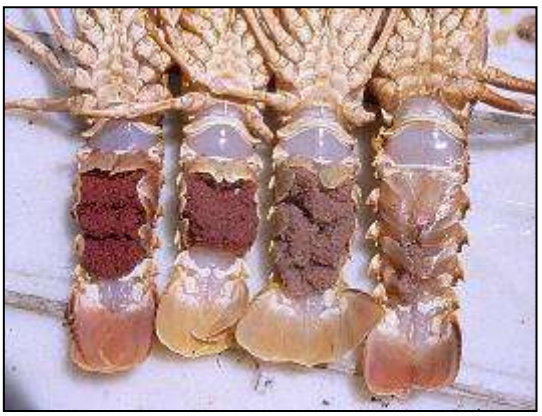


Figure 17: Berry stages in rock lobster.

Stage 1 Bright orange, looks new and shiny

Stage 2 Eye-spots become visible as fine black dots in each of the eggs. Eye-spots are only barely visible. Still bright orange but some discolouration (fading) visible.

Stage 3	Eye-spots are large and clearly visible. Egg-mass has changed colour to brown. Egg-mass still in good condition without any signs that eggs are being scratched off.
Stage 4	Egg-mass brown and stringy where female has scratched eggs off, and where larvae have hatched. Egg-mass visibly disintegrating.

AGE AND GROWTH

Observers may be expected to collect otoliths for age and growth studies.

Otoliths are hard milky white structures composed of calcium carbonate that form part of the inner ear of fish and are used in maintaining balance.

They grow throughout the life of fish by and form layers each year or season. The layers are used by scientists to estimate fish age (same principle as that of the cross section of a tree trunk that reveals its age).

Figure 18: Crosscut of otolith showing annual rings.

EXTRACTING OTOLITHS:

Open the skull of the fish (use knife or saw) to access cavities containing otoliths. This can be done in several ways:

- Dorsal cross-section - most commonly used, on all types of fish (any species, individual size or cranial morphology).
- Transversal cross-section - performed by separating the body of the fish's head, may be more practical on certain species (i.e. swordfish, tuna).
- Ventral cross-section - through the gills; does not damage the appearance of a fish.

After cutting, remove the brain and tissue to access the semicircular canals and extract the otoliths using tweezers. Clean the otoliths and store in clearly labelled paper envelopes.

Figure 19: Cutting area on head of a toothfish to remove otoliths.

FEEDING BIOLOGY

Fish may be generalists (feed on a wide range of prey items) or specialists (feed on specific types of organisms). Where requested, the stomach (or other parts of the digestive tract) must be collected and frozen in well-labelled plastic bags. Specific instructions on sampling method and storage to be given by the scientist requesting the samples.

GENETICS

Genetic samples to be collected on request. Detailed instructions on which part of the body to sample (fin clip, muscle, or walking leg in lobster), how many samples required per site, and storage methods (90% alcohol or frozen) to be given by the scientist requesting the samples.

SPECIES IDENTIFICATION

A hierarchical classification system exists that shows the relationships between all living organisms on earth. All animals belong to the Kingdom Animalia, all bony fishes belong to the Class Osteichthyes. All tunas belong to the Family *Scombridae*, and a single "type of fish" is then described by its Genus and Species names: i.e. *Katsuwonus pelamis.*

Kingdom → Phylum → Subphylum → Superclass → Class → Subclass → Super-order → Order → Family → Genus → Species

Keep in mind that when reporting to species level the identification must be 100% correct.

It is the observer's responsibility to record all species that interact with the fishing gear, whether they are target species or bycatch, retained or discarded.

Identifying fresh species is relatively easy compared to distinguishing frozen or iced fish. Even at small sizes, freshly caught target species have distinct coloration, body markings and body morphologies that provide rapid visual keys to positive identification. Frozen species are far more difficult to distinguish due to fin damage, discoloration, skin abrasion and distortion or crushing during the storage process.

Even though the target species are relative easy to distinguish in fresh condition, misidentifications between similar species. Observers need have ability to identify these to 100% certainty. Bycatch identification is also very important in some fisheries, especially for SEAFO toothfish and often these species can only be identified to family level.

There are a number of recommended resources available to assist with species identification and these will be provided to the observer during their trip briefing and specialised training, however to fully be able to accurately determine a sample to species level the observer requires a thorough understanding of the taxonomy of the main organisms likely to be encountered.

DETERMINING CONVERSION FACTORS

Fisheries scientists use the whole weight (Greenweight) of fish or crustacean when looking at fishing mortality. As vessels generally land processed product a conversion factor (CF) needs to be determined for different processing method so that the whole weight can be calculated from the weight of the product.

CRAB

*In the SEAFO CA crabs are processed at sea into a flake product (*Figure 20*) and leg meat product (*Figure 21*).*

To determine a conversion factor (CF) entails taking a sample of un-processed crabs and record the "greenweight". This is then given to the factory to process (making sure all other product is cleared out of the machinery and cookers). After processing the products are re weighed to get the "product" weights produced from the sample. The CF is then calculated by dividing the greenweight with product weight.

Figure 20: Flake product from cooked deep sea red crab.

Figure 21: Leg meat product produced from deep sea red crab.

FISH

Similar to crab a CF for toothfish is required to calculate the greenweight caught from the products landed. Toothfish are generally "trunked" by removing the head, tail and innards. However there are also various methods used to cut off the head that can influence the CF, by using a straight cut using a circular saw or V-cut and / or J-cut using a knife (Figure 22 and Figure 23).

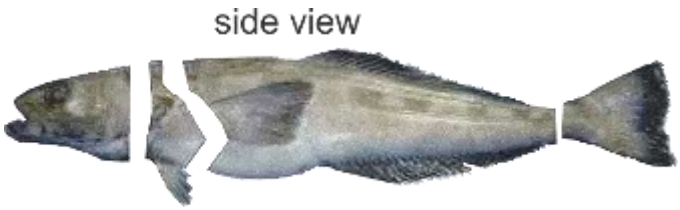


Figure 22: Side view of a J-cut.

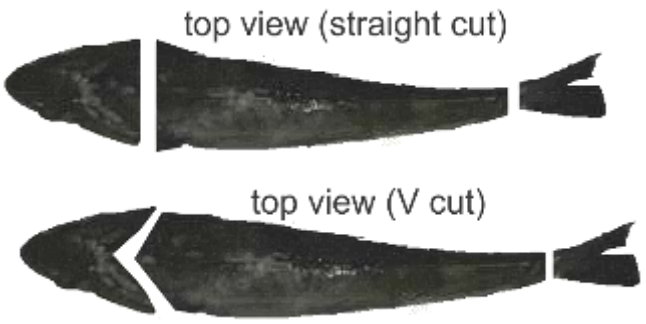


Figure 23: Top view showing difference between a straight cut and a V-cut.

1. first record fish length and weight;
2. where possible whole fish should be weighed on a motion compensated [MC] scale and the water drained from the stomach before weighing;

*[Suggest suspend fish and insert a sharp pointed knife or optimally a sharpened stainless steel tube approx. 1mm or insert a 25mm tube through the mouth and down the throat](*Figure 24*).*

3. the whole fish MUST then be cut and processed by a member of the CREW only;
4. the processed trunk MUST then be reweighed on the SAME scale; and
5. do batches of at least 5-fish at a time, preferably individual fish measurements etc. and not combined data from a number of fish to facilitate recording sex and maturity for each fish.

Figure 24: Draining water from stomach of a toothfish before weighing to determine a Conversion Factor.

PART E: ENVIRONMENTAL OBSERVATIONS

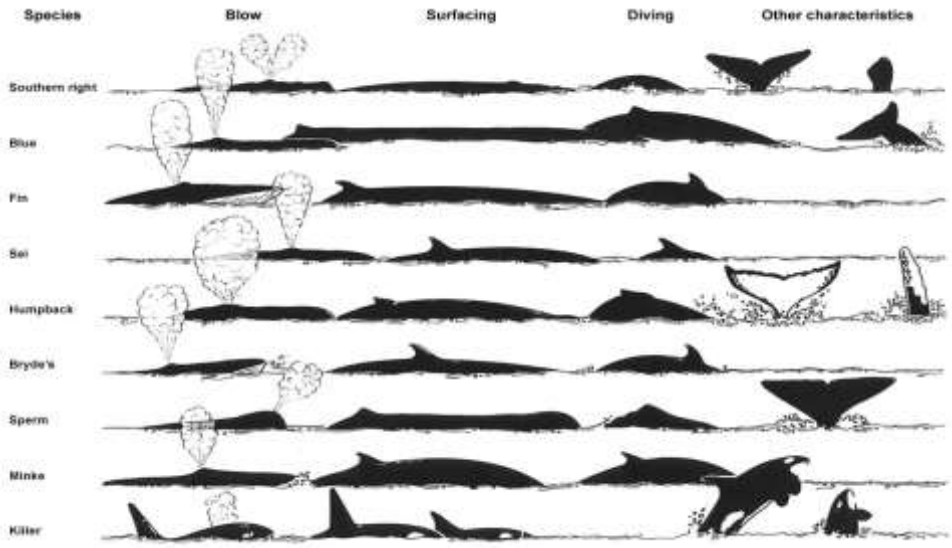
MARINE MAMMAL OBSERVATIONS

IDENTIFICATION

Animals caught and brought on-board can be accurately identified and photographed. However in the water, most whales and dolphins emerge only briefly to breathe, thus providing only a short period for identification. Some species look similar, and within the same species there may be significant variation between individuals. By taking into account certain criteria, the identification of cetaceans becomes simpler and with a little practice, everyone can recognize a wide range of species. Important criteria to look out for are:

- animals size;
- group size;
- dive pattern;
- blow pattern (whales);
- behaviour regarding boats (tendency to flee, follow the bow);
- swimming speed and behaviour at the surface;
- shape and body coloration, presence of scars, and specific marks;
- shape of the head (ex: presence of a large melon; frontal beak length);
- position and shape of the dorsal fin;
- shape and presentation of the caudal fin; and
- whale dive sequence.

Visual ID guide of cetacean profiles in the water



Animal size will immediately limit the number of possibilities. If a cetacean is bigger than 10 meters it can immediately be classed as a whale and not a dolphin.

Group size and social behaviour can be used to differentiate between species. Small coastal dolphins (striped-, common-, spotted- and spinner dolphins) and small whales (melon-headed- and false killer whales) tend to aggregate in large groups (100 to 500). Toothed whales (sperm whales etc.) and oceanic dolphins (bottle-nose dolphin etc.) tend to aggregate in relatively small groups of 10 to 25. Baleen whales are usually seen in groups of fewer than 10 individuals.

Cetacean blow shape, size and angle varies from species to species due to the size of the animal and the shape and location of the blowhole(s). An observer can often identify a whale species only by its blow.

Interactions and Mitigation Measures

Interactions between longliners and killer whales (*Orcinus orca*) and sperm whales (*Physeter catodon*) are relatively common in the southern ocean. Vessels can lose a significant percentage of their catch to both species.

The only passive mitigation measure currently used is the cetacean exclusion device (CED), which can be deployed on the trotline system (Figure 25 and Figure 26).

Figure 25: Cetacean exclusion device (CED) mad up from trawl net.

Figure 26: Toothfish covered by the CED when hauled.

SEABIRD OBSERVATIONS

Identification

Numerous sea bird books are available and all list over 40 species that may be found in the southern Atlantic Ocean. Seabirds species routinely reported in the southern area Area D are

- Wandering albatross *Diomedea exulans*
- Black browed albatross *Thalassarche melanophris*
- Northern giant petrel *Macronectes halli*
- Cape petrel *Daption capense*
- Grey petrel *Procellaria cinerea*
- Great shearwaters Puffinus gravis
- White chinned petrel *Procellaria aequinoctialis*

- Buller's albatross *Thalassarche bulleri*
- Wilson's storm petrel *Oceanites oceanicus*

The identification of the different species of birds at sea must be carried out on the basis of the following identification criteria:

1. Relative size and wing spread
2. The silhouette in flight
3. The light / dark contrast of the plumage
4. The type of hunting / fishing behaviour
5. The shape of the beak and nostrils
6. The shape of the feet

Seabird Interactions and Mitigation Measures

Sea birds are often attracted to fishing boats to eat waste (viscera, bycatch), bait or catch especially in the lower latitudes. In our region this concerns mainly albatrosses and some species of petrels from the sub Antarctic islands and due to the very high numbers and concentrations of some species there is always a high risk of interaction with vessels. In contrast tropical seabird species are not often attracted to vessels and due to their lower numbers seldom interact with vessels.

When eating near the boats, albatrosses and petrels are frequently the victims of fishing gear, which can causes a high mortality.

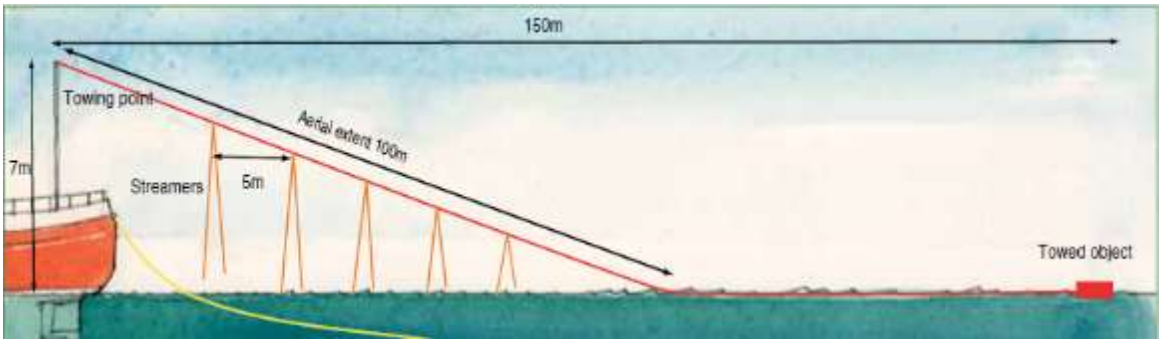
All incidental catches of seabirds must be reported in the Observer trip report. The information to be noted for each capture is as follows:

- The circumstance of the discovery (fishing catch, found on deck, other);
- Date, time and position (Latitude / Longitude);
- The species. To be able to confirm the identification of the species later, consider taking pictures for each bird found;
- the ring or beacon number (if applicable);
- If the bird is dead: Cause of death, apparent wounds, if the bird has been preserved;
- If the bird is injured: Type of injury, released (?), Euthanized (?);
- If it is an accidental catch: N ° of fishing stroke, what were the measures of avoidance of the by-catch?

Mitigation Measures (SEAFO Conservation Measure 25/12

The conservation and management measures put in place by the SEAFO and included in vessels permit conditions aim to limit the capture and mortality of seabirds include the usage of the following effective mitigation measures.

- Night setting with minimal bridge lighting;
- Bird scaring devices ("Tori lines");
- Weighted lead.
- Restrictions on offal disposal



For demersal and mid-water trawlers

- trawlers are required to tow bird scaring lines to mitigate against trawl warp interactions; and
- restrictions apply to the disposal of offal while trawling.

BEST PRACTICE HANDLING METHODS FOR SUCCESSFUL LIVE RELEASE

Many seabirds are caught during line setting, and are therefore dead by the time gear is hauled, however, when live seabirds are caught alive it is important to handle it in a way that will not cause further injury. Seabirds can be quite large and will bite, so gloves, eye protection, long sleeves and the help of a crewmember are all useful. The correct way to handle a seabird is to:

- Hold it behind the head at the top of its neck
- Fold the feathers and wings back into their natural position against the body
- Not restrict its breathing by covering its nostrils or squeezing the body too tightly
- Cover its body with a towel to protect the bird's feathers from oils and other things that could damage it during handling

The correct way to handle a seabird (left) and the incorrect way to handle a seabird (right)[3]

For cases where a seabird is lightly hooked in the bill, leg or wing, and the barb is visible then the excess line can be removed, the barb can be cut with bolt cutters and the remainder of the hook can be eased out. If the bird is more deeply hooked in the body or throat the line should be cut as close as possible to the bird, leaving the hook in place. Trying to remove a deeply embedded hook can do more damage than good.

A bird's feathers must be dry for it to fly properly and it may take between 30 minutes and 4 hours for them to dry if wet. A cardboard box with a towel is a good place for it to rest and recuperate before being released. The bird should not be given any food or water. A fully recovered bird can:

- Stand on its feet
- Hold its head up
- React to sound
- Breathe without making a noise
- Retracts its wings into a normal position against its body

SHARKS AND RAYS OBSERVATIONS

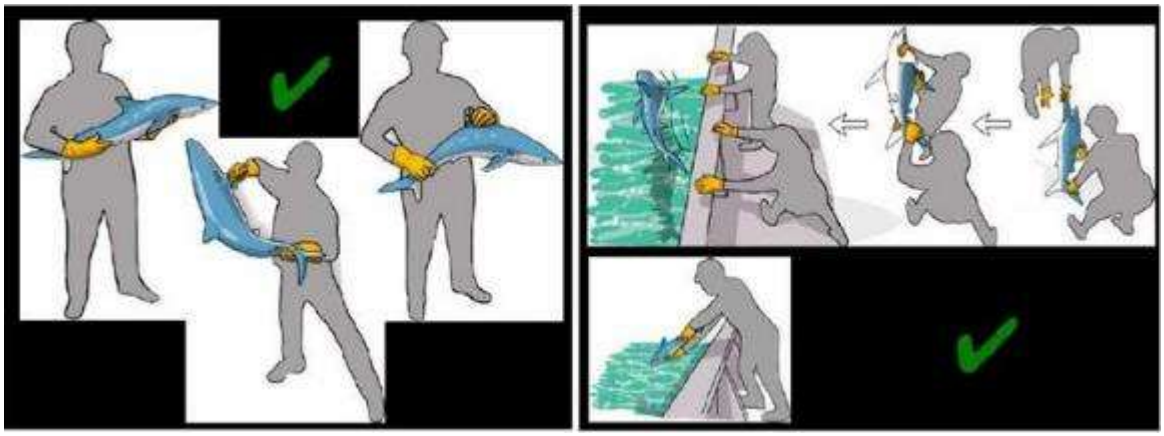
BEST PRACTICE HANDLING METHODS FOR SUCCESSFUL LIVE RELEASE

The handling of catch and bycatch is the responsibility of the crew and not the observer. Nevertheless, it is a good idea for the observer to understand the best practice handling techniques for sampling purposes.

Most fish species with an airbladder are dead by the time the line reached the surface. However some fish like toothfish and sharks do not have an airbladder and can survive if released. (It is for this reason that the toothfish tagging program can take place in CCAMLR).

Large sharks that become hooked or entangled in longline gear also have a good chance of survival if released without sustaining further injury. Sharks likely to be caught in the toothfish longline are porbegal sharks and Greenland or sleeper sharks. These species can be exceptionally large and need to be released while still in the water. Long-handled line cutters and dehookers should be used for this while the animal is still in the water, however, if the shark is relatively small it may be brought onboard carefully. Dehookers, bolt and line cutters can then be used to remove a hook, disentangle and animal or cut a leader if the hook is too deeply embedded.

[3] ISSF Longline skippers guidebook (a) John Paterson, ATF Namibia, (b) Juliano Cesar, Projecto Albatroz.



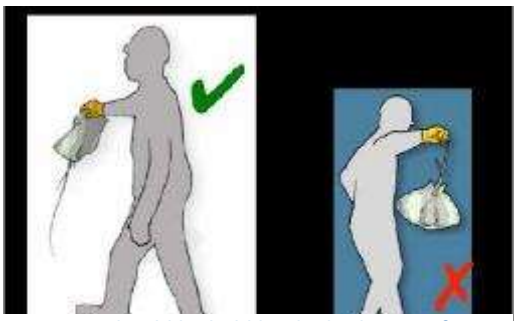
Proper handling of (left) small sharks (right) medium sized sharks

There are three ways to properly handle a small shark:

1. One hand on the dorsal (top) fin and the other holding the body from below
2. Both hands holding the body
3. One hand on the pectoral (side) fin and the other holding the tail. To release the shark, the head should be pointed down towards the water and the shark then dropped in.

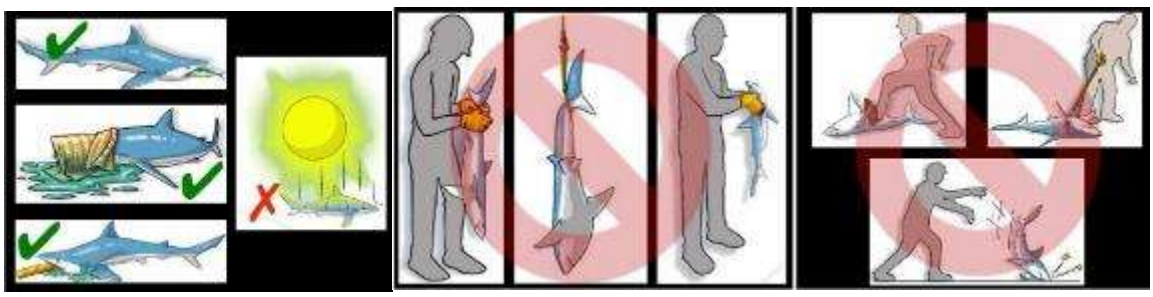
For a medium-sized shark, one or two people should hold the dorsal and pectoral fins, with the other person holding the tail. To release the animal, the crew should drop (not throw) the shark over the side.

Because a stingray's spine is located at the base of its tail, it is best to avoid the rear of the animal and grasp it near the head to avoid injury from its spine. This also applies to small manta rays which can be safely carried with a person holding each wing.



Sting rays should be held by the body away from the person to avoid injury from its spine

Where sharks cannot be released immediately, they should be kept cool with a wet towel draped lightly over the head and with a fish in the mouth to prevent bites or a hose to allow it to breathe. Sharks should not be held by the tail or gills and should not be stepped on, handled with a gaff or other sharp object or thrown on the ground as all of these can severely damage the internal organs.



Practices that can severely damage the internal organs of sharks

PART F: SEAFO ONBOARD DATA CAPTURE AND SAMPLING PROCEDURES

This section covers the main gear, species and data collection method for the fisheries that are currently taking place and have occurred historically within the SEAFO CA.

Generically the main data categories that provide information used by Fisheries Biologists and Managers to assess and manage a fishery are:

1. catch and effort;
2. biological sampling; and
3. interaction between the fishery and the environment.

Catch and effort data that include:

- fishing gear specifications;
- electronic aids to fishing;
- total catch determination;
- fishing strategies;
    - time start fishing;
    - time end fishing; and
    - search times.

Biological sampling of the catch:

- determining catch composition;
- taking and recording specific biological samples of the catch;
- length frequencies;
- length and weight ratios;
- sex and maturity.

Record interactions of the fishing activities with the environment;

- assess negative interactions; and
- monitor the effectiveness of mitigation measures.

At the end of this section trainees need to have a knowledge of the gear, data categories and data capture procedures for each of the main SEAFO fisheries:

- deep sea red crab *Chaceon erytheiae*; (currently active)
- Patagonian toothfish *Dissostichus eleginoides*; (currently active)
- alfonsino *Beryx splendens*; (historical)
- pelagic armourhead/southern boarfish *Pseudopentaceros richardsoni* (historical)
- orange roughy *Hoplostethus atlanticus* (historical)

During an assignment observers are required to collect a vast amount of information covering a broad spectrum of data categories that include; trip logistics, vessel data and fishing activities and catch. In addition to this are specific biological sampling of key species and recording the impact of the fishing activities on other marine fauna. To capture and record this information accurately, observers are required to complete a series of data forms and will also be required to capture the data onto an electronic database.

Data forms are designed so that each field captures a specific item of data. Where data is either not available or not relevant, then the observer should provide a comment to explain this. The basic information covering vessel specifications is similar for most vessels and fisheries and is normally trip-specific. Catch and effort data on the other hand, will be more specific to the different fisheries, target species and fishing gear and methods used, for example Trawl, Purse-seiners or Long-liners fishing boats. Procedures for biological sampling may cover several fisheries but sampling strategies are often determined by the operational nature of the fishery and specific data collection requirements specified by working groups or specialised studies that are taking place at the time.

Data collection protocols can be separated into several categories and these can be adapted to the vessel and specific fishery being monitored. These data categories include:

- generic data;
- specific fisheries vessel & gear;
- biological data collection; and
- environmental monitoring.

Generic data encompasses all vessel types and fisheries. These data are generally trip specific and headings in this category will include:

- observer and deployment details;
- vessel owners and compliment;
- vessel details;
- vessel electronics;
- trip information; and
- catch information.

Fisheries specific data will cover vessel and gear parameters pertaining to the fishery and include catch and effort information that is collected continuously during the trip specific to each fishing event. Data headings in this category will include:

- operational vessel and gear details;
- catch per unit fishing effort;
- catch processing and storage;
- by-catch and environmental mitigation measures; and
- tagging and tag returns.

Biological sampling is generic to most fisheries. It includes recording the species composition of the catch and the length, weight, sex and maturity of the main species caught. Catches are also monitored for the recapture of tagged fish.

Note	**By-catch species are the all species that include fish, sharks and invertebrates as well as seabirds and marine mammals caught together with the target species.** **Discards are the portions of the by-catch that is returned to the sea.**

The deep-sea red crab fishery in SEAFO has traditionally been focussed mainly on *Chaceon erytheiae* on Valdivia seamount complex – a fairly extensive sub-area of the Walvis Ridge.

The overall distribution of deep-sea red crab fishery within the SEAFO CA is still unknown. Further encounter records documented through video footage during the 2015 FAO-Nansen VME survey in the SEAFO CA indicate that deep-sea red crab are distributed across a major part of the Valdivia seamount range, as well as the Ewing and Vema seamounts. Records from the SEAFO database indicate that fishing for crab in this area occurred over a depth range of 280-1150 m.

The current fishing area is located in Division B1 of the SEAFO CA (Figure 28) and has been the main fishing area of the crab fishery since 2005 when the resource was accessed by Japan.

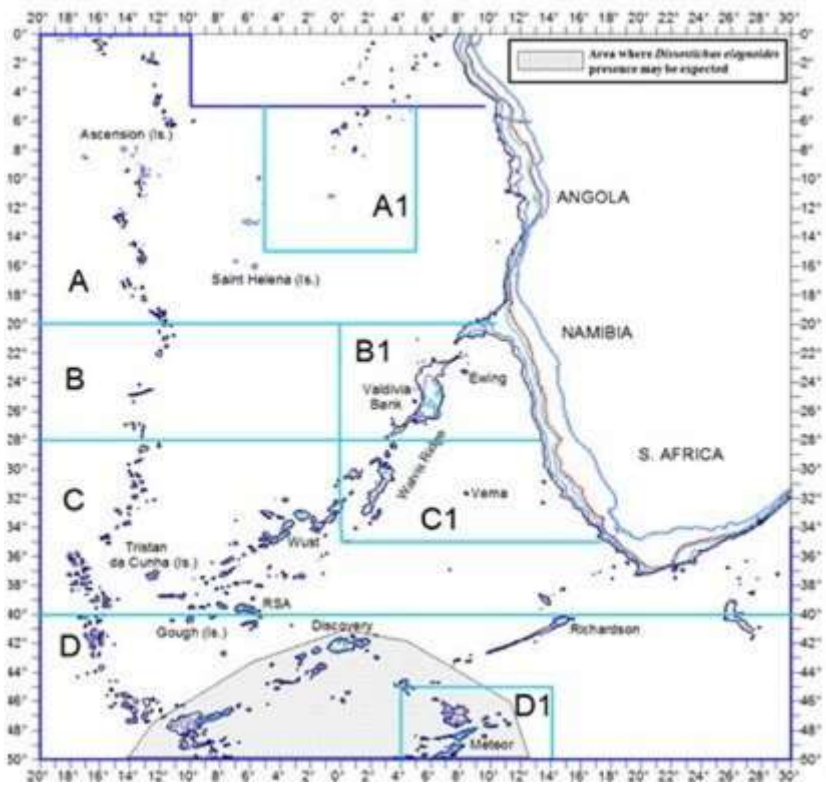


Figure 27: Divisions (A, B, C, & D) and Sub-divisions (A1, B1, C1, & D1) of the SEAFO Convention Area

Data within the SEAFO database indicate that the Deep-sea red crab (DSRC) resource has been utilized by two nations primarily, Namibia and Japan with both countries using use similar gear known as *Japanese beehive pots* (Figure 29).

Trap or pot fishing is a passive fishing method in which multiple baited pots are set in strings along an anchored bottom long-line called *long-line trap-fishing*. The beehive pots are conical metal frames covered in fishing net with an inlet shoot at the trap entrance on the upper side of the structure and a catch retention bag on its underside (Figure 29). When settled on the seabed the upper side of the trap are roughly 50 cm above the ground ensuring easy access to the entrance of the trap. The trap entrance is

baited with a net “bait bag” fixed below the conical entrance that ensures all crabs end up in the bottom of the trap.

The pots are attached to a floating bottom line at approximately 18 m apart. On each end of the line (set) is an anchor and a buoy line leading to the surface where it is buoyed off with a series of 2 A5 plastic floats. Each end of a set is visible at the surface of the water that allows the vessel to retrieve the line from the opposite end in the event the line on the seabed gets snagged.

One pot line (or set) can consisted of up to 400 or more beehive pots on a line of approximately 7440 meters long, depending on the vessels capabilities.

Figure 28: View of the Japanese beehive trap Top (left) showing bait bag and trap bottom (right) showing catch retention bag on its underside tied up.

SEAFO DEEP SEA RED CRAB OBSERVER DATA FORMS *SEAFO E-POT FORM V2 2015*

Observer deployed onto vessels targeting DSRC are required to capture catch and effort and biological data in an excel Logbook (SEAFO E-POT FORM V2 2015). A detailed understanding of the logbook fields is required as well as knowledge of the units and format in which the data is recorded.

The logbook contains several sheet, each designed to capture specific information:

- P1 = Vessel and Observation Program Details
- P2 = Gear and Processing Details
- P3 = Set and Haul Details
- P3 IMAF = Incidental Mortality of Seabirds and Marine Mammals
- P4 = Biological Data Collection
- P5 = Conversion Factors

P1 = VESSEL AND OBSERVATION PROGRAM DETAILS

Sheet P1 in the SEAFO E-Pot Form v2 2015 requires summary information to be recorded for the whole trip. This would be completed by the observer at the end of the trip but BEFORE disembarking from the vessel.

Form P1(i): Cruise Details

Cruise Details	Start Date (dd/mm/yy)	Record the date the vessels sailed for fishing grounds.
	End Date (dd/mm/yy)	Record the date the vessel returned to port at the end of the trip and the observer disembarks

Form P1(ii) Vessel Details

Vessel Details	Accurate vessel details can be obtained from the vessels registration papers. Ask the Captain if you can record them.
Vessel Name	Record vessel full name
Vessel Type	Note vessel type
Port of Registration	Record the port the vessel is registered in
Captain's Name	Record the full name of the Captain *(Note the Captain may not be the same person as the Fishing Master)*
Length (LOA)	Record the overall length (LOA) of the vessel
Size (GRT)	Record the gross tonnage
Hold Capacity (M^3)	Record the hold capacity in cubic meters
Call Sign	Record the Call sign
Flag State	Record the flag State of the vessel. This will be the country where the vessel is registered.
Owner/Charterer	Record full details of the owner of charterer or operator if not the actual owner.
Fishing Master's Name	Record the name of the Fishing Master
Position-fixing equipment	Record a full list of the electronic equipment on the bridge, noting make and model numbers. Take photographs if possible.

P1(iii): Observer Details: Observer ID 1

Use ID 1 for this observer only to identify the data they collect and record routinely throughout this logbook
Note the second observer will record the same information for the ID 2

Name	Record full name of observer.
Nationality	Record observers nationality.
Employing Organisation	Record details of the observer employing organisation.
Contact name in organisation	Record contact person in the observer employing organisation.
Address/email/fax	Provide full address and email details for observer employing organisation.
Dates of Observation Program	Provide the date the observer was contracted for the deployment
Boarding Location	Record port and country of embarkation onto the observed vessel.
Disembarkation Location	Record the port and country of disembarkation from the observed vessel.
SEAFO Area fished	Record the Area and Sub area in which the vessel fished.
Time Zone (UTC +-)	Record the ships time and time zone that data is recorded

Form P1(iv): Fishing Effort Details for CCAMLR Convention Area

Total number of sets undertaken during observation program	Record the total number of sets made by the vessel during the trip
Total number of sets observed	Record the total number of sets that were sampled during the trip
Total number of pots set	Record the total number of pots set
Total number of pots observed	Record the number of pots observed during your tally periods
Total number of pot hours	Add up the fishing time for each set. This is done by calculating the hours for each set between start and end of the set.

P2 = GEAR AND PROCESSING DETAILS

Information must be recorded for each pot type. The data sheets provides space to insert a sketch of the pot and record detailed measurement.

It is important for observer to also take detailed photographs of each pot type from different angles showing top entrance and bottom areas to in their cruise report.

P2(i): Pot description

Mesh size (mm)	Record the mesh size in millimetres (mm) of the netting covering the pot. Use a Vernier callipers to record the width and height of each mesh.
Funnel position	Record the funnel (entrance) position. This could be on the top for a single entrance or on the sides and have multiple entrances.
orientation	Record the orientation, downwards or sideways angled horizontally to opposite side or slightly upwards.
aperture (cm)	Record the aperture (opening) size in centimetres (cm). If circular record diameter on top and bottom of funnel and the depth of the funnel. Note any extra dimensions that the data sheet does not allow for and record in your notebook and include details in your cruise report.
Number of chambers	If the pot or trap is a single or sub-divided into different chambers then record number.
Escape port present	Note if there is an escape port (Y or N) for undersize crabs to escape and the number if more than one.
dimensions (cm)	Record in detail the dimensions of the escape port as for the main entrance.

P3 = SET AND HAUL DETAILS

The traps are baited, usually using a fish bait such as horse mackerel or fish heads obtained from hake trawl vessels. A bait bag made up out of netting is attached inside the trap entrance funnel. The traps are stacked and set from the stern of the vessel and attached to the bottom rope during setting.

Figure 29: Horse-mackerel bait used to fill

A vessel will typically set three to four lines at a time and haul two to three lines per day.

The trap rope is hauled on the starboard side. The traps are disconnected when hauled onto the deck and the catch retention bag is opened the catch is emptied into a chute that leads down to the factory area. The trap is then rebaited and stacked for the next set.

Note: Detail of both Setting and Hauling operations are recorded on the same sheet

Details for all lines set and hauled MUST be recorded. Even if the set is not observed or sampled.

P3(i): Set Details

Set Number	*A set number is record for each line set, (even is not observed). The set numbers must run consecutively (1, 2, 3, ……) from the first set of the trip to the last set.*		
Date of observation (dd-mmm-yyyy)	*Record the date you observer the set. Use date format dd-mmm-yyyy [for example 08-May-2019]* *Note excel date format may not match the format you entered it.*		
Target species	*Record the target species using the FAO 3-alphs code. [for example GER for Chaceon erytheiae]*		
Offal dumped during setting (Yes / No)	*Record if you observe offal being discarded overboard when the vessel is setting the line. Note it is important that you actually observer the offal being dumped and not suspect or record on another person's information. This has compliance implications.*		
Offal dumped during hauling (Yes / No)	*Record if you observe offal being discarded overboard when the vessel is hauling the line.* *Note it is important that you actually observer the offal being dumped either from the upperdeck or while in the factory. Do not record if you only suspect or record on another person's information.*		
Start Setting	Date (dd/mm/yy)	*Record date at the time the vessel starts setting the line.*	
	Time (hh:mm)	*Record the time the anchor goes into the water as the start time.*	
	Latitude	degrees (-DD)	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Longitude	degrees (DD)	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the start of the setting.*	
End Setting	Date (dd/mm/yy)	*Record date at the time the vessel starts setting the line.*	
	Time (hh:mm)	*Record the time the anchor goes into the water as the start time.*	
	Latitude	degrees (-DD)	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*

		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Longitude	degrees (DD)	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the end of the setting.*	
Start Hauling	*Date (dd/mm/yy)*	*Record date at the time the vessel starts hauling the line.*	
	Time (hh:mm)	*Record the time the anchor comes onboard as the start of hauling.*	
	Latitude	*degrees (-DD)*	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Longitude	*degrees (DD)*	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the start of the haul.*	
End Hauling	Date (dd/mm/yy)	*Record date at the time the vessel ends hauling the line .*	
	Time (hh:mm)	*Record the end hauling time the when the anchor comes onboard.*	
	Latitude	degrees (-DD)	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Longitude	degrees (DD)	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the end of hauling.*	

P3(ii): Gear Details

Length of line (m)	*Record the length of the line set. This information will be obtained from the Captain. It can also be verified by multiplying the pot spacing on the bottom line with the number of pots set.*		
Type of line			
Pot spacing (m)	*Record the spacing of the pots on the line. This information can be provided by the Captain and can be measured using a flexible tape. However only do this while they are hauling and if there are clear markings on the bottom line.*		
Bait type	*Record the bait type using the species code [eg "**JAX**" for Trachurus Spp. horse mackerel]*		
Percentage of pots baited	*Record the percentage of pots baited. When observing the setting operation monitor a fixed number of pots noting if the bait bag is attached. Divide the number of posts observed baited by the total number of pots observed to get the percentage.* ***[No. baited pots / Total No. pots observed X 100 = % baited]*** *Note that as pots are hand baited it is most likely that the baiting is 100%*		
Pot type 1	Setting	Number of pots set	*Record the number of pots set that are Type 1 as recorded on the P2 sheet for pot description.*
		Number of pots observed	*Record the number of pots Type 1 that you observed being set.*
	Hauling	Number of pots hauled	*Record the number of pots hauled that are Type 1 as recorded on the P2 sheet for pot description.*
		number of pots observed	*Record the number of pots Type 1 that you observed being hauled.*
		number of pots lost	*Record the number of pots Type 1 lost. This may be recorded by the observer but needs to be checked with the Captain if the whole hauling operation is not observed.*
Pot type 2	*If more than one pot type is used then the number of pots Type 2 and/or 3 etc. as recorded in the P2 sheet needs to be recorded.* *If the exact number for different pot types is not known or cannot be accurately recorded then only record total number of pots set/hauled and lost.* *Keep record in your note book and add a comment on this in your cruise report.*		

P3 (iii): Gear Lost

Number of sections lost	*Record the number of line sections lost if the bottom line is snagged on the seabed and breaks.* *Note if this occurs the vessel will have to steam to the opposite end anchor buoy and start hauling from this end. If the line breaks again then the number of section lost and left on the bottom must be recorded. This information is best obtained from the Captain.* *Record in your note book if any attempts are made to recover lost section and the success of these attempts and record in your cruise report.*
Number of pots lost that were attached to lost sections of the line	*Record the number of pots lost on the sections of line lost.* *By subtracting the number of pots hauled (<u>adding</u> the number of other individual pots lost) from the total number of pots recorded being set will also provide an indication of the number of pots lost.*

	Multiplying the number of pots lost by the pot spacing will also provide an indication of the length of line sections lost.
Number of other pots lost (excluding pots attached to lost sections)	*Record the number of pots lost. <u>Excluding those lost on line sections</u>.* *This may be recorded by the observer when observing the line being hauled, but needs to be checked with the Captain if the whole hauling operation is not observed.*

P3(iv): Observed Interactions with Birds or Marine Mammals

Species code	*Record the species code of the seabird or marine mammal using the FAO 3-Alphs code (for example **DIM** for Black-browed albatross Thalassarche melanophris)*	
Setting	Abundance (500m radius)	*Record the number per species (seabird and marine mammals) counted in an approximate 500m radius around the stern of the vessel.* *This will only be possible when setting in daylight hours.*
	Gear interaction (Yes / No)	*Record (Yes / No) if any interactions with the line and pots being set are observed.* *For example seabirds diving to get to the bait in pots.*
Hauling	Abundance (500m radius)	*Record the number per species (seabird and marine mammals) counted in an approximate 500m radius around the starboard side of the vessel.* *This will only be possible when setting in daylight hours.*
	Gear interaction (Yes / No)	*Record (Yes / No) if any interactions with the line and pots being hauled are observed.* *For example seabirds diving to get to the bait in pots.*
Species code	*Record all details as above for each species of seabird or marine mammal observers during hauling and setting.* *Note it is always a good practice to keep additional notes in your note book for your cruise report.*	

P3(v): Observed catch composition during tally period

Observer ID	*Record the observer ID number (1 or 2 …) as recorded in the P1 Sheet if more than one observer is deployed on the vessel.*
Was Haul observed for fish/invertebrate by-catch (Y/N):	*Record Y or N if the haul was observed for fish and invertebrate by-catch.*
Was the catch estimated by the Master or the Observer (M/O):	*Record M or O if the total <u>by-catch</u> per species was determined by the Fishing Master or Captain or if the Observer recorded the catch.*
Record the total weight of all sub-samples for this set (kg):	*Record the total weight of the sub-sample taken by the observer to determine catch composition. Note several samples should be taken at random throughout the hauling period and each of these sample weights are added up to a total sample weight.*
Estimate percentage of the haul observed for by-catch (%):	*Estimate the percentage of the haul observed. This can be calculated by counting the number of pots sampled for by-catch and dividing it by the number of pots hauled. (This would exclude number of lost pots)* *[No. pots sampled / total No. pots hauled X 100 = % pots observed]*
Number of pots observed for by-catch:	*Record the number of pots observed for by-catch*

Species Code	*During the observed "tally" period record code for each species recorded caught in pots using the FAO 3-alpha code.*
retained catch	*Record number for recorded species that are retained onboard.*
discarded catch	*Record per species the total number for the haul that are discarded, either directly at the hauling point and from the factory.*
observed number discarded dead	*Record the number observed discarded only during the observers tally period. These are the species directly observed by the observer.*
observed number released alive	*Record the number observed released alive only during the observers tally period. These are the species directly observed by the observer.* *Note some fish species are unlikely to survive if brought to the surface while most invertebrates have a good chance of surviving if in a whole and uninjured state.*
observed number lost/dropped off at surface	*Record the number observed lost or dropped off at the surface only during the observers tally period.* *These are the species directly observed by the observer.* *Note crabs may be stuck on the mesh on the outside of the pot and these can drop off when the pot is lifted out of the water.*

DETERMINING CATCH COMPOSITION (TALLY OBSERVATION DURING HAULING);

During the tally period the observer must count the number of each species of organism in a selected number of pots (percentage of the total number hauled)

At the end of the observation period the total number of each organism is tallied (added) up and the catch composition can be calculated by dividing the number of each organism by the total count of all organism's counted.

P3 IMAF = INCIDENTAL MORTALITY OF SEABIRDS AND MARINE MAMMALS

P3(v): Incidental Mortality of Seabirds and Marine Mammals

Set Number	*Record the set number of the line*
Observer ID	*Record the observer ID who recorded observation*
Species Code	*Record the species code using the FAO 3-alphs code*
Caught during Hauling or Setting	*Record if the seabird or marine mammal was caught during setting or hauling. Note Seabirds or marine mammals caught during setting will be dead and the body temperature the same as the water. Seabirds or marine mammals caught when hauling will most likely be alive and injures*

Released Status	*Record the release status according to the following criteria:*
	• *A Alive: released without injury*
	• *I Injured: landed on deck with injuries*
	• *D Dead: refers to birds and mammals dead*
	  ○ *not landed on board but observed to be killed by direct interactions with fishing gear*
	  ○ *birds and mammals brought on board the vessel that were dead.*

Cause of Injury	*Record the cause of injury or death according to the following criteria codes:* • *D Drowned (entangled with pot)* • *T Tangled in line* • *C Collision with vessel (not fishing gear)* • *O Other*

P4 = BIOLOGICAL DATA COLLECTION

At least 100 of the target species of crab must be sampled and if more than one species of crab is present then up to a maximum of 100 of the other species should be sampled. *(It is however unlikely that there will high numbers of a second or third species*)

SAMPLE SELECTION

Crabs selected for sampling must be collected randomly. Suggest that the entire catch from a pot be sampled and where possible random selections of pots be made to collect the sample. The objective being to sample randomly along the full length of the line.

For example select every 10th pot irrespective of the catch. If high numbers are being caught per pot then attempt to subsample a number of crabs for the pots selected.

INDIVIDUAL LENGTH AND WEIGHT

Record the carapace width (Figure 31) in millimetres (mm) using a Vernier callipers. Record to the lowest whole millimetre.

Record the weight to the lowest whole gram. Where possible an electronic motion compensated scale should be used.

Figure 30: Recoding carapace width to lowest millimetres (MM) using Vernier callipers.

SEX (MALE AND FEMALE) AND FEMALE MATURITY

Record sex of the crab discerning between Male (M) and female (F). Note the relative size of the abdomen (Figure 32) with the larger abdomen on the female on which the berry is held.

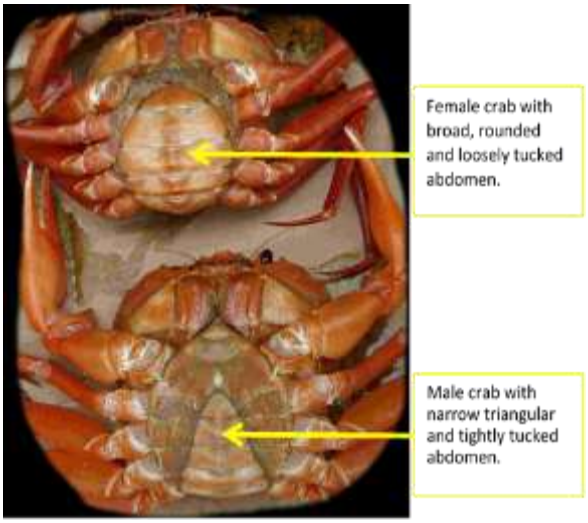


Figure 31: Morphological difference between female and male crabs.

On female crabs record the maturity stage by noting the development and size of the vulvae.

Record: 0 = vulvae closed

1 = vulvae half-opened

2 = vulvae fully opened

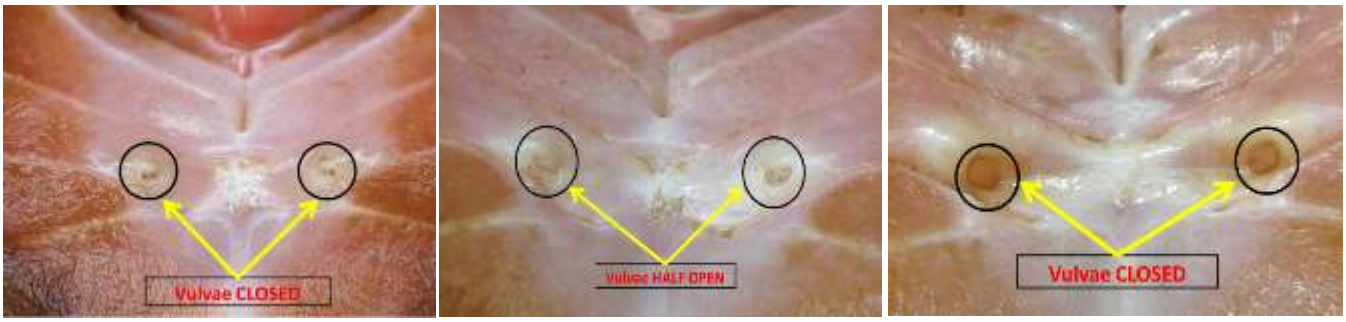
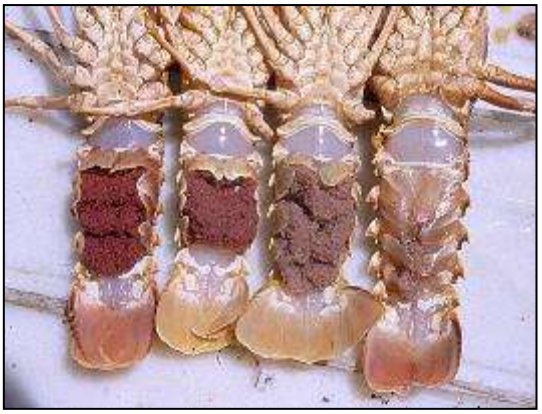


Figure 32: Maturity stages of a female deep sea red crab showing Vulvae closed, half open and fully open.

Currently there is no requirement for recording the egg stage of deep sea red crab. However there has been some interest from scientists to include this information. Until detailed criteria have been determined for deep sea red crabs it is should be possible to use the staging criteria for spiny rock lobster to determine the four stages for crab.



The key to staging the berry is noting the colour and visibility of the eye-spot in the eggs.

Stage 1	Bright orange, looks new and shiny
Stage 2	Eye-spots become visible as fine black dots in each of the eggs. Eye-spots are only barely visible. Still bright orange but some discolouration (fading) visible.
Stage 3	Eye-spots are large and clearly visible. Egg-mass has changed colour to brown. Egg-mass still in good condition without any signs that eggs are being scratched off.
Stage 4	Egg-mass brown and stringy where female has scratched eggs off, and where larvae have hatched. Egg-mass visibly disintegrating.

P4: Biological Data

Set Number	*Record the set number of the haul sampled*
Set date	*Record date line was set*
Haul date	*Record the date line was hauled and sampled*
Observer ID number	*Record observer ID as recorded in P 1.* *Note if two observers are present it can occur that both observers sample the same line at different times.*
Sample Weight (kg)	*Record the total sample weight in kilograms*
No. of Pots sampled	*Record the total number of pots sampled*
Sex - M / F	*Record M or F*
Carapace Width (mm)	*Record the carapace width (Figure 9) in millimetres (mm) using a Vernier callipers. Record to the lowest whole millimetre.*
Weight (g)	*Record the weight to the lowest whole gram. Where possible an electronic motion compensated scale should be used.*
Maturity Stage	*Record maturity stage (Figure 33)* *0 = vulvae closed* *1 = vulvae half-opened* *2 = vulvae fully opened*
Berry Presence	*Record presence or absence of berry* *0 = NO - Berry NOT Present* *1 = YES - Berry PRESENT*
Shell State	*Record shell hardness according to hardness criteria* *11 = Hard OLD [shell is hard and stained or scratched]* *12 = Hard NEW [shell is hard but has few to no stains and scratches]* *21 = Soft OLD [shell is soft around the edges, suture, and is stained or scratched]* *22 = Soft NEW [shell is soft around the edges, suture, but has few to no stains or scratches]*

CONVERSION FACTORS

Crabs processed at sea are processed as a flake product (Figure 35) and leg meat product (Figure 34).

To determine a conversion factor (CF) entails taking a fixed weight un-processed product and then allowing the factory to process the sample and determine the weight of each product produced from the sample.

The conversion factors is then calculated before freezing by dividing the unprocessed weight with the total processed weight of crab product.

Figure 34: Flack product produced from deep sea red crab.

Figure 33: Leg product produced from deep sea red crab.

SEAFO LONGLINE FISHERY FOR PATAGONIAN TOOTHFISH

CLASSIFICATION AND DISTRIBUTION

There are two species of toothfish, Antarctic toothfish *Dissosticus mawsoni* and Patagonian toothfish *D. eleginiodes* (Family: *Nototheniidae*, Genus: *Dissostichus*)

Both species are managed exclusively by the Commission for the Conservation of Marine Living Resources (CCAMLR) within the CCAMLR Convention Area. Antarctic toothfish are distributed farther south around the edges of the Antarctic shelf and in the Ross Sea. Patagonian toothfish is a southern circumpolar, eurybathic species found at depths between 70m and 1600m, however fish have been caught in depths exceeding 2500m. The species is associated with shelves of the sub-Antarctic islands, north of 55ºS. In the Indian Ocean region toothfish are targeted in the within the EEZs of South African, France and Australian around Prince Edward and Marion, Crozet, Kurgelen and Heard and Macdonald Islands. These areas are associated with the El Cano Ridge and Kerguelen-Heard Ridge. A limited fishery for toothfish also exists north of the CCAMLR Convention Area and French and South African EEZs in the South Western Indian Ocean region of the El Cano ridge.

The species is also known from the southern coast of Chile northward to Peru in the Pacific Ocean and in the Atlantic Ocean off the coast of Argentina, especially in the Patagonian area, around the South Georgia and South Sandwich Islands, where it is targeted by Chili, Argentina, Uruguay and United Kingdom. Toothfish and are also present in Discovery and Meteor seamounts in the SEAFO CA north of the CCAMLR Convention Area.

Fishing for Patagonian toothfish *Dissosticus eleginoides* in the SEAFO CA started around 2002 and was targeted mainly by four countries Japan, South Korea, Spain and South Africa.

The fishery from 2011 to 2018 has taken place in Sub-Area D, being concentrated over seamounts in Division D1, at Discovery seamount and also at seamounts located in the western part of Sub-Area D (Figure 28).

GEAR

Toothfish are caught predominantly using demersal longlines, the main systems used are Spanish longline (double line) system and trotlines. Trawling for toothfish is prohibited in the CCAMLR Convention Area. Limited trawling for toothfish does occur within the EEZs of Australia, Falkland Islands and in areas on the high seas north of the CCAMLR Convention Area outside the Argentinian EEZ.

MANAGEMENT

Within the CCAMLR Convention Area the stock is closely managed by scientific working groups using data from commercial fisheries and data collected by observers. The convention area is divided into Statistical Divisions and Statistical Subareas and annual catch limits are set for research and commercial catches.

In the In SEAFO CA the stock structure of the species is unknown. The CCAMLR Scientific Committee in 2009 noted that in most years (since 2003) the main species caught in CCAMLR Subarea 48.6 (adjacent to

and directly south of SEAFO Division D) is *D. eleginoides*. The distribution of the species appears to be driven by the sub-Antarctic front which extends into the SEAFO CA.

GUIDE TO COMPLETING SEAFO TOOTHFISH LOGBOOK AND FIELD DESCRIPTIONS

The Scientific Observer Logbook for longline (SEAFO_E-Longline_Form_v2_2015) is an excel file with ten main spreadsheets. Each spreadsheet captures a specific data set covering gear, operations and biological sampling. Observers need to be familiar with the information and format that has to be captured in each of the data fields.

A single logbook is completed for a trip and is submitted together with the Cruise report at the end of the trip.

Spread sheets in the logbook include:

- L1 = Vessel and Observation Program Details
- L2 = Longline and streamer line descriptions
- L3 = Daily work schedule of Observer (optional)
- L4 = Daily setting observations
- L4 IMAF = Seabird Activity for Day Setting Only (optional)
- L5 = Daily hauling observations
- L5 IMAF = Incidental Mortality of Seabirds and Marine Mammals
- L5 VME = VME Sampling Form
- L6 = Biological data collection
- L6 SP = Sampling protocol
- L7 = Conversion Factors
- L8 = Waste Disposal
- L9 = Sightings of Unidentified or IUU Vessels
- L10 = TDR-Bottle Test

L1 = Vessel and Observation Program Details

The L1 form is a summary of information recorded for the whole trip that has to be completed by the observer at the end of the trip but BEFORE disembarking from the vessel.

L1(i): Cruise Details

Cruise Details	Start Date (dd/mm/yy)	*Record the date the vessels sailed for fishing grounds.*
	End Date (dd/mm/yy)	*Record the date the vessel returned to port at the end of the trip and the observer disembarks*

Form P1(ii) Vessel Details

Vessel Details	*Accurate vessel details can be obtained from the vessels registration papers. Ask the Captain if you can record them.*
Vessel Name	*Record vessel full name*
Vessel Type	*Note vessel type*
Port of Registration	*Record the port the vessel is registered in*
Captain's Name	*Record the full name of the Captain (Note the Captain may not be the same person as the Fishing Master)*
Length (LOA)	*Record the overall length (LOA) of the vessel*
Size (GRT)	*Record the gross tonnage*
Hold Capacity (M^3)	*Record the hold capacity in cubic meters*
Call Sign	*Record the Call sign*
Flag State	*Record the flag State of the vessel. This will be the country where the vessel is registered.*
Owner/Charterer	*Record full details of the owner of charterer or operator if not the actual owner.*
Fishing Master's Name	*Record the name of the Fishing Master*
Position-fixing equipment	*Record a full list of the electronic equipment on the bridge, noting make and model numbers. Take photographs if possible.*

P1(iii): Observer Details: Observer ID 1

Use ID 1 for this observer only to identify the data they collect and record routinely throughout this logbook
Note the second observer will record the same information for the ID 2

Name	*Record full name of observer.*
Nationality	*Record observers nationality.*
Employing Organisation	*Record details of the observer employing organisation.*
Contact name in organisation	*Record contact person in the observer employing organisation.*
Address/email/fax	*Provide full address and email details for observer employing organisation.*
Dates of Observation Program	*Provide the date the observer was contracted for the deployment*
Boarding Location	*Record port and country of embarkation onto the observed vessel.*

Disembarkation Location	*Record the port and country of disembarkation from the observed vessel.*
SEAFO Area fished	*Record the Area and Sub area in which the vessel fished.*
Time Zone (UTC +-)	*Record the ships time and time zone that data is recorded*

L1(iv): Fishing Effort Details for SEAFO Convention Area

Total number of sets undertaken during observation program	*Record the total number of sets made by the vessel during the trip*
Total number of sets observed	*Record the total number of sets that were sampled during the trip*
Total number of hook set	*Record the total number of pots set*
Total number of hooks observed	*Record the number of pots observed during your tally periods*

L2 = Fishing Description

Fields relating to the fishing gear description can be complex and it may be necessary to consult the Captain and Fishing Master to obtain some of the longline specifications.

Special attention should be paid to the longline design as this may differ considerably from vessel to vessel. Observers need to be familiar with the names of longline elements. The same gear component can have different names ascribed to it depending on the nationality of the vessel. These details are covered in detail in the manual section on Fishing Gear Description.

Form L2 (i): Longline description

Observers are required to weigh at least 30 line weights selected at random. This information is recorded in kilograms in the box provided. It is a good practice to copy the weights recorded into the spreadsheet and use the excel function to calculate the *average weight* and *standard deviation (SD*).

The spread sheet also has numerous field that are not applicable, depending on the gear used by the vessel. Some field are also served by a drop-down menu requiring a specific answer selected from the menu.

Longline Type	*Record the main longline type:* • *Auto* • *Spanish* • *Trotline* • *Vertical* • *Other (describe in cruise report)*
Target Species	*Record the FAO 3-alpha code from the menu (**TOP**) for Patagonian toothfish*
Method of Baiting	***Manual** or **Automatic***

	Note that Spanish and Trotline are always hand baited. Only Autoline is automatically baited with a baiting machine.
Offal dumping position	*Port side* *Starboard side* *Stern* *It is important to be correct in this field as it can have compliance implications* *If this changes throughout the cruise, supply the dates from when it was changed.*
Offal dumping during hauling	*Never* *Occasionally* *Always* *If offal dumping occurs at any other time please describe this in your cruise report.*

Three diagrams are provided, single, double (Spanish) and trotline systems, with boxes for the recording of distance between the line weights and the mass of the line weight used. If the mass of the line weights vary then record the mass of the minimum and maximum weights used on the line.

It is generally not possible to measure accurately the spacing between line weights and this information will come from the Captain of Fishing Master. However the relative spacing of line weights to the actual weight of the line weight has compliance implications. If the information provided to the observer does not appear to be correct then you can request and opportunity to measure this. The best time is during hauling when the top line or main line is being lead back to the rope bin aft. The positions where the down lines are attached are often marked on the main line and the spacing can be measured using a flexible tape. Other descriptive measurements may be added to the diagrams if needed."

Also collect samples of hooks used, attach a label to each hook describing its type, size and make and forward this to the SEAFO Secretariat. A detailed diagram of the gear should be drawn, showing all elements and dimensions and included in the cruise report.

L2 (ii): General Streamer Line Description (routine streamer line data should be collected on form L2 (iii) below.)

The use of a Streamer Line (Tori line) is a compliance function and it is essential that these measurements are accurately recorded both in the spread sheet and in the cruise report. The figures recorded in the cruise report must correspond to the General Streamer Line Description in the spreadsheet.

It is recommended that the observer record the streamer line measurements together with a member of the vessel crew designated by the Captain.

As the vessel may have several streamer lines that are not all the same it is also important to have them specify to you the line that complies with their permit conditions for you to measure and that these measurements are recorded in the spreadsheet.

There are several drop-down menus in this section that must be selected accurately.

Vessel equipped with a streamer line	*The observer must ask to see the streamer line and should monitor if it is deployed during setting operations. The unknown option will indicate the vessel is not deploying it or there is a language problem.* • ***Yes*** • ***No*** • ***Unknown***
SEAFO configuration	*To check this the observer must be familiar with the SEAFO Conservation Measure xxx/12*
Streamer line position	*Record the point of attachment of the streamer line* • ***Port side*** • ***Starboard side*** • ***Stern*** *Note if a vessel uses two or more streamer lines then the position of their designated compliant must be recorded.*
Streamer line over bait entry position?	*Record* • ***Yes*** *if the streamers cover the baited hooks* • ***No*** *it the streamers are to one side and hooks are exposed* • ***Unknown*** *(as the lines are required to be set at night it may not be possible to accurately record the position of the streamers.*
Is SEAFO educational material (e.g. ID guides) available on board?	*Record* ***Yes*** *if the streamers cover the baited hooks* ***No*** *it the streamers are to one side and hooks are exposed* ***Unknown*** *These materials should be visible as posters but also ask the Captain or Fishing Master is he has books etc.*

L2 (iii): Streamer line data (the fields to be collected are based on the diagram above)

This section should be filled in once every seven days or if the streamer line is changed.

L4 = Daily Setting Observations

Longlines are set from the stern of the vessel. The buoyline is first deployed and the anchor line is then run out. Once the anchor is deployed the main line starts running out. Downlines (droppers) are attached to the main line at intervals and the bottom line or trot sections are connected to the ends of the droppers as the main line is deployed. This process is continued until the whole line is set and the anchor at the end of the line is deployed.

A vessel often sets two or three lines in succession. The SEAFO Conservation Measure xxx/12 requires all lines to be set at night only in the SEAFO CA.

The observer will have to get most of the information to complete the L4 spreadsheet from the Captain or Fishing Master.

Observers should observe a percentage of the setting operations

L4 (i): General Information

Set Number	*Record the set numbers consecutively starting with the first set of the trip to the last set.*
Set Type: Research or Commercial (R/C)	*Record "**R**" if the set is a research set in accordance with a research plan being undertaken;* *or "**C**" if it is a normal commercial fishing set*
Longline Type Code	*Record the code for the line type. Note this would be the same as the codes recorded in the L2 Form for gear:* *AU: Autoline (single)* *SP: Spanish (double)* *TR: Trotline (vertical droppers/trots attached to a mainline)* *VL: Vertical dropline (a single Vertical dropline)* *OT: Other - please provide full specifications in your cruise report* *Note it is possible for a vessel using Spanish line to convert to trot line or the reverse. Should a vessel use both system a detailed explanation needs to be included in the cruise report.*
Trotline cetacean exclusion device used (Y/N)	*Record **Y** or **N** if the vessel uses a Cetacean Exclusion Device (CED) on all or some of the downlines.*
ASD Code	*Record the Division or Subarea*
Date of observation (dd/mm/yy)	*Record the date of your observation*

L4(ii): Setting Information

Set interrupted (yes/no)	*Record **Y** or **N** if for any reason the setting operation is interrupted. Reason for Interruption could be an entanglement of the main line or drop lines.*
Total interruption time (hrs)	*Record the total interruption time*
Vessel setting speed (knots)	*Record the average vessel speed in knots. This information will be obtained from the bridge.*
No. sets unobserved since last set	*If all setting operations are not observed then record the number of sets that were not observed before the current set.*

Start Setting	Date (dd/mm/yy)	*Record date at the time the vessel starts setting the line.*	
	Time (hh:mm)	*Record the time the anchor goes into the water as the start time.*	
	Latitude	degrees (-DD)	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*

	Longitude	degrees (DD)	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the start of the setting.*	
End Setting	Date (dd/mm/yy)	*Record date at the time the vessel starts setting the line.*	
	Time (hh:mm)	*Record the time the anchor goes into the water as the start time.*	
	Latitude	degrees (-DD)	*Record the whole degree of Latitude. Note south latitude is recorded as a negative (minus "–") number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Longitude	degrees (DD)	*Record the whole degree of longitude. Note east latitude is recorded as a positive number.*
		minutes (MM.mm)	*Record the minutes of latitude to 2-decimal places. Note this is a positive number.*
	Bottom Depth (m)	*Record the depth in meters (m) at the end of the setting.*	

Observation 1	Start	Date (dd/mm/yy)	*Record the date the setting observation stared for the first observation.*
		Time (hh:mm)	*Record the time the observation period started*
	End	Date (dd/mm/yy)	*Record the date the setting observation ended for the first observation. Note that the setting at night can go past midnight into the next day.*
		Time (hh:mm)	*Record the time the observation period ended.*

The same information is recorded if the setting is observed for multiple periods during the entire setting operation. Note a setting operation can take several hours, depending on the length of the line being set.

L4(iii): Alterations to Line setting

Alteration No. 1	Course (degrees)	*"Record the first line-setting course as a bearing (0–359°). This information will be obtained from the bridge.*
	Wind direction (degrees)	*Record the wind direction in relation to the course of the vessel.*
	Time (hh:mm)	*Record the time this information was noted.*

Record the same in any subsequent change in course

L4(iv): Details of Longline Setting

Some of the gear details will remain constant throughout the cruise and will coincide with the details recorded in the L 2 sheet (such as number of hooks per basket and spacing between hooks). However, details on length of line and number of baskets set are likely to change and the detail need to be obtained daily from the he Fishing Master's log.

It is good practice for the observer to check in on the bridge before starting a setting observation and check back on the bridge after the observation. This will allow an opportunity to cross-check some detail such as the vessels course and speed during setting and positions.

Main line length (m)	Record the total length in meters (m) of the main line set. This information will be obtained from the Fishing Masters log.
Number of hooks set	Record the total number of hooks set. This information will be obtained from the Fishing Masters log.
Number of Baskets/Magazines Set	Record the number of baskets or magazines set. This information will be obtained from the Fishing Masters log. Note that magazines apply only to auto line. Currently there are no vessels using auto line in the SEAFO CA.
Number of hooks per Basket/Magazine	Record the number of hooks per basket or magazine. This information is likely to be constant throughout the trip and conform to the L2 detail.
Percentage hooks baited	Record the percentage of hooks baited. For Spanish and trot lines made up in baskets this is likely to be 100% as the hooks are baited by the crew. However if the vessel is an auto liner then a baiting machine will be used to bait hooks. A fixed number of hooks has to be observed as a sample observation. The number of baited and unbaited hooks are counted. The percentage is calculated by dividing the number of baited hooks with the total number of hooks monitored and multiplied by 100. Record details of the automatic baiting machine, make and model in your cruise report.
Distance between branches (m)	Record the spacing between hooks. This information is likely to be constant throughout the trip and conform to the L2 detail. The observer can measure this personally when the baskets are made up between sets.
Distance of hooks off bottom (m)	This information will be obtained from the Fishing Masters. The distance of the hooks off the bottom will depend on the type of longline and longline setup. Auto line is usually a sinking line and can have integrated weighting (IW). Spanish line can be a sinking (negatively buoyant) or a floating line that will result in the section between weights floating off the bottom. This may also be enhanced using a small pressurised float. Trot line can also by raised vertically off the bottom using a small float.
Bait species	Record the species of bait used using the FAO 3-alphs code
Bait size	Record the length of the bait in centimetres (cm)
Bait proportion	If more than one bait species is used then record the relative percentages. For example 30% SQA 70% PIL

Deck lights during setting (On, Off)	Record if deck lights at the stern are "**On** or **Off** when setting.
Streamer lines used (Yes, No)	Record "**Yes"** or "**No"** if the Streamer line is deployed. As this is a compliance issue the accuracy of this reporting is critical. According to CM 25/12 the streamer line must be set prior (before) the line enters the water. Therefore if the line is not set before: the field must be recorded as "**No**" even if they set the streamer line a few minutes after the start of setting. Similarly if the streamer line is set before the start of setting in accordance with CM 25/12 and breaks off shortly afterwards and the rest of the set is completed without a streamer line the field will still reflect "**Yes**"
No. of streamer lines used	Record the number of streamer lines used. Provide additional detail on this in your cruise report. Note that if more than one streamer line is set then at least one must conform to the specification of CM 15/12
Offal dumping during setting (Yes, No)	Record "**Yes"** or "**No"** if you observe offal being discarded during setting.
Daylight period	Record if the line is being set during the **day** or **night**. Note that night is defined after nautical dusk and before nautical dawn.
Moonlight	Record the moon phase. This information can be obtained from a normal calendar. For example "first quarter" "half-moon" "full moon"
Bait entry position (Port, Starboard, Stern)	Record the position or side of the vessel that the baited hooks enter the water referencing Port, Starboard or Stern.

L4 (v): Seabird Activity for Day Setting Only (optional)

As setting is required to take place at night only it is unlikely that the observer will be able to accurately capture this information.

Should there be sufficient light during full moon periods it is worthwhile keeping notes under the field headings for your cruise report.

L5 = Daily Hauling Observations

L5 (i): General Information

Set number	Record the corresponding set number from the L4 sheet. Note the lines may not be hauled in the same sequence as setting but the data for the set mus be captured for the correstponding set specifications.
Date of observation (dd/mm/yy)	Record the date of your hauling observation

L5 (ii): Hauling Information

Number of hooks Observed for seabird and fish by-catch (tally period)	Record the number of hooks that are observed during your direct monitoring of the line being hauled. (tally period)
Set interrupted (yes/no)	*Record **Y** or **N*** Record Y if the hauling is interrupted for any length of time for possible mechanical breakdown or gear getting fouled. This

	does not include routine stopping the hauling to land fish or clear minor entanglement. Significant interruption time may occur if the main line breaks and the vessel has to steam to the opposite end to start hauling again. The vessel may also stop hauling and buoy the line off if there are serious marine mammal interaction or for severe weather.
Total interruption time (hrs)	Record the total time the hauling is interrupted.
Bird scaring device used during hauling (Yes / No)	*Record **Y** or **N*** Record if the vessel deploys a bird scaring device at the hauling station to keep seabirds away from the baited hooks being hauled.

Figure 35: Bird scaring device deployed at the hauling station on the starboard side.

Offal dumped during hauling (Yes / No)	*Record **Y** or **N*** Record if the vessel discards offal while hauling form the factory and note on which side of the vessel offal is being discarded.

Record the Start and End hauling position and times the same as that for setting operations.

Note: time spent in the factory sampling is not recorded as observation times.

Record your tally observation times the same as your observations times for setting observations.

L5 (iii): Gear Lost

Record in your note book details of the lost gear and attempts made to recover any of the lost gear.

Number of sections lost	Record the number of sections, when whole sections of either hook (bottom) line and if sections of the mainline are lost.
Number of hooks lost that were attached to lost sections of the longline	Record the estimated number of hooks associated with the lost section of line. This information should be obtained from the Captain or Fishing Master.
Number of other hooks lost (excluding hooks attached to lost sections)	Record the number of hooks generally lost on the line. There are several ways this information can be calculated. A number of section of the line being hauled can be monitored, counting the number of hooks lost and raising the relative percentage to the total number of hooks that should be attached to the sections hauled. Alternatively get from the vessel the number of hooks that were replaced on the line when remaking up the pots, being sure to subtract the number of damaged hooks replaced. Overall this data is subjective to error and the observer must look at the method that will provide the most accurate estimate.

L5 (iv): Observed catch composition during tally period

Observer ID	Record the Observer ID that is observing the hauling operation in accordance with their ID recorded on L1 form.
Was Haul observed for fish/invertebrate by-catch (Y/N):	*Record **Y** or **N*** ***Note** if an observation took place on the designated haul. If no observation took place then none of the other data fields will be filled in.*
Was the catch estimated by the Master or the Observer (M/O):	Record if the catch estimated was recorded by the Fishing Master (**M**) or the Observer (**O**)
Record the total weight of all sub-samples for this set (kg):	Record the total weight in (kg) of the combined subsamples taken during the set to record catch composition.
Species code	Record the FAO 3-alph code for the species recorded below.
total retained catch weight (kg)	Record the total catch weight in (kg) for the species for this section. This information will either be extrapolated for your sub-sampling or obtained from the vessel.
total discarded catch weight (kg)	Record the discarded weight of the species. Note if it is not possible to weigh the total then the weight may be calculated form a count of the discarded species using the mean weight calculated from the samples taken.
mean weight (kg)	Record the mean weight of all the samples by dividing the total sample weight by the number of fish in the sample.
observed number retained	Record the number of fish retained onboard
observed number discarded	Record the number of fish observed discarded

Observer ID	Record the Observer ID that is observing the hauling operation in accordance with their ID recorded on L1 form.
Was haul observed for fish/invertebrate by-catch Y/N	*Record **Y** or **N***
Estimate percentage of the haul observed for by-catch (%)	To get a percentage it is practical to observer a fixed number of hooks that can be calculated from the number of downlines observed coming up and the number of hooks set between each down line. The percentage is the number of hooks observed divided by the number of hooks set. However if sections of the line are lost then the number of hooks lost on these sections must be subtracted from the total number of hooks set.
Where were the majority of skates released (code)	You must record the code from the skate poster for release condition. Other than other bycatch that is mostly dead when hauled to the surface skates can survive and the policy is to release the skates as they come up and the skate condition is recorded according to the following criteria: **In *good health***,*(Condition 4 in exploratory fisheries skate condition poster)*, Skate alive and in good condition or may have some small injury that is not deemed to be life threatening; • No apparent damage • Minor hook damage, no other injuries

	• Minor damage to skin, not penetrating body cavity **In *average health***, *(Condition 3)*, Injuries serious enough to possibly reduce survival post release; • More extensive hook damage • Small part of intestine showing; prolapse • Soft tissue damage but corner of jawbone not exposed **In *poor health**, *(Condition 1 or 2)*, Skate with life threatening injuries: • crushed or missing jaws/mouthparts, • prolapsed intestines, • severely ripped muscles in the oesophagus and mouth
Were hooks normally taken out of the skates (Y/N)	*Record **Y** or **N*** from your observations of the crew handling the skates.
Species code	Record species code for each skate. As far as possible try to distingwish between *Raje spp*. [RAJ] hardnose skates and *Bathyraje Spp.* [BHY] softnose skates.
total retained catch weight (kg)	Record the total retained weigh of the species. This information will have to be obtained from the vessel.
total discarded catch weight (kg)	Record the discarded weight of the species.
observed number retained with tags	If tagged fish are recovered record the number of tagged fish.
observed number retained without tags	Record the number retained for the species. This should correspond to the total retained weight.
observed number discarded dead	Record the number of fish discarded. This should also correspond to the weight of the discarded fish.
observed number released alive	Record if any fish were released alive. This would either be tagged fish or those too small to be commercially viable.
observed number lost/dropped off at surface	Observer the number of fish lost at the surface.

skates only	observed number released alive good health	Record the number in (Condition 4)
skates only	observed number released alive average health	Record number in (Condition 3)
skates only	observed number released alive poor health	Record number in (Condition 1 & 2)
skates only	observed number released alive and seen predated	Record number seen predated on by seabirds or marine mammals.
skates only	observed number released condition unknown	Record number released in an unknown condition if you are unable to clearly view the skate at the time of release.

L6 = Biological Data Collection

A representative [*randomly selected*] sample of fish should be taken from each haul for biological data

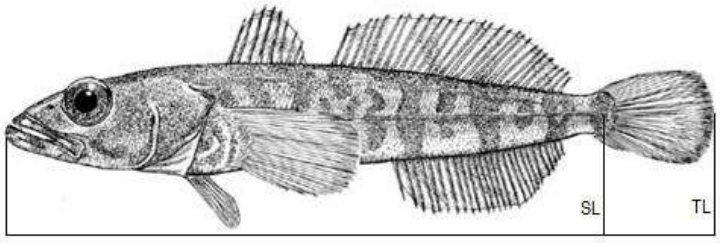
Sheet L6 SP), recommends for each set at least **20 *D. eleginoides*** be sampled for length, weight, sex and maturity and 20 gonad weights be collected for GSI and collect 5 otoliths for age and growth studies.

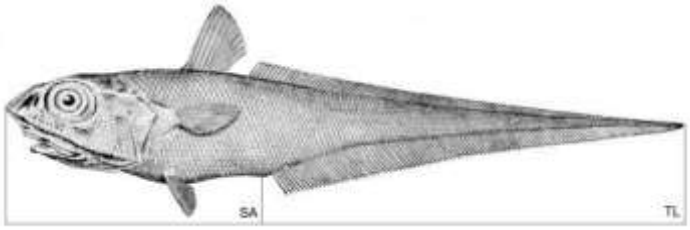
Alternatively for every 150 hooks set: sample one D. eleginoides and one D. mawsoni [if any of this species is caught] where less than 3000 hooks are set.

Fish should be selected randomly to ensure a representative sample of the size range of the fish caught are sampled. *Recommended that batches of fish [5 per batch] are collected as the fish are hauled and all fish in batch are sampled irrespective of size.*

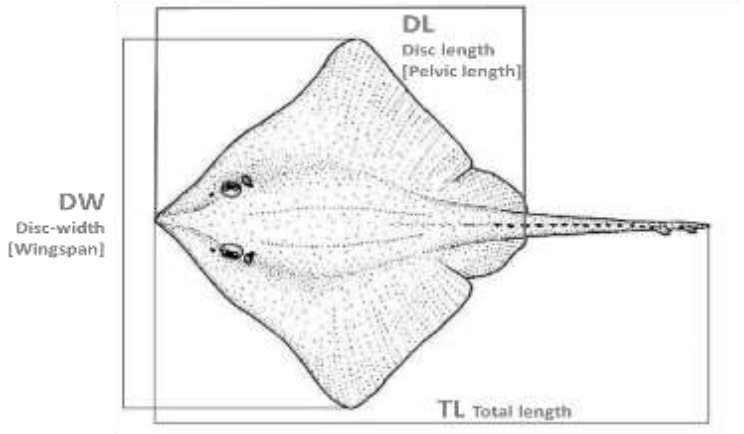
Note the procedure used for sampling fish, e.g. from the line, on the working deck or from the fish holding tank in the cruise report.

A representative sample [*of at least 10 fish per species*] of all by-catch are measured for length and weight.

Set number	*Record the set number of the line*
Date	Record the date that samples were taken. This should correspond to the hauling date.
Observer ID	Record the Observer ID that is observing the hauling operation in accordance with their ID recorded on L1 form.
Basket/ Magazine No.	To estimate the number and location on the line relating to each *Dissostichus spp.* sub-sampled, record the number of the basket or magazine relating to the fish being samples. The baskets and magazines should be numbered from 1, where 1 is the first basket or magazine set. *Note this information will have to be obtained from the officer hauling the line.*
Serial No.	Assign a serial number for each fish sampled. *For example; start with serial number 1 to the number of the last fish sampled for <u>each</u> species. The serial number must be noted on for any samples taken; such as otoliths*
Species Code	Record the FAO 3-alph code for the species sampled.
Scale/Otolith/ Both/Thorns	Record which sample was taken for age and growth studies.
Total Length (cm)	For toothfish and any other fish bycatch species record the total length to lowest whole centimetres (cm). 
Snout-Anus Length (cm)	For *Macrourus spp.* also record the snout-anus length in centimetres (cm).



Wingspan [Disc width] (cm)	For skates also record the wingspan [Disc width] length in centimetres (cm).
Pelvic length [Disc length] (cm)	For skates also record the pelvic length [Disc length] in centimetres (cm).



Weight (kg)	Record the total weight in kilograms (kg)
Sex	Record the sex: M = Male F = Female U = Unknown I = Indeterminate
Maturity Stage	Record maturity scale in numeric code 1 to 5 For Fish and other species except Skates and rays (see below) 1 = Immature 2 = Developing/Resting 3 = Developed 4 = Gravid/Ripe 5 = Spent For skates and rays 1 = Immature 2 = Maturing 3 = Mature The gonad maturity stage guide can also be downloaded separately with larger images here: https://www.ccamlr.org/en/document/science/dissostichus-eleginoides-gonade-maturity-guide
Maturity Stage Description	Reference https://www.ccamlr.org/en/science/ccamlr-scheme-international-scientific-observation-siso
Gonad Weight	Record the toothfish gonad weight in grams (g)

	This requires accuracy to the nearest gram if possible and should be weighted on a motion compensated scale.
Comments	Record detail on scales used and accuracy of scales. Also record any comment on sampling procedures that may influence accuracy or needs to be noted by data analysts and where data fields are not available.

Toothfish Maturity Guide

Female Maturity stage:	**Description:**
F1. Immature	Ovary small, firm, no eggs visible to the naked eye.
F2. Maturing virgin or resting	Ovary more extended, firm, small oocytes visible, giving ovary a grainy appearance.
F3. Developing	Ovary large, starting to swell the body cavity, colour varies according to species, contains oocytes of two sizes.
F4. Gravid	Ovary large, filling or swelling the body cavity, when opened large ova spill out.
F5. Spent	Ovary shrunken, flaccid, contains a few residual eggs and many small ova.

Male Maturity stage:	**Description:**
M1. Immature	Testis small, translucent, whitish, long, thin strips lying close to the vertebral column.
M2. Developing or resting	Testis white, flat, convoluted, easily visible to the naked eye, about $^1/_4$ length of the body cavity.
M3. Developed	Testis large, white and convoluted, no milt produced when pressed or cut.
M4. Ripe	Testis large, opalescent white, drops of milt produced when pressed or cut.
M5. Spent	Testis shrunk, flabby, dirty white in colour.

Skates and Rays

Female Maturity stage:	**Description:**
F1. Immature	Ovary invisible or contains only small (pinhead-sized) ova that have no trace of yellow or orange yolk. Uteri thread-like. No uterine egg cases.
F2. Maturing	Ovary contains small to medium (up to marble-sized) white to orange ova. Uteri may have visible swellings at anterior or posterior ends. No uterine egg cases.
F3. Mature	Ovary contains some large (greater than marble-sized) yellow or orange ova, in addition to small and medium ova. Uteri enlarged (>1 cm wide) and *may* contain egg cases. The presence of uterine egg cases guarantees that the female is mature, but females without uterine egg cases are still mature if they have some large ovarian eggs.

Male Maturity stage:	**Description:**
M1. Immature	Claspers short (not extending beyond pelvic fins) and uncalcified.
M2. Maturing	Claspers extend beyond pelvic fins but are soft and uncalcified (rarely, some calcification may have begun).
M3. Mature	Claspers extend well beyond pelvic fins and are hard, rigid and calcified.

Random sampling for conversion factors of unprocessed weight (greenweight) to processed weight must be recorded for each species of finfish that are processed during the trip.

Record a detailed description of the processing method and type of equipment used (e.g. manually cut with a knife, fed through saw, automated cutting or filleting machine, peeling machine) in the comments section of the form.

Where appropriate, illustrate the angle and position of the cuts used.

Use a separate data form for each processing method. If processing methods change during the trip, record the date and reason for the change in the comments section. Supplementary information may be submitted as needed.

The suggested sample size for *Dissostichus spp.* should be 20 fish or 200 kg per week.

Take samples that cover the whole size range of the target species caught. If necessary, use size categories and report the range of length in each category (e.g. small, medium, large).

Weigh the sample of whole fish (fresh whole weight) then pass the fish through the factory processing system (with the help of the factory manager). Recover the processed fish and weigh the product (processed weight).

All weights must be in kilograms.

Haul No.	Record the set number of the line
Observer ID	Record the Observer ID that is observing the hauling operation in accordance with their ID recorded on L1 form.
Species Code	The FAO ASFIS three-character code which identifies the species of fish.
Processing Code	Record the relevant processing code [table below]
Length Range	If fish are measured in batches and entered into a single row then record the minimum and maximum length of the fish in the batch. If fish are individually measure then just record the fish length.
No. of individuals	Record the numbe of fish in the batch
Weighing Code	Record the weighing code. 1:motion-compensated electronic scales 2: non-motion-compensated electronic scales 3: spring balance 4: beam balance 5: other (describe in cruise report) Ensure that the same device is used to measure the fresh whole and processed product for each sample
Green Weight (kg)	*Record the unprocessed weight of the fish before bleeding or cutting.*
Processed Weight (kg)	*Record the final processed weight of the fish before freezing.*
Grade	*Record the grade assigned by the factory.*
Conversion Factor	*Divide the Green Weight [unprocessed weight] by the processed weight.*

	Note this number will always be more than "1"
Processing Cut Description	*Record the processing cut type. [Note details in cruise report]* • *Straight cut - bandsaw* • *Straight cut - hand* • *V cut - bandsaw* • *V cut - hand* • *J Cut* • *Other - describe in comment field*

Processing Codes	**Processing Code Description**
HAG	HAG : Headed and gutted (tail not removed)
HAT	HAT : Head and Tail removed (viscera not removed)
HGT	HGT : Head, gut and tail removed
WHO	WHO : Whole
FLT	FLT : Filleted
GUT	GUT : Gutted only (head and tail on)
OTH	OTH : Other - please describe in cruise report

L8 = Waste Disposal

This form is designed to collect summary information relating to the loss, retention and discarding of fishing gear and waste products at sea.
The form is to be completed by the Observer once for each cruise.
Observers are to record if an incinerator or waste storage facilities are present on board the vessel. For retained waste, indicate if it was retained on board for disposal at port or incinerated.
Fishing Gear: This refers to all fishing gear that is no longer usable due to damage, loss, or hooks and sections of line that are cut off (e.g. when the line is cut to release a shark or marine mammal).
General Waste: This refers to all other waste such as plastics, metal, packaging material, oil and sewage.
Lost refers to gear or waste that was unintentionally swept into the sea; e.g. washed into the sea due to rough weather or the loss of a longline or trawl net etc.
Discarded refers to the intentional dumping of gear or waste into the sea; e.g. the dumping of galley waste, plastics or damaged fishing gear.
The frequency for which these items are either lost or discarded has been divided into three categories:

- occasionally (less than once a week or once a month)
- weekly (up to several times a week) and
- daily (every day).

Space is provided for comments, but specific problems or concerns should be written up in the observers cruise report.

Snoods	Snoods are the line of cord that attaches hook to fishing line or the clip on trotlines. Note this applies to the snook without the hook. *These are generally found in the area where lines are repaired and new pots or cases are made up.*
Snoods and hooks	This will apply if a hook is still attached to the snood.

	This often occurs when hooks are broken or bent and the snood and hook is just cut off.
Hooks in offal discharge	Look for hooks in the offal before it is discarded. Hooks are often broken off the snood when the toothfish or bycatch pass through the roller. As this is a compliance issue the observer must actually see the hooks in the offal or whole by-catch that is being discarded. (*Do not assume the hooks are in offal being discarded*)
Weights and anchors	These will include the line weights that are attached at prescribed intervals along the length of the fishing line as well as anchors on either end of the line. The observer can record lost line weights during their line observation period (tally period) Anchors can be lost when they are stuck on seabed.
Sections of mainline	If the mainline or gets fouled on seabed, sections may be lost. Best to get this information from the fishing master.
Trawl nets	On a trawler, record if the net or codend is lost or if sections of the net are torn off.
Pots	Pots can refer to crap pots or the pots in which the fishing / hook line or trots are made up for setting. Sometimes these get caught on the hooks and are lost overboard. *This is sometimes recorded when the observers are monitoring the line setting operation.*
Floats/Buoys/Bobbins	These items are often lost if gear is fouled on seabed. Best to ask fishing master about this.
Streamer line sections	The streamer line can sometimes get entangled with the longline during setting and break off.
Rope	Anchore Rope is sometimes lost when gear gets fouled on seabed. Rope offcuts are also generated when gear is maintained and the observer should monitor this.
General Waste	
Galley waste organic	Organic waste from the galley is and food material that can consist of peelings from vegetables or uneaten food.
Galley waste inorganic	Inorganic waste from galley generally consists of tins and bottles
Plastic (bags etc.)	Any plastic material from wrapping, bags, plastic bottles.
Plastic packaging bands	This is any strapping material used around boxes. Note the use of packaging bands around bait boxes is a compliance issue.
Metal/Glass/Bottles	Same as for galley inorganic waste
Paper/Cardboard	General paper material that is burnable
oil	Old cooking oil or oil from engine room. Hydraulic equipment can sometimes leak or break, releasing hydraulic oil overboard.
Sewage	Some vessels have sewage tanks and release this at intervals or toilets may empty directly into sea.
Polystyrene etc.	Any polystyrene or insulation material. This material is highly buoyant and can easily be seen if discarded.
Incinerator ash	Record if the incinerator ash is discarded overboard or retained with other inorganic waste.

L9 = Sightings of Unidentified or IUU Vessels

This form is to be completed by Observers only

This form is for reporting sightings by observers of unidentified vessels, or those vessels suspected to be engaging in IUU fishing activities. If a vessel is sighted several times within a day, note each time and position in the comments section or complete a new form.

Comments: Indicate the direction in which the vessel was steaming. Summarise any radio conversation that took place. Record the level of seabird and marine mammal activity in the area.

"Diagram of vessel: Draw the profile of the vessel, indicating

Observer ID	Record your ID number "1" or "2" as reflected on the L1 Sheet
Vessel Name Call Sign Flag	Record the vessel name, call sign and flag if you van visually observe the vessel and details or record the above details if obtained from radio contact with the vessel (*the source if this information visual sighting or radio contact must be reported*).
Distinguishing markings	Record any noticeable markings, dents or structural damage or modification. If possible take clear photos from different angle to obtain view from different profiles.
Vessel Type	Describe the type of vessel and gear sighted (e.g. longliner, trawler, factory ship, carrier ship) or any other type that may be evident from the vessel profile or if gear is observed. [for example extended roller used for gillnets]
Initial position	Record your co-ordinates [in latitude and longitude of the initial sighting of the vessel, and note in comment the range and bearing from your position.
SEAFO Area	Include the SEAFO Convention Area/Subarea/Division.
Contact/Sighting	Record if it was a visual sighting or radar contact.
Radio contact with vessel	Record if radio contact was made and try capture details of the communications.
Vessel activity	
Date and Time	Record the date and time of the sighting time
Activity	Record whether the vessel was fishing, setting fishing gear, trawling, hauling or other activities.
Tori line	Record the presence/absence of a streamer line.
Heading	Record the heading the vessel is steaming in (degrees).
Record of sighting	Indicate if the sighting of the vessel was photographed or recorded on video
Sketch of vessel	Make a sketch of the vessel to highlight distinguishing features or markings that could be used for identification.

Comments	Record any additional information on the direction in which the vessel was steaming or changes in direction. Summarise any radio conversation that took place. Record the level of seabird and marine mammal activity in the area.

L 10 = DR-Bottle Test

These notes are supplementary to SEAFO Conservation Measure (25/12) and describe in more detail how to conduct a Line Sink Rate Test and record the test results.
There are two methods of conducting a sink rate test:

- using a TDR (Time Depth Recorder) or
- using a Bottle Test.

The data recording and test randomisation are basically identical for both types of test.

Set ID	Record the set ID corresponding to the setting numbers on the L4 sheet
Observer ID	Record the ID number "1" or "2" as reflected on the L1 Sheet for the observer undertaking the line sink rate test.
TDR or Bottle Test	Record **"T"** for TDR (Time Depth Recorder) or **"B"** forBottle Test
TDR/Bottle Number	Give each TDR or Bottle test a unique identification number for refrence.
TDR/Bottle Position	Record where the TDR or Bottle was attached: W = At weight attachment point M = Midway point between weights B = Between midway point and weight
Time to sink (seconds)	Enter the time taken to sink 10 m in seconds. *Note for a TDR this information will only be obtained after the line is hauled and the information is downloaded from the TDR* *For Bottle test the time is taken from the time the bottle clip hits the water until the bottle disappears below the surface.*
Sink Rate (m/s)	The sink rate is calculated by dividing "10" by the time it took the line to sink to 10m. *Example. It took 25 seconds before the bottle disappeared.* *Therefore the sink rate is 10/25 = 0.4m/s* The sink rate should be equal to or greater than 0.3 m/s
Test performed normally (y/n)	Record: Y: test was uninterrupted, not tangled, sank normally and is therefore usable. N: there was a problem with the test, it got tangled or you could not see it to accurately measure the time etc..
Comments	Note any lost TDR's or Bottles, Null results or failed tests.

PART G: SCIENTIFIC OBSERVER CRUISE REPORTS AND NOTE BOOKS

POINTS TO NOTE WHEN WRITING OBSERVER REPORTS

The "SEAFO Scientific Observer Longline Vessel Cruise Report" is an official document and an integral part of the SEAFO Scheme of International Scientific Observation. A completed cruise report is a confidential document that provides important feedback to the SEAFO Secretariat, and is shared with the Commissioner of the vessel's Flag State.

The format and objective of the report are to provide:

- summary cruise information in the specified tables; and
- general commentary and feedback under specific headings, particularly for details which are not captured in the Longline Observer Logbook.

To meet these objectives observers are required to maintain a personal note book that captures wide-ranging information on all aspects of their work and fishing practices during the trip.

> Don't think you will remember ALL incidences or observations by the end of your trip.
>
> WRITE IT DOWN

Provide clear wording in the report when documenting any potential compliance issues during a trip. Be aware of the relevant Conservation Measures and reference if applicable.

If issues of compliance are noted in the report they may be referred to at the Commission's annual Compliance Evaluation Procedure meeting.

> DO NOT FORGET
>
> *At no stage will you ever be asked to enforce or advise on Conservation Measures while on-board a vessel*

In the cruise report format, the wording in italics under each section is there to provide guidance for narrative in that section. [*It is not limited to the suggested information*]. Please remove the instruction once you are ready to submit the report to your supervisor.

In addition, the observer is not limited to the prescribed headings and can append any additional information that they think is important and they are encouraged to do so.

Observers must provide clear descriptions of all information collected and observations made relevant to a specific section, and are encouraged to attach photos and diagrams in this cruise report where appropriate to aid in descriptions.

The summaries in the report are based on the recorded data in the electronic logbook.

Observers must ensure that details between the two documents are consistent.

A cruise report must be written starting with a blank copy of the SEAFO Cruise Report format.

A constant and recurring problem experienced with observer reports is the practice of observers CUTTING and PASTING text from other reports

THIS IS NOT PERMITTED AND IS UN-PROFESSIONAL

It copies across formatting from the copied document, it can destroy or make the new report un-manageable and it can introduce viruses to your computer

DON'T DO IT

TRIP SUMMARY

The trip summary should give a short, and clear summary of the content of the report. Write this section of the report last, once the other sections have been completed.

It should not be longer than a single page and should provide the reader with the most important information for a particular cruise.

Follow the headings in your report when writing the trip summary and use the following guidelines:

- paragraph 1 should give details on the vessel, the flag state, the name of the observer(s), his/her nationality, the target species, the areas fished and the period(s) when fishing occurred;
- paragraph 2 should give a short summary of the cruise itinerary (dates and ports of departure and return etc.);
- paragraph 3 should give a short summary of fishing operations – the number of days fished & days lost, the number of sets/trawls, the number of hooks/pots set, the fishing depth, bait types used and the number of hooks/hauls observed;
- paragraph 4 should give details on target species catches (number, weights and products), and the CF used, (observer and vessel);
- paragraph 5 details on by-catches, species number and weight;
- paragraph 6 should give a short summary of biological sampling done by the observer (e.g. length, weight, maturity, otoliths, tagging etc.);
- paragraph 7 should give details on bird mortalities, entanglements, mitigation measures, marine mammal entanglements and interactions etc.;
- paragraph 8 should mention any vessel sightings (important for IUU vessels) and difficulties encountered (with operational issues and observer tasks;

- additional paragraphs can be added to cover other relevant information.

ONLY WRITE THE TRIP SUMMARY **AFTER** YOU HAVE FINISHED WRITING YOUR REPORT

FORMAT ISSUES IN OBSERVER REPORTS

Date format:

Use only this following date format:

- in the report text (dd/mm/yyyy), e.g. [04/11/2018]; and
- in tables the shortened format (dd/mm/yy), e.g. [04/11/18].

Species names:

The first time a species is mentioned in the title or text it should be written out in full, e.g. *Dissostichus eleginoides* and then followed by its common name.

E.g. *Dissostichus eleginoides,* Patagonian toothfish or *Dissostichus mawsoni,* Antarctic toothfish

- the genus name (1st of the two names) always starts with a capital letter;
- the specific epithet (2nd of the two names) always begins with a small letter;
- the genus and species names are always written in italics;
- after the species name has been written out in full the first time, it must be abbreviated to the genus represented by first capital letter and a full stop followed by the species,

  e.g. *D. eleginoides*, i.e. the genus has been abbreviated
- Don't use codes (i.e. TOP instead of *D. eleginoides*), in the text of the report, only use the codes in tables.

If you need to mention the species name many times in your report you may find it better to use the common name, but the species name should always be included when mentioning an organism for the first time.

Common names of fish, bird & mammals etc. should be written in small letters, e.g. giant petrels and not Giant Petrels

By-catch:

By-catch can be written with a hyphen or without i.e. by-catch or bycatch but be consistent throughout the report.

SEAFO Convention Area

The SEAFO Convention Area is divided into numbered statistical areas that are further divided into subareas for research and reporting purposes:

- check that the area fished is correctly referenced:
    - statistical subarea; or
    - statistical division;
- when referring to different subareas use a small letter,

e.g. “fishing took place in two statistical subareas.”A1 and D1

Formatting - page layout, text and tense

Body text should use the following format:

- font: Times New Roman, regular, size 12;
- table text and figures should be Times New Roman, regular, size 10
- paragraphs should be aligned to the left [Not “justified to both margins]; and
- line spacing single.

Note:

- headings in the SEAFO report are formatted. If you add headings to your comments do this first in unformatted text; and
- Report margins are formatted to “mirrored margins”.

Numbering:

Use the metric system of measurement and abbreviate measurements without periods (i.e. 1cm and 3kg)

- numbers smaller than 10 should be written out in full, (i.e. one line was lost and 22 lines were recovered);
- unless the number is associated with measurements (e.g. 6mm or 2g); and
- numbers larger than 10 are written as numbers. For example, a total of 215 fish were sampled for standard and total length.

Reporting on specific incidents:

Reports are written in the “third person” and not the first person (i.e. I or we).

E.g. Do not write “<u>the observer saw hooks in the offal on 2 occasions</u>”

it should be written “<u>hooks were observed in the offal on two occasions</u>”

Within the report, the exact format of particular items is less important than consistency of application.

E.g. you can write "%" or "percent" but do not mix the formats using the one in one part of the report and the other in another part of the report.

Tense

Use the past tense and be consistent within the report. Do not use the present tense.

Note:

- "data" is plural and "datum" is singular; and
- species is singular and plural.

Paragraphs

Divide paragraphs correctly covering a single topic or subject in a paragraph. Use starting and ending sentences that indicate the purpose of the paragraph. A report or a section of a report should not be one long paragraph.

Using bullet points

If you wish to list a number of points or items in a sentence then consider using bullet points for clarity.

For example, the following sentence covers several species separated by a “comma”.

The weight and number of the major by-catch species caught included Grenadiers, *Macrourus spp*, 6513 fish totalling 6764.69 kg, Icefishes, *Channichyidae*, 2978 fish totalling 943.12 kg, Violet cod, *Antimora rostrate*, Moray Cod, *Muraenolepis spp,* Antarctic Rockcods, *Nototheniidae*, Plunderfish, *Pogonophryne spp.* and a single Octopus spp, *Octopodidae*.

This could be listed clearly using bullet points

The weight and number of the major by-catch species caught included:

- grenadiers, *Macrourus spp.*, 6513 fish totalling 6764.69 kg;
- icefishes, *Channichyidae*, 2978 fish totalling 943.12 kg;
- violet cod, *Antimora rostrate*;
- moray cod, *Muraenolepis spp.*;
- Antarctic rockcods, *Nototheniidae*;
- plunderfish, *Pogonophryne spp.*; and
- a single octopus spp, *Octopodidae*.

Remember:

- to introduce the list using a colon [:];

- the first word of each bullet point starts with lower case and the point ends with a semi-colon [;]; and
- the last point end with a full stop. [.].

Referencing figures and tables.

Photographs and tables in the report must be clearly labelled using captions. Use "REFERENCES, Insert Caption" tool on your menu. Select figure or table as required. Note, figure captions appear under the figure whereas table captions are situated above the table.

Use the cross-reference function in your text to refer to the figure or table, which will automatically enter the figure or table number. Figures and tables appear after the reference in the text.

E.g. All fish were measured for total length (TL) to the lowest whole centimetre (Figure 1).

Figure 1: Fish measure measured to total.

OBSERVER NOTE BOOKS

A SEAFO SISO observer is expected to record prescribed information in the SEAFO logbook however, additional information not routinely captured is also important and the Cruise Report is designed to capture this information. Therefore the information recorded in your notebook should cover observations in addition to the information recorded on the data sheets.

The primary objectives to keeping a note book are *inter alia*:

- provides notes and information that can be added to and enhance the content of reports;
- provides a historical record of observation and actions taken that can be referred to at a later date;
- records points made in informal conversations that can be referred to at a later stage;
- records actions observed or taken in different circumstances.

Some examples of relevant information that could be recorded:

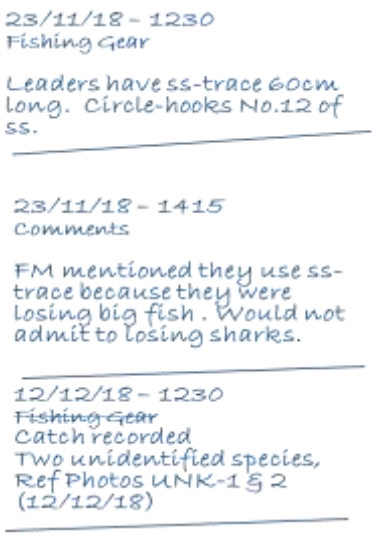
- information on fishing strategy;
    - is the vessel fishing on hard ground or on less rough terrain?

    - are the lines being set on slopes, over the tops of hills or in trenches?
    - are the length of lines changed to suit changes in topography?
    - are line lengths changed to mitigate against by-catch limits per line?
- consequence of area fished and gear loss.
- does the catch composition, condition, size etc. of toothfish and by-catch differ from area to area?
- does the moon phase, sea temperature or sea depth have any effect on the catch composition?
- record metrological data such as pressure, cloud and temperatures as well as changes in the weather conditions; and
- record the change in seabird numbers and species composition between time of day and for different areas.

Observers are expected to make a concerted effort to identify fish, invertebrate, marine mammals and seabird species. When this is not possible or a new species is encountered, record detailed notes and back these up with photographs that are referenced in your note book and later in your report. If possible bag, tag and retain.

Keeping a note book is a discipline that must be learnt and practiced AT FIRST IT IS NOT EASY TO MAINTAIN but gets easier with time and practice.

Notebooks are official documents and must be kept secure at all times as they are strictly confidential. The company will ask you to submit them at the end of the trip.



Guide to setting up and keeping a notebook

- entries should follow a professional format and capture information on a wide range of topics.
- Start off each entry with a heading and date and time;

Use the section headings in the cruise report format as a guide in the beginning to head off notes. This assists in collating your notes into your report at the end of the trip.

- Rule-off each entry to separate it from the next entry;
- don't attempt to scratch out errors just put a line through it and follow with corrected information;

Your notebook is not going to be assessed for spelling or grammar;

- deleted entries should be ruled through with a line and signed off with a date inserted;
- number your pages consecutively so pages missing can easily be noted;
- entries should be in chronological order;

- cross-referencing can be made to previous entries.

How to keep a note book:

Make times to capture information such as:

- quiet time when having a cup of coffee;
- after a conversation or when taking a break between activities take a minute to catch up on anything you think important.

ANNEXURE 1: OBSERVER DEPLOYMENT LOGISTICS

OBSERVER CHECKLISTS

Given that individuals may be required to travel large distances to meet their vessel and facilities may be limited, it is recommended that Observers be prepared to travel with all essential items required for a trip. A provisional checklist includes:

- Passport
- Cash (reasonable amount to cover taxi, etc.)
- Credit card
- ICCAT ID Card & Letter of Introduction
- Copy of the MoU
- Language Phrase Book(s)
- Mobile / Cell Phone
- Programme Manual
- Observer Data Forms
- Laptop Computer
- Electronic database where applicable
- Safety Equipment issue
- Sampling Equipment

RECOMMENDED HEALTH & SAFETY EQUIPMENT ISSUE

Health and Safety equipment issued should include all of most of the following items:

- immersion suit;
- Personal Floatation Device (PFD), (A minimum safety requirement for the vessel will be to supply the observer with a SOLAS approved Life Jacket)
- strobe light;
- signal mirror;
- Personal Emergency Position Indicating Radio Beacon (406 MHz EPIRB, preferably with integral GPS navigation receiver).
- dry bag to store gear and serve as an emergence “grab bag” onboard.

Taking into consideration the working environment on-board fishing vessels the observer’s operational health and safety gear should include *inter alia*:

- safety helmet;
- waterproof boots with steel-cap toe and ankle protection;
- waterproof clothing;
- working gloves (sufficient to last a trip);
- Working Personal Floatation Device (This could be the same as issued above);
- sun protection cream; and

- suitable dark glasses.

PROFESSIONAL EQUIPMENT TO UNDERTAKE THE TASKS ALLOCATED

Professional equipment to undertake the tasks allocated to them should include:

- species ID publication (FAO identification guides);
- data recording forms;
- laptop computer with the database installed to ensure timely and submission of satisfactory data;
- camera;
- measuring board, callipers and take to record length measurements;
- scales to weigh samples;
- waterproof paper or waterproof slates for on-deck recordings; and
- knife and forceps.

OBSERVERS BRIEFING

Prior to being deployed observers will be given a formal briefing. The process will include checking that all items on the check-lists are in place and observers will sign for issued equipment. The objectives of the trip and any special sampling requirements will be discussed in detail. The observer will also be advised on the reporting requirements for the trip. The following documentation should be provided:

- briefing notes outlining their assignments for the trip;
- travel itinerary and any necessary travel documents to enter the country and access the port where the vessel is docked, (These will include *inter alia* contact name and numbers of the vessel agents and owner);
- depending on their contractual arrangements with their controlling organisation, the observer may be required to sign a contract for the deployment period;
- copy of the pre-sea safety check list; and
- copy of the MoU with the vessel operators.

DEPLOYMENT

Prior to embarking on-board a vessel, the observer will have to undertake a pre-sea safety inspection of the vessel, Appendix II. The object of these inspections is to confirm that all the required safety equipment are present on-board. Should the minimum requirements of the checklist not be met the observer may not embark until they have contacted and reported these to their controlling organisation. Observers are not considered as qualified safety inspectors and the minimum requirements are items of safety equipment that can be clearly ascertained as present or not.

Once embarked observers will be required to send an “embarkation report” back to their controlling agency within 24-hours of the vessel leaving port.

IN-TRIP REPORTING

The observer will be required to submit a series of reports to the controlling organisation at predetermined times throughout each trip. These include:

- Deployment Report (within 24-hours of the vessel sailing)
- Five-day status report
- Preliminary trip summary report and full set of data forms

Deployment Report

Within 24 hours of the vessel sailing the observer must send a deployment report to their controlling organisation. The content will include confirmation of the contact details of the vessel and serves to set up and confirm the line of communication between the observer and their controlling organisation. This report includes the outcome of the pre-sea inspection as details of flights and logistics prior to boarding.

If a report is not received within 24 hours of the due date, the observer coordinator will contact the vessel operator to send a message to the vessel to remind the observer of his/her obligation in this respect. If a report is not received within a further 24 hours it will be assumed that there is no means of formal communication with the vessel and the vessel operators will be contacted to make arrangements either to establish these or request the immediate return of the observer. Taking into consideration that a breakdown in communication may also indicate an emergency situation with the vessel, emergency search and rescue operations may be initiated.

Five-day Status Reports

Throughout deployment observers will be required to send status reports to their controlling agency on specific dates. The monthly schedule for these will be the 1st, 6th, 11th, 16th, 21st and 26th days of the month to report on the preceding five days. The report will provide a summary of fishing operations, catch and sampling undertaken during the period covered. Following a similar procedure to the deployment report, should a report not be received by the time the next report is due the observer coordinator will start the process to establish contact via the vessels operators. In situations where reports have previously been regularly received it may be deemed that there is a problem with the observer's well-being and appropriate action may be necessary.

Preliminary Trip Summary Report

At the conclusion of the trip, prior to disembarking, the observer must prepare a brief summary report of the trip. The report should include details of sampling, summaries of catches and processing, interactions with protected and threatened species and any notable incidences with respect to the vessel operations or weather. The observer will be expected to give a copy to the vessel Captain or Fishing Master and they will be advised to forward any comments they might have directly to the observer's controlling agency within a specific time period (to be defined by the controlling agency). This summary report will also form the basis for the observer debriefing.

OBSERVER RETURN - DE-BRIEFING

At the end of the trip the observer will be required to attend a formal debriefing. This process will include returning the issued equipment and presenting all the data collected for the trip. The observer's coordinator will be expected to run routine checks on the data. The observer will also have to present a preliminary report of their trips and this will be discussed with them.