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Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
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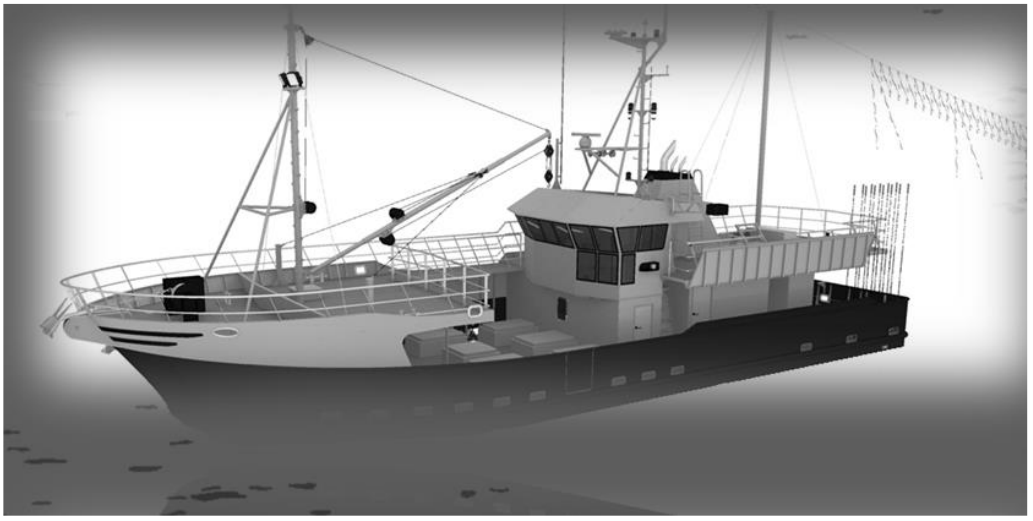
IOTC Regional Observer Scheme

Scientific Field Observer Training

Scientific Field Observer

Guidelines for Observers on Pelagic Longliners



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INTRODUCTION

Observers collect valuable fisheries information which cannot be collected any other way. They provide much of the information needed to understand and manage the fishery and help enforce legislation.

The data is costly to gather in terms of both funding and work hours. It is therefore important that observer follows work and sampling protocols, respects sampling instructions and priorities, and completes data collection forms accurately to ensure that the collected data is of high quality and can be used for the intended purposes.

Follow the simple instructions in this section to ensure accurate, clear data is collected.

Consult observer manual and workbook regularly to avoid repetitive errors.

OBSERVER CONDUCT

Your role is to monitor the fishing activity of a pelagic longline vessel for the entire duration of the trip. As an observer, you must collect accurate information and closely follow the instructions below:

- You've embarked with the consent of the vessel owner and of the captain. Nevertheless, your stay on the ship will go all the better if you integrate yourself with life on board.
- Keep good relations with the crew and inform them of your objectives.
- Explain to the captain your observers' duties and the data confidentiality issues and ask him where can you can place yourself when conducting your work. Find a solution that suits both parts if you think the first proposal is not good enough.
- The captain will be your constant source of information. However, be respectful and do not disturb him when he is busy with an important task. You must interfere as little as possible with fishing operations in general while conducting your work and without impeding the work of the crew.
- You must not get involved with the commercial fishing operation of the vessel or crew. You do not have to search for fish with the crew. You will not participate in the handling and operation of the gear.
- The information you collect is strictly confidential. You are not to make copies, share or mention what has taken place on board the vessel to anyone other than the captain of the vessel on which you've embarked and the persons responsible for the observer program, whether at sea or on land. This includes any photographs or video footage that you collect.

You are responsible for the accuracy of data collected.

FALSIFYING INFORMATION IS FAR MORE SERIOUS THAN NOT COLLECTING IT AT ALL.

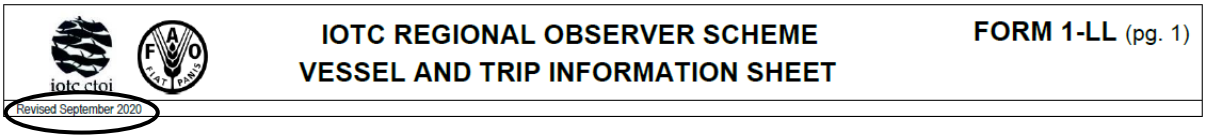
GENERAL INSTRUCTIONS

>> FORM EDITION

Observer forms may be revised by the IOTC. Changes that have been made to observer forms and other materials developed to support the IOTC Regional Observer Scheme are available on IOTC's website.

Which form edition to use?

CHECK you have the most current forms at https://iotc.org/science/regional-observer-scheme-science. *Ensure that old form editions haven't been picked up by mistake. All older editions should be disposed of. Avoid mixing forms from different editions (or revision dates) during one trip. However, if you find yourself at sea with mixed editions of forms fill in the forms as you find them, using the format and codes marked on the form. The form revision date is marked on the upper-left-hand corner of all observer forms and indicates the date the form was last reviewed.*



>> INSTRUCTIONS FOR FILLING IN THE FORMS

On the notes section of every observer form there are detailed instructions about the information to be recorded for each data field. **Read these instructions carefully to find out exactly what data to collect**. All forms will be reviewed at a debriefing at the end of the trip.

Each small box on a form is called a data field. The information collected in each data field is defined by the data field header.

>> FILL IN FORMS ONLY WHEN ONBOARD

Only start filling your notebook and forms when you embark the vessel you've been assigned to. The first data fields to be filled in will be the *departure port*, *date* and *time* on the *Form-1*. Form filling will then continue until the trip ends and the observer leaves the fishing vessel. The last data fields to be filled in will be the *return port*, *date* and *time* also on *Form-1*.

>> FILL IN ALL FORMS

At least one of each type of form must be filled in during every trip. If there is no relevant information to fill in for a particular form, make a comment on the first page of that form stating the reason. For instance, if there were no tag recoveries observed, make a comment such as "*No tag recoveries observed this trip*" on the Form-5. The person responsible for your debriefing will then know that no forms were forgotten / left out by accident. You do not have to repeat this declaration more than once per type of form.

>> FILL IN ALL REQUIRED DATA FIELDS

Every data field must be filled in or a dash (-) must be put in the field. Leaving data fields blank does not tell the person responsible for debriefing whether the information was simply not available or if the observer was unable to record it for some reason. A dash in the data field means the observer tried to get the information but could not. The information might not have been available, the language barrier may have made it difficult to get, or the observer may need extra guidance on how to collect the data. Whatever the reason, if a dash is inserted in a data field, **always make a note in your notebook or in the trip report to explain why the information was not filled in.** If the person responsible for debriefing can see why the data field was not collected (-), they can confirm that the observer has completed the work or, if necessary, give them further help on collecting the data and filling in the form.

>> CHOOSE THE BEST OR MOST INFORMATIVE CODE

Each data field should have only one answer (except for comment data fields and multiple answer data fields). Choose the most accurate or most informative code(s) when choosing between codes. For instance, if a damaged yellowfin tuna was retained onboard and then eaten by the crew, the observer may need to choose between multiple codes say, DPQ (discarded – unfit for human consumption), or RCC (retained - crew consumption). In this example, the observer should record the RCC fate code. Therefore, the RCC code is the most informative code.

>> ONLY RECORD DIRECTLY OBSERVED INFORMATION

All information recorded on data forms should be information that has been directly observed by the observer. Nonetheless, you should maintain constant communication with the crew as their collaboration can be helpful many times.

Do not copy information from the vessel's records on to the observer data collection forms unless this is clearly indicated. If observers do want to record information that they did not personally witness (for instance - they missed a set position) they must make a comment on the form, stating where the information came from.

 **Attention!**

Experience shows that vessels can deliberately give observers incorrect data. Such faulty data entries can harm the rest of the observer's data. Avoid this by always commenting if the information recorded was not directly observed. However, observers are recruited and paid to observe vessel activity and so generally they should not be recording information that they have not directly observed.

>> RECORD REPEATING VALUES FULLY

Do not use the ditto symbol (˝) when recording the same repeating values. There should be enough time to fill in every data field properly; this will help improve the clarity and readability of the form. Observers may be tempted to use the ditto symbol on the Form 5 to describe the same species. At times, things might get busy but there will be enough quiet times to make sure every data field is properly filled in.

>> USE PENCILS TO FILL IN YOUR FORMS

Use a pencil to fill in your data forms. Never use a pen to record samples details on waterproof paper. It's recommended to use 1B or 2B pencils as they are darker than normal HB pencils, especially on waterproof paper. This makes the work clearer and helps when the forms are photocopied or scanned. Always carry many backup pencils and a sharpener when you go to sea.

>> WRITE CLEARLY

It is no use if the person responsible for debriefing cannot read what has been recorded. Observers need good, clear handwriting. Aim to write clearly or to use capital letters when writing. Keep pencils sharpened and use a clean eraser to rub out errors.

>> FIXING ERRORS

If a mistake is made, simply erase it and write in the correct information. However, if a mistake is noticed after the day, it was made correct it but, then draw a neat circle around it and note next to it: Mistake corrected – see page '……'. referring to the page number of the notebook where a note about the mistake and how it was discovered can be found.

>> DO NOT RE-WRITE DATA

Fill in the observer forms when the event occurs, directly on to the form. Sampling details are to be written on waterproof slates, while sampling, and the information transferred to the respective data collection forms as soon as possible. There is no need to re-copy dirty forms onto clean observer forms, as Re-writing data has been found to be a common source of errors.

>> FILL IN THE HEADER DETAILS ON EVERY FORM

It is important that the header details are filled in on every used form. The header details are the first block of data fields at the top of each form. Forms can easily become separated during photocopying, scanning or filing, or while the observer is travelling to and from the vessel. Without the header details there is a risk that some of these separated forms will not be identifiable and the work the observer has done to collect the data will be wasted. Do not fill in the header details on forms before they are used. This can end up being a waste of blank data forms!

>> CARRY A NOTEBOOK

Carry a small notebook and pencil at all times. Use the notebook to write down any extra information that is picked up during the day. The notebook can also be used if the observer is under pressure to record information quickly and the relevant data form is not handy. For instance, if a marine mammal is sighted from the deck, the notebook can be used to record as much information about the sighting as possible before getting the form and filling in all the required data fields. Use the notes to help complete the form.

Under no circumstances should the notebook be used to collect standard data to fill in forms later on a continual basis. Notebooks should be handed in to the person responsible for debriefing at the end of the trip in preparation for debriefing.

Can I show my data to the captain or crew?

It is best to keep data and forms to yourself, however, if the captain requests to see the data, he has the right to see it. The type of information observers collect is not a secret, but do not leave your data forms lying around. Forms should be stored away in a secure area when they are not being used. If you feel you are under constant pressure to hand over your data sheets, be careful to make a report of these incidents in your trip report. This should also be done if the captain changes anything on the data form, or requests that changes are made. Record these incidents in detail in your private notebook.

>> COMMENTS

Observers are encouraged to write comments on their notebooks. Record the notebook page number where the comments can be found in the forms (for example, *'see (a) page 12 of 50 in notebook'*). Comments by new observers can help to clarify any misunderstandings or mistakes they may have made with their data, while comments by experienced observers can draw attention to new fishing practices or highlight areas where changes in the form may be helpful, etc.

>> FILL IN YOUR NOTEBOOK

All observers are expected to keep a notebook / diary and to make an entry in it **at least once every day**. An entry is required even if very little happens during the day, or if the observer is tired at the end of the day. The entry should give a general idea of what happened on the vessel during the day. The notebook / diary can be used to note down any pieces of information that are picked up. This will help observers fill in their trip report later and refer back to specific events that took place on a certain day (since the notebook must have dates recorded). The notebook must be used to:

1) Clarify any mistakes that were made on the form and changed after the day they were recorded.

2) Continue comments from the comments section of the form.

3) Record any incidents on the day that it happened.

4) Keep a list of photos taken during the trip (data, time, number and short description of the film / photo).

All entries should be made on the day they happen and not on a later date. If more information is discovered later on, fill it in under the date that it was first discovered. It is very important that any *incidents* or *critical incidents* are reported in detail in the notebook / diary, even if these incidents are thought to be minor. Record information on the time, date (UTC) and position of occurrence of the incident. New information on the issue, or further developments, can be recorded on the day they are discovered. One idea is to draw up a table on a spare page of the notebook / diary (or spare page appended to the trip report) to record daily times, positions, etc., in one place.

>> AT THE END OF THE DAY

Get into the habit of checking completed forms at the end of each day. Check through them again when there is more spare time, for instance, on a rest day.

Take time to ensure:

1) The *header details* are filled in and the page numbers are up-to-date.

2) All data fields on forms that have been used are filled in, completed or dashes have been inserted when required.

3) The *set start times*, which refer to the same fishing operations or event, are the same on all forms.

>> AT THE END OF THE TRIP

Take time to check:

1) The *page numbering* is complete and the total number of pages used for each form type is filled in.

2) *Return port and date*—fill in the *date, time* and *port of return*. Observers who pack their forms into their bags before they have this information often forget to fill in these details.

>> COMPLETE DRAFT TRIP REPORT

Try to fill in every section of the trip report (Annex 4). If a section is not relevant to the trip (for instance, no species of special interest were seen during the trip), complete these sections by writing something like '*no interactions with species of special interest were observed*' in the space provided. Gaining experience will help observers write increasingly better trip reports as different trips or fishing strategies can be compared to the most recent trip and the observer builds on lessons learnt from past trips and debriefings.

>> TIMELY REPORTING

Complete the draft trip report, check through the data forms and submit all the information that has been collected during the trip as soon as possible. The longer it takes to fill in the written report, the more likely it is that information will be forgotten. The written report should always be completed within seven days of returning to the home port. Just because you have disembarked the vessel does not mean that your job is finished.

>> DEBRIEFING

Observers are to benefit from a comprehensive debriefing at the end of their trip. Debriefing gives observers a chance to learn about any mistakes they have made and to improve their observer skills. If observers have any problems collecting information during the trip, they should make a comment, and a further note in the trip report if necessary so the person responsible for debriefing can respond to the issue and update the observers' skills in that area if necessary.

WORK METHODOLOGY TO FOLLOW ON-BOARD A DRIFTING LONGLINER

>> PRIOR TO BOARDING

1. Following standby notification by your Coordinator or designated officer, you are to settle your personal affairs and to prepare yourself for the time you will be away from your home and family.

2. Prior to boarding the coordinator or designated officer shall arrange your briefing. The briefing shall include details on:

   I. Fishing Vessel
      a. Name
      b. Type
      c. Gear
      d. Target species
      e. Owner contact details

   II. Trip details
      a. Expected dates and location of departure and return
      b. Expected duration
      c. Area to be covered

   III. Work details
      a. Operational issues
      b. Tasks
      c. Protocols
      d. Samples

   IV. Safety at sea
      a. Instructions on the usage of personal lifesaving and safety equipment
      b. Vessel Safety Check (VSC) procedures
      c. Distress Codes
      d. Emergency Action Plan (EAP) procedures

   V. Reports
      a. Deployment report
      b. Weekly status report
      c. Trip summary report
      d. Trip final Report

   V. Allocation of material
      a. Work material
      b. Personal lifesaving and safety equipment

      1) Allocation of documents
         a. Pre-sea VSC form
         b. Copy of FV license conditions
         c. EAP protocol
         d. List of contacts
         e. Sampling instructions
         f. Data catch forms
         g. Species ID manuals
         h. Etc.

3. Following the briefing you are to prepare for your deployment.

It is your responsibility as an observer to ensure that you are properly prepared for the trip, i.e., that you are in good health, good mental state, up to date with current requirements and that you have all necessary data collection forms, work and safety equipment.

It is therefore imperative that you check that all the following items are up to data and available.

Tick a box only when you are sure you have that item.

1	**Personal belongings for the trip**	
	✓ Clothes (work and leisure)	
	✓ Toiletries (shampoo, soap, tooth brush, tooth paste, deodorant, razor, etc.)	
	✓ Medicines (paracetamol, vitamins, etc.)	
	✓ Comfort foods (anything you might need until you adapt to vessel food)	
2	**Official documents required for the trip**	
	✓ Valid passport (valid > 6 months)	
	✓ Valid yellow-fever card	
	✓ Valid certificate of medical fitness	
	✓ Valid certificate of sea survival	
	✓ Valid Seamans book	
3	**Work materials**	
	✓ Laptop and required software (digital manuals, data base, etc.)	
	✓ Photographic material (e.g.: camera, phone or tablet with incorporated camera…).	
	✓ Sampling material (e.g., calliper, measuring board, metric tape, scales, knife, etc.)	
	✓ Notebooks	
	✓ Gloves	
	✓ Box of pens and pencils (10 x 2B pencils; 2 x erasers; 1 x pencil sharpener; paper clips; 2 x pens; 1 ruler)	
4	**Personal lifesaving and safety equipment**	
	✓ Personal Floatation Device (PFD)	
	✓ Personal Localisation Beacon (EPIRB)	
	✓ Helmet	
	✓ Safety shoes or boots	
	✓ Two- way communication satellite device satellite	
5	**Documents**	
	✓ Pre-sea Vessel Safety Check Form	
	✓ FV license conditions	
	✓ Emergency Action Plan protocol	
	✓ List of contacts (including FV owner or operator, Observer Coordinator and any other contact considered important)	
	✓ Valid data collection forms (for every 15 days at sea you should have)	
	- 1 x Form 1-LL – General information	
	- 1 x Form 2-LL – Gear	
	- 50 x Form 3-LL – Fishing event (FE)	
	- 50 x Form 4 -LL – Fishing event catch details	
	- 1 x Form 5-LL – Fishing event biometric information	
	- 100 x Form 6-LL - Fishing event sample collection	
	- 1 x Form 7-LL – Vessel transhipment	
	✓ Manuals (observer manual, ID manuals), guidelines and data collection instructions	

You will be asked to return materials in good working condition.

>> AT BOARDING

Upon arrival at the vessel, you are to:

1) Request permission to photograph the following outside areas of the vessel:

   - The stern displaying the vessel name and port of registration
   - The side displaying the vessel call sign
   - The bow displaying the vessel name and registration numbers

2) Request permission to take pictures of the following documents:

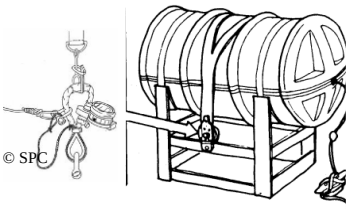
   - Vessel safety certificate
   - Fishing licence
   - Service documents if service dates are not clear on life rafts

3) Conduct the vessel "pre-sea" safety check inspection in the company of a vessel crew member and fill in "V*essel pre-sea safety check form"* (Annex 1). Ensure that the whole inspection form is complete and where there are spaces provide reasons.

4) The vessel will be considered safe to board if it meets the following Minimum Safety Requirements on:

   - Valid safety certificate
     i) present on-board
     ii) in date and not due to expire for a period of at least four (4) months
     iii) crew compliment, INCLUDING THE OBSERVER, must not exceed the maximum specified number of crew listed in the safety certificate

   - Life rafts
     i) capacity to accommodate full crew and the OBSERVER
     ii) within service date; not to expire during the trip
     iii) fitted with a Hydrostatic Release mechanism

   Life raft and Hydrostatic Release mechanism

   - Life Jackets
     i) sufficient number for the full crew and the OBSERVER
     ii) compliant with IMO – SOLAS LSA standards

   - GMDSS Requirements (Global Maritime Distress Safety Systems)
     i) compliant with the vessel tonnage and area of operation
     ii) GMDSS components within service date
        - EPIRBs
        - SART
        - VHF, MF and HF radios

5) You may "refuse to board a vessel" if:

   - the vessel does not meet "minimum compulsory requirements"
   - the overall vessel state puts its sea-worthiness in question

6) If you refuse to embark, you should immediately submit a report clearly stating the reasons to your Coordinator. Ensure that you take pictures for the expired document and equipment.

7) If you decide to embark, you should confirm your embarkation with your Coordinator by phone.

>> UPON EMBARKATION

1) Upon embarkation you are to:

   - Present yourself at the bridge and meet bridge officers (Captain, 1st officer, etc.).
   - Prepare your living and work area
   - Meet other key people such as the Bosun, and the Cook
   - Visit the vessel with the bosun or the lead crew member to familiarize yourself with vessel configuration/equipment layout
   - Inform the Bosun of your work objectives, ask for advice on how to meet the objectives without interfering with the crew work. Agree on your sampling areas (i.e., the areas from where you will observe line setting and line hauling operations and where you will conduct biometric sampling).

1) **Locate the GPS that displays latitude and longitude in degrees (°), minutes (') and seconds (").** Latitude and Longitude can be read in a GPS in THREE different notations:

   1. DMS: degrees, minutes, and seconds (*Lat dd mm ss / Long ddd mm ss*). *Note seconds will always only be recorded as two digits.*
   2. DDM: degrees and decimal minutes (*Lat dd mm.mmm / Long dd mm.mmm*). *Note the minutes can be recorded to more than two decimal places.*
   3. *DD: decimal degrees* (*Lat dd.ddd / Long dd.ddd*). *Note the degrees can be recorded to more than two decimal places.*

IT IS VERY IMPORTANT that you are absolutely certain of which notation is displayed on the GPS to ensure that you collect the degrees, minutes, and seconds notation (DMS).

If you can't find a GPS that collects position in the DMS format, you should note on the data collection forms, notebook and final report the format collected.

<u>You ARE NOT to convert DDM / DD positions into DMS format</u> has this has proven to be a major source of errors.

2) **Set all your personal work devices (watch, laptop, voice recorder, digital camera/smartphone) to UTC time** and start taking notes on your journal. Setting your personal work devices to UTC time shall give you access to the UTC time, as you will always have UTC time on personal work devices.

3) Start filling IOTC form 1-LL.

4) Corroborate *mainline diameter* by measuring it with callipers.

5) Characterize vessel *branchline configuration*/s. Check number of *sections* for each individual branchline *configuration*, ascertain *material* used in each section, measure section(s) *length* and *diameter*.

6) Check if the vessel caries a tori–line. If yes, measure *tori-line total length*, count the *number of streamers*, check *streamer type (paired or single*), measure the length of multiple *streamers* and where lengths vary record both *maximum and minimum length*, also measure the *distance between*

streamers and the *height of tori line towing point*. Check how many *towed objects* are attached to the tori line and what *type*.

7) Verify if the vessel caries *other depredation/mitigation device*(s) and describe them on your notebook.

8) Confirm that the vessel caries *de-hookers and line cutters* and detail them on your notebook.

9) Collect information on IOTC form 2- LL concerning fishing gear.

10) **Within 24h of your embarkation** request bridge officers to facilitate to **send by email your deployment report** (Annex 2) and **copy of vessel inspection report** to your Coordinator. This opens a channel of communication with the coordinator and ensures your safety.

11) After requesting the permission of the captain, you are to familiarize yourself with vessel instruments: navigation system, depth sounder, sonar, bird radar, etc. Make sure to take an interest in vessel safety procedures and equipment: life jackets, life rafts, fire extinguishers, first aid kit, etc.

>> DURING THE COURSE OF THE TRIP

> Active days

The amount of time observers will need to spend on deck on longline vessels depend on the total number of hooks set by the vessel. Some vessels will set a comparatively small number of hooks and observers should have no problems monitoring every single part of the fishing operation. However, some of the larger longliners will set large numbers of hooks and have two teams working in rotation, making it difficult for one observer to monitor every fishing operation.

Observers are required to fully monitor all periods of the fishing event. A fishing event includes the set and the haul periods. However, **observers can choose the number of fishing operations that they will fully monitor**. This choice should be based on the average number of hooks being set by the vessel. A rough guideline for how many fishing operations should be monitored by observers on longline vessels is given below.

All observers are encouraged to aim for 100% coverage of all fishing operations. Many observers achieve this, and national coordinators are requested to recognise observers who make the extra effort to monitor as many fishing operations as is comfortably possible.

If observers are not able to achieve 100% coverage, they should follow these rough guides for choosing how many fishing operations to monitor:

- For **vessels setting less than 1000 hooks**, the observer is expected to **monitor every fishing operation.**
- For **vessels setting between 1000 and 2000 hooks**, the observer is expected to **monitor two out of every three fishing operations.**
- For **vessels setting more than 2000 hooks**, the observer is also expected to **monitor two out of every three fishing operations**. However, on especially long trips (over one month), observers are advised to keep their own personal well-being in mind **and** are permitted to **take additional rest days if necessary**.

Before setting

1) Ensure you are present at least 30 minutes before the commencement of the line setting activity, as changes are often made to the setting specifications at these times;
2) Familiarize yourself with setting times;
3) Discuss with the bosun or the lead crew member to understand the setting instructions from the fishing master which will include the number of hooks to be set between buoys and the line formation in general and use this information to verify set mainline length, target species (which can be determined by bait type, presence/absence of light sticks and fishing depth).
4) Verify if there are any lights attached to the gear, if yes count the number of lights per type and colour.
5) Check percentage (%) of branchlines weighted (i.e., if there are line weights) and estimate sinker average weight.
6) Measure the distance from the hook to the sinker.
7) Confirm what branchline configuration(s) and respective proportions are to be used during the set. **If a new branchline configuration is to be used in the set make sure you characterize it and allocate it a new branchline configuration number (in Form 2-LL)** before you record in Form 3-LL the proportion of the new branchline configuration used.
8) Assert the proportion (%) of hooks to be set by type and characterize them by recording hook types and sizes and providing information on variations in hook types.
9) Request from Captain and/or crew the proportion (%) of bait expected to be set by type, species and dye colour; and
10) **Record information collected on IOTC form 3-LL.**

During setting

The setting operation takes an average of 4 hours depending on the length of the line set. There is no sampling required during the line setting operation but the data collection during this time is crucial for the CPUE calculations and spatial data.

During this period, you are to:

1) Place yourself strategically to observe setting operations without disturbing crew activities (Figure 2);
2) Monitor:
    - bait ratio and gear configurations (branch lines used and hook ratio if different);
    - setting speed and clip on time and ensure that line setter speed is collected if present;
    - number of shark lines set (if any);
3) Collect data regarding the application of the mitigation measures towards the seabird bycatch. These measures include the branch line weighting, tori line deployment as well as the night setting which are tabled in IOTC resolution 12/06.
4) Check if the VMS is on.

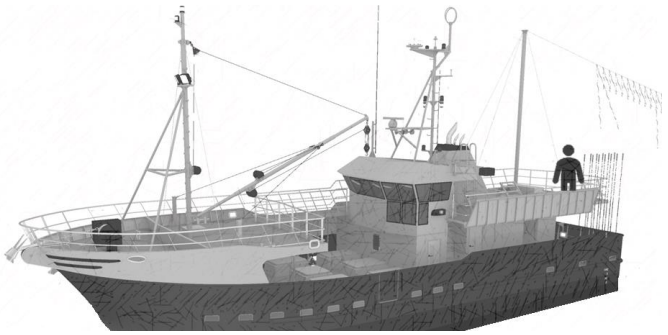


Figure 1- Suggested placement during line setting observation periods. The 🧍 indicates the observer.

5) ***Fill in all data fields within the setting operations section of the IOTC form 3-LL for every fishing event*** (set), even for fishing events where nothing is caught.

MONITORING THE SETTING OF THE LINE

The time and position for the start and end of every set must always be observed directly and recorded, even on rest days (the time and position for the start and end of haul positions should also be recorded for every haul made by the vessel). Observers must make an effort to always record this information and should ask the captain and crew to wake them up at these times.

You are required to fully monitor all of the first three setting operations you have decide to monitor. 'Fully monitoring' the set means being on deck for all of the setting period. This allows observers to see for themselves how the setting is done and what the standard setting specifications are. After the first three sets, you can stay on standby during the setting periods. Standby is not a time for sleeping however. During standby observers should make regular visits to the deck. These visits should be long enough to confirm and record information on setting specifications.

When the setting specifications are the same for each basket, you only need to confirm this while on deck. Setting specifications can be cross-checked again during the hauling period. However, if the setting specifications for a basket change within the setting period, then you need to pay close attention and spend more time on deck during the setting period. Keep an eye out for any setting specifications that change near the end of the setting period.

Extended time should be spent on deck to monitor the set if:

(1) The setting specifications change between different baskets.
(2) The vessel changes its target species during setting.
(3) The vessel deliberately starts a new set.

If you fully monitor the first 3 sets, you will get a good idea if the vessel uses any of these tactics (1–3). If tactics 2 and 3 are used, then you will need to stay out on deck for most of the setting period to record exactly when these changes are being made, and to start a new LL-2/3 form. The vessel may suddenly start using such tactics after the first three sets. In these cases, you should be able to see the changes in the setting specifications during the hauling period and should change the way you monitor the following set. You will also need to go back to the LL-2/3 forms and record the changes in the setting specifications.

Caution: The start of the fishing operation is defined as when the first radio buoy/float is thrown into the water. However, if the vessel cuts its line during setting (for example, due to the presence of whales) and moves a considerable distance (more than 2-3 nautical miles) away. Then you should start a new LL-2/3 forms with a new start of set date and time. Make sure you complete previous LL2/3 forms, that you cross out the 'Hauling operations' section and indicate on the form and on your notebook the reason why.

Note: Vessels have been seen to completely switch their target species from tuna to shark during the setting period. This may first be noticed by a change in the gear; for example, using fewer hooks in a basket (to give a shallower line), using chunks of bycatch as bait instead of the smaller standard sardine and mackerel, or using larger hook sizes. If there is a very clear change in target species during the setting period, this must be recorded in the 3-LL form, commented in observer notebook, and you expanded upon in observer trip report.

Before hauling

1) Ensure you are present at least 30 minutes before the commencement of the line hauling activity;

2) Discuss with the bosun or the lead crew member of the sampling protocol you plan to follow (see Chapter 2: Sampling protocols to follow on-board a longliner) and of your placing during the line hauling observation periods and biometric the sampling observation periods.

During hauling

The hauling operation takes about 8 to 12 hours depending on the length of the line set, the volume of the catch, the weather conditions and the conditions of the gear.

1) For every fishing event, even where nothing is caught, gather information on fishing event *start hauling* and *end hauling date, time and position*.

2) Place yourself strategically during line hauling observation periods so you don't disturb crew work (Figure 2);

3) Observe hauling operations according to the chosen sampling protocol and monitor:

Figure 2- Suggested placement during line hauling observation periods. The 🧍 indicates the observer.

- *method(s) use(d) to stun fish;*
- *usage of a bird scaring device at hauler;*
- *number of bite-offs by branchline type;*
- *target catches (number per species);*
- *non-target catches (number per species and condition); and*
- *SSIs catches ((number per species and condition, gear interaction and handling method);*

4) **Complete 3-LL Form "Hauling Operations" section for every observed set,** even for those where nothing is caught.

5) **Fill in IOTC form 4-LL – Catch details**.

6) **Collect biometric information** according to priorities listed in this document (page 22) and **fill in IOTC form 5-LL - Biometrics**.

7) **Collect required biological samples** *(e.g., otoliths, stomachs, genetic samples, etc.)* as detailed during briefing and fill **in IOTC form 6-LL – Biological sample collection**.

MONITORING THE HAULING OF THE LINE

You are to be on deck for the entire haul of every fishing operation you have chosen to monitor. If you need to leave the deck for more than a few minutes, you should always record on your notebook the time when you left and when you returned to the deck. Do not ask the crew to record the data if away from the deck for extended periods. It is unnecessary and may result in incorrect data.

The most important thing during hauling is that observers carefully record all the species and all the hooks that they have observed directly. So, scientists can assess the observed 'catch per unit effort' (n° fish caught/ 100 hooks observed).

> Rest days (if any)

Rest days are days with fishing operations that the observer has chosen not to monitor. On these days you must directly observe the start and end of the set, and the start and end of the haul and record times and positions for every fishing operation made by the vessel. This includes fishing operations that you have chosen not to monitor.

When not monitoring, observers can use the rest days to:

1) Get some rest.
2) Continue to fill in the relevant forms.
3) Take photos (for example, of the vessel, the gear and marine species).
4) Ensure that any previously collected samples are properly labelled and packaged. Check to see that samples are correctly stored, have not been moved, and are not in a position that may cause problems for others.
5) Check how the vessel is using its electronics and fishing equipment. In particular, note how the electronics are being used during fishing and gather extra information about the vessel and its fishing strategy. Make notes on your notebook.
6) Check the completed data forms; make sure every data field is filled in or a dash is inserted.
7) Work on the trip report. Look at the type of questions that are asked and make notes on these topics in the diary. This will make it easier to complete the trip report later.

If the vessel does not set the mainline on any day, due to a long transit period, etc., you should record it on your notebook (and explain why) as you will need this information to complete Form 1-LL. During days when the vessel does not set the line, the observer can also carry out many of the items listed above.

> Every 7 days

1) Every seven days, you will submit by email your weekly status report to your Coordinator as per the format provided (Annex 3).
2) The report period will be for the preceding seven (7) days.
3) Be aware that if the report is not received within 24h of the date it is due, your Coordinator shall start the process to establish contact via the vessel operator to ensure your safety.

> Upon offloading and/or transhipping

1) Be present 15 minutes before the start of the operation;
2) **Fill in IOTC Form LL-7;**
3) If requested by your Coordinator sample catch being offloaded / transhipped;
4) Follow sampling protocol provided by your Coordinator; and
5) Fill in the sampling form provided by your Coordinator for this purpose.

>> PRIOR TO DISEMBARKING

1) Inform your Coordinator of vessel expected date and time of arrival (EDA & ETA) to a specific port so logistics can be arranged to organize for your travel to your home if and where needed.

2) Prepare your draft trip report (Annex 4).

3) **Finish filling IOTC Form LL-1** with disembarkation information.

4) Verify, organize and pack away your personal, work and safety materials so you don't forget anything on-board (filled data collection forms, sampling materials, safety materials, personal items).

>> UPON DISEMBARKING

1) The forms that you filled must always stay with you (do not leave any form on-board – even blank forms!). **During your return trip, they should be kept as "hand luggage"**. Under no circumstances should they be handed over to a third party or deposited.

2) At the end of the trip, you will report to your Coordinator any special event that could inform port sampling operations (e.g., large set of bigeye tuna, major rejections, etc.).

3) **Upon arriving at your final destination**, you are to **immediately contact your Coordinator** to organize for early submission of the draft trip report, all data collection forms, electronic data, notebooks, samples (if any). You should also return work and safety materials that have been issued to you by the Observer Programme Coordinator.

4) Approximately one (1) week following disembarkation you are to participate in the debriefing. Following debriefing you are to correct data forms, electronic data and finalize the trip report as instructed.

5) **All final, revised documents are to be submitted to your Coordinator a maximum of 4 weeks after disembarkation.**

SAMPLING PRIORITIES TO FOLLOW ON-BOARD A LONGLINER

>> TUNA DISCARDS/REJECTIONS

- Collect catch information on 'discarded/rejected' tuna specimens (*species and fate*);
- Sample 'discarded/rejected' tuna specimens for *length frequency and gender*.

>> SPECIES OF SPECIAL INTEREST

- Collect catch information on SSI specimens caught (*species, fate and condition at capture and at release)*. If it is not possible to conduct size sampling, a mean size or mean weight is also needed, even if it is estimated by eye;
- Sample SSI specimens caught for *length frequency* (and *gender for elasmobranch and turtle spp*.).
  - If sampling the total of SSI specimens for a particular spp. note as EXHAUSTIVE for that spp.
  - If sampling the total of SSI specimens for a particular fishing event (set) note as EXHAUSTIVE for all SSI spp.

>> OTHER BYCATCH SPECIES

- Collect catch information on 'bycatch' specimens caught (*species, fate and condition at capture and at release*);
- Sample 'other bycatch' specimens for *length frequency and gender*.
  - If sampling the totality for a particular spp. note as EXHAUSTIVE for that spp.
  - If sampling the total of 'other bycatch' specimens for a particular fishing event (set) note as EXHAUSTIVE for all 'other bycatch' spp.

>> RETAINED TARGET CATCH (TUNA)

- Collect catch information on 'retained target catch' specimens caught (*species and fate*);
- Sample 'retained target catch' specimens for *length frequency and gender*.

WORK STRATEGIES TO FOLLOW ON-BOARD A LONGLINER

The IOTC is responsible for the overall management of tuna and tuna like species within their Convection Area in the Indian Ocean. This includes a conservation role of species of special interest (SSI) that interact with the fishery. To fulfil these task, scientist and fisheries managers require a range of information on the fishery, actual catches at sea, interactions with SSIs and commercial landings.

Information on the catch composition of a fishing event can be obtained from the vessel logbook (catch statistics) of recorded production. The Fishing Master will typically only record in his logbook the total retained catch and sometimes discarded catch for sharks and Species of Special Interest (SSIs). However, this will not necessarily reflect any of the catch lost at the surface or unwanted by-catch that is discarded or has no commercial value.

The catch composition of the target and commercial by-catch species is routinely recorded from monitoring landings ashore. The length frequencies of these species can also be recorded from shore-based sampling.

To capture information that is not routinely available, observers are deployed onboard vessels to provide independent information on the timing and location of fishing operations, the total effort (number of lines and hooks) deployed by the vessel and the vessel total catch composition (including retained, discarded and released specimens).

During the hauling operation on a longline vessel each fish is brought onboard individually allowing the opportunity to collect detailed information on the catch.

To collect all this information, the observers need to follow two main working strategies:

1. **Strategy 1** - monitoring a percentage of the line hauled, recording catch details for each hook, the catch (species) and the fate of the catch (retained, discarded dead or released alive, etc.), and

2. **Strategy 2** - biometric sampling of a representative portion of the catch and SSI's.

By correctly following these strategies the information recorded allows for the statistical analysis of catches and biological information on size, biology of various species in relation to ocean areas and time of the year. *For example; which species are found where at times of the year and when and where they possibly spawn etc.*

Normally, only one observer is deployed at a time on a longline vessel and it would be impossible for the observer to conduct accurate and comprehensive line observation as well as detailed biometric sampling periods at the same time. Meaning that you (or your coordinator) will have to decide on sampling priorities to follow to adequately meet the objectives of both sampling strategies.

In addition, observers also need to monitor a host of other information on the relevant form that include:

1) start set and hauling date, time, and positions;

2) setting operations to record setting specifications (e.g.: vessels speed; branchline clip on time, etc.) and any mitigation deployed, such as a bird scaring device;

3) mitigation measures during hauling, such as bird scaring devised at the hauler, disposal of offal and unused bait and measures used to land or release SSIs;

4) tag returns; and

5) transhipment information if this takes place.

The work strategies you select will also be dependent on several additional factors including:

- the sea-state;
- catch rate;
- working space on deck; and
- observer safety to conduct sampling etc.

Some of these elements can be determined before the vessel sails and agreed with the coordinator which strategy to prioritise with respect to the percentage of the line observed and number of biometric samples to take per species. In other times it will be up to you (the observer) to decide which work strategy is most appropriate while you are at sea.

There are a number of sampling protocols that can be used for each of the two strategies:

- exhaustive sampling
- random sampling
- systematic sampling
- exhaustive when present

>> EXHAUSTIVE SAMPLING

If selecting **Strategy 1** recording catch is prioritised over **Strategy 2** for taking biometric sampling and the following process is to be followed:

A. ensure that the entire line hauled is visually monitored, i.e., you have to observe all hooks hauled;

B. record catch details:

   a) species and fate for all specimens caught;
   b) condition (at catch and at release), only for bycatch species (including SSIs);
   c) gear interaction, handling method, revival, and photo, only for SSIs biometric data estimation (and sex where possible) for bycatch specimens 'cut off' (including SSIs);

In this case Strategy 2 for the biometric sampling requirements will be a low priority. Should it be possible, the crew could be requested to set aside a representative number of specimens for the observer to sample after the last hook has been hauled. As this is unlikely to be practical for target or commercial by-catch, it is only likely to entail SSIs that could not be released.

You will therefore proceed as follows:

1) When hauling is about to start check if a bird scaring device is installed at the hauler;

2) Collect start hauling date, time, and position at the hauling of the first dhan buoy and / or radio buoy;

3) Record the above information on Form 3-LL;

4) Observe the totality of the hooks hauled, collect the following data and record it on Form 4-LL:

- species and fate data for all specimens caught;
- depredation details for all depredated specimens;
- condition at capture for all non-target specimens caught and condition at release for all non-target specimens released; and
- gear interaction, handling information (i.e., if the specimen was brought on board and how) and release information for all SSIs specimens caught.

5) Collect estimated biometrics on all SSIs on Form 5-LL, and ONLY IF HAULING IS SUSPENDED you can leave your observation point to collect physical biometric data.

>> RANDOM SAMPLING

A simple random sample is where hooks hauled and / or fish are selected randomly for sampling during an entire line hauling period. A simple random sample is meant to be an unbiased representation of the catch on an entire line.

If selecting this strategy, the observer should be able to follow both sampling Strategies 1 and 2.

Essentially, following a random sample table, (for Strategy 1 to sample catch details), a random sample of the hooks hauled would be selected to record catch details on the selected hooks. For biometrics sampling (Strategy 2), fish would be randomly selected as they are caught to meet the number of fish (per species) required to be sampled.

In practice, it would be difficult for an observer to practically sample hooks randomly as it would result in the observer having to spend time waiting during the hauling operation, and only record details from the randomly selected hooks.

Example:

A random table selects / generates the numbers 2,10, 22, 38, 39, 40, 42, 43, 60, 62, etc. for monitoring the catch. The observer would only record the details for these hooks and ignore the other. Similarly, for fish selected for biometrics. Note also; that SSIs should all be sampled by estimation or physically where possible.

Random table for 120 hooks (*the minimum of 10%*) out of a total of 1200 hooks set. (Note; *Where two numbers are the same the next hook would be monitored*)											
2	81	169	295	398	485	585	664	761	838	908	1075
10	82	171	311	403	491	607	665	768	841	928	1116
22	83	184	314	404	494	608	682	776	848	985	1123
38	94	191	354	404	498	612	685	786	849	1015	1130
39	103	219	357	422	531	621	713	792	851	1024	1142
40	104	244	359	431	543	629	725	812	868	1024	1154
42	134	256	389	437	544	639	728	813	873	1030	1161
43	144	268	390	453	564	643	728	823	877	1038	1166
60	162	284	391	455	574	657	731	832	891	1058	1175
62	163	293	397	470	579	663	732	834	906	1068	1176

Random tables can be generated in excel using the function RANDBETWEEN selecting the range Top [1] and Bottom [the total number of hooks set] Then copy the function to the total number of hooks that you want to sample. The list of numbers generated can then be sorted from lowest to highest to get a sampling sequence.

You will therefore proceed as follows:

1) When hauling is about to start check if a bird scaring device is installed at the hauler;

2) Collect start hauling date, time, and position at the hauling of the first dhan buoy and / or radio buoy;

3) Record the above information into FORM 3-LL;

4) Prepare ahead of time a random sampling table that takes into account the total number of hooks that need to be hauled and the number of hooks to be sampled.

5) Starting numbering with the first hook hauled and keep track of the hooks hauled, collect for:

   - hooks randomly selected for catch composition (FORM 4-LL):

     i) number (or weight) per species and fate for all species caught;
     ii) depredation details;
     iii) condition at capture for all non-target specimens caught and condition at release for all non-target specimens released;
     iv) gear interaction, handling information (i.e., if the specimen was brought on board and how) and release information for all SSIs specimens caught; and
     v) estimated biometrics on all SSIs caught (record details on Form 5-LL).

     Note that during 'line hauling observation periods' ONLY IF HAULING IS SUSPENDED you can leave your observation point to collect physical biometric data.

   - Hooks randomly selected for biometrics (FORM 5-LL) record;

     i) species code;
     ii) fate;
     iii) species length and length type;
     iv) weight and weight collection / estimation method;
     v) processing details;
     vi) and where possible sex.

THIS SAMPLING METHOD MUST BE STRICTLY ADHERED TO BE STATISTICALLY VALID

>> SYSTEMATIC SAMPLING

Systematic sampling is a probability sampling method whereby a fixed number of hooks would be sampled, or a fixed sampling period is selected (time wise), but the start times are randomly selected. *A random sampling table should be used to determine random sampling times or periods.*

Considering that systematic sampling includes an element of random selection as well as exhaustive sampling during the sampling periods it would most likely be the most practical strategy for an observer to follow. A number of practical examples are provided in cases below.

Taking into account that:

a) a minimum of *10% of the total hooks set will need to be monitored for catch composition* to ensure meeting IOTC 5% observation coverage requirement as stipulated in Res. 11-04, (*practically this could be at least 25% or more)*;

b) '*line observation periods'* and '*biometric sampling periods'* should be randomly selected to cover at least, the beginning, middle and towards the end of the hauling operation to ensure representative sampling of the line *(a random sampling table can be used to achieve this).*

Clearly categorise in your notebook the information collected during:

a) Strategy 1 - line hauling observation periods
   i) date and time start/end '*line hauling observation periods (to be checked during debriefing)*;
   ii) number of retrieved hooks observed for catch composition (to be *recorded in Form 3-LL*);
   iii) species and fate for all specimens caught during line hauling observation periods (to be *recorded in Form 4-LL*);
   iv) condition (at catch and at release), only for bycatch species (*Form 4-LL*); and
   v) gear interaction, handling method, revival (for turtles), and photo (if any), only for SSIs (*Form 4-LL*).

b) Strategy 2 - biometric sampling periods (*Systematic Random sampling of a mixed species sample, see page 83*).
   i) date and time start/end '*biometric sampling periods* and number of hooks hauled in this period *(to be checked during debriefing)*;
   ii) species and fate for all specimens brough on-board during biometric sampling periods (to be *recorded in Form 5-LL*);
   iii) condition (at catch and at release), only for bycatch species (*Form 4-LL*);
   iv) gear interaction, handling method, revival (for turtles), and photo (if any), only for SSIs (*Form 4-LL*); and
   v) biometric data and sex (where possible) for all specimens brough on-board during biometric sampling periods (*Form 4-LL*).

c) rest periods
   i) date and time start/end '*rest periods', to be used to take lunch breaks and visit the washrooms (to be checked during debriefing)*.

For **Strategy 1** we can distinguish two systematic sampling techniques to use during the hauling periods. For catch composition, determine a *fixed number or batch of hooks during randomly selected periods during hauling* (case 2A), or the monitoring for catch composition of *all hooks during fixed periods of time selected randomly during hauling* (case 2B).

> Case 2A -– Fixed number of hooks randomly selected periods

Monitoring for catch details (Strategy 1), and biometrics (Strategy 2) from a fixed number of hooks randomly selected during the hauling process, you will proceed as follows:

1) Before hauling starts decide on the number of hooks to be monitored or sampled for the entire line, also allowing for rest periods. Divide this into the number of hooks to be sampled at a time (batch).

2) Follow selected random sampling protocol and work pattern, collect and record information as per requested in FORM 4-LL and FORM 5-LL.

Example

A longliner set 2400 hooks. Vessel skipper estimates that hauling will take 12 hours. Therefore, the observer decides to:

- Monitor a total of 800 hooks for catch composition, in batches of 200 hooks, selected random intervals along the line (i.e.; 33% of the line);
- Conduct biometric catch sampling of another 800 hooks hauled outside of the 'line hauling observation period' (i.e.; total of 33% of the line);
- Rest or undertake other tasks in the remaining time;
- Follow a work pattern that ensures the representative sampling of the line.

Table 1 –Random work pattern

OP	OP	RP	OP	SP	RP	SP	OP	RP	SP	SP	RP
200 hooks	200 hooks	1 hour	200 hooks	200 hooks	1 hour	200 hooks	200 hooks	1 hour	200 hooks	200 hooks	1 hour

OP: Line hauling observation period; SP: biometric sampling observation period; RP: rest period

> Case 2B -– All hooks during randomly selected fixed periods of time

Monitoring for catch details (Strategy 1), and biometrics (Strategy 2) of all hooks during fixed periods of time selected randomly during hauling, you will proceed as follows:

1) Before hauling starts decide on a fixed period of time to be '*randomly observed/sampled/or not'*, during *line hauling.*

2) Follow selected random sampling protocol and work pattern, collect and record information as per requested in FORM 4-LL and FORM 5-LL.

Example

A longliner set 2400 hooks. Vessel skipper estimates that hauling will take 12 hours. Therefore, the observer decides to:

- Monitor the hauling of the line for catch composition, for a total time of 4 hours, in batches of 1 hour (i.e., total of 33% of the estimated hauling time);
- Sample the catch brought onboard for another 33% of the estimated hauling time;
- Rest the remaining time;
- Follow a work pattern that ensures the representative sampling of the line (Table 2).

Table 2 – Random work pattern

SP	OP	OP	RP	OP	SP	OP	SP	RP	SP	SP	RP
1st hour	2nd hour	3rd hour	4th hour	5th hour	6th hour	7th hour	8th hour	9th hour	10th hour	11th hour	12th hour

OP: Line hauling observation period; SP: biometric sampling period; RP: rest period

>> EXHAUSTIVE WHEN PRESENT

This sampling method can be used when the observer is required to sample everything, but due to the duration of hauling, which can be up to 14 hours or more, the observer will need to take lunch breaks and visit the washrooms etc.

If the observer has opted for this method, the observer notebook becomes vital as all breaks must be recorded to provide an opportunity to raise up the catch towards the total catch.

When selecting this option, the observers will have to ensure that the totality of the hooks are monitored during the observation period **you will therefore proceed as detailed for Exhaustive Sampling Strategy**.

INSTRUCTIONS ON THE FILLING OF DATA COLLECTION FORMS

>> GENERAL INSTRUCTIONS

> Header details

Observer's name

Observers must write their name **on every single form**. Put the last name or family name first (in capitals) and the first name last (in minuscules). Do not abbreviate the name on any of the forms.

Observed trip number

Fill in the *observed trip number* as issued by the observer programme that has authorised the placement, or as determined by the number of trips done by the observer during the year. Observer trip identification numbers are individual trip codes so each observer trip can be uniquely identified. A 3-letter country code and a 3-digit serial number (*e.g., FRA001*) is assigned to all observers by the IOTC when they are registered into the ROS (IOTC observer registration number). This code identifies the observer in the IOTC databases and is used to generate IOTC ROS observed trip number. IOTC observed trip number, begins with trip's start date (yyyy-mm-dd), followed by IOTC observer registration number and vessel main gear code (e.g.: *2018/01/23-IOTCFRA001-LL*).

National Observer Programme trip identification number can be also used here. Most national observer programmes use the **personal observer trip ID numbering system**. **Observer ID code**, space, two digits indicating **the year of the trip**, dash, **trip number** (i.e., the current trip number based on the number of trips (1, 2, 3, 4, etc.) completed by the observer during the calendar year).

Page numbering

Forms of the same form type should be numbered together. For instance, number all the 3-LL forms as a group and all the 4-LL forms together as another group. Number each form as it is used. At the end of the trip, go back and fill in the total number of each form type used.

> UTC time and date

Since vessels use a variety of times, observers are asked to collect a standard time, so people reviewing several observer trips can compare the time of day when activities took place. The standard time that observers are asked to collect is UTC time (Coordinated Universal Time). It is an internationally agreed time standard and may also be referred to as GMT time (Greenwich Mean Time).

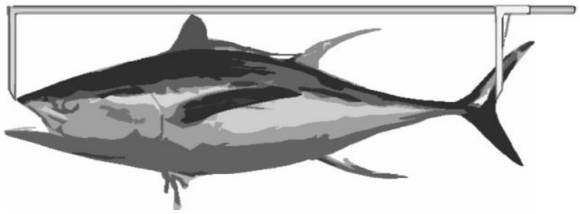
> Measuring lengths

BE CLEAR ON EXACTLY WHAT MEASUREMENTS YOU ARE TAKING AND HOW!

- *Length measurements are always **rounded down** to the nearest whole centimetre.*
  - If the length of the fish is 43.1 cm, note 43 cm.
  - If the length of the fish is 43.8 cm, note also 43 cm.
- *Length measurements are always associated with an IOTC code for **length type***
  - **FL** - Straight fork length taken with a calliper;
  - **FT** - Curved fork length taken with a tape measure.

Callipers

Always aim to measure fish using callipers. Callipers provide the most accurate measurements and are good for measuring small and medium size tuna and by-catch species.



Understand how to use callipers correctly. Callipers are designed so that the groove, on the fixed leg of the calliper, is normally placed on the snout/upper jaw of the fish and not on the fork of the tail.

When a fish is larger than the callipers, measure it by taking two or more measurements. One method is to first measure as much of the fish as possible, make a light mark on the fish at the point where the measurement stops, and then take a second measurement from that point. Adding the two measurements together gives the length of the fish. Another method is to take the first measurement at 100 cm, lightly mark the fish at this point, and then take a second measurement from the point. It is then easy to add the two measurements together to get the full length.

Flexible tape

A flexible tape is a versatile means of measuring large tuna and the larger billfish. However, it must be used correctly to record straight measurements.

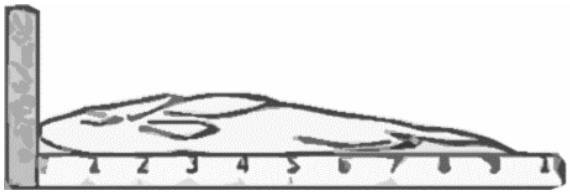


Image adapted from SPC.

Always place the flexible tape up against a straight (90 degrees) vertical object. If this is not done, the fish can easily slip down the deck tape when it is being measured, giving an incorrect measurement.

Pay attention to collect the true measurement when using a flexible tape. The observer's eye must be directly above the tail of the fish to ensure the correct measurement is recorded.

Image adapted from SPC.

If the measurement is taken when the eye is not directly above the tail of the fish, the measurement will be read at an angle, possibly giving an incorrect result.

> Recording weights

BE CLEAR ON EXACTLY WHAT MEASUREMENTS YOU ARE TAKING AND HOW!

- *Weights are recorded to the **nearest kilogram**.*
  - If the weight of the species is 34.2 kg round the value down to 34 kg.
  - If the weight of the species is 34.6 kg round the value up to 35 kg.
- *Weights are always associated with an IOTC code for **processing type** (state) and an IOTC code for **estimation method** (tool).*
  - Headed and tailed weight (HT), taken with a spring balance (SB).
  - Headed and tailed weight (HT), taken with a spring balance (SB).

>> FORM 1-LL: VESSEL AND TRIP INFORMATION

This is a generic form that is designed to capture all the information regarding a particular vessel, a particular observer and trip. The following instructions outline how Form 1-LL is used. *Observers must fill in only one Form 1-LL per fishing trip.*

Fishing trip definition: A complete fishing trip is defined as *'from one full or partial offloading to the next full or partial offloading'*. If the longline vessel you are on, comes into port but does not unload fish, you should consider that the fishing trip is not yet complete. If the vessel returns to port or tranships at-sea to unload some or all of its fish and you are instructed to stay with the vessel, you should consider that the fishing trip is complete, fill in a new Form 1-LL and allocate a new trip number to the starting fishing trip. If your trip does not cover a complete fishing trip as defined in the box above, you should state the reason in your written report.

To obtain some data requirements you will need to question the captain or other officers. Do not record assumptions. If the information is unclear, verify the answers with the captain. It might be difficult to fill on the Form 1-LL as soon as you get on board, but you should make a start after the first few days. It can be a good way to build up a relationship with a new captain and officers before the fishing starts. If you cannot get the information for some of the data fields at the beginning of the trip, you may find them later on as the trip progresses.

Fill in all data fields on the Form 1-LL, or insert a dash. A dash shows that you tried to get the information, but were not able to get it (for a variety of reasons such as language barrier). If a dash is inserted in a data field where information is normally expected, then write a comment to explain why. If there is not enough room on the form to write the full comment, record the page number of your notebook where the rest of the comment can be found.

OBSERVER INFORMATION

Observer identification

On the Form 1-LL the trip details are the header details.

Observer identification	
1. Observer IOTC registration number	Observer trip number
IOTCKEN001	2020/02/10 - IOTCKEN001 - LL
2. Observer full name	3. Observer nationality
Peter SHUNULA	KEN

1. Observer IOTC registration number: Scientific observer registration number allocated by the IOTC.

Observer trip number: This is the observed trip unique identifier.

2. Observer name: Full name of the scientific observer that collected the data on-board the fishing vessel. Last name first, first name last.

3. Observer nationality: Scientific observer nationality as it appears in the observer passport. Record FAO ISO_3 country code (page 79).

Observer trip details

The following four data fields ask for information related to the observer, not the vessel.

Observer trip details collect all dates and times in Coordinated Universal Time (UTC)

4. Location of embarkation (country and port or at-sea)

COUNTRY	PORT (name)	AT SEA (√)
KEN	MOMBASA	---

Position of embarkation (dd° mm' ss") specify quadrant (circle)

LATITUDE			LONGITUDE		
4° 02'	(S)	N	039° 40'	(E)	W

5. Date / time of embarkation (UTC)

DD	MM	YYYY	hh	mm
10	02	2020	14	00

6. Location of disembarkation (country and port or at-sea)

COUNTRY	PORT (name)	AT SEA (√)
KEN	MOMBASA	---

Position of disembarkation (dd° mm' ss") specify quadrant (circle)

LATITUDE			LONGITUDE		
4° 02'	(S)	N	039° 40'	(E)	W

7. Date / time of disembarkation (UTC)

DD	MM	YYYY	hh	mm
29	02	2020	19	00

4. Location of embarkation: Country code (page 79), *port name and/or geographical coordinates* of the port where the observer boarded the vessel. If the observer embarked at sea outside port limits via a vessel transfer record "at sea", and record the position in latitude and longitude in DMS format.

5. Date and time of embarkation: Date and time that the observer boarded the vessel. *Note that observer's embarkation date/time may not coincide with the date/time the vessel sails.*

6. Location of disembarkation: Country code (page 79), port name and/or geographical coordinates of the port where the observer disembarked. If the observer disembarked at sea outside port limits via a vessel transfer, record "at sea" and record the position in latitude and longitude in DMS format.

7. Date and time of disembarkation: Date and time that the observer disembarked from the vessel. *Note that observers' disembarkation date/ time may not coincide with the date/time the vessel lands.*

VESSEL INFORMATION

Accurate vessel information is best obtained by requesting a copy of the vessel's registration certificate, a copy of the safety certificate, and a copy of its fishing permit issued by its flag State, or any coastal State. Vessel details can also be obtained from the IOTC website.

Vessel identification

Vessel identification

8. Vessel name	9. Vessel flag/chartering state	10. Vessel IOTC number
FV Seamar II	KEN	16906
11. Vessel IMO or Lloyds number	**12. International radio call (IRCS)**	**13. Vessel port/country of registration**
7902790	5ZZS	Mombasa / KEN
14. Vessel registration number	**15.Vessel phone(s)**	**16. Vessel fax(es)**
6595	773192926	783196926
17.Vessel email(s)	**18. Licensed target species (FAO codes)**	**19. Main fishing gear**
seamar2@pweza.ke	TUS	Drifting longline (DLL)

8. Vessel name: Fill in vessel full name with no abbreviations, as recorded on vessel official documents, and crosschecked with the name recorded on the vessel itself. Record vessel name correct spelling and character spacing including any corresponding numbers.

9. Vessel flag / chartering state: Country (page 79) where vessel is registered as shown on its registration documents. Where chartering occurs, name of chartering country. *Note that the vessel flag state (or chartering flag) may not be the same as the nationality from which the vessel originates.*

10. Vessel IOTC number: Vessel IOTC number as per the IOTC Record of Authorized Vessels, crosschecked with the number recorded on vessel certificates (*any discrepancies to be reported to the IOTC*).

11. Vessel IMO or Lloyd's number: A seven digits number allocated to the vessel by the International Maritime Organization of the United Nations (*e.g.: IMO8814275*).

12. International radio call sign (IRCS): Vessel radio call sign if available. The radio call sign should be displayed on the vessel's licence and clearly on the sides of the vessel (port and starboard). The IRCS must be in either black letters on a white background or white letters on a black background.

13. Vessel port / country of registration: Vessel country code (page 79) and port of registry shown on its registration documents and on the stern of the ship's hull.

14. Vessel registration number: Number issued by country (Flag State) in which the vessel is registered, shown on its registration documents and written on the hull of the vessel. This may be a combination of characters and numbers; record them all (*e.g.: CBG303*).

15. Vessel phone / 16. Vessel Fax / 17. Vessel e-mail: A vessel may have several contact numbers and email addresses depending on the satellite communications systems installed onboard; record them all. Make sure to take note of the ocean region code.

18. Licensed target species: Observers are to use FAO spp. 3-alpha codes to record target species (page 76) that are caught by the vessel, as specified in vessel licences or permit conditions. *If unable to find the code for a particular species fill in species scientific name. If unsure of the correct species use FAO three-letter species group code, and provide further description of the species (e.g.: TUN for tuna).*

> ***Attention:*** Do not write local names for species in the data field. If the FAO species code is not known, record the code 'UNS' (unspecified) in the data field and make a comment in your notebook with the local name. During debriefing, at the end of the trip to try to determine the correct species code and correct it on all the forms before submitting them.

19. Main fishing gear: Vessel main fishing gear. In this case drifting longline (DLL).

Vessel owner and personnel

Registered owner

20. Full name / 21. Nationality / 22. Contact details: Name of Company or Person who owns the vessel, nationality and contact details in full (mobile and fix phone, email). This should be in the Vessel Registration Papers.

Charter operator

23. Full name / 24. Nationality / 25. Contact details: Where the vessel has been chartered and is operated and managed by a company other than the owner, record operator's full name (company or individual as appropriate), nationality (page 79) and contact details (mobile and fix phone, email).

Vessel owner and personnel

Registered owner		Charter operator	
20. Full name	21. Nationality	23. Full name	24. Nationality
PWEZA FISHERIES LIMITED	KEN	WEZA FISHERIES LIMITED	KEN
22. Contact details		25. Contact details	
UNK		UNK	

Fishing master		Skipper (Captain)	
26. Full name	27. Nationality	28. Full name	29. Nationality
Filipe Hernandez	ESP	Filipe Hernandez	ESP
			30. Crew n°
			25

Fishing master

26.Full name / 27. Nationality: Fishing master name and nationality (page 79) in full. There may be a vessel skipper (captain) and a fishing master. The fishing master will usually be in control of the vessel during fishing operations.

Skipper

28.Full name / 29. Nationality: Skipper name and nationality (page 79) in full. *In some instances, the fishing master and skipper (captain) may be the same person. In such cases record here "N/A" for not applicable.*

30. Crew number: Number of crew, cross checked against vessel's crew list.

Vessel trip details

Vessel trip details

31. Port of departure *(country and port or at-sea)*			33. Port of return *(country and port or at-sea)*		
COUNTRY	PORT (name)	AT SEA (√)	COUNTRY	PORT (name)	AT SEA (√)
KEN	MOMBASA	---	KEN	MOMBASA	---

Position of embarkation *(dd° mm' ss") specify quadrant (circle)*				Position of disembarkation *(dd° mm' ss") specify quadrant (circle)*			
LATITUDE		LONGITUDE		LATITUDE		LONGITUDE	
4° 02'	(S) N	039° 40'	(E) W	4° 02'	(S) N	039° 40'	(E) W

32. Date / time vessel sailed *(use UTC)*					34. Date / time vessel returned to port *(use UTC)*				
DD	MM	YYYY	hh	mm	DD	MM	YYYY	hh	mm
11	02	2020	02	00	29	02	2020	15	00

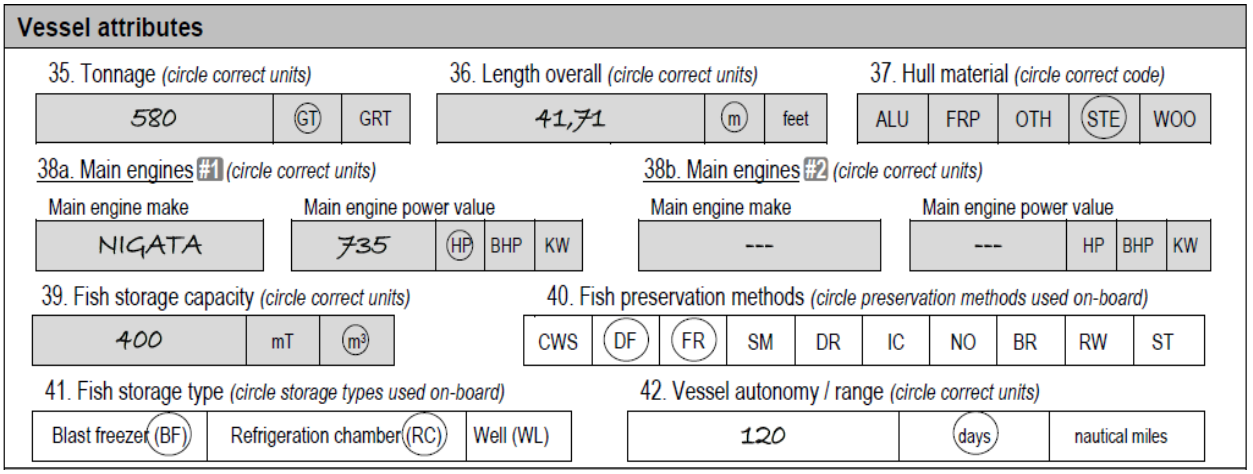
31. Port of departure: Country code (page 79), port name and/or geographical coordinates of the port from where the vessel sailed. If the vessel started a new trip at sea following transhipment record 'at-sea' plus the geographical coordinates corresponding to the location the trip started.

32. Date and time the vessel sailed: Date and time the vessel departed from port or from a transhipment location. *Note that date / time the vessel sails may not coincide with observer's embarkation date / time.*

33. Port of return: Country code (page 79), port name and/or geographical coordinates of the port where the vessel returned. If the vessel arrived at a transhipment location record 'at-sea' plus the geographical coordinates corresponding to the location the transhipment started. *If the observer disembarked before the vessel returned then record expected port of return as provided by the vessel.*

34. Date and time the vessel returned: Date and time the fishing vessel finishes its fishing campaign. I.e., returns to port or to a transhipment location for offloading. *If the observer disembarks before the vessel returns then record expected date and time of arrival (ETA) as provided by the vessel.*

Vessel attributes



35. Tonnage: Vessel tonnage as specified in vessel registration papers. Vessel tonnage can be registered in Gross Tonnage (GT) or Gross Registered Tonnage (GRT). *Make sure you circle the correct type of tonnage used.*

36. Length overall (LOA): Vessel overall length as specified in vessel registration papers. *Make sure you circle the correct units used (meter or feet).*

37. Hull material: Vessel hull material(s) as specified in vessel registration papers. *Make sure you circle the correct hull material code (page 79).*

38a and 38b. Main engine make and power: The make (brand) and the power of the main engine(s) if more than one (HP, KW, or BHP). *Make sure you circle the correct power units used.*

39. Fish storage capacity: Vessel total maximum capacity to store catches in metric Tons (mT) or cubic metres (m3). This should include blast freezer(s) capacity. *Make sure you circle the correct units used.*

40. Fish preservation methods: Method or methods used by the vessel to preserve the catch. *Make sure you circle the correct fish preservation method code(s) (page 79).*

On a longliner these will normally include:

- Freezing (FR). Fish frozen and stored between 0° and -30°C. Freezing at -18°C is mostly done on board smaller longline vessels (15 to 30 meters);
- Refrigerated sea water (RW). Some vessels store fish in a tank of refrigerated sea water (RSW). The water temperature is maintained at around -1°C. The water is pumped through the refrigeration unit and the temperature is checked frequently. The fish are dropped into the tank

slowly to avoid damage and normally come to rest at the bottom of the tank. The water in the tank is a mix of around 80–90% fresh water and 10–20% sea water;

- Ice (IC). Vessels doing shorter trips, smaller longliners 15 to 30 meters, often use flake ice for storage. Ice is often taken onboard the vessel before it leaves port. Some boats are equipped with ice-making machines. The fish are often first chilled by putting them into an ice slurry until their core temperature is brought down. They are then stacked in the hold with ic e; and

Tuna chilled on ice

- Deep Freezing (DF). Fish frozen bellow -30°C To preserve the quality of the fish, deep frozen tunas are rapidly frozen in blast freezers (-55°C to -65°C) immediately after processing. Fish is then transferred to the hold storage at (-40° C to -50°C). Deep-freezing mainly occurs on larger industrial LSTLVs fishing on the high seas (vessels over 40-meter), mainly for the Japanese sashimi market.

Deep-frozen tuna

41. Fish storage type: Type of structure(s) present on-board used by the vessel to store the catch. On a longliner these will normally include Blast Freezer (BF) and / or Refrigeration Chamber (RC). *Record fish storage type code (page 79).*

42. Vessel autonomy / range: Vessel autonomy, expressed in the time (days) a vessel can spend at sea without refuelling. If this information is not available, record vessel range expressed in cruising distance (nautical miles -nm). *Make sure you circle the correct units used (days or nm).*

Vessel electronics

Most of the vessel's electronic equipment will be found in the bridge or in a room off the bridge. Indicate if each piece of electronic equipment listed is onboard by first circling either 'Yes' or 'No. Remember 'No' must also be circled if no new piece of electronic equipment is seen onboard. The following section will help observers identify the electronic equipment requested on the 1-LL form and outlines how it is used.

Vessel electronics circle the correct answer

43. GPS (YES) NO	44. VMS (YES) NO	45. Radars (YES) NO	46. Track plotter (YES) NO	47. Depth sounder (YES) NO
48. Sonar YES (NO)	49. Doppler current meter YES (NO)	50. Expendable bathythermographs YES (NO)	51. VHF radios (YES) NO	52. HF radios (YES) NO
53. Satellite com. system (YES) NO	54. SST gauge YES (NO)	55. Weather facsimile (YES) NO	56. Fisheries information services YES (NO)	

43. Global Positioning System (GPS): The GPS displays the vessel's exact position in latitude and longitude. GPS incorporated into track plotters and acoustic systems shouldn't be considered here.

44. Vessel Monitoring Systems (VMS): The VMS tracks the vessel's position using satellite technology and relays the position to a monitoring station on shore. Observers should be able to identify the mobile transponder unit box or 'black box' in the bridge.

45. Radars: Also, circle "Y" if a high frequency radar is used to search for seabird activity or activity on the sea surface is present on-board. A bird radar is equipped with a large coloured screen. It displays the presence of small items that cannot normally be seen with the navigational radar. This includes flocks of birds, which may be a sign that there is a school of tuna present.

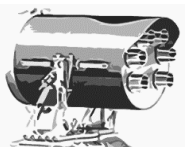
46. Track Plotter: The track plotter shows a continuous track of the vessel's movements. Important positions (i.e.: fishing positions, anchored FAD locations) can be logged into the track plotter, allowing the vessel to return to these exact positions. It is usually linked to the GPS and can be used with the auto-pilot to guide the vessel to a specific position. The track plotter may be connected to other pieces of electronic equipment and may display values such as sea temperature on its screen.

47. Depth Sounder: The depth sounder searches for and displays objects below the vessel. It may show the presence of fish and can be used to help with navigation, especially when travelling in shallow waters or entering harbour areas.

48. Sonar: The sonar displays solid objects in the water column below or to the side of the vessel. It can display the presence and movements of fish close to the vessel. This includes bait fish and rainbow runners, as well as tuna. The sonar is a critical piece of equipment when a vessel is preparing to make a set and wants to keep an eye on the school of fish. The size, depth, speed and the total tonnage of the school of tuna can be judged from the sonar display.

49. Doppler current meter: The Doppler current meter displays the direction (in units of degrees) and strength (in units of knots) of the current at various depths. Only circle "Y" if and independent current meter is on-board as other devices can be used to ascertain current speed.

50. Expendable bathythermographs (XBT): XBT can be handheld or automatic (mounted on the bridge wings). XTBs are periodically used to determine the depth of the thermocline. Only circle "Y" if and independent XBT is present on-board, as other devices can be used to determine the depth of the thermocline.



51. Very high frequency radios (VHF): VHF radios used for local communications up to approximately 25 miles.

52. High frequency radios: HF radios are used for communication over longer distances over 1000 miles.

53. Satellite communication systems: The vessel may have access to a variety of communication services, such as telephone, telex and email, via satellite technology. Inmarsat A and B that provide telephone, telex, fax and data transmission or Inmarsat C that provides telex (fax), data transmission and internet. *Note that the satellite monitor that shows weather reports and maps may look like a computer screen.*

54. Sea Surface Temperature (SST) gauge: Mechanical or electronic thermometer measuring the sea surface temperature. Only circle "Y" if and independent SST gauge is present on-board, as other devices can be used to determine sea surface temperature. SST gauge is usually mounted on the bridge.

55. Weather facsimile: Supplies vessels with weather information. Only circle "Y" if and independent weather facsimile is on-board, as other devices can be used to receive weather information.

56. Fishery information services (FIS): Only circle "Y" if the vessel as a FIS installed on-board. Note that vessels may access fishery information services for instant information on weather and oceanographic features (SST, phytoplankton densities or sea height).

WASTE MANAGEMENT (MARPOL agreement, annex 5)

"Waste" or "Garbage" means all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the ship and liable to be disposed of continuously or periodically.

Observer should note "Y" (yes) or "N" (no), in the table below, to indicate one or more waste storage/disposal method used by the vessel per waste category.

WASTE MANAGEMENT (MARPOL AGREEMENT, ANNEX 5) fill in at the end of the trip						
57. WASTE CATEGORY	58. STORAGE / DISPOSAL METHOD *note "Y" or "N" to indicate how waste is stored/disposed of*					
	At sea	Incinerated	Land disposal	Other (detail)	Retained	Unknown
Cardboard and paper	X					
Kitchen waste	X					
Metal and glass						
Non-biodegradable fishing gear					X	
Oil and fuels					X	
Other					X	
Plastic					X	

57. Waste category: Category of the waste produced by the vessel (*cardboard and paper, kitchen waste, metal and glass, non-biodegradable fishing gear, oil and fuels, plastic*).

58. Storage / disposal method: How the waste was disposed of (*disposed at-sea, incinerated, disposed on land, retained, other, unknown*).

OBSERVED TRIP SUMMARY

OBSERVED TRIP SUMMARY [fill in at the end of the trip] [collect all dates and times in Coordinated Universal Time (UTC)]			
59. No. fishing events/sets conducted with observer onboar	60. Number of fishing events/sets observed	61. Number of days searching	62. No. active fishing days
11	11	4	11
63. Number of days lost	64. Reason for days lost (circle)	65. No. days in fishing area	66. No. of days transiting
0	Bad weather / Breakdown / Other	15	2

59. Number of fishing events/sets: Total number of fishing events/sets conducted by the vessel while the observer was on-board, independently of their success and of being sampled or not by the observer.

60. Number of fishing events/sets observed: Number of fishing events/sets monitored by the observer.

61. Number of days searching: Number of days that the vessel was engaged in actively searching for fish (this includes active fishing days).

62. Number of active fishing days: Number of days that the vessel actually fished (when the vessel had gear in the water). *For some events/sets this may be for only a few hours of the day. Alternatively, a single event/set may span part of two days.*

63. Number of days lost: Number of days where a vessel was unable to fish due to factors such as adverse weather conditions, mechanical failure or other unforeseen events.

64. Reason(s) for days lost: Reason(s) why a vessel was unable to fish: *(i) adverse weather conditions, (ii) mechanical breakdown or inoperative gear or (iii) other unforeseen events (to be specified).*

65. Number of days in the fishing area: Number of days the vessel spent in the fishing area while the observer was onboard. This does not include transit time even if the area being transited is within the fishing area.

66. Number of days transiting: Number of days the vessel spent steaming or transiting to / between / from fishing areas while the observer was onboard.

Observations / Comments on Other Gear / Unusual Use of Gear

Write brief notes on anything special about the vessel, the equipment or crew in your notebook. Pay special attention to any new electronic equipment or new fishing gear, as well as any new or unusual techniques for using fishing gear or electronics.

New technology or fishing practices may result in higher catches for a vessel, or a fleet of vessels, so it is important to learn about them straight away.

>> FORM 2-LL: LONGLINE GEAR

This form contains detailed questions about the fishing gear. Most fishing gear is kept on the deck of the vessel. The following instructions help observers to identify each piece of fishing gear as listed on Form 2-LL and outlines how it is used.

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

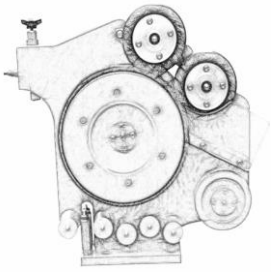
IOTC REGIONAL OBSERVER SCHEME LONGLINE GEAR SPECIFICATIONS	FORM 2-LL
Revised September 2020	

Observer full name	Observer trip number
Peter SHUNULA	2020/02/10 - IOTCKEN001 - LL

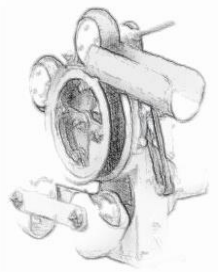
Special equipment or machinery

Special equipment or machinery circle either "YES" or "NO" to indicate presence or absence of a device on-board.								
1. Line setter	(YES)	NO	2. Line hauler	(YES)	NO	3. Bait casting machine	YES	(NO)

1. Line setter: A line setter / shooter is situated on the stern and is used to pull mainline from the storage drum or its storage bin. It deploys the mainline at a consistent speed (m/s) during setting. By varying the line setter speed to the vessels setting speed the depth of the hooks can be controlled. The branchlines, floats and floatlines are snapped onto the mainline at regular intervals. Line setters are slightly different for rope and monofilament gear, because of the type and size of the mainline.

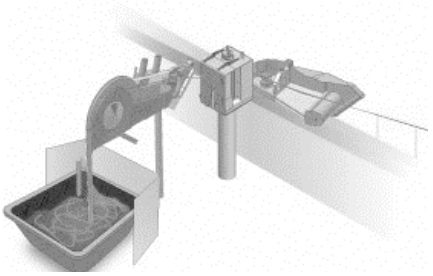


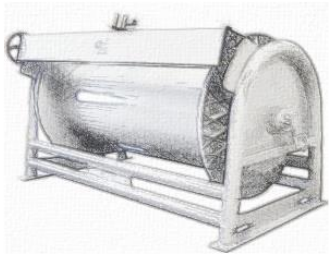
Monofilament gear



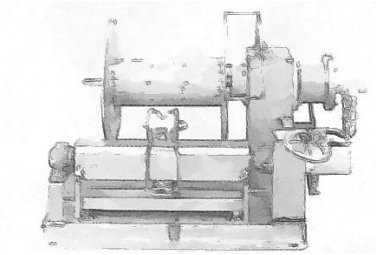
Rope gear

2. Line hauler: The line hauler uses hydraulic motor to assist with retrieving the main line. There are different types of mainline haulers. Traditional rope haulers, Japanese reel system, Monofilament reel system, etc. The line hauler is used predominantly on vessels that use a multi-strand rope or braided monofilament nylon mainline, which is stored in layers in a large bin; storage well or reel. The line hauler is generally positioned on the starboard side.

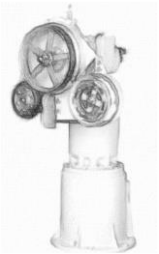




Monofilament reel system

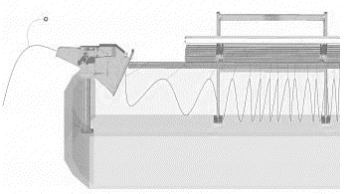


Japanese reel system



Traditional hauler

3. Bait casting machine: Some large, modern longline vessels use bait casting machines sometimes coupled with baiting machines. They are used to cast the bait away from the vessel outside of wake zone so it sinks more quickly and without tangling. This is especially important if there is a problem with sea birds. They are generally situated at the stern of the vessel.



General gear attributes

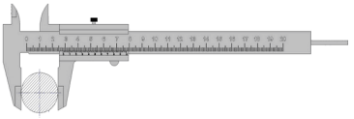
General gear attributes note mainline material code as per table provided in notes and circle units of measure used

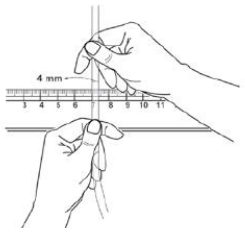
4. Mainline material	5. Mainline length			6. Mainline diameter		
BRL	150	(Km)	nm	5	(mm)	cm

4. Mainline material: Three main materials can be used as the mainline for horizontal longlines —*tarred 3-stranded rope; nylon monofilament; and braided nylon mono-filament*. Check mainline material with the captain and record it using codes provided (page 80).

5. Mainline length: Total length of the mainline (i.e., mainline maximum length) in kilometres (Km) or nautical miles (nm). Request this information from the Captain or Fishing Master. The value can be recorded up to one decimal place.

6. Mainline diameter: The diameter of the mainline. Measure it with a calliper or place the mainline against a ruler to read off the width of the mainline. The value can be recorded up to one decimal place.





Branchline configurations

Branchline configurations note branchline material code as per table provided in notes and circle units of measure used

Branchline configuration # 1

Section #	1		2		3		4	
7. Material	MON		---		---		MUN	
8. Length	33.2		---		---		0.2	
	m	cm	m	cm	m	cm	m	cm
9. Diameter	3		---		---		1.5	
	mm	cm	mm	cm	mm	cm	mm	cm

Branchline configuration #

Section #								
7. Material								
8. Length								
	m	cm	m	cm	m	cm	m	cm
9. Diameter								
	mm	cm	mm	cm	mm	cm	mm	cm

Branchline configuration number (#): Branchlines can have multiple configurations. A unique serial number is to be allocated to individual branchline configurations.

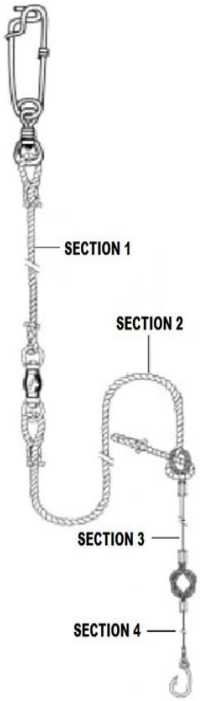
Branchline section number (#): Branchlines can be composed of multiple sections each made of different materials, lengths and diameters. A unique serial number is to be allocated to each section.

7. Branchline section material: Note down what line or string materials are used to make each section of the branchline (*use codes provided in page 79)*. It is not necessary to record any of the other pieces of material that make up the branchline. Just record the key line materials. A range of materials can be used on their own or combined for making up branchlines.

- Monofilament (see-through, colourless, synthetic material).

- Tarred line (rope-like, natural material) is often used as the top part of a branchline.
- Tarred red polyester line (synthetic material) is popular as its easier to handle and set
- Sekiyama wire, can be used as the middle material, as it adds weight and assists sinking the line. This line material is composed of a central wire, bound with cotton or synthetic fibre, usually tarred.
- Turimoto galvanised and stainless-steel wire can be used to protect the leader from marine species biting trough it (wire trace).

8. Branchline section length: Use callipers or tape measure to measure the length of each branch line section. The value can be recorded up to one decimal place. Ensure you record the units used (*metres or centimetres)*. *Measure at least every single branchline in one 'basket'*.



- Measure the string part of the branchline section (polyester, monofilament, wire trace).
- If branchlines total length are within a metre of each other, then calculate the average length of each branchline section from these measurements and record the data in the specified data field.
- If branchlines total length in a single 'basket' vary by more than one metre, then measure all the branchlines in another 'basket' to find out if there is a deliberate pattern of different branchline lengths within a 'basket'.
- It is also helpful to talk to the captain and the crew to find out if there are deliberate differences in branchline lengths and branchline section lengths within a 'basket'.

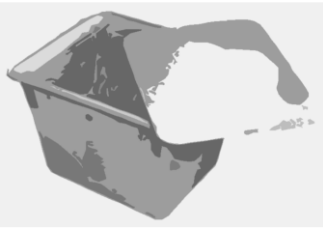
9. Branchline section diameter: Measure the diameter of each branch line section preferably *in millimetres (mm)* with a calliper or place the mainline against a ruler to read off line width. *Measure at least every single branchline in one 'basket'*. The value can be recorded up to one decimal place.

Additional branchline details and Mitigation devices

Additional branchline details circle storage method used				**Mitigation devices** circle codes of DMDs used							
10. Branchline storage	(Baskets)	Tubs	Reels	11. DMDs used	(AWM)	ACD	AAD	LIS	LIG	NON	
					NTS	OVM	OTH	PAD	UNK	VID	SPD

10. Branchline storage: Branchlines can be layered into large rectangular "tubs or bin" for storage, one on top of the other with the hooks and clips arranged around the edge of the bin. On vessels using shorter longlines the branch lines and buoy lines may be wound up into large baskets, or on to reels one on top of the other.






11. Mitigation devices: Depredation and mitigation device(s) used by the vessel (if any) during the observed trip. If no DMDs used thank put a cross over the all section. *Use codes provided in page 79.*

On a longliner these can include:

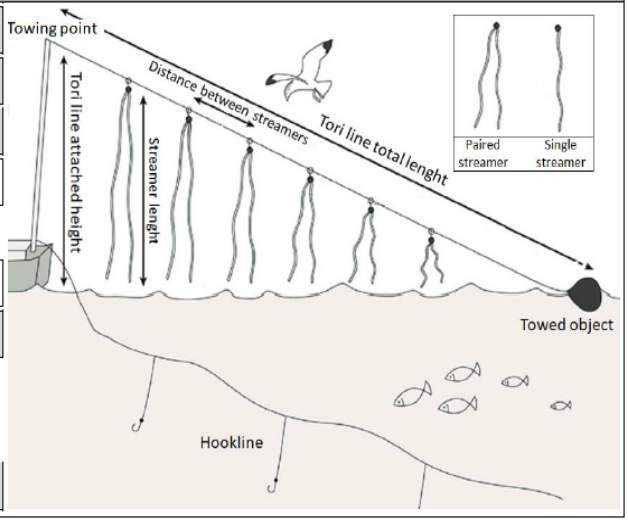
- *Active acoustic deterrents* that transmit sounds that deter animals from the vessels (e.g., pingers).
- *Acoustic decoys*, that transmits acoustic cues to attract animals away from fishing activity.
- *Above water methods*, used to reduce sea-turtles, cetaceans and sea-birds bycatch (e.g., tori lines, kites, drones, raptor silhouettes).
- *Light-sticks*, used to illuminate portions of the fishing gear to reduce sea turtle bycatch.
- *Lights of different colour* attached to the fishing gear.
- *Other visual methods* used to increase fishing gear visibility and reduce sea-turtles, cetaceans and sea-birds bycatch.
- *Passive acoustic deterrents*, that use sonar reflective systems on the fishing gear, such as streamers with reflective spheres, cones, and cylinders.
- *"Spiders" or "Socks",* that physically protects hooked fish from depredation by cetaceans.
- *Visual decoys or deterrents* (e.g., dummy buoys)

Tori line details

Tori lines are the most commonly prescribed seabird bycatch mitigation measures for longline fisheries. A tori line is a line with streamers that is towed from a high point near the stern as baited hooks are deployed. As the vessel moves forward, drag on the line creates an aerial segment (extent) from which streamers are suspended at regular intervals. With streamer lines, the aerial extent is critical when attempting to scare birds away from baited hooks. A towed object is used to create additional drag to maximise the aerial extent. The goal is to maintain the streamer line over the sinking baited hooks in such a way that the streamers prevent seabirds from attacking bait, becoming hooked and subsequently killed.

Tori line details circle units of measure used

12. Tori line length	155	(m)	ft	
13. Streamer type (circle)	Paired	Single		
14. Streamer line length (max)	8.5	(m)	ft	cm
15. Streamer line length (min)	3.5	(m)	ft	cm
16. No. streamers per line	9			
17. Distance between streamers	5	(m)	ft	cm
18. Tori line attached height	8	(m)	ft	cm
19. Streamer reach surface (circle)	(Yes)	No		
20. Towed objects number	0			
21. Towed objects type	No towed objects			



12. Tori line length: Tori line total length from the point of attachment (towing point) to the towed object, measured preferably in meters (m). The value can be recorded up to one decimal place.

13. Streamer type: Type of streamers are used with the tori line. These can be "paired" or "single".

14. Streamer line length (max): Length of the streamer closest to tori line point of attachment (towing point) measured preferably in meters (m). The value can be recorded up to one decimal place.

15. Streamer line length (min): Where tori line streamers lengths vary, this will be the length of the streamer closest to towed object, measured preferably in meters (m). The value can be recorded up to one decimal place. If streamers lengths don't vary record here N/A for not applicable.

16. Number of streamers per line: Count the number of streamers that are attached to a single tori line.

17. Distance between streamers: The distance between aerial streamers might vary. Measure several distances between aerial streamers (preferably in meters), and provide the maximum distance; The value can be recorded up to one decimal place.

18. Tori line attached height: Tori line attached towing point height measured in meters. The value can be recorded up to one decimal place.

19. Streamer reach surface? Specify if all streamers are long enough to touch the sea in calm conditions

20. Towed objects number: Number of towed objects used to achieve aerial extent when deployed.

21. Towed objects type: Objects used to maintain tori line tension and achieve aerial extent.

>> FORM 3-LL: LONGLINE FISHING EVENT

This form contains detailed questions about the fishing event (set). It is to be completed each time the line is deployed. The following instructions outline how to fill Form 3-LL.

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

SETTING OPERATIONS

The time and position for the start and end of every set must always be observed directly and recorded by observers, even for blank sets (i.e.: set with zero catches).

IOTC REGIONAL OBSERVER SCHEME
LONGLINE FISHING EVENT

FORM 3– LL (pg. 1)
Page_001_ of _011

iotc ctoi — Revised September 2020

Observer Name:	Observed trip No:	Fishing event number:
Peter SHUNULA	2020/02/10 - IOTCKEN001 - LL	001

SETTING OPERATIONS collect all dates and times UTC and positions as dd°mm'ss". Circle units used.

1. Start setting date and time					2. Start setting position specify quadrant (circle)			
DD	MM	YYYY	hh	mm	LATITUDE		LONGITUDE	
13	02	2020	23	10	34° 50' 30"	(S) N	025° 00' 40"	(E) W
3. End setting date and time					**4. End setting position specify quadrant (circle)**			
DD	MM	YYYY	hh	mm	LATITUDE		LONGITUDE	
14	02	2020	03	53	34° 47' 42"	(S) N	025° 32" 55"	(E) W

5. Vessel speed	6.0 knots	6. Line setter speed	6.0 (m/s) cm/s	7. Length of mainline set	109 (Km) m
8. Branchline clip-on-time	6 seconds	9. Buoys clip-on-time	66 seconds		
10. Total No. of hooks set	2640	11. Total No. floats set	240 seconds	12. No. hooks set between floats	11
13. Distance between branchlines	41.5 (m) ft	14. Floatline length(s)	30 25 20 (m) ft	15. Total No. radio/dhan buoys set	2

16. Attached lights (No. of lights attached to the gear per type and colour)

TYPE OF LIGHT	COLOUR (of light-emitting source)				
	Number of yellow lights	Number of red lights	Number of green lights	Number of blue lights	Number of other colour lights
Chemical light sticks	8	---	---	---	---
Electric lights	---	---	---	---	---
Luminescent lights	---	---	---	---	---
Other	---	---	---	---	---

19. Shark lines set (circle)	Yes (No)	20. Number of shark lines set	---
21. Target species (FAO code)	TUS	22. VMS on	(Yes) No

Set / fishing event number: Set numbers are recorded in the order that they happen while the observer is on-board the vessel. The observer should allocate a unique set number each time the net is deployed. This should be a three-digit numerical code. Set numbers should be consecutive from the start to the end of the observed trip. Start at Set "001", "002", etc., throughout a trip.

1. Start setting date and time: This is the date and time that the first dhan buoy and / or radio buoy is thrown into the water, *recorded in UTC time*. The mainline will be attached to this radio buoy/float.

2. Start setting position: The vessel position in latitude and longitude at the start of the setting operation, *recorded recorded in DMS format.*

3. End setting date and time: This is the date and the time that the last dhan buoy and / or radio buoy is deployed, *recorded in UTC time*. *Longline vessels often set lines at the night and the setting operation may continue beyond midnight and into the following day.*

4. End setting position: The vessel position in latitude and longitude at the end of the setting operation, *recorded in DMS format.*

5. Vessel speed: The vessel average speed during setting (*in knots*). Watch the GPS for several seconds at a time and also check it a number of times during setting.

- If the speed varies, record the standard or most frequent vessel speed.
- The recorded value can include up to one decimal place. If the value calculated has more than one decimal place, then round the value off to the nearest one decimal place.
- Watch out for any deliberate changes made to the standard vessel speed value within the set and record these in your notebook. Vessels may deliberately reduce or increase their vessel speed at some point within the set to change the depth of the mainline.

6. Line setter speed: The line setter speed *is only recorded* when there is a line shooter onboard the boat with a visible line setting speed gauge. Record the line setting speed displayed on the gauge. If there is no line shooter onboard, or no visible line setting speed gauge, remember to put a dash in the data field.

Look at the line setting speed gauge to see which units of speed are being used. Circle the form to indicate the units of speed shown by the instrument – either in *m/s (metres per second)* or *kts (knots)*. Be careful to circle the correct unit. *Most line shooters will display the line setting speed in metres per second. Vessels using monofilament reels to haul the mainline often display the line shooting speed in knots.*

- The recorded value can have up to one decimal place. If the value has more than one decimal place, round the value off to the nearest one decimal place.
- If there are any deliberate changes made to the standard line setting speed value during the setting of the line, record this information in your notebook.

7. Length of mainline set: The total deployed length of the mainline for the specific set *in Kilometres*.

- Usually calculated by multiplying the total time to set the line and the average line setter speed, taking into account any interruption times.
- Cross check your calculations by asking this information from the fishing master. He can judge the length of mainline set by using vessel track plotter.
- The recorded value can have up to one decimal place. If the value has more than one decimal place, round the value off to the nearest one decimal place.

8. Branchline clip on time: Record the branchline clip on time (set interval) *in units of seconds*. This information is best collected when there is a line shooter onboard.

- The line shooter will make a sound (a beep) to indicate when the crew should attach (clip) the branchlines to the mainline. This helps the crew maintain a constant distance between branchlines. The branchline '*clip on time'* will often be shown, in seconds, on line shooter instrument.
- If no line shooter is onboard, observers can calculate the branchline clip on time by using their watch to measure the average time between the clipping of two branchlines. Measure this over at least the three buoys and record the average branchline clip on time value.
- If there were any *deliberate changes* to the standard branchline clip on time value between floats, record this information in your notebook.

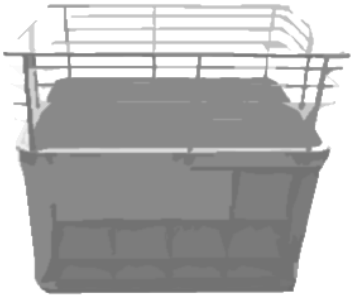
9. Buoys clip on time: Record the buoys clip on time (set interval) *in units of seconds*. This is best done when there is a line shooter onboard.

- As previously seen the line shooter will make a sound (a beep) to indicate when the crew should clip the branchlines to the mainline. A different sound will be made to indicate when the buoys should be attached. The buoys clip on time in seconds can also be shown on the line shooter instrument.
- If no line shooter is onboard, observers can calculate the buoys clip on time by using their watch to measure the average time between the clipping of two buoys. Measure this over at least half of the line setting time and record the average buoys clip on time value.
- If there were any *deliberate changes* to the standard buoys clip on time value, record this information in your notebook.

10. Total number of hooks set: This is the total number of hooks deployed for the set.

- Usually calculated by multiplying number of 'baskets' (*a basket starts when a float comes in and ends when the next float comes in*), by the average number of hooks between the 'baskets'.
- This information can be obtained from the Fishing Master and cross checked against observer calculations.
- The recorded value should always be a whole number. The number can be cross-checked during the hauling period.

Caution: These are not 'baskets', they are bins. Do not count the number of hooks in a bin.



How to calculate the total number of hooks set by the vessel?

1. Calculate the number of hooks per basket

Count the **number of hooks per basket** *(i.e., set between two floats)*. To start this count, watch out for when a floatline is attached to the mainline. From this point on, count every single branchline that is then attached to the mainline. Stop the count when the next floatline is attached.

Caution: When counting the '*number of hooks set between two floats*' do not count any branchlines that are attached to the floats. These are shark lines, not branchlines.

2. Calculate the total number of 'baskets'

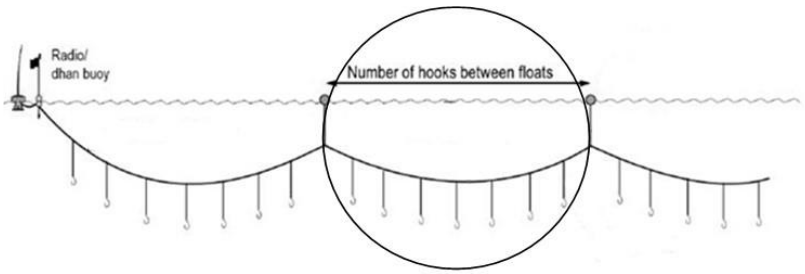
Count the *total number of 'baskets'* that have been set by the vessel. This is best done by counting all the floats that are set by the vessel. Watch out for radio buoys, which sometimes replace floats. They also need to be counted. Counting the total number of floats set by the vessel is best done during the first three sets, which observers are required to monitor fully. After that, this information can be asked from the captain. This number can be cross-checked during the hauling period by counting every one of the floats hauled back in.

Total number of baskets = Total number of floats **minus one**

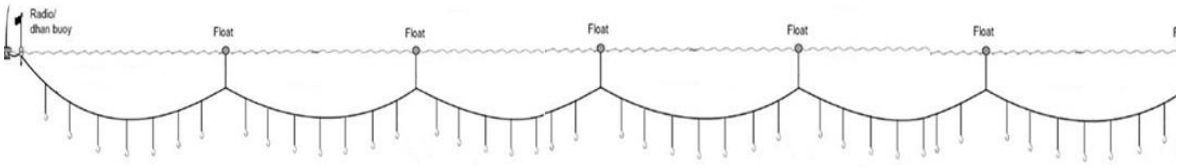
3. Calculate the total number of hooks

Calculate the *total number of hooks set* using the formula given in the example bellow.

Example:



In this example there are 7 hooks between every 2 floats.



In this example there are 7 floats.

Total n° of hooks set = N°. of hooks between two floats X (Total n° of floats set – 1)

= 7 X (7-1)

= 7 X 6

= 42

11. Total number of floats set: The total number of floats deployed during the set. This should not include the radio/dhan buoys.

- Usually calculated by subtracting the number of buoys in their holders before setting by the number of buoys in their holders after setting.
- This information can be obtained from the Fishing Master and cross checked against observer calculations.

12. Number of hooks set between floats ('hooks per basket'): Count the number of hooks set between two floats *(i.e., number of hooks per 'basket')*. This will be equivalent to the number of branch lines set between two floats.

13. Distance between branchlines: The distance between branch lines (i.e., the interval at which they were set along the mainline) *in metres*. This is best done when there is a line shooter onboard.

- When a line shooter is used, the distance between branchlines can be calculated by multiplying 'Branch line clip on time (s)' by the 'line setter speed' (m/s).
- The recorded value can have up to one decimal place. If the value has more than one decimal place, round the value off to the nearest one decimal place.

14. Floatline length(s): Measure the different lengths of the floatlines used *in metres* using the callipers. *The recorded value can have up to one decimal place. If the value has more than one decimal place, round the value off to the nearest one decimal place.*

15. Total number of radio/dhan buoys set: The total number of radio and /or dhan buoys deployed.

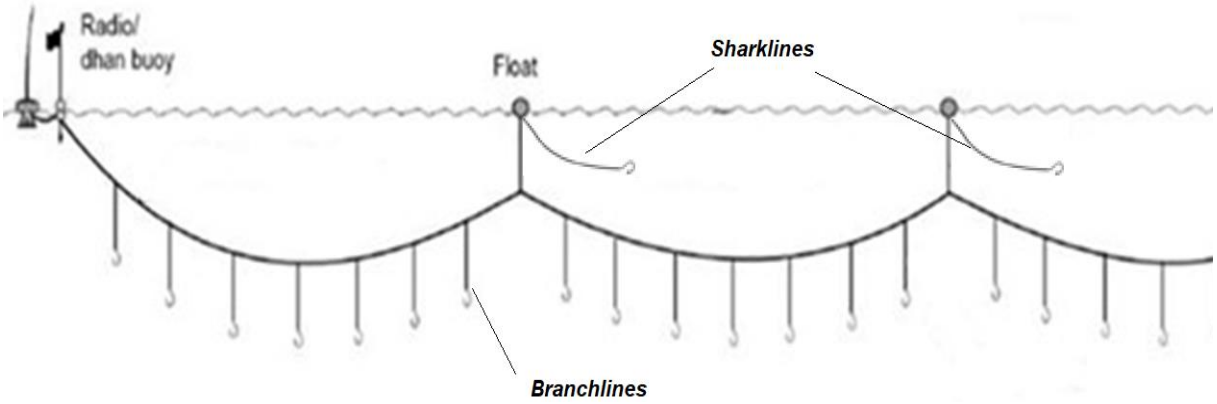
16. Attached lights: The number of lights attached to the branchlines per type and colour. Generally, lights aren't placed on every single hook, so calculate the number of lights that are placed in one 'basket' and multiply that number by the total number of 'baskets' to get the total number of lights. This information may also be available from a crew member.

Lights are mainly used in the swordfish fishery to attract the fish to the baited hook, but may also be used when targeting bigeye. Tree main types of lights can be attached to the branchlines: chemical light sticks, electric lights, or luminescent lights.

1. *Chemical disposable light sticks* emit light for 8 to 12 hours based on a chemical reaction. They can only be used once.
2. *Electric lights or battery-operated pressure lights* can be used over many sets before the batteries need changing.
3. *Luminescent lights also called glow beads or luminescent beads*, are sometimes used on branchlines just above the hook. The theory is that, being luminescent, the beads will help to attract fish to the baited hook, much the same as a light stick does.

19. Shark lines set? Record if any shark lines are set for the observed fishing event by stating 'Yes' or 'No'.

- Shark lines are fishing lines or drop lines, that are attached directly to the longline floats. They are different to ordinary branchlines, which are attached directly to the mainline (see figure below.



20. Number of shark lines set: If shark lines are set during the operation, count them.

- If the shark lines are attached to every float, then the number of shark lines will be equal to the number of 'baskets' plus one.
- The recorded value should always be a whole number.
- If no shark lines are set then record zero (Ø).

21. Target species: The species the vessel is targeting for the specific fishing event (set). Ask the captain what species is being targeted and confirm the response by looking at the gear. Record it using FAO species 3-alpha code (page 76).

- Vessel's target species indicates the species the vessel is attempting to catch. It should not be used to indicate the type of species that were finally landed. Just because a certain species is landed does not mean it is a target catch. For instance, it is quite possible that a vessel that is targeting tuna will also catch swordfish and sharks as bycatch. In this case, only tuna should be ticked as the target species.
- Some vessels have been seen to completely switch their target species from tuna to shark during the setting period. This may first be noticed by a change in the gear; for example, using fewer hooks in a basket (to give a shallower line), using chunks of bycatch as bait instead of the smaller standard sardine and mackerel, or using larger hook sizes.
- If there is a very clear change in target species during the setting period, you must record the second target species on the form and provide details on your notebook and trip report.

22. VMS on? Check if the VMS is on during setting and hauling operations. You should be able to identify the ALC (automatic locator communicator) box in the wheelhouse. The box may make a beeping sound at constant intervals, but this can be turned off. Check if VMS power LED light in on.

- The VMS (vessel monitoring system) is the system that tracks the vessel's position, course and speed using satellite technology. The system relays vessel movements to a monitoring station onshore. The positional data received can be used to analyse the vessels' behaviour for resource management purposes.

MITIGATION MEASURES

MITIGATION MEASURES circle the correct answer(s) where needed					
23.No. of tori-lines deployed	1	24. Minimum deck lighting used	Yes (No)	25. Hooks set between dusk & dawn	Yes (No)
26. Branchline weighted	(Yes) No	27. Sinker average weight	60 g	28. % Branchline weighted	100 %
29. Hook-sinker distance	200 cm	30. Underwater setting	Yes (No)	31. Other mitigation measures used	--- --- ---

23.No. of tori-lines deployed: The total number of tori lines deployed during the setting operation. *Record zero if none were deployed.*

Night setting with minimum deck lighting

Setting lines at night is a simple but highly effective way of reducing seabird bycatch and bait loss. This mitigation measure is binary, and can only be considered as being implemented when there's:

1. Deck lighting is kept to a minimum; and
2. No setting between nautical dawn and before nautical dusk.

This is if all hooks are set between nautical dusk and dawn, then night setting was used. If some hooks are set outside of nautical darkness, then night setting was not used.

24. Minimum deck lighting used? Deck lighting should be kept at the minimum level and directed inboard so the line is not illuminated as it leaves the vessel. Minimum deck lighting should not breach minimum standards for safety and navigation. *Indicate whether minimum deck lighting is used during night setting.*

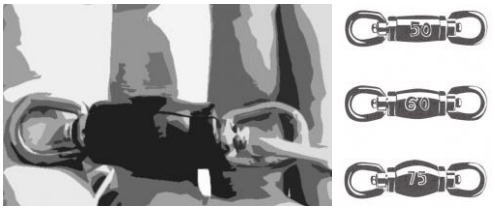
25. Hooks set between dusk & dawn: Line setting should not commence until after nautical dusk and should be completed before nautical dawn, when the sun is still below the horizon. The exact times of nautical dusk and dawn are set out in the Nautical Almanac tables for the relevant latitude, local time and date. *Indicate whether the totality of the hooks have been set between nautical dusk and dawn.*

Branchline weighting

Branchline weighting helps sink hooks beyond the dive depths of surface- and shallow-foraging seabirds and thus helps reduce the likelihood of birds accessing baited hooks.

The sink rate of a hook primarily depends on:

1. The mass of the weight attached to it; and
2. The distance between the weight and the hook



Adapted from SPC image - Longlines terminal gear ID guide

26. Branchline weighted? Indicate if weights, sinkers or leaded swivels are deployed on branchlines snood prior to setting.

27. Sinker average weight: Record the average weight in *grams (g)* of weights, sinkers or leaded swivels attached to the branchlines.

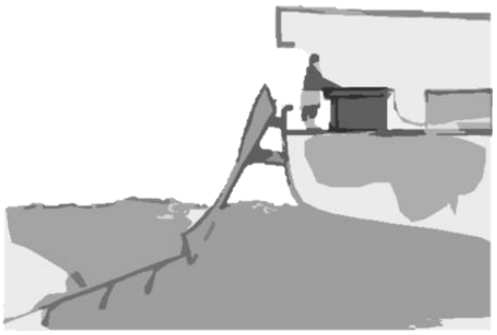
28. % branchline weighted: Proportion of branchlines weighted. If all weighted, record 100%.

29. Hook-sinker distance: The distance, in *centimetres (cm),* of the weights, sinkers or leaded swivels from the eye of the hook.

Underwater setting

Underwater setting is a means of deploying hooks below the sea's surface and therefore out of the reach and sight of foraging seabirds. This has traditionally been achieved by setting through a tube (chute) that opens 1–2 metres below the surface.

30. Underwater setting: Indicate by circling 'Yes' or ''No' if the bait is protected on the branchlines until they are a certain depth below the surface.

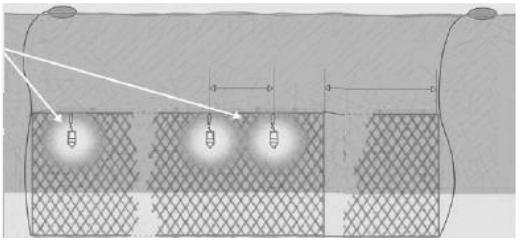


Adapted from RSPB image Bycatch Mitigation Fact-sheet 6 (V1)

31. Other mitigation measures used: Record any other mitigation measures observed during the set using codes provided (page 82).

DETAILS ON MITIGATION DEVICES

- Active acoustic deterrents (AAD), also called '*pingers*', are acoustic devices that alert or warn marine mammals, turtles and sea-birds about the presence of fishing activity, in this particular case the presence of nets.
- Passive acoustic deterrents (PAD), use air-filled or metallic components incorporated into fishing gear to alert a marine cetacean to fishing gear presence by increasing their detection by echolocating cetaceans (e.g., rubber tubes, thick polyester rope, and chains attached to fishing nets).
- Acoustic decoys (ACD), use recorded sounds as a potential means to scare or attract animals away, from locations of actual fishing.
- Light-sticks (LIS): By lighting up the layers of submerged nets, light sticks help turtles as well as sea-birds to avoid entanglement.
- Lights of different colour (LIG): By lighting up the layers of submerged nets, light-emitting diode lamps (LEDs) of different colours help turtles as well as sea-birds avoid entanglement.



- Visual decoys or deterrents (VID): Are visual 'scarecrows' that trigger avoidance behaviours in bycatch species such as seabirds (floating buoy that displays large, obvious 'looming eyes'), cetaceans, and sea turtles (e.g., shark shapes).
- Other visual methods (OVM): other than those described above. Example, the use of *warning net panels*, consisting in replacing 10 to 25 percent of the monofilament panels of the upper part of the net with a section of more visible white braided nylon twine can offer a sufficiently dissuasive obstacle to prevent birds from getting entangled in nets as they dive.
- Above water methods (AWM): For example, bird curtain, tori lines, underwater setting, branch line hauler, line shooter, laser beams, etc.
- Other: Other mitigation devices than those described above (electrical barriers attached to nets, which could repel sharks, rays and skates, thus preventing entanglement).

32. Branchlines set: Record the number of branchlines set by type. Branchlinline types must be in accordance to types previously defined under Form 2-LL - "Gear specifications" (see below).

IOTC REGIONAL OBSERVER SCHEME
LONGLINE FISHING EVENT

FORM 3– LL (pg. 1)
Page_001_ of _011

32. Branchlines set (*to be filled in in accordance to Form 2-LL*)

Branchline configuration number	#1	#2	#3	#4	#5	#6	#7
Number of branchlines set	240	---	---	---	---	---	---

IOTC REGIONAL OBSERVER SCHEME
LONGLINE GEAR SPECIFICATIONS

FORM 2-LL

Branchline configurations note branchline material code as per table provided in notes and circle units of measure used

Branchline configuration # 1

Section #	1	2	3	4
7. Material	MON	---	---	MUN
8. Length	33.2 m / cm	---	---	0.2 m / cm
9. Diameter	3 mm / cm	---	---	1.5 mm / cm

Branchline configuration # _____

Section #				
7. Material				
8. Length	m / cm	m / cm	m / cm	m / cm
9. Diameter	mm / cm	mm / cm	mm / cm	mm / cm

33. Hook type: Hooks used in pelagic fisheries are correctly identified and characterised based on type, material and type variations. Standardization of hook types and characteristics is therefore very important for data recording and analysis and for scientific studies on their effects on catch rates and post-capture survival. *For each kind of hook set, record the hook type (page 80); the ratio (%) of hooks set by type; and the details on hook variations in the observed set. This is if the hook is offset, made of stainless steel, with a ring, or if its round instead of regular (only for Japanese hooks).*

33. Hook type	#1	#2	#3	#4	#5	#6	#7
Type	H38	---	---	---	---	---	---
% Hooks set by type	100	---	---	---	---	---	---
Variations in hook type	---	---	---	---	---	---	---

34. Bait: Bait used for longline fishing is usually frozen whole finfish such as sardines, saury, or mackerel scad. Frozen whole squid is often used for tuna longlining but is more important as bait for swordfish. Live milkfish is also used for tuna longlining, particularly by Taiwanese boats.

34. Bait	#1	#2	#3	#4	#5	#6	#7
Type	FRC	FRC	FRC	---	---	---	---
Species	CHP	JAX	SAE	---	---	---	---
Ratio (%)	45.4	36.4	18.2	---	---	---	---
Dye colour	---	---	---	---	---	---	---

For each kind of bait placed on hooks during the observed set, record:

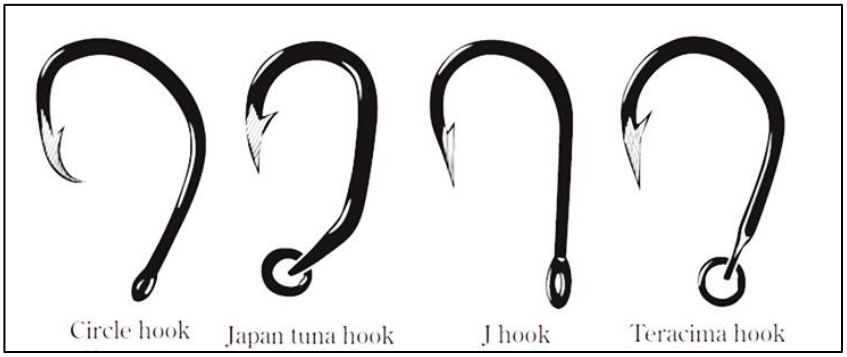
- the bait type (page 81), i.e., bait condition (e.g., frozen chopped);
- the species names. It is best to use the 3-letter FAO species code (page 78), but the common names can be recorded if the FAO code is not known;
- the approximate proportion used across all hooks in the set (%); and
- the colour or colours that the different baits are dyed (e.g., blue to avoid bird bycatch). If none, write NONE or put a line across the data field to indicate you haven't forgotten to fill it in.

MAIN HOOKS USED IN THE PELAGIC LONGLINE FISHERIES

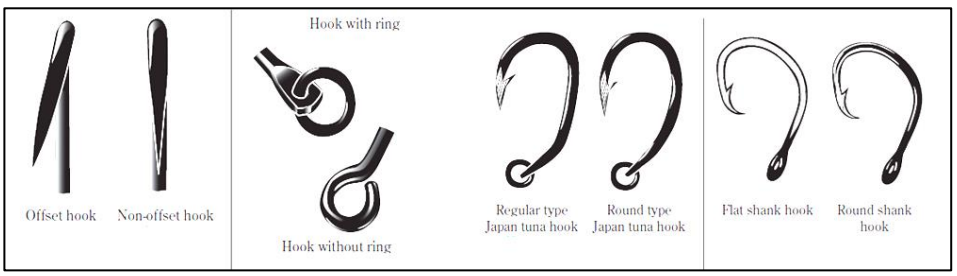
Fishers have different preferences when it comes to hooks. They base their selection on the target species, method of capture, time fish needs to stay on the hook, bait and baiting procedure, and what the individual fisher thinks is best. Generally, commercial longline tuna fishers use three types of hooks.

1) The standard **Japanese tuna hook**.
2) The **J-hook**, which has the same general design as the Japanese tuna hook, but is generally a lot larger. The J-hook has advantages when fishing for swordfish as it grabs a larger portion of the fish's flesh. (The lower jaw of the swordfish is fragile and likely to fall away if the standard Japanese tuna hook is used.) However, J-hooks are frowned on by environmentalists as they also grab a larger portion of a turtle's flesh, reducing its chances of survival.
3) The **circle hook**, these are less likely to be ingested by turtles and are therefore preferred by environmentalists; and
4) The **Teracima hook**.

TYPE OF HOOKS



HOOK TYPE VARIATIONS



 SECRETARIAT OF THE PACIFIC COMMUNITY CATALOGUING-IN-PUBLICATION DATA. LONGLINE TERMINAL GEAR IDENTIFICATION GUIDE. 639.22022. AACR2. ISBN: 978-982-00-0374-3.

>> FORM 4-LL: LONGLINE FISHING EVENT (SET)- CATCH DETAILS

This form contains questions about fishing set catch details including target and non-target catches together with Species of Special Interest and it is to be completed each time the line is hauled. The following instructions outlines how observers are to complete Form 4-LL.

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

IOTC REGIONAL OBSERVER SCHEME LONGLINE FISHING EVENT – CATCH DETAILS		FORM 4–LL Page 001 of 130
Revised September 2021		
Observer name: Peter SHUNULA	Observed trip number: 2020/02/10 - IOTCKEN001 - LL	Fishing event number: 001

Fishing event number: Observer is to record here the number corresponding to the fishing event observed. You should refer to the parent set number as specified in the 3-LL form (e.g.: 001, 002, …, etc.).

CATCH DETAILS

Fill in catch details for all specimens observed including depredated, non-target and SSI specimens. An example on how to fill in catch details table is provided here.

CATCH DETAILS to be recorded for all specimens observed, including depredated, non-target and SSI specimens. Use codes provided in form notes to fill in data collection fields.

	SPECIES AND FATE		DEPREDATION DETAILS		ADDITIONAL DETAILS ON NON-TARGET SPP.		ADDITIONAL CATCH DETAILS ON SPECIES OF SPECIAL INTEREST (SSIs) *(Whale sharks, oceanic white tip sharks, thresher sharks, striped marlin, black marlin, blue marlin and Indo-Pacific sailfish, marine turtles, marine mammals and seabirds)*										
Catch #	1. Spp.	2. Fate	3. Depredat. source	4. Predator observed	5. Condition at capture	6. Condition at release	7. Gear interaction	8. Hook type	9. Bait type	10. Leader material	11. Leader diameter	12. De-hooker / line cutter	13. Brought on board?		14. Landing method	15. Revived (turtles only)?		16. Photo ID
1	BET	RET	—										Y	N		Y	N	—
2	YFT	RET	—										Y	N		Y	N	—
3	TKH	DUD	NA	NA	A0	A1	HB	H38	CHP	MUN	1.5	LC	(Y)	N	SN	Y	(N)	001
4	BET	DPQ	SH	UNK	—	—	—	—	—	—	—	—	Y	N	—	Y	N	—
5	BET	RET	—										Y	N		Y	N	—

Catch detail number (#): This should be a three-digit numerical code beginning 001 *allocated to each specimen observed*. Catch numbers should be consecutive within the same set of the observed trip. *Use as many 4-LL forms as needed to record all specimens observed during the set.*

Species and fate

1. Species: Use the Food and Agriculture Organization (FAO) three-letter species codes to record any species that are caught. These codes are marked in the 'IOTC species identification guides' and provided in page 78.

- If you are unable to find FAO species 3-alpha code for a particular species, fill in species scientific name.
- If unsure of the correct species use FAO three-letter species group code, and provide further description of the species.
- If the species or group is not known, use the three-letter code ('UNS' - Unspecified), and provide further description of the species.
- If more than one unknown species, use your own numbering system to separate out the different species (i.e.: UNS #1, UNS #2). Take notes in your journal to help re-coding these species later, take photos, make drawings and descriptions.

➢ *Further descriptions for all UNS codes must be supplied (see box below).*

How to provide further descriptions for unspecified (UNS) or group codes

1) Take photographs of the specimen.

2) Bring the specimen back to shore for further identification (if possible).

3) Draw the species and write a full description in the written report. When drawing or describing unidentified species, pay special attention to:

- Ø overall body shape
- Ø colour of the fish
- Ø where the fins are attached to the body and their relative position
- Ø size of the fins, and number of fin spines and rays
- Ø height of the dorsal fins (especially for marlins)
- Ø presence or absence of the lateral line and its shape
- Ø scales or skin of the fish
- Ø any other distinctive features

2. Fate: Observers are to record the fate (i.e., the destination given) of every specimen caught by the vessel using fate codes provided in page 83 (*e.g., retained, discarded, etc.*).

Depredation details

'Depredation' is the term used when unwanted species such as cetaceans, sharks, squids, birds consume hooked fish (bait or catch).

How to identify predators based on the damaged provoked

Ø **Depredation by marine mammals.** Identified by bite marks of irregular contours often accompanied by long pieces of skin and tendons; often only the head or mouth parts remain attached to the hook, being usually the result of a single bite; The fish looks crushed and shredded. Damage usually recorded to several fish in a single set.

Ø **Depredation by large sharks:** Identified by clean bite marks with few if any large piece of flesh attached, shark bite marks are more like cuts and lacerations than perforations, the cut of each tooth is sometimes visible on the surface of the wound, abrasion and superficial cuts often the result of several bites.

Ø **Depredation by squid:** identified by injuries of irregular sizes and irregular edges, with significant traces of suction on the skin at the wound edge and the fish's body; Fish vertebrae and column, when visible, are pretty clean. Injuries provoked by squid predation can be found any were on the fish body.

Ø **Depredation by *Isistius brasiliensis*** (IBR: cookie shark): Identified by circular or oval injuries with sharp edges and a very concave shape. Injuries can be located anywhere on the body but most often on its lower part.

3. Depredation source: Toothed whales sometimes attack and eat tuna and swordfish that are caught on longlines. When a pod of these whales finds a longline with fish, they follow the line eating everything except the head of the hooked fish. Squid and sharks can also sometimes eat fish caught on longlines but the damage they provoke is quite small compared to toothed whales. Some dolphin and bird species have been associated with the loss of bait from longline gear.

- *Based on the damaged provoked to the baited line and/or the hooked catch, select the depredation source(s) using codes given in page 83.*

4. Predator observed: The predator species directly observed and identified (FAO spp. 3-alpha code). If not observed record UNK (unknown). Use codes provided in page 78.

- *Species observed in the area may not necessarily be associated with predation unless directly observed.*

Additional details on non-target species

Observers are to observe and record the state of health of non-target species that are caught by the vessel.

5. Condition at capture: The health condition at capture of non-target specimens (including SSIs) caught on the line during the observed set (brought onboard or not). Use condition codes listed in page 84. Use the condition code 'U' (condition unknown) if there was no opportunity to assess the condition.

6. Condition at release: The health condition at release of non-target specimens (including SSIs) caught on the line during the observed set (brought onboard or not). Use condition codes listed in page 84. Use the condition code 'U' (condition unknown) if there was no opportunity to assess the condition.

Additional details on SSIs

The following species have been considered by the IOTC as Species of Special Interest (SSI): marine mammals and turtles, seabirds, whale sharks, oceanic white tip sharks, thresher sharks, striped, black, blue marlin and Indo-Pacific sailfish). Observers are therefore required to collect catch details on these species at specimen level. Fill in additional details on non-target species and additional catch details for every SSI specimen caught.

7. Gear interaction: The type of interaction of the SSI specimen with vessel primary gear or the vessel itself. *Make sure to use the code(s) that best describe the situation (page 84).*

8. Hook type: Information on hook type to be collected only for branchlines where SSIs specimens are caught. *To be described as in Form 3-LL: "Set and haul information"*.

9. Bait type: Information on bait type to be collected only for branchlines where SSI specimens are caught. *To be described as in Form 3-LL: "Set and haul information".*

10. Leader material: Information on leader material to be collected only for branchlines where SSI specimens are caught. *To be described as in the Form 2-LL: "Gear specifications".*

11. Leader diameter: Information on leader diameter *(in mm)* to be collected only for branchlines where SSI specimens are caught. *To be described as in the Form 2-LL: "Gear specifications".*

12. De-hooker / line cutter: De-hooking/line cutting device used to release the SSI caught in the gear. *To be described using codes provided in page 84.*

13. Brought on board? Indicate if the SSI specimen caught was brought on board the vessel.

14. Handling method: How the SSI caught was hauled on-board. *Make sure to use the code that best describes the situation (page 84).*

15. Revival: FOR TURTLES ONLY indicate if the release took place following the application of turtle revival procedures. *A turtle is determined to be dead if the muscles are stiff (rigor mortis) and/or the flesh has begun to rot. Otherwise, the turtle is considered comatose or inactive and resuscitation attempts are necessary.*

TURTLE REVIVAL PROCEDURES

1. Place the turtle on deck and elevate hindquarters
2. Keep the sea turtle shaded and damp or moist, but out of the water
3. Periodically, gently rock the turtle side to side
4. Gently touch the eyes and pinch the tail periodically to see if it reacts
5. Continue resuscitation attempts for at least 4h and up to 24h.

16. Photo ID: If a photo is taken, record photo number / code. Make sure to follow basic rules for the photographing of specimens.

BASIC RULES FOR THE PHOTOGRAPHING OF SPECIMENS

1) Photograph whole animals individually;
2) Place a piece of paper with your name, vessel name and date next to the animal;
3) Include an object in the photograph to indicate the scale;
4) Photograph unusual marks;
5) Photograph the location of the interaction (preferably with the fishing gear still attached) and identification characteristics.
6) For sea-mammals photograph the head for species confirmation;
7) For sea-birds photograph the beak, the paws and the colour of the plumage (dorsal & ventral);
8) For sharks photograph the shape of the head, the mouth, the underside of the muzzle, the gill slits and the position of all the fins.
9) For sea-turtles photograph the carapace, the plastron; the shape of the head (top view); and the head left and right profiles.

TAG DETAILS

The 'Tag details' data-fields are to be completed for each and every tag recovery, if the tag is recovered by the observer or by a crew member during the observed trip or during previous trips. Tags found on the vessel are also to be reported with the maximum information possible.

	TAG DETAILS *to be recorded for every tagged specimen*								
Catch #	17. Tag release?		18. Tag recovery?		19. Tag type	20. Tag number 1	21. Tag number 2	22. Tag finder full name	23. Tag finder contact
3	(Y)	N	Y	(N)	MT	SKA7113	SKA7114	NA	NA

Catch detail number (#): Record catch number allocated to tagged specimen. Refer to the parent '*Catch #*' as specified in the 'Catch details' table previously filled.

17. Tag release: Indicate whether this individual was re-released with the tag(s) still attached.

18. Tag recovery: Indicate whether a tag was recovered from this individual.

19. Tag type: Specify the type of tag observed, using codes provided in page 84.

20. TAG # 1 and **21. TAG # 2**: Provide the tag number(s). If a turtle, provide both tag numbers (right and left flipper).

22. Tag Finder Name: Record the full name of the person who recovered the tag.

23. Tag Finder Contact Details: Record the contact details of the person who found the tag, including physical address, phone number and email address.

Attention: Tagged specimens are to be sampled for length. Elasmobranchs and turtles are also to be sexed and ascertained for maturity.

>> FORM 5-LL: LONGLINE FISHING EVENT - BIOMETRIC INFORMATION

This form is to be completed when conducting standard biometric sampling (i.e., length-frequency, weight and sex) for every positive set where there is catch to be sampled. When collecting detailed biological information (i.e., length(s)/weight, sex/ and maturity) and/or biological samples, the observer should use Form 6-LL.

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

IOTC REGIONAL OBSERVER SCHEME
LONGLINE – CATCH DETAILS & Biometric information

FORM 5–LL
Page 001 of 200

Revised September 2021

Observer name:	Observed trip no:
Peter SHUNULA	2020/02/10 - IOTCKEN001 - LL

CATCH DETAILS to be recorded for all specimens sampled, including SSIs. Use codes provided in form notes to fill in data collection fields.

				BIOMETRIC INFORMATION						
Set #	Catch #	Spp.	Fate	1. Sampling method biological information	2. Length 1 Type	3. Length 1 Value (cm)	4. Fish processing type	5. Weight Value (kg)	6. Weight estimation method	7. Sex
1	1	BET	RET	SPS	FL	141	RD	50	MB	M
1	2	YFT	RET	SPS	FL	142	RD	55	MB	M
1	3	TKH	DUD	EXS	CT	102	RD	UNK	NA	F
1	5	BET	RET	SPS	FL	151	RD	61	MB	M

Fishing event number: Record here the number corresponding to the fishing event/set observed. Refer to the parent set number as specified in Form 4-LL.

Catch #, Species and Fate: Record the catch detail number, the species and fate allocated in Form 4-LL to the specimens sampled for biometrics.

1. Sampling method for the collection of biological information: The sampling method used for the collection of the biological sub-sample. *Use codes listed in page 83. Observers should sample fishing event catch according to IOTC standard* sampling priorities*, listed in these guidelines.*

2. Length 1 type: The length measurement taken. *Use codes listed in page 85. Give priority to species reference length measurement and only record here another length measurements for processed fish.*

3. Length 1 value: The length corresponding to the length type taken *rounded down to the lowest centimetre*.

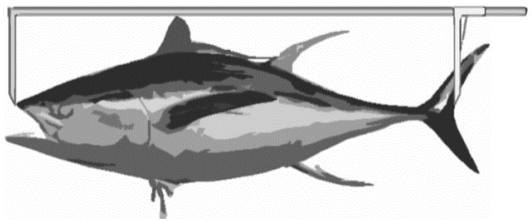
4. Fish processing type: Processed state of the specimen when it was weighted. *Record this information using the codes listed in page 83.*

5. Weight value (kg): The specimen's weight corresponding to the specified processing type *in kilograms rounded off to one decimal place*.

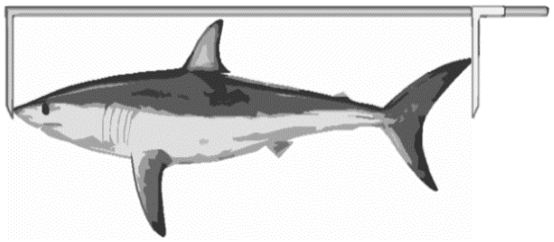
6. Weight estimation method: The estimation method used to obtain specimen weight. *Record this information using the codes listed in page 83.*

SPECIES REFERENCE LENGTH MEASUREMENT

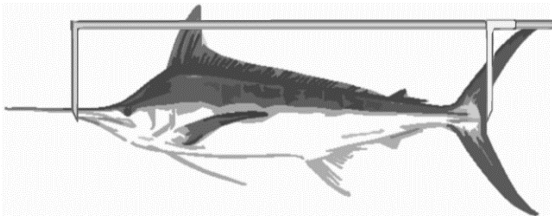
Tuna – UJFL length measured as a straight line from the tip of the upper jaw to the fork of tail.



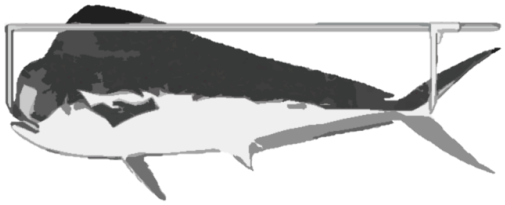
Sharks – TL length measured as a straight line from the tip of the snout to the extreme end of the tail.



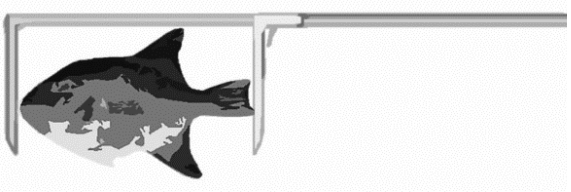
Billfish – LJFL length measured as a straight line from the tip of the lower jaw to the fork of tail.



Other fish with forked tails – FL length measured as straight line from the tip of the snout to the fork of the tail.

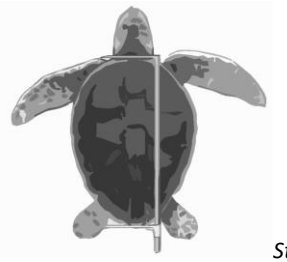


Other fish without a fork in the tail – TL length measured as a straight line from the tip of the snout to the end of the tail.

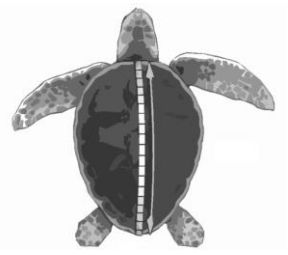


Rays – TW length measured as a straight line from one wing tip to another to obtain the total disk width.

Turtles – CL length measured as a straight line from notch to notch to obtain the total carapace length. *Note: If you don't have callipers than measure curved carapace length (CT) with a flexible tape.*



Straight carapace length (CL)

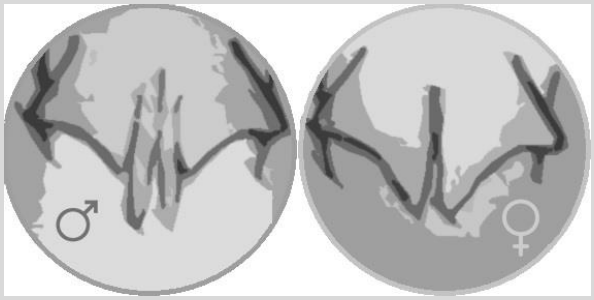


Curve carapace length (CT)

7. Sex: Ascertain the sex of landed fish by checking their gonads (if allowed) and of sharks, turtles, marine mammals (etc.) by looking at external features. *Record specimen sex using the codes listed in page 83.*

MARINE SPECIES THAT CAN BE SEXED FROM EXTERNAL FEATURES

Sharks and rays

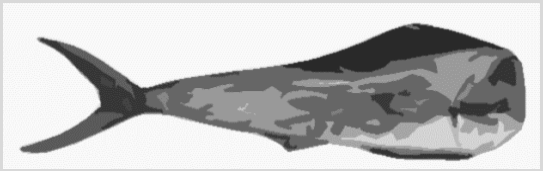


Male have claspers Female have no claspers

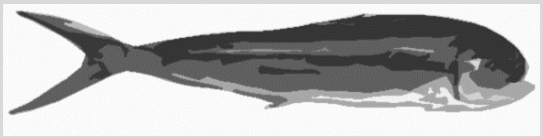
Turtles

The female's tail is shorter and thinner. The cloaca is located at the base of the tail & almost disappears into the shell.	
The male's tail is longer and thicker than a female is and the cloaca is located in the last third of the tail, towards the tip.	

Dolphinfish -DOL (*C. hippurus*)



Male: Straight blunt head

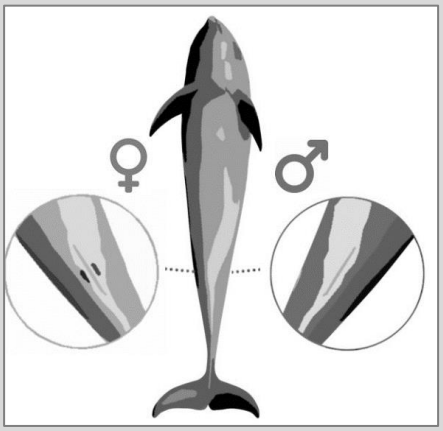


Female: Curved backward head

Marine mammals (whales and dolphins)

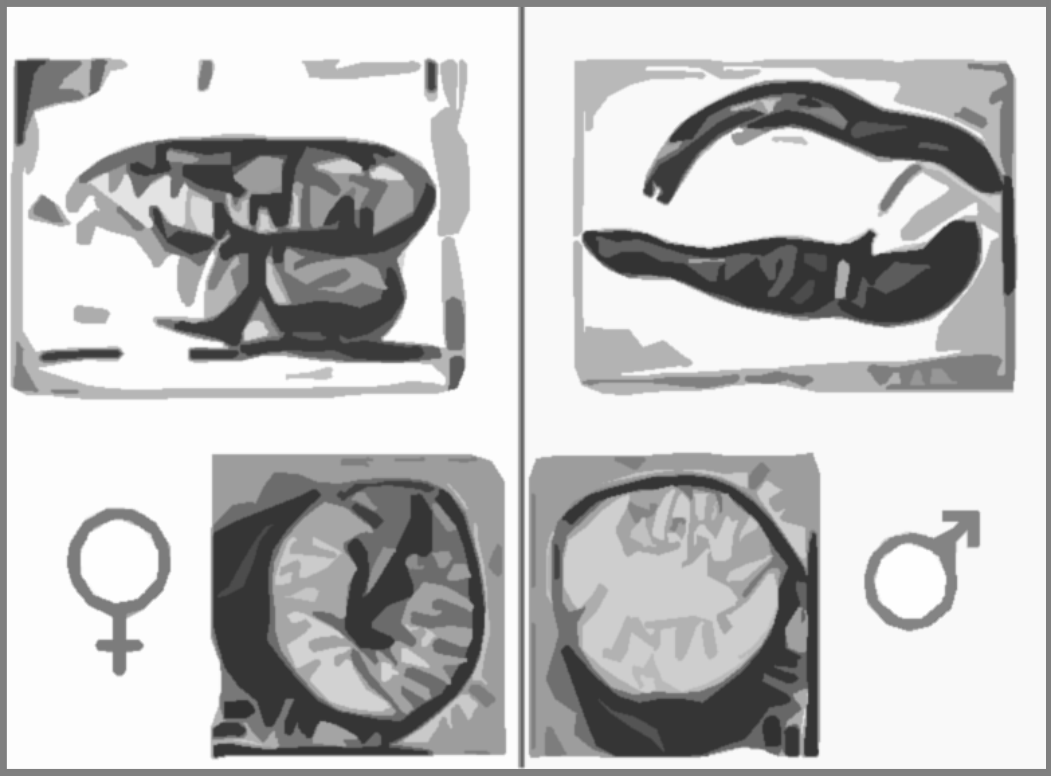
Cetaceans have their reproductive organs and mammary glands hidden inside "slits" near their abdomen.

- In males, the genital "slit" and the anus are vertically separated.
- In females, the genital "slit" is connected to the anus, and they also have a pair of shorter "slits" called the mammary slits.



SEXING LANDED FISH BY CHECKING THEIR GONADS

Gonads from different species have the same basic design.



Male – 'M'- A cross-section of the male gonad looks ovoid. It contains no lumen (small hole) that runs the full length of the gonad. Male gonads are likely to be white but there may be a red tinge, depending on the maturity of the gonad. If the gonad is lightly squeezed, a white liquid (semen) may emerge. No granules can be seen when looking closely at the tissue of male gonads.

Female – 'F' - A cross-section of the female gonad looks mostly circular. It also contains a small lumen (hole) that is somewhat rough at the edges and runs the full length of the gonad. Female gonads usually, but not always, have a yellow to orange tinge. The colour may be deeper, depending on the maturity of the gonad. When looking closely at female gonad tissue, small granules (eggs) can be seen. These are more obvious in more mature gonads.

Immature or indeterminate - 'I' - If the gonad is checked but is too immature to determine the sex, the observer can record I – (indeterminate). Both immature male and female gonads are likely to be string-like and thin and some of the features outlined above may not be obvious when the gonad is examined.

Unknown – 'U' - Use the sex code 'U' – (unknown) when unable to check the sex of the marine species. Note the difference between the sex codes 'I' and 'U'.

>> FORM 6-LL: FISHING EVENT –CATCH DETAILS – BIOLOGICAL SAMPLE COLLECTION

This form is to be completed when collecting detailed biological information (i.e., length(s)/weight, sex and maturity) and/or biological samples (e.g., otoliths, stomachs, genetic samples, etc.).

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

IOTC REGIONAL OBSERVER SCHEME — **FORM 6–LL**

FISHING EVENT – CATCH DETAILS – Biological data and sample collection — Page 001 of 001

Revised September 2021

Observer name:	Observed trip number:
Peter SHUNULA	2020/02/10 - IOTCKEN001 - LL

					Length 1		Length 2									
Fishing event #	Catch #	Species	Fate	1. Sampling method	2. Type	3. Value (cm)	4. Type	5. Value (cm)	6. Type of processing	7. Value (Kg)	8. Estimation method	9. Sex	10. Maturity stage level	11. Type	12. Method preservation
001	012	YFT	RFL	SRP	FL	61	---	---	---	---	---	M	---	muscle	frozen
001	012	YFT	RFL	SRP	FL	60	---	---	---	---	---	M	---	muscle	frozen
001	012	YFT	RFL	SRP	FL	59	---	---	---	---	---	F	---	muscle	frozen

Fishing event / set number (#): Record here the number corresponding to the fishing event observed. Refer to the parent set number as specified in Form 4-LL.

Catch #, Species and Fate: Record the catch detail number, the species and fate allocated in Form 4-PS to the specimen sampled for biometric data.

1. Sampling method for the collection of biological information: Indicate the sampling method used for the collection of the biological sub-sample. Use codes listed in page 83.

Length 1

2. Type: The length measurement taken. Use codes listed in page 85.

3. Value: Record the length corresponding to the length type taken rounded down to the lowest centimetre.

Length 2

4. Type: When an additional measurement is taken, the corresponding measurement type should be recorded under length 2. Use codes listed in page 83.

5. Value: When an additional length measurement is taken, the corresponding length should also be recorded rounded down to the lowest centimetre.

Weight

Only record weights if supplied with a scale and if instructed to collect fish or other specimen weights.
If no weight data has been collected the observer should mark in NM (not measured) at the top and bottom of the weight related columns and then draw a line down through all the data fields.

6. Type of processing: Processed state of the specimen when it was weighted. Record this information using the codes listed in page 83.

7. Value (kg): The specimen's weight corresponding to the specified processing type *in kilograms rounded off to one decimal place*. If the fish has not been processed, record the unprocessed (or round) weight.

8. Estimation method: The estimation method used to obtain specimen weight. Record this information using the codes listed in page 83.

Gender and maturity

9. Sex: Record the sex of sharks, turtles, marine mammals, and other species whose sex can be easily determined by looking at external features. Ascertain the sex of other landed fish by checking their gonads (if permitted). *Sex codes: Male (M), Female (F), Immature or indeterminate (I), Juvenile (J).*

10. Maturity stage level: The level of maturity of the specimen according to standard maturity scales approved by the IOTC or another if no IOTC approved scale. If unknown record UNK.

*If the observer uses a maturity stage level scale other than the one(s) approved by the IOTC he should **record the scale used under the COMMENTS section** (e.g., IFREMER swordfish maturity scale developed in 2012 for the IOSSS project: "IOSSS-IFREMER, 2012").*

Sample collected

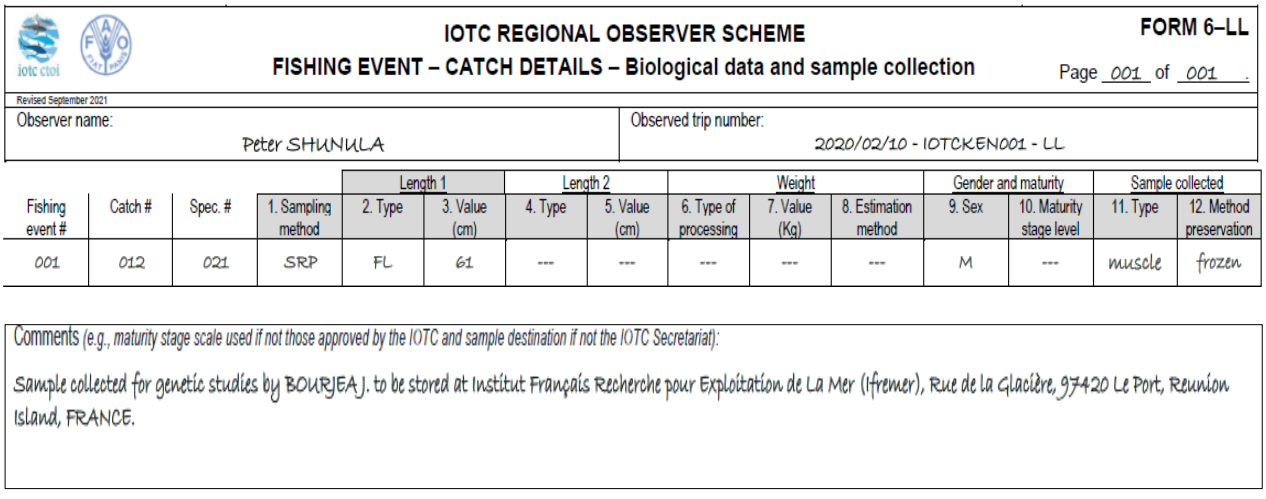
11. Type: Record the type of sample collected (otoliths, spine clippings, stomach, muscle, etc).

12. Preservation method: Record the method used to preserve the collected sample (alcohol, frozen, stored on otolith envelops, etc).

*If the sample is to be sent / stored to / on a destination other than the IOTC Secretariat the observer should **record sample destination in the COMMENTS section,** this is, the name and email address of the person and organisation responsible for the analysing / storing of the collected sample (e.g., Institut Français Recherche pour Exploitation de La Mer (Ifremer), Rue de la Glacière, 97420 Le Port, Reunion Island, FRANCE).*

Comments

Record here any information of importance such as macroscopic maturity stage scale used, sample purpose and destination, if there were photographs taken, or any other information of interest.



IOTC REGIONAL OBSERVER SCHEME

FISHING EVENT – CATCH DETAILS – Biological data and sample collection

FORM 6–LL

Page 001 of 001

Revised September 2021

Observer name: Peter SHUNULA

Observed trip number: 2020/02/10 - IOTCKEN001 - LL

				Length 1		Length 2			Weight			Gender and maturity		Sample collected	
Fishing event #	Catch #	Spec. #	1. Sampling method	2. Type	3. Value (cm)	4. Type	5. Value (cm)	6. Type of processing	7. Value (Kg)	8. Estimation method	9. Sex	10. Maturity stage level	11. Type	12. Method preservation
001	012	021	SRP	FL	61	---	---	---	---	---	M	---	muscle	frozen

Comments *(e.g., maturity stage scale used if not those approved by the IOTC and sample destination if not the IOTC Secretariat):*

Sample collected for genetic studies by BOURJEA J. to be stored at Institut Français Recherche pour Exploitation de La Mer (Ifremer), Rue de la Glacière, 97420 Le Port, Reunion Island, FRANCE.

>> FORM 7-LL: VESSEL OFFLOADING / TRANSHIPMENT

In case that an at-sea transhipment to a carrier / fishing vessel takes place during the trip the Observer should complete this form, except if an 'IOTC REGIONAL OBSERVER PROGRAMME' Observer is present on the carrier vessel monitoring the transhipment. The following instructions outlines how observers are to fill Form 7-LL.

Header details

The header details *must be fully filled in on every completed form* (for information on observer name, observed trip number and page number, see > Header details', page 29).

IOTC REGIONAL OBSERVER SCHEME
VESSEL TRANSHIPMENTS

FORM 7-LL
Page 001 of ____.

iotc ctoi
Revised September 2020

Observer name:	Observed Trip No:
Peter SHUNULA	2020/02/10 - IOTCKEN001 - LL

Vessel transhipment #: 001

1. Start date and time (UTC):

DD	MM	YYYY	hh	mm
14	02	2020	14	10

2. End date and time (UTC:

DD	MM	YYYY	hh	mm
14	02	2020	17	15

3. Position (dd° mm' ss") specify quadrant (circle)

LATITUDE		LONGITUDE	
34° 47' 42"	(S) N	025° 32" 55'	(E) W

4. Category (tick the correct option):

TRANSHIP FROM:		TRANSHIP TO:	X
NET LOAD:		NET OFFLOAD:	

Product transhipped

#	5. Spp.	6. Processing type	7. Quantity (encircle unit used)			
1	YFT	GT	1	(Mt)	Kg	No
2	YFT	PD	1	(Mt)	Kg	No
3	BET	GT	0,5	(Mt)	Kg	No
4				Mt	Kg	No
5				Mt	Kg	No
6				Mt	Kg	No
7				Mt	Kg	No
8				Mt	Kg	No
9				Mt	Kg	No
10				Mt	Kg	No
11				Mt	Kg	No
12				Mt	Kg	No
13				Mt	Kg	No
14				Mt	Kg	No

8. Name of carrier / fishing vessel:	ASIAN MARINE REEFER	9. Flag:	THAILAND
10. Call sign:	HSB2993	11. Port of registry:	BANGKOK THAILAND
12. Registration number	UNK (IMO: 7637589)		

Vessel transhipment number: Transhipment numbers are recorded in the order that they occur. Allocate a unique consecutive transhipment number each time there's a transhipment. These should be consecutive from the start to the end of the observed trip. Start at "001", "002", etc., all through a trip.

1. Start date and time: Date and time the transhipment starts (recorded in UTC time).

2. End date and time: Date and time the transhipment ends (recorded in UTC time).

3. Position: The GPS position of your vessel, at the start of transhipment collected in the DMS format.

4. Category: Record if your vessel is transhipping to or transhipping from, (i.e., receiving fish from) another vessel (carrier/fishing vessel).

> **Attention:** Stores, bait or fuel may also be transhipped. The date, time and details of this must not be confused with the time that fish or fish products are being transhipped.

Product transhipped

Record the quantity of fish products transhipped (per species and product type) using FAO spp.3-Alpha codes and IOTC processing type codes.

5. Species: The species code for fish products transhipped *(page 76)*. If species FAO code is not available, the species scientific name.

6. Processing code: The code corresponding to the type of processing the specimen underwent according to IOTC categories *(page 83)*.

7. Quantity: The quantity of fish products transhipped, per species and processing / product type (preferably metric tonnes). Make sure you specify the units used to account for fish products transhipped, per species and processing/product type (*Mt = metric tonnes; Kg = kilogram; or # = numbers*). *Request this information from captain and / or bridge officers.*

8. Name of carrier / fishing vessel: Full name with no abbreviations, correctly spelled and including any corresponding numbers, as recorded on vessel official documents, and crosschecked with the name recorded on the vessel itself (*E.g., "Agnes 83"),* any discrepancies to be reported to the IOTC.

9. Registration #: Number issued by country (Flag State) in which the vessel is registered, shown on its registration documents and written on the hull of the vessel. This may be a combination of characters and numbers; record them all (*e.g.: CBG303*).

10. Port of registry: Country and port of registry as shown on vessel's registration documents and lettered on the stern of the ship's hull.

11. Flag: Country where vessel is registered as shown on its registration documents. Where chartering occurs, name of chartering country. Note that vessel flag state (or chartering flag) may not be the same as the nationality from which the vessel originates.

12. Call sign: Vessel international radio call sign if available. Series of numbers and letters painted on vessel's side or superstructure, either in black lettering on a white background or white on black.

ANNEXES

ANNEX 1 - VESSEL PRE-SEA SAFETY CHECK FORM

VESSEL PRE-SEA SAFETY CHECK FORM

Observer / Observer Coordinator / NOP designated officer		Date		Signature	
Vessel Agent		Date		Signature	
Port / Position					

Vessel Details:

Vessel Name		
Captain/Fishing Master Name		
Call Sign		
Flag		
Size GRT		
Length Over All (LOA)		
Vessels Compliment		
Vessel contact Number	Telephone	
	Fax	
	Inmarsat (A/C/M) & No.	
Vessel Owners / Charter's	Name	
	Telephone	
	Fax	
	Mobile	

Safety Equipment:

Safety Certificate In-date (Y/N)		Issuing Authority	
Flares: Location		If checked No./Exp Date	
First Aid Materials: Location		Name of Medical Officer	

Life Rafts				
Type	Number	Capacity	Hydrostatic release (Y/ N)	Date Next Service Due

Life Jackets			
Type Inflatable / Packed	Number on-board	Location Cabin /Muster Station/ Both	SOLAS Approved (Y/N)

Fire Extinguishers			
Positioned in main corridor's (Y/N)		Charge seals intact (Y/N)	
Positioned on bridge (Y/N)		Charge seals intact (Y/N)	

Life Buoys	Number on-board	Free Release (Y/N)	Light/SART Attached (Y/N)

Immersion Suits *(only required by vessels operation south of 30o S)*			
Type	Number on-board	Location Cabin /Muster Station/ Both	SOLAS Approved (Y/N)

Flares: Location		If checked No. / Exp Date	
First Aid Materials: Location		Certified Medical Officer (Y/N)	

GMDSS Requirements

Radio Equipment	HF Operational yes or no	MF Operational yes or no	VHF Operational yes or no	INMARSAT Operational yes or no	NAVTEX Operational yes or no

EPIRB			
Type / Manufacturer	Number of units on board	Location	Release method manual / float free

SART's			
Type / Manufacturer	Number of units on board	Location	Release method manual / float free

Accommodation:

Vessel Emergency Evacuation and Muster Stations Lists – Displayed (Y/N)	
Cabin - Single or Sharing	

General Comments:

Minimum safety requirements before an observer will be permitted to embark

Safety Certificate (Safety Management Certificate)

The vessel must have on-board a current and valid Safety Certificate that does not expire for a period of at least four months from the date of embarkation of the observer. The total crew compliment on board the vessel INCLUDING THE OBSERVER must not exceed the maximum specified number of crew listed in the safety certificate.

Life Rafts

The Life rafts capacity must have the capacity to accommodate the full crew compliment, including the observer. (In other words, the total life raft capacity must be equal to or exceed 100% of the vessels compliment). Life Rafts must be within their serviceable date, which must cover the expected maximum duration of observer deployment. All Life Rafts must be fitted with a serviceable Hydrostatic Release mechanism.

Life Jackets

There must be a total number of life jackets onboard, readily available at the emergency muster stations to accommodate each of the compliment onboard the vessel. All Life Jackets must comply with IMO – SOLAS LSA standards.

GMDSS Requirements

The vessel must be GMDSS compliant in accordance to its tonnage and its area of operation. Any component of the GMDSS requirement that is out of date or unserviceable will render the vessel as NOT being GMDSS compliant. These items shall include inter alia EPIRP's, SART's and distress flares and rockets.

ANNEX 2 - OBSERVER DEPLOYMENT REPORT FORM

OBSERVER DEPLOYMENT REPORT FORM

(Complete and send within 24 hours to National Observer Programme Coordinator)

Date		
Observer name		
Vessel name/Call sign		
Vessel company		
Captain name		
Fishing Master		
Vessel contact details	Email	
	Phone Number	

Deployment details

Briefing date	
Contract start date	
Flight no.	
Departure date from home	
Departure time from home	
Landing date at deployment destination	
Landing time at deployment destination	
Safety inspection completed (Yes/No)	
Embarkation Date	
Port of embarkation	
Sailing date	
Comments	

ANNEX 3 - OBSERVER WEEKLY REPORT FORM

OBSERVER WEEKLY REPORT FORM

(Complete and send every week to Observer Programme Coordinator)

Vessel Name / Call sign	
Observer name	
Date / Report Period	
Location at time of report	

SET DETAILS	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Set No.							
Date							
Latitude							
Longitude							
No. fish sampled							
No. PET caught							
Compliance							

Spp.	**Monday**		**Tuesday**		**Wednesday**		**Thursday**		**Friday**		**Saturday**		**Sunday**	
	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg	No.	Kg
YFT														
BET														
SKJ														
BSH														
SWO														
BLM														
MAK														

Comments *(comment on any items considered important for immediate attention)*

ANNEX 4 - INSTRUCTIONS TO OBSERVERS TO WRITE THE OBSERVER TRIP REPORT

INSTRUCTIONS TO OBSERVERS TO WRITE THE OBSERVER TRIP REPORT

Basic outline and headings

The basic outline and headings of the report shall include:

- Formal cover page that includes trip reference number, vessel name, observer's name and trip start and end dates.
- Trip summary, *[observers are only to compiled it after they have written the report]*
- Observer and vessel details
- Cruise itinerary
- Fishing operations
    - Fishing strategy
    - Gear details
    - Lost gear
    - Catch
    - Processing
- Observer Sampling and Biological Data Collected
    - Sampling methodologies
    - Samples taken and storage location
- Summary of weather and oceanographic conditions
- Environmental interactions with vulnerable marine fauna
- Waste management
- Vessel sightings
- General report back

General style

- Strive for logic and precision and avoid ambiguity, especially with pronouns and sequences
- ONLY use the International Metric System of measurement and abbreviate measurements without periods (i.e. cm and kg)

	International Metric System
Length	millimetre (mm) centimetre (cm) metre (m)
Area	square metre (m2)
Volume	litre (l) cubic metre (m3)
Weight	gramme (g) kilogramme (kg) ton (t)

- Spell out all numbers beginning sentences or less than 10 (i.e. "two explanations of six factors").
- Write numbers as numerals when greater than ten (i.e. 156) or associated with measurements (i.e. 6 mm or 2 g)

Within the report, the exact format of items is less important than consistency of application. For example, if you indent paragraphs, be sure to indent them all; use a consistent style of headings throughout (e.g. major headings in bold with initial capitals, minor headings in italics, etc.); write "%" or "percent" but do not mix them, and so on. In other words, establish a template and stick to it. Have a neutral person review and critique your report before submission

Trip Summary

The trip summary should give a concise and clear summary 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 trip. Follow the headings of the report when writing the trip summary and use the following guidelines:

- The 1st paragraph 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.
- The 2nd paragraph should give a short summary of the cruise itinerary (dates and ports of departure and return etc.)
- The 3rd paragraph 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.
- The 4th paragraph should give details on catches (weights and products). Mention the catch by weight and/or number of the target species and details on by-catches. Mention the conversion factors if any were used (observer and vessel).
- The 5th paragraph should give a short summary of biological sampling undertaken by the observer (e.g. length, weight, maturity, otoliths, tagging etc.)
- The 6th paragraph should give details on bird mortalities, entanglements, mitigation measures, marine mammal entanglements and interactions etc.
- The 7th paragraph should mention any fishing vessel sightings (important for IUU vessels) and any difficulties encountered (with operational issues and observer tasks).
- Keep your writing impersonal, in the third person (the observer) and avoid the use of the first person (i.e. I or we).
- Use the past tense and be consistent within the report - do not change between past and present tense.

Guide to some specific formats in Observer Reports

Date format: Only use the following format: *dd/mm/yyyy* (eg. 25/12/2010 for the 25th December 2010)

Species names: The Latin names for individual species are written using a system termed "binomial nomenclature". Each species is identified by a combination of "two names": its genus name and its specific epithet. A familiar example is that of human beings, Homo sapiens.

Simple Rules for Writing Latin Names in Papers

- The first time a species is mentioned in the title and in the text, it should be written out in full, e.g., *Thunnus albacares*
- The genus name (1st of the two names) should always start with a capital letter
- The specific epithet (2nd of the two names) should always be with a small letter
- The species names should always be in *italics*
- Avoid using species codes in the text of the report instead of species names or common names
- After the species name has been written out in full the first time, it must be abbreviated as follow: *T. albacares*, i.e. the genus has been abbreviated to the first capital letter and a full stop.
- Always write the species name after the common name when mentioning a fish, bird or mammal for the 1st time, e.g. Five wandering albatross, *Diomedea exulans*, were observed (…).
- 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 should be written in small letters, e.g. giant petrels and not Giant Petrels

Text format: Body text should use the following font: Times New Roman, regular, size 12. Paragraphs should be aligned to the left and line spacing should be single.

ANNEX 5 - CODE TABLES OF INTEREST FOR OBSERVERS ONBOARD LONGLINERS

FAO species codes[1]

Tuna and tuna-like species under the IOTC mandate

ALB	Albacore
BET	Bigeye tuna
BLM	Black Marlin
BUM	Blue Marlin
BLT	Bullet tuna
FRI	Frigate tuna
GUT	Indo-Pacific king mackerel
SFA	Indo-Pacific sailfish
KAW	Kawakawa
LOT	Longtail tuna
BIL	Marlins,sailfishes,etc. nei

COM	Narrow-barred Spanish mackerel
SSP	Short-billed spearfish
SKJ	Skipjack tuna
SBF	Southern bluefin tuna
MLS	Striped marlin
SWO	Swordfish
TUS	True tunas nei
TUX	Tuna-like fishes nei
TUN	Tunas nei
YFT	Yellowfin tuna

Other bony fish species that may be caught incidentally in IOTC fisheries

BAU	Australian bonito
BAR	Barracudas nei
LEC	Black escolar
MAA	Blue mackerel
BUK	Butterfly kingfish
DOL	Common dolphinfish
DOT	Dogtooth tuna
DBM	Double-lined mackerel
AMB	Greater amberjack
RAG	Indian mackerel
KAK	Kanadi kingfish
KOS	Korean seerfish

SPF	Longbill spearfish
OIL	Oilfish
LAG	Opah
MZZ	Other marine bony fishes NEI
SAP	Pacific saury
BRA	Pomfrets nei
CFW	Pompano dolphinfish
RRU	Rainbow runner
STS	Streaked seerfish
BIP	Striped bonito
WAH	Wahoo

Sharks and rays common species in the Indian Ocean Pelagic Fisheries[2]

Sharks

BSK	Basking shark
ODH	Bigeye sand tiger shark
BTH	Bigeye thresher
CCA	Bignose shark
BLR	Blacktip reef shark
CCL	Blacktip shark
BSH	Blue shark
CCE	Bull shark
ISB	Cookie cutter shark
BRO	Copper shark
PSK	Crocodile shark
DUS	Dusky shark

CCG	Galapagos shark
SPK	Great hammerhead
AML	Grey Reef Shark
LMA	Longfin mako
OCS	Oceanic whitetip shark
PTH	Pelagic Thresher Shark
POR	Porbeagle
LMD	Salmon shark
CCP	Sandbar shark
SPL	Scalloped hammerhead
SMA	Shortfin mako
FAL	Silky shark
ALS	Silvertip shark

[1] February 2018 version of the FAO ASFIS_sp.zip file (http://www.fao.org/fishery/collection/asfis/en)

[2] As per IOTC species identification cards for "Shark and Ray identification in Indian Ocean Pelagic Fisheries".

SPZ	Smooth hammerhead
ALV	Thresher Shark
TIG	Tiger shark
RHN	Whale shark
TRB	Whitetip reef shark
EUB	Winghead shark

Rays

MRJ	Javanese cownose ray (Flapnose ray)
RMA	Alfred manta
RMT	Chilean devilray/sicklefin deveilday
RMM	Devil fish
RMB	Giant manta
WSH	Great White shark
RME	Longhorned mobula
PSL	Pelagic stingray
RMO	Smoothtail mobula
RMJ	Spinetail mobula

Sharks, other species that may be caught incidentally in IOTC fisheries

AGN	Angel shark
OXY	Angular rough shark
MTM	Arabian smooth-hound
SUU	Australian angelshark
SHBC	Banded cat shark
HXN	Bigeyed sixgill shark
SBL	Bluntnose sixgill shark
NTC	Broadnose sevengill shark
OQX	Brownbanded bambooshark
CWZ	Carcharhinus sharks nei
HAY	Cow Shark
CCY	Graceful shark
ORR	Grey bambooshark
CCM	Hardnose shark
HCM	Hooktooth shark
SCK	Kitefin shark
GUQ	Leafscale gulper shark
NGB	Lemon shark
CPU	Little gulper shark
RHA	Milk shark
CYT	Ornate dogfish
HXT	Sharpnose sevengill shark
DOP	Shortnose spurdog
ORI	Slender bambooshark
CLD	Sliteye shark
CEM	Smallfin gulper shark
SMD	Smooth-hound
SLA	Spadenose shark
CCB	Spinner Shark
CCQ	Spot-tail shark
ORZ	Tawny nurse shark
GAG	Tope shark
SSQ	Velvet dogfish
CCD	Whitecheek shark
RHA	White-eyed shark
OSF	Zebra shark
SKH	Sharks various NEI

Marine turtles that may be caught incidentally in IOTC fisheries

FBT	Flatback turtle
TUG	Green turtle
TTH	Hawksbill turtle
DKK	Leatherback turtle
TTL	Loggerhead turtle
LKV	Olive ridley turtle
TTX	Marine turtles NEI

Seabirds that may be caught incidentally by IOTC fisheries

DAM	Amsterdam Albatross
DQS	Antipodean Albatross
DCR	Atlantic Yellow-nosed Albatross
DIM	Black-browed Albatross
DIB	Buller's Albatross
TQW	Campbell Albatross
MWE	Cape Gannet
DAC	Cape/Pintado petrel
DER	Chatham Albatross
PCF	Flesh-footed shearwater
PDM	Great-winged petrel
PCI	Grey petrel
DIC	Grey-headed Albatross
TQH	Indian Yellow-nosed Albatross

PHE	Light-mantled Albatross
MAH	Northern Giant Petrel
DIQ	Northern Royal Albatross
DKS	Salvin's Albatross
PFT	Short-tailed Shearwater
DCU	Shy Albatross
PHU	Sooty Albatross
PFG	Sooty Shearwater
MAI	Southern Giant Petrel
DIP	Southern Royal Albatross

DBN	Tristan Albatross
DIX	Wandering Albatross
PCW	Westland Petrel
TWD	White-capped Albatross
PRO	White-chinned Petrel
ALZ	Albatrosses NEI
PTZ	Petrels NEI
SZV	Boobies and gannets NEI
PQW	Shearwaters NEI
LHX	Seagulls NEI

Sea mammals that occur within the IOTC Area of Competence

BDW	Andrews' beaked whale
BAW	Arnoux's beaked whale
BBW	Blainville's beaked whale
BLW	Blue whale
DBO	Bottlenose dolphin
BRW	Bryde's whale
CMD	Commerson's dolphin
DCO	Common dolphin
BCW	Cuvier's beaked whale
DDU	Dusky dolphin
DWW	Dwarf sperm whale
FAW	False killer whale
FIW	Fin whale
PFI	Finless porpoise
FRD	Fraser's dolphin
TGW	Ginkgo-toothed beaked whale
BYW	Gray's beaked whale
BHW	Hector's beaked whale
HRD	Hourglass dolphin
HUW	Humpback whale
DHI	Indo-Pacific hump-backed dolphin
IRD	Irrawaddy dolphin
KIW	Killer whale

PIW	Long-finned pilot whale
BNW	Longman's beaked whale
MIW	Minke whale
DPN	Pantropical spotted dolphin
KPW	Pygmy killer whale
CPM	Pygmy right whale
PYW	Pygmy sperm whale
DRR	Risso's dolphin
RTD	Rough-toothed dolphin
BSW	Sherpherd's beaked whale
SHW	Short-finned pilot whale
SRW	Southern bottlenose whale
EUA	Southern right whale
RSW	Southern right whale dolphin
SPP	Spectacled porpoise
SPW	Sperm whale
DSI	Spinner dolphin
TSW	Strap-toothed whale
DST	Striped dolphin
DLP	Dolphins NEI
ODN	Toothed whales NEI
MYS	Baleen whales NEI

Bait species

ENR	Anchovies nei
MAC	Atlantic mackerel
BIS	Bigeye scad
JAA	Blue jack mackerel
BSH	Blue shark
BOC	Boarfish
BOG	Bogue
BSR	Brazilian sardinella
APO	Cardinal fishes, etc. nei
MAS	Chub mackerel

SPD	Delicate round herring
PIL	European pilchard (=Sardine)
CJX	Fusiliers nei
CLP	Herrings, sardines nei
RAG	Indian mackerel
JAX	Jack and horse mackerels nei
JAN	Japanese anchovy
RSA	Japanese scad
SNS	Longspine snipefish
MSD	Mackerel scad

MAX	Mackerels nei
SAE	Madeiran sardinella
MIL	Milkfish
SAP	Pacific saury
MSB	River sardine
SAA	Round sardinella
SAX	Sauries nei

SIL	Silversides (sand smelts) nei
SRH	Silver-stripe round herring
CHP	South American pilchard
OMZ	Squids nei
SQU	Various squids nei

Country codes/names (FAO[3] ISO$_3$)

AUS	Australia
BLZ	Belize
CHN	China
COM	Comoros
ERI	Eritrea
FRA	European Union
GIN	France (EU)
IND	Guinea
IDN	India
IRN	Indonesia
ITA	Iran
JPN	Italy (EU)
KEN	Japan
KIR	Kenya
KOR	Kiribati
AUS	Korea, Republic
LBR	Lyberia
MDG	Madagascar
MYS	Malaysia
MDV	Maldives

MUS	Mauritius
MOZ	Mozambique
NLD	Netherlands (EU)
OMN	Oman
PAK	Pakistan
PAN	Panama
PHL	Philippines
PRT	Portugal (EU)
SYC	Seychelles
SLE	Sierra Leone
SGP	Singapore
SOM	Somalia
ZAF	South Africa
ESP	Spain (EU)
LKA	Sri Lanka
SDN	Sudan
TZA	Tanzania
THA	Thailand
GBR	United Kingdom (EU)
YEM	Yemen

Vessel and gear codes

Gear types

GIL	Gillnet
DLL	Drifting longline

TPL	Pole and line
TPS	Tuna purse seine

Vessel hull material

STE	Steel
FRP	Fibre glass reinforced plastic
WOO	Wood

ALU	Aluminium
OTH	Other

Preservation methods

NO	None
ST	Salt

DR	Dried
SM	Smoked

[3] http://www.fao.org/countryprofiles/iso3list/en/

IC	Ice
CWS	Chilled with sea water (higher temp than refrigerated sea water)
RW	Refrigerated sea water

BR	Refrigerated brine (cooler than RW)
FR	Cold storage between 0 and -30 degrees
DF	Cold storage below -30 degrees

Storage type

WL	Well
BF	Blast Freezer

RC	Refrigeration chamber

Waste category

PL	Plastic
CP	Cardboard & paper
KW	Kitchen waste
OF	Oil and fuel

MG	Metal and glass
NB	None biodegradable fishing gear
OT	Other (specify)

Storage/disposal method

AS	At sea disposal
IN	Incinerated
RO	Retained on board

LD	Land disposal
UK	Unknown
OT	Other (specify)

Line material types

MON	Monofilament nylon
GLW	Galvanized wire (mat)
SSW	Stainless steel wire (bright)
TR3	3 strand tarred rope (red or black)
BRL	Braided line (kuralon- braided nylon)
SKW	Sekiyama wire (central part of the wire is surrounded by a cotton or synthetic fiber thread, and usually tarred)
MUN	Multifilament nylon

MUC	Multifilament Cremona
MOC	Monofilament Cremona
MUD	Multifilament Dyneema
MOD	Monofilament Dyneema
MUK	Multifilament Kevlar
MOK	Monofilament Kevlar
MUT	Multifilament Tetoron
MOT	Monofilament Tetoron

Hook type[4]

C11	Circle hooks 11/0
C12	Circle hooks 12/0
C13	Circle hooks 13/0
C14	Circle hooks 14/0
C15	Circle hooks 15/0
C16	Circle hooks 16/0
C18	Circle hooks 18/0
H32	Japan tuna hooks 3.2
H34	Japan tuna hooks 3.4
H36	Japan tuna hooks 3.6
H38	Japan tuna hooks 3.8
H40	Japan tuna hooks 4.0
H42	Japan tuna hooks 4.2

J08	J Hooks 8/0
J09	J Hooks 9/0
J10	J Hooks 10/0
J12	J Hooks 12/0
S01	Spanish hooks 1
S02	Spanish hooks 2
S03	Spanish hooks 3
S04	Spanish hooks 4
T32	Teracima hooks 3.2 sun
T34	Teracima hooks 3.4 sun
T36	Teracima hooks 3.6 sun
T38	Teracima hooks 3.8 sun

Sinker materials

WLL	Weighted footrope
LEA	Lead
CEM	Cement
STO	Stones
OTH	Other, record on comments
UNK	Unknown

Types of light-emitting sources attached to the gear

CL	Chemical light sticks
EL	Electric lights
LL	Luminescent lights
OT	Other (describe)

Colour of light-emitting sources attached to the gear

YL	Yellow
RE	Red
GR	Green
BL	Blue
OT	Other

Operation codes

Fish stunning methods

CO2	Carbon dioxide narcosis
PS	Percussive stunning
SP	Spiking
ELC	Electrocution

Bait type/condition

BLI	Live bait
FRC	Frozen/chopped
THC	Thawed/chopped
FRW	Frozen/whole
THW	Thawed/whole
BDE	Dead bait (bait that dies during live bait fishing event, kept for chum).
BOT	Other

Mitigation devices to reduce bycatch and depredation

SPD	"Spiders" or "Socks", physically protects hooked fish from depredation by cetaceans.
VID	Visual decoys or deterrents (e.g., dummy buoys)
ACD	Acoustic decoys, transmits acoustic cues to attract animals away from true fishing activity (e.g., hauling noises broadcasted from moored buoys).
AAD	Active Acoustic Deterrents transmits sounds that deter animals from the vessels. These can be sounds that provoke physical discomfort (e.g., pingers), an avoidance response (e.g., transient killer whale sounds), or "jam" the biosonar of a species.
PAD	Passive Acoustic Deterrents, use sonar reflective systems on the fishing gear, such as streamers with reflective spheres, cones, and cylinders.
LIS	Light-sticks can be used to illuminate portions of the nets to reduce sea turtle bycatch.
LIG	Lights of different colour (LEDs or UV) are attached to the net headline every 5 m to 10 m. Can be placed on nets to reduce sea turtle and sea-bird bycatch.
OVM	Other Visual Methods used to increase net visibility reduce sea-turtles, cetaceans and sea-birds bycatch. • Reflective material • Solid, high visibility panels • Making the net itself more visible, by using high visibility webbing, weaving colours through nets, using high visibility monofilament (entire net), high contrast rope in mesh, etc. • Streamers
AWM	Above Water Methods can be used to reduce sea-turtles, cetaceans and sea-birds bycatch. • Tori lines above water over the net • Kites or drones flown over net • Raptor silhouettes
NTS	Net Type and Setting: the use of sub-surface nets can help to reduce sea-turtles, cetaceans and seabird bycatch.
OTH	Other (specify)
UNK	Unknown
NON	None

Catch and sampling codes

Sampling protocol for catch estimation on longlines, gillnets and pole and line

EX	Exhaustive Sampling: The totality of the hooks or net panels hauled were observed.
MRS	Random sampling: hooks or panels were sampled randomly (e.g. Batch of 10 hooks selected at random along the line, or all hooks sampled for a period of 10 minutes selected at random during the hauling time).
SPS	Systematic sampling: a proportion (%) of the line or net was observed (e.g. Batch of 10 hooks selected at every 100 hooks along the line or all hooks sampled for a period of 10 minutes every hour).
EWP	Exhaustive When Present: the observer monitors the totality of hooks or net panels except when, for practical reasons, the observer is not present (e.g. breaking for meals/rest).

Sampling methods for the collection of biological information

EXS	Exhaustive Sampling: the totality of the catch or all individuals caught for this species has been subsampled.
SPS	Systematic Proportional Sampling: a proportion (%) of the catch or of the individuals caught and brought on-board for this species has been sub-sampled in a systematic way. (E.g., every 10^{th} fish is sampled).
SRF	Systematic Random sampling of a Fixed number of each species: of the random sample taken, the fish are identified to species level. Once the main species have been determined, a pre-determined number of fish of each species is subsampled.
SRM	Systematic Random sampling of a mixed species sample: of the random sample taken, a small random subsample is taken and biological information extracted.
SRP	Systematic Random sampling of Priority species: of the random sample taken, priority species are selected and biological information extracted.
OTH	Other. Provide details in comments

Fate

DTS	Discarded - too small. Fish of no commercial value due to being of small size
DUS	Discarded - unwanted species (e.g., with no commercial value or other than target species)
DRB	Discarded - retention ban on the species due to flag state measures
DFL	Discarded - vessel fully loaded
DUD	Discarded – due to IOTC retention ban
DPQ	Discarded – unfit for human consumption
DDL	Discarded - too difficult to land
DFR	Discarded - trunk - fins retained (shark only)
DTR	Discarded - trunk retained, fins discarded (shark only)
RCC	Retained - crew consumption
RFL	Retained - for landing / sold
RFR	Retained trunk - fins retained (shark only)
RFT	Retained for at-sea-transhipment
ESC	Escaped
UNK	Unknown fate

Weight estimation method

EB	Electronic balance
SB	Spring balance
MB	Mechanical balance
EM	Eye measurement (observer)
LO	Vessel logbook (eye measurement crew)
LW	Length weight relationship

Processing/product type

RD	Unprocessed; Round (whole, live)
GG	Gilled-and-gutted (bill-off)
HD	Headed-and-gutted
PD	Headed and caudal peduncle-off
HT	Headed and tailed
HG	Headed, gutted and tailed
FL	Fish loins
GT	Gilled, gutted and tailed
GO	Gutted only (gills left)
FW	Fillet
FT	Fins and trunk (shark)
SF	Fins (shark)

Depredation source

SH	Shark
TW	Toothed whales
SW	Sharks/toothed whales
MM	Marine mammal

CC	Cookie-cutter shark
BA	Depredation on bait
SQ	Squid
SB	Birds
OT	Other (specify)
UNK	Unknown

Condition

A0	Alive - condition unknown
A1	Alive - active, healthy
A2	Alive - injured, distressed
A3	Alive - very weak, dying
D	Dead
U	Condition unknown

Gear interaction

EL	Entangled in the line
EG	Entangled in ghost fishing gear
OT	Other (describe)
UK	Unknown

Hauling methods

HD	By hand
GR	Using the gear
GF	Using a gaff
SN	Using a scoop net
ON	Using another net
OT	Using another method (describe)

De-hook line cutting device

LC	Line cutter
WC	Rebar wire cutter
HD	Hook disgorger
KN	Knife

Sex

M	Male
F	Female
J	Juvenile
UNK	Not determined

Tag type

TC	Conventional (plastic spaghetti tags inserted through fish first dorsal fin)
TR	Rototags (a two-piece plastic tag inserted through fish first dorsal fin)
TS	Sonic tags (implanted in the body cavity).
TP	Pop-up tags (inserted into the dorsal musculature).
TI	Internal archival tags (implanted in the body cavity).
TT	Smart Position/ Temperature Transmitting tags (attached to the dorsal fin)
MB	Metal legband tag (seabirds)
MT	Metal tag (turtles - a different tag number for each flipper).
ST	External satellite tag (placed in turtle / bird back).
TO	Other (specify)

Length measurement descriptions[5][6][7]

Straight measurements to be taken with a calliper or a measuring board

FL	Fork length	Tip of the snout to the fork of the tail
EF	Eye fork length	Caudal margin of eye to the fork of the tail
PF	Pectoral fork length	Anterior insertion of the pectoral fin to the fork of the tail
DF	Dorsal fork length	Anterior insertion of the dorsal fin to the fork of the tail
CK	Cleithrum-keel length	Posterior point of cleithrum to the anterior point of the caudal keel
CF	Cleithrum-fork length	Posterior point of cleithrum to the fork of the tail
PAL	Pectoral-anal length	Anterior insertion of pectoral fin to the posterior rim of the anal fin
	BILLFISH	
LJFL	Lower Jaw Fork Length	Tip of the lower jaw to the fork of the tail
	SHARKS	
PCL	Precaudal Length	Tip of the head to the anterior portion of the caudal keel
	RAYS	
TW	Total width	Total disc width
	TURTLES	
CL	Carapace Length	Total carapace length - notch to notch
	BIRDS	
TL	Total length	Tip of bill to tip of tail
WL	Wing length	Bend of the wing to the tip of the longest primary feathers

Curved measurements to be taken with a flexible tape

FT	Curved fork length	Tip of the snout to the fork of the tail
ET	Curved eye fork length	Caudal margin of eye to the fork of the tail
PT	Curved pectoral fork length	Anterior insertion of the pectoral fin to the fork of the tail
DT	Curved dorsal fork length	Anterior insertion of the dorsal fin to the fork of the tail
KT	Curved cleithrum keel length	Posterior point of cleithrum to anterior point of caudal keel
CT	Cleithrum-fork length	Posterior point of cleithrum to the fork of the tail
PAT	Curved pectoral anal length	Anterior insertion of pectoral to posterior rim of the anal fin
	BILLFISH	
LJFT	Curved Lower Jaw Fork Length	Tip of the lower jaw to the fork of the tail
	SHARKS	
PCT	Curved Precaudal Length	Tip of the head to the anterior portion of the caudal keel
	RAYS	
TT	Curved Total width	Total disc width
	TURTLES	
CT	Curved Carapace Length	Total carapace length - notch to notch

[5] IOTC-2013-WPDCS09-13 Rev_1

[6] Collette, B.B. and C.E. Nauen, 1983. FAO species, catalogue. Vol. 2. Scombrids of the world. An annotated and illustrated catalogue of tunas, mackerels, bonitos and related species known to date. Fish.Synop. (125) Vol.2: 137 p.

[7] Nakamura, I., 1985. FAO species catalogue. Vo1.5. Billfishes of the World. An annotated and illustrated catalogue of marlins, sailfishes, spearfishes and swordfishes known to date. FAO Fish. Synop., (125) Vo1.5:65 p.