Food and Agriculture Organization of the United Nations

Indian Ocean Tuna Commission
Commission des Thons de l'Ocean Indien
iotc ctoi

IOTC-2021-WPDCS17-INF07

IOTC Regional Observer Scheme

Scientific Field Observer Training

Scientific Field Observer

Guidelines for Observers on Tuna Purse-seiners

2021 Forms Edition

CapMarine
Capricorn Marine Environmental

Version 1.0 | 2021

Original text: English

First edition 2021

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INTRODUCTION

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

The data is costly to gather in terms of both funding and work hours. It is therefore important that observers follow work and sampling protocols, respect sampling instructions and priorities, and complete 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 activities of a tuna purse-seine 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. You will neither board the skiff or the annexes, etc., used during fishing operations nor dive.
- 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.

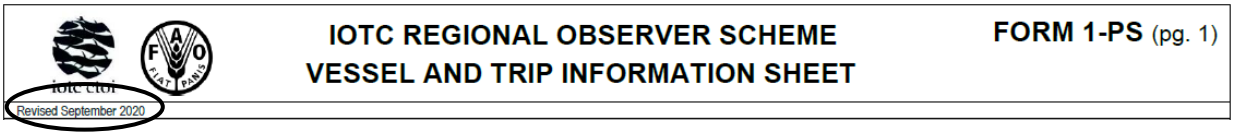
GENERAL INSTRUCTIONS

>> 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 – *for example in the estimation of total catches (tons), discards when slipping occurs, bycatch from the main deck when the observer is on the well's deck, buoy data, etc*.

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 of 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 PERSONAL 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 PURSE-SEINER

>> 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 date 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, toothbrush, toothpaste, 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)	
	✓ Helmet / hard hat / safety hat	
	✓ 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-PS – General information	
	- 1 x Form 2-PS – Gear	
	- 50 x Form 3-PS – Fishing event (FE)	
	- 50 x Form 4 -PS – Fishing event catch details	
	- 1 x Form 5-PS – Fishing event biometric information	
	- 100 x Form 6-PS - Fishing event sample collection	
	- 1 x Form 7-PS – Vessel transhipment	
	- 10 x Form 8-PS – Surface daily activity information	
	✓ 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 tern 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:

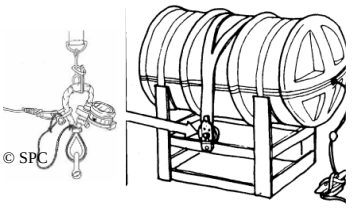
   - Vessel safety certificate
   - Fishing licence
   - Service documents if service dates are not clear on life rafts

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 the bridge officers (Captain, 1st officer, Fishing master)
   - Prepare your living and work area
   - Meet other key people such as the Factory Manager, Bosun, and the Cook
   - Visit the vessel factory (lower deck) with the Factory Manager 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 on the lower and main decks (i.e., the areas/moments where you will collect your samples and areas where sampling will be conducted) and request the Bosun permission to use the vessel sorting bins to retrieve your samples.

2) 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.

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

3) **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**.

4) Start filling IOTC form 1-PS.

5) Collect information on IOTC form 2-PS concerning fishing gear.

6) **Within 24h of embarking request the bridge officers to facilitate the submission of an email containing your deployment report** (Annex 2) and a **copy of your vessel inspection report** to your Coordinator. This opens a channel of communication with the coordinator and ensures your safety.

7) 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

> On a daily basis

1) Be present on the bridge ¼ hour before sunrise.

2) **Fill in IOTC form 8-PS, starting from sunrise to sunset every 2 hours** independently of vessel activity (steaming, searching, fishing, etc.), every time the vessel fishes and during any FAD/Log activities.

3) At sunset you can end data collection if the vessel has also ended its searching and fishing activities for the day (might continue if fishing on a FAD), verify and correct all forms filled for the day and enter data in the database provided (if any).

4) For **every fishing event** (set), and before brailing starts, **fill in IOTC form 3-PS** (even for fishing events where nothing is caught).

5) For **every fishing event** (set):

   - Gather information on the fishing event (set) catch details: ***(a) catch composition (target and non-target species); (b) non-target species condition at catch and at release; (c) SSIs specimens' condition at catch and at release; (d) SSIs specimens additional catch details; and (e) tag details for all tagged specimens caught.*** by following the sampling protocol that best applies to the situation (*see page 21)* and ***fill in IOTC form 4-PS –Catch details.***
   - ***Collect biometric information*** according to priorities listed in *Sampling priorities to follow on-board a Purse-seiner* and **fill in IOTC form 5-PS - Biometrics.**
   - Collect required biological samples (e.g., otoliths, stomachs, genetic samples, etc.) as detailed during briefing and **fill in IOTC form 6-PS – Biological sample collection.**

> Upon shifting

If you've embarked on a vessel that conducts "shifting", i.e., that transfer the catch from a well to another during the fishing trip. Every time the vessel is to shift the catch you are to:

1) Be present 15 minutes before the start of the operation;

2) Conduct an exhaustive sampling of the bycatch (no raising required);

3) **Correct your bycatch (non-target) data in forms 4-PS for a specific set after shifting**;

4) Complete IOTC form 5-PS with non-target catch biometric data collected during shifting.

> Every week

1) Every week, you will submit your weekly status report by email to your Coordinator as per the format provided (Annex 3). Your Coordinator will instruct you of the week format to be used (5- or 7-days format) and day of the week to submit your report (e.g.: every Sunday).

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[1] and/or transhipment

1) Be present 15 minutes before the start of the operation;

2) Fill in IOTC Form PS-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*****.**

3) ***Finish filling in IOTC Form PS-1*** with disembarkation information

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

>> UPON DISEMBARKING

1) The forms that you filled in 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 help with inform port sampling operations (e.g., wells where a large set of bigeye tuna or a set with major discards have been stored, 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*****.**

[1] According to IOTC ROS 11-04 paragraph 3: "When purse seiners are carrying an observer as stated in paragraph 1, this observer shall also monitor the catches at unloading to identify the composition of bigeye tuna catches. The requirement for the observer to monitor catches at unloading is not applicable to CPCs already having a sampling scheme, with at least the coverage set out in paragraph 2."

SAMPLING PRIORITIES TO FOLLOW ON-BOARD A PURSE-SEINER

>> TUNA DISCARDS

- Estimate 'tuna discards' weight (or number) per species and fate;
- Sample discarded/rejected tuna (per species) for length frequency.
  - Exhaustive sampling if less than 50 individuals per species
  - Stratified sampling is more than 50 individual per species

>> SPECIES OF SPECIAL INTEREST

- Estimate *SSI bycatch number* (or weight) per species, fate and *condition at capture* and *at release* (if released/discarded). If number is collected and it is not possible to conduct size sampling (immediate release for instance), a mean size or mean weight is also needed, even if it is estimated by eye.
- Collect other catch information on SSI specimens caught, as per required by the IOTC (*e.g.: gear interaction, handling method if brought on-board, etc.*);
- Sample SSI specimens caught for *length frequency* (and *gender* for elasmobranch and turtle spp.).
  - For NON-SORTED catch note as PROPORTIONAL SAMPLING
  - For SORTED catch note as STRATIFIED SAMPLING
  - If sampling all SSI specimens for a particular spp. note as EXAUSTIVE for that spp.

>> OTHER BYCATCH SPECIES

- Estimate 'other bycatch' weight (or number) per species, fate and condition (at capture & release);
  - Proportional estimation RAISED TO TOTAL CATCH if the catch is NOT SORTED
  - Proportional estimation RAISED TO TOTAL BYCATCH if the catch is SORTED
- Sample 'other bycatch' species for length frequency (and sex for spp. whose gender is identifiable through external features).
  - For NON-SORTED catch note as PROPORTIONAL SAMPLING
  - For SORTED catch note as STRATIFIED SAMPLING
  - If sampling ALL 'other bycatch' specimens for a particular spp. note as EXHAUSTIVE for that spp.

>> RETAINED TARGET CATCH (TUNA)

- Estimate retained target catch weight (or number) per species;
  - For sets conducted on free-schools of tuna, which is more likely monospecific in terms of species, the retained target catch per species can be estimated simply by requesting the captain, 1st officer or factory manager for this information.
- For sets conducted on FAD, estimate retained target catch (weight per species and fate) via:
  - PROPORTIONAL ESTIMATION if the 'retained target catch' it's NOT SORTED per species and sizes and stored in different wells.

- STRATIFIED ESTIMATION if the 'retained target catch' is SORTED per species and sizes and stored in different wells.

➢ Sample 'retained target catch' for length frequency

i) For NON-SORTED catch note as PROPORTIONAL SAMPLING

ii) For SORTED catch note as STRATIFIED SAMPLING

The requirement for the observer to sample retained target catches is not applicable if the vessel is flagged under a CPC already having a port sampling scheme.

To extrapolate proportional samples, you will need to calculate each fishing event total catch weight. This can be done by requesting information from:

1) ***Factory manager on volume of fish stored in the WELLS. Set total catch volume can be estimated from the volume of fish stored in the fish wells in the case of zero discards.***

2) ***1st Officer on fishing event (set) total catch weight estimated based on NUMBER OF BRAILERS and AVERAGE BRAILER CAPACITY (Mt-metric tons).***

$$\textit{TOTAL CATCH VOLUME} = \frac{\textit{NO. of Brailers X Brailer Weight}}{\textit{Species (Mt/brail)}}$$

SAMPLING PROTOCOLS TO FOLLOW ON-BOARD A PURSE-SEINER

These protocols provide guidance on the strategy to follow depending on the circumstances and procedures followed during the pursing, brailing and processing of the catch.

Once the net is deployed and pursed, the catch is concentrated within a restricted area of the net along the vessel portside. This operation takes about one (1) hour depending on the volume of the catch and is followed by the boarding of the catch using a large scoop-net or "brailer". The catch is then transferred to the fish-wells or hold, located in the lower deck.

Difficulties faced by the observer to estimate catch composition (target catch + non-target catch) will vary between vessels and sets. They are linked to the volume and diversity of the catch but also to vessel catch sorting arrangements and the well where the catch is to be stored.

Part of the catch (mainly the bycatch) may be: *1) returned to sea before the brailing begins*; *2) boarded onto the main deck*; *3) sorted on main deck* or *4) sorted on the lower deck*, *5) not sorted*; *6) discharged/returned to sea using a conveyor belt*; *7) discharged/returned to sea using a net or fish bins* (for vessels with no discharge conveyor belt); or *8) placed in fish-wells and stored until offloading / transhipment*; 9*) placed in fish-wells, sorted during shifting and stored in cold stores*.

There can also be a combination of the situations listed above. For example, it can happen that during a set where the catch is being brailed and sorted on the main and lower deck, vessels fish wells get full. In this situation the captain might decide to release the remaining fish by inverting the net. In such situations, the observer should use **more than one protocol**. In this case *Protocol 3* and *Protocol 1*.

>> PROTOCOL 1 – INVERTING THE POCKET (BUNT)

The bag of the net is not brought on board, being instead fully or partially emptied into the sea.

This usually happens when fish-wells are full, when the net holds a small volume of catch or no commercial species, when there's an equipment / mechanic failure and on the few occasions where a very large animal (e.g., a whale shark) is caught in the seine and released alive.

When the pocket of the net is emptied into the sea, you won't have direct access to information on the released catch and you might not have sufficient experience to estimate the amount or specific compositions of the catch released.

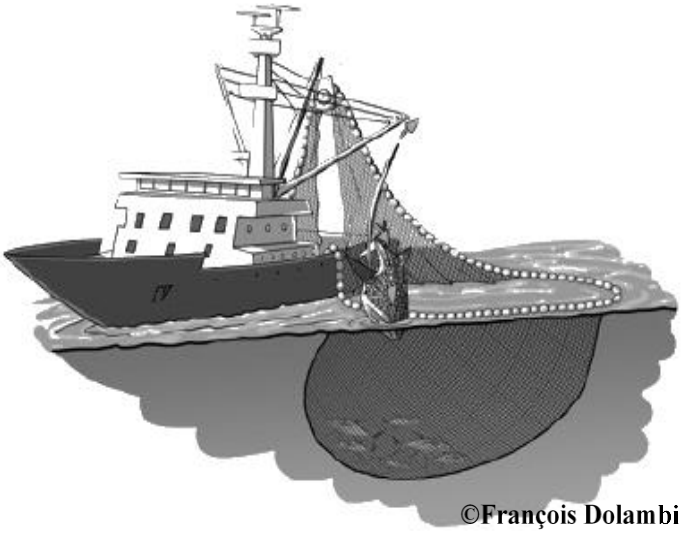


Figure 1: Partial inversion of the net due to release a whale shark caught in the purse-seine.

You will therefore proceed as follows:

1) Observe the pursing and hauling of the net from the upper deck;

2) Check quantity (in tons) and the specific composition of the catch discarded when of the inverting of the net with the captain, the first officer, the Chief Engineer or the Factory Manager

3) If possible, place yourself behind the manoeuvring cabin from where the first officer and the bosun usually manoeuvre the net, in order to ask their estimation of the catch released and to better observe the species contained in the pocket and the species released (*their sizes, their fate - released dead or alive*, or even take a picture to clarify the specific composition later);

4) If in the presence of a marine mammal or a whale shark, try to identify it (possibly take a photograph), to determine the sex and to assess or estimate its size;

5) Fill in FORM 3-PS including sections «Cetaceans and whale sharks' sightings»; and

6) Fill in FORM 4-PS.

>> PROTOCOL 2 - UNSORTED CATCH

The catch is brailed and passed directly to the wells. In this case no significant sorting is done apart from some large individuals (sharks, marlins...) that can be sorted on the upper deck. In this case, the observer has access to only part of the information whilst hauling the catch. We can distinguish here between two types of vessels, the ones who sort catches at landing (case 2A) and those who sort catches at sea during the shifting of the catch (case 2B).

<u>For both vessels type you will start by proceeding as follows:</u>

1) Observe the pursing and hauling of the net from the upper deck and check if there are any large size bycatch and / or SSI individuals swimming in the net.

2) Observe the first brail on the upper deck to ensure that the net is not fully inverted. If the pocket is fully inverted you are to follow protocol 1.

3) Before moving to the lower deck request the:

   - 1st officer in charge of hauling the net to keep track of all large bycatch species that aren't brought onboard or that are released 'alive' (i.e., that the observer won't have the opportunity to sample), and of their *number, weight, gender (where possible), fate, condition (at capture and at release), gear interaction, handling method;*
   - crew to place all dead large bycatch species aside for latter sampling.

4) Return to the main deck to observer brailing final moments and to estimate discard volume, if the net is inverted. You will be able to procced with your sampling later while the crew is tiding up.

The net might be inverted at the end of the brailing time, if vessel top limit freezing capacity has been achieved or if only small size damaged fish remains in the net.

T*here will be a long pause between full/nearly full brails and nearly empty brails. This pause, will allow you to anticipate the moment where a decision will be taken.* At this moment, you should return to the main deck to observer brailing final moments and to estimate discards volume, if any.

> Case 2A -– Vessels sorting their catch at landing

For vessels sorting their catch at landing, you will proceed as follows:

1) When on the upper deck you are to record information / sample all large size bycatch and SSI individuals that are landed in the first brails, swimming in the net, and set aside on the deck by the crew.

   - exhaustively sample large bycatch individuals for:

     i) *species, fate* and *condition at catch and release* (if released);

     ii) l*ength* and *sex* (where possible); and

     iii) additional catch details for SSIs only (gear interaction, handling method, revival, and photos);

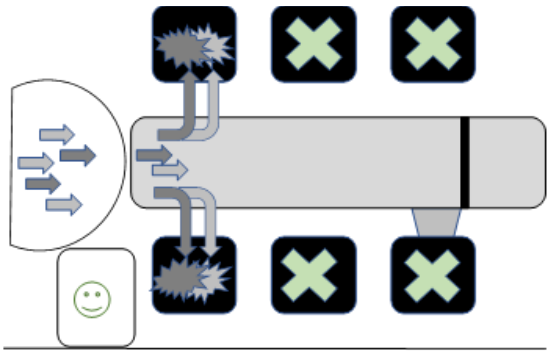


Figure 2- Plan of the factory deck of a vessel where the catch has been brailed and moved directly to the wells. The catch shall only be sorted at landing. This ☺ indicates the placement of the observer on the factory deck.

   - use the information to complete *SSI specimen details table* in *Form 4-PS* and *Form 5-PS*. **DON'T EXTRAPOLATE AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

2) When on the lower deck you are to collect a **PROPORTIONAL SAMPLE for the estimation of catch composition**. The sample is to be collected with the help of the crew. This needs to be organised before-hand with the Bosun and/or the Factory Manager.

   - Collect a sample of 50 to 100 kg of fish, directly from the catch that goes to the wells, using vessel sorting bins (Av. capacity of 30kg);

   - Separate the different species present on your sample and sub-sample them for:

     i) *weight and/or number per species and fate;*

     ii) *condition (at catch and at release),* only for bycatch species (including SSIs);

     iii) *gear interaction, handling method, revival, and photo,* only for SSIs;

     iv) *length frequency* and *gender* (where possible), for all individuals present in the sample.

   - Use the information to complete the '*SSI specimen details'* table in Form 4-PS as well as Form 5-PS with the biometric details for all sampled individuals.

   - **EXTRAPOLATE YOUR SAMPLE** and complete the '*Catch details'* table in Form 4-PS**.** To extrapolate your sample, proceed as follows:

     i) Calculate fishing event total catch weight (see page 20) and ensure you convert catch weight from tons to kilograms;

     ii) Extrapolate sample weights per species / fate to total catch to obtain set estimated catch composition.

Example: *The observer collects a proportional sample and calculates set total catch weight. Using this information, the observer raises its sample and estimates set catch composition.*

Proportional sample

Species	Weight (Kg)
SKJ	70
YFT	10
BET	2
FRI	5
FAL	3
KAW	5

Set total catch weight

30 tons = 30 000 Kg

Sample total weight

95 Kg

Estimation of set catch composition

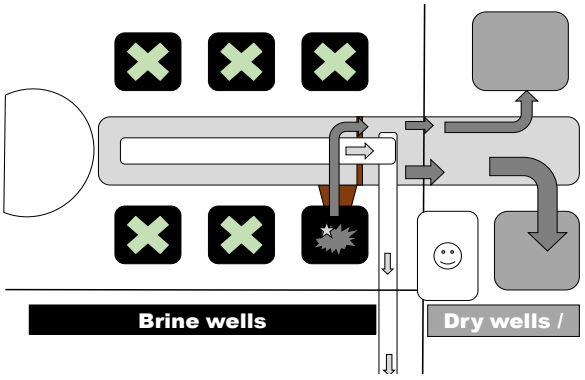
Species	Weight (Kg)	% Spp	Raising (Kg)
SKJ	70	74%	22 105
YFT	10	11%	3 158
BET	2	2%	632
FRI	5	5%	1 579
FAL	3	3%	947
KAW	5	5%	1 579

3) If you can't collect a proportional sample for the estimation of catch composition, you should ask the Captain, Chief Engineer or Factory Manager for an indication of the proportions of target and bycatch species. You should record the information provided in the Form 4-PS '*Catch details'* table, taking care to **note under the "*sampling method*" data field that the estimations are '*vessel estimations' (VES)*.**

4) If you are an experienced observer, you can also try to estimate the volume of bycatch being directly loaded into the wells (experienced observer) and ask the crew for an indication of the proportions of target species and volume.

> Case 2B - –Vessels sorting catch at sea during shifting

Figure 3: The plan of the factory deck of a vessel sorting its catch at-sea during the shifting operation (i.e., the passing of fish from brine wells to dry wells). The ☺ indicates the placement of the observer on the vessel factory deck.



For vessels sorting their catch at sea during shifting, you will proceed as follows:

1) **Be sure to be present during the "SHIFTING" OPERATION**, which can take place during the evening.

2) Ask the Chief Engineer or Factory Manager for an indication of the sets stored on the wells to be transhipped.

3) For each well that is open for shifting record associated fishing set number(s) and sample as follows:

   - Count all discards (No. per species) and determine discards specific composition (weight / N°);
   - Collect a SUB-SAMPLE for length-frequency. <u>If a high volume of discards is expected, collect several samples of the discards at different moments of the shifting (100kg minimum)</u> and store them in vessel sorting bins (Av. capacity of 30kg). Check that the volume of your sample is sufficient before you start sorting the sample by species (e.g.,5 full vessel sorting bins will make

up to a sample of around 150kg). If a low total catch volume and / or a low volume of discard is expected, collect the totality of the discards.

- Separate the different species present on your discards sample and sub-sample them for:
  i) *weight and/or number per species and fate;*
  ii) *condition (at catch and at release),* only for bycatch species (including SSIs);
  iii) *gear interaction, handling method,* only for SSIs;
  iv) *length frequency* and *gender* (where possible), for all individuals present in the sample.
- **EXTRAPOLATE YOUR SAMPLE TO THE TOTAL CATCH IF YOUR SAMPLE IS NOT EXHAUSTIVE** and complete the *Catch details table* in *Form 4-PS***.** To extrapolate your sample, proceed as follows:
  i) Calculate shifting event total catch weight (see page 20) and ensure you convert catch weight from tons to kilograms;
  ii) Extrapolate YOUR discards sample weights per species / fate / condition to shifting operation total catch weight to obtain shifting operation total discard volume and volume composition.
- If several fishing sets are mixed in the same well you should fill in a new Form 4-PS and a new Form 5-PS for that specific well and record the different set numbers associated to the data you've collected.
- If only one fishing set is stored in a particular well you should complete Form 4 and Form 5 for that specific fishing set.

>> PROTOCOL 3 – CATCH IS SORTED DURING THE FISHING EVENT (SET)

Sorting of the catch happens both on the main deck and on the lower deck. The catch is brailed and substantial sorting is performed immediately before placing the target catch in the wells allowing for the separation of target species from bycatch species. Large bycatch species (sharks, marlins...) can be set aside on the upper deck and other small bycatch species (triggerfish, mahi-mahi, small sharks, ...) can be sorted on the lower deck.

We can distinguish here between two scenarios related to the method and swiftness by which the vessel discards the sorted catch. This depends on the presence or absence of a discard chute in the vessel factory deck.

Vessels equipped with a discard chute conduct ad-hoc discards (case 3A), while those that don't have a discard chute, conduct batch discards (case 3B), using a net or fish bins, during or at the end of the brailing operations.

Observers on-board vessels that sort catch during the fishing event, will be able to collect samples to determine: 1) tuna discards, 2) SSI bycatch, and 3) other bycatch and perform requested measurements. Retained target catch specific composition will be recorded in Form 4-PS based on information provided by the vessel taking care to note under the '*sampling method*' data field, that the estimations are *'vessel estimations'* (VES).

However, if the bycatch volume is too high, the observer might not be able to independently estimate total bycatch. In such cases total bycatch estimation will have to be done based on information provided by the vessel.

To estimate bycatch based on information provided by the vessel the observer is to:

- **Ask the total catch weight (in tons) from the bridge officer participating in the brailing operation. Clearly specify that you are requesting the catch total weight, i.e., TARGET CATCH + BYCATCH.**
- **Ask from the Factory Manager, the total weight (in tons) of the sorted catch stored in the wells, i.e., the RETAINED TARGET CATCH.**
- **To estimate bycatch value (in tons), use the following calculation**

BYCATCH ESTIMATION = TOTAL CATH – RETAINED TARGET CATCH

Note that some catch (target and/or bycatch) might be set aside for crew consumption. This catch will need to be accounted for by the observer when filling in FORM 4-PS.

For both vessels type you will start by proceeding as follows:

1) Observe the pursing and hauling of the net from the upper deck and check if there are any large size bycatch and / or SSI individuals swimming in the net.

2) Observe the first brail on the upper deck to ensure that the net is not fully inverted. If the pocket is fully inverted you are to follow protocol 1.

3) Before moving to the lower deck request the:

   - 1st officer in charge of hauling the net to keep track of all large bycatch species that aren't brought onboard or that are released 'alive' (i.e., that the observer won't have the opportunity to sample), and of their *number, weight, gender (where possible), fate, condition (at capture and at release), gear interaction, handling method;*
   - crew to place all dead large bycatch species aside for latter sampling.

4) The net might be inverted at the end of the brailing time, if vessel top limit freezing capacity has been achieved or if only small size damaged fish remains in the net. *There will be a long pause between full/nearly full brails and nearly empty brails. This pause, will allow you to anticipate the moment where a decision will be taken.*

   At this moment, you should return to the main deck to observer brailing final moments and to estimate discard volume, if the net is inverted. You will be able to procced with your sampling later while the crew is tiding up.

> Case 3A - – Vessels conducting ad-hoc discards

For vessels who have a discard chute and conduct ad-hoc discarding, the observer will proceed as follows:

1) When on the upper deck you are to record information / sample all large size bycatch and SSI individuals that are landed in the first brails and/or swimming in the net.

   - exhaustively sample large bycatch individuals for:

     i) *species, fate* and *condition at catch and release* (if released);

     ii) l*ength* and *sex* (where possible); and

     iii) additional catch details for SSIs only (gear interaction, handling method, revival, and photos);

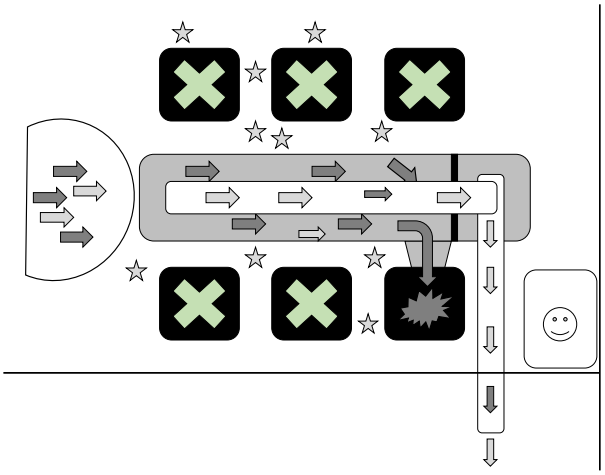


Figure 4: Plan of the factory deck of a vessel who sort the catch and conduct ad-hoc discarding during the brailing operation, using a discard chute in the factory deck. The ☺ indicates the placement of the observer on the vessel factory deck.

   - use the information to complete *SSI specimen details table* in *Form 4-PS* and *Form 5-PS*. **DON'T EXTRAPOLATE AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

2) ***When on the lower deck, place yourself next to the discard hatch*** (see Figure 4), identify and count all discards.

3) Collect a **SAMPLE** to estimate fishing set discards volume and composition:

   - If a high total catch volume and/or a high volume of discards is expected, collect several samples of the discards at different moments of the brailing (100kg minimum) and store them in vessel sorting bins (Av. capacity of 30kg). Check that the volume of your sample is sufficient before you start sorting the sample by species (e.g.,5 full vessel sorting bins will make up to a sample of around 150kg). If a low total catch volume and / or a low volume of discard is expected, collect the totality of the discards.

   - Separate the different species present on your discards sample and sub-sample them for:

     i) weight and/or number per species and fate;

     ii) condition (at catch and at release), only for bycatch species (including SSIs);

     iii) gear interaction, handling method, only for SSIs;

     iv) length frequency and gender (where possible), for all individuals present in the sample.

   - **EXTRAPOLATE YOUR SAMPLE TO THE TOTAL CATCH IF YOUR SAMPLE IS NOT EXHAUSTIVE** and complete the *Catch details table* in *Form 4-PS***.** To extrapolate your sample, proceed as follows:

     i) Calculate fishing event total catch weight (see page 20) and ensure you convert catch weight from tons to kilograms;

     ii) Extrapolate YOUR discards sample weights per species / fate / condition to total catch to obtain an estimation of the fishing event total discards volume and discards volume composition.

- Determine the specific composition of discards (weight/No. per species). Note in FORM 4-PS discard species composition (total weight/N ° per species). **EXTRAPOLATE TO THE TOTAL AMOUNT ESTIMATION PROVIDED IF YOUR SAMPLE IS NOT EXHAUSTIVE.**

4) Also keep an eye out for any retained bycatch species (crew will store them in baskets).

   - Sample retained bycatch species exhaustively to determine the specific composition (weight/No. per species).

   - Note in FORM 4-PS retained bycatch species (total weight/N ° per species). **DON'T EXTRAPOLATE THIS INFORMATION AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

5) When sorting is finished, return to the upper deck and ensure the exhaustive sampling of all large bycatch individuals set aside by the crew.

   - exhaustively sample large bycatch individuals for:

     i) *species, fate* and *condition at catch and release* (if released);

     ii) l*ength* and *sex* (where possible); and

     iii) additional catch details for SSIs only (gear interaction, handling method, revival, and photos);

   - use the information to complete *SSI specimen details table* in *Form 4-PS* and *Form 5-PS*. **DON'T EXTRAPOLATE AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

6) If necessary, return to the lower deck to finish sampling.

> Case 3B - Vessels conducting batch discards

For vessels that conduct batch discards, that don't have a discard chute, you will proceed as follows:

1) When on the upper deck you are to record information / sample all large size bycatch and SSI individuals that are landed in the first brails and/or swimming in the net.

   - exhaustively sample large bycatch individuals for:

     i) *species, fate* and *condition at catch and release* (if released);

     ii) l*ength* and *sex* (where possible); and

     iii) additional catch details for SSIs only (gear interaction, handling method, revival, and photos);

   - use the information to complete *SSI specimen details table* in *Form 4-PS* and *Form 5-PS*. **DON'T EXTRAPOLATE AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

2) When on the lower deck move around the factory deck (*see Figure 5*), identify and count all discards - target species and bycatch (weight/No. per species), sorted by the crew and stored into bins and in the discard net (if any). These will be emptied again on the conveyer belt and conducted to the discard net ***once the retained catch is stored in the wells. You should therefore place yourself next to the discard net*** at this moment (*see Figure 6*).

Also note that some vessels empty the discard bins and/or net on a regular basis, if there's a large volume of bycatch.

VESSEL USING A DISCARD NET

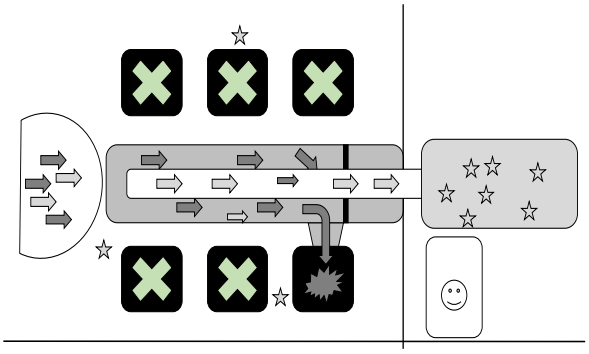


Figure 5: Plan of the factory deck of a vessel that conducts batch discards using a discards net. The ☺ indicates the placement of the observer on the vessel factory deck.

VESSEL USING DISCARD BINS

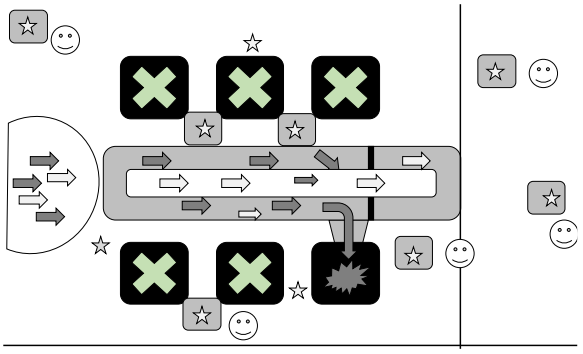


Figure 6: Factory deck plan of a vessel conducting batch discards with a rejection net. The ☺ indicates the placement of the observer on the vessel factory deck.

3) Ask the crew to store discard bins against the factory wall until you sample them (note that each basket can contain up to 30kg of fish).
   - Separate the different species present on each basket and record:
     i) weight and/or number per species and fate;
     ii) condition (at catch and at release), only for bycatch species (including SSIs);
     iii) gear interaction, handling method, and gender (where possible) only for SSIs;
   - use the information to complete *Form 4-PS*. **EXTRAPOLATE TO THE TOTAL AMOUNT ESTIMATION PROVIDED IF YOUR SAMPLE IS NOT EXHAUSTIVE.**

4) Collect a **SUB-SAMPLE** for length-frequency
   - If a high total catch volume and/or a high volume of discards is expected, pull aside an enough number of sorting bins to obtain a sub-sample of 100kg minimum. Check that the volume of your sample is sufficient before you start sorting the sample by species and sampling (e.g.,5 full vessel sorting bins will make up to a sample of around 150kg).
   - If a low total catch volume and / or a low volume of discard is expected, sample for biometrics the totality of the discards.

5) Fill in the Form 5-PS as required noting that you've conducted STRATEFIED SAMPLING when collecting length frequency for both discarded tuna and bycatch species sorted on the lower deck.

6) When sorting is finished, return to the upper deck and ensure the EXHAUSTIVE SAMPLING of all large bycatch individuals set aside by the crew.
   - exhaustively sample large bycatch individuals for:
     i) *species, fate* and *condition at catch and release* (if released);
     ii) l*ength* and *sex* (where possible); and
     iii) additional catch details for SSIs only (gear interaction, handling method, revival, and photos);
   - use the information to complete *SSI specimen details table* in *Form 4-PS* and *Form 5-PS*. **DON'T EXTRAPOLATE AS YOUR SAMPLE IS TO BE EXHAUSTIVE.**

7) If necessary, return to the lower deck to finish sampling.

INSTRUCTIONS ON THE FILLING OF DATA COLLECTION FORMS

>> GENERAL INSTRUCTIONS

> Header details

Observer 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-PS*).

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

Data collection forms of the same type should be numbered together. For instance, number all the 3-PS forms as a group and all the 4-PS 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).

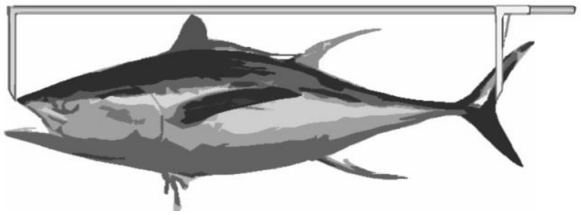
> Measuring lengths

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.

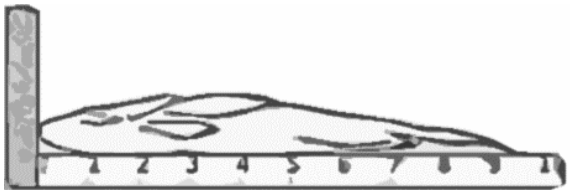


Image adapted from SPC.

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.

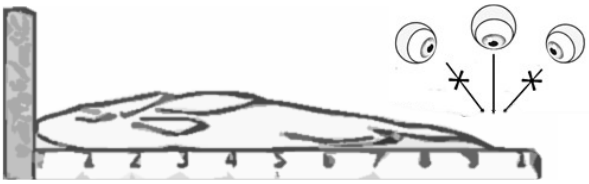


Image adapted from SPC.

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-PS: 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-PS is used. *Observers must fill in only one Form 1-PS 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 purse-seine vessel arrives in port, but does not offload fish, then the trip has not been completed. If the vessel returns to port to offload some or all of its fish than the trip has been completed.

If you are instructed to return to sea on the same vessel, then you should consider this to be a new fishing trip and you should fill in a new 1-PS Form and allocate a new trip number. If your trip does not cover a complete fishing trip as defined above, you should state the reason in your 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-PS 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 collect 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-PS, or insert a dash. A dash shows that you tried to get the information, but you were unable 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-PS the trip details are the header details.

Observer identification	
1. Observer IOTC registration number	Observer trip number
IOTCKEN001	2020/02/10 - IOTCKEN001 - PS
2. Observer full name	3. Observer nationality
GONDA James	KEN

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

Observer trip number: This is the unique observed trip 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 70).

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		
04° 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		
04° 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 70), *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 the observer embarkation date/time may not coincide with the date/time that the vessel sailed.

6. Location of disembarkation: Country code (page 70), 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 that the vessel landed.

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
LU QING YUAN YU 155	KEN	17391
11. Vessel IMO or Lloyds number	**12. International radio call (IRCS)**	**13. Vessel port/country of registration**
8529454	5ZAAK	UNK
14. Vessel registration number	**15.Vessel phone(s)**	**16. Vessel fax(es)**
UNK	UNK	UNK
17.Vessel email(s)	**18. Licensed target species (FAO codes)**	**19. Main fishing gear**
UNK	TUS (tuna & tuna like species)	Tuna purse seine (TPS)

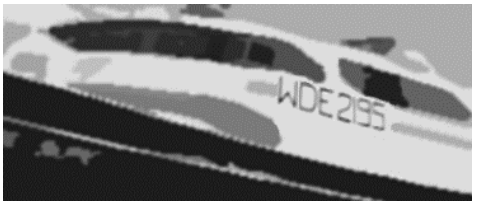
8. Vessel name: Vessel full name with no abbreviations, as recorded on vessel official documents, and crosschecked with the name recorded on the vessel itself. Record vessel name with the correct spelling and character spacing including any corresponding numbers.

9. Vessel flag / chartering state: Country (page 70) 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: seven-digit 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 70) 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: target species that are caught by the vessel, as specified in vessel licences or permit conditions. use FAO spp. 3-alpha codes marked in the 'IOTC species identification guides' and the species lists provided in page 68. *If unable to find the code for a particular species fill in the species scientific name. If unsure of the correct species use the FAO three-letter species group code, and provide further description of the species (e.g.: TUS 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 tuna purse seine (TPS).

Vessel owner and personnel

Vessel owner and personnel

Registered owner		Charter operator	
20. Full name: Intertuna N.V	21. Nationality: Netherlands	23. Full name: INTERATUN LTD.	24. Nationality: SEY
22. Contact details: Grebbelinieweg 88- A, Curacao, Netherlands Antilles		25. Contact details: Box 177, Maison La Rosiere, Palm Street, Victoria, Mahé, Seychelles	
Fishing master		**Skipper (Captain)**	
26. Full name: Jose Iragualdes	27. Nationality: SPAIN	28. Full name: Joseba Aritzarco	29. Nationality: SPAIN 30. Crew n°: 30

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 the operator's full name (company or individual as appropriate), nationality (page 70) and contact details (mobile and fix phone, email).

Fishing master

26.Full name / 27. Nationality: Fishing master name and nationality (page 70) 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 70) in full. In some instances, the fishing master and skipper (captain) may be the same person. In these cases, record here "N/A" for not applicable.

30. Crew number: Number of crew, cross checked against the vessel 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 (√)
URT	DAR ES SALAM	--	URT	DAR ES SALAM	--
Position of embarkation (dd° mm' ss") specify quadrant (circle)			Position of disembarkation (dd° mm' ss") specify quadrant (circle)		
LATITUDE	LONGITUDE		LATITUDE	LONGITUDE	
06° 49' (S) N	039° 17' (E) W		06° 49' (S) N	039° 17' (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	
25 02 2020	06 00		20 03 2020	07 30	

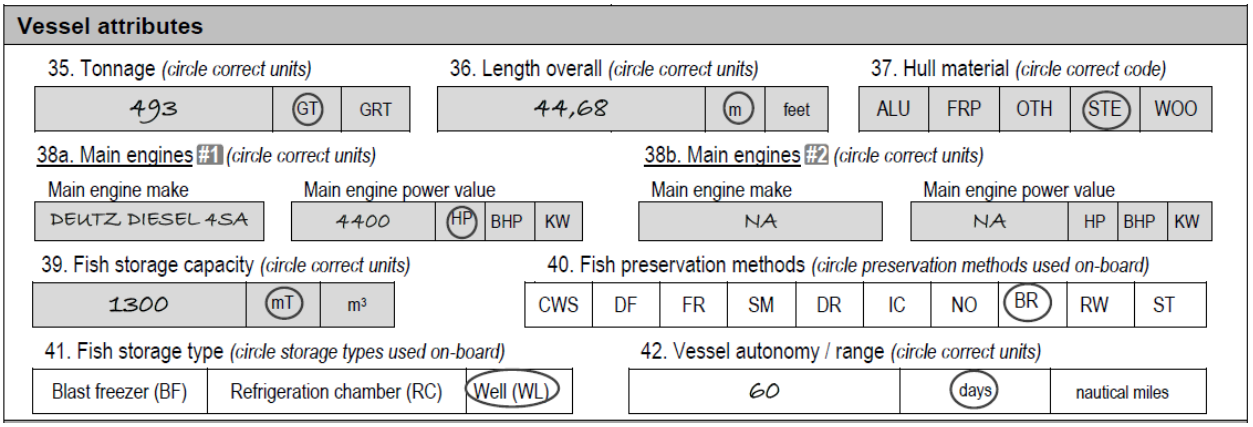
31. Port of departure: Country code (page 70), name and / or geographical coordinates of the port from where the vessel sailed. If the vessel started a new trip at sea following transhipment record 'at-sea' plus the geographical coordinates corresponding to the location the trip started.

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

33. Port of return: Country code (page 70), 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 the 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 the 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 that you circle the correct units used (meter or feet).*

37. Hull material: Vessel hull material(s) as specified in the vessel registration papers. *Make sure you circle the correct hull material code (page 71).*

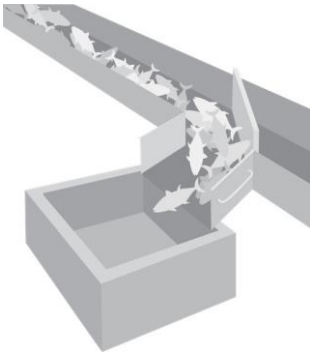
38a and 38b. Main engine make and power: The make (brand) and the power of the main engine(s) if more than one (HP, KW, or BHP). *Make sure you circle the correct power units used.*

39. Fish storage capacity: Vessel total maximum capacity to store catches in metric Tons (t) 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 71).*

On a purse-seiner these will normally include:

- Refrigerated brine (BR). Purse-seiners freeze and store tuna in refrigerated brine and store the catch on brine wells. This fish is mainly sold to the canneries for the tuna can market.
- Freezing (FR). Some purse-seiners chill large tuna in their brine wells and store them on a refrigeration chamber at between 0° and -60°C. Such fish is to be processed into loins, fillets and steaks and to be sold to the European sashimi / fresh fish market.



Tuna being loaded into a purse-seine refrigerated brine

41. Fish storage type: Type of structure(s) present on-board used by the vessel to store the catch. On a purse-seiner these will normally be the brine wells (WL). Some purse-seiners can also store catch on a refrigeration chamber (RC). *Record fish storage type code (page 71).*

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 (cabin) off the bridge. Indicate if each unit 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 observed onboard. The following section will help observers identify the electronic equipment requested on the 1-GIL 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 positions 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.

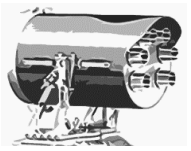
46. Track Plotter: The track plotter shows a continuous track of the vessel's movements. Important positions (i.e.: fishing positions, anchored FAD locations) can be logged into the track plotter, allowing the vessel to return to these exact positions. It is usually linked to the GPS and can be used with the auto-pilot to guide the vessel to a specific position. The track plotter may be connected to other 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. The captain will not set the purse-seine net if he thinks the current is too strong, as the net could be badly torn. Only circle "Y" if and independent current meter is on-board as other devices can be used to ascertain the 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 are 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 displays 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 (food), 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.

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	X					
Non-biodegradable fishing gear			X			
Oil and fuels			X			
Other						
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 onboard	60. Number of fishing events/sets observed	61. Number of days searching	62. No. active fishing days
5	5	24	5
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	24	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).

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 regarding 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-PS: PURSE-SEINE 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-PS and outlines how it is used.

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

IOTC REGIONAL OBSERVER SCHEME
PURSE-SEINE GEAR SPECIFICATIONS

FORM 2-PS

Revised September 2020

Observer full name	Observer trip number
GONDA James	2020/02/10 - IOTURT001 - PS

Special equipment or machinery circle either "YES" or the "NO" to indicate presence or absence of a device on-board.

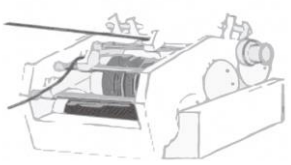
1. Power block	2. Purse winch
(YES) NO	(YES) NO

General gear attributes circle units used

3. Maximum length of the net	4. Maximum depth of the net	5. Bunt stretched mesh size
1500 (m) feet	240 (m) feet	100 (mm) cm
6. Mid-net stretched mesh size	**7. Maximum brail capacity**	**8. Skiff power**
100 (mm) cm	10 metric tons	250 (HP) KW BHP

Special equipment or machinery

1. Power block: A powerful hydraulic power block attached to the end of the main boom used to haul the net back and restack it ready for the next set. The power block hauls the net on board during the net stacking/rolling stage.



2. Purse winch: Equipment or machinery used to winch the steel cable of the purse line that runs through the purse rings and that serves to close (purse) the bottom of the net once it has been set around a school of fish. It's usually located mid-ship on the main working deck.

General gear attributes

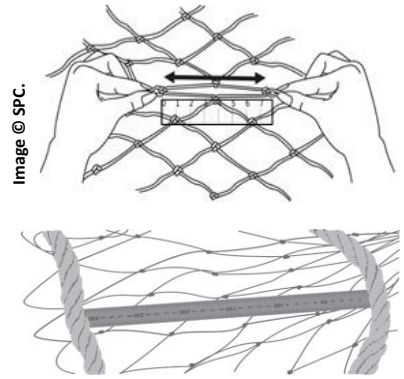
3. Maximum length of the net: The maximum length of the net indicates how large a circle the net can make around the school of fish. Record maximum net length (preferably in meters) according to the net specifications. *Ask the captain or chief engineer for this information.*

4. Maximum depth of the net: The maximum depth of the net tells us how deep the net will drop down into the water. Record maximum net depth (preferably in meters) according to the net specifications. *Ask the captain or chief engineer for this information.*

5. Bunt stretched mesh size: The bunt is the region in the purse seine net where the catch is accumulated before brailing and it is made up of heavier netting.

6. Mid-net stretched mesh size: Measure mesh size of the mid-net. The mesh size is often considerably smaller at the top of the net near the floats and at the bottom of the net near the chain. Make sure that you measure the mesh in the main section. It should be possible to measure bunt and mid-net sections when the net is stacked on deck. Ask the deck Bosun for help in locating them.

- Measure 3 stretched mesh lengths (knot to knot) as shown and calculate the average.
- Pull the net's diamond mesh lengthways so that it reaches its greatest width. Measure this width preferably to the decimals of centimetres.
- Request mesh size values from captain or officers;
- If values differ, record measured average mesh size and report this on your trip report.

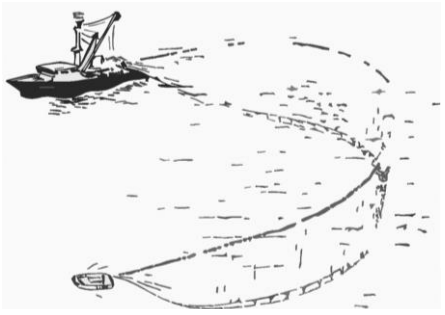


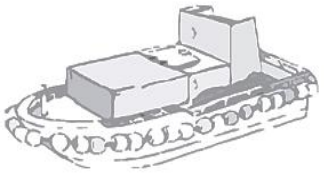
7. Maximum brail capacity: A brail is a large scoop-net used to scoop the fish out of the net. Ask the captain or officers what is the maximum weight capacity of a full brail in metric tonnes.

Long handle brail (Image adapted from SPC)

Heavy framed brail (Image adapted SPC)

8. Skiff power: The skiff, is a flat-bottom high-powered boat that is used as a fixed point in the deployment of the net while the purse-seine vessel encircles the of fish school. Returning to the skiff to collect the start-end of the purse-seine net.





- Ask the captain or officers what is the skiff engine power is (HP, KW or BHP).
- Make sure you *circle the correct unit for the skiff engine power* provided by the vessel officers.

>> FORM 3-PS: PURSE-SEINE FISHING EVENT

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

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

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
PURSEINE FISHING EVENT

FORM 3– PS
Page 001 of 005

iotc ctoi
Revised September 2020

Observer Name:	Observed trip No:	Set number:
GONDA James	2020/02/10 - IOTURT001 - PS	0001

SETTING OPERATIONS collect all dates and times in Coordinated Universal Time (UTC); collect all positions as dd°mm'ss''

1. Start setting date and time:

DD	MM	YY	hh	mm
26	02	2020	06	15

2. Start setting position *specify quadrant* by circling it

LATITUDE			LONGITUDE		
06°06'10''	(S)	N	042°17' 07''	(E)	W

3. Beaufort: 1

6. School size: 20 *metric tonnes (MT)*

4. School sighting cues: DFAD | BIR

5. First detection method: AS

7. Time net pursed: 07:00 hh:mm

8. Time start brailing: 08:30 hh:mm

9. Time end brailing: 09:15 hh:mm

10. Time skiff onboard: 10:30 hh:mm

11. Max closing net depth: 150 m

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 skiff is launched to start the setting operation, *recorded in UTC time*.

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

3. Beaufort: Wind force at the start of the fishing event record using the Beaufort scale listed in page 73.

4. School sighting cues: Cue(s) which lead the vessel to detect the tuna school. Record up to the first three sighting cues using codes provided in page 72.

5. School first detection method: How the vessel detects the tuna school, floating object or birds. If more than one method used, record only what initially made the vessel change course. Use codes provided in page 72.

6. School size: Estimation of the size of the tuna school targeted (in metric tonnes). *Request this information from the bridge officers.*

7. Time net pursed: Time when the net is fully pursed, this is when all the purse-rings are up, *recorded in UTC time*. Once the encirclement is complete, the end of the net attached to the skiff is transferred to the purse seine vessel. The two ends of the purse line cable are hauled in with the winch as rapidly as possible to close the bottom of the net - this is called "pursing".

8. Time start brailing: Time when brailing starts, *recorded in UTC time.* When most of the purse seine net has been retrieved, and the tuna are concentrated within the 'bunt of the net'. The fish are scooped out of the purse-seine net using a large scoop-net called the 'brailer'.

9. Time end brailing: Time when brailing ends, *recorded in UTC time*.

10. Time skiff onboard: Time when the skiff comes back on board, *recorded in UTC time*. This is the time that the fishing event (set) ends.

11. Maximum closing net depth: When the net is pursed consult the net depth gauge (if available) and fill in the real, measured, closed net depth (in meters). Use information from middle gauge if more than one gauge is present.

Object details

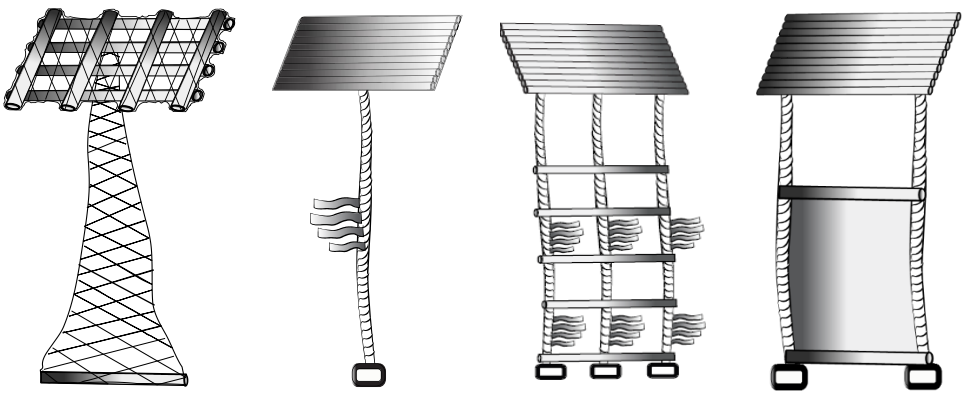
For sets conducted on natural or artificial FADs collect the following information.

Object details for sets conducted on natural or artificial FADs		
12. Buoy ID: 33 ALBACORA IV	13. Buoy equipped with artificial lights (√) Deployed? (Y) N Recovered? (Y) N	14. Artificial FAD design use codes to describe raft and tail materials Raft: RNL Tail: TNL

12. Buoy ID: Instrumented buoys containing a GPS transmitter attached to the drifting FADs are marked with manufacturer unique reference number and vessel unique IOTC registration number. Record both or any other marking allowing to identify buoy owner.

13. Buoy equipped with artificial lights: When the vessel conducts a set on a natural or artificial FAD verify if any buoys equipped with artificial lights are deployed / recovered.

14. Artificial FAD design: Characterize artificial FAD design using codes listed in page 73 to describe raft (floating part) and tail (underwater hanging structure) materials.



Possible FADs designs (1st image is a classic FAD and the 3 others are ecological (non-entangling) FAD designs ©ISSF

Cetaceans and whale sharks' sightings, support vessel details and details on the current

Cetaceans and whale sharks' sightings during setting				***Support vessels***			***Current*** that might influence set performance	
Answer questions by filling Yes or No	#1	#2	#3	Answer questions by filling Yes or No	#1	#2	23. Direction: cardinal points	SW
15. Sighted before setting?	N	N	N	19. Support vessel present?	N	N	24. Speed:	5 knots
16. Species (FAO code):	_	_	_	20. Support vessel name	_	_	25. Depth:	50 meters
17. Number sighted:	_	_	_	21. Participation?	_	_		
18. Caught in the net?	_	_	_	22. Participation description	NA			

15. Sighting before setting: *Details on cetaceans and whale sharks sightings during the set.* Indicate YES if the sighting occurred before setting or NO if it occurred after.

16. Species (FAO code): FAO three-letter species code of the sighted specimen/s. These codes are marked in the 'IOTC species identification guides' and provided in page 68.

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.

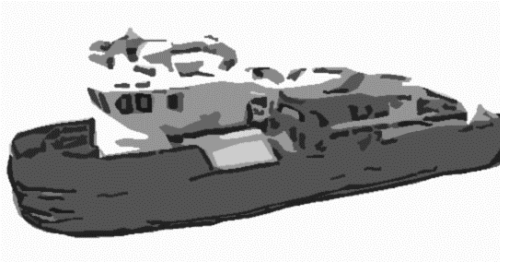
If the species or group is not known, use the three-letter code ('UNS' - Unspecified), and provide further description of the species.

17. Number sighted: Fill in the number of individuals sighted *per species*.

18. Caught in the net: Indicate YES or NO whether sighted specimen/s was / were caught inside the net once the purse line was closed.

Support vessel details

19. Support vessel presence: Record if a support vessel is present during the observed set.



20. Support vessel name: Name of the support vessel present during the observed set.

21. Support vessel participation: Record if the Supply Vessel too part in the setting operation (YES/NO).

22. Support vessel participation description: If YES, describe it (e.g.: acting as floating object).

Details on the current *(that might influence set performance)*

23. Current direction: Current direction recorded as cardinal points (E, W, SW, SSW, etc.). *Request information from bridge officers.*

24. Current speed: Current speed in knots. *Select the highest value of the current if the current meter is configured for more than one depth (the most common) or request the information from the bridge officers.*

25. Current depth: Current depth in meters. *Request information from bridge officers.*

>> FORM 4-PS: PURSE-SEINE FISHING EVENT (SET)- CATCH DETAILS

This form contains questions about catch details including target and non-target catches together with SSIs and it is to be completed each time the net is deployed. The following instructions outline how observers should complete Form 4-PS.

Header details

IOTC REGIONAL OBSERVER SCHEME PURSEINE FISHING EVENT – CATCH DETAILS	FORM 4– PS Page 001 of _____
Revised September 2020	

Observer name:	Observed trip no:	Set number:
GONDA James	2020/02/10 - IOTCKEN001 - PS	001

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

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

CATCH DETAILS

Complete catch details table per species, fate, sampling method and condition (at catch and release). An example on how to fill in the catch details table is provided here.

CATCH DETAILS to be recorded per species for all spp. Use codes provided in form notes to fill in data collection fields.

	Catch details				Weight					Additional details on non-target species *(except SSIs)*	
Catch #	1. Species	2. Fate	3. Sampling method	4. Number	5. Processing type	6. Value (circle unit used)			7. Estimation method	8. Condition at capture	9. Condition at release
001	YFT	DPQ	SPS	NA	RD	3	mT	Kg	CA	---	---
002	BET	DPQ	SPS	NA	RD	6	mT	Kg	CA	---	---
003	YFT	RFL	VES	NA	RD	60	mT	Kg	CA	---	---
004	BET	RFL	VES	NA	RD	10	mT	Kg	CA	---	---
005	SKJ	RFL	VES	NA	RD	100	mT	Kg	CA	---	---
006	TTH	DUD	EXS	1	RD	10	mT	Kg	CA	D	D
007	BLM	RCC	EXS	1	RD	100	mT	Kg	LO	A0	A0
008	FAL	DUS	EXS	3	RD	60	mT	Kg	EM	A3	D
009	FAL	DUS	EXS	2	RD	24	mT	Kg	LO	A3	D

Catch detail number (#): This should be a three-digit numerical code beginning with 001. Catch numbers should be consecutive within the same set of the observed trip. *Use as many 4-PS forms as needed to record all pairs of 'species/fate' observed during the fishing event.*

1. Species: Use the Food and Agriculture Organization (FAO) three-letter species codes to record all species that are caught. These codes are marked in the 'IOTC species identification guides' and provided in page 68.

- If you are unable to find FAO species 3-alpha code for a particular species, fill in species scientific name.

- If you are 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

2. Fate: The fate of every species caught in the set. Use fate codes provided in page 75. Ensure that you fill in a new 'catch detail number' row for every different destination given to a species. *E.g.: Catch 001 refers to YFT whose fate was discarded as they were unfit for consumption, while catch 003 refers to YFT retained - for landing / sold. Therefore, a new catch detail number has been filled in.*

Catch #	1. Species	2. Fate	3. Sampling method	4. Number	5. Processing type	6. Value (circle unit used)			7. Estimation method	8. Condition at capture	9. Condition at release
001	YFT	DPQ	SPS	NA	RD	3	mT	(Kg)	CA	---	---
002	BET	DPQ	SPS	NA	RD	6	mT	(Kg)	CA	---	---
003	YFT	RFL	VES	NA	RD	60	mT	(Kg)	CA	---	---

3. Sampling method: Sampling method used to estimate catch per species. Use codes provided in page 75. Ensure that you fill in a new 'catch detail number' row for every different sampling method for a given species.

4. Number: Number of individuals per spp. for each specified fate. If the observers only collect weight per species/fate they should recorded here as NA (not applicable).

5. Processing type: Observers deployed on tuna purse-seiners are expected to provide unprocessed, whole, round (code RD) weights.

6. Weight value: Species weight corresponding to the specified 'processing type'. *Make sure you indicate units used by circling kilograms (Kg) or metric tonnes(mT).*

7. Weight estimation method: Estimation method used to obtain the weight via the use of the codes listed on the back of Form 4-PS.

8. Condition at capture: The state of health of non-target species that are caught by the vessel.

- Use codes provided on page 76 to specify the condition at time of capture for a group of individuals of the same species (except SSIs) caught during the set. *Information on SSIs condition is to be collected for every specimen caught in the specimen details table further below.*
- Use the condition code 'U' (condition unknown) if there was no opportunity to assess the condition.
- Ensure you fill in a new '*catch detail number*' row for every different condition at capture for a given species.

E.g.: Catch 008 and 009 refer both to Silky sharks (FAL) with the same fate and sampling method but whose condition at capture was different (Alive - injured, distressed and Alive - very weak, dying). Therefore, a new catch detail number has been filled in.

Catch #	1. Species	2. Fate	3. Sampling method	4. Number	5. Processing type	6. Value (circle unit used)			7. Estimation method	8. Condition at capture	9. Condition at release
008	FAL	DUS	EXS	3	RD	60	mT	(Kg)	EM	A3	D
009	FAL	DUS	EXS	2	RD	24	mT	(Kg)	LO	A2	D

9. Condition at release: The state of health of non-target species that are released by the vessel.

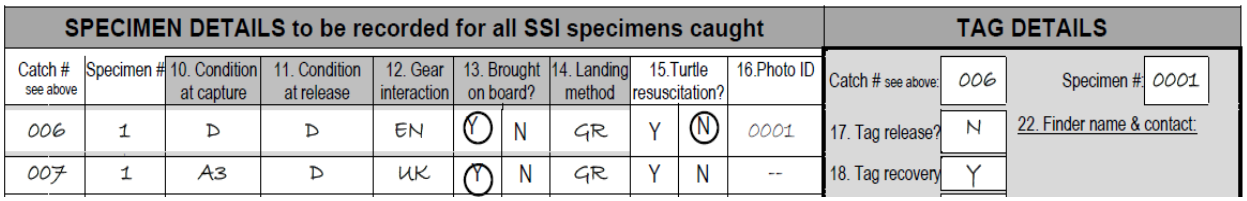
- Use codes provided in page 76 to specify condition at release for a group of individuals of the same species (except SSIs) caught during the set. *Information on SSIs condition is to be collected for every specimen caught in the specimen details table below.*
- For non-target specimens retained on-board record as not applicable (NA).
- Use the condition code 'U' (condition unknown) if there was no opportunity to assess the condition.
- Ensure you fill in a new '*catch detail number*' row for every different condition at capture for a given species.

E.g.: Catch 008 and 018 refer both to Silky sharks with the same fate and condition at capture but whose condition at release was different (unknown and dead), therefore a new catch detail number has been filled in.

Catch detail #	1. Species	2. Fate	3. Sampling method	4. Number	5. Processing type	6. Value (circle unit used)			7. Estimation method	8. Condition at capture	9. Condition at release
008	FAL	DUS	SPS	NA	RD	759	mT	(Kg)	CA	A3	U
018	FAL	DUS	EXS	12	RD	240	mT	(Kg)	LO	A3	D

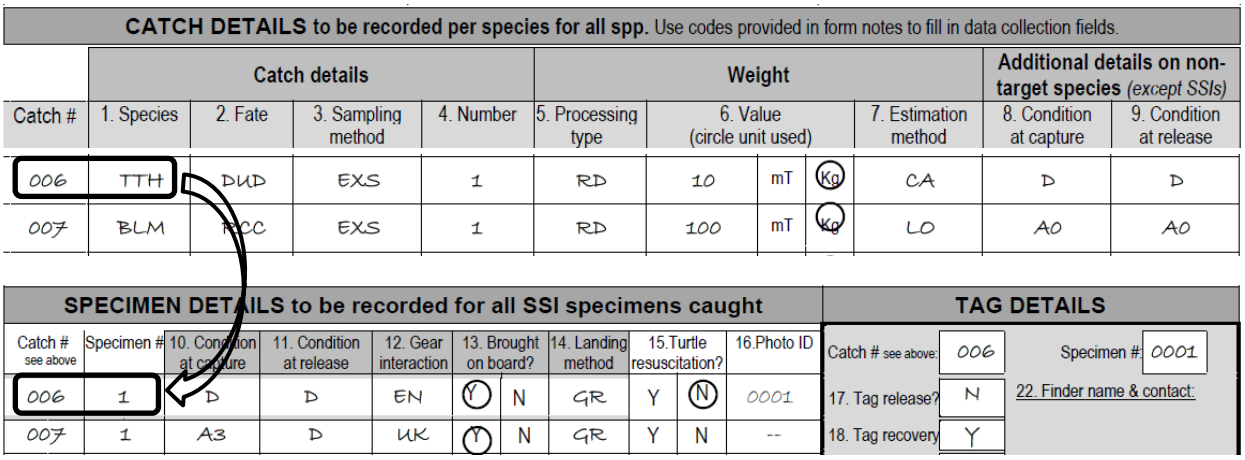
SPECIMEN DETAILS to be recorded for all SSI specimens caught

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 the additional details on non-target species and additional catch details for every SSI specimen caught.



SPECIMEN DETAILS to be recorded for all SSI specimens caught											TAG DETAILS		
Catch # see above	Specimen #	10. Condition at capture	11. Condition at release	12. Gear interaction	13. Brought on board?		14. Landing method	15.Turtle resuscitation?		16.Photo ID	Catch # see above: 006	Specimen #: 0001	
006	1	D	D	EN	(Y)	N	GR	Y	(N)	0001	17. Tag release? N	22. Finder name & contact:	
007	1	A3	D	UK	(Y)	N	GR	Y	N	--	18. Tag recovery Y		

Catch detail number (#): Catch number allocated to the SSI species in the 'parent' 'Catch details' table previously completed (see example below).



CATCH DETAILS to be recorded per species for all spp. Use codes provided in form notes to fill in data collection fields.

	Catch details				Weight					Additional details on non-target species *(except SSIs)*	
Catch #	1. Species	2. Fate	3. Sampling method	4. Number	5. Processing type	6. Value (circle unit used)			7. Estimation method	8. Condition at capture	9. Condition at release
006	TTH	DUD	EXS	1	RD	10	mT	(Kg)	CA	D	D
007	BLM	RCC	EXS	1	RD	100	mT	(Kg)	LO	A0	A0

SPECIMEN DETAILS to be recorded for all SSI specimens caught											TAG DETAILS		
Catch # see above	Specimen #	10. Condition at capture	11. Condition at release	12. Gear interaction	13. Brought on board?		14. Landing method	15.Turtle resuscitation?		16.Photo ID	Catch # see above: 006	Specimen #: 0001	
006	1	D	D	EN	(Y)	N	GR	Y	(N)	0001	17. Tag release? N	22. Finder name & contact:	
007	1	A3	D	UK	(Y)	N	GR	Y	N	--	18. Tag recovery Y		

Specimen number (#): Numerical code beginning '1'. Specimen numbers should be consecutive within the same catch detail section within the same set. *In the example provided above, the observer correctly recorded the first specimen ('Specimen #': 1) of a Hawksbill turtle (FAO 3-alpha species code: TTH), inscribed as 'Catch #': 015 in the Catch detail table.*

10. Condition at capture: The state of health of SSI specimens caught by the vessel.

- Use codes provided in page 76 to specify SSI specimen condition at capture
- Use the condition code 'U' (unknown) if there was no opportunity to assess the condition.

11. Condition at release: The state of health of SSI specimens that are released by the vessel.

- Use codes provided in page 76 to specify SSI specimen condition at capture
- Use the condition code 'U' (unknown) if there was no opportunity to assess the condition.

12. Gear interaction: 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*, see page 77.

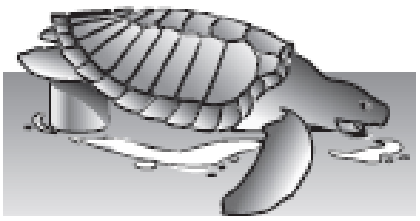
13. Brought on board: If the SSI specimen caught was brought on board the vessel.

14. Handling method: How the SSI caught was brought on-board. *Make sure to use the code that best describes the situation.* See codes in page 77

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 under no circumstance place in a container holding 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 the observer's name, vessel name and date on the side of the animal's body before photographing it;
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 (both dorsal and 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.

SPECIMEN DETAILS to be recorded for all SSI specimens caught

Catch # see above	Specimen #	10. Condition at capture	11. Condition at release	12. Gear interaction	13. Brought on board?		14. Landing method	15.Turtle resuscitation?		16.Photo ID
006	1	D	D	EN	(Y)	N	GR	Y	(N)	0001
007	1	A3	D	UK	(Y)	N	GR	Y	N	--
					Y	N		Y	N	
					Y	N		Y	N	
					Y	N		Y	N	

TAG DETAILS

Catch # see above:	006	Specimen #:	0001
17. Tag release?	N	22. Finder name & contact:	
18. Tag recovery	Y		
19. Tag type	MT		
20. Tag # 1:	A2045		
21. Tag # 2:	A2046	23. Well #:	

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

Specimen number (#): Allocate a specimen number. If there is more than one specimen, allocate a numerical code to each. If an SSI, refer to the parent specimen number, as specified in the 'Specimen details' table previously filled in (see above).

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 77.

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 and Contact Details Full: The full name of the person who recovered the tag and their contact details, including physical address, phone number and email address.

23. Well number: The well number from which the tagged fish has been recovered if the fish is FOUND during shifting, transhipping or offloading.

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

>> FORM 5-PS: PURSE-SEINE 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-PS.

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

IOTC REGIONAL OBSERVER SCHEME — **FORM 5–PS**
PURSE-SEINE – CATCH DETAILS & Biometric information — Page 001 of 020

Revised September 2021

Observer name:	Observed trip no:
GONDA James	2020/02/10 - IOTCKEN001 - PS

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 #	Spp.	Fate	Specimen #	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
001	YFT	DPQ	1	EXS	FB	27	---	---	---	---
001	YFT	DPQ	2	EXS	FB	35	---	---	---	---

Set number (#): The number corresponding to the fishing event / fishing set observed. Refer to the parent set number as specified in Form 4-PS.

Species and fate: Record the species and fate allocated in Form 4-PS to the specimen sampled for biometric data.

Specimen number (#): Consecutive specimen number. Before allocating a new specimen number in Form 5-PS ensure that you haven't yet allocated any specimens numbers to the species/fate pair, for the specific set, under Form 4-PS.

1. Sampling method for the collection of biological information: The sampling method used for the collection of the biological sub-sample. Use codes provided on page 75. *Observers should sample catches according to IOTC standard sampling priorities, listed in these guidelines.*

2. Length 1 type: The length measurement taken. Use codes provides in page 77. *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.

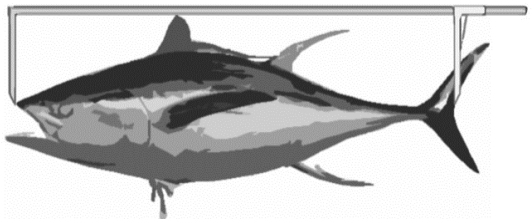
4. Fish processing type: Processed state of the specimen when it was weighted. *Record this information using the codes listed on page 76.*

5. Weight 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.

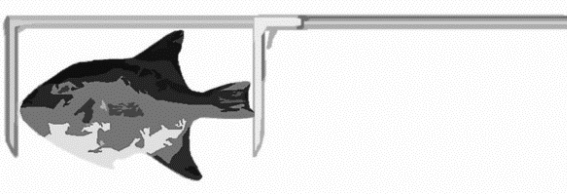
6. Weight estimation method: The estimation method used to obtain specimen weight. *Record this information using the codes listed on page 76.*

SPECIES REFERENCE LENGTH MEASUREMENT

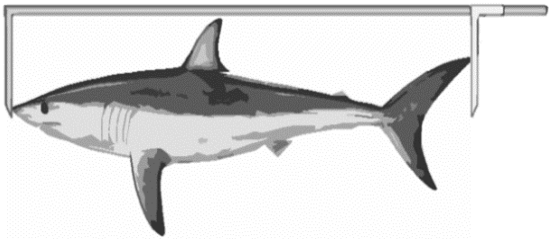
Tuna – UJFL length measured as a straight line from the tip of the upper jaw to the fork of tail.



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.

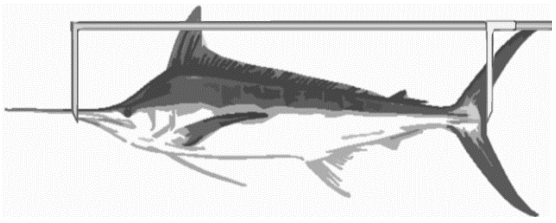


Sharks – TL length measured as a straight line from the tip of the snout to the extreme end of the tail.

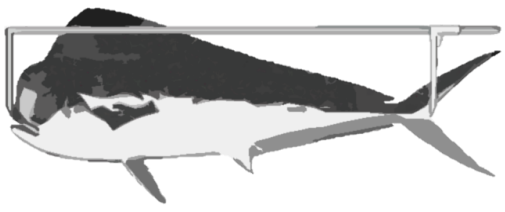


Rays – TW length measured as a straight line from one wing tip to another to obtain the total disk width.

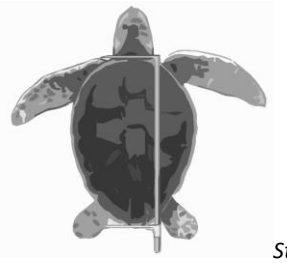
Billfish – LJFL length measured as a straight line from the tip of the lower jaw to the fork of tail.



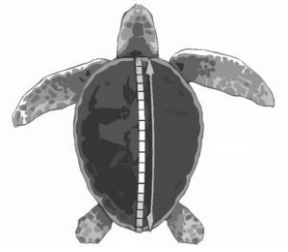
Other fish with forked tails – FL length measured as straight line from the tip of the snout to the fork of the tail.



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)

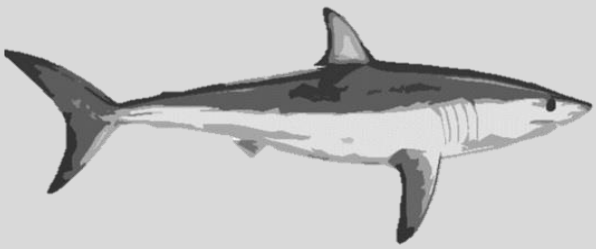


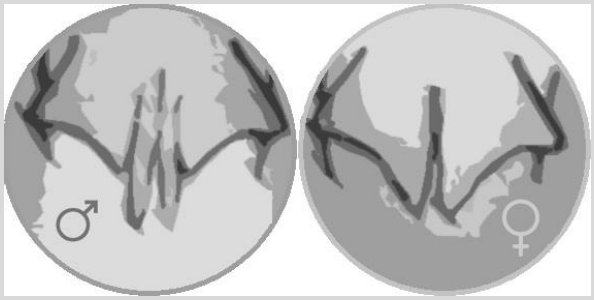
Curve carapace length (CT)

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 77.*

MARINE SPECIES THAT CAN BE SEXED FROM EXTERNAL FEATURES

Sharks and rays



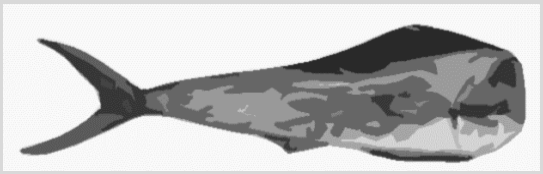


Male have claspers Female have no claspers

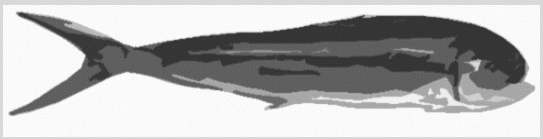
Turtles

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

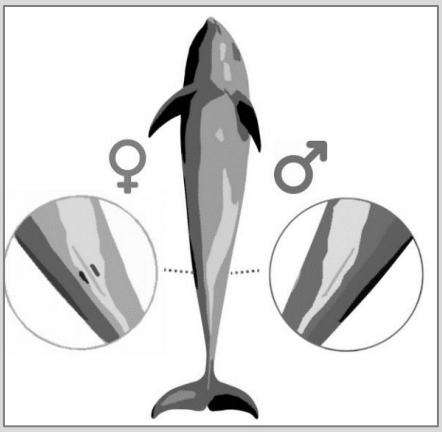


Female: Curved backward head

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.



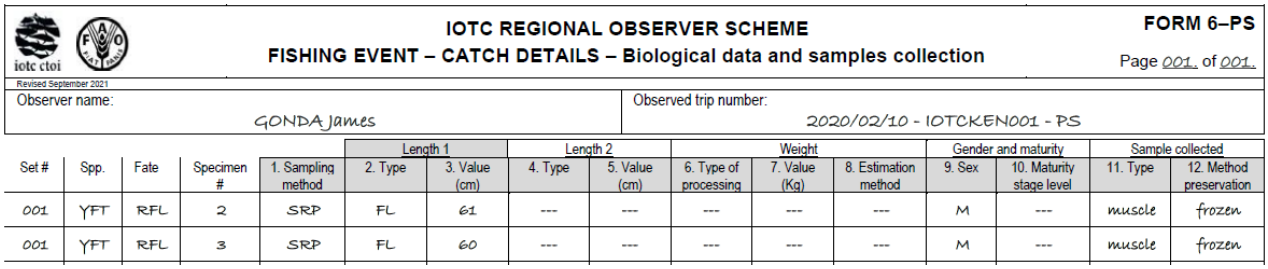
Attention: *Purse-seiners preserve their catch whole (i.e., unprocessed) and it will probably not be appreciated if an observer cuts open a fish just to check the sex of the fish, unless they have been specifically requested to do so for biological sampling, for instance. If the gonads were not checked because the fish was not gutted, record the code 'U' (unknown) in the sex data field.*

>> FORM 6-PS: 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.). The following instructions outline how observers should complete Form 6-PS.

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).



IOTC REGIONAL OBSERVER SCHEME — FORM 6–PS
FISHING EVENT – CATCH DETAILS – Biological data and samples collection — Page 001 of 001
Revised September 2021

Observer name: GONDA James
Observed trip number: 2020/02/10 - IOTCKEN001 - PS

				Length 1			Length 2		Weight			Gender and maturity		Sample collected	
Set #	Spp.	Fate	Specimen #	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	YFT	RFL	2	SRP	FL	61	---	---	---	---	---	M	---	muscle	frozen
001	YFT	RFL	3	SRP	FL	60	---	---	---	---	---	M	---	muscle	frozen

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

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 provided in page 75.

Length 1

2. Type: The species reference length measurement. Use codes provided on page 77.

3. Value: Record the length 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 provided on page 77.

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 on page 76.

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 on page 76.

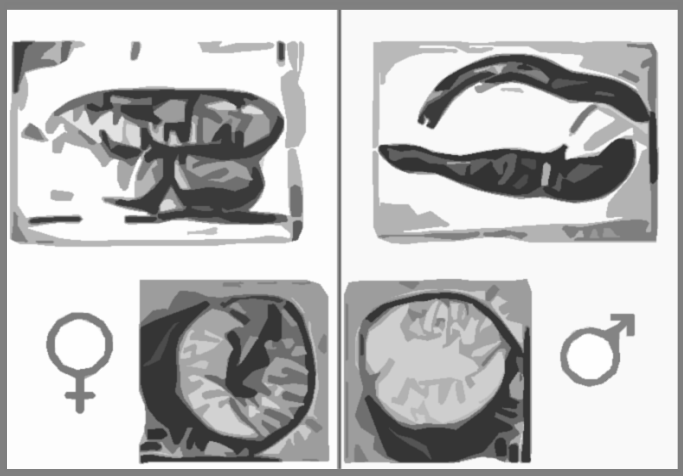
Gender and maturity

9. Sex: Ascertain the sex of sampled fish by checking their gonads. Note that sharks, turtles, marine mammals, and other species gender can be easily determined by looking at external features. *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 in the COMMENTS section*** *(e.g., IFREMER swordfish maturity scale developed in 2012 for the IOSSS project: "IOSSS-IFREMER, 2012").*

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'.

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 will be sent / stored in / 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 analysing / storing 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 — **FORM 6–PS**

FISHING EVENT – CATCH DETAILS – Biological data and samples collection

iotc ctoi

Revised September 2021

Page 001. of 001.

Observer name: GONDA James

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

					Length 1		Length 2		Weight			Gender and maturity		Sample collected	
Set #	Spp.	Fate	Specimen #	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	YFT	RFL	2	SRP	FL	61	---	---	---	---	---	M	---	muscle	frozen
001	YFT	RFL	3	SRP	FL	60	---	---	---	---	---	M	---	muscle	frozen
001	YFT	RFL	4	SRP	FL	59	---	---	---	---	---	F	---	muscle	frozen
001	YFT	RFL	5	SRP	FL	63	---	---	---	---	---	M	---	muscle	frozen
001	YFT	RFL	6	SRP	FL	61	---	---	---	---	---	F	---	muscle	frozen
001	YFT	RFL	7	SRP	FL	60	---	---	---	---	---	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):*

Samples of muscle collected from specimens #21 to 26 are destined for an isotopes study requested by the South West Indian Ocean Fisheries Project (SWIOFP). Samples are to be sent to IFREMER in Reunion Island (France) for analysis.

>> FORM 7-PS: VESSEL UNLOADING / TRANSHIPMENT

Tuna purse-seiners are not allowed to tranship at-sea in the IOTC Convention Area. Nonetheless, and in case that an at-sea transhipment to a carrier / fishing vessel takes place during the trip by such a vessel the Observer should complete this form. The following instructions outlines how observers are to fill Form 7-PS.

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

IOTC REGIONAL OBSERVER SCHEME
VESSEL TRANSHIPMENTS

iotc ctoi

Revised September 2020

FORM 7-PS
Page 001 of ____.

Observer name:	Observed Trip No:
GONDA James	2020/02/10 - IOTCKEN001 - PS

Vessel transhipment #: 001

1. Start date and time (UTC):					2. End date and time (UTC:				
DD	MM	YYYY	hh	mm	DD	MM	YYYY	hh	mm
19	03	2020	14	10	19	03	2020	17	15

3. Position (dd° mm' ss") specify quadrant (circle)				4. Category (tick the correct option):			
LATITUDE		LONGITUDE		TRANSHIP FROM:		TRANSHIP TO:	X
06° 49'	(S) N	039° 17'	(E) W	NET LOAD:		NET OFFLOAD:	

Product transhipped

#	5. Spp.	6. Processing type	7. Quantity (encircle unit used)				#	5. Spp.	6. Processing type	7. Quantity (encircle unit used)			
1	YFT	RD	200	(Mt)	Kg	No	8				Mt	Kg	No
2	SKJ	RD	200	(Mt)	Kg	No	9				Mt	Kg	No
3	BET	RD	50	(Mt)	Kg	No	10				Mt	Kg	No
4				Mt	Kg	No	11				Mt	Kg	No
5				Mt	Kg	No	12				Mt	Kg	No
6				Mt	Kg	No	13				Mt	Kg	No
7				Mt	Kg	No	14				Mt	Kg	No

8. Name of carrier / fishing vessel:	INTERTUNA 3	9. Flag:	SEYCHELLES
10. Call sign:	S7SA	11. Port of registry:	VICTORIA SEYCHELLES
12. Registration number	50126		

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) or if loading from the net or allowing to load fish from the net (this may occur if a purse seiner has pursed more fish than its present loading capacity).

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 68). 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 the IOTC categories (page 76).

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 the 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.

>> FORM 8-PS: PURSE-SEINE DAILY ACTIVITY LOG

This form contains detailed questions on purse-seine vessel daily activities and it should be completed by the observer at two-hour intervals from sunrise to sunset and at the start of every fishing activity. The following instructions outline how observers are to complete Form 8-PS.

Header details

The header details should be completed in full *on every form* (*observer name, observed trip number and page number*, see > Header details', page 31).

IOTC REGIONAL OBSERVER SCHEME
SURFACE FISHERIES - DAILY ACTIVITIES

FORM 8-PS (pg. 1)
Page 001 of ____.

Revised September 2020

Observer Name:	Observed Trip No:
GONDA James	2020/02/10 - IOTURT001 - PS

1. Date UTC			2. Time UTC		3. Position *specify quadrant by circling it*						4. Activity
DD	MM	YYYY	hh	mm	LATITUDE			LONGITUDE			
26	02	2020	03	30	05° 36' 00"	(S)	N	041° 59' 05"	(E)	W	SE
26	02	2020	05	30	05°46' 10"	(S)	N	042° 00' 07"	(E)	W	SE
26	02	2020	06	15	06 °06' 10"	(S)	N	042° 17' 07"	(E)	W	FI
26	02	2020	07	30	06 °06' 10"	(S)	N	042° 17' 07"	(E)	W	FI
26	02	2020	09	30	06 °06' 20"	(S)	N	042° 18' 00"	(E)	W	FI
26	02	2020	11	30	06 °02' 02"	(S)	N	042° 10' 13"	(E)	W	SE

5. Comments:

- 26/02/2020 at 06h15 UTC fishing event # 1 on a FAD equipped with ALBACORA IV buoy number 33 equipped with artificial lights. This buoy was replaced with the INTERTUNA 1 buoy number 55. Skiff crew found a dead loggerhead turtle meshed in the net hanging under the raft. The turtle was brough to the Observer for species confirmation and sampling.

1. Date: Record observed vessel activity date (DD/MM/YYYY) in UTC regardless of the time zone used by the vessel.

2. Time: Record the UTC time (hh:mm) at the start of every fishing activity and every two hours from sunrise to sunset, regardless of time zone.

3. Position: Record vessel geographic position (in DMS format) at the start of every fishing activity and every two hours from sunrise to sunset.

4. Activity: Record vessel activity at the start of every fishing activity and every two hours from sunrise until the search ends when the watchers stop searching for fish using binoculars (normally sunset) using codes provided on page 72.

5. Comments: Provide a short description for exceptional events that could not be described by previous fields.

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). Mention any rare catch event (i.e., rare species such as *megachasma pelagios*, big volume of discards, big amount of devil rays in a single set, etc.)
- 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, marine mammal entanglements and interactions etc.
- The 7th paragraph should mention any fishing vessel sightings (important for IUU vessels), any difficulties encountered (with operational issues and observer tasks) as well as details on deployment general impressions (vessel living and working conditions, coexistence, and crew collaboration level).
- 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 TUNA PURSE-SEINERS

FAO species codes[2]

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[3]

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
SPZ	Smooth hammerhead

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

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

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

Country codes/names (FAO4 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

4 http://www.fao.org/countryprofiles/iso3list/en/

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
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)

Operation codes

Tuna School first detection method[5]

SV	Seen from vessel
MB	Marked with beacon (instrumented buoy)
BR	Bird radar
AS	Acoustic – sonar / echo-sounder

IV	Information from another vessel
OTH	Other (specify)
RDR	Radar
UNK	Unknown

Activity[6]

ES	End of searching (when the watchers stop searching for fish using binoculars).
FI	Fishing (skiff is deployed)
IF	Installation or modification of a floating objet (natural or artificial).
SO	Steaming at night towards a floating object (logs or FADs)
TR	Transhipping at sea.
ZC	EEZ zone change
DF	Drifting during the day near a tuna school, a log or a FAD
DN	Drifting during the night (engine stopped)
DT	Drifting due to mechanical problems
DW	Drifting because of bad weather.
PO	In port (includes all reasons or being in port including mechanical problems).
SE	Searching in general (for tuna schools, logs, or FADs or other vessels)
SI	Steaming towards (& investigating) observed system (birds, floating object, etc.) associated with the tuna school.
ST	Transit (steaming without searching day or night).
OT	Other activities (describe in comments)

Observed System (school sighting cue / school type)[7]

School sighting		**School type**	
NSC	No sighting cue	**0**	Undetermined
UTS	Tuna school (no details given on the type of school)	**2**	Free school
CSA	Changes on sea surface appearance. Marks left by the fish on the surface of the water. It can be a zone of the surface presenting a different texture, oil marks, rippling of the sea surface as if produced by a breeze, an area of extremely choppy sea that gives the impression that the sea surface is boiling, an area of very choppy / foamy sea surface, created by the constant jumping of small fish. Or a school indicated by tuna jumping.	**2**	Free school
DTS	Presence of a deep tuna school	**2**	Free school
BIR	Presence of birds	**2**	Free school
LW	Presence of large live whales (killer whales, sperm whales, baleen whales)	**2**	Free school

[5] Revised accordingly to IOTC ROS OMv1.2, SPC/WCPFC ROP and Observ DB (EU OPs).
[6] Revised accordingly to IOTC ROS OMv1.2, SPC/WCPFC ROP and Observ DB (EU OPs).
[7] As per the Observ Database developed by the French Research Institute (IRD) and used by EU and Seychelles Observer programmes.

DOL	Presence Small toothed whales / dolphins (dolphins, pilot and/or false killer whales)	**2**	Free school
SHA	Presence of shark(s)	**2**	Free school
OVF	Another tuna vessel	**1**	Associated school
STS	Same school that escaped the previous set	**0**	Undetermined
SAV	School associated to the tuna vessel	**1**	Associated school
SM	Fishing on a seamount	**1**	Associated school
OTH	Other (to detail in the comments)	**0**	Undetermined
SBV	Supply or bait-boat vessel	**1**	Associated school
WSB	Whale shark seen before set	**1**	Associated school
WSA	Whale shark seen later during set	**1**	Associated school
DFAD	Drifting man-made FAD (bamboo or metallic raft)	**1**	Associated school
AFAD	Anchored man-made FAD (huge buoy)	**1**	Associated school
LS	Drifting log. Including logs of plant (branches, trunk, palm leaf, etc.), animal (carcasses, live whale sharks); and human origin (nets, wreck, ropes, washing machine, oil tank, etc.)	**1**	Associated school
FSB	Feeding on bait fish	**2**	Free school

Artificial FAD design/materials[8]

RE	Raft covered with ecological materials (Burlap, Canvas of sisal, thick fabric, tarpaulin, raffia, canvas claustra, horticultural felt).
RNS	Raft covered using a net with a stretched mesh of less than 7 cm.
RNL	Raft covered with large mesh net (stretched mesh of more than 7 cm).
RNC	Raft not covered
TNR	Tail made of nets rolled in "sausages"
TNS	Tail made of nets panels with a stretched mesh of less than 7 cm
TRO	Tail made of ropes
TRC	Tail made of ropes and canvas
TNL	Tail made of hanging large mesh net (stretched mesh of more than 7 cm)

Beaufort wind scale

Beaufort	Name	Wind Speed	Wave Height	Visible Sea State
0	Calm	0 to 1 knots / neuds	0 metres	Sea like a mirror
1	Light Air	1 to 3	0.1 to 0.2	Ripples with appearance of scales: no foam crests: sea still has glassy appearance.
2	Light breeze	4 to 6	0.3 to 0.5	Small wavelets: crests have glassy appearance but do not break.
3	Gentle breeze	7 to 10	0.6 to 1.0	Large wavelets: crests begin to break: few scattered white horses.
4	Moderate breeze	11 to 16	1.5	Small waves, becoming longer: fairly frequent white horses.
5	Fresh breeze	17 to 21	2.0	Moderate waves, longer form: many white horses and scattered spray.
6	Strong breeze	22 to 27	3.5	Large waves forming, white foam crests extensive everywhere and spray.

[8] ISSF GUIDE FOR NON-ENTANGLING FADs, International Seafood Sustainability Foundation (ISSF), 2015.

7	Moderate gale	28 to 33	5.0	Sea starts to heap up and white foam breaking waves begin to be blown in streaks: spindrift begins to be seen.
8	Fresh gale	34 to 40	7.5	Moderately high waves of greater length, edges of crests break into spindrift: foam blown into well-marked streaks.
9	Strong gale	41 to 47	9.5	High waves; dense streaks of foam; sea begins to roll; spray begins to affect visibility.
10	Whole gale	48 to 55	12.0	Very high waves with overhanging crests; sea surface takes on white appearance as foam in great patches is blown in very dense streaks; rolling sea and visibility reduced.
11	Storm	56 to 64	15.0	Exceptionally high waves; sea covered with long white patches of foam. Small and medium sized vessels lost to view between waves. Visibility further reduced.
12	Hurricane	64 +	15 +	Air filled with foam and spray; sea completely white with driving spray; visibility greatly reduced.

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 methods for obtaining total catch estimates by species

EXS	Exhaustive Sampling: The observer weighted/counted every individual (only feasible if the catch is small)
MRS	Observer collected Random Sample. Observer raised sample to obtain total catch per species (e.g., brail capacity x brail tally; fish weight x number of fish)
SPS	Systematic Proportional Sampling: a proportion (%) of the catch or of the individuals were weighed/counted in a systematic way to obtain catch composition. Observer raised sample to obtain total catch per species
VES	Observer used Vessel Estimates to estimate catch per species (e.g., logbook, well contents)
OTH	Other. Provide details in comments

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 subsampled in a systematic way. (E.g., every 10^{th} fish is sub-sampled).
SSS	Stratified Sampling of a sample taken via "Spill method". The observer tipped the fish from a pile/receptacle/conveyer belt into a bin to avoid hand selection of individual fish, divided fish into homogeneous subgroups before subsampling. (e.g.: observer sub-sampled 50 fish for large fish (≥15 kg))
SSG	Stratified Sampling of a sample taken via "Grab method". The observer pulls by hand a selected number of fish from a pile/ receptacle/ conveyer belt and divided fish into homogeneous subgroups before subsampling (e.g.: observer sub-sampled 50 yellowfin tuna).
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
CA	Calculation

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)

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

EN	Entangled in the net	**OT**	Other (describe)
EF	Entangled with FAD	**UK**	Unknown
EG	Entangled in ghost fishing gear		

Handling methods

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

De-hook line cutting device

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

Sex

M	Male	**J**	Juvenile
F	Female	**UNK**	Not determined

Tag type

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

Length measurement descriptions[9][10][11]

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

[9] IOTC-2013-WPDCS09-13 Rev_1

[10] 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. FAO Fish. Synop.Vol. 2: 137 p.

[11] 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.

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