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

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SC-10-60

# Tagging Methodology for Southern Indian Ocean Fisheries Agreement Area

Delegation of Australia

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| <b>Abstract</b>      | <p>Following tasking from SC 9 (275-277), Australia has prepared the SIOFA skate tagging method that has been adapted from the CCAMLR Tagging Methods. CCAMLR has also updated the Toothfish tagging protocols and Australia recommends these updated protocols also be adopted by SIOFA.</p> |

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<sup>2</sup> Documents available only to members invited to closed sessions.

**Recommendations** (for proposals and working papers only)

- Note the report by Australia
- Endorse the skate tagging rate per level of observer coverage
- Endorse the methods and handling guidelines in Attachment A

# Tagging Methodology for Southern Indian Ocean Fisheries Agreement Area

**Brooke D'Alberto and Trent Timmiss**

**Delegation of Australia**

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# Background

The Southern Indian Ocean Fisheries Agreement (SIOFA) tagging program, is administered by the SIOFA Secretariat, which provides standardised tagging protocols and tagging equipment to fishing vessels engaged in the program, as well as receives and stores data of all fish that are tagged, released and recaptured.

SIOFA tagging programs are coordinated and adapted from the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) tagging program. Scientific information on toothfish, including tagged and recaptured fish are exchanged with CCAMLR as a boarding organisation, for the management of the toothfish fisheries in SIOFA Area. This standardisation is an essential component of the tagging program as SIOFA and CCAMLR uses the fisheries-based tag recapture rates as the foundation for estimating abundance for both toothfish and skates.

The 2021 SIOFA toothfish tagging protocol (SC-07-06) was adapted from the methods of CCAMLR Toothfish and Skate Tagging Instructions (version 2013; [www.ccamlr.org/node/85702](http://www.ccamlr.org/node/85702)) and skate and ray specifications were removed.

As well as in the CCAMLR Area, skates are primarily taken as bycatch in demersal longline vessels targeting Antarctic and Patagonian toothfish (*Dissostichus* spp) in the SIOFA Area.

The 10<sup>th</sup> SIOFA Meeting of the Parties (MoP10) endorsed the recommendation from 8<sup>th</sup> Meeting of the Scientific Committee of SIOFA (SC8) to consider developing and implanting a skate tagging program for skates caught alive and with a high probability of survival on longline vessels.

SIOFA SC9 requested Australia to prepare a proposal for a skate tagging program and that summarised the skate tagging program operated by CCAMLR, including procedures, methodologies, and data collection forms.

In recent years, CCAMLR have considered the Toothfish and Skate Tagging Instructions for use by vessels and observers in CCAMLR fisheries. In 2024, the CCAMLR tagging manual was updated to standardise the procedures, include additional handling and assessment guidelines for skates, and structured to outline Standard Operating Procedures. This version was endorsed by the Forty-third Meeting of the CCAMLR Commission in 2024 (paragraph 3.28).

Attachment A outlines the proposed SIOFA skate and ray tagging methods. It also includes CCAMLR updates on toothfish. The proposed SIOFA tagging protocol have been updated to be consistent with the revised CCAMLR manual.

Additionally, tagging rates for skates and rays based on the number of observers onboard vessels are proposed, noting the tagging rates for toothfish in Conservation and Management Measure (CMM) 2023/15 (Management of Demersal Stocks)<sup>3</sup> CMM 2023/15.

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<sup>3</sup> CMM 15(2023) (Management of Demersal Stocks) supersedes CMM 2021/15 (Management of Demersal Stocks).

# Tagging rates

SIOFA fisheries catching toothfish must tag toothfish in accordance with paragraph 26 of SIOFA CCM 2023/15.

*“CCPs shall require their flagged vessels to tag and release *Dissostichus spp.* specimens at a rate of at least 5 fish per tonne green weight caught. A minimum overlap statistic of at least 60% shall apply for tag release, once 30 or more *Dissostichus spp.* specimens have been caught.”*

In the SIOFA Area, the number of observers on vessels can vary by CCP and limit the ability of observers to conduct additional tasks such as skate tagging.

It is proposed that the skate tagging rate is based on level of observer coverage with

- Vessels with 1 observer, as opportunity allows.
- Vessels with 2 or more observers, all released skate that are likely to survive.

## Recommendations

It is recommended that the Scientific Committee:

- Note the report by Australia.
- Endorse the skate rate of tagging per observer coverage.
- Endorse the methods and handling guidelines for toothfish and skate in Attachment A.

# Attachment A: Commercial and Scientific Observer Tagging Manual Finfish Fisheries

Version 2024

**Adapted for SIOFA**



This manual is adapted from the CCAMLR Commercial and Scientific Observer Tagging Manual Finfish Fisheries Version 2024 for SIOFA. The CCAMLR is manual produced in the official languages of the CCAMLR Commission (English, French, Russian and Spanish) and may be downloaded from the CCAMLR website at the CCAMLR Scheme of International Scientific Observation webpage ([www.ccamlr.org/node/73033](http://www.ccamlr.org/node/73033)).



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# Rationale

Fish tagging data enable scientists to better understand fish behaviour, migration patterns, and population dynamics, which is essential for effective conservation, fisheries management, and the sustainable exploitation of marine resources.

## Introduction

The SIOFA tagging program, is administered by the SIOFA Secretariat, which provides standardised tagging protocols and tagging equipment to fishing vessels engaged in the program.

SIOFA tagging programs are coordinated and adapted from the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) tagging program. Scientific information on toothfish, including tagged and recaptured fish are exchanged with CCAMLR as a boarding organisation, for the management of the toothfish fisheries in SIOFA Area. This standardisation is an essential component of the tagging program as SIOFA and CCAMLR uses the fisheries-based tag recapture rates as the foundation for estimating abundance for both toothfish and skates.

The Secretariat receives and stores data of all fish that are tagged and released as well as data from the subsequent recapture of those fish. Each recapture must be linked to the tagging event to verify the data for use in population estimates as well as for examining movement and growth.

Toothfish tagging requirements are described in SIOFA Conservation and Management Measure (CMM) 2023-15 and are a CCP responsibility. Information on the SIOFA tagging program is available in the [Scientific Committee circular 2021/36](#).

The observers and or appropriately trained crew members on each longline vessel need to be trained in the best practice to tag and release toothfish, and skates and rays. Although it is the vessel's responsibility to ensure tagging and tag recovery protocols are correctly followed, the crew are expected to cooperate with the SISO observer during these operations.

To assist CCAMLR Members and their vessel crew and observers in implementing the tagging program, the CCAMLR Secretariat, in consultation with the Scientific Committee and its working groups, have revised and updated the original *Toothfish and Skate Tagging Instructions* (2013) transforming it into a manual format to better define best practice and guidance for tagging fish.

This manual aims to standardise the tagging and recapture procedures for finfish fisheries operating in CCAMLR and should be provided to the vessel crew and observers prior to sailing. To achieve this objective, the manual is structured to outline Standard Operating Procedures (SOPs), followed by the [reference criteria for best practice](#), that can be quickly accessed through hyperlinks in the text.

# Standard Operating Procedures (SOPs) for vessel crew and observers

## Pre-trip preparation

Vessel operators need to ensure the following components are onboard prior to sailing:

- CCAMLR tags, enough for the duration of the trip.
- Tag applicator and needles in good condition with spares and cleaning supplies.
- Landing nets and cradles.
- Working station prepared with:
  - measuring board.
  - suitable holding tank.

## Tagging equipment

As specified in SIOFA Circular 2021-36, CCAMLR tags must be ordered in sets of 1000 tags from the Secretariate, using the [Tagging Equipment Order Form](#) on the CCAMLR website. It is recommended that for each set of 1000 tags members purchase two tagging guns. It is also recommended that new tagging guns and needles be purchased at the start of each season. Members can order a complete Tagging Equipment Box (Figure 1) together with their tag orders that will include:

- One waterproof storage box large enough to hold tags, guns and spare needles.
- Plastic container for storing damaged or partially used magazines, spare needles etc.
- CCAMLR pen.
- CCAMLR tag photo template ruler.

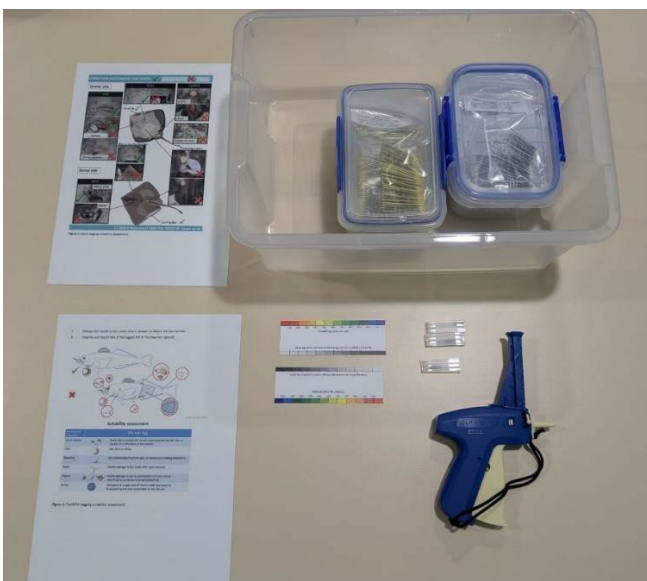


Figure 1. Tagging equipment from CCAMLR

The CCAMLR tag photo template rule is a very important tool, and it is recommended to have several water repellent copies on board.

Note, that CCAMLR no longer requires the physical recaptured tags to be returned. Instead, take photographs of

any recovered tags using the supplied CCAMLR tag photo template ruler as a background (Figure 2). Make sure the tag numbers are readable and return these photographs along with the electronic logbooks to the Secretariat. The physical tags should be destroyed to avoid future reporting confusion. The SIOFA toothfish tagging protocol for the SIOFA Area is the same as the CCAMLR Tagging protocol.

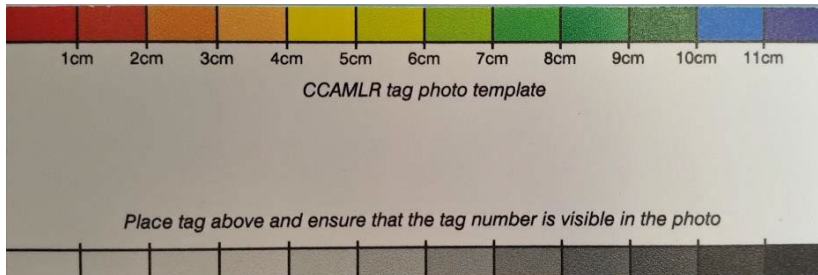


Figure 2. CCAMLR tag photo template ruler

Throughout the season, vessel crew and observers are encouraged to maintain the equipment. Refer to [Tag applicator maintenance \(tagging gun\)](#) in the reference criteria for best practice below.

It is recommended that all unused and damaged tags be retained and returned to the SIOFA Secretariat as part of the tagging program auditing process. The return postal address is:

SIOFA Tagging Program Coordinator  
13 Rue de Marseille  
97420 Le Port  
LA REUNION

## Landing nets and cradles

One of the most important points to remember when tagging is that the fish must be in a condition that gives it the best chance of survival. The first step is to land the fish without injury. As the fish is neutrally buoyant in the water, strain on the hooking site from supporting the fish's weight when lifting can damage tissue at the hook site. While unsupported by water, the weight of the fish's body can stretch its backbone and severely injure its vertebra, reducing its chances of survival. A landing net and cradle must therefore be used to support the fish from underneath when lifting from the water. It is recommended that both cradles (for large fish) and long-handled nets (for smaller fish) be assembled prior to the vessel sailing. The design should be such that they are both effective at capturing the fish on the surface and easy to operate once the fish is onboard. Delays in collecting the fish at the surface results in poorer fish condition as well as lost fishing time (refer to [Fish handling](#)).

## Tagging workstation and holding tanks

Optimally a tagging station should be sheltered from the weather and conveniently situated near the hauling station or room. This will minimise the distance for carrying fish, provide safe access for fish handlers, and reduce handling time. For very large fish, consideration must be given to the need for two persons to carry a fish in a landing [net or stretcher](#). If possible, depending on the layout of the hauling station, large fish can be measured and tagged in their landing net without transporting them, allowing immediate lowering back into the water.

## Proposed SOPs for tagging operations

**Data quality and accurate recording of tag numbers must be given the highest priority.**

Tag numbers from recaptured tagged fish that cannot be matched to those numbers of released fish are useless. Tagging and releasing fish without high quality tag data is a waste of time and effort, as well as their commercial value.

Where possible, two people should be involved in a tagging event, one to record and verify the data, and the other to perform the tagging procedures.

### Crew and observer preparation for tagging

- Familiarize yourself with the tag rate for the SIOFA Area to guarantee compliance with SIOFA CMM 2023/15.
- Update the [tag overlap statistic](#) form on a daily basis to ensure the minimum rate is being maintained and that the optimum size distribution is being achieved.
- Ensure the tagging team is properly trained and knowledgeable about the best practice tagging protocols and procedures - review with the team as necessary.
- Display the tagging suitability criteria poster and tagging protocol prominently near the tagging station for easy reference.
- Prepare the tagging station, ensuring that all gear and equipment, including [hook removal tools](#), are ready and in good condition.

### Tagging operations.

Tagging operations should be coordinated with the vessel's tagging crew and observer and should include the following steps;

- Keep the tagging station prepared at all times during hauling.
- Be aware of the bridge notification to the hauling crew indicating which fish to tag.
- Prepare landing gear at the hauling station (i.e. do not use a gaff).
- Notify the observer or responsible crew member on duty when tagging is to occur.
- Land the selected fish.
- Consider tagging larger fish directly at the hauling station.
- Measure the fish for total and standard length.
- [Insert tags](#), test attachment, and record tag numbers, then double check them.
- Gently [release](#) the fish back into the water.
- Record additional information, including haul number, fate, and release location (obtained from the bridge).

Fish selected for tagging must be in a suitable condition to give it the maximum chance of survival. As soon as the fish is landed the crew can immediately assess it against the [Tagging suitability criteria](#). If the fish is not suitable, it is sent for processing and the next suitable fish is selected. Fish should not be held out of water for more than three (3) minutes.

The use of holding tanks should be avoided if possible. If a holding tank is used, fish should be held for the minimum time needed to evaluate suitability, recuperate swimming ability, and be released where there is no visible predation threat. The number of fish in a holding tank should be carefully controlled to prevent overcrowding. Water flow and temperature should be adequate, and the time a fish is held should be minimized. Remember that the fish from the depths were recently acclimated to a temperature likely to be very different to the surface water temperature of the holding tank.

Double-check the tag codes, fish length, and haul number before releasing the fish. At the end of each shift, compare the tag logbook with used tags and broken tags to ensure they match up. Waiting to do this jeopardises all the data since the last check.

## Tagging data sheet

As specified in SIOFA CMM 2023-02 (Data Standards), the following data is required to be collected and reported for tag releases for all tagged, fish seabird, mammal, or reptile:

- Tag type, wording, and colour
- Tag number,
- Date and time of tagging,
- Species,
- Animal length,
- Type of length
- Animal sex (F = female, M = male, I = indeterminate, D = not examined),
- Position (Lat/Lon) of release
- Animal status at release (injured/uninjured)

The observer is responsible for recording all the tagging information on the tag release sheet in their logbook. Check and re-check that the tag numbers are recorded correctly. The tag sheet will highlight in “red” the tag numbers that are not consecutive. This can happen if there is a broken tag or if the next tag series loaded does not follow the previous one for some reason. It is very easy to miss a change in the tag number sequence, especially when it is not just the last few digits that change (e.g. a batch change). Record in the comments the numbers of all broken/misfired tags. All broken tags must be retained and returned to the CCAMLR Secretariat. This is the vessel’s responsibility, but often the observers may be asked to assist with this requirement.

The release position for the tagged fish should be cross checked with the bridge. In other words, tagging worksheets in both the Observer Logbook and in the Logbook must be completed and should be verified against each other.

## Tag overlap statistic

Meeting the tag overlap percentage is always the vessel’s responsibility. The [tag overlap statistic calculator](#) is provided on the CCAMLR website to assist with achieving an appropriate tag overlap, and is periodically updated, so make sure you have the latest version (Figure 3). The calculator also provides an indicative tagging rate at the relevant fishery scale, and users should refer to the appropriate SIOFA CMM to ensure they are meeting the correct tagging rate requirements.

The tag overlap statistic is calculated by comparing the length frequency of tagged fish, with the length frequency

of fish recorded by SISO observers in their biological sampling measurements. The length frequency of tagged toothfish must have at least a 60% overlap with the length frequency of the total catch for each species of toothfish, unless fewer than 30 toothfish have been tagged. However, the target overlap statistic is > 80%, which is easily achievable if an appropriate fish selection method is used.

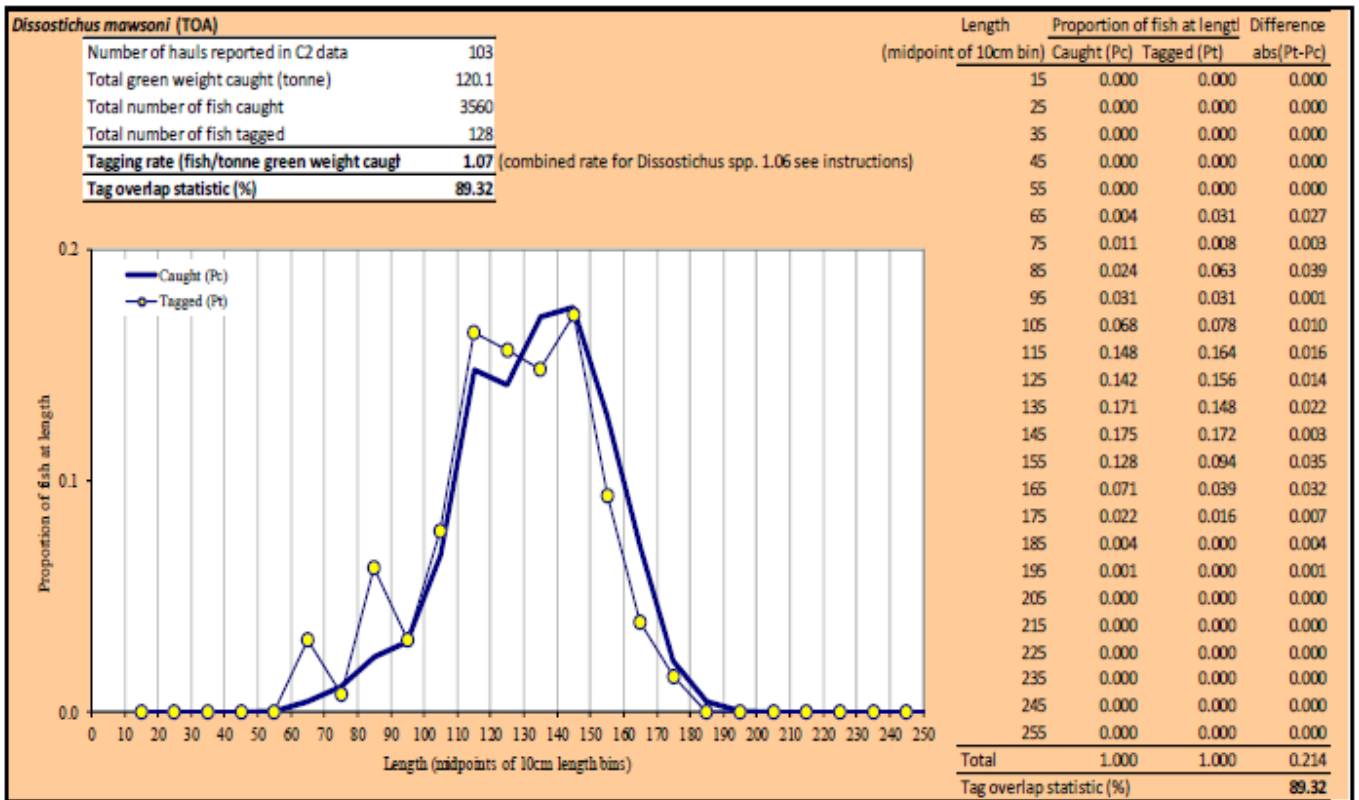


Figure 3. Tag overlap statistic calculator



## Proposed SOPs for tag **recapture** operations

Crew at the hauling station and in the processing area need to check every fish for tags.

### Crew responsibilities

Any recaptured toothfish and skate must be given to the observer for sampling. A dedicated bin can be placed at the observers sampling station to keep the fish in one place. All recaptures must be retained by the vessel regardless of their time at liberty.

### Observer responsibilities

#### Sampling

All recaptured toothfish must be sampled as type III (refer to CCAMLR SISO Manual Finfish Fisheries 2023 and below, sampling requirements can also be found here: <https://www.ccamlr.org/node/81589>). An electronic time-stamped photograph must be taken of both the tags in situ and with the tags and otoliths placed on the CCAMLR tag photo template ruler. Ensure that the photographs clearly show the tag numbers so that they are readable. Photos of recapture tags can be attached to the observer's cruise report, or if they are excessive in number stored in a folder to give to your technical coordinator to send to the SIOFA Secretariat.

#### TYPE III Sampling

|           |  |
|-----------|--|
| Toothfish | <ul style="list-style-type: none"><li>• Record length, weight, and sex.</li><li>• Measure gonad weight and collect both otoliths.</li><li>• Determine gonad stage.</li></ul> |
| Skates    | <ul style="list-style-type: none"><li>• Record total length, pelvic length, wingspan, weight, and sex.</li><li>• Determine gonad stage.</li></ul>                            |

### Tag recapture data sheet

As specified in SIOFA CMM 2023-02 (Data Standards), the following data is required to be collected and reported for all recovered fish seabird, mammal, or reptile tags if the organism is dead, to be retained, or alive:

- Name of the observer
- Name of the vessel
- International radio call sign (if any)
- Vessel flag CCP (ISO-3-alpha)
- Collect, label (with all details below) and store the actual tags for later return to the tagging agency
- Species from which the tag was removed
- Tag colour
- Tag wording and type of tag (spaghetti, archival)
- Tag numbers
- Data and time of capture (UTC),

- Location of capture (Lat/Lon, to the nearest 1 minute)
- Animal length/size (cm or mm) with description of what measurement was taken (such as total length, fork length, etc.)
- Sex (F = female, M = male, I = indeterminate, D = not examined)
- Whether the tags were found during a period of fishing that was being observed (Y/N)

The tag code (including any prefix letters) and colour and inscription, together with the biometric data from each fish must be captured in the tag recapture sheet in the excel logbooks. There is a fish serial number field on both the biological sampling worksheet and the tag recapture worksheet in the observer logbook to link any records.

# Reference criteria for best practice

## Fish and skate suitability criteria for tagging

To ensure the highest chance of survival, toothfish and skates should only be tagged if the fish are in good condition. Only fish that are in good condition should be selected for tagging. The fish should meet the condition assessment criteria in the toothfish and skate tagging posters ([Appendix 1](#)).

Toothfish should never be tagged and released if any of the following characteristics are present:

- Hook injuries are present anywhere on body other than in mouth area.
- Gills are pink or white.
- Gills have visible bleeding, or if excessive bleeding is present anywhere on fish.
- There is visible damage to fish body with open wounds.
- There is visible damage to eye or penetration of body cavity, caused by crustaceans (amphipods/lice).
- An area of abrasions or recent scale loss equal to or exceeds the area equivalent to the fish's tail.
- No physical movement is detected.

Skates should never be tagged and released if any of the following characteristics are present

- Broken jaw or significant tearing of tissue around mouth.
- White or bleeding gills on either dorsal or ventral surface.
- Lice damage.
- Visible prolapse of a large part of intestine or bleeding.
- Eye or spiracle injury.

## Tagging station layout

Select a tagging station location that is sheltered from the weather and conveniently situated near the hauling room, holding tanks, and release positions. This will ensure efficient handling time, minimise transport distance, and the safety of both the fish handlers and health of the fish.

Prepare a tagging station with a fixed measuring board (not tape) wide enough for skates and clip board (Figure 4). Keep these items together with spares near the tagging station,

- Haul number
- Tagging suitability checklist
- Pre-loaded tagging gun with a sharp clean needle (Figure 4)
- Tag release sheet
- Pencils and erasers
- Handling gear for large fish
- [Tools for hook removal](#)
- Storage place for broken tags



Figure 4. Tagging station layout and maintenance

### Tag applicator maintenance (tagging gun)

Always keep the tagging station and tag applicators (including handling devices) clean (Figure 6). The tag applicator must be rinsed in fresh water before and after use and be free from tissue, blood, grease, or contaminants. Do not use oil-based lubricants on the needle and replace blunt needles with sharp needles. Needles typically dull after 30-50 tagging events. Insert correct end of tag strip (mark it with a colour pen) into applicator. It is recommended to remove needles and sterilise them regularly by placing them into an Eppendorf tube with alcohol. It is also recommended that tags should be stored in a dark, cool environment. Tags are often stored on the bridge of a vessel, and despite the tags being UV stabilised, they can become brittle in such dry conditions with time. Tag packaging should be developed to prevent UV exposure during storage and brittle tags can be remoisturised by placing them for some time in a wet environment.

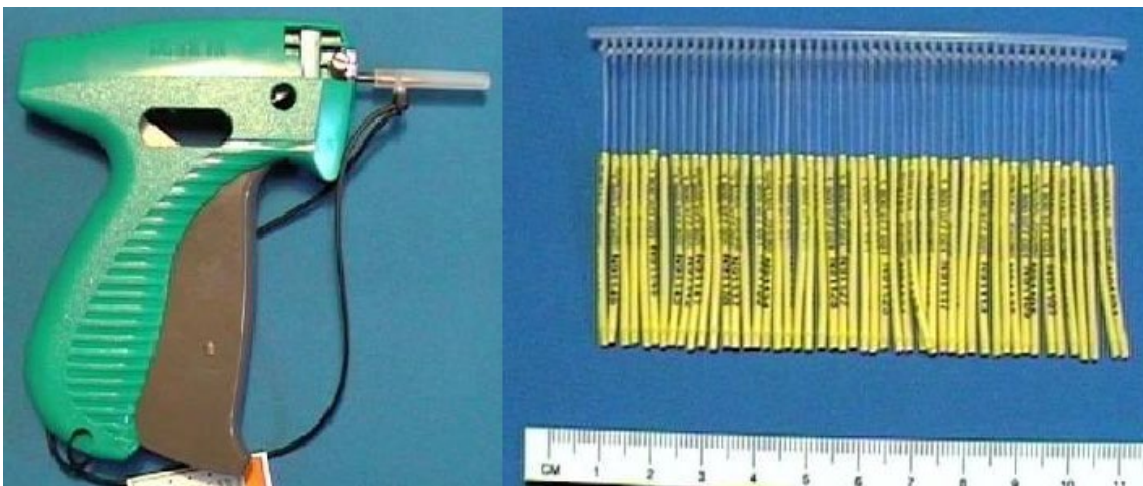


Figure 5. Example of a tag applicator (left) and tags (right)



Figure 6. Keep your tagging station clean and tidy

## Toothfish handling

The overall goal for fish handling is to maximise its chance of survival by reducing injury and stress to the animal. This is done by minimising the time out of water and adhering to best practice guidelines for safe handling and release. In general, it is important that correct welfare protocols for all fish and bycatch (regardless of health status) that may come onboard, are followed.

Determine that the next fish will be tagged before it arrives, i.e. "Decide to tag the next fish." This is to prevent the tagging crew using a gaff and to ensure a handling net, sling or cradle is ready (Figure 7). It also reduces the fish's time out of water and facilitates gentle handling and allows for immediate assessment of its suitability before tagging (refer to posters in Appendix 1). The total time fish are out of any water should be less than three (3) minutes.

Fish that are selected for tagging should be landed on the vessel using a lifting aide that supports the weight of the fish from underneath (e.g. cradle, stretcher, dip net, or sling) to minimise potential injury. There are different approaches to handling small fish versus large fish. Above a certain size/weight, a lifting aide such as a cradle will be necessary, and the need for this will be dependent on a number of factors, such as the height to be lifted or weather conditions. Weather can be an important factor when fish are brought onboard the vessel. Extreme cold and wind (e.g. -20 C) can result in the surface of the fish's eyes freezing, with unknown consequences. One method of preventing corneal damage and reducing the effects of light could be to place a wet towel over the fish's eyes. This would be particularly beneficial where tagging is done in an exposed open deck environment, but only when significant risk of freezing exists. Wet towels, especially with ice crystals or frozen debris on them also risk scratching the cornea. In most areas, temperatures are warm enough where this is not a risk, or tagging can be done inside.



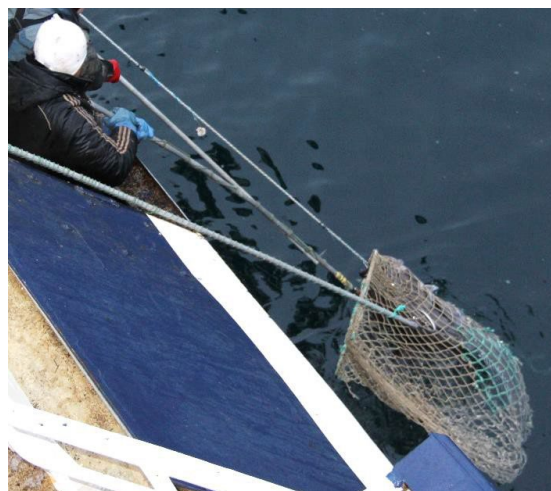


Figure 7. Lifting aids for supporting the fish onboard

Once the fish is onboard, hold and support it horizontally and away from your body (where possible) to avoid scale loss. Do not lift it by the head, gills or tail. Do not dump or drag the fish to the tagging station (Figure 8).

- Use wet gloves and wet surfaces to minimize scale loss and abrasion.
- Handle the fish gently to avoid dropping it and causing shock.
- Avoid touching the gills or eyes.
- Do not hang the fish vertically, as this can stretch its backbone.







Figure 8. Correct (top) and incorrect (below) fish handling techniques

If the fish are too large to carry by hand, use a cradle or sling to transport them on board (Figure 9). Lifting aids are made from various materials, and some, such as trawl mesh, can be abrasive to the fish's skin and surface protective slime layer. Vessels must use materials that ensure that fish are released in the best condition possible, such as vinyl or knotless netting.



Figure 9. Lifting aids for large fish

## Skate handling

Skate handling should follow the guidelines in Figure 10 and Appendix 1. It is important when handling skates to support the animal by the jaw and the base of the tail, never carry a skate by the tail only as this can damage their vertebrae. Large skates can require handling by two people.



Figure 10. Skate handling guidelines.

## Holding tanks

The use of holding tanks should be avoided whenever possible. If holding tanks are necessary, the time fish spend in them should be minimized (Figure 11). Recommendations on holding tank design can be found in the [Commercial Data Collection Manual – Longline Fisheries](#).

- Large, clean tank (at least 2 times the average fish length, 2+ meters).
- Smooth walls.
- Preferably circular in shape.
- High flow rate of fresh and clean seawater.

Ideally, fish should be released immediately after tagging. However, if holding tanks are used, the duration should be minimized, especially during periods when large predators (e.g., killer whales) are present; in such cases, fish should be kept in the tanks until it is safe to release them. Toothfish and skates should be kept separately to reduce potential injury.



To avoid overcrowding and water levels should be sufficient to allow complete submersion of the fish. The volume of fish should not exceed 10% of the water volume in the holding tank. Holding tanks are beneficial for batch tagging, assessing fish condition and suitability for tagging, and preventing depredation. However, poor design or operation of the tanks can reduce fish survival rates.



Figure 11. Holding tanks designs

## Hook removal

Hooks need to be removed quickly and gently. Use wire cutters to clip the hook's shank as close to the skin as possible, then carefully remove the remaining portion of the hook (Figure 12). Make sure you have the appropriate tool ready to remove hooks to minimise time spent out of the water. Do not tag fish if the hook is in the gills or throat.



Figure 12. Dehooking a fish before tagging and examples of dehooking tools

## Applying tags to toothfish and skates

### Toothfish

Using a tag applicator gun, insert tags at an angle into the second dorsal fin so that the T-bar is firmly lodged behind the dorsal fin rays, and point it backwards to reduce effects of drag on the tag. It can be helpful to slide the tip of the needle forward along the fish scale to slip underneath the subsequent scale and enter the fish rather than trying to push the needle directly through a scale. Pull trigger, rotate applicator 45° and withdraw needle (Figure 13). Gently tug on the tag to ensure that it is securely attached. For large fish the T-bar tags may not be anchored behind the fin rays but can be anchored into the muscle (Figure 14). Incorrectly applied tags can be pulled out easily.

Other common problems associated with tagging toothfish include;

- Inappropriate placement: angle, depth too shallow and location on the fish.

- Tissue damage caused by the applicator.
- Broken, stuck or immediately shed tags.
- Dropping or injuring the fish while tagging.
- Forgetting to record tag codes or double check.
- Predation or attack on release.

If any of these problems occur, observers must write it down in the comments section of the logbook as well as in the cruise report.

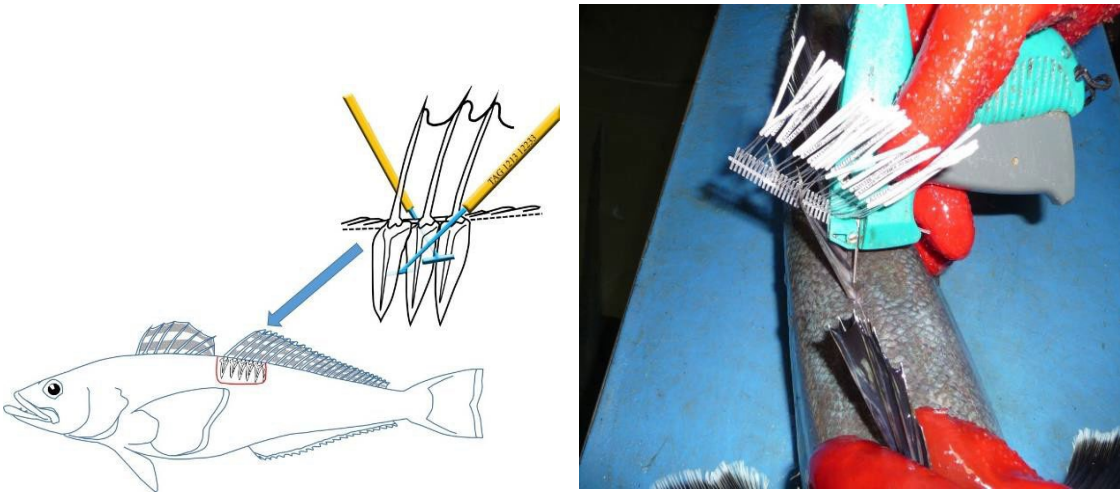


Figure 13. Applying tags to toothfish



Figure 14. Correct placement of tag in toothfish

## Skates

When tagging skates, it is important to avoid placing tags near body cavities to minimize potential harm to the organism (Figure 15). Instead, place one tag in the muscle of each wing on the eyed side to ensure secure attachment. Additionally, tags should be inserted straight down to effectively anchor them between fin rays, providing stability and reducing the risk of tag loss.



Figure 15. Applying tags to skates

## Releasing tagged toothfish and skates

It is recommended to use appropriate mitigation devices to prevent predation of tagged and released fish. For fisheries facing seabird predation issues, tagged fish should be released within the area protected by a bird exclusion device (CM 25-02), or a water spray from a fire hose should be used to deter birds

After the fish has been tagged and released, watch it swim away. This may take a moment for the fish to acclimatise to its surroundings. Record the fate of the fish as either successful, seal predation, bird predation, cetacean predation, tags seen falling off, fish appearing dead after release or unobserved.



Figure 16. Releasing tagged toothfish and skates

## Toothfish

Fish should be gently released headfirst into the water with the minimum vertical distance possible. Depending on the fish size, this should be carried out either manually by the person assigned to tag or by using a sling or stretcher. If the height of the release point on the vessel is excessive, operators should use other methods to assist with fish releases, such as a chute or a hatch on the side of the vessel.



## Skates

The best practice for releasing skates is bringing the animal to the roller, cutting the snood and thoroughly inspecting it for damage onboard the vessel before determining if the skate is suitable for release (refer to Appendix 1). Their body shape does not place as much strain on vertebrae when lifted and they are typically much smaller. Very large skates are rare and specific handling practices for these individuals should be determined by the environmental and operating conditions at the time.

### **Tag recaptures**

Develop a routine to thoroughly examine every fish for tags. When a tag is discovered, leave the tag in the fish and notify an observer for sampling. Remember, not reporting tags does not result in a higher future catch limit. A lower number of tag returns may indicate that more fish need to be tagged. Note that statistical methods are now available to compare tag recapture rates among vessels.

Observers are required to photograph all attached tags in situ, using the tag photo template to ensure tag numbers are clearly visible; take multiple photos if necessary. Additionally, observers should store otoliths and recaptured tags according to the Flag State's guidelines, ensuring all related data are accurately recorded. After each haul, check the logbook and coordinate the return of otoliths to the SIOFA Secretariat.

If there are issues related to recaptures, such as finding a loose tag on the vessel, discovering a tag in a fish after processing, being unable to link a tagged fish to a specific haul, or losing a tag after sampling, follow these steps: If the tag is available, record the vessel name and the date it was found, report the likely haul number, and return the tag to SIOFA Secretariat. If the tag is lost, record the vessel, the likely date or haul number, and note that no tag was returned.

### **Other types of tags**

If archival or satellite tags are found, please return them to the address printed on them. Fish with these tags should also have a normal tag as well and be sampled as per normal recapture instructions. Many of these experimental tags will have an email address or contact point on them. Record any of this information as well in the tag recapture sheet, including if there are any serial numbers or identifying codes on the tag as a comment.

# Appendix 1. Tagging Protocol for Toothfish and Skates

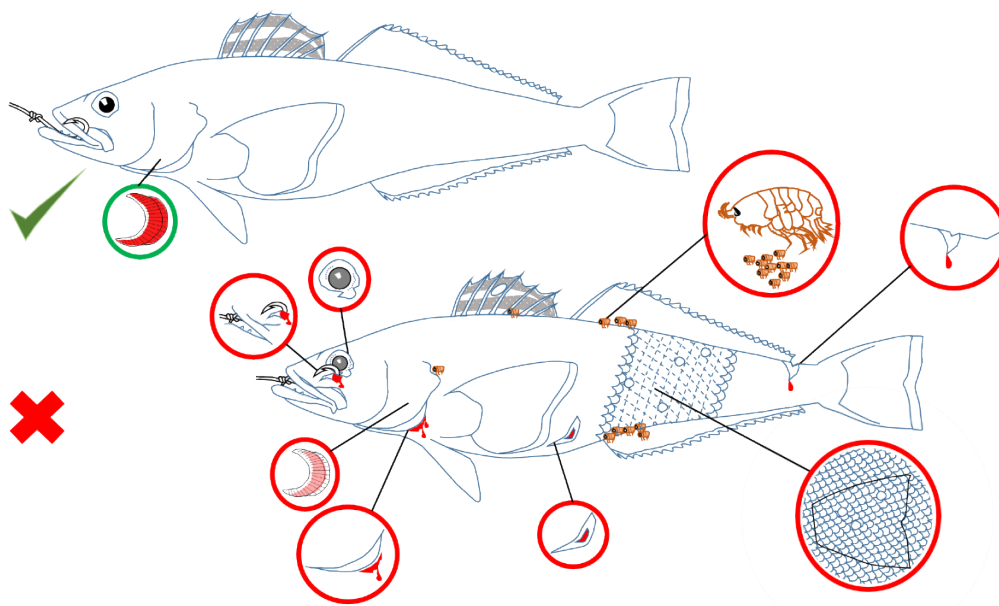
## TAGGING PROTOCOL FOR TOOTHFISH

1. The Flag State of the vessel is responsible for all tagging procedures and tagging equipment, including sourcing of tags for vessels.
2. Vessels are encouraged to work with observers to ensure that tagging and sampling procedures, specified in this manual are conducted in an efficient manner.
3. Fish that are selected for tagging should be landed on the vessel using a lifting aide that supports the weight of the fish from underneath (e.g. cradle, stretcher, dip net, or sling) to minimise potential injury.
4. Fish that are selected for tagging shall not be lifted using a gaff.
5. Fish that are selected for tagging must be assessed to be in good condition and free from injuries as specified in Figure 17.
6. Vessels are encouraged to configure the distance between the hauling bay, the tagging station and the release point to be as short as practicable, and to minimise obstacles that may hinder fish transportation.
7. Fish handling between the hauling bay, tagging station and release point should follow the methods recommended in [www.ccamlr.org/node/85702](http://www.ccamlr.org/node/85702).
8. The tagging station should be protected from the weather, and ensure the safety of the fish handlers and the health of the fish.
9. Fish handling time, from landing to release, is encouraged to be as short as possible.
10. The total time fish are out of any water should be less than three minutes.
11. The time fish are held in a holding tank should be minimised.
12. Any fish tilting sideways or belly up after being held in a holding tank are not suitable for tagging.
13. The design of a holding tank should follow the specifications in section 6.3 of [Commercial Data Collection Manual – Longline Fisheries](#). The percentage of fish volume to volume of water in the holding tank should not exceed 10%. Toothfish and skates should be held separately.
14. Tagged toothfish should be released headfirst, ensuring that the distance between the release point and the sea surface is as short as practicable.
15. Tagged skates should be released dorsal side up, ensuring that the distance between the release point and the sea surface is as short as practicable.

## Toothfish Tagging Procedure and Suitability Assessment

1. Transport fish to the tagging station using the handling procedures outlined in [www.ccamlr.org/node/85702](http://www.ccamlr.org/node/85702).

2. Carefully remove the hook and assess suitability for tagging. Do not tag and release fish if any of the conditions listed Figure 16 are present.
3. Double-tag fish using tags with sequential numbers if possible.
4. Confirm tags are anchored with a gentle tug.
5. Record data as required in observer logbook. Make sure to include all leading characters, tag type, colour and inscription).
6. Check that tag numbers are recorded correctly.
7. Release fish headfirst into water where release conditions are appropriate.
8. Observe and record fate of the tagged fish in the observer logbook.



credit: Alan Hart, NIWA

### Suitability assessment

| Assessment category | Do not tag |  |
|---------------------|------------|--|
| Hook injuries       |            | Hook injury outside the mouth area (outside the lips, jaw, or cheek), or in the back of the mouth.       |
| Gills               |            | Gills pink or white  |
| Bleeding            |            | Any visible bleeding from gills, or excessive bleeding elsewhere   |
| Body                |            | Visible damage to fish body with open wounds   |
| Organs              |            | Visible damage to eye or penetration of body cavity, including by crustaceans (amphipods/lice)           |
| Scales              |            | Abrasions or single area of recent scale loss equal to or exceeding the area equivalent to the fish tail |

Figure 17. Toothfish tagging suitability assessment.

## TAGGING PROTOCOL FOR SKATES

1. Transport fish to the tagging station using the handling procedures outlined in [www.ccamlr.org/node/85702](http://www.ccamlr.org/node/85702).
2. Carefully remove the hook and assess suitability for tagging. Do not tag and release fish if any of the retain conditions listed Figure 18 are present.
3. Double-tag the skate using tags with sequential numbers if possible.
4. Confirm that tags are anchored with a gentle tug.
5. Record data as required in the observer logbook. Make sure to include all leading characters, tag type, colour and inscription.
6. Check that tag numbers are recorded correctly.
7. Release skate dorsal side up into water where release conditions are appropriate.
8. Observe and record fate of the skate in the observer logbook.

CONDITION ASSESSMENT FOR SKATES

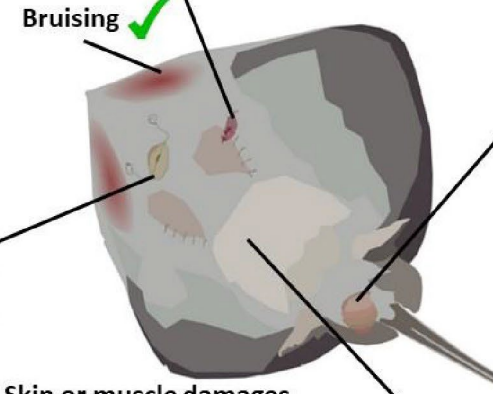
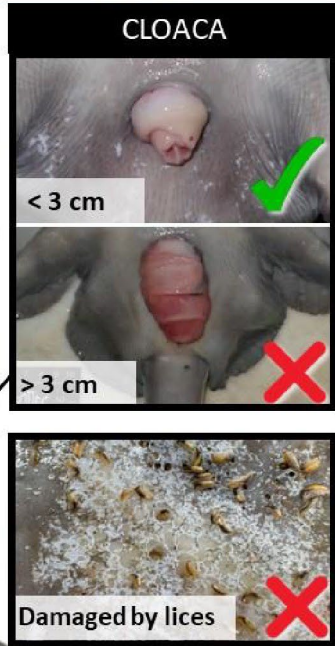
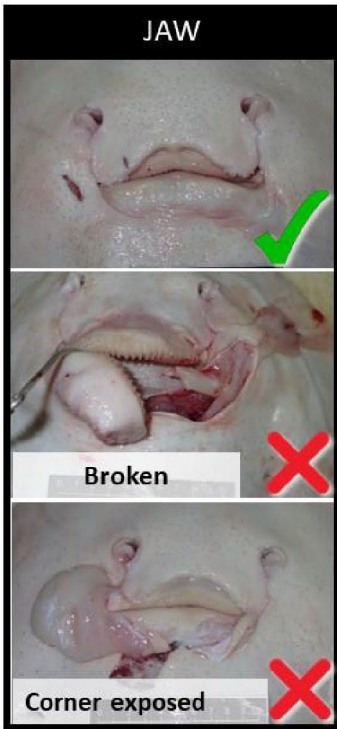


RELEASE AT SEA

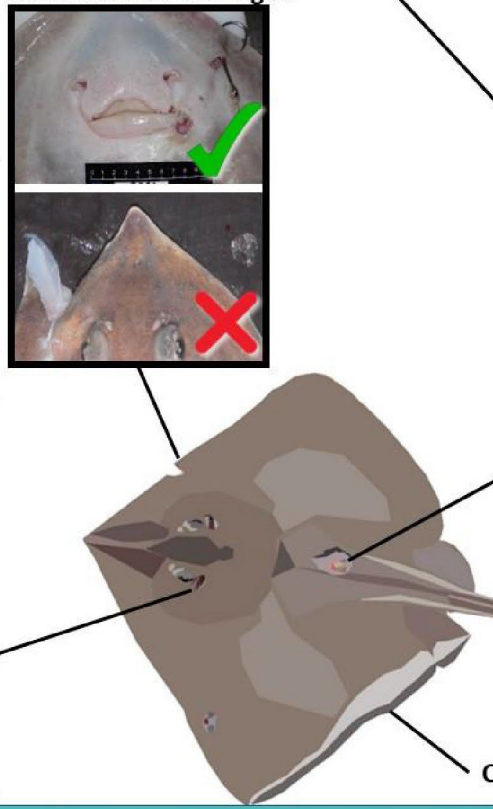
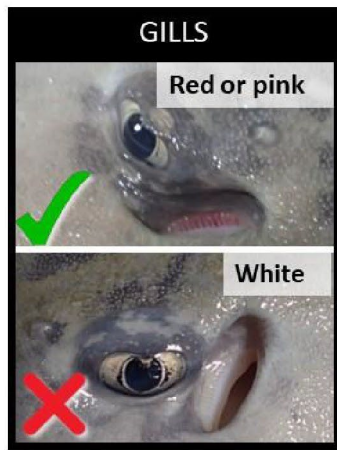


RETAIN

Ventral side



Dorsal Side



CCAMLR Document WG-FSA-2022/19, Faure *et al.*

Figure 18. Skate tagging suitability assessment.