Commission for the Conservation of Antarctic Marine Living Resources
Commission pour la conservation de la faune et la flore marines de l'Antarctique
Комиссия по сохранению морских живых ресурсов Антарктики
Comisión para la Conservación de los Recursos Vivos Marinos Antárticos

Commercial Data Collection Manual
Longline Fisheries
Version 2023

This manual is produced in the official languages of the Commission (English, French, Russian and Spanish) and may be downloaded from the CCAMLR website.

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1.   Table of Contents

2.   Introduction

The Commission for the Conservation of Antarctic Marine Living resources (CCAMLR) requires both catch and effort reporting (CE), and fine-scale catch and effort data, also known as haul by haul data (C2) to be supplied by members participating in CCAMLR longline fisheries. Both CE and C2 data are submitted to the CCAMLR Secretariat on excel based forms that are standardized in structure with observer data forms. This manual covers the terms and methods that are used for the collection of data by vessels in CCAMLR Longline fisheries, instructions on completing the C2 forms, and information on the relevant regulations that apply to CCAMLR Longline Fisheries. Feedback on the manual, or any queries regarding the content can be addressed to: data@ccamlr.org

CE and C2 data reporting are mandatory in all fisheries, and must be submitted to the Secretariat by email (data@ccamlr.org). Data are reported by the vessel's Flag State, and the regulations covering data submission requirements are detailed in Section 4 of this manual. In addition to CE and C2 data, vessels participating in exploratory fisheries are required to collect and report VME indicator data. Detailed instructions on completing the C2 form are covered in Appendix 2 of this manual, and detailed instructions on completing the VME indicator form are covered in Appendix 3.

All CCAMLR vessel data collection forms are reviewed annually before the commencement of a new season, are circulated to all members, and are updated on the CCAMLR website (https://www.ccamlr.org/data/ccamlr-data-forms). It is therefore important to ensure that fishing vessels are in possession of the up-to-date form before embarking on the new trip, and it is recommended that the responsible officer(s) on each vessel take time to ensure they are familiar with these forms

3.   Definition of Terms

The following definitions to the terms used on this manual are for the purpose of clarification and to avoid confusion with other fishery operations terminologies and to ensure standardisation with other manuals.

Autoline: Fishing gear type consisting of a single mainline with hooks attached which are mechanically baited.

By-catch: By-catch includes all living material (excluding target species) which is caught whilst fishing. This includes discards and the part of the catch which is not landed but affected by interactions with fishing gear.

C2: Fine scale catch and effort data form, also known as the C2 data form

CE: Catch and Effort Data form

Conservation Measure a regulation designed to support the conservation of Antarctic marine living resources and the management of fisheries in the Southern Ocean. These are reviewed and developed at each annual meeting of the Commission, and subsequently implemented by Members during the ensuing intersessional period and fishing season

Conversion factor: The ratio between the total weight of a fish or fishes caught (referred to as green weight) divided by the weight of the same fish or fishes after processing (referred to as processed weight). The conversion factor is used to calculate the total greenweight of catch taken for a particular species back-calculated from the processed products.

Discards: Whole fish or other organisms returned to the sea dead, or with low expectation of survival.

Haul: The act of hauling a fishing line, or the recovery of the fishing gear. Hauling begins when the first anchor attached to the main line is recovered on board the vessel. The haul ends when the final anchor attached to the main line is recovered by the vessel.

IMAF: Incidental mortality associated with fishing. Refers to marine mammal and seabird mortalities.

Longline: Fishing method using hooks spaced on a long line.

Line segment: A 1 000-hook section of line or a 1 200 m section of line, whichever is the shorter. For pot lines it is defined as a 1 200 m section.

Offal: Bait and by-products from the processing of catch or bycatch, including parts or sections of fish or organisms which are by-products of processing.

Setting: The act of paying out a line with hooks attached. Setting begins when the first anchor attached to the main line is deployed by the vessel. The set ends when the last anchor attached to the main line is deployed by the vessel.

Spanish line or double line: Longline gear type, where a secondary backbone line is attached to the main fishing longline. It is commonly used in areas of rough ground as the backbone line can be used to haul the main fishing line when the main line becomes snagged on the bottom.

Tag: Generally refers to T-bar style plastic tags, supplied by the CCAMLR Secretariat, which have unique serial numbers. They are used on toothfish and skate species. Older style tags include dart tags, and satellite pop up tags are occasionally deployed for research purposes.

Trotline: Longline gear type. Fishing hooks are attached to the main line in clusters of hooks, known as trots or dropper lines.

VME: Vulnerable marine ecosystem. In the context of CCAMLR this refers to seamounts, hydrothermal vents, cold water corals and sponge fields.

VME indicator organism or taxon: Any benthic organism listed in the CCAMLR VME Taxa Classification Guide (www.ccamlr.org/node/74322).

VME indicator unit: Either one litre of VME indicator organisms that can be placed in a 10-litre container; or one kilogram of those VME indicator organisms that do not fit into a 10-litre container

4.   CCAMLR regulations

CCAMLR implements a comprehensive set of measures to support the conservation of Antarctic marine living resources and the management of fisheries in the Southern Ocean. These conservation measures are reviewed and developed at each annual meeting of the Commission, and subsequently implemented by Members during the ensuing intersessional period and fishing season. Conservation measures are published in the annual Schedule of Conservation Measures in Force. https://cm.ccamlr.org/en

Members are notified of new or amended conservation measures in early November, following the Commission's annual meeting, and these are usually implemented on 1 December to align with the start of the fishing season. Conservation measures become binding, according to Article IX.6 of the Convention, around early May of the following year (180 days after the first notification).

Some measures apply to a specific time period (e.g. a fishing season) while other measures remain in force at all times. Measures which are no longer applicable are removed from the schedule and archived by the Secretariat.

Conservation measures are listed under general categories, and each measure is uniquely identified by a numeric code consisting of a leading 2-digit code designating the category to which the measure belongs and a trailing 2-digit number identifying the measure within that category; the year in which the version of the measure was agreed follows in brackets, e.g. 22-06 (2010). The categories used for the measures are:

Compliance (10 series)

General fishery matters (20 series)

Fishery regulations (30-60 series)

Protected areas (90 series)

Of particular relevance to vessels in CCAMLR longline fisheries are the 20 series as this contains data collection and submission requirements, and the 30 and 40 series, as these cover fishery regulations at both a CCAMLR Convention Area wide scale, and at individual smaller Subarea scales.

5.   Catch and Effort (CE) Form

Vessels in CCAMLR longline fisheries are required to complete the finfish fishery CE form. The form and detailed instructions on how to complete it are located on the CCAMLR website here: https://www.ccamlr.org/node/74766. Catch and effort data are used to monitor CCAMLR fisheries and to forecast fishery closures, so it is critically important to ensure that data are submitted at the correct frequency as required by the relevant Conservation Measure for the fishery you are operating in.

6.   General procedures

6.1   Data Entry on Forms

CCAMLR data collection forms are reviewed annually before the commencement of a new season, are circulated to all Members, and are updated on the CCAMLR website here (https://www.ccamlr.org/data/ccamlr-data-forms). It is therefore important to ensure that fishing vessels are in possession of the up-to-date form before embarking on the new trip, and it is recommended that the responsible officer(s) on each vessel take time to ensure they are familiar with these forms. For the longline fisheries C2 form the following general comments should be noted:

- Please use a new C2 form for each month's data submission to ensure that data is not accidentally duplicated or corrupted
- Data should only be entered into cells with a white background
- Rows can be inserted to add additional data, however, please do not add additional columns to the workbook.

A list of standard data entry formats is listed in in Table 1

Table 1: Description of standard data entry formats

Field	Format	Description
Date	dd/mm/yyyy	d = day, m = month y = year (e.g. 31/12/2018)
Time	hh:mm	h = hour, m = minute. All times are recorded in 24 hour format (e.g. 21:20, NOT 9:20pm) and are recorded in UTC, **not** local times.
Latitude degrees	-DD	D = degrees e.g. -65 for 65 degrees South
Longitude degrees	-DDD for West + DDD for East	d = degrees (e.g. -52 for 52 degrees West and 172 for 172 degrees East)
Latitude and longitude decimal minutes	MM.mm	M = minute, m = decimal minute (e.g. 26.12). Decimal minutes should be recorded to at least two decimal places

6.2   Conducting a Conversion Factor Test

Process: The process of determining a conversion factor (Table 2) is by recording fish weights in an unprocessed state and later recording the weights of the same fish when processed. The conversion factor value is the number obtained by dividing the green weight by the processed weight.

Number of Fish and Frequency of Sampling: Sample five fish per individual haul with a weekly sample size of 25 individuals

Table 2: Conversion Factor Step by Step Procedure

01	Randomly select the fish that will be used for the process. It is important to select a range of fish sizes that are representative of the whole catch for the haul
02	Drain the water from the fish's stomach using a sharp knife or a pipe (Figure A1) to ensure that water swallowed by the fish during the hauling process is not included as part of the live weight
03	Weigh the fish whole and unprocessed, before any parts are removed.
04	Record the product type (e.g. HGT for headed, gutted and tailed) and if appropriate the cut type (e.g. straight cut)
05	Record the weight of the final processed product for each fish. For HGT this is normally just the trunk of the fish (Figure A2). Calculate the conversion factor by dividing the whole live weight by the processed weight

Figure A1: Demonstration of a drain tube used for draining toothfish stomachs of water

Figure A2: Trunks produced using the HGT processing method. Photo: Knowledge Xuba (Imvelo Blue environment Consultancy).

6.3   Tagging Procedure

The CCAMLR tagging program is administered by the Secretariat which provides standardised tagging protocols and tagging equipment to fishing vessels engaged in the program. This standardisation is an essential component of the tagging program as CCAMLR uses the fisheries-based tag and recapture rates as the basis of abundance estimation for toothfish.

The Secretariat receives and stores data on all fish that are tagged and the subsequent recapture of those fish. Each recapture is linked to the tagging event in order to verify the data for use in population estimates as well as to examine movement rates and growth of fish.

The tagging of skates and rays is voluntary with tagging of these species occurring in some domestic EEZ fisheries within the Convention Area, and as part of dedicated research studies. Any skate tagging should follow CCAMLR protocols.

Tagging is the responsibility of the vessel, and it is therefore expected that the vessel will either train and assign the crew to conduct fish tagging as per the recommended CCAMLR best practice, or coordinate with an observer to ensure tagging operations and data reporting occur correctly. Any tagging procedures should follow the extensive CCAMLR toothfish and skate tagging guide which can be found at www.ccamlr.org/node/85702. The guide should be provided to whomever is responsible for tagging prior to embarkation of the vessel. Pay particular attention to the handling recommendations for large fish. Videos of tagging processes can also be requested from the Secretariat to aid with training.

Tagging requirements and tag overlap statistic

The tagging rate per tonne of catch varies depending on the fishery. Tag rates are specified for each fishery in the relevant 40 series Conservation Measure. To reflect the length frequency of the catch, the length frequency of tagged toothfish must have at least 60% overlap with the catch frequency for each species of toothfish, unless fewer than 30 toothfish have been tagged. 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

6.4   Vulnerable Marine Ecosystem (VME) Data

Compared to many global ocean areas where bottom fishing occurs, the Southern Ocean has extremely limited data on both the prevailing bottom topography and associated benthic marine ecosystems. Furthermore, in the Antarctic, where growth rates of benthic taxa are typically slower than in more temperate regions, the impacts of fishing gear on vulnerable taxa may be magnified because of the much longer time taken to recover. As a result data on VMEs are collected by both fishing vessels and scientific observers in CCAMLR exploratory fisheries, and if large quantities of VME taxa are landed fishing activities are restricted. It is recommended that the vessel officials familiarize themselves with conservation measures 22-06 (https://cm.ccamlr.org/measure-22-06-2019) and CM 22-07 (https://cm.ccamlr.org/measure-22-07-2013) to understand in which fisheries VME data is required to be recorded. CM 22-09 also contains details of areas closed to fishing (https://cm.ccamlr.org/measure-22-09-2012).

Vessels are required to clearly mark fishing lines into line segments. A colour-coding or other system should be used for marking each line section, so that crew, master, and observer are able to tell which line segment is being hauled. For each line segment, the vessel must:

a) retain all VME-indicator organisms in 10-litre containers.

b) determine the quantity of VME-indicator units recovered.

c) record the quantity of VME-indicator units recovered, including zero catches.

d) If 5 or more VME-indicator units are recovered within one line segment the vessel must immediately notify this to the CCAMLR Secretariat.

e) If 10 or more VME indicator units are recovered in one line segment the vessel must immediately notify this to the CCAMLR Secretariat, complete hauling any lines intersecting with the Risk Area without delay and not to set any further lines intersecting with the Risk Area.

7.   C2 Form – Individual Worksheet Instructions

The C2 form now consists of seven individual worksheets for recording data on particular subjects, with an eighth for fisheries where VME data is required to be collects. It is similar in structure to the SISO observer logbook, and includes many within worksheet validations to reduce data entry errors. This may result in an error being displayed if, for example, text is attempted to be entered in a numeric field such as weight, or number of fish. Some fields are also now restricted to drop down lists for codes such as species, or bait type. Where worksheet exists with these particular code fields you will find at the top of the worksheet green coloured cells which contain drop down reference guides to assist with completing these. Please do not alter the structure and content of C2 workbook.

7.1   Vessel and Gear

Vessel information

All fields on this worksheet must be completed. Vessel call sign is the international radio call sign of the vessel. IMO Number is the International Maritime Organisation ID number that consists of 7 digits, this is a permanent vessel ID number that does not change even if the vessel changes flags and or ownership. Enter the name(s) of the SISO/national scientific observer(s) on board the vessel, the name of the person completing the form, and enter the email address of the person responsible for data enquiries.

Longline Gear Details

Details in this section should match the vessel notification information provided to the Secretariat. Please complete the fields on the hook measurements, for the primary hook type that is used during fishing.

Trotline Gear Details

Only complete these fields if the vessel uses the trotline system.

7.2   Set and Haul Details

This section records details for each set and haul that take place during the voyage. All fishing events are numbered in a consecutive numerical sequence from the first event of the trip, beginning at Set No 1. The set/haul numbers therefore become the unique identity of the line. In some cases, the vessel may set multiple lines and the hauling might not be in the same sequence, however hauling information is still recorded under the relevant set/haul number. Most fields are quite self-explanatory, please see the details for individual fields below.

Setting

- Fishing Depth: the depth (m) from the surface to the depth where the gear is set to fish at the start of the set.

- Fishing Type: Fishing is either Commercial (C), Research (R), or Survey (S). What constitutes a research line or survey will depend on the fishery, and the exploratory research plan the vessel is operating under. It is highly recommended to consult with your government officials if these are unclear. Guidelines on fishing type are also detailed in the relevant CMs for exploratory fisheries.

- Bait type and percentage: Three options for the type of bait used during the cruise can be recorded at the top of the worksheet in the cells with the blue headings, with the green box at the top of the worksheet providing a description of the bait codes. For each set please record the percentage of each bait type used. For example if an even mix of Argentine Shortfin Squid and Jack Mackerel is used, you would select the bait codes SQA and JAX in the bait type 1 & 2 boxes, and enter 50 in both the bait type % 1 & 2 cell for that haul. Conditional formatting has been applied to the bait type fields and bait percentage fields. The bait type fields are highlighted yellow if multiple bait codes are identical, and the % bait fields are highlighted yellow if the sum of the bait fields exceeds 100%.

- Mainline length (m): The length of the main hook line between the start and end line anchors

- Bottom to line distance (m): If the mainline is set above the seafloor, please record the distance between the two.

<u>Hauling</u>

- Haul interruption duration: Please record this as a decimal number in fractions of an hour. For example one hour and thirty minutes would be recorded as 1.5.

- Number of hooks lost attached to line: If a section of the line is lost with hooks attached, please record the number of hooks on this section

- Number Hooks lost other: Complete this section if individuals hooks lost from the main line are recorded.

- Length of line lost: Record the length of the mainline, and any other sections of the line that are lost, such as backbone line in double line systems, or float lines.

7.3   Haul Catch

This worksheet details all catch and bycatch species caught during each haul, including seabirds and marine mammals. Record individual species codes for each haul on a single row. The definitions for each subsection are as follows:

- Retained: Refers to any species that is retained on the vessel for processing, or for macerating for later discharging

- Discarded: Refers to any species that is landed on the vessel, and then discarded overboard without processing.

- Released alive: Refers to any species that is released due to it being in good condition, therefore with a high probability of survival. Generally this section is used for skate species, or for tagged toothfish or skates

- Number lost/ dropped off at surface: Refers to species that drop off the hooks during the hauling process

- Incidental Catch: This section should be used for seabird and marine mammal species to indicate whether they were recovered alive or dead.

Conditional formatting has been applied to the haul number and species code fields. These will be highlighted yellow if there are duplicate haul numbers and species code combinations.

7.4   Conversion Factors

This worksheet records all details pertaining to species that are processed for commercial use. Please complete the fields for each species and processing code used on each individual haul including the product and green weights for each code, as this allows the tracking of product types and weights

through the CDS system. There is also a code for damaged or liced fish that are caught by the vessel and not commercially landed.

7.5   Tagging

As noted in section 6.3 tagging is a vessel responsibility, therefore it is critical to ensure that this worksheet is completed accurately. Firstly, ensure that the details in tag ID header fields (at the top of the worksheet with blue title cells) are recorded, then complete the worksheet for each haul fish are tagging on. The worksheet contains conditional formatting to highlight if tag numbers are duplicated (cells will be highlighted red). Try to ensure accurate tagging release positions are recorded rather than just haul start or end positions. If extra details are required with regard to any tagging information please use the comment field, or the observer's cruise report to detail these. For example if there are frequent tag breakages it is useful to document these.

7.6   Tag Recapture

All tagged fish and skates must be retained by the vessel regardless of their time at liberty. It is good practice to encourage crew to look for tags, particularly as an annual prize is offered by the coalition of legal toothfish operators (COLTO) for tag finders!

For each fish caught an electronic time-stamped photograph must be taken of the tags in situ using the "CCAMLR tag photo template". Please check that the photograph clearly shows the tag numbers and that the number is readable. Zip up the photos and send them separately to the Secretariat through your fisheries data coordinator or give them to the observer to attach to their cruise report. Fill out the required biological measurements in the worksheet, noting the specific fields required for skate and rays and toothfish. The worksheet also contains conditional formatting to highlight if tag numbers are duplicated (cells will be highlighted red).

7.7   Vulnerable Marine Ecosystems (VME)

This worksheet is only required to be completed in fisheries where CM 22-07 applies. For each haul and line segment please enter data in a single row, including where no VME catches are recorded. The number of VME indicator units is the sum of weight (kg) and volume (l). Volume should be used where VME species can fit into a 10 litre bucket. Where species cannot fit (e.g. for large branching cold water corals) please weigh the items instead.

7.8   CCAMLR Codes

This worksheet contains the lists of codes used through the logbook and can be referenced for data completion. Please do not delete or alter this worksheet, as the logbook will not function properly.

8.   CCAMLR resources

CCAMLR data forms and instructions:

www.ccamlr.org/node/74640

By-catch guides, sampling protocols and training materials for observers:

www.ccamlr.org/node/77322

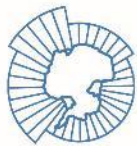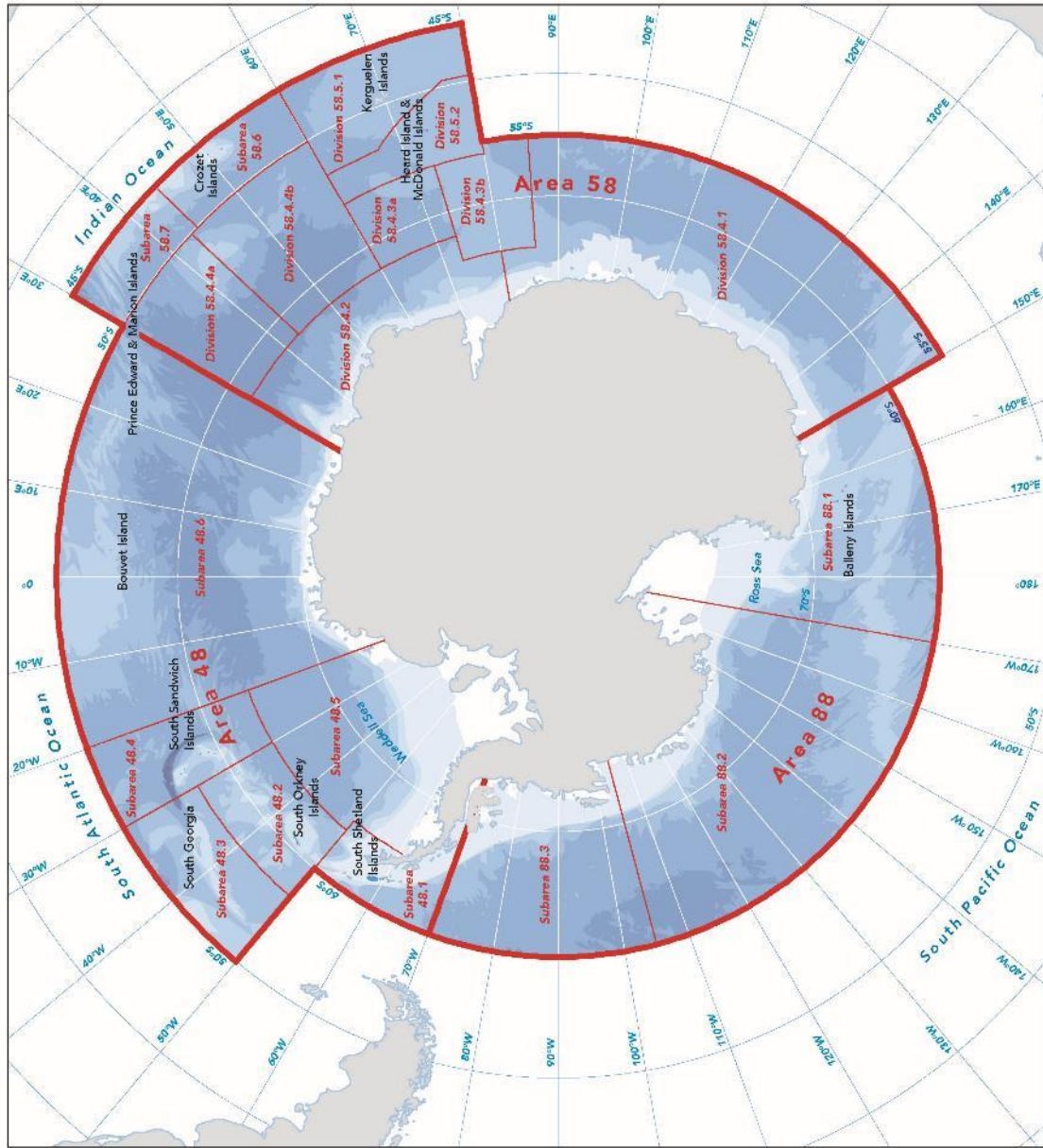Tagging program ordering information:

www.ccamlr.org/node/76310

CCAMLR conservation measures:

https://cm.ccamlr.org/

Text of the Scheme of International Scientific Observation:

www.ccamlr.org/node/74295

9. Appendix 1 – Map of the CAMLR Convention Area