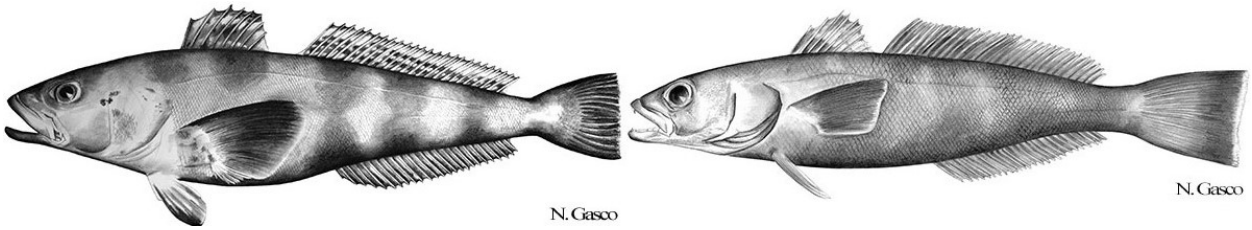
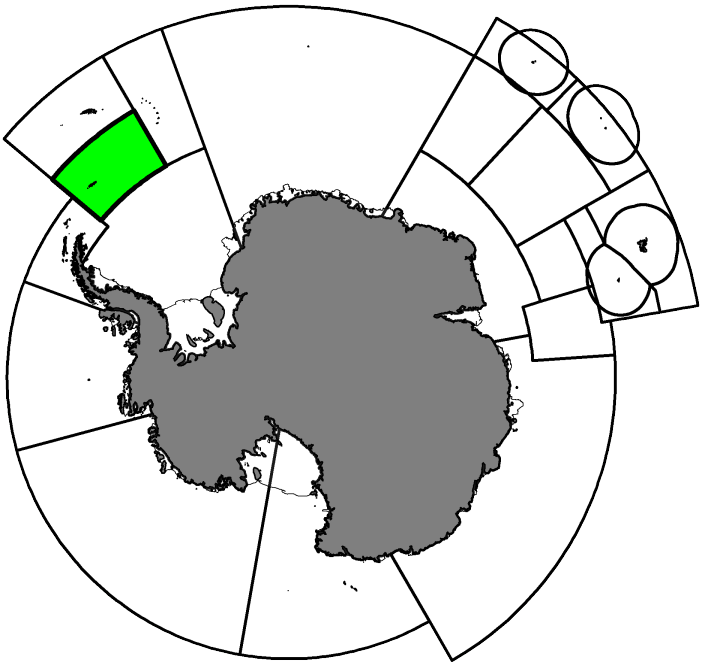
Fishery Report 2024: *Dissostichus eleginoides* and *Dissostichus mawsoni* in Subarea 48.2

CCAMLR Secretariat

07 April 2025



Antarctic toothfish, *Dissostichus mawsoni* Norman, 1937, and, Patagonian toothfish, *Dissostichus eleginoides* Smitt, 1898.



Map of the management areas within the CAMLR Convention Area. Subarea 48.2, the region discussed in this report is shaded in green. Throughout this report, "2024" refers to the 2023/24 CCAMLR fishing season (from 1 December 2023 to 30 November 2024). Coastlines and ice shelves: UK Polar Data Centre/BAS and Natural Earth. Projection: EPSG 6932.

Contents

1. Introduction to the fishery

1.1. History

Research fishing for *Dissostichus* spp. in Subarea 48.2 was first conducted by Chile in 1998, when seven hauls were conducted and 36kg of Patagonian toothfish (*Dissostichus eleginoides*) were caught.

In 2015, Ukraine began a multi-year research program and conducted 29 hauls with a total catch of 31 tonnes of Antarctic toothfish (*D. mawsoni*) and 4 tonnes of *D. eleginoides*. Research has continued since 2016 in two Research Blocks (Fig. 1) as part of a multi-year research program in the east of Subarea 48.2. The research plan for this area concluded in 2019.

1.2. Conservation Measures currently in force

Directed fishing for *Dissostichus* spp. in Subarea 48.2 is prohibited under Conservation Measure 32-02 at least until further scientific information is gathered and reviewed by the Scientific Committee and the Working Group on Fish Stock Assessment (WG-FSA).

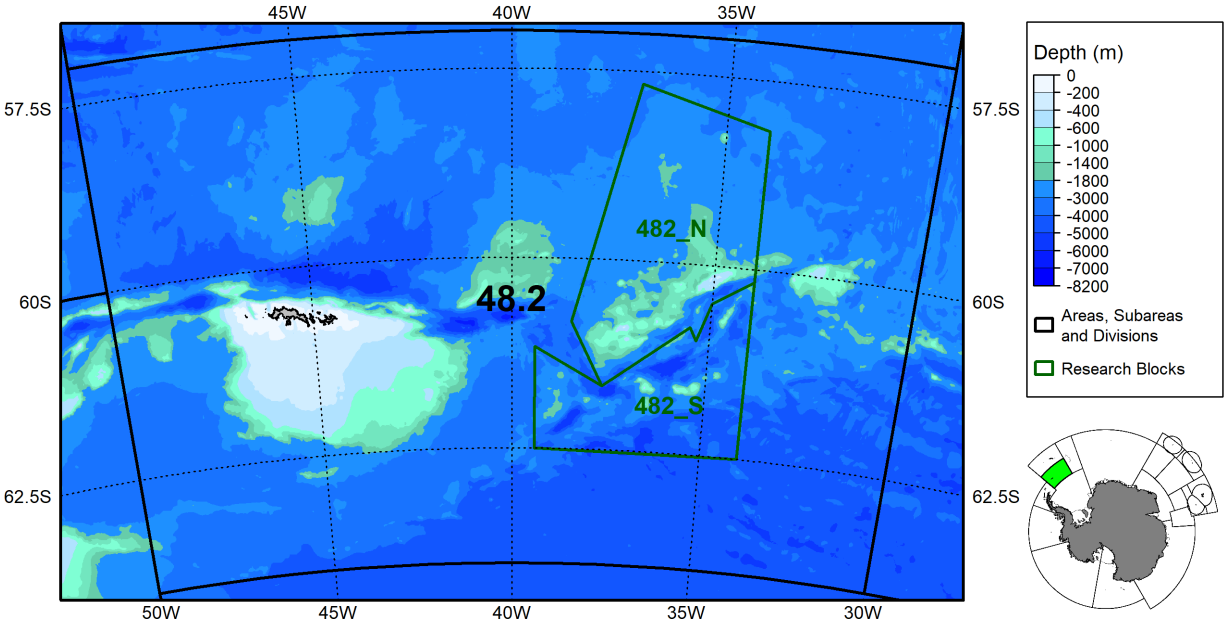


Figure 1: Location of the Research Blocks in Subarea 48.2. The fishable depth range (600m-1800m) is highlighted in shades of green. Coastlines and ice shelves: UK Polar Data Centre/BAS and Natural Earth. Bathymetry: GEBCO. Projection: EPSG 6932 (rotated).

1.3. Active vessels

In 2019, when fishing last occurred, 3 vessels participated in this fishery.

2. Reported catch

2.1. Latest reports and limits

The total catch reported from research surveys that have been conducted in Subarea 48.2 are shown in Table 1. In this fishery, the catch of *D. mawsoni* reached a maximum of 35 tonnes in 2019, when fishing last occurred.

The catches reported in Subarea 48.2 include catch data that CCAMLR has agreed should be quarantined as there is no confidence in the amount and/or the location of those catches (SC-CAMLR-38, paragraph 3.56). All ancillary data associated with these vessels (*e.g.*, by-catch, tagging, observer data) are also quarantined and are not included in the data presented in this report.

Table 1. Catch (tonnes) and effort history for *Dissostichus* spp. in this fishery. Source: Fine scale data and past estimates for IUU catch (-: no fishing, or no IUU estimate available; q: catch data currently quarantined).

Season	Number of vessels	*D. eleginoides*	*D. mawsoni*	Estimated IUU catch (tonnes)
1998	1	0	0	-
2015	1	0 (q: 4)	0 (q: 31)	-
2016	2	1 (q: 2)	6 (q: 66)	-
2017	3	0 (q: 7)	11 (q: 56)	-
2018	5	1 (q: 2)	8 (q: 56)	-
2019	3	1	35	-
2020	-	-	-	-
2021	-	-	-	-
2022	-	-	-	-
2023	-	-	-	-
2024	-	-	-	-

2.2. By-catch

Table 2. Reported catch for by-catch species (*Macrourus* spp., skates and rays, and other species) in this fishery. -: no fishing. Source: fine-scale data.

Season	*Macrourus* spp.		Skates and rays			Other catch	
	Catch Limit (tonnes)	Reported Catch (tonnes)	Catch Limit (tonnes)	Reported Catch (tonnes)	Number Released	Catch Limit (tonnes)	Reported Catch (tonnes)
1998		<1		<1	0		<1
2015	12	<1 q	3.75	<1 q	1 q	12	<1 q
2016	12	<1 q	3.75	<1	82	12	<1 q
2017	12	3 q	3.75	<1	452	12	<1 q
2018	12	3 q	3.75	<1	206	12	<1 q
2019	12	5	3.75	<1	371	12	<1
2020	12	-	3.75	-	-	12	-
2021	12	-	3.75	-	-	12	-
2022		-		-	-		-
2023		-		-	-		-
2024		-		-	-		-

2.3. Vulnerable marine ecosystems (VMEs)

All Members are required to submit, within their general fisheries notifications requirements, information on the known and anticipated impacts of their gear on vulnerable marine ecosystems (VMEs), including benthic

communities and benthos such as seamounts, hydrothermal vents and cold-water corals. All of the VMEs in CCAMLR's VME Registry are currently afforded protection through specific area closures.

By the end of the 2019 fishing season, there were 16 VMEs and no VME Risk Areas designated in Subarea 48.2.

2.4. Incidental mortality of seabirds and marine mammals

The requirements of Conservation Measure 25-02, including the 'Minimisation of the incidental mortality of seabirds in the course of longline fishing or longline fishing research in the Convention Area' apply to this fishery. There is an exemption to the requirement for night setting by achieving the sink rates described in Conservation Measure 24-02 and subject to a bird by-catch limit.

There has been no observed seabird mortality reported by vessels from Subarea 48.2 in this fishery.

There has been no observed mammal mortality reported by vessels from Subarea 48.2 in this fishery.

3. Illegal, Unreported and Unregulated (IUU) fishing

Illegal, unreported and unregulated (IUU) fishing gear was recovered from Subarea 48.2 in March 2016 (CCAMLR-XXXV/10). There has been no other recorded evidence of IUU activities in this region since 2006.

4. Data collection

4.1. Data collection requirements

The collection of biological data as part of the CCAMLR Scheme of International Scientific Observation (SISO) includes representative samples of length, weight, sex and maturity stage, as well as collection of otoliths for age determination of the target and most frequently taken by-catch species.

4.2. Summary of available data

Both the vessel's crew and observers collect fishing effort, catch, and by-catch information.

Following Conservation Measure 22-07, vessels participating in this fishery must report the occurrence of VME indicator organisms on hauled lines. To do so, the vessel's crew observe lines in segments (1000-hook sections or 1200m sections, whichever is the shorter) and report the number of VME indicator units (either one litre of those 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). Depending on the number of VME indicator units landed, vessels must immediately report and potentially cease fishing in the area (termed a Risk Area) until further review of the data is completed (see Conservation Measure 22-07). Based on the portion of the line monitored, observers further identify VME indicator organisms to the lowest taxonomic level possible.

The vessel's crew report total catch of non-VME by-catch (mostly fishes) by coarse taxonomic groups given the taxonomic expertise required to discriminate similar species. Observers collect biological information on toothfish and by-catch specimens at a finer taxonomic resolution, as well as data on individual specimens such as size and maturity.

Summaries of data reported to CCAMLR for the past five years are given in Tables 3 and 4.

Table 3. Summary of VME indicator taxa by-catch, by-catch of other species and biological data reported by vessels crew and observers in each of the last five seasons. By-catch records correspond to the number of observations of total weight and count of individuals for each taxon identified. Observers may take further biological measurements on toothfish and by-catch taxa. Taxonomic identification may occur at different levels. -: no fishing.

Data source	Data class	Variable	2020	2021	2022	2023	2024
Last data in 2019							

Table 4. Summary of biological data for predominant by-catch groups reported by observers (from random subsets of lines) in each of the last five seasons. Taxonomic identification may occur at different levels. -: no fishing.

By-catch group	Variable	2020	2021	2022	2023	2024
Last data in 2019						

4.3. Length frequency distributions

The length frequency distributions of *D. mawsoni* caught during research are shown in Figure 2. These length frequency distributions are unweighted; they have not been adjusted for factors such as the size of the catches from which they were collected. The interannual variability exhibited in the figure may reflect changes in the fished population but is also likely to reflect changes in the gear used, the number of vessels in the fishery and the spatial and temporal distributions of fishing.

The majority of *D. mawsoni* caught during research fishing ranged from 125 to 175cm.

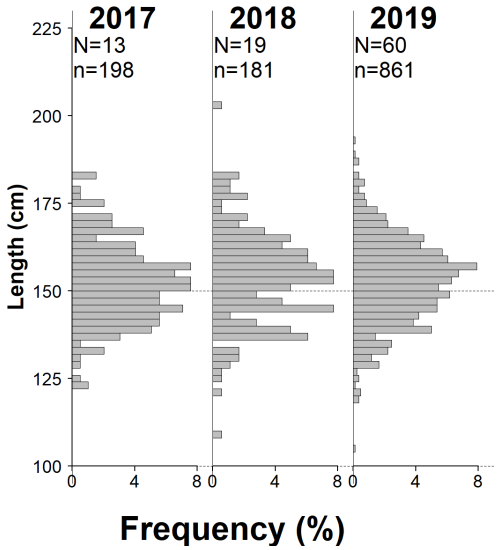


Figure 2. Annual length frequency distributions of *D. mawsoni* caught in Subarea 48.2. The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are indicated. Note: length frequency distributions are only shown where more than 150 fish were measured in a given season.

4.4. Tagging

To date in this area, 1359 *D. mawsoni* have been tagged and released (17 have been recaptured, 15 of which were released in this area; Table 5), and, 88 *D. eleginoides* have been tagged and released (0 have been recaptured).

Table 5. Number of *Dissostichus mawsoni* tagged and recaptured in the area for each fishing Season.

		Recaptured				
Season	Tagged	2016	2017	2018	2019	Total
2015	156	1				**1**
2016	346		4			**4**
2017	349		2	1	1	**4**
2018	323			3	3	**6**
2019	185					
Total	**1359**					**15**

5. Research

5.1. Status of the science

Ukraine initiated a three year (2015-2017) research plan using longline gear (trotline) to sample the toothfish populations in Subarea 48.2 (WG-FSA-14/08). The purpose of the research was to characterise the toothfish populations found in that region to better understand stock structure, movement patterns and improve estimates of population characteristics in the northern Weddell/Scotia Sea. The distributions of the two species of *Dissostichus* overlap in this area. Additional outcomes of the research related to mapping of the fishable area, documenting relative abundance of *D. eleginoides* and *D. mawsoni*, tagging toothfish for biomass estimation and for stock linkage studies, input into spatial population models and collecting information on distribution, relative abundance and life history of by-catch species. The Ukrainian research was continued after 2017 by the vessel Simeiz.

In 2019, Ukraine reported on its research progress, including data on the distribution of Antarctic toothfish and by-catch, and, biological characteristics (length, weight and age) of Antarctic and Patagonian toothfish (WG-FSA-19/51).

In 2016, the United Kingdom proposed to undertake a 3-year research survey in the eastern part of Subarea 48.2 (also extending into Subarea 48.4; WG-FSA-16/40 Rev. 1). The aim of the UK study was to understand the connectivity of toothfish stocks between Subareas 48.2 and 48.4.

The results (WG-FSA-2021/22) provided evidence linking *D. mawsoni* with the Antarctic continental shelf and indicated a potential *D. mawsoni* spawning region in Subarea 48.2. The movements of recaptured tagged fish indicated potential connections with the Lazarev Sea (Subarea 48.6) as well as the southern South Sandwich Islands (Subarea 48.4).

In 2023, a proposal submitted to WG-SAM (WG-SAM-2023/05) with revisions submitted to WG-FSA (WG-FSA-2023/36) were not evaluated and forwarded to the Scientific Committee (SC-CAMLR-42, paragraph 2.156).

5.2. Research plans

Objectives

In 2014, the Scientific Committee endorsed the advice of the Working Group on Fish Stock Assessment (WG-FSA) (SC-CAMLR-XXXIII, Annex 7, paragraph 5.48) that the research plan of Ukraine in Subarea 48.2 proceed in 2015 with an effort limit of 30 lines and catch limit of 75 tonnes of *Dissostichus* spp. and a tagging rate of 5 toothfish per tonne. This research program was continued in 2016 with the following specific objectives:

(i) to utilise the expertise and experience of crew aboard vessels to explore and locate fishable habitat and sample toothfish in Subarea 48.2

(ii) to document the spatial distribution of toothfish species in the area to east of the South Orkney Islands, thus providing catch and biological observations to test and develop the functionality of spatial population models of the north Weddell Sea region

(iii) to tag toothfish and collect biological samples to further understand toothfish movement, migration, spawning and stock linkages within Area 48 and adjacent waters.

In 2016, the Scientific Committee endorsed the UK survey and recommended research catch limits of 23 tonnes in the eastern area of Subarea 48.2 and 18 tonnes in the southern area of Subarea 48.4 (SC-CAMLR-XXXV, paragraph 3.231). The specific objectives of the UK survey were:

(i) determine population connectivity of *D. eleginoides* and *D. mawsoni* between Subareas 48.2 and 48.4 adjacent to the established fishery in Subarea 48.4,

(ii) expand information on population structures of *D. eleginoides* and *D. mawsoni* in Subareas 48.2 and 48.4 adjacent to established fishery in Subarea 48.4,

(iii) improve data on bathymetry and associated distributions of target and benthic by-catch species, improve data available to CCAMLR on bathymetric features.

The UK vessel Argos Froyanes and the New Zealand vessel San Aspiring undertook research fishing in 2018 for the UK research survey.

5.3. Advice by the Scientific Committee

Research fishing in Subarea 48.2 was conducted under Conservation Measure 24-01.

6. Stock status

6.1. Summary of current status

As a data-limited fishery, this fishery does not have such estimates.

6.2. Year of last assessment, year of next assessment

Research plans for data-limited fisheries are reviewed annually.

7. Climate Change and environmental variability

In 2022, the Commission recognised that climate change is already having effects in the Convention Area (CCAMLR-41, paragraph 6.3) and agreed that it needed to act urgently to prepare for, and adapt to, the effects of climate change on the marine ecosystems within the Convention Area (CCAMLR-41, paragraph 6.5). The Commission noted (CCAMLR-41, paragraph 6.4) that the Scientific Committee had incorporated climate change into its advice (SC-CAMLR-41, paragraph 7.8) and through discussions at the SC-Symposium (SC-CAMLR-41, Annex 11) had also added climate change to the work plans and terms of reference of its Working Groups (SC-CAMLR-41, paragraph 7.14). The Commission adopted (CCAMLR-41, paragraph 6.28) Resolution 36/41.

In 2023, the Scientific Committee held a workshop on Climate Change (WS-CC-2023) which made recommendations regarding monitoring and management actions CCAMLR could progress to document and track the effects of climate change in the Convention Area. The recommendations were incorporated into the workplan of the Scientific Committee. Further, the Scientific Committee recommended that summaries of evidence for changes in stock assessment parameters or processes that could be due to the effects of environmental variability or climate change be developed for all fisheries (SC-CAMLR-42, paragraph 2.149).

In 2024, Members developed such summaries, in the form of tables, for fisheries in Subarea 48.3, Divisions 58.5.1 and 58.5.2 and in the Ross Sea region.

Additional Resources

- Fishery Summary: pdf, html
- Species Description for Patagonian Toothfish: pdf, html
- Species Description for Antarctic Toothfish: pdf, html
- Fisheries Documents Browser