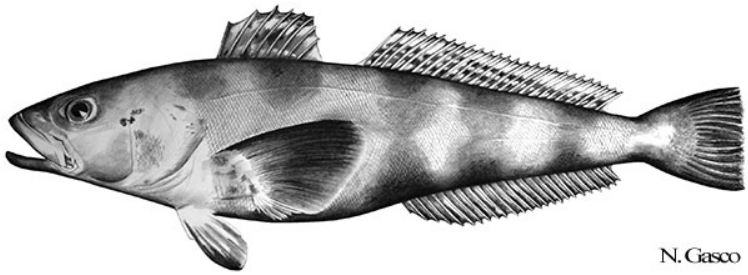
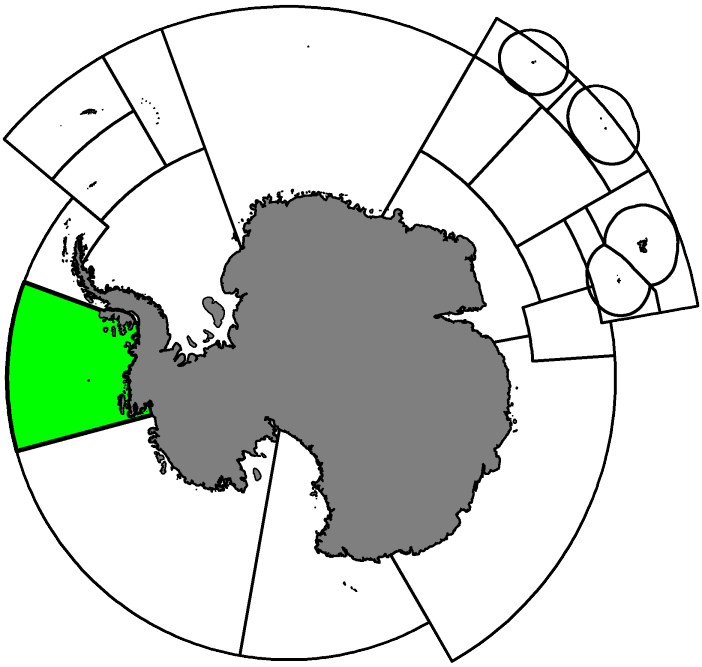
Fishery Report 2020: *Dissostichus mawsoni* in Subarea 88.3

CCAMLR Secretariat

16 March 2021



Antarctic Toothfish, *Dissostichus mawsoni* Norman, 1937.



Map of the management areas within the CAMLR Convention Area. Subarea 88.3, the region discussed in this report is shaded in green. Throughout this report, "2020" refers to the 2019/20 CCAMLR fishing season (from 1 December 2019 to 30 November 2020).

Contents

1. Introduction to the fishery

1.1. History

Research fishing for Antarctic toothfish (*Dissostichus mawsoni*) in Subarea 88.3 has been conducted by Chilean, New Zealand and Russian flagged vessels between 1998 and 2012. Since 2016 research fishing has been conducted by a Korean flagged vessel in Research Blocks (Fig. 1) in this Subarea.

1.2. Conservation Measures currently in force

Directed fishing for *Dissostichus* spp. in Subarea 88.3 is prohibited under Conservation Measure 32-02 until further scientific information is gathered and reviewed by the Scientific Committee and the Working Group on Fish Stock Assessment (WG-FSA).

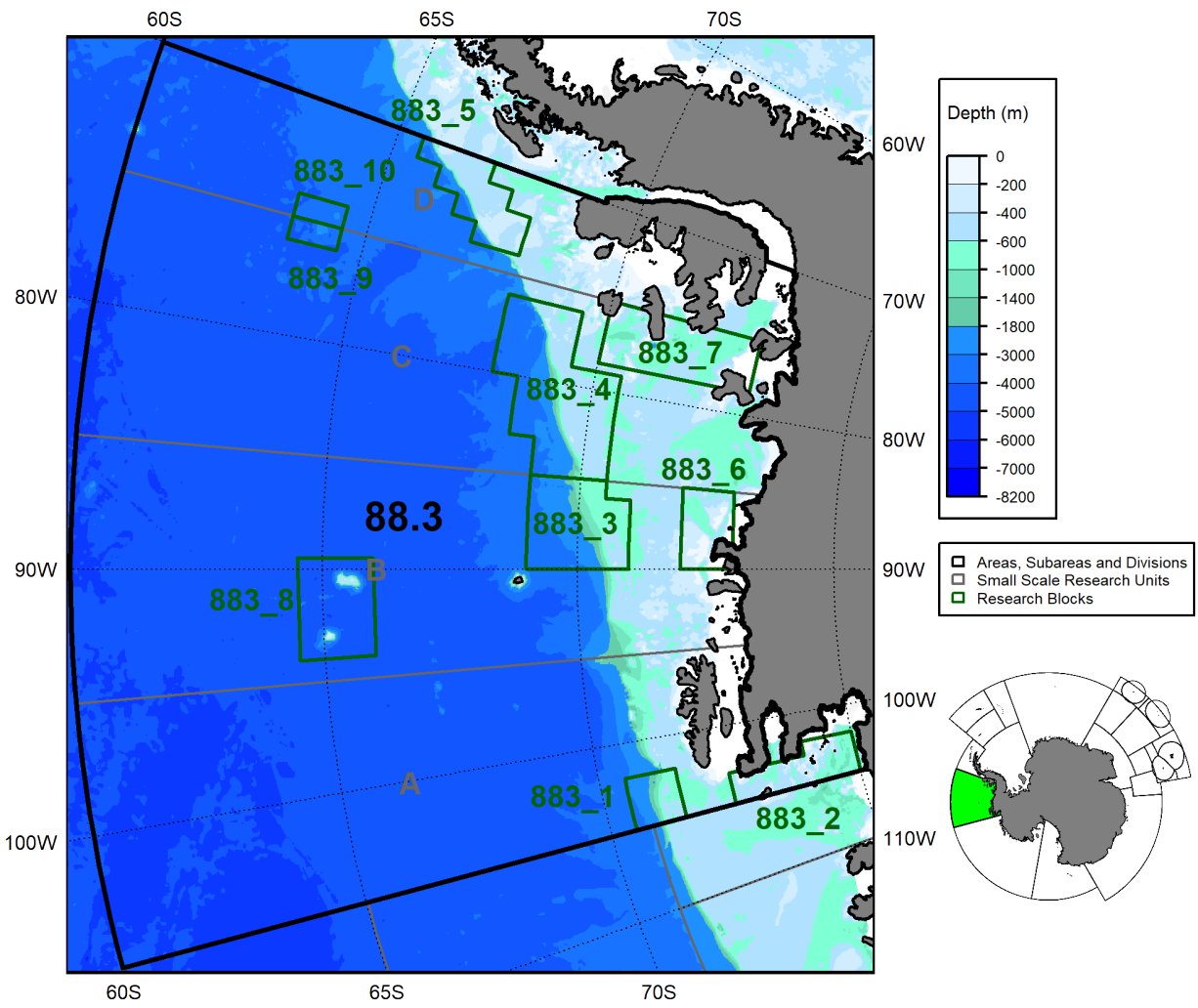


Figure 1: Location of the Research Blocks in Subarea 88.3. The fishable depth range (600m-1800m) is highlighted in shades of green.

1.3. Active vessels

In 2020, 2 vessels participated in this fishery.

1.4. Timeline of spatial management

Following a proposal from Korea to begin research fishing under Conservation Measure 24-01 in 2016, Research Blocks 1 to 5 were defined (Fig 1). Other subsequent research proposals have included additional Research Blocks, however, fishing has been limited to Research Blocks 1-5.

2. Reported catch

2.1. Latest reports and limits

The total catch reported from the research surveys that have been conducted in Subarea 88.3 is shown in Table 1. In this fishery, the catch of *D. mawsoni* reached a maximum of 119 tonnes in 2017. In 2020, 0 tonnes of *D. eleginoides* and 96 tonnes of *D. mawsoni* were caught.

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

Season	Number of vessels	Catch limit (tonnes)	*D. eleginoides*	*D. mawsoni*	Estimated IUU catch (tonnes)
2011	1	65		5	-
2012	1	65	0	4	-
2016	1	171	0	106	-
2017	1	171		119	-
2018	1	245	0	39	-
2019	1	245	1	63	-
2020	2	254	0	96	-

Table 2: Catch and catch limits by Research Block in 2020 for *Dissostichus mawsoni* in Subarea 88.3. Source: Fine scale data.

Research Block	Catch limit	Catch (% of catch limit)
883_1	16	5 (31.2%)
883_3	60	29 (48.3%)
883_4	60	55 (91.7%)
883_5	8	0 (0%)
883_6	30	3 (10%)
883_7	30	2 (6.7%)

2.2. By-catch

Catch limits for by-catch species groups (macrourids, rajids and other species) are defined in Conservation Measure 33-03 and provided in Table 3.

If the by-catch of any one species is equal to, or greater than, 1 tonne in any one haul or set, then the fishing vessel must move at least 5 nautical miles away for a period of at least five days.

If the catch of *Macrourus* spp. taken by a single vessel in any two 10-day periods in a single SSRU exceeds 1 500kg in a 10-day period and exceeds 16% of the catch of *D. mawsoni* in that period, the vessel shall cease fishing in that SSRU for the remainder of the season.

Skates thought to have a reasonable chance of survival are released at the surface in accordance with Conservation Measure 33-03. The current by-catch limits and move-on rules for rajids are given in Conservation Measure 33-03.

Table 3. Reported catch and catch limits for by-catch species (*Macrourus* spp., Rajids and others) in this fishery. see Conservation Measure 33-03 for details. Source: fine-scale data.

Season	*Macrourus* spp.		Rajids			Other catch	
	Catch Limit (tonnes)	Reported Catch (tonnes)	Catch Limit (tonnes)	Reported Catch (tonnes)	Number Released	Catch Limit (tonnes)	Reported Catch (tonnes)
2016	39.2	3	12.25	<1	0	39.2	1
2017	39.2	7	12.25	<1	0	39.2	<1
2018	39.2	7	12.25	<1	0	39.2	<1
2019	39.2	5	12.25	<1	197	39.2	1
2020	43	11	16	<1	69	43	<1

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.

There are no VMEs or VME Risk Areas designated in Subarea 88.3.

2.4. Incidental mortality of seabirds and marine mammals

There have been no observed bird or mammal mortalities reported by vessels from Subarea 88.3 in this fishery.

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.

3. Illegal, Unreported and Unregulated (IUU) fishing

There are no records of illegal, unreported and unregulated (IUU) fishing activities in Subarea 88.3.

4. Data collection

4.1. Data collection requirements

The collection of biological data under Conservation Measure 23-05 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. Length frequency distributions

The length frequency distributions of *D. mawsoni* caught during research activities 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 50 to 175cm with two broad modes at approximately 60cm and 150cm.

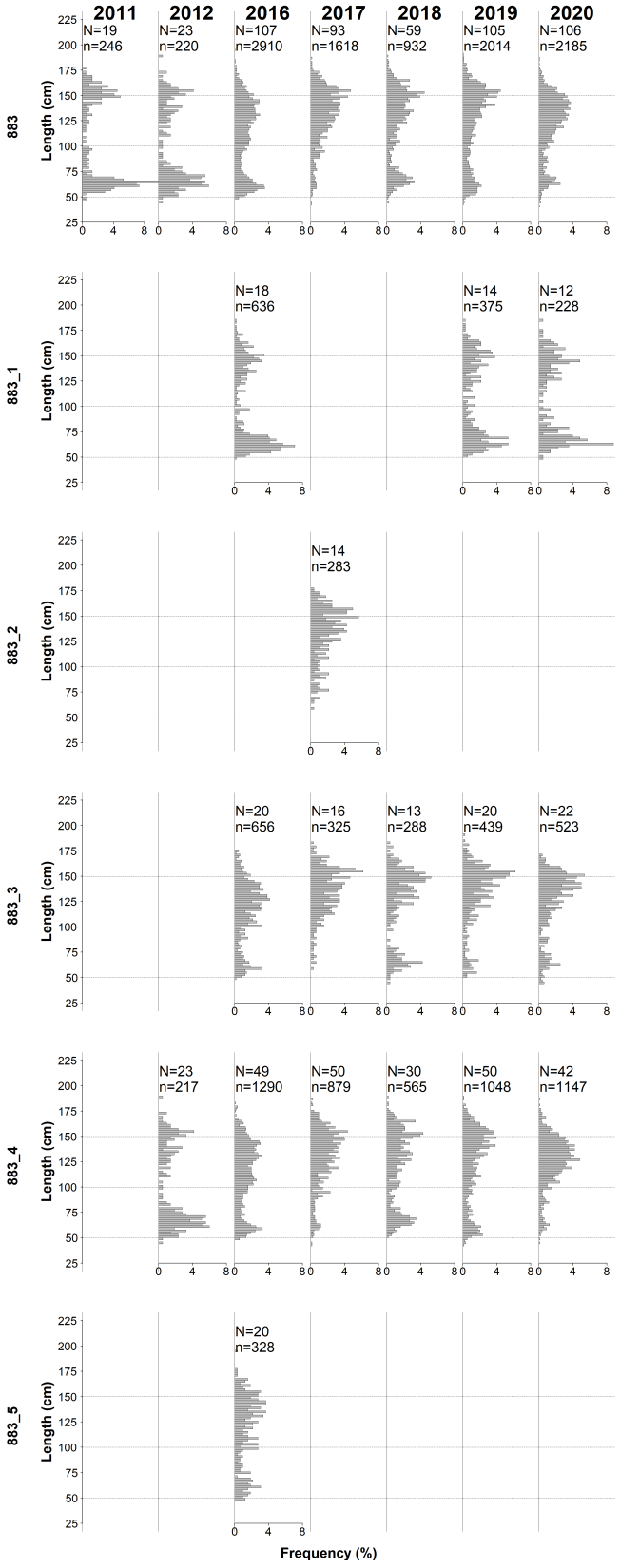


Figure 2. Annual length frequency distributions of *D. mawsoni* caught in Subarea 88.3 and its Research Blocks. The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are indicated. Note: length frequency distributions are only shown where more than 150 fish were measured.

4.3. Tagging

Since 2012, vessels have been required to tag and release *Dissostichus* spp. at a rate of 5 fish per tonne of green weight caught.

To date in this area, 2304 *D. mawsoni* have been tagged and released (11 have been recaptured, 11 of which were released in this area; Table 4), and, 6 *D. eleginoides* have been tagged and released (0 have been recaptured).

Table 4. Number of *Dissostichus mawsoni* tagged and recaptured in the area for each fishing Season.

		Recaptured		
Season	Tagged	2019	2020	Total
2005	8			
2011	30			
2012	63			
2016	566	1		**1**
2017	597	1	1	**2**
2018	203	2	2	**4**
2019	342		4	**4**
2020	495			
Total	**2304**			**11**

5. Research

5.1. Status of the science

There has been a total of 95 research hauls and 131 tagged fish as part of surveys conducted by Chilean, New Zealand and Russian flagged vessels up to 2012. This level of research activities meant that there was insufficient data to assess the toothfish stock in this subarea. The previous surveys were restricted by sea-ice. However, as the ice concentration in the west of the Antarctic is reducing, this led the Republic of Korea to propose a multi-year research plan for Subarea 88.3 starting in 2016.

New Zealand (in 2017) and Ukraine (in 2018) joined the Republic of Korea in these research efforts.

In 2019, An integrated research proposal for *Dissostichus* spp. in Subarea 88.3 was submitted by the Republic of Korea, New Zealand and Ukraine (WG-FSA-19/02).

5.2. Research plans

5.2.1. Background As well as providing key data on the toothfish stock in Subarea 88.3, the research will also provide data with which to understand how the stock in this region is linked with the stocks in other management areas, in particular in Subareas 88.1 and 88.2.

5.2.2. Objectives The research proposal (WG-FSA-19/02) aims at acheiving five objectives:

- Determine the abundance and distribution of Antarctic toothfish in Subarea 88.3
- Improve understanding of stock structure of toothfish in Statistical Area 88
- Carry out calibration trials among vessels
- Collect data on the spatial and depth distributions of bycatch species
- Trial scientific electronic monitoring technologies

5.3. Advice by the Scientific Committee

The advice from the Scientific Committee in 2016 on this research proposal is presented in SC-CAMLR-XXXV, paragraphs 3.255 and 3.256. The Scientific Committee recommended that the catch limits and priority for each Research Block should be as in 2016 should ice conditions allow.

In 2017, the Scientific Committee recommended that the catch limits for the Korean and New Zealand joint research plan in Subarea 88.3 be endorsed for 2018 (Table 5 and SC CAMLR-XXXVI, paragraph 3.142).

In 2019, the Scientific Committee endorsed the Research proposal as described in WG-FSA-19/02 (SC-CCAMLR-38 paragraphs 4.59 to 4.61).

6. Stock status

6.1. Summary of current status

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

6.2. Assessment method

Stock biomass and catch limits in data-limited fisheries are estimated using the trend analysis.

6.3. Year of last assessment, year of next assessment

Research plans for data-limited fisheries are reviewed annually.

7. Climate Change and environmental variability

A recent summary of the potential impacts of climate change on Southern Ocean fisheries (FAO 2018) highlights the following key points:

The Antarctic region is characterized by complex interaction of natural climate variability and anthropogenic climate change that produce high levels of variability in both physical and biological systems, including impacts on key fishery taxa such as Antarctic krill.

The impact of anthropogenic climate change in the short-term could be expected to be related to changes in sea ice and physical access to fishing grounds, whereas longer-term implications are likely to include changes in ecosystem productivity affecting target stocks.

There are no resident human populations or fishery-dependent livelihoods in the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Area, therefore climate change will have limited direct implications for regional food security. However, as an "under-exploited" fishery, there is potential for krill to play a role in global food security in the longer term.

The institutional and management approach taken by CCAMLR, including the ecosystem-based approach, the establishment of large marine protected areas, and scientific monitoring programmes, provides measures of resilience to climate change.

There is no formal evaluation of the impacts of climate change and environmental variability available for this particular fishery.

Additional Resources

- Fishery Summary: pdf, html
- Species Description: pdf, html
- Trend Analysis: pdf, html
- Fisheries Documents Browser