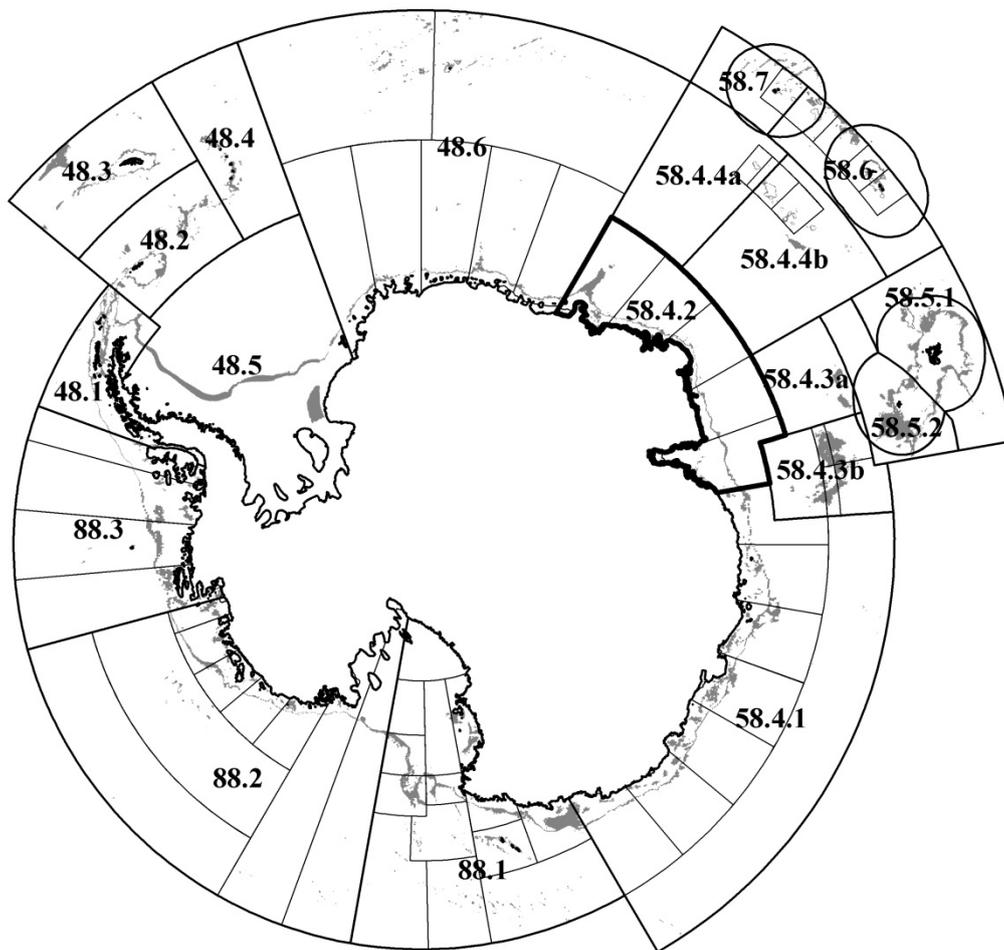


**Fishery Report 2014: Exploratory fishery for
Dissostichus spp. in Division 58.4.2**



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The map on the cover page shows the management areas within the CAMLR Convention Area, the specific region related to this report is outlined in bold. Depths between 600 and 1 800m (the ‘fishable depths’ for *Dissostichus* spp.) are shaded.

Throughout this report the CCAMLR fishing season is represented by the year in which that season ended, e.g. 2014 represents the 2013/14 CCAMLR fishing season (from 1 December 2013 to 30 November 2014).

Fishery Report 2014: Exploratory fishery for *Dissostichus* spp. in Division 58.4.2

Introduction to the fishery

1. This report describes the exploratory longline fishery for toothfish (*Dissostichus* spp.) in Division 58.4.2. This fishery was first agreed by the Commission in 2000 and started as a trawl fishery for spiny icefish (*Chaenodraco wilsoni*), striped-eye rockcod (*Lepidonotothen kempfi*), Antarctic rockcod (*Trematomus eulepidotus*) and Antarctic silverfish (*Pleuragramma antarcticum*) (Conservation Measure (CM) 186/XVIII). In 2001 and 2002, the exploratory trawl fishery was also permitted in association with a new fishery for grenadier (*Macrourus* spp.). In 2003, the fishery for *Dissostichus* spp. in Division 58.4.2 changed to an exploratory longline fishery and since 2004 has targeted primarily Antarctic toothfish (*D. mawsoni*).
2. The current limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.2 are described in CM 41-05. From 2009 to 2013, the precautionary catch limit for *Dissostichus* spp. was set at 70 tonnes, but in 2014, it was reduced to 35 tonnes and applied to small-scale research unit (SSRU) E. Although a catch limit of 30 tonnes has been set in SSRU A, the Commission agreed that no fishing would take place there. SSRUs B, C and D are closed to exploratory research fishing.
3. In 2014, the fishery was limited to one Japanese and one Spanish flagged vessel using longlines only, but there was no fishing activity in Division 58.4.2.
4. For 2015, a total of three vessels, one each from of Japan, the Republic of Korea and Spain, notified their intention to participate in the exploratory fishery for *Dissostichus* spp. in Division 58.4.2.

Reported catch

5. Reported catches of *Dissostichus* spp. over the past 10 seasons are presented in Table 1. The catches reported in Division 58.4.2 include catch data from particular vessels that CCAMLR has agreed should be quarantined as there is no confidence in the amount and/or the location of those catches (SC-CAMLR-XXXIII, paragraph 3.68). Those years that include quarantined data are indicated with a superscript q and vessel-specific details are provided in the footnote to Table 1. All ancillary data associated with these vessels (e.g. by-catch, tagging, observer data) is also quarantined and is not included in the data presented in this report. In 2010 and 2011, the quarantined catch represents 100% of the reported catch in this division.

Table 1: Catch history for *Dissostichus* spp. in Division 58.4.2. (Source: STATLANT data for past seasons and catch and effort reports for current season, past reports for IUU catch.)

Season	Catch limit (tonnes)	Reported catch (tonnes)			Estimated IUU catch (tonnes)
		<i>D. mawsoni</i>	<i>D. eleginoides</i>	Total	
2004	500	20	0	20	197
2005	780	125	1	126	86
2006	780	163	0	164	192
2007	780	124	0	124	288
2008	780	216	0	217	0
2009	70	19 ^q	0	19	176
2010	70	0 ^q	0	0	432
2011	70	0 ^q	0	0	*
2012	70	54	0	54	*
2013	70	4	0	4	*
2014	35	-	-	-	*

^q Some catch data in these years is now quarantined, the following catch is not included in the reported catch table above:

2009 – vessel *In Sung No. 22*, 47 tonnes *D. mawsoni*

2010 – vessel *In Sung No. 2*, 93 tonnes *D. mawsoni*

2011 – vessel *In Sung No. 7*, 136 tonnes *D. mawsoni*.

* Not estimated.

Illegal, unreported and unregulated (IUU) fishing

6. Illegal, unreported and unregulated (IUU) fishing in the Indian Ocean sector of the Convention Area remains an issue for the Commission. Estimates of illegal fishing in Division 58.4.2 indicate that ~1 400 tonnes of *Dissostichus* spp. have been taken by IUU fishing since 2004 (Table 1). Since the reduction in the catch limit from 780 tonnes to 70 tonnes in 2009, high levels of IUU fishing have resulted in estimates of the total removals in this division being well in excess of the catch limits. However, since 2011, following the recognition of methodological issues in its assessment, no estimates of the IUU catch of *Dissostichus* spp. have been provided (SC-CAMLR-XXIX, paragraph 6.5).

Data collection

7. Catch limits for CCAMLR's fisheries for *D. mawsoni* and Patagonian toothfish (*D. eleginoides*) for the 'assessed' fisheries in Subareas 48.3, 88.1 and 88.2 and Division 58.5.2 are set using fully integrated assessments; more basic approaches are used for the 'data-poor' fisheries (in Subarea 48.6 and in Area 58 outside the exclusive economic zones (EEZs)). The management of these data-poor fisheries has been a major focus of attention in CCAMLR in recent years after the acknowledgement that commercial fishing by itself had resulted in too few data to develop a full assessment of the targeted stocks in these areas. CCAMLR has developed a framework for designing and undertaking research fishing designed to lead to an assessment of these toothfish stocks in the short to medium term,

established under the provisions of CM 41-01. This research planning framework has three phases: prospecting phase, biomass estimation phase and assessment development phase, with a set of decisions and review for the progression between stages.

8. In order to obtain the data necessary for a stock assessment, catch limits for research fishing by commercial vessels are set at a level intended to provide sufficient information (including sufficient recaptures of tagged fish) to achieve a stock assessment within a time period of 3 to 5 years. These catch limits are also set so that they provide reasonable certainty that exploitation rates at the scale of the stock or research unit will not negatively impact the stock. Appropriate exploitation rates are based on estimates from areas with assessed fisheries and are not more than 3–4% of the estimated stock size.

9. In 2014, one research block was designated in Division 58.4.2 and catch limits applied (Figure 1). This research block was designed to ensure that research fishing occurred in the area with the highest probability of recapturing tagged fish; fishing in this division, other than the depletion experiment conducted by Spain, is restricted to the research block only.

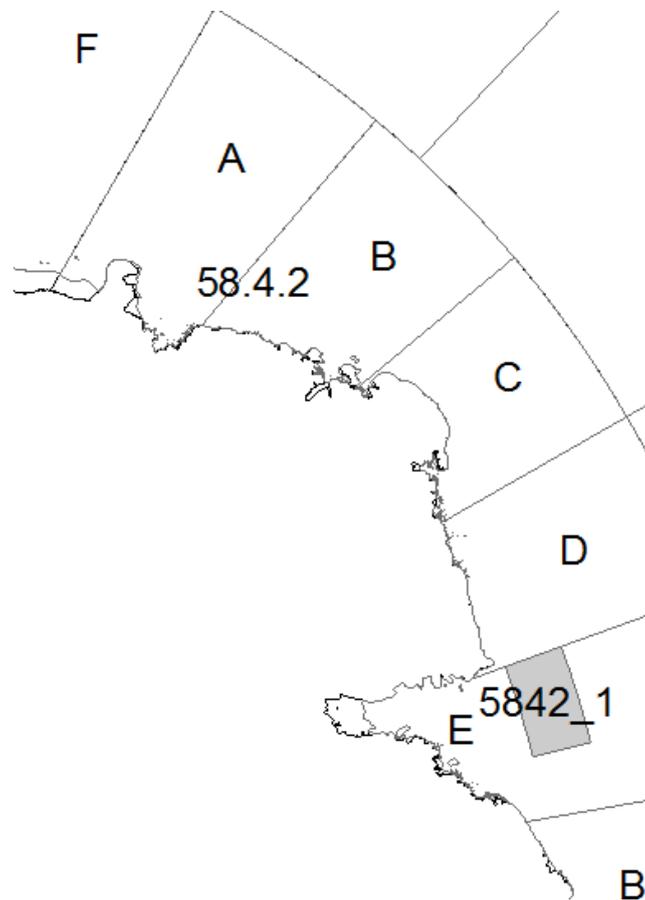


Figure 1: Location of the research block in Division 58.4.2.

Biological data

10. The collection of biological data under CM 23-05 is conducted as part of the CCAMLR Scheme of International Scientific Observation. In exploratory longline fisheries

targeting *D. mawsoni* and *D. eleginoides*, biological data collection 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.

Length distributions of catches

11. The length-frequency distributions of *D. mawsoni* caught in this fishery from 2004 to 2013 are shown in Figure 2. These length-frequency distributions are unweighted (i.e. 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 differences 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 distribution of fishing.

12. The length-frequency distributions of catches for *D. mawsoni* for the past eight seasons across the entire division and in each SSRU (Figure 2) indicate that the majority of *D. mawsoni* caught in Division 58.4.2 ranged from 50 to 175 cm in total length. A distinct bimodal distribution was observed in 2003–2005 with modes at approximately 60–80 cm as well as the dominant mode at 120–160 cm. The mode of smaller fish observed is likely to be as a result of vessels fishing in shallower water on the shelf.

Tagging

13. Since 2012, vessels have been required to tag and release *Dissostichus* spp. at a rate of five fish per tonne of green weight caught (Table 2). The tag-overlap statistic estimates the representative similarity between the size distributions of those fish that are tagged by a vessel and of all the fish that are caught by that vessel. Each vessel catching more than 10 tonnes of each species of *Dissostichus* is required to achieve a minimum tag-overlap statistic¹ of 60% (Annex 41-01/C).

14. To date, a total of 1 719 *D. mawsoni* and 30 *D. eleginoides* have been tagged in Division 58.4.2 (Tables 3a and 3b) and no tagged individuals have been recaptured.

¹ The tag-overlap statistic estimates the similarity in size distributions of fish that are tagged and all fish caught by a vessel (Annex 41-01/C, footnote 3).

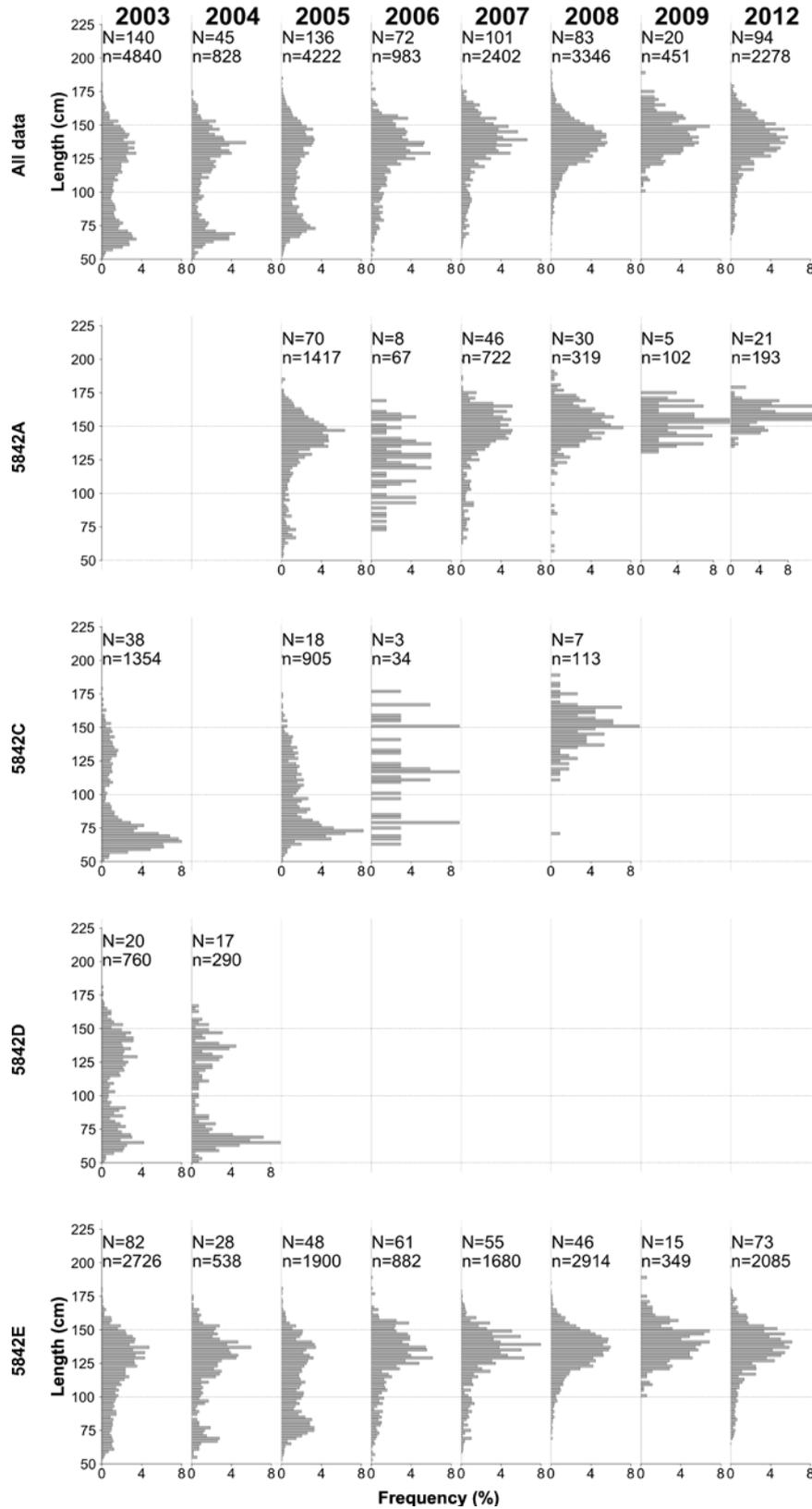


Figure 2: Annual length-frequency distributions of *Dissostichus mawsoni* caught in Division 58.4.2 (top panel) and in each SSRU (lower panels). The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are provided. Note: length-frequency distributions are only presented for those years/SSRUs in which the number of fish measured was >150.

Table 2: Annual tagging rate, by vessel, operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.2. The tag-overlap statistics (CM 41-01) for *D. mawsoni* and *D. eleginoides* respectively are provided in brackets. Values for the tag-overlap statistic are not calculated for catches of less than 10 tonnes (*).

Flag State	Vessel name	Season									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	<i>Eldfisk</i>										
Chile	<i>Globalpesca I</i>		0.9								
	<i>Globalpesca II</i>	5.8									
Japan	<i>Shinsei Maru No. 3</i>					3.1 (36, -)				5.6 (*, -)	
Korea,	<i>Bonanza No. 707</i>	2.6									
Republic of	<i>Hong Jin No. 701</i>								5 (78, -)		
	<i>Insung No. 1</i>			4.4 (35, -)	3 (22, -)						
	<i>Insung No. 2</i>		0.8								
	<i>Jung Woo No. 2</i>			1.9 (29, -)							
Namibia	<i>Antillas Reefer</i>			1.3 (18, -)	5.4 (*, -)						
	<i>Paloma V</i>				3 (17, *)						
New Zealand	<i>Janas</i>	1.2									
South Africa	<i>Koryo Maru No. 11</i>								5.2 (49, -)		
Spain	<i>Arnela</i>	1.3									
	<i>Galaecia</i>		1								
Required tagging rate		1	1	1	3	3	3	3	3	5	5

Table 3: The number of individuals of (a) *Dissostichus mawsoni* and (b) *D. eleginoides* tagged in each year. The number of fish recaptured by each vessel/year is provided in brackets.

(a)

Flag State	Vessel name	Season											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
Australia	<i>Austral Leader</i>												
	<i>Eldfisk</i>												
Chile	<i>Globalpesca I</i>		23 (0)										
	<i>Globalpesca II</i>	138 (0)											
Japan	<i>Shinsei Maru No. 3</i>					59 (0)						20 (0)	
Korea,	<i>Bonanza No. 707</i>	136 (0)											
Republic of	<i>Hong Jin No. 701</i>									203 (0)			
	<i>Insung No. 1</i>			88 (0)	248 (0)								
	<i>Insung No. 2</i>		101 (0)										
	<i>Jung Woo No. 2</i>			74 (0)									
Namibia	<i>Antillas Reefer</i>			86 (0)	47 (0)								
	<i>Paloma V</i>				368 (0)								
New Zealand	<i>Janas</i>	43 (0)											
South Africa	<i>Koryo Maru No. 11</i>									63 (0)			
Spain	<i>Arnela</i>	11 (0)											
	<i>Galaecia</i>		11 (0)										
Total		328 (0)	135 (0)	248 (0)	663 (0)	59 (0)	0 (0)	0 (0)	0 (0)	266 (0)	20 (0)		

(b)

Flag State	Vessel name	Season									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	<i>Austral Leader</i> <i>Eldfisk</i>										
Chile	<i>Globalpesca I</i> <i>Globalpesca II</i>	7 (0)	1 (0)								
Japan	<i>Shinsei Maru No. 3</i>					1 (0)				1 (0)	
Korea, Republic of	<i>Bonanza No. 707</i> <i>Hong Jin No. 701</i> <i>Insung No. 1</i> <i>Insung No. 2</i> <i>Jung Woo No. 2</i>	5 (0)									
Namibia	<i>Antillas Reefer</i> <i>Paloma V</i>				1 (0) 9 (0)						
New Zealand	<i>Janas</i>	2 (0)									
South Africa	<i>Koryo Maru No. 11</i>								3 (0)		
Spain	<i>Arnela</i> <i>Galaecia</i>										
Total		14 (0)	1 (0)	0 (0)	10 (0)	1 (0)	0 (0)	0 (0)	3 (0)	1 (0)	

Life-history parameters

Data collection

15. The life histories of *D. mawsoni* and *D. eleginoides* are characterised by slow growth, low fecundity and late maturity. Both *D. mawsoni* and *D. eleginoides* appear to have protracted spawning periods, taking place mainly in winter, but which may start as early as late autumn and extend into spring. However, as this is the period least accessible to fishing, and thus the collection of biological data, specific life-history traits for these species are limited (WG-FSA-08/14). The areas that are considered to be the most likely spawning grounds for *D. mawsoni* include the north of the Ross Sea associated with the Pacific–Antarctic Ridge (SSRUs 881B–C) and the Amundsen Ridge (SSRU 881E) in the Amundsen Sea. In the Cooperation Sea, *D. mawsoni* most likely spawn on BANZARE Bank (Division 58.4.3b). *Dissostichus eleginoides* are thought to spawn in deep water around South Georgia Island (Subarea 48.3), Bouvet Island (Subarea 48.6) and on the Kerguelen Plateau (Divisions 58.5.1 and 58.5.2).

Parameter estimates

16. There are no specific life-history parameters for either *D. mawsoni* or *D. eleginoides* in this division; the parameters used in assessed fisheries can be found in the ‘Stock assessment’ appendices of the relevant Fishery Reports.

Stock assessment status

17. There has been no integrated stock assessment for this data-poor exploratory fishery.

By-catch of fish and invertebrates

Fish by-catch

18. Catch limits for by-catch species groups (macrourids, rajids and other species) are defined in CM 33-03 and provided in Table 4. Within these catch limits, the total catch of species caught as by-catch in any SSRU or combination of SSRUs, as defined in relevant conservation measures, shall not exceed the following limits:

- skates and rays (rajids) – 5% of the catch limit of *Dissostichus* spp. or 50 tonnes, whichever is greater
- *Macrourus* spp. – 16% of the catch limit of *Dissostichus* spp. or 20 tonnes, whichever is greater
- all other species combined – 20 tonnes.

Table 4: Catch history for by-catch species (macrourids, rajids and other species), including catch limits and number of rajids released alive, in Division 58.4.2. Catch limits are for the whole fishery (see CM 33-03 for details). (Source: fine-scale data.)

Season	Macrourids		Rajids			Other species	
	Catch limit (tonnes)	Reported catch (tonnes)	Catch limit (tonnes)	Reported catch (tonnes)	Number released	Catch limit (tonnes)	Reported catch (tonnes)
2004	80	1	50	0	-	100	<1
2005	124	28	50	3	3	60	2
2006	124	4	50	0	-	60	1
2007	124	7	50	0	-	60	<1
2008	124	12	50	0	-	60	1
2009	20	1	50	0	-	40	<1
2010	20	^q	50	0	^q	40	^q
2011	20	^q	50	0	^q	40	^q
2012	20	1	50	0	-	40	<1
2013	20	0	50	0	-	20	<1
2014	20	-	50	-	-	20	-

^q Quarantined data (see paragraph 5).

19. 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 n miles away for a period of at least five days.

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

21. The by-catch in Division 58.4.2 consists predominantly of macrourids. The largest catch of 28 tonnes, reported in 2005 (Table 4), equates to 22% of the catch of *Dissostichus* spp. but only 18% of the catch limit set for that group in that year.

Invertebrate by-catch including VME taxa

22. All Members are required to submit, within their general new (CM 21-01) and exploratory (CM 21-02) fisheries notifications, information on the known and anticipated impacts of their gear on vulnerable marine ecosystems (VMEs), including benthos and benthic communities such as seamounts, hydrothermal vents and cold-water corals. All of the VMEs in CCAMLR's VME Register are currently afforded protection through specific area closures, the locations and other details of which can be found in Annex 22-09/A.

23. There are no VMEs or VME Risk Areas designated in Division 58.4.2.

Incidental mortality of birds and mammals

Incidental mortality

24. There have been no observed incidental mortalities of seabirds in Division 58.4.2.
25. In 2005, there was one reported mortality of a leopard seal (*Hydrurga leptonyx*). Since then, there have been no reported marine mammal mortalities in Division 58.4.2.

Mitigation measures

26. The requirements of CM 25-02 ‘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 CM 24-02 and subject to a seabird by-catch limit.
27. The risk level of seabirds in this fishery is category 2 (average to low) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

Ecosystem implications and effects

28. There is no formal evaluation available for this fishery.

Current management advice and conservation measures

29. The limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.2 are defined in CM 41-05. The limits in force are summarised in Table 5.

Table 5: Limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.2 in force (CM 41-05).

Element	Limit in force
Access	Fishing for <i>Dissostichus</i> spp. in Division 58.4.2 shall be limited to the exploratory longline fishery by Japan and Spain. The fishery shall be conducted by one (1) Japanese and one (1) Spanish flagged vessel using longlines only. Japan and the Republic of Korea shall conduct research fishing in the research block defined in Annex 41-05/A, and Spain shall conduct a depletion experiment in SSRU E outside the research block.
Catch limit	The total catch of <i>Dissostichus</i> spp. in Division 58.4.2 shall not exceed a precautionary catch limit of 35 tonnes, applied as follows: SSRU A – 30 tonnes ¹ SSRU B – 0 tonnes SSRU C – 0 tonnes SSRU D – 0 tonnes SSRU E – 35 tonnes
Season	1 December to 30 November

(continued)

Table 5 (continued)

Element	Limit in force
Fish by-catch	Regulated by CM 33-03
Seabird mitigation	In accordance with CM 25-02. Limit of three (3) seabirds per vessel during daytime setting
Observers	At least two (2) scientific observers, one of whom shall be appointed in accordance with the CCAMLR Scheme of International Scientific Observation
Data	Daily and five-day catch and effort reporting Haul-by-haul catch and effort data Biological data reported by the CCAMLR scientific observer
Research	Fishery-based research in accordance with CM 41-01, including the collection of detailed catch, effort and biological data (Annex 41-01/A), setting of research hauls (Annex 41-01/B) and tagging (Annex 41-01/C) Toothfish tagged at a rate of at least five fish per tonne of green weight caught
Environmental protection	Regulated by CMs 22-06, 22-07, 22-08 and 26-01

¹ The Commission agreed that no fishing would take place in this SSRU in 2015.