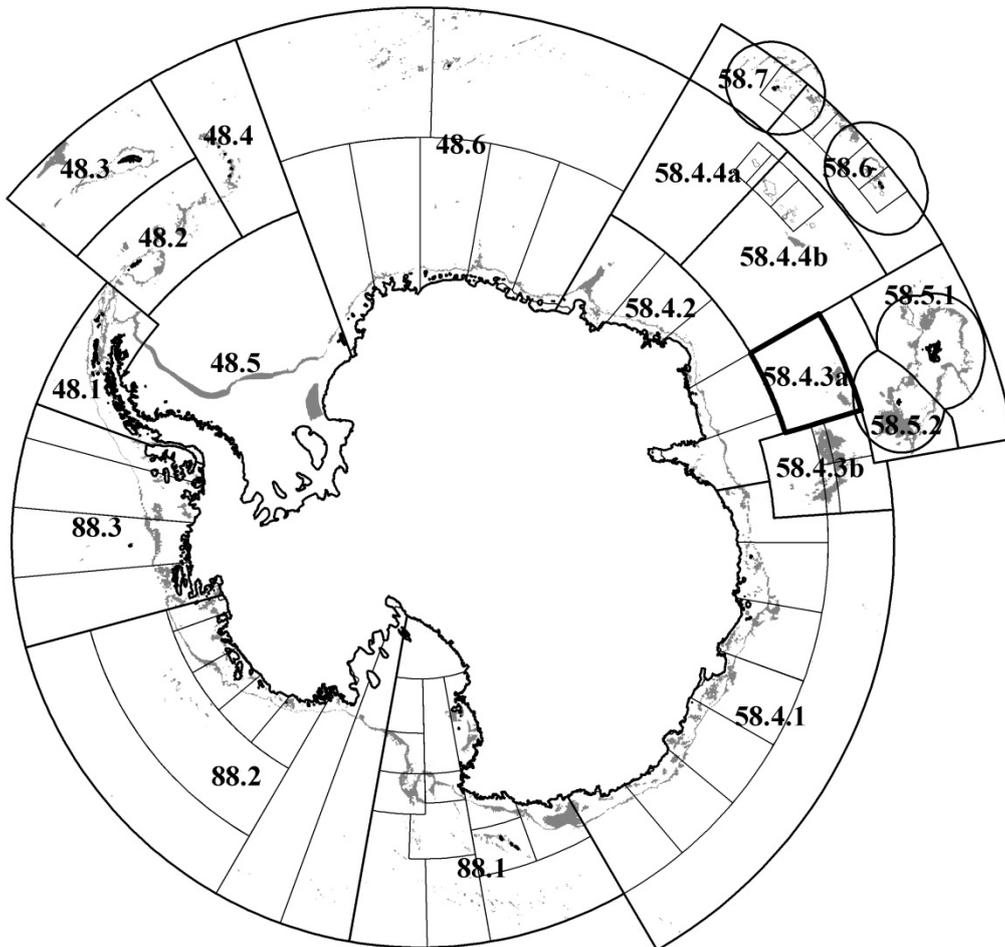


**Fishery Report 2014: Exploratory fishery for
Dissostichus spp. in Division 58.4.3a**



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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 58.4.3a

Introduction to the fishery

1. This report describes the exploratory longline fishery for toothfish (*Dissostichus* spp.) in Division 58.4.3a. The fishery in Division 58.4.3 began as a new fishery in 1997 (Conservation Measure (CM) 113/XV). Following the Commission's decision that high levels of illegal, unreported and unregulated (IUU) fishing for *Dissostichus* spp. in the Convention Area had rendered it unrealistic to consider this fishery as 'new' (CCAMLR-XVIII, paragraph 10.14), along with a renewed interest in this fishery, the fishery was reclassified as exploratory in 2000. That year, the Commission agreed on four exploratory fisheries for *Dissostichus* spp. in this region outside areas of national jurisdiction: exploratory trawl fisheries on BANZARE Bank (CM 203/XIX) and Elan Bank (CM 205/XIX); and exploratory longline fisheries on BANZARE Bank (CM 204/XIX) and Elan Bank (CM 206/XIX).

2. In 2001, the boundaries of Division 58.4.3 were reassigned based on ecological considerations, and two new divisions were formed: Division 58.4.3a (Elan Bank) and Division 58.4.3b (BANZARE Bank). Since 2005, licensed longline vessels have fished in Division 58.4.3a targeting primarily Patagonian toothfish (*D. eleginoides*) (Table 1).

Table 1: Catch history for *Dissostichus* spp. in Division 58.4.3a. (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	
2005	250	9	97	105	98
2006	250	1	88	89	0
2007	250	1	3	4	0
2008	250	0	9	9	0
2009	86	0	31	31	0
2010	86	0	0	0	0
2011	86	0	4	4	*
2012	86	0	37	37	*
2013	32	0	16	16	*
2014	32	0	32	32	*

* Not estimated.

3. The current limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.3a are described in CM 41-06. From 2009 to 2012, the precautionary catch limit for *Dissostichus* spp. was set at 86 tonnes, but in 2013 was reduced to 32 tonnes and remained at that level in 2014.

4. In 2014, the fishery was limited to one French and one Japanese flagged vessel using longlines, both of which conducted research fishing in Division 58.4.3a.

5. For 2015, one vessel from France and one from Japan notified their intention to participate in the exploratory fishery for *Dissostichus* spp. in Division 58.4.3a.

Reported catch

6. Reported catches of *Dissostichus* spp. in recent seasons peaked in 2005 at 105 tonnes (42% of the catch limit) when, along with *D. eleginoides*, significant catches of Antarctic toothfish (*D. mawsoni*) were also taken. Since then, the catches have been dominated by *D. eleginoides* and have remained substantially lower. The catch limit has never been exceeded in Division 58.4.3a (Table 1).

7. In 2014, two vessels, the Japanese-flagged *Shinsei Maru No. 3* and the French-flagged *Saint André*, fished in Division 58.4.3a and caught a combined total of 32 tonnes of *D. eleginoides* (100% of the catch limit).

Illegal, unreported and unregulated (IUU) fishing

8. IUU fishing in the Indian Ocean sector of the Convention Area remains an issue for the Commission. Estimates of illegal fishing in Division 58.4.3a indicate that 98 tonnes of *Dissostichus* spp. were taken illegally in 2005 and there have been no further reports of sightings or landings related to IUU fishing since then (Table 1). Since 2011, following the recognition of methodological issues in its assessment, no estimates of the IUU catch of *Dissostichus* spp. have been provided for this division (SC-CAMLR-XXIX, paragraph 6.5).

Data collection

9. Catch limits for CCAMLR's fisheries for *D. mawsoni* and *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.

10. 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. In 2012 and 2013, CCAMLR put in place a more structured approach to setting catch limits, and spatially constraining research, in data-poor fisheries. This process attempts to use all available information combined with a regular review process to make progress, while recognising the inherent uncertainties and data limitations in data-poor fisheries.

Biological data

11. 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

12. The length-frequency distributions of *D. mawsoni* and *D. eleginoides* caught in this fishery are presented for all years in which the number of that species measured was more than 150 fish. 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.

13. The length-frequency distributions of catches for *D. eleginoides* for each season from 2005 to present indicate that most *D. eleginoides* caught in Division 58.4.3a ranged from 30 to 150 cm in length (Figure 1). A bimodal distribution was observed from 2005 to 2007 and again in 2012. The 2013 catch had broad modes evident at approximately 50–80 and 90–130 cm, while the catch in 2014 was relatively unimodal with the highest frequency of individuals in the 50–90 cm range.

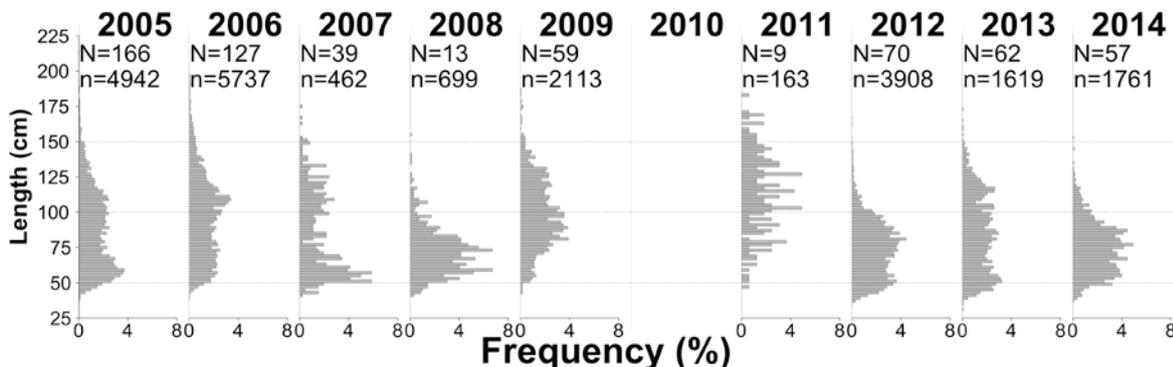


Figure 1: Annual length-frequency distributions of *Dissostichus eleginoides* caught in Division 58.4.3a. The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are provided. Note: length-frequency distributions are only presented for those years/SSRUs in which the number of fish measured was >150.

Tagging

14. 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).

15. To date, a total of 921 *D. eleginoides* have been tagged and 53 recaptured in Division 58.4.3a (Table 3). No *D. mawsoni* have ever been tagged nor recaptured in this division.

Life-history parameters

Data collection

16. 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 (small-scale research units (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

17. 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

18. A preliminary stock assessment for Division 58.4.3a was detailed in WG-SAM-08/05 and employed a biomass dynamic surplus production model to assess the status of the stock using the tag/release of 199 individuals and recapture of six individuals from 2005 and 2006 data respectively, as well as legal and estimated illegal catches. Resultant stock size estimates were then used to estimate long-term yields (using the CCAMLR decision rules) under four different assumptions about the additional uncertainty in future stock dynamics, beyond that already accounted for in the stock assessment. This gave a range of potential long-term yields of 113, 105, 103 and 86 tonnes, which encompassed a wide range of future stock dynamic uncertainty assumptions.

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).

Table 2: Annual tagging rate, by vessel, operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.3a. 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 (*). Tbs: data to be submitted.

Flag State	Vessel name	Season									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	<i>Avro Chieftain</i>	2.8 (-, -)									
France	<i>Saint André</i>								6.9 (-, 79)	9.2 (-, *)	5.6 (-, 85)
Japan	<i>Shinsei Maru No. 3</i>			1.8 (-, *)		3.7(-, 45)		3.9 (-, *)		6 (-, *)	tbs
Korea, Republic of	<i>Bonanza No. 707</i>	3.7 (-, -)									
Spain	<i>Arnela</i>	2 (-, -)									
	<i>Galaecia</i>	1.6 (-, -)	1.2 (-, -)								
	<i>Tronio</i>			2.2 (-, *)							
Uruguay	<i>Banzare</i>				4.7 (-, *)						
Required tagging rate		1	1	1	3	3	3	3	5	5	5

Table 3: The number of individuals of *Dissostichus eleginoides* tagged in each year. The number of fish recaptured by each vessel/year is provided in brackets. Tbs: data to be submitted.

Flag State	Vessel name	Season									
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Australia	<i>Avro Chieftain</i>	4 (0)									
France	<i>Saint André</i>								235 (9)	60 (11)	90 (22)
Japan	<i>Shinsei Maru No. 3</i>			4 (0)		113 (2)		14 (0)		56 (1)	tbs
Korea, Republic of	<i>Bonanza No. 707</i>	32 (0)									
Spain	<i>Arnela</i>	19 (0)									
	<i>Galaecia</i>	144 (0)	104 (6)								
	<i>Tronio</i>			5 (0)							
Uruguay	<i>Banzare</i>				41 (2)						
Total		199 (0)	104 (6)	9 (0)	41 (2)	113 (2)	0 (0)	14 (0)	235 (9)	116 (12)	tbs

By-catch of fish and invertebrates

Fish by-catch

19. 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 by-catch species 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), catch limits and number of rajids released alive in Division 58.4.3a. 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)
2005	26	2	50	17	985	20	2
2006	26	1	50	7	-	20	1
2007	26	0	50	0	-	20	1
2008	26	0	50	2	-	20	0
2009	26	2	50	2	57	20	2
2010	26	0	50	0	-	20	0
2011	26	0	50	0	-	20	0
2012	26	4	50	32	-	20	3
2013	26	2	50	0	3 666	20	1
2014	26	2	50	2	6 148	20	1

20. 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.

21. If the catch of *Macrourus* spp. taken by a single vessel in any two 10-day periods 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 for the remainder of the season.

22. Those skates and rays which are caught alive and which have not been tagged (CM 41-01, Annex 41-01/C, paragraphs 2v and vii), should be released by cutting the snood and, when practical, removing the hooks, and the number recorded and reported.

23. The by-catch in Division 58.4.3a consists predominantly of rajids with a maximum, reported in 2012, of 32 tonnes or 64% of that catch limit for that group (Table 4). In 2013, all rajids were released alive and thus the reported catch of this group is 0 tonnes.

Invertebrate by-catch including VME taxa

24. 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.
25. There are no VMEs or VME Risk Areas designated in Division 58.4.3a.

Incidental mortality of birds and mammals

Incidental mortality

26. Prior to 2012, there were no seabird mortalities observed in Division 58.4.3a. In that year, a single mortality of a white-chinned petrel (*Procellaria aequinoctialis*) was reported. There have been no observed seabird mortalities in 2014.
27. There have been no observed incidental mortalities of marine mammals in Division 58.4.3a.

Mitigation measures

28. 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.
29. The risk level of seabirds in this fishery in Division 58.4.3a is category 3 (average) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

Ecosystem implications and effects

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

Current management advice and conservation measures

31. The limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.3a are defined in CM 41-06. The limits in force are summarised in Table 5.

Table 5: Limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.3a in force (CM 41-06).

Element	Limit in force
Access	Fishing for <i>Dissostichus</i> spp. on Elan Bank (Division 58.4.3a) outside areas of national jurisdiction shall be limited to the exploratory fishery by France and Japan. The fishery shall be conducted by one (1) French and one (1) Japanese flagged vessel using longlines only.
Catch limit	The total catch of <i>Dissostichus</i> spp. on Elan Bank (Division 58.4.3a) outside areas of national jurisdiction in 2015 shall not exceed a precautionary catch limit of 32 tonnes.
Season	1 May to 31 August
Fish by-catch	Regulated by CM 33-03
Seabird mitigation	In accordance with CM 25-02. Limit of three (3) seabirds per vessel fishing outside the prescribed season
Observers	At least one (1) scientific observer 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) and CM 24-01. Toothfish tagged at a rate of at least five fish per tonne green weight caught
Environmental protection	Regulated by CMs 22-06, 22-07, 22-08 and 26-01