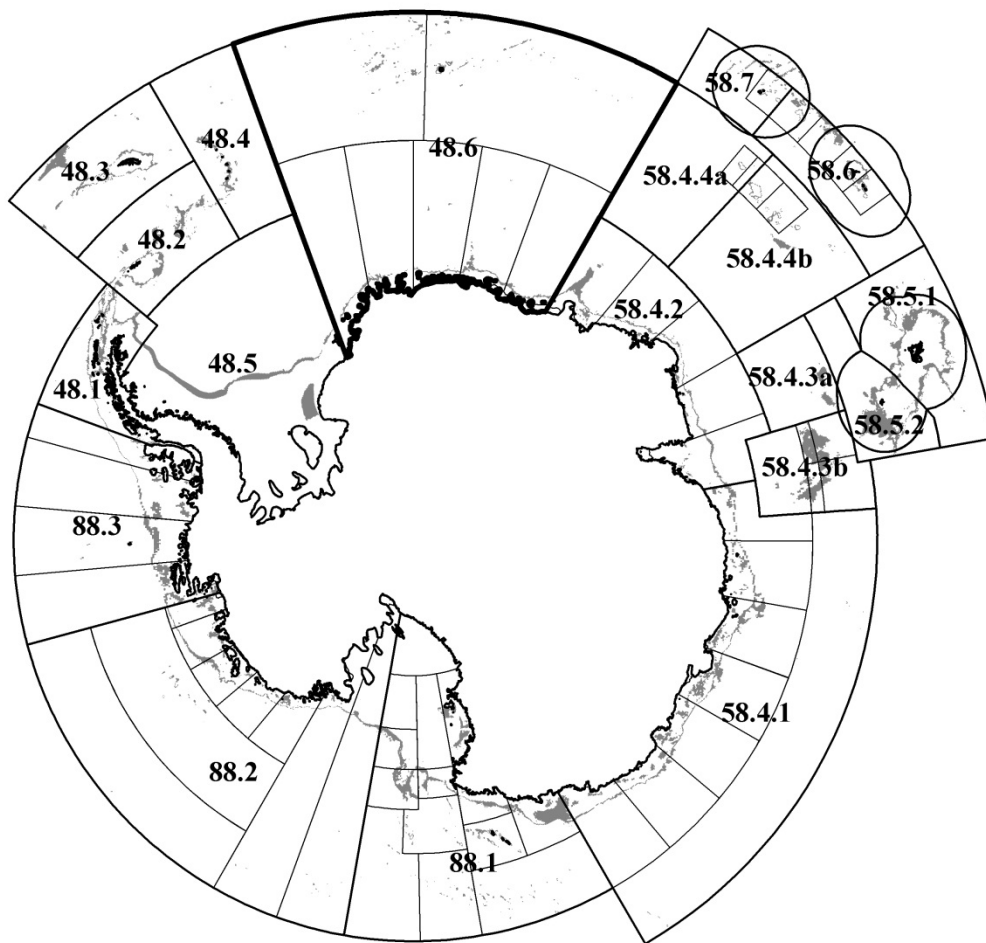


**Fishery Report 2013: Exploratory fishery for  
*Dissostichus* spp. in Subarea 48.6**



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## **FISHERY REPORT 2013: EXPLORATORY FISHERY FOR *DISSOSTICHUS* SPP. IN SUBAREA 48.6**

### **Introduction to the fishery**

1. This report describes the exploratory longline fishery for toothfish (*Dissostichus* spp.) in Subarea 48.6. This fishery began as a new fishery in 1997 (Conservation Measure (CM) 114/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), the fishery was reclassified as exploratory in 2000. Since 2004, licensed longline vessels have fished in Subarea 48.6 for *Dissostichus* spp., originally targeting primarily Patagonian toothfish (*Dissostichus eleginoides*) but more recently Antarctic toothfish (*D. mawsoni*) has dominated the catches.
2. The current limits on the exploratory fishery for *Dissostichus* spp. in Subarea 48.6 are described in CM 41-04. Since 2008, the precautionary catch limit for *Dissostichus* spp. has remained at 400 tonnes; 200 tonnes north of 60°S (small-scale research units (SSRUs) A and G) and 200 tonnes south of 60°S (SSRUs B–F).
3. In 2013, the fishery was limited to one Japanese and one South African flagged vessel using longlines only.
4. For 2014, a total of three vessels, one each from Japan, South Africa and Ukraine have notified their intention to participate in the exploratory fishery for *Dissostichus* spp. in Subarea 48.6.

### **Reported catch**

5. Reported catches of *Dissostichus* spp. in Subarea 48.6 peaked at 392 tonnes in both 2010 and 2011 which was 98% of the catch limit set for that year (Table 1).
6. In 2013, one vessel from Japan and one vessel from South Africa caught a combined total of 237 tonnes of *Dissostichus* spp. The northern SSRUs A and G had a reported catch of 128 tonnes (64% of catch limit) while the southern SSRUs (B–F) had a reported catch of 163 tonnes (81% of catch limit).

Table 1: Catch history for *Dissostichus* spp. in Subarea 48.6. (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	910	0	7	7	-
2005	910	2	49	51	-
2006	910	63	100	163	-
2007	910	34	78	112	-
2008	400	11	12	24	-
2009	400	265	17	282	-
2010	400	342	50	392	-
2011	400	359	32	392	*
2012	400	377	6	383	*
2013	400	259	11	270	*

\* Not estimated.

### Illegal, unreported and unregulated (IUU) fishing

7. There is no information on which to derive an estimate of the level of IUU fishing in Subarea 48.6.

### Data collection

8. 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.

9. 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**

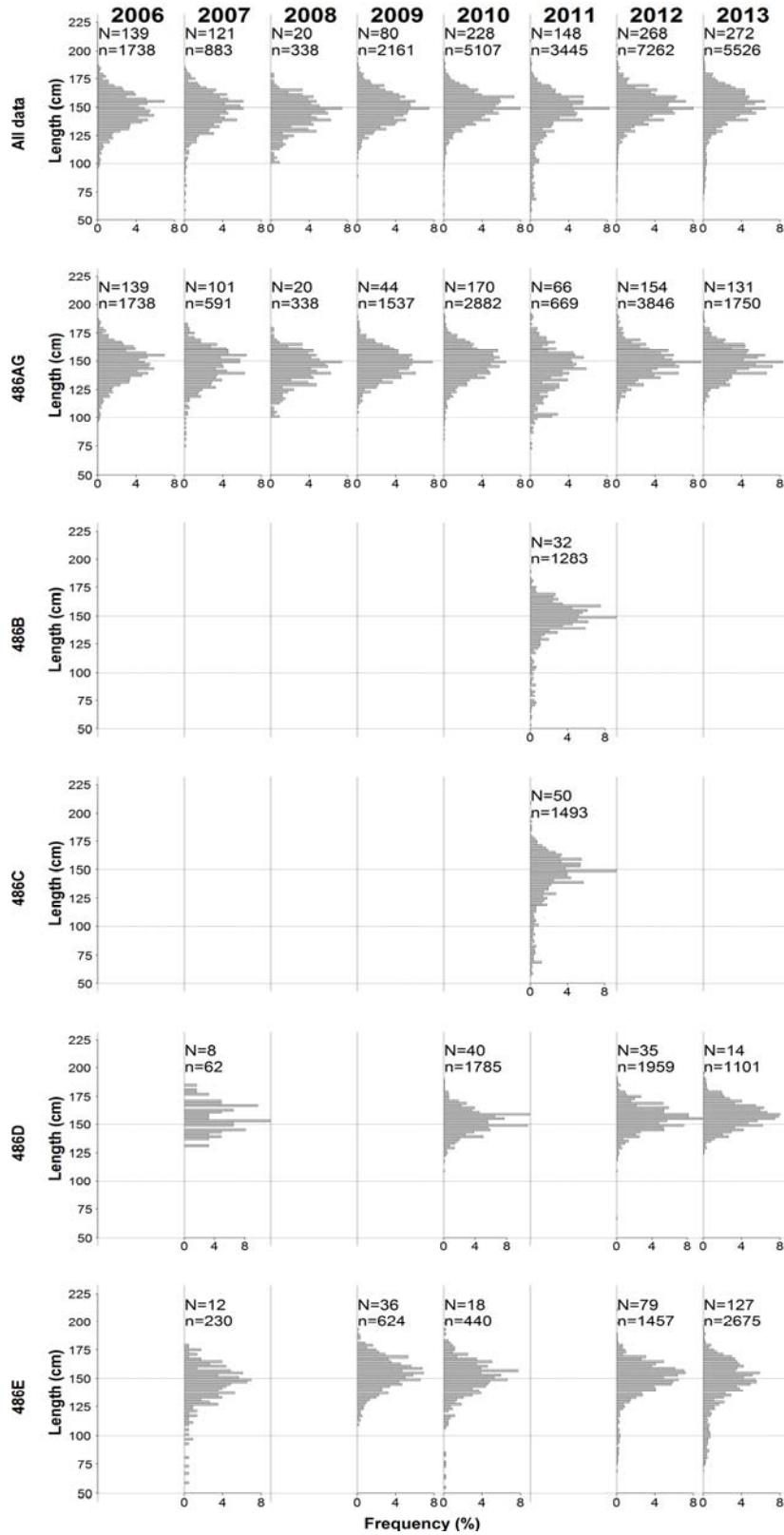
10. The collection of biological data under CM 23-05 is conducted as part of the CCAMLR Scheme of International Scientific Observation. In exploratory longline fisheries targeting *D. mawsoni* and *D. eleginoides*, biological data collection includes representative samples of length, weight, sex and 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* 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.

12. The length-frequency distributions of the catches of *D. mawsoni* and *D. eleginoides* for each season across the entire subarea and in each SSRU are presented in Figure 1. These length-frequency distributions indicate a consistent difference in modal size between the two species.

(a)



(continued)

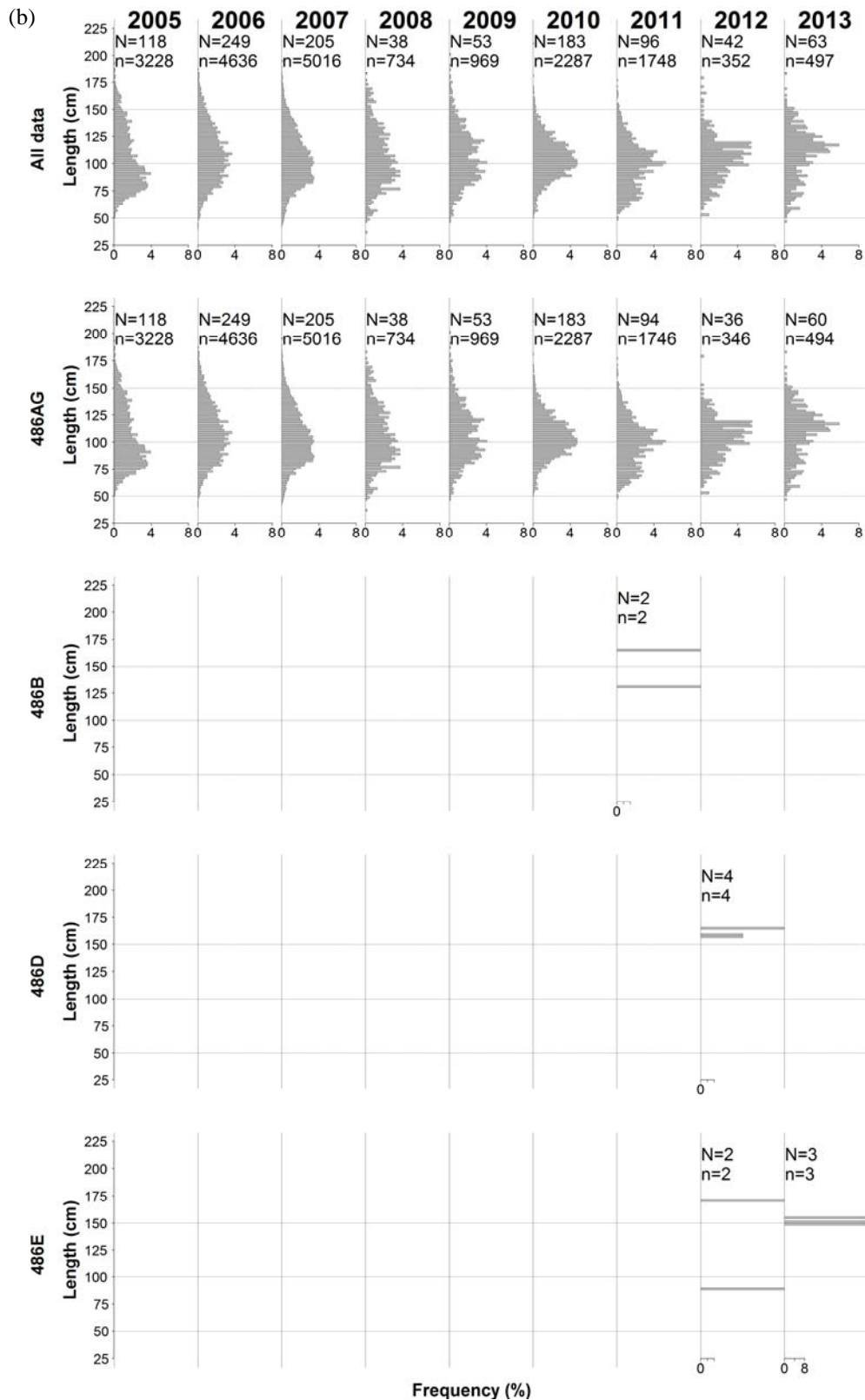


Figure 1: Annual length-frequency distributions of (a) *Dissostichus mawsoni* and (b) *D. eleginoides* caught in Subarea 48.6 and those caught in each SSRU (lower panels). The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are provided. Note: length-frequency distributions are only presented for those years/SSRUs in which the number of fish measured was >150.

13. The majority of *D. mawsoni* caught in the Subarea 48.6 fishery ranged from 120 to 180 cm in total length, with a relatively consistent broad mode at approximately 130–160 cm (Figure 1a).

14. *Dissostichus eleginoides* exhibits a much wider length distribution with the majority ranging from 60 to 150 cm in total length (Figure 1b). A shifting mode is evident throughout the time series with length distribution skewed towards smaller fish early in the time series and towards larger fish in more recent seasons (Figure 1b).

### Tagging

15. 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 statistic<sup>1</sup> of 60% (Annex 41-01/C).

16. In 2013 both the *Shinsei Maru No. 3* and the *Koryo Maru No. 11* exceeded the required tagging rate and the minimum tag-overlap statistic (Table 2).

17. To date, a total of 5 992 *D. mawsoni* and 1 143 *D. eleginoides* have been tagged and 50 *D. mawsoni* and 21 *D. eleginoides* have been recaptured in Subarea 48.6 (Tables 3(a) and 3b). All of the fish that have been recaptured in Subarea 48.6 were also tagged in that division.

### Life-history parameters

18. 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).

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<sup>1</sup> 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, reported by vessel operating in the exploratory fishery for *Dissostichus* spp. in Subarea 48.6. The tag-overlap statistics (CM 41-01) for *Dissostichus mawsoni* and *D. eleginoides* respectively are provided in brackets. Values for tag-overlap statistics are not calculated for catches of less than 10 tonnes (\*).

Flag State	Vessel name	Season											
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013		
Japan	<i>Shinsei Maru No. 3</i>	0.6	1.2	1.1	1 (33, 34)	1.1 (31, 44)	3.6 (65, 26)	3.1 (68, 42)	3	(95, -)	5.1 (85, *)	5.6 (79, *)	
Korea,	<i>Bonanza No. 707</i>		2.2										
Republic of	<i>Hong Jin No. 701</i>									4	(84, *)		
	<i>Insung No. 1</i>							3.2	(-, 34)				
	<i>Insung No. 2</i>							3.1	(42, -)				
	<i>Insung No. 7</i>									3	(54, *)		
	<i>Insung No. 22</i>							3	(12, -)				
	<i>Jung Woo No. 2</i>				3	(*, *)							
Norway	<i>Froyanes</i>				1.6	(*, *)							
South Africa	<i>Koryo Maru No. 11</i>									3.1	(*, 82)	5.2 (72, *)	5.7 (69, *)
Required tagging rate		1	1	1	1	1	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) *Dissostichus mawsoni*

Flag State	Vessel name	Season								
		2005	2006	2007	2008	2009	2010	2011	2012	2013
Japan	<i>Shinsei Maru No. 3</i>		2 (0)	23 (0)	15 (0)	327 (2)	560 (1)	594 (1)	1225 (14)	731 (6)
Korea, Republic of	<i>Bonanza No. 707</i>	5 (0)								
	<i>Hong Jin No. 701</i>							441 (0)		
	<i>Insung No. 1</i>						0 (2)			
	<i>Insung No. 2</i>						305 (0)			
	<i>Insung No. 22</i>					520 (0)				
	<i>Insung No. 7</i>							127 (0)		
	<i>Jung Woo No. 2</i>			4 (0)						
Norway	<i>Froyanes</i>			10 (0)						
South Africa	<i>Koryo Maru No. 11</i>							10 (0)	651 (19)	442 (5)
Total		5 (0)	2 (0)	37 (0)	15 (0)	847 (2)	865 (3)	1 172 (1)	1 876 (33)	(11)

(b) *Dissostichus eleginoides*

Flag State	Vessel name	Season									
		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Japan	<i>Shinsei Maru No. 3</i>	4 (0)	57 (0)	169 (3)	76 (2)	14 (0)	65 (0)	38 (4)		14 (0)	92 (1)
Korea, Republic of	<i>Bonanza No. 707</i>										
	<i>Hong Jin No. 701</i>								52 (1)		
	<i>Insung No. 1</i>							310 (3)			
	<i>Insung No. 2</i>										
	<i>Insung No. 22</i>										
	<i>Insung No. 7</i>								5 (0)		
	<i>Jung Woo No. 2</i>				15 (0)						
Norway	<i>Froyanes</i>				1 (0)						
South Africa	<i>Koryo Maru No. 11</i>								79 (0)	57 (1)	94 (6)
Total		4	57	169 (3)	92 (2)	14 (0)	65 (0)	348 (7)	136 (1)	72 (1)	186 (7)

## Parameter estimates

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

## Stock assessment status

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

## By-catch of fish and invertebrates

### Fish by-catch

21. 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 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 for *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 Subarea 48.6. 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	146	0	100	0	-	120	0
2005	146	6	100	0	-	120	0
2006	146	10	100	0	-	120	3
2007	146	13	100	0	-	120	2
2008	62	1	100	0	-	140	0
2009	64	5	100	0	-	140	2
2010	64	10	100	0	-	140	1
2011	64	8	100	0	-	140	1
2012	64	6	100	0	2	140	1
2013	64	18	100	0	-	140	2

22. 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.

23. 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.

24. The by-catch in Subarea 48.6 consists predominantly of macrourids with a maximum of 16 tonnes being reported in the 2013 season, which accounts for 28% of the catch limit for that group (Table 4).

25. In February 2013, the *Koryo Maru No. 11* triggered the move-on rule for *Macrourus* spp. in SSRU E by catching 4 251 kg of *Macrourus* spp. in a 10-day period, which accounted for 23% of the catch of *Dissostichus* spp.

### **Invertebrate by-catch including VME taxa**

26. 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.

27. There are no VMEs or VME Risk Areas designated in Subarea 48.6.

### **Incidental mortality of birds and mammals**

#### **Incidental mortality**

28. There have been no observed seabird or marine mammal mortalities in Subarea 48.6.

#### **Mitigation measures**

29. 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.

30. The risk level for seabirds in this fishery in Subarea 48.6 is category 1 (low) south of 55°S, and category 2 (average to low) north of 55°S (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

### **Ecosystem implications and effects**

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

## Current management advice and conservation measures

32. The limits on the exploratory fishery for *Dissostichus* spp. in Subarea 48.6 are defined in CM 41-04. The limits in force and the advice of WG-FSA to the Scientific Committee for the forthcoming season are summarised in Table 5.

Table 5: Limits on the exploratory fishery for *Dissostichus* spp. in Subarea 48.6 in force (CM 41-04) and advice to the Scientific Committee.

Element	Limit in force	Advice for 2014
Access	Fishing for <i>Dissostichus</i> spp. in Subarea 48.6 shall be limited to the exploratory longline fishery by Japan and South Africa. The fishery shall be conducted by Japanese and South African flagged vessels using longlines only. No more than one vessel per country shall fish at any one time.	Carry forward
Catch limit	The total catch of <i>Dissostichus</i> spp. in Subarea 48.6 in 2014 shall not exceed a precautionary catch limit of 538 tonnes, applied as follows: SSRUs A and G: <i>Dissostichus eleginoides</i> 28 tonnes <i>Dissostichus mawsoni</i> 170 tonnes SSRUs B and C: <i>Dissostichus</i> spp. 190 tonnes SSRU D: <i>Dissostichus</i> spp. 50 tonnes SSRU E: <i>Dissostichus</i> spp. 100 tonnes SSRU F: <i>Dissostichus</i> spp. 0 tonnes.	
Season	1 December to 30 November	Same period
Fish by-catch	Regulated by CM 33-03.	Carry forward
Seabird mitigation	In accordance with CM 25-02 (night setting), which shall not apply as long as the requirements of CM 24-02 are met  Limit of three (3) seabirds per vessel during daytime setting	Carry forward  Carry forward
Observers	At least two (2) scientific observers, one of whom shall be appointed in accordance with the CCAMLR Scheme of International Scientific Observation	Carry forward
Data	Daily and five-day catch and effort reporting (CM 23-07)  Haul-by-haul catch and effort data (CM 23-04)  Biological data reported by the CCAMLR scientific observer (CM 23-05)	Carry forward  Carry forward  Carry forward
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	Carry forward  Carry forward
Environmental protection	Regulated by CMs 22-06, 22-07, 22-08 and 26-01 No offal discharge	Carry forward