

**Fishery Report: Exploratory fishery for
Dissostichus spp. (TOT) in Division 58.4.1**

CONTENTS

	Page
1. Details of the fishery	1
1.1 Reported catch	1
1.2 IUU catch	2
1.3 Size distribution of catches	2
2. Stocks and areas	3
3. Parameter estimation	6
3.1 Observations	6
3.2 Fixed parameter values	8
4. Stock assessment	8
5. By-catch of fish and invertebrates	9
5.1 By-catch removals	9
5.2 Assessment of impacts on affected populations	9
5.3 Identification of levels of risk	9
5.4 Mitigation measures	9
6. Incidental mortality of birds and mammals	9
6.1 Incidental mortality reported	9
6.2 Identification of levels of risk	10
6.3 Mitigation measures	10
7. Ecosystem implications/effects	10
8. Harvest controls and management advice	10
8.1 Conservation measures	10
8.2 Management advice	11

Throughout this report the CCAMLR fishing season is represented by the year in which that season ended, e.g. 2012 represents the 2011/12 CCAMLR fishing season (from 1 December 2011 to 30 November 2012).

FISHERY REPORT: EXPLORATORY FISHERY FOR *DISSOSTICHUS* SPP. (TOT) IN DIVISION 58.4.1

1. Details of the fishery

1. The exploratory longline fishery for *Dissostichus* spp. in Division 58.4.1 was first agreed by the Commission in 1999 (Conservation Measure (CM) 166/XVII), and licensed vessels first operated in this fishery in 2005.

2. The limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 are described in CM 41-11. In 2012, the fishery was limited to Japanese, Korean, New Zealand, Russian, South African and Spanish vessels using longlines only. The precautionary catch limit for *Dissostichus* spp. was 210 tonnes and the following limits applied to small-scale research units (SSRUs): 100 tonnes in SSRU C, 50 tonnes in SSRU E and 60 tonnes in SSRU G (Figure 1). Five other SSRUs (A, B, D, F and H) were closed to fishing. The catch limits for by-catch species were defined in CM 33-03. Environmental protection in this fishery is regulated by CMs 22-06, 22-07, 22-08 and 26-01.

3. Three Members (Japan, Republic of Korea and Spain) and a total of three vessels notified their intention to participate in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 in 2013.

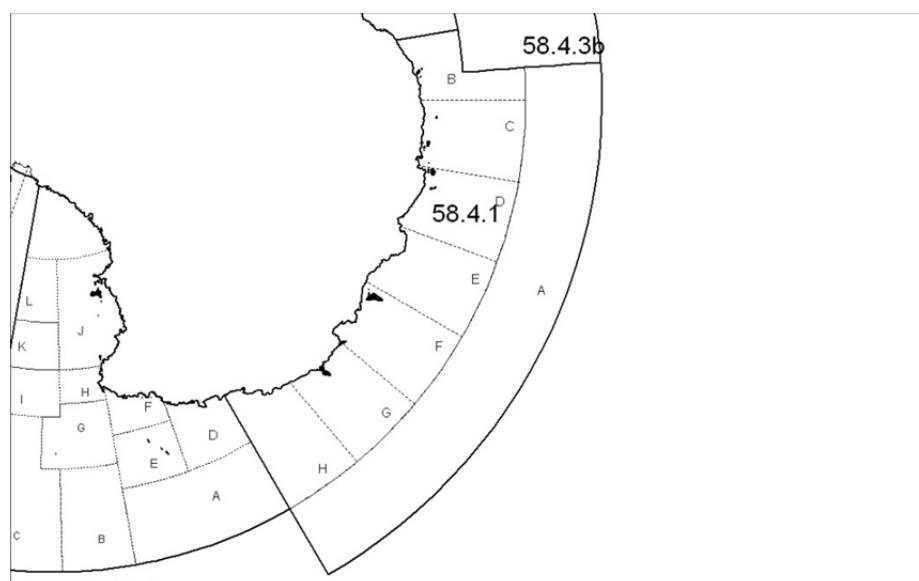


Figure 1: General map of Division 58.4.1 and location of SSRUs (A–H in that division).

1.1 Reported catch

4. Licensed longline vessels have fished the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 since 2005, and the target species is *D. mawsoni* (Table 1). In 2012, one vessel operated in the fishery and caught 157 tonnes of *Dissostichus* spp. in SSRUs C, E and G (Table 1a). SSRU C was closed on 9 February 2012 (catch limit for *Dissostichus* spp.):

100 tonnes; final reported catch: 98 tonnes), and SSRU E was closed on 15 January 2012 (catch limit for *Dissostichus* spp.: 50 tonnes; final reported catch: 51 tonnes (Table 1b)).

5. Reported catches of *Dissostichus* spp. over the past eight seasons peaked at 634 tonnes in 2007.

Table 1(a): Catch history for *Dissostichus* spp. in Division 58.4.1. (Source: STATLANT data for past seasons, and catch and effort reports for current season, past reports for IUU catch.)

Season	Regulated fishery						Estimated IUU catch (tonnes)	Total removals (tonnes)
	Effort (number of vessels)		Catch limit (tonnes)	<i>Dissostichus</i> spp.				
	Limit	Reported		Reported catch (tonnes)				
				<i>D. eleginoides</i>	<i>D. mawsoni</i>	Total		
2004	-	0	800	0	0	0	-	0
2005	9	7	600	1	479	480	-	480
2006	11	6	600	0	421	421	597	1 018
2007	9	4	600	94	540	634	626	1 260
2008	16	6	600	<1	410	410	136	546
2009	13	3	210	0	222	222	152	374
2010	10	2	210	2	194	196	910	1 106
2011	10	3	210	<1	216	216	*	216
2012	10	1	210	0	157	157	*	157

* Not estimated

Table 1(b): Catch (tonnes) of *Dissostichus* spp. in Division 58.4.1 reported by SSRU. (Source: fine-scale data pro-rated by total reported catch in Table 1(a).) SSRUs are as defined in CM 41-01 (2011).

Season	<i>D. eleginoides</i>								<i>D. mawsoni</i>							
	A	B	C	D	E	F	G	H	A	B	C	D	E	F	G	H
2005			<1				<1				183		154		143	
2006											250		22		152	
2007			69		9		16				170		193		188	
2008							<1	<1			177	10	15	3	197	10
2009							<1				108		54		60	
2010			2				<1				96		51		47	
2011			<1								100		56		59	
2012											98		51		8	

1.2 IUU catch

6. IUU fishing in Division 58.4.1 was first detected in 2006, and high levels of IUU fishing in 2006, 2007 and 2010 resulted in the total removals being well in excess of the catch limits. The IUU catch of *Dissostichus* spp. in 2011 and 2012 was not estimated (SC-CAMLR-XXIX, paragraph 6.5).

1.3 Size distribution of catches

7. Length frequencies for *D. mawsoni* (TOA) for each season are presented in Figure 2. These length-frequency distributions of catches are unweighted and the interannual variability

shown in the figure may reflect differences in the fished population but are also likely to be biased by changes in factors such as the characteristics/number of vessels in the fishery and the spatial and temporal distribution of fishing. A description of how length data are used in assessments is provided in the relevant section of this report. Most *D. mawsoni* caught in the fishery ranged from 100 to 170 cm in length, with a broad mode at approximately 120–160 cm (Figure 2).

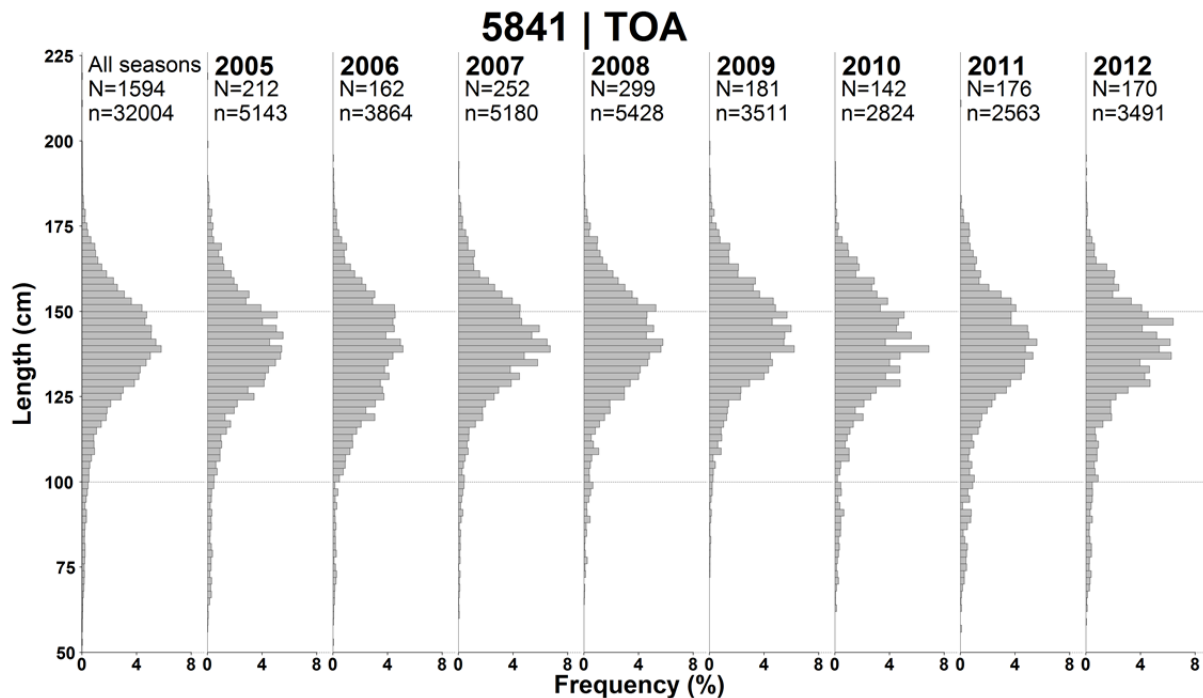


Figure 2: Length frequencies for *Dissostichus mawsoni* (TOA) in Division 58.4.1 from 2005 to present using observer data. The number of hauls (N) and the number of fish measured (n) in each year are given at the top of each panel.

2. Stocks and areas

8. The Working Group noted that the two-stock ‘east and west’ hypothesis presented in WG-FSA-08/43 could also be simply a differential immature/mature distribution of animals of one stock, as is seen in the Ross Sea. It was agreed that even though the very low number of tag-returns might support a two-stock hypothesis, the sample size is currently so low that both hypotheses are equally plausible.

9. The most likely areas where *D. mawsoni* spawn are the Pacific–Antarctic Ridge (SSRU 881B/C) north of the Ross Sea and the Amundsen Ridge (SSRU 881E) in the Amundsen Sea. In the Cooperation Sea (Division 58.4.2) the most likely area of spawning is BANZARE Bank. Spawning occurs in winter and may extend into autumn or spring (WG-FSA-08/14).

10. The Working Group noted that the results in WG-FSA-08/43 and Figures 3 and 4 confirm the hypotheses that juvenile fish inhabit mostly the shelf, while larger fish live on the slope and pre-spawning fish are found either on their northward spawning migration or inhabit the deeper slope.

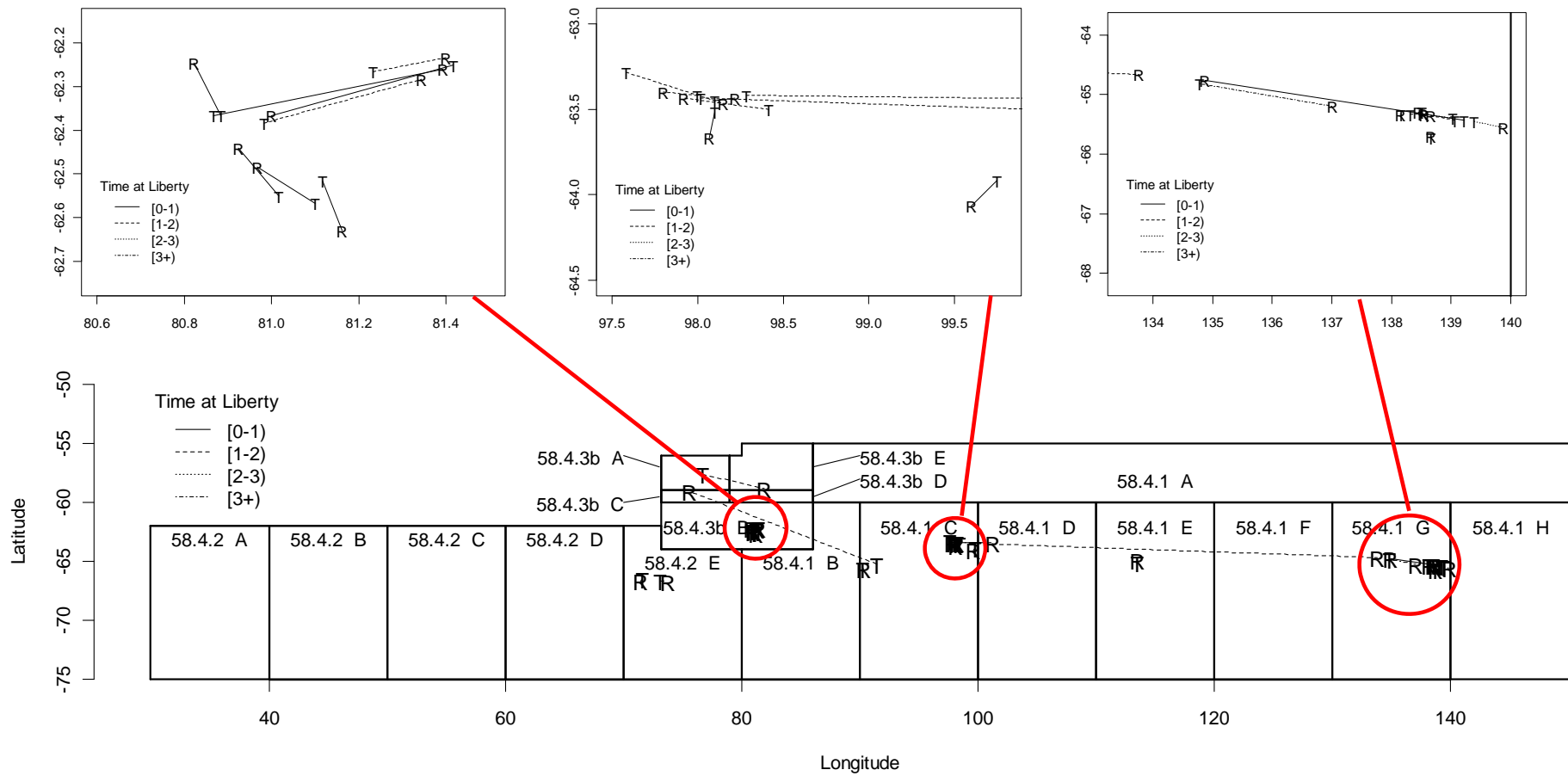


Figure 3: Plot of tag-recaptures of *Dissostichus mawsoni* in Divisions 58.4.1, 58.4.2 and 58.4.3b recorded between 2004 and 2010. 'T' indicates the release location and 'R' indicates the recapture location.

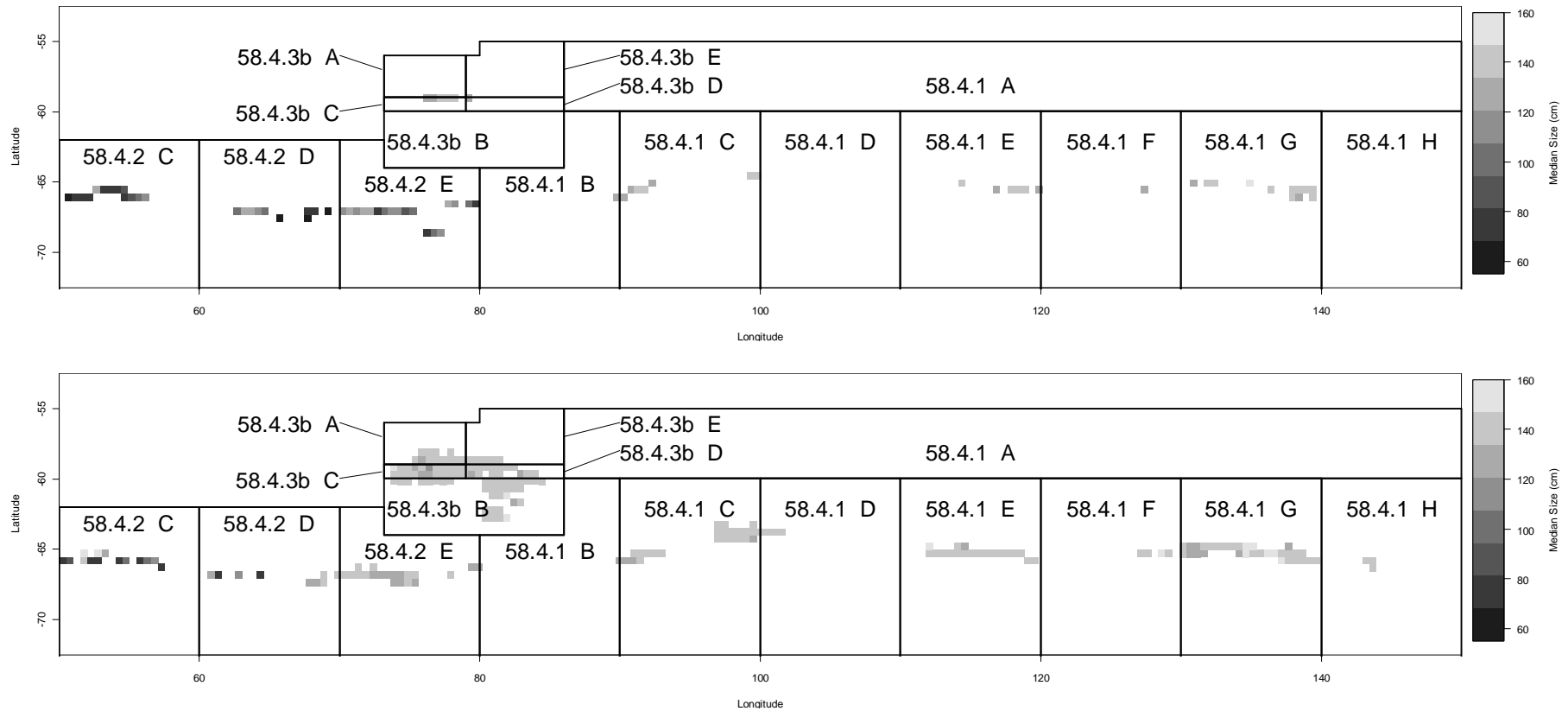


Figure 4: Plot of median length of *Dissostichus mawsoni* caught in Divisions 58.4.1, 58.4.2 and 58.4.3b between 2004 and 2009, aggregated into 0.5° latitude × 0.5° longitude boxes. The upper panel shows data for fishing in depths shallower than 1 000 m, the lower panel for fishing in depths deeper than 1 000 m. Note: darker squares indicate smaller median length; lighter squares indicate larger median length.

3. Parameter estimation

3.1 Observations

11. Vessels operating in this fishery are required to conduct fishery-based research in accordance with CM 41-01. This includes the collection of detailed catch, effort and biological data (Annex 41-01/A), the setting of research lines (Annex 41-01/B) and participation in the tagging program (Annex 41-01/C). The number of research hauls reported in each SSRU are summarised in Table 2.

12. Since 2012, vessels have been required to tag and release *Dissostichus* spp. at a rate of five fish per tonne of green weight caught (previously three fish per tonne between 2007 and 2011, one fish per tonne prior to 2007; a limit of 500 fish tagged per vessel applied until the end of 2010). A total of 6 571 *D. mawsoni* and 314 *D. eleginoides* have been tagged and released, and 26 *D. mawsoni* and one *D. eleginoides* have been recaptured in that division (Table 3).

13. Vessels catching more than 2 tonnes of *Dissostichus* spp. were required to achieve a minimum tag-overlap statistic¹ of 50% in 2011 and of 60% from 2012 onwards (Annex 41-01/C). The vessel fishing in Division 58.4.1 in 2012 achieved a tag-overlap statistic of 89% (Table 4).

Table 2: Number of research longline hauls and total number of hauls (in brackets) reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1. (Source: fine-scale data.) SSRUs are as defined in CM 41-01.

Season	Flag State	Vessel name	SSRU					
			C	D	E	F	G	H
2005	Chile	<i>Globalpesca II</i>	2 (2)		20 (31)		8 (8)	
	Korea, Republic of	<i>Bonanza No. 707</i>	13 (13)					
		<i>Yeon Seong No. 829</i>	10 (24)		10 (13)		10 (55)	
	New Zealand	<i>Janas</i>	2 (2)					
		<i>San Aspiring</i>					20 (20)	
Spain	<i>Arnela</i>	5 (29)						
	<i>Galaecia</i>	20 (73)		12 (17)				
2006	Chile	<i>Globalpesca I</i>	20 (20)		10 (10)			
		<i>Globalpesca II</i>	20 (23)				20 (21)	
	Korea, Republic of	<i>Insung No. 2</i>			15 (21)		20 (49)	
	New Zealand	<i>San Aspiring</i>			1 (1)			
	Spain	<i>Tronio</i>	20 (74)					
Uruguay	<i>Paloma V</i>					5 (5)		
2007	Korea, Republic of	<i>Insung No. 1</i>	8 (8)		20 (35)		20 (79)	
	Namibia	<i>Antillas Reefer</i>	17 (24)					
	Spain	<i>Tronio</i>	20 (58)		20 (78)	0 (4)		
	Uruguay	<i>Paloma V</i>	20 (71)		21 (21)		20 (25)	

(continued)

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 (continued)

Season	Flag State	Vessel name	SSRU					
			C	D	E	F	G	H
2008	Korea, Republic of	<i>Insung No. 1</i>	12 (19)		2 (2)		20 (75)	
		<i>Insung No. 2</i>	41 (41)		7 (7)		20 (62)	
	Namibia	<i>Antillas Reefer</i>	20 (49)					
		<i>Paloma V</i>					20 (23)	
	Spain	<i>Tronio</i>	14 (16)	13 (13)	9 (9)	6 (6)	20 (40)	7 (7)
	Uruguay	<i>Banzare</i>	10 (16)		4 (4)			
2009	Korea, Republic of	<i>Insung No. 1</i>	10 (24)		10 (45)			
		<i>Insung No. 22</i>					10 (95)	
	Uruguay	<i>Banzare</i>	10 (43)					
2010	Japan	<i>Shinsei Maru No. 3</i>	10 (55)				10 (38)	
	Korea, Republic of	<i>Insung No. 2</i>	5 (5)		10 (13)		10 (44)	
2011	Korea, Republic of	<i>Hong Jin No. 701</i>	10 (69)				10 (47)	
		<i>Insung No. 7</i>			9 (9)		10 (73)	
	Spain	<i>Tronio</i>	10 (37)					
2012	Korea, Republic of	<i>Hong Jin No. 701</i>	33 (91)		20 (43)		16 (41)	

Table 3: Number of individuals of *Dissostichus* spp. (a) tagged and released and (b) tagging rates reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 since 2007, and (c) total number of tagged fish released and recaptured. (Source: observer data and catch and effort reports.)

(a) Number of individuals of *Dissostichus* spp. tagged and released. The number of *D. eleginoides* is indicated in brackets.

Flag State	Vessel name	Season					
		2007	2008	2009	2010	2011	2012
Japan	<i>Shinsei Maru No. 3</i>				275 (12)		
Korea, Republic of	<i>Hong Jin No. 701</i>					180 (0)	812 (0)
	<i>Insung No. 1</i>	732 (9)	370 (0)	418 (0)			
	<i>Insung No. 2</i>		449 (8)		352 (0)		
	<i>Insung No. 22</i>			533 (14)			
	<i>Insung No. 7</i>					335 (0)	
Namibia	<i>Antillas Reefer</i>	3 (0)	56 (0)				
	<i>Paloma V</i>		47 (5)				
New Zealand	<i>San Aspiring</i>						
Spain	<i>Tronio</i>	502 (5)	202 (7)			232 (0)	
Uruguay	<i>Banzare</i>		10 (0)	176 (0)			
	<i>Paloma V</i>	270 (231)					

(b) Tagging rate (number of fish tagged per tonne of green weight caught) of *Dissostichus* spp.

Flag State	Vessel name	Season					
		2007	2008	2009	2010	2011	2012
Japan	<i>Shinsei Maru No. 3</i>				3.1		
Korea, Republic of	<i>Hong Jin No. 701</i>					4.5	5.2
	<i>Insung No. 1</i>	(>500 fish)	3.0	3.8			
	<i>Insung No. 2</i>		2.9		3.3		
	<i>Insung No. 22</i>			8.9			
	<i>Insung No. 7</i>					3.3	

(continued)

Table 3(b) (continued)

Flag State	Vessel name	Season					
		2007	2008	2009	2010	2011	2012
Namibia	<i>Antillas Reefer</i>	0.13	1.2				
	<i>Paloma V</i>		3.4				
New Zealand	<i>San Aspiring</i>						
Spain	<i>Tronio</i>	(>500 fish)	3.0			3.1	
Uruguay	<i>Banzare</i>		1.0	3.4			
	<i>Paloma V</i>	2.29					
Required rate		3	3	3	3	3	5

(c) Total number of tagged *Dissostichus* spp. released and recaptured in Division 58.4.1.

Season	Number tagged and released			Number recaptured		
	<i>D. eleginoides</i>	<i>D. mawsoni</i>	Total	<i>D. eleginoides</i>	<i>D. mawsoni</i>	Total
2005	22	440	462	0	0	0
2006	1	468	469	0	0	0
2007	245	1262	1507	0	4	4
2008	20	1114	1134	0	6	6
2009	14	1113	1127	0	8	8
2010	12	615	627	1	3	4
2011	0	747	747	0	5	5
2012	0	812	812	0	0	0
Total	314	6571	6885	1	26	27

Table 4: Time series of the tag-overlap statistic (CM 41-01) for *Dissostichus mawsoni* and *D. eleginoides* tagged in Division 58.4.1. The statistic was implemented in 2011, and comparative values were calculated for previous seasons. Values were not calculated for total catches of less than 2 tonnes (*) and length data were aggregated by 10 cm length intervals. Only vessels fishing in CCAMLR fisheries in 2012 are listed in the table.

Species	Flag State	Vessel name	Season					
			2007	2008	2009	2010	2011	2012
<i>D. mawsoni</i>	Japan	<i>Shinsei Maru No. 3</i>			*	57		
	Korea, Republic of	<i>Hong Jin No. 701</i>					70	89
<i>D. eleginoides</i>	Spain	<i>Tronio</i>	31	21			52	
	Japan	<i>Shinsei Maru No. 3</i>			*	43		
	Spain	<i>Tronio</i>	*	*			*	

3.2 Fixed parameter values

14. None available for this fishery.

4. Stock assessment

15. There is no stock assessment for this data-poor exploratory fishery.

5. By-catch of fish and invertebrates

5.1 By-catch removals

16. Catches of by-catch species groups (macrourids, rajids and other species) reported in each season, their respective catch limits, and number of rajids cut from lines and released alive are summarised in Table 5. The by-catch in this fishery consists predominantly of macrourids (up to 41 tonnes per season).

Table 5: Catch history for by-catch species (macrourids, rajids and other species), catch limits and number of rajids released alive in Division 58.4.1. 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	96	0	50	0	-	60	0
2005	96	17	50	<1	-	60	1
2006	96	15	50	<1	-	60	1
2007	96	41	50	<1	-	60	2
2008	96	36	50	<1	-	60	1
2009	33	8	50	<1	-	60	<1
2010	33	6	50	0	-	60	<1
2011	33	3	50	0	-	60	<1
2012	33	2	50	0	-	60	<1

5.2 Assessment of impacts on affected populations

17. None available for this fishery.

5.3 Identification of levels of risk

18. None available for this fishery.

5.4 Mitigation measures

19. Catch limits for by-catch species groups (macrourids, rajids and other species) are provided in CM 33-03.

6. Incidental mortality of birds and mammals

6.1 Incidental mortality reported

20. There have been no observed incidental mortalities of seabirds in Division 58.4.1 since 2005 (Table 6).

Table 6: Seabird by-catch limit, observed mortality rate and total estimated mortality of seabird by-catch in Subarea 58.4, including Division 58.4.1.

Season	By-catch limit (number of birds)	Mortality rate (birds/thousand hooks)	Total estimated mortality (number of birds)
2005	3*	<0.001	8
2006	3*	0	0
2007	3*	0	0
2008	3*	0	0
2009	3*	0	0
2010	3*	0	0
2011	3*	0	0
2012	3*		

* Per vessel during daytime setting.

21. No marine mammal interactions or mortalities were observed in 2011.

6.2 Identification of levels of risk

22. The risk level for seabirds in the fishery in Division 58.4.1 is category 2 (average to low) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

6.3 Mitigation measures

23. CM 25-02 applies to this fishery and in recent years has been linked to an exemption for night setting in CM 24-02 and subject to a seabird by-catch limit. Offal and other discharges are regulated under CM 26-01.

7. Ecosystem implications/effects

24. No evaluation available for this fishery.

8. Harvest controls and management advice

8.1 Conservation measures

25. The limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 are defined in CM 41-11. The limits in force and the Working Group's advice to the Scientific Committee for the forthcoming season are summarised in Table 7.

Table 7: Limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 in force (CM 41-11) and advice to the Scientific Committee for 2013.

Element	Limit in force	Advice for 2013
Catch limit	Precautionary catch limit for <i>Dissostichus</i> spp. was 210 tonnes, and catch limits for each SSRU was as follows: A – 0 tonnes; B – 0 tonnes; C – 100 tonnes; D – 0 tonnes; E – 50 tonnes; F – 0 tonnes; G – 60 tonnes; H – 0 tonnes.	Carry forward
Season	1 December to 30 November	Same period
By-catch	Regulated by CM 33-03.	Carry forward
Mitigation	In accordance with CM 25-02, except paragraph 5 if requirements of CM 24-02 are met.	Carry forward
	Limit of three (3) seabirds per vessel during daytime setting.	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	Carry forward
	Haul-by-haul catch and effort data	Carry forward
	Biological data reported by the CCAMLR scientific observer.	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).	Carry forward
	Toothfish tagged at a rate of at least five fish per tonne green weight caught.	Carry forward
Environmental protection	Regulated by CMs 22-06, 22-07, 22-08 and 26-01. No offal discharge.	Carry forward

8.2 Management advice

26. The advice of WG-FSA in respect of research plans for exploratory fisheries in this Division (and Division 58.4.2) is presented in the main report, paragraphs 5.58 to 5.82. The Scientific Committee noted this advice (SC-CAMLR XXXI, paragraphs 3.142 to 3.145) and agreed that fishing should only occur in the research blocks in SSRUs D, E and G as shown in Figure 5.



Figure 5: Research blocks for proposed research in Divisions 58.4.1 and 58.4.2 in 2013.