

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

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

1. Details of the fishery

The exploratory longline fishery for *Dissostichus* spp. in Division 58.4.1 was first agreed by the Commission in 1998/99 (CM 166/XVII), and licensed vessels first operated in this fishery in 2004/05.

2. In 2010/11, the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 was limited to Japanese, Korean, New Zealand and Spanish vessels using longlines only (CM 41-11). The precautionary catch limit for *Dissostichus* spp. was 210 tonnes and the following limits applied to SSRUs: 100 tonnes in SSRU C; 50 tonnes in SSRU E and 60 tonnes in SSRU G (see 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. The fishing season was from 1 December 2010 to 30 November 2011. Environmental protection in this fishery is regulated by CMs 26-01, 22-06, 22-07 and 22-08.

3. Six Members (Japan, Republic of Korea, New Zealand, Russia, South Africa and Spain) and a total of 11 vessels notified their intention to participate in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 in 2011/12 and the Working Group recommended the existing limits for this fishery be retained in 2011/12.

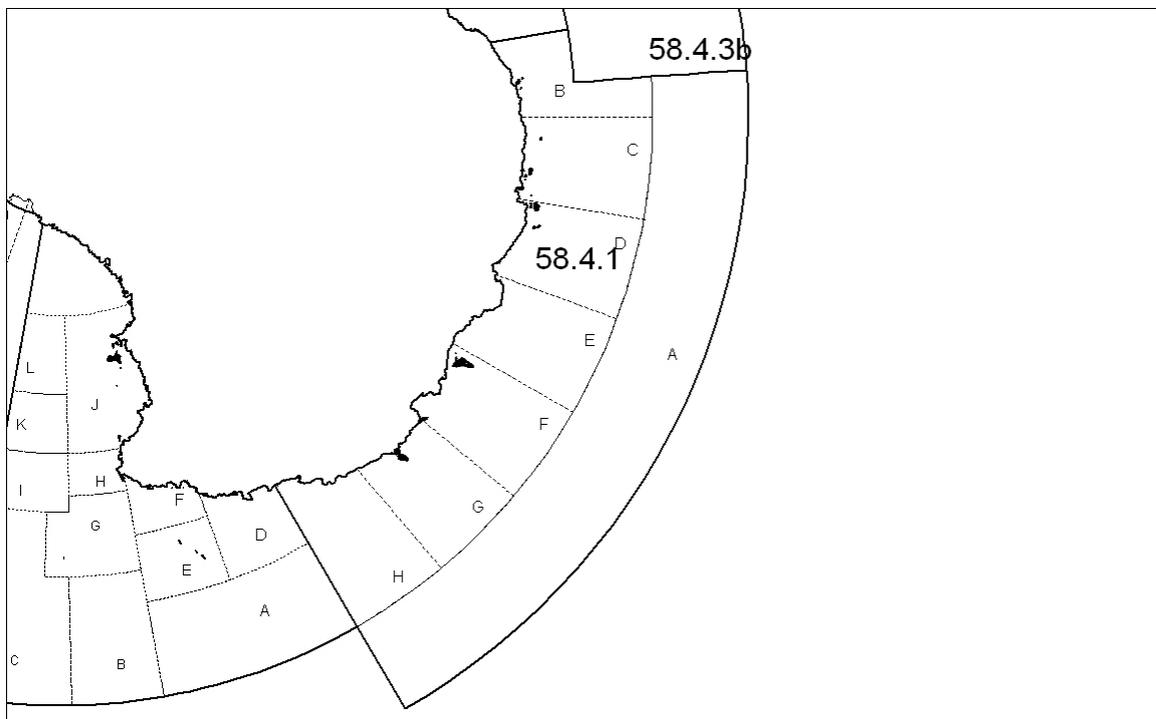


Figure 1: General map of Division 58.4.1 and location of SSRUs (A–H in that division).

1.1 Reported catch

4. Licensed longline vessels have fished the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 since 2004/05, and the target species is *D. mawsoni* (Table 1(a)). In 2010/11, three vessels fished in SSRUs C, E and G (Figure 1). SSRU E was closed on 11 February 2011 (catch limit for *Dissostichus* spp.: 50 tonnes; final reported catch: 56 tonnes), and SSRU G was closed on 12 February 2011 (catch limit for *Dissostichus* spp.: 60 tonnes; final reported catch: 59 tonnes). SSRU C, and consequently the fishery, was closed on 12 March 2011 (SSRU C catch limit for *Dissostichus* spp.: 100 tonnes; final reported catch: 100 tonnes). Whole fishery catch limit for *Dissostichus* spp.: 210 tonnes; final reported catch: 216 tonnes) (Table 1(b)).

5. Reported catches of *Dissostichus* spp. over the past seven seasons peaked at 634 tonnes in 2006/07.

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, WG-FSA-11/10 and 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		
2003/04	-	0	800	0	0	0	-	0
2004/05	9	7	600	1	479	480	-	480
2005/06	11	6	600	0	421	421	597	1 018
2006/07	9	4	600	94	540	634	626	1 260
2007/08	16	6	600	<1	410	410	136	546
2008/09	13	3	210	0	222	222	152	374
2009/10	10	2	210	2	194	196	910	1 106
2010/11	10	3	210	<1	216	216	*	216

* Not estimated

Table 1(b): Catch 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)).

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
2004/05			<1				<1				183		154		143	
2005/06											250		22		152	
2006/07			69		9		16				170		193		188	
2007/08							<1	<1			177	10	15	3	197	10
2008/09							<1				108		54		60	
2009/10			2				<1				96		51		47	
2010/11			<1								100		56		59	

1.2 IUU catch

6. IUU fishing in Division 58.4.1 was first detected in 2005/06, and high levels of IUU fishing in 2005/06, 2006/07 and 2009/10 resulted in the total removals being well in excess of the catch limits. The IUU catch of *Dissostichus* spp. in 2010/11 was not estimated (SC-CAMLR-XXIX, paragraph 6.5).

1.3 Size distribution of catches

7. 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).

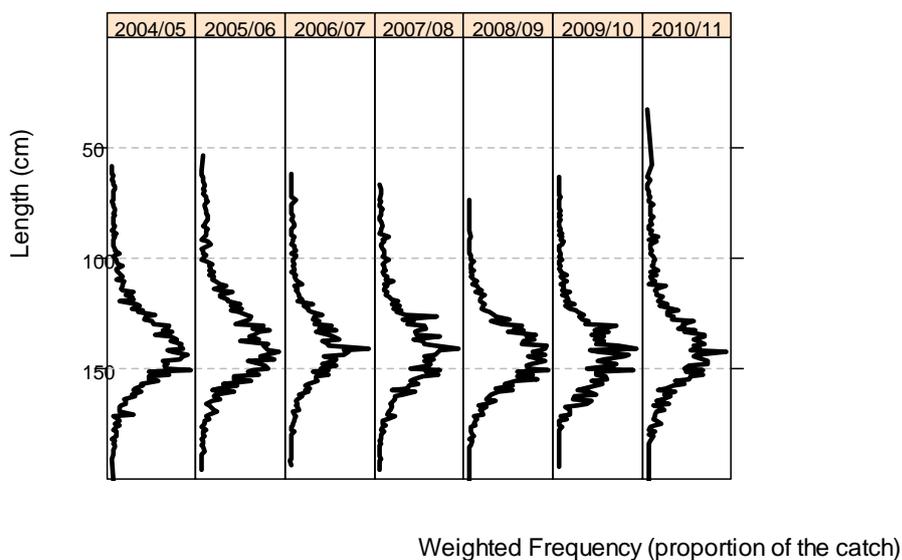


Figure 2: Catch-weighted length frequencies for *Dissostichus mawsoni* in Division 58.4.1 (source: observer and fine-scale data).

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 north of the Ross Sea and the Amundsen Ridge in the Amundsen Sea. In the Cooperation Sea 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.

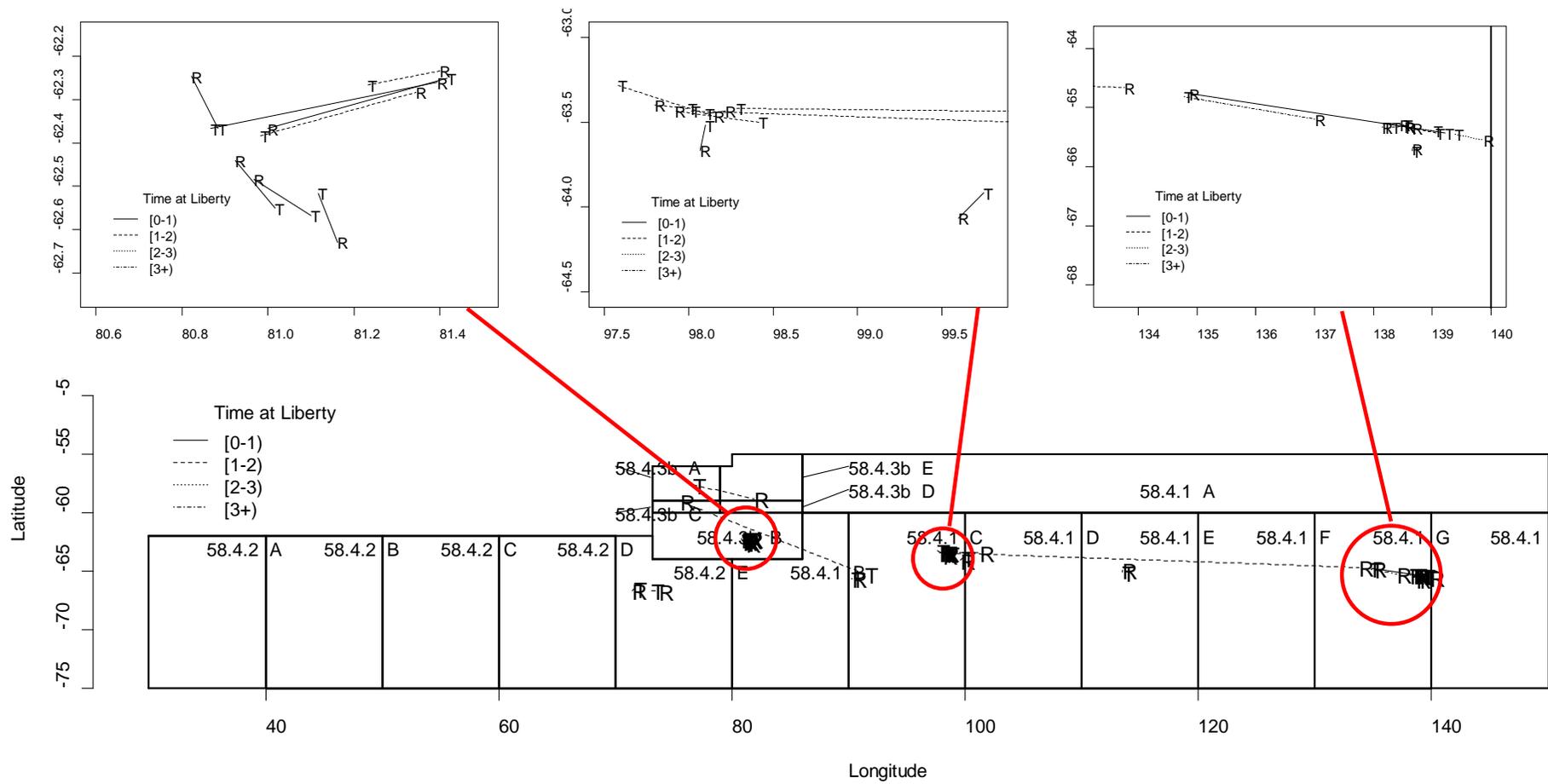


Figure 3: Plot of tag-recaptures in Divisions 58.4.1, 58.4.2 and 58.4.3b recorded between 2003/04 and 2009/10. 'T' indicates the release location and 'R' indicates the recapture location.

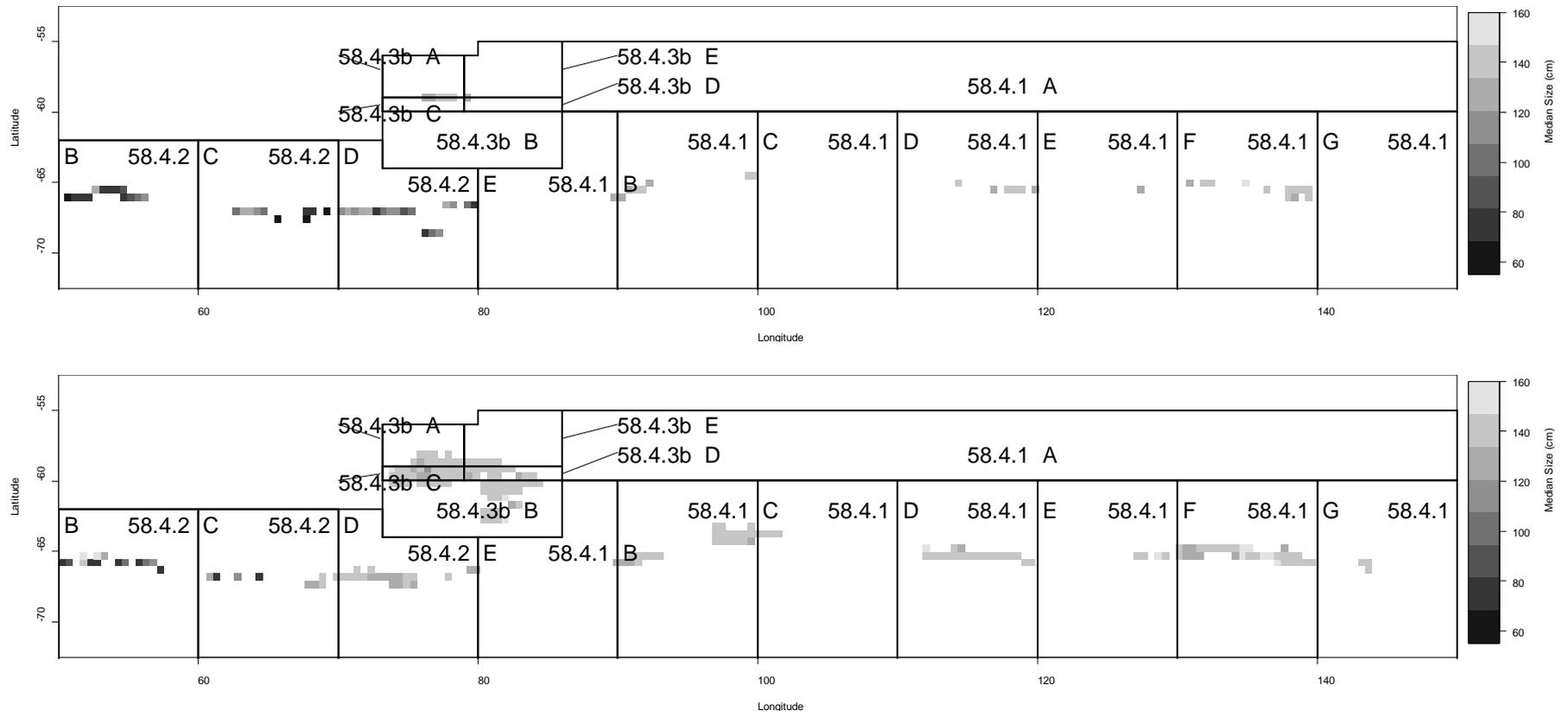


Figure 4: Plot of median lengths for longlines sampled in Divisions 58.4.1, 58.4.2 and 58.4.3b between 2003/04 and 2008/09, aggregated into 0.5° latitude × 0.5° longitude boxes. The upper panel shows data for fishing in depths shallower than 1 000 m, the lower panel for fishing in depths deeper than 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).

12. Vessels, on first entry into an SSRU, are required to make 10 research longline hauls. The requirement for a further 10 research hauls during the course of fishing was removed in 2008 and since 2008/09 the starting position of research hauls has been allocated by the Secretariat. The number of research hauls reported in fine-scale data are summarised in Table 2.

13. Since 2006/07, vessels have been required to tag and release *Dissostichus* spp. at a rate of three fish per tonne of green weight caught (previously one fish per tonne), and a limit of 500 fish tagged per vessel applied until the end of 2009/10. A total of 5 759 *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). Of the fish tagged and released, 2 286 were released in SSRU C, 33 in SSRU D, 1 347 in SSRU E, 9 in SSRU F, 2 325 in SSRU G and 73 in SSRU H.

14. In 2010, the Commission required each vessel catching more than 2 tonnes of *Dissostichus* spp. in an exploratory fishery to achieve a minimum tag overlap statistic of 50% in 2010/11 and of 60% from 2011/12 onwards (Annex 41-01/C). All vessels fishing in Division 58.4.1 in 2010/11 achieved a tag overlap statistic greater than 50% (range 52 to 74%, Table 4).

Table 2: Research (R) and commercial (C) longline hauls reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 (source: fine-scale data).

Season	Flag State	Vessel name	SSRU	Number of hauls		
				R	C	Total
2004/05	Chile	<i>Globalpesca II</i>	5841C	2		2
		<i>Globalpesca II</i>	5841E	20	11	31
		<i>Globalpesca II</i>	5841G	8		8
	Korea, Republic of	<i>Bonanza No. 707</i>	5841C	13		13
		<i>Yeon Seong No. 829</i>	5841C	10	14	24
		<i>Yeon Seong No. 829</i>	5841E	10	3	13
		<i>Yeon Seong No. 829</i>	5841G	10	45	55
	New Zealand	<i>Janas</i>	5841C	2		2
		<i>San Aspiring</i>	5841G	20		20
	Spain	<i>Arnela</i>	5841C	5	24	29
<i>Galaecia</i>		5841C	20	53	73	
<i>Galaecia</i>		5841E	12	5	17	
2005/06	Chile	<i>Globalpesca I</i>	5841C	20		20
		<i>Globalpesca I</i>	5841E	10		10
		<i>Globalpesca II</i>	5841C	20	3	23
	Korea, Republic of	<i>Globalpesca II</i>	5841G	20	1	21
		<i>Insung No. 2</i>	5841E	15	6	21
		<i>Insung No. 2</i>	5841G	20	29	49

(continued)

Table 2 (continued)

Season	Flag State	Vessel name	SSRU	Number of hauls			
				R	C	Total	
2006/07	New Zealand	<i>San Aspiring</i>	5841E	1		1	
	Spain	<i>Tronio</i>	5841C	20	54	74	
	Uruguay	<i>Paloma V</i>	5841G	5		5	
	Korea, Republic of	<i>Insung No. 1</i>	5841C	8		8	
		<i>Insung No. 1</i>	5841E	20	15	35	
		<i>Insung No. 1</i>	5841G	20	59	79	
	Namibia	<i>Antillas Reefer</i>	5841C	17	7	24	
	Spain	<i>Tronio</i>	5841C	20	38	58	
		<i>Tronio</i>	5841E	20	58	78	
	Uruguay	<i>Tronio</i>	5841F		4	4	
		<i>Paloma V</i>	5841C	20	51	71	
		<i>Paloma V</i>	5841E	21		21	
2007/08	Korea, Republic of	<i>Paloma V</i>	5841G	20	5	25	
		<i>Insung No. 1</i>	5841C	12	7	19	
		<i>Insung No. 1</i>	5841E	2		2	
		<i>Insung No. 1</i>	5841G	20	55	75	
		<i>Insung No. 2</i>	5841C	41		41	
		<i>Insung No. 2</i>	5841E	7		7	
		<i>Insung No. 2</i>	5841G	20	42	62	
		Namibia	<i>Antillas Reefer</i>	5841C	20	29	49
		<i>Paloma V</i>	5841G	20	3	23	
	Spain	<i>Tronio</i>	5841C	14	2	16	
		<i>Tronio</i>	5841D	13		13	
		<i>Tronio</i>	5841E	9		9	
	<i>Tronio</i>	5841F	6		6		
	<i>Tronio</i>	5841G	20	20	40		
	<i>Tronio</i>	5841H	7		7		
Uruguay	<i>Banzare</i>	5841C	10	6	16		
	<i>Banzare</i>	5841E	4		4		
2008/09	Korea, Republic of	<i>Insung No. 1</i>	5841C	10	14	24	
		<i>Insung No. 1</i>	5841E	10	35	45	
		<i>Insung No. 22</i>	5841G	10	85	95	
Uruguay	<i>Banzare</i>	5841C	10	33	43		
2009/10	Japan	<i>Shinsei Maru No. 3</i>	5841C	10	45	55	
		<i>Shinsei Maru No. 3</i>	5841G	10	28	38	
	Korea, Republic of	<i>Insung No. 2</i>	5841C	5		5	
		<i>Insung No. 2</i>	5841E	10	3	13	
		<i>Insung No. 2</i>	5841G	10	34	44	
2010/11	Korea, Republic of	<i>Hong Jin No. 701</i>	5841C	10	59	69	
		<i>Hong Jin No. 701</i>	5841G	10	37	47	
		<i>Insung No. 7</i>	5841E	9	0	9	
		<i>Insung No. 7</i>	5841G	10	63	73	
		Spain	<i>Tronio</i>	5841C	10	27	37

Table 3: Number of individuals of *Dissostichus* spp. tagged and released (a) and tagging rates (b) reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.1 since 2006/07, and total number of tagged fish released and recaptured (c) (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				
		2006/07	2007/08	2008/09	2009/10	2010/11
Chile	<i>Globalpesca I</i>					
	<i>Globalpesca II</i>					
Japan	<i>Shinsei Maru No. 3</i>				275 (12)	
Korea, Republic of	<i>Hong Jin No. 701</i>					180 (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				
		2006/07	2007/08	2008/09	2009/10	2010/11
Chile	<i>Globalpesca I</i>					
	<i>Globalpesca II</i>					
Japan	<i>Shinsei Maru No. 3</i>				3.1	
Korea, Republic of	<i>Hong Jin No. 701</i>					4.5
	<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
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

(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
2004/05	22	440	462			
2005/06	1	468	469			
2006/07	245	1262	1507	0	4	4
2007/08	20	1114	1134	0	6	6
2008/09	14	1113	1127	0	8	8
2009/10	12	615	627	1	3	4
2010/11	0	747	747	0	5	5
Total	314	5759	6073	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 2010/11, 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.

Species	Flag State	Vessel Name	2006/07	2007/08	2008/09	2009/10	2010/11
<i>D. mawsoni</i>	Japan	<i>Shinsei Maru No. 3</i>			*	56	
	Korea, Republic of	<i>Hong Jin No. 701</i>					74
		<i>Insung No. 7</i>					70
<i>D. eleginoides</i>	Spain	<i>Tronio</i>	31	21			52
	Japan	<i>Shinsei Maru No. 3</i>			*	43	
		Korea, Republic of	<i>Hong Jin No. 701</i>				
	Spain		<i>Tronio</i>	*	*		

3.2 Fixed parameter values

15. None available for this fishery.

4. Stock assessment

16. WG-FSA-08/63 examined expected tag-recapture rates in new and exploratory *Dissostichus* spp. fisheries in the southern Indian Ocean sector. In particular, the paper considered the potential for tagging programs in new and exploratory fisheries to yield sufficient data to be of use in determining catch limits in the early stages of fishery development. Scenarios were developed using a range of tag-release rates, tag-detection rates, natural mortality, fish movement out of the fishery, and IUU removals in order to estimate the expected numbers of tag-returns. Even under 'worst-case' assumptions (e.g. lower detection rates, higher tag mortality, high levels of emigration and high IUU) tag-recaptures were still expected to be considerably higher than currently observed in Divisions 58.4.1 and 58.4.2. The paper concluded that if current tag-recapture rates continue, then tag-based assessments of stock status in Divisions 58.4.1 and 58.4.2 are likely to remain uncertain in the short to medium term, and fishing should remain focused in areas where tag-releases have been concentrated until these uncertainties can be addressed.

17. Progress on assessing the exploratory fishery in Divisions 58.4.1 and 58.4.2 was presented in WG-SAM-08/4 and a summary was provided in SC-CAMLR-XXVII, Annex 7, paragraphs 3.1 to 3.5. WG-SAM recommended that WG-FSA use the methods described in this paper to provide management advice for the *Dissostichus* spp. fishery in this division, once a number of modifications had been made (SC-CAMLR-XXVII, Annex 7, paragraph 4.3). WG-SAM also recommended that tagging be continued at the current rate in these divisions.

18. An updated assessment of the exploratory fisheries in Divisions 58.4.1 and 58.4.2, including the minor modifications requested by WG-SAM, was provided in WG-FSA-08/43. The authors compared estimates of abundance for these areas using four methods: comparative CPUE trends, local depletions, a constant recruitment model and mark-recapture data. Recapture rates were so low that a reliable stock assessment based on these data was not possible, and instead they presented estimates of the number of expected tag-returns given the estimated biomass. Estimates of biomass by SSRU were moderately consistent between CPUE comparisons and local depletion methods. However, the predicted estimates of tag-recaptures were much higher than those observed. The paper provided tentative estimates of precautionary yield from Divisions 58.4.1 and 58.4.2, noting that these are substantially lower than the existing catch limits.

19. The Working Group noted that the full uncertainty in the longline CPUE in the two areas had not been incorporated into the assessment. For the purposes of providing advice on potential catch limits for the open SSRUs in Divisions 58.4.1 and 58.4.2, a further analysis was carried out which incorporated the uncertainty in CPUE into the biomass estimates for the SSRUs obtained using the comparative CPUE method detailed in WG-FSA-08/43. SSRU-specific yield calculations were calculated assuming an exploitation rate of 0.05 (which appears to be a sustainable exploitation rate for the assessed *Dissostichus* spp.) multiplied by the biomass estimate. Estimates of yield were also made for SSRUs 5841C, 5842A and 5842E based on depletion-derived biomass estimates. These are the only SSRUs for which depletion estimates were available over several years, from which the most recent best-fit depletion was selected. Yields were calculated separately for the median, 25 percentile and 75 percentile biomass values for each SSRU. The results of the analysis are presented in Table 5.

20. WG-FSA-09/14 Rev. 1 presented an assessment of *D. mawsoni* in Division 58.4.1 using an age-structured TISVPA model and a dynamic Schaefer-production model. The analysis suggested that current biomass in the division was about 12 000 tonnes and initial stock biomass was 19 000 tonnes. The paper used these results to calculate yield based on a proportion of 3.75% of initial biomass as being 724 tonnes (SC-CAMLR-XXVIII, Annex 5, paragraphs 4.15 to 4.19).

Table 5: Yield estimates (tonnes) assuming a 5% exploitation rate by SSRU using the median, 25 percentile (25%), and 75 percentile (75%) biomass levels calculated using the comparative CPUE and depletion-derived methods. Estimates are relative to the 2006/07 fishing season.

Method	SSRU			
	5841C		5841E	5841G
	CPUE	Depletion	CPUE	CPUE
Median	98	95	43	51
25%	58	90	4	13
75%	138	100	83	88
Current catch limit		200	200	200
2007/08 catch		177	16	197
Range in catches		177–249	16–186	144–206

21. Dr L. Pshenichnov (Ukraine) noted that the estimation of fished areas of Divisions 58.4.1 and 58.4.2 has not been corrected for the closed SSRUs of Divisions 58.4.1 and 58.4.2. He noted that the assumption that CPUE is proportional to toothfish density is not correct for a longline fishery, and that this leads to an increase in the uncertainty of the analysis. He further noted that the biomass of toothfish was estimated by means of an unknown constant (the catchability) (WG-FSA-08/43). Catchability of longline as a whole, and longlining of toothfish in particular, is unknown and should not be used for biomass estimation. He also considered that catches of immature (1–4 years old) fish in Division 58.4.2 (WG-FSA-08/23) using bottom trawls are similar to those found in other subareas which suggests that recruitment and biomass of fish in this division is also similar to those subareas. This is inconsistent with the summary of WG-FSA-08/43.

22. The Working Group considered that although the estimates of yield from the analysis were uncertain, the results suggested that the size of the *Dissostichus* spp. population in these two divisions was likely to be small and that the current catch limits were unlikely to be sustainable. The Working Group therefore recommended that the catch limits be reduced in each of the open SSRUs in Divisions 58.4.1 and 58.4.2 to the estimates of yield based on the median biomass estimates provided in Table 5. The Working Group also recalled the work of WG-SAM which considered that catches of 10 tonnes were unable to provide useful information to enable the assessment of a stock except in circumstances of well-designed research programs testing clear hypotheses (SC-CAMLR-XXVII, Annex 7, paragraph 4.6). Therefore, the Working Group further recommended that SSRUs with a yield of less than 20 tonnes be closed to fishing.

23. The Working Group noted that Russia had begun research on *Dissostichus* spp. in this division (WG-FSA-09/14 Rev. 1). The Working Group encouraged the continuation of the work during the intersessional period and for the otolith readings to be verified by CON (SC-CAMLR-XXVIII, Annex 5, paragraphs 9.4 to 9.8) and for the results to be evaluated by WG-SAM (SC-CAMLR-XXVIII, Annex 6, paragraph 3.18).

5. By-catch of fish and invertebrates

5.1 By-catch removals

24. Catches of by-catch species groups (macrourids, rajids and other species) reported in fine-scale data, their respective catch limits, and number of rajids cut from lines and released alive are summarised in Table 6. The by-catch in this fishery consists predominantly of macrourids (up to 41 tonnes per season). The total reported catch of rajids has been low (<100 kg).

Table 6: 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)
2003/04	96	0	50	0	-	60	0
2004/05	96	17	50	<1	-	60	1
2005/06	96	15	50	<1	-	60	1
2006/07	96	41	50	<1	-	60	2
2007/08	96	36	50	<1	-	60	1
2008/09	33	8	50	<1	-	60	0
2009/10	33	6	50	0	-	60	0
2010/11	33	3	50	0	-	60	0

5.2 Assessment of impacts on affected populations

25. None available for this fishery.

5.3 Identification of levels of risk

26. None available for this fishery.

5.4 Mitigation measures

27. In 2008, the Commission agreed to the Year-of-the-Skate, and the protocol in CCAMLR-XXVII, paragraph 4.55, was implemented.

28. In 2009, the Commission agreed that the Year-of-the-Skate should be extended to 2009/10 in order to allow for sufficient data to be collected for preliminary assessments to be made in the future (see SC-CAMLR-XXIX, Annex 8, paragraphs 6.14 to 6.21).

29. During WG-FSA-10 it was concluded that the Year-of-the-Skate had been a success overall and had met its objectives to enhance data collection and improve tagging in order to develop assessments (SC-CAMLR-XXVI, Annex 5, paragraphs 6.34 and 6.35). Based on the

conclusions reported in WG-FSA-10/25 for data in Subareas 88.1 and 88.2 and review of data across all exploratory areas and divisions during the meeting, the Working Group concluded that data collection rates for skates could return to standard levels for these species in 2010/11 until further notice, and the mandatory skate tagging requirements could be removed from the relevant conservation measures. However, the requirement for all skates to be brought on board or alongside the hauler to be correctly identified, scanned for tags and for their condition to be assessed should be made mandatory, and the Working Group recommended that CM 33-03 be revised accordingly. Continued scanning for tags by crew and observers is imperative to enable updates to be made to preliminary assessments of skates in the future.

6. By-catch of birds and mammals

6.1 By-catch removals

30. There have been no observed incidental mortalities of seabirds in Division 58.4.1 in the past four seasons (Table 7).

Table 7: 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)
2004/05	3*	<0.001	8
2005/06	3*	0	0
2006/07	3*	0	0
2007/08	3*	0	0
2008/09	3*	0	0
2009/10	3*	0	0
2010/11	3*	0	0

* Per vessel during daytime setting.

31. No marine mammal interactions or mortalities were observed in 2010/11.

32. In 2011, as in previous seasons, WG-IMAF agreed the risk level of seabirds in this fishery in Division 58.4.1 is category 2 (average to low) (SC-CAMLR-XXX, Annex 8).

6.2 Mitigation measures

33. 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

34. No evaluation available for this fishery.

8. Harvest controls and management advice

8.1 Conservation measures

35. 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 8.

Table 8: 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 2011/12.

Element	Limit in force	Advice for 2011/12
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 three fish per tonne green weight caught.	Carry forward
Environmental protection	Regulated by CMs 26-01, 22-06, 22-07 and 26-01. No offal discharge.	Carry forward

8.2 Management advice

36. The Working Group agreed that it could provide no new advice on catch limits for this subarea and noted the recommendations for increasing the research requirements in this fishery identified in the main report, paragraphs 6.75 to 6.80.