APPENDIX H

FISHERY REPORT: EXPLORATORY FISHERY FOR *DISSOSTICHUS* SPP. IN DIVISION 58.4.3B

CONTENTS

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1. Details of the fishery

The longline fishery for *Dissostichus* spp. in Division 58.4.3 began as a new fishery in 1996/97 (Conservation Measure 113/XV). Following the Commission's decision that high levels of IUU fishing for *Dissostichus* spp. in the Convention Area had rendered it unrealistic to consider this fishery as 'new' (CCAMLR-XVIII, paragraph 10.14), and 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 in 2000/01: exploratory trawl fisheries on BANZARE Bank (Conservation Measure 203/XIX) and Elan Bank (Conservation Measure 205/XIX); and exploratory longline fisheries outside areas of national jurisdiction at BANZARE Bank (Conservation Measure 204/XIX) and Elan Bank (Conservation Measure 206/XIX).

2. In 2001, the boundaries of Division 58.4.3 were rearranged on the basis of ecological considerations, and two new divisions were formed: Division 58.4.3a (Elan Bank) and Division 58.4.3b (BANZARE Bank) (see Figure 1). The Commission agreed to exploratory fishery for *Dissostichus* spp. in each of these new divisions, outside areas of national jurisdiction.

3. In 2006/07, the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b was limited to Australian, Japanese, Korean, Namibian, Spanish and Uruguayan vessels using longlines only, and no more than one vessel per country was permitted to fish at any one time (Conservation Measure 41-07). The precautionary catch limit for *Dissostichus* spp. was 300 tonnes. The catch limits for by-catch species were defined in Conservation Measure 33-03. The fishing season was from 1 May to 31 August 2007. Fishing was permitted outside the prescribed season provided that each vessel demonstrated its capacity to comply with the requirements for longline weighting outlined in Conservation Measure 24-02.

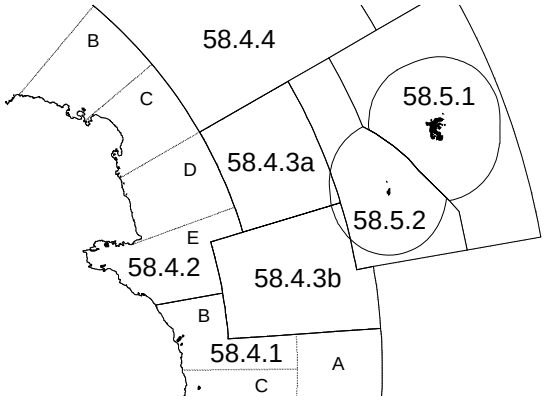

Figure 1: General map of Division 58.4.3b (BANZARE Bank). This division consists of a single SSRU.

1.1 Reported catch

4. Licensed longline vessels have fished the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b since 2003/04, and the target species is *D. mawsoni* (Table 1). In 2006/07, four vessels fished and reported a total catch of 253 tonnes of *Dissostichus* spp. (84% of the precautionary catch limit for the fishery). The catch consisted predominantly of *D. mawsoni*, however, a higher proportion of *D. eleginoides* was reported in 2006/07 than in previous seasons. Following information received from the People's Republic of China (see COMM CIRC 07/69), the fishery was closed on 30 June 2007 (CCAMLR-XXVI/BG/17, Table 3 and paragraph 12).

1.2 IUU catch

5. Information on IUU activities indicated high levels of IUU fishing, and the estimated catch of *Dissostichus* spp. exceeded 1 000 tonnes in 2004/05 and in 2005/06, and exceeded 2 000 tonnes in 2006/07 (Table 1, see also WG-FSA-07/10 Rev. 5). The total removals of *Dissostichus* spp. estimated in 2006/07 were 2 546 tonnes (8.5 times the catch limit).

Table 1: Catch history for *Dissostichus* spp. in Division 58.4.3b (source: STATLANT data for past seasons, and catch and effort reports for current season, WG-FSA-07/10 Rev. 5 and past reports for IUU catch).

Season	Regulated fishery						Estimated IUU catch (tonnes)	Total removals (tonnes)
	Effort (number of vessels)		*Dissostichus* spp.					
			Catch limit (tonnes)	Reported catch (tonnes)				
	Limit	Reported		*D. eleginoides*	*D. mawsoni*	Total		
2003/04	6	1	300	1	6	7	246	253
2004/05	5	4	300	1	296	297	1015	1312
2005/06	5	4	300	44	317	361	1903	2264
2006/07	6	4	300	75	178	253	2293	2546

1.3 Size distribution of catches

6. Most *D. mawsoni* caught in the fishery ranged from 110 to 170 cm in length, with a broad mode at approximately 130–160 cm (Figure 2). *Dissostichus eleginoides* caught in 2006/07 ranged from 50 to 180 cm in length, with a broad mode at approximately 120–130 cm (Figure 3). There was some concern over the correct identification of this species.

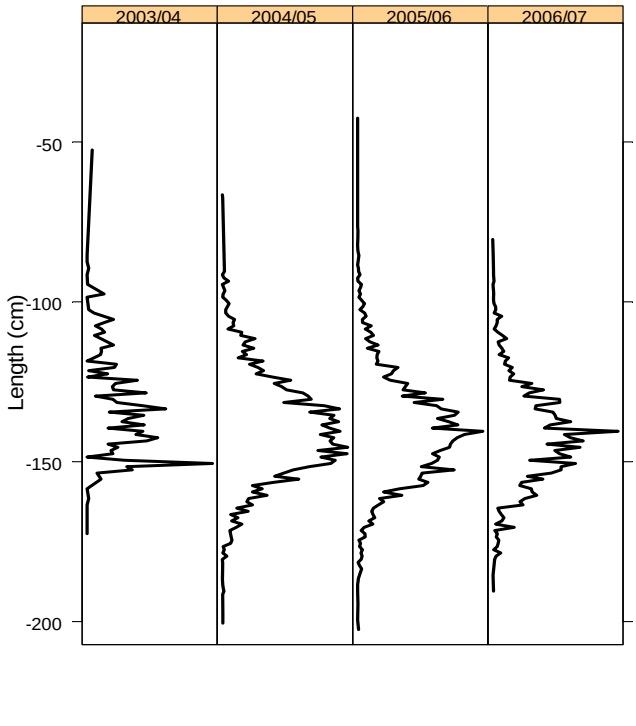

Figure 2: Catch-weighted length frequencies for *Dissostichus mawsoni* in Division 58.4.3b (source: observer, fine-scale and STATLANT data, and the length–weight relationship was taken from observations on *D. mawsoni* in Subarea 88.1.)

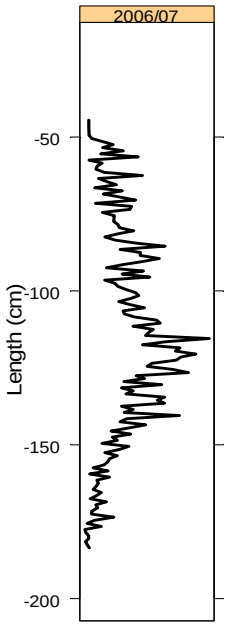

Figure 3: Catch-weighted length frequencies for *Dissostichus eleginoides* in Division 58.4.3b in 2006/07. There was some concern over the correct identification of this species. (Source: observer, fine-scale and STATLANT data, and the length–weight relationship was taken from observations on *D. eleginoides* in Subarea 48.3.)

2. Stocks and areas

7. No data are available on the stock structure of fish in this fishery. The persistent lack of small *D. mawsoni* in the catch from this area suggests that juveniles live outside this area and move in as adults. The apparent sudden change in species composition (more *D. eleginoides* reported in the catch) indicates that the population of this species on BANZARE Bank is also connected with those in adjacent areas.

3. Parameter estimation

3.1 Observations

8. A demersal trawl survey has been undertaken in this area in 1999, which caught only two fish of *Dissostichus* spp. in 40 shots taken across the area (SC-CAMLR-XVIII, Annex 5, paragraph 3.79; WG-FSA-99/69).

9. Vessels operating in this fishery are required to conduct fishery-based research in accordance with Conservation Measure 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).

10. Vessels, on first entry into an SSRU, are required to make 10 research longline hauls. A further 10 research hauls are required during the course of fishing. The number of research hauls reported in fine-scale data are summarised in Table 2.

11. Vessels are also required to tag and release *Dissostichus* spp. at a rate of one fish per tonne of green-weight catch, and vessels may discontinue tagging once 500 fish have been tagged. A total of 554 *D. mawsoni* and 141 *D. eleginoides* (total 695 fish) have been tagged and released and eight *D. mawsoni* have been recaptured in that division (Table 3).

12. The Working Group noted that tagging rates by vessels in this area have apparently been much lower than tagging rates by the same vessels in other areas in the past, however, all vessels reported tagging rates of one fish per tonne or above in 2006/07. The Working Group also noted that *D. eleginoides* tends to be tagged at a higher rate than *D. mawsoni* on particular vessels. The Working Group requested information from the vessels and observers operating in Subarea 58.4 on the reasons for this different tagging rate between species.

Table 2: Research (R) and commercial (C) longline hauls reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b (source: fine-scale data).

Season	Flag State	Vessel name	Number of hauls		
			R	C	Total
2003/04	Australia	*Eldfisk*	13	6	19
2004/05	Chile	*Globalpesca II*	10	9	19
	Korea, Republic of	*Yeon Seong No. 829*	10	6	16
	Spain	*Arnela*	30	67	97
		Galaecia	20	8	28
2005/06	Chile	*Globalpesca I*	11		11
	Spain	*Galaecia*	21	47	68
		Tronio	6	63	69
	Uruguay	*Paloma V*	23	20	43
2006/07	Japan	*Shinsei Maru No. 3*	20	128	148
	Namibia	*Antillas Reefer*	18	32	50
	Spain	*Tronio*	20	17	37
	Uruguay	*Paloma V*	20	27	47

Table 3: Number of individuals of *Dissostichus* spp. tagged and released and the tagging rate (fish per tonne of green weight caught) reported by vessels operating in the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b. The number of *D. eleginoides* is indicated in brackets. The total number of tagged fish recaptured to date in Division 58.4.3b is also included. (Source: observer data and catch and effort reports.)

Season	Flag State	Vessel name	*Dissostichus* spp. tagged and released		
			Number of fish		Tagging rate
2003/04	Australia	*Eldfisk*	0		0
2004/05	Chile	*Globalpesca II*	13	(0)	0.33
	Korea, Republic of	*Yeon Seong No. 829*	1	(0)	0.08
	Spain	*Arnela*	206	(6)	0.93
		Galaecia	11	(4)	0.52
2005/06	Chile	*Globalpesca I*	0		0
	Spain	*Galaecia*	97	(2)	0.66
		Tronio	38	(0)	0.23
	Uruguay	*Paloma V*	40	(2)	0.85
2006/07	Japan	*Shinsei Maru No. 3*	112	(37)	1.02
	Namibia	*Antillas Reefer*	49	(47)	2.06
	Spain	*Tronio*	81	(0)	1.00
	Uruguay	*Paloma V*	47	(43)	1.24
Total number of fish tagged and released			695	(141)	
Total number of tagged fish recaptured in Division 58.4.3b			8	(0)	

3.2 Fixed parameter values

13. None available for this fishery.

4. Stock assessment

14. The catch limits in this fishery were agreed by the Commission based on advice provided by the Scientific Committee. Analysis provided in WG-FSA-07/44, based on fine-scale catch and effort data, indicates that CPUE data for BANZARE Bank show high levels of heterogeneity in catch and effort, making the production of a standardised CPUE series difficult. The Working Group concluded that the combination of high IUU and legal fishing focusing in small areas was resulting in severe decline in CPUE, indicating unsustainable depletion of toothfish in the main areas where fishing data are available.

5. By-catch of fish and invertebrates

5.1 By-catch removals

15. 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 4. The by-catch in this fishery consists predominantly of macrourids (up to 17 tonnes per season). Catches of rajids have reached 6 tonnes per season.

16. Analyses of catch rates of macrourids and rajiformes presented in WG-FSA-07/44 indicate that they are highly variable. Attempts to analyse the population characteristics of the main by-catch groups were impossible due to a lack of reporting of biological data by observers from vessels that caught substantial amounts of by-catch (Table 5).

Table 4: Catch history for by-catch species (macrourids, rajids and other species), catch limits and number of rajids released alive in Division 58.4.3b. Catch limits are for the whole fishery (see Conservation Measure 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	159	0	50	0	-	20	0
2004/05	159	7	50	6	-	20	0
2005/06	159	8	50	1	-	20	0
2006/07	159	17	50	3	1267	20	1

Table 5: By-catch reported in C2 data from BANZARE Bank (Division 58.4.3b) showing total weight (kg) of by-catch species by Flag State and vessel. Shaded cells show instances where catch of a species/group was reported in the C2 dataset, but no biological data was reported in the observer data. AUS – Australia; CHL – Chile; ESP – Spain; JPN – Japan; KOR – Republic of Korea; NAM – Namibia; URY – Uruguay.

	Flag State										Total
	AUS	CHL		ESP			JPN	KOR	NAM	URY	
Vessel number:	1	1	2	1	2	3	1	1	1	1	
By-catch species											
Antimora rostrata (ANT)	-	-	14	13	120	75	519	4	10	38	793
Bathyraja mccaini (BAM)	-	-	-	-	-	-	-	810	-	-	810
Bathyraja spp. (BHY)	-	-	-	-	-	-	-	-	-	1 395	1 395
Macrourus spp. (GRV)	131	40	478	1 955	5 337	4139	-	663	-	10 384	23 126
Somniosus microcephalus (GSK)	-	-	-	-	300	-	-	-	-	-	300
Channichthyidae (ICX)	-	-	-	2	-	-	-	-	4	-	6
Invertebrata (INV)	-	7	-	-	-	-	-	-	-	10	17
Lithodes spp. (KCX)	-	-	-	-	-	20	13	-	-	-	33
Lithodidae (KCZ)	-	-	-	-	-	-	-	-	-	13	13
Lampris immaculatus (LAI)	-	-	15	-	-	-	-	-	-	-	15
Muraenolepis spp. (MRL)	-	1	-	-	4	2	67	-	-	-	73
Notothenia squamifrons (NOS)	-	-	-	-	-	-	234	-	17	-	251
Octopodidae (OCT)	-	1	-	-	-	-	-	-	-	-	1
Rajiformes (RAJ)	-	42	-	-	-	-	-	-	-	-	42
Salilota australis (SAO)	-	-	-	-	-	-	-	-	-	35	35
Raja Georgiana (SRR)	-	-	-	-	4 328	1	-	-	-	-	4 328
Raja spp. (SRX)	114	-	365	533	-	319	-	-	1 452	354	3 137
Macrourus whitsoni (WGR)	-	-	-	-	-	-	7 764	-	671	-	8 435

5.2 Assessment of impacts on affected populations

17. The current by-catch limit for *Macrourus* spp. was estimated in 2003 using the precautionary approach adopted for krill (SC-CAMLR-XXII, Annex 5, paragraphs 5.250 to 5.252; van Wijk et al., 2003), where the estimate of B_0 was taken from the trawl survey in 1999 (van Wijk et al., 2000).

18. No new information was available for this fishery.

5.3 Identification of levels of risk

19. None available for this fishery.

5.4 Mitigation measures

20. The Commission has agreed that, where possible, vessels should release rays from the lines by cutting the snoods when the rays are still in the water, unless requested not to do so by the scientific observer during the biological sampling period (CCAMLR-XXIV, paragraph 4.51). The Commission has been requested to review this mitigation practice (see SC-CAMLR-XXVI, Annex 5, paragraph 5.53).

6. By-catch of birds and mammals

6.1 By-catch removals

21. Details of seabird by-catches are summarised in Table 6.

Table 6: Seabird by-catch limit, observed mortality rate and total estimated mortality of seabird by-catch in Division 58.4.3b (from SC-CAMLR-XXVI, Annex 6, Part II, Table 2).

Season	By-catch limit (number of birds)	Mortality rate (birds/thousand hooks)	Total estimated mortality (number of birds)
2003/04	3*	0	0
2004/05	3*	0	0
2005/06	3*	0.0002	2
2006/07	3*	0	0

* Per vessel during daytime setting

22. No marine mammal interactions or mortalities were reported.

23. Ad hoc WG-IMAF assessed the risk level of seabirds in this fishery in Division 58.4.3b as category 3 (average) (SC-CAMLR-XXVI, Annex 6, Part II, Table 20).

6.2 Mitigation measures

24. Conservation Measure 25-02 applies to this fishery and in recent years has been linked to an exemption for night setting in Conservation Measure 24-02 and subject to a seabird by-catch limit. Offal and other discharges are regulated under annual conservation measures (e.g. Conservation Measures 41-07 and 26-01).

7. Ecosystem implications/effects

25. No evaluation available for this fishery.

8. Harvest controls and management advice

8.1 Conservation measures

26. The limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b are defined in Conservation Measure 41-07. The limits in force in 2006/07 and the Working Group's advice to the Scientific Committee for the forthcoming 2007/08 season are summarised in Table 7.

Table 7: Limits on the exploratory fishery for *Dissostichus* spp. in Division 58.4.3b in 2006/07 (Conservation Measure 41-07) and advice to the Scientific Committee for 2007/08.

Element	Limit in 2006/07	Advice for 2007/08
Access	No more than one vessel per country at any one time.	Carry forward
Catch limit	Precautionary catch limit for *Dissostichus* spp. was 300 tonnes outside areas of national jurisdiction.	review
Season	1 May to 31 August, with fishing permitted outside the prescribed season provided that each vessel demonstrated its capacity to comply with the requirements for longline weighting outlined in Conservation Measure 24-02.	Same period and conditions
By-catch	Regulated by CM 33-03.	Review
Mitigation	In accordance with CM 25-02, except paragraph 4 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 one scientific observer appointed in accordance with the CCAMLR Scheme.	Carry forward
Data	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 one fish per tonne green weight caught.	Carry forward
Environmental protection	Regulated by CM 26-01.	Carry forward

8.2 Management advice for *Dissostichus* spp. in Subarea 58.4

27. In 2006 the Scientific Committee noted several features of exploratory *Dissostichus* spp. fisheries in the southern Indian Ocean (Subarea 58.4) which gave cause for concern as to the status of the resource in this area, and the lack of a scientific basis for setting catch limits (SC-CAMLR-XXV, paragraphs 4.184 to 4.192). In its management advice for this and other exploratory fisheries, the Scientific Committee requested urgent consideration by Members of methods for collecting data and of assessing these stocks.

28. The Working Group requested submissions by Members on stock structure, biological parameters (e.g. growth, length–weight relationship, maturity), recruitment and methods for assessment of these stocks.

29. The Working Group recommended that the minimum tag rate be at least three fish per tonne for Subarea 58.4 and that the Scientific Committee consider whether a higher rate should be applicable for each of the divisions of Subarea 58.4 which:

(i) was commensurate with the size of the fishery and the stock abundance in the division;

(ii) took into account the practical considerations of maintaining a high-quality tagging program.

30. The Working Group recommended that a depletion analysis similar to that applied to Division 58.4.3b and presented in WG-FSA-07/44 be completed for Divisions 58.4.1 and 58.4.2.

31. The Working Group recommended that Division 58.4.3b be divided into two SSRUs with the line of division running along latitude 60°S. This division would separate the main fishing grounds and could be used to better manage those grounds (SC-CAMLR-XXVI, Annex 5, Figure 5).

32. The Working Group recommended that the precautionary catch limit for *Dissostichus* spp. in Division 58.4.3b, which was 300 tonnes, should be reviewed given the rapid and unsustainable depletion seen in the fishery.

33. The Working Group further recommended that the new southern SSRU from the recommended division of Division 58.4.3b be closed to fishing for the 2007/08 season, given the rapid and unsustainable depletion seen in the fishery.

34. Dr Naganobu expressed the view that the priority is to decrease the level of IUU occurring in Division 58.4.3b before considering a closure of part or all of the division, as this is the reason why the stock has sustained such a high level of depletion.

References

van Wijk, E.M., A.J. Constable, R. Williams and T. Lamb. 2000. Distribution and abundance of *Macrourus carinatus* on BANZARE Bank in the southern Indian Ocean. *CCAMLR Science*, 7: 171–178.

van Wijk, E.M., R. Williams and A.J. Constable. 2003. Age, growth and size at sexual maturity of *Macrourus carinatus* caught as by-catch in Australian sub-Antarctic trawl fisheries. *CCAMLR Science*, 10: 139–151.