

Fishery Report: Exploratory fishery for *Dissostichus* spp. in Subareas 88.1 and 88.2

1. Details of the fishery

1.1 Reported catch

5.50 The number of vessels active in fisheries for *Dissostichus* spp. in Subareas 88.1 and 88.2 during the current year is shown in Tables 5.2 and 5.3 respectively.

Table 5.2: Number of vessels authorised in Conservation Measure 41-09, number of vessels that fished, and the catch of *Dissostichus* spp. in Subarea 88.1 in 2003/04 (source: catch and effort reports).

Member	Vessels authorised in CM 41-09	Number of vessels that fished	Reported catch (tonnes)		
			<i>D. mawsoni</i>	<i>D. eleginoides</i>	Total
Argentina	2	2	162	1	163
Japan	1	0	0	0	0
Korea, Rep. of	2	2	114	0	114
New Zealand	6	4	729	1	729
Norway	1	1	98	0	98
Russia	2	2	283	0	283
South Africa	2	1	110	0	110
Spain	2	1	114	0	114
Ukraine	3	3	153	9	162
UK	1	1	16	0	16
USA	2	2	185	1	187
Uruguay	2	2	190	0	191
Total	26	21	2154	12	2166

Table 5.3: Number of vessels authorised in Conservation Measure 41-10, number of vessels that fished, and the catch of *Dissostichus* spp. in Subarea 88.2 in 2003/04 (source: catch and effort reports).

Member	Vessels authorised in CM 41-10	Number of vessels that fished	Reported catch (tonnes)		
			<i>D. mawsoni</i>	<i>D. eleginoides</i>	Total
Argentina	2	0	0	0	0
Korea, Rep. of	2	0	0	0	0
New Zealand	6	3	374	<1	375
Norway	1	0	0	0	0
Russia	2	0	0	0	0
South Africa	2	0	0	0	0
Ukraine	3	0	0	0	0
Total	18	3	374	<1	375

5.51 The catch limit for Subarea 88.1 was 3 250 tonnes, and for Subarea 88.2 was 375 tonnes.

5.52 The fishery was active from 1 December 2003 to 31 August 2004 for Subarea 88.1, and 1 December 2003 to 6 March 2004 for Subarea 88.2.

5.53 The fishery saw a steady expansion of effort from 1997/98 to 2000/01, a slight drop in 2001/02, followed by an increase in 2002/03, and an almost three-fold increase in 2003/04. The catch of *D. mawsoni* has shown a steadier increasing trend over the same period, peaking at 2 166 tonnes in Subarea 88.1 and 374 tonnes in Subarea 88.2 for the 2003/04 season. There has been a general trend towards fishing deeper over the course of the exploratory fishery, though in 2003/04 fishing was slightly shallower than 2002/03 (WG-FSA-04/20).

5.54 Although the total catch was about 67% of the catch limit for Subarea 88.1, catch limits in SSRUs B, C, G and H (see Figure 5.2), were exceeded by 1.8, 2.2, 0.1 and 199 tonnes respectively. Heavy ice conditions restricted fishing south of 73°S. Consequently little catch was taken in SSRUs 881J–L. With the southern SSRUs closed from ice, the fishery was effectively closed from mid-March 2004 (WG-FSA-04/20).

5.55 It was noted that the catch limits were exceeded because of the rapid changes in fishing pattern, the late submission of catch and effort reports, difficulties in forecasting closures in SSRUs, time lags in reporting, small catch limits in some SSRUs, and communication problems between the Secretariat, some Members and vessels (CCAMLR-XXIII/38).

5.56 In Subarea 88.2, the catch limit of 375 tonnes was fully taken (375 tonnes), and the fishery was closed on 6 March 2004. Fishing was carried out in SSRUs 882A, B, E and G, although no catch was recorded in SSRU 882G. Most of the catch (362 tonnes) was taken in SSRU 882E.

5.57 The historical catches for Subareas 88.1 and 88.2 are given in Tables 5.4 and 5.5.

Table 5.4: Catch history for *Dissostichus* spp. in Subarea 88.1 (source: STATLANT data to 2002/03, and catch and effort data in 2003/04).

Fishing season	Reported catch (tonnes)	Estimated IUU catch (tonnes)	Total (tonnes)	Catch limit
1996/97	<1	0	<1	1980
1997/98	42	0	42	1510
1998/99	297	0	297	2281
1999/00	751	0	751	2090
2000/01	660	0	660	2064
2001/02	1325	92	1417	2508
2002/03	1831	0	1831	3760
2003/04	2166	240	2406	3250

Table 5.5: Catch history for *Dissostichus* spp. in Subarea 88.2 (source: STATLANT data to 2002/03, and catch and effort data in 2003/04).

Fishing season	Reported catch (tonnes)	Estimated IUU catch (tonnes)	Total (tonnes)	Catch limit
1996/97	0	0	0	1980
1997/98	0	0	0	63
1998/99	0	0	0	0
1999/00	0	0	0	250
2000/01	0	0	0	250
2001/02	41	0	41	250
2002/03	106	0	106	375
2003/04	374	0	374	375

1.2 IUU catch

5.58 The total estimated IUU catch in Subarea 88.1 was 240 tonnes in 2003/04. The only previously estimated IUU catch in Subarea 88.1 was 92 tonnes in 2001/02.

5.59 The Working Group noted that caution should be exercised in using the IUU data for Subarea 88.1. The estimates of IUU catch were based on an assumption that two IUU vessels fished for a period of 40 days each in Subarea 88.1, at a catch rate of 3 tonnes per day. The estimates were based on sightings of two unidentified vessels that occurred on one day only (9 February 2004). While the accuracy of the sightings is not in doubt, the Working Group noted that subsequent aerial surveillance of the Ross Sea by New Zealand did not detect any IUU vessel activity.

5.60 There was estimated to be no IUU catch in Subarea 88.2 in 2004, as was the case for previous years.

1.3 Size distribution of the catches

5.61 Mean length and age of *D. mawsoni* in the catch has increased over the course of the fishery, with most fish caught in 2003/04 between 100 and 170 cm TL (WG-FSA-04/84 Rev. 1 and 04/89).

5.62 Mean length and age of the *D. mawsoni* catch have generally increased in the past few years. Smaller fish tended to be caught closer to the shore, in the southern areas, with the larger fish caught on the northern offshore zone of the Ross Sea (WG-FSA-04/20, 04/25, 04/28 Rev. 1, 04/34, 04/84 Rev. 1 and 04/89).

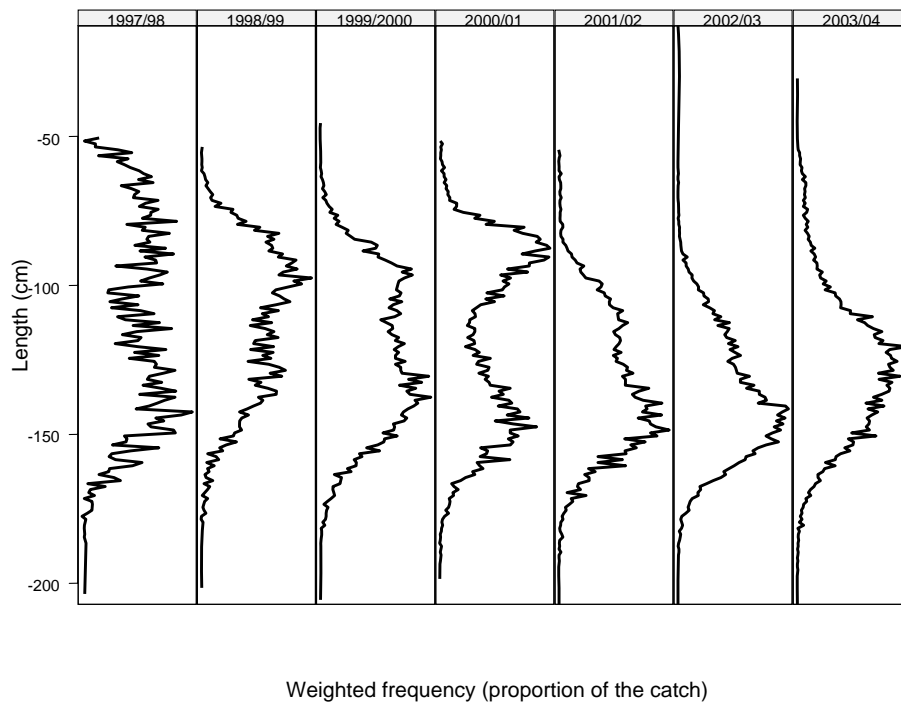


Figure 5.1: Catch-weighted length frequencies for *Dissostichus mawsoni* in Subarea 88.1 (source: observer, fine-scale and STATLANT data reported by 6 October 2004).

2. Stocks and areas

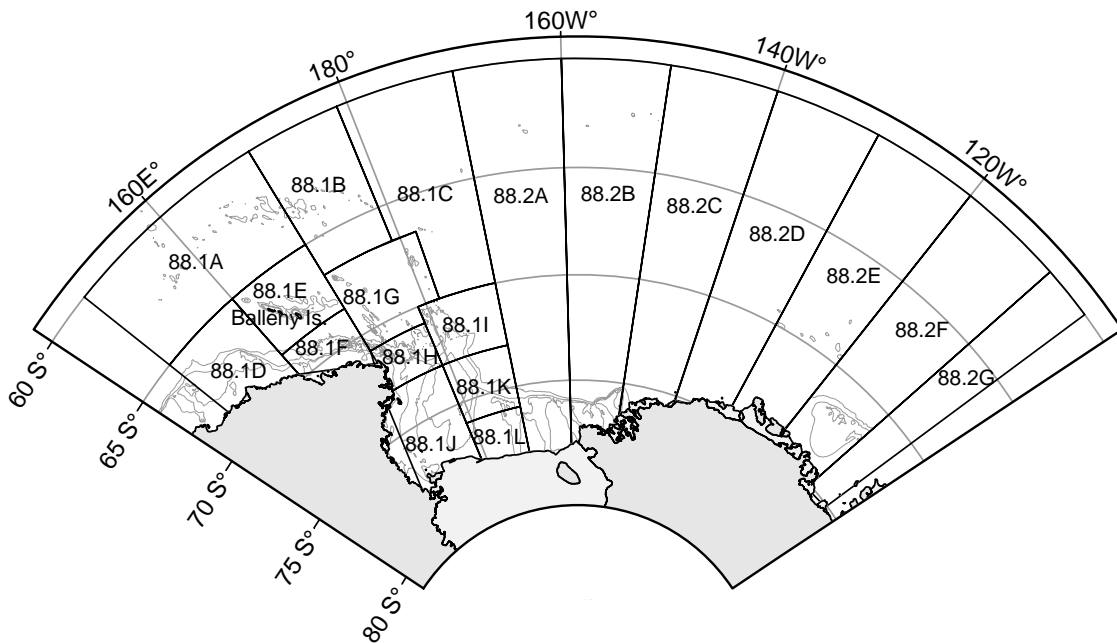


Figure 5.2: The Ross Sea, showing Subareas 88.1 and 88.2, and the subarea SSRUs (depth contours shown are at 500, 1 000 and 2 000 m).

5.63 Analysis of the genetic diversity for *D. mawsoni* from Subareas 48.1 and 88.1 and Division 58.4.2 found weak genetic variation between the three areas (WG-FSA-04/32). The weak genetic differentiation is supported by oceanic gyres, which may act as juvenile retention systems, and by limited movement of adult tagged fish.

5.64 Fully mature female fish were found in Subarea 88.1 in December (three months earlier than in the previous season) and in Subarea 88.2 for the first time. The onset of spawning may occur in December, continuing until at least June in both Subareas 88.1 and 88.2. Spawning is suspected to occur on isolated geographic features north of the main Antarctic shelf areas (WG-FSA-04/28 Rev. 1 and 04/35).

5.65 The Working Group recommended that Subareas 88.1 and 88.2 be treated as a single stock unit for assessment purposes, and that further research be undertaken on the stock structure of *D. mawsoni*.

3. Parameter estimation

3.1 Estimation methods

Standing stock

5.66 There are no estimates of the standing stock.

Population structure

5.67 The age composition of the commercial catch is given in WG-FSA-04/20. In the past three years, the catch composition has been dominated by fish aged 8 to 30 years (range 3 to 48 years).

Standardised CPUE analysis

5.68 A standardised CPUE analysis of the three main fishing grounds in Subarea 88.1 showed no significant trend from 1998/99 to 2002/03, but showed a large decline in 2003/04 (WG-FSA-04/25). The decline in 2003/04 was thought to be related to a combination of extreme ice conditions and effects from a large number of vessels operating in a confined area. The Working Group recommended that further intersessional work be undertaken to incorporate these effects within the CPUE standardisation. The CPUE indices are given in the Table 5.6.

Table 5.6: Standardised CPUE indices (catch/hook) for all vessels in Subarea 88.1 for 1998/99 to 2003/04.

Fishing season	Index	95% CI	CVs
1998/99	1.15	0.97–1.35	0.082
1999/00	1.10	0.99–1.23	0.053
2000/01	0.85	0.76–0.96	0.057
2001/02	1.20	1.08–1.32	0.052
2002/03	1.15	1.04–1.27	0.050
2003/04	0.67	0.61–0.74	0.050

3.2 Parameter values

Fixed parameters

Table 5.7: Parameter values for *Dissostichus mawsoni* in Subarea 88.1.

Component	Parameter	Value		Units
		Male	Female	
Natural mortality	M	0.15–0.2	0.15–0.2	y^{-1}
VBGF	K	0.102	0.095	y^{-1}
VBGF	t_0	0.31	0.50	y
VBGF	L_{∞}	170.3	184.5	cm
Length to mass	' a '	0.00000986	0.00000617	cm, kg
Length to mass	' b '	3.0335	3.1383	
Maturity	L_{m50}	100	100	cm
Range: 5 to 95% maturity		85–115	85–115	cm

4. Stock assessment

4.1 Calculation of existing catch limits

5.69 Previously, the Working Group used the approach for calculating precautionary catch limits for *Dissostichus* spp. for Subarea 88.1 outlined in SC-CAMLR-XIX, Annex 5, paragraphs 4.20 to 4.33. This approach was based on analogy with *D. eleginoides* in Subarea 48.3, and was scaled by the estimates of mean recruitment in that population, and as such cannot be considered an independent assessment. The Working Group noted that this method was no longer considered appropriate for estimating yields for Subareas 88.1 or 88.2 (SC-CAMLR-XXII, paragraphs 4.186 and 4.189).

5.70 The Working Group recalled that catch limits should be applied separately for each SSRU and should reflect the fishable seabed area and fish density from that SSRU (SC-CAMLR-XXII, Annex 5, paragraph 5.36). The Working Group agreed that there was no new evidence presented to suggest that the SSRU catch limits should be revised.

5.71 There was no stock assessment available for the current year.

4.2 Progress towards assessment

5.72 The Working Group welcomed the development of an integrated assessment model using CASAL for Subarea 88.1 (WG-FSA-04/36). Catch, CPUE, proportions-at-age in the catch, and New Zealand vessels' tag–release and tag–recapture data from Subarea 88.1 were included with an illustrative model using the generalised stock modelling software CASAL.

4.3 Future research requirements

5.73 The Working Group recalled that WG-FSA-03 recommended the development of stand-alone methods to monitor abundance and estimate precautionary yields in Subarea 88.1. The Working Group also noted that WG-FSA-SAM-04 agreed that further development of an integrated stock-modelling approach to the assessment of *D. mawsoni* using CASAL would be desirable. WG-FSA-SAM-04 made the following recommendations:

- (i) The model should be further developed, and should investigate methods for addressing problems with the existing fishing selectivity parameterisation.
- (ii) Approaches to the validation of the software should be investigated (e.g. the simulation model used to evaluate the assessment of toothfish at Macquarie Island based on a mark–recapture model could be used).
- (iii) Operating/simulation model approaches should be developed to investigate the following issues:
 - evaluate selectivity versus availability issues;
 - number of recaptures required for suitably precise estimates of biomass and yield;
 - evaluate potential biases associated with closure of areas between years due to ice;
 - tagging protocols (e.g. size, location and number of fish to tag);
 - explore consequences of alternative model structural assumptions;
 - use of research sets to provide contrast with commercial CPUE;
 - alternative tagging estimators (e.g. Macquarie Island approach).

5.74 The Working Group noted that alternative methods of monitoring and assessing toothfish in new and exploratory fisheries were presented at WG-FSA-SAM-04 (WG-FSA-SAM-04/8). The papers recommended that tag–recapture experiments be used in conjunction with experimental manipulation of effort to monitor toothfish – and perhaps as importantly – the wider ecosystem effects of the toothfish fisheries. The papers further noted that simulation studies be carried out to determine the best way to use the effort manipulation.

5.75 The Working Group thanked New Zealand for the work that had gone into the development of an integrated modelling approach, and the examination of alternative approaches for monitoring abundance during the intersessional period.

5. By-catch of fish and invertebrates

5.1 By-catch removals

5.76 Appendix 3 of CCAMLR-XXIII/38 provided summaries of total removals of macrourids, rajids and other species by SSRU in Subarea 88.1. Data on by-catch in the exploratory fishery in Subareas 88.1 and 88.2 were described and analysed in WG-FSA-04/20. History of catch and limits are given for Subareas 88.1 and 88.2 in Tables 5.8 and 5.9 respectively.

Table 5.8: Reported by-catch landings for 1997/98 to 2003/04 in Subarea 88.1.

Fishing season	Macrourids		Rajids		Others	
	Catch	Limit	Catch	Limit	Catch	Limit
1997/98	9		5		1	
1998/99	22		39		5	50
1999/00	74		41		7	50
2000/01	62		9		14	50**
2001/02	154		25		10	50**
2002/03	67	140+#	11	50+	12	20+
2003/04	319	520†	23	163*	23	20

† or 16% of toothfish catch

* or 5% of toothfish catch

50 for SSRU A

** for each SSRU

Table 5.9: Reported by-catch landings for 2000/01 to 2003/04 in Subarea 88.2.

Fishing season	Macrourids		Rajids		Others	
	Catch	Limit	Catch	Limit	Catch	Limit
2000/01	0		0		0	
2001/02	4		0		0	
2002/03	18	50†	0	60*	8	20+
2003/04	37	60†	0	50*	8	20

† or 16% of toothfish catch

* or 5% of toothfish catch

+ by SSRU

5.77 The Working Group expressed concern that three by-catch limits were exceeded in Subarea 88.1 during the 2003/04 exploratory fishery:

- (i) the limit of 124.2 tonnes for *Macrourus* spp. in SSRU 881I was exceeded by 141 tonnes (114%);

- (ii) the limit of 20 tonnes for *Macrourus* spp. in SSRU 881E was exceeded by 12.2 tonnes (61%);
- (iii) the limit of 20 tonnes for ‘all other combined species’ in SSRU 881I was exceeded by 1.8 tonnes (9%).

5.2 Assessments of impacts on affected populations

5.78 The estimate of γ for *M. whitsoni* in Subarea 88.1 in 2003 was 0.01439 (SC-CAMLR-XXII, paragraph 4.132). This indicates that *M. whitsoni* has relatively low productivity and thus may be vulnerable to overexploitation.

5.79 Mean standardised catch rates for *M. whitsoni* and *B. eatonii* were calculated from bottom trawls carried out during the BioRoss survey in February–March 2004 (paragraphs 6.7 to 6.15). However, trawl catch rates did not provide good estimates of standing stock for SSRU 881E and H because the small number of tows did not provide a representative sample of the overall area in the depth range 600 to 1 800 m in each SSRU (paragraphs 6.14 and 6.15).

5.80 In 2003, the Scientific Committee encouraged further work to examine more appropriate SSRU by-catch levels in Subarea 88.1 that are more in accordance with the by-catch distribution and abundance (SC-CAMLR-XXII, paragraph 4.199).

5.81 The Working Group explored three options for allocation of macrourid by-catch between SSRUs in Subarea 88.1 based on the current total catch limit of 520 tonnes (paragraphs 6.19 to 6.28):

1. Status quo
2. CPUE proportional limits
3. fixed SSRU limits.

5.82 The Working Group recommended that the Scientific Committee consider these alternative options for managing macrourid by-catch by SSRU in Subarea 88.1.

5.3 Mitigation measures

5.83 The Working Group compared by-catch rates of autoline and Spanish line vessels in Subarea 88.1 (paragraphs 6.60 to 6.64).

5.84 This analysis suggested that use of the Spanish longline system may reduce by-catch rates of macrourids. However, the Working Group noted that catch rates of macrourids were highly variable between SSRUs and a more complete analysis considering the spatial distribution of vessels with different gear types is required. The Working Group recommended that this work be conducted in the intersessional period.

5.85 The current by-catch limits and move-on rules are given in Conservation Measure 33-03.

5.86 The Working Group recommended that, where possible, all rajids should be cut from the line while still in the water, except on the request of the scientific observer (paragraph 6.75).

6. By-catch of birds and mammals

6.1 By-catch removals

5.87 Details of seabird by-catch are reported in paragraph 7.12 and Table 7.3, and summarised in Table 5.10.

Table 5.10: Seabird by-catch limit, reported seabird by-catch, by-catch rate and estimated by-catch for 1997/98 to 2003/04 in Subareas 88.1 and 88.2.

Fishing season	By-catch limit	By-catch rate (birds/thousand hooks)	Estimated by-catch
1997/98		0	0
1998/99		0	0
1999/00		0	0
2000/01		0	0
2001/02	3*	0	0
2002/03	3*	0	0
2003/04	3*	0.0001	1

* Per vessel during daytime setting.

5.88 Ad hoc WG-IMAF assessed the risk level of seabirds in this fishery in Subarea 88.1 as category 2 south of 65°S and category 3 north of 65°S (Table 7.16) and recommended:

- strict compliance with Conservation Measure 25-02 (but with the possibility of exemption to paragraph 4 to allow for daytime setting);
- south of 65°S, no need to restrict longline fishing season;
- north of 65°S restrict longline fishing to the period outside at-risk species' breeding season where known/relevant, unless line sink rate requirement is met at all times;
- daytime setting permitted subject to line sink rate requirements and seabird by-catch limits;
- no offal dumping.

5.89 Ad hoc WG-IMAF assessed the risk level of seabirds in this fishery in Subarea 88.2 as category 1 (Table 7.16) and recommended:

- strict compliance with Conservation Measure 25-02 (but with exemption to paragraph 4 to allow for daytime setting);
- no need to restrict longline fishing season;

- daytime setting permitted subject to line sink rate requirement;
- no offal dumping.

6.2 Mitigation measures

5.90 Conservation Measure 25-02 applies to these areas 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 41-09 and 41-10).

7. Ecosystem implications/effects

5.91 The Working Group noted that studies on the food-web interactions of macrourids would be useful in understanding the ecosystem effects of by-catch in this fishery.

8. Harvest controls for the 2003/04 season and advice for 2004/05

8.1 Conservation measures

Table 5.11: Summary provisions of Conservation Measure 41-09 for limits on the exploratory fishery for *Dissostichus* spp. in Subarea 88.1 and advice to the Scientific Committee for the 2004/05 season.

Paragraph and topic	Summary of CM 41-09	Advice for 2004/05	Paragraph reference
1. Access (gear)	Limited to vessels from Argentina, Japan, Republic of Korea, New Zealand, Norway, Russia, South Africa, Spain, Ukraine, UK, USA and Uruguay using longlines.	Review	
2. Catch limit	3 250 tonnes for Subarea 88.1 Individual SSRU limits (tonnes): A, D, F – 0 B – 80 C – 223 E – 57 G – 83 H – 786 I – 776 J – 316 K – 749 L – 180		
3. Season	1 December 2003 to 31 August 2004		
4. Fishing operations	In accordance with CM 41-01 (except paragraph 6).		
5. By-catch	Regulated in accordance with CM 33-03.	Review	5.81–5.82
6. Mitigation: seabirds	In accordance with CM 25-02 (except paragraph 4 night setting). CM 24-02 to apply.	Modify CM 24-02	7.111
7. Mitigation	Daylight setting allowed under CM 24-02.	Modify CM 24-02	7.111
8. Mitigation	No offal discharge.		
9. Observers	Each vessel to carry at least two scientific observers, one of whom shall be a CCAMLR observer.		
10. VMS	To be operational in accordance with CM 10-04.		
11. CDS	In accordance with CM 10-05.		
12. Research	Undertake research plan and tagging program as set out in CM 41-01, Annexes B and C.		
13. Data: catch and effort	(i) Five-day reporting system as in CM 23-01 (ii) Monthly fine-scale reporting system as in CM 23-04 on haul-by-haul basis.		
14. Target species	For the purposes of CMs 23-01 and 23-04, the target species is <i>Dissostichus</i> spp. and the by-catch is any species other than <i>Dissostichus</i> spp.		
15. Data: biological	Monthly fine-scale reporting system as in CM 23-05. Reported in accordance with the Scheme of International Scientific Observation.		
16. Discharge	Prohibition of discharge of: (i) oil (ii) garbage (iii) food waste >25 mm (iv) poultry or parts thereof (v) sewerage within 12 n miles of land.		

17. Additional elements	No live poultry or other living birds to be taken into Subarea 88.1, and any unconsumed dressed poultry is to be removed from Subarea 88.1.
18. Additional element	Fishing within 10 n miles of Balleny Islands is prohibited.

Table 5.12: Summary provisions of Conservation Measure 41-10 for limits on the exploratory fishery for *Dissostichus* spp. in Subarea 88.2 and advice to the Scientific Committee for the 2004/05 season.

Paragraph and topic	Summary of CM 41-10	Advice for 2004/05	Paragraph reference
1. Access (gear)	Limited to vessels from Argentina, Republic of Korea, New Zealand, Norway, Russia, South Africa and Ukraine using longlines.	Review	
2. Catch limit	375 tonnes south of 60°S		
3. Season	1 December 2003 to 31 August 2004		
4. Fishing operations	In accordance with CM 41-01 (except paragraph 6).		
5. By-catch	Regulated in accordance with CM 33-03.		
6. Mitigation: seabirds	In accordance with CM 25-02 (except paragraph 4 night setting). CM 24-02 to apply.	Modify CM 24-02	7.111
7. Mitigation	Daylight setting allowed under CM 24-02.	Modify CM 24-02	7.111
8. Mitigation	No offal discharge.		
9. Observers	Each vessel to carry at least two scientific observers, one of whom shall be a CCAMLR observer.		
10. VMS	To be operational in accordance with CM 10-04.		
11. CDS	In accordance with CM 10-05.		
12. Research	Undertake research plan and tagging program as set out in CM 41-01, Annexes B and C.		
13. Data: catch and effort	(i) Five-day reporting system as in CM 23-01 (ii) Monthly fine-scale reporting system as in CM 23-04 on haul-by-haul basis.		
14. Target species	For the purposes of CMs 23-01 and 23-04, the target species is <i>Dissostichus</i> spp. and the by-catch is any species other than <i>Dissostichus</i> spp.		
15. Data: biological	Monthly fine-scale reporting system as in CM 23-05. Reported in accordance with the Scheme of International Scientific Observation.		
16. Discharge	Prohibition of discharge of: (i) oil (ii) garbage (iii) food waste >25 mm (iv) poultry or parts thereof (v) sewerage within 12 n miles of land.		
17. Additional elements	No live poultry or other living birds to be taken into Subarea 88.2, and any unconsumed dressed poultry is to be removed from Subarea 88.2.		

8.2 Management advice for new and exploratory fisheries

5.92 The Working Group reiterated the necessity for Members fishing in exploratory fisheries to ensure that the required research sets are completed (Conservation Measure 41-01) and submitted to the Secretariat in a timely manner and accurate format. In addition, *Dissostichus* spp. should be tagged and data submitted in accordance with Conservation Measure 41-01.

5.93 The Working Group recommended that tagging be continued as part of the Research and Data Collection Plan (Conservation Measure 41-01), and take account of the revision in the tagging protocol, especially the requirement that all tagged fish be double-tagged.

5.94 For high-latitude areas with narrow continental shelves the Working Group recommended that the existing depth limit should be retained in order to reduce the impact on benthic communities in shallower waters. It would also provide opportunities to better understand and assess the potential effects of fishing before it occurs throughout the area. In this respect the Working Group recommended the extension of the approach from Division 58.4.1 into Division 58.4.2.

5.95 In a similar way, the Working Group recommended that some SSRUs within exploratory fisheries in Divisions 58.4.1 and 58.4.2 and Subarea 88.1 retain zero catch limits, so that effects of fishing on *Dissostichus* spp. populations can be distinguished from environmental effects.

5.96 The Working Group noted a large number of notifications were received for exploratory fisheries in 2004/05 in Subareas 48.6, 88.1 and 88.2 and Divisions 58.4.1, 58.4.2 and 58.4.3b. Large numbers of vessels fishing in a particular SSRU may lead to difficulties with the standardisation of CPUE data for assessments (paragraph 5.68 and WG-FSA-04/25) and may also reduce the effectiveness of the move-on rule to limit by-catch in the fishery (paragraphs 6.72 and 6.73).

5.97 The Working Group noted the information presented in CCAMLR-XXIII/38 which indicated that there are additional administrative problems in determining closure dates for fishing in SSRUs when many vessels are fishing simultaneously in a subarea or division (paragraph 5.1).

5.98 The Working Group recalled that catch limits should be applied separately for each SSRU and should reflect the fishable seabed area and fish density from that SSRU (SC-CAMLR-XXII, Annex 5, paragraph 5.36). The Working Group noted that there was no new information on which to provide advice on SSRU catch limits for *Dissostichus* spp.

5.99 The Working Group noted that the number of vessels participating in the Subarea 88.1 toothfish fishery had increased substantially in the 2003/04 season, and had the largest number of vessels fishing in any of the CCAMLR statistical areas in this season. The number of vessels has had an impact on several aspects of the Working Group advice. The lack of important assessment information, such as standing stock and recruitment data, and the variable ice influence make this a difficult fishery for which to provide management advice. The Working Group reiterated the urgent need for data that will lead towards a formal assessment, and welcomed the progress with the tagging program and the development of an integrated stock-assessment model.

5.100 The Working Group was unable to provide any new advice on catch limits for *Dissostichus* spp. or any by-catch species in any of the exploratory fisheries.

5.101 The Working Group reiterated the urgent need to develop a means for estimating abundance and providing assessments of stock status for all exploratory fisheries.

5.102 The Working Group recommended that Subareas 88.1 and 88.2 be treated as a single stock unit for assessment purposes, and that further research be undertaken on the stock structure of *D. mawsoni*.