

**FISHERY REPORT: CLOSED FISHERY FOR  
*DISSOSTICHUS* SPP. IN DIVISIONS 58.4.4a AND 58.4.4b**

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## **FISHERY REPORT: CLOSED FISHERY FOR *DISSOSTICHUS* SPP. IN DIVISIONS 58.4.4a AND 58.4.4b**

### **1. Details of the fishery**

The longline fishery for *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b<sup>1</sup> began as a new fishery in 1997/98 (Conservation Measure 138/XVI). These divisions were managed as a single area and a catch limit for *Dissostichus* spp. applied to fishing north of 60°S, and in waters outside areas of national jurisdiction<sup>2</sup>. Following the Commission's recognition 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), the fishery was reclassified as exploratory in 1999. In 1999, the divisions were subdivided into SSRUs A, B, C and D.

2. In 2002, the Commission expressed concern regarding the low levels of stocks of *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b and the high levels of IUU fishing in that region (CCAMLR-XXI, paragraph 11.36). Consequently, the Commission prohibited directed fishing for *Dissostichus* spp. in these divisions and the fishery for *Dissostichus* spp. was closed (Conservation Measure 32-10). The Commission agreed that such prohibition shall apply at least until further scientific information is gathered and reviewed by the Scientific Committee and WG-FSA.

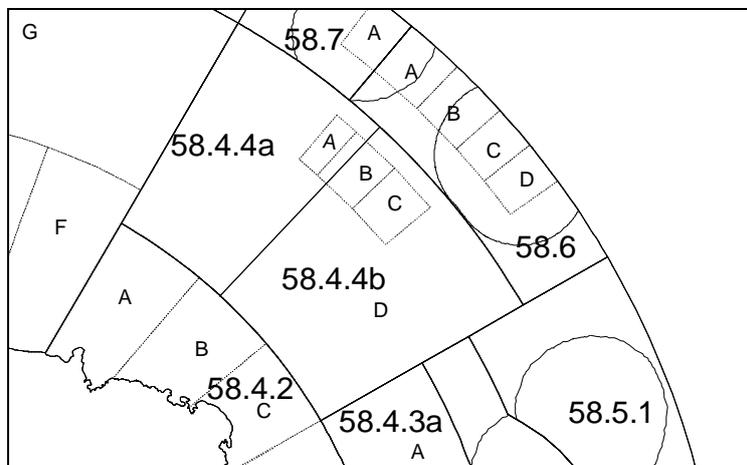


Figure 1: General map of Divisions 58.4.4a and 58.4.4b and location of SSRUs A, B, C and D.

<sup>1</sup> In 1995, Division 58.4.4 was subdivided into Division 58.4.4a (Ob Bank) and Division 58.4.4b (Lena Bank) (SC-CAMLR-XIV, Annex 5, paragraph 5.175).

<sup>2</sup> The South African EEZ at Prince Edward and Marion Islands extends into the northern part of Division 58.4.4a.

### 1.1 Reported catch

3. Two licensed longline vessels operated in the exploratory fishery for *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b in 1999/2000 and reported a total catch of 156 tonnes of *D. eleginoides* (Table 1(a)). In the following season, a single vessel fished briefly, reporting a total catch of 8 tonnes of *D. eleginoides*. The fishery was closed in December 2002 (Conservation Measure 32-10). Most of the reported catch of *D. eleginoides* was taken in SSRUs A and D (Table 1(b)).

4. In 2007/08, one Japanese-flagged longliner conducted research fishing in accordance with a research plan submitted under Conservation Measure 24-01. The vessel caught 77 tonnes of *D. eleginoides* and <1 tonne of *D. mawsoni* (Tables 1(a) and 1(b)).

Table 1(a): Catch history for *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b. Catch limits are for both divisions combined, and apply to the north of 60°S. (Source: STATLANT data for past seasons, and catch and effort reports for current season, WG-FSA-09/5 Rev. 1 and past reports for IUU catch)

Season	Effort (number vessels)	Regulated fishery						Estimated IUU catch (tonnes)	Total removal (tonnes)	
		Catch limit (tonnes)	<i>Dissostichus</i> spp.							
			Reported catch (tonnes)							
			Division 58.4.4a		Division 58.4.4b		Total			
		<i>D. eleginoides</i>	<i>D. mawsoni</i>	<i>D. eleginoides</i>	<i>D. mawsoni</i>					
1996/97	0	-	0	0	0	0	0	375	375	
1997/98	0	580	0	0	0	0	0	1298	1298	
1998/99	0	572	0	0	0	0	0	1519	1519	
1999/00	2	370	84	0	72	0	156	1254	1410	
2000/01	1	370	4	0	4	0	8	1247	1255	
2001/02	0	103	0	0	0	0	0	880	880	
2002/03	0	closed	0	0	0	0	0	110	110	
2003/04	0	closed	0	0	0	0	0	0	0	
2004/05	0	closed	0	0	0	0	0	220	220	
2005/06	0	closed	0	0	0	0	0	104	104	
2006/07	0	closed	0	0	0	0	0	109	109	
2007/08	1	closed*	18	0	58	<1	77	0	77	
2008/09	0	closed	0	0	0	0	0	0	0	

\* Research fishing permitted in accordance with Conservation Measure 24-01.

Table 1(b): Catch of *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b 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	A	B	C	D
1999/00	84	5	14	53				
2000/01	4	4						
....								
2007/08	19	11	21	26				<1

## 1.2 IUU catch

5. Information on IUU activities indicated high levels of IUU fishing, and the estimated annual catch of *Dissostichus* spp. exceeded 1 000 tonnes in each season between 1997/98 and 2000/01 (Table 1(a)). An estimated total of 7 116 tonnes of *Dissostichus* spp. has been removed by IUU fishing. There was no evidence of IUU fishing in 2003/04, 2007/08 and 2008/09.

## 1.3 Size distribution of catches

6. Most *D. eleginoides* caught in the fishery and during research fishing ranged from 50 to 100 cm in length in Division 58.4.4a and from 70 to 120 cm in Division 58.4.4b (Figure 2).

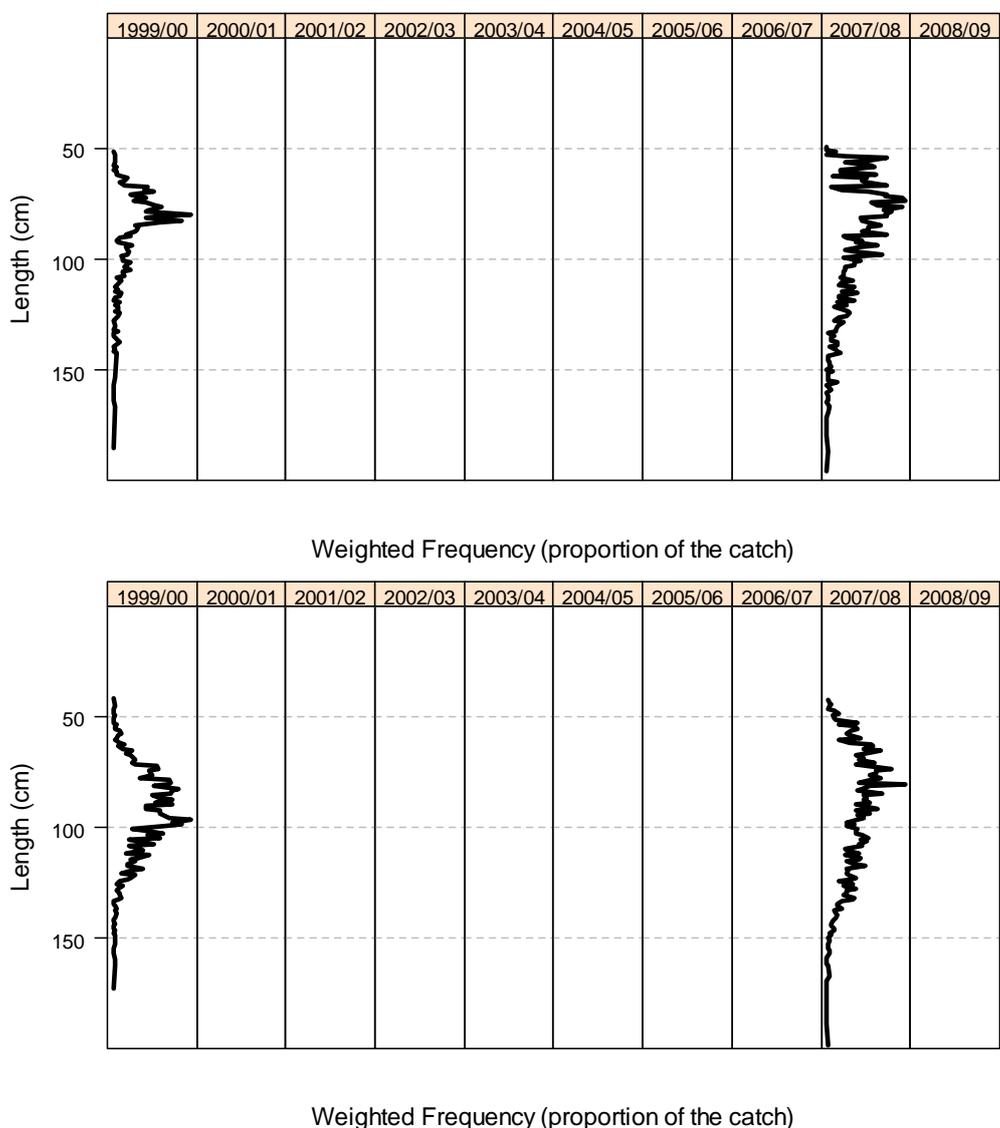


Figure 2: Catch-weighted length frequencies for *Dissostichus eleginoides* in Divisions 58.4.4a (top panel) and 58.4.4b (bottom panel) (source: observer, fine-scale and STATLANT data, and the length–weight relationships were taken from observations on *D. eleginoides* in Division 58.5.2).

## **2. Stocks and areas**

7. No data are available on the stock structure of fish in this fishery.

## **3. Parameter estimation**

### **3.1 Observations**

8. Individual *D. eleginoides* were tagged and released by the Japanese-flagged vessel conducting research fishing in Divisions 58.4.4a and 58.4.4b in 2007/08. A total of 280 *D. eleginoides* were tagged and released (64 fish in Division 58.4.4a and 216 fish in Division 58.4.4b). Fish were tagged at a rate of 3.6 fish per tonne of green weight caught. No *D. mawsoni* were tagged and there has been no tag recapture reported.

### **3.2 Fixed parameter values**

9. None available for this fishery.

## **4. Stock assessment**

10. None available for this fishery.

## **5. By-catch of fish and invertebrates**

### **5.1 By-catch removals**

11. 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 2. The by-catch in this fishery consists predominantly of macrourids (up to 14 tonnes per season).

Table 2: Catch history for by-catch species (macrourids, rajids and other species), catch limits and number of rajids released alive in Divisions 58.4.4a and 58.4.4b combined. Catch limits are for both divisions combined (see Conservation Measure 33-03 for details). The fishery for *Dissostichus* spp. in these divisions was closed in 2002. MoR: Move-on rule only applied. (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)
1996/97	50		50			50	
1997/98	50		50			50	
1998/99	50		50			50	
1999/00	MoR	14	50	<1	0	50	<1
2000/01	MoR	<1	80	<1	0	80	<1
2001/02	160		80			80	
2002/03	closed		closed			closed	
2003/04	closed		closed			closed	
2004/05	closed		closed			closed	
2005/06	closed		closed			closed	
2006/07	closed		closed			closed	
2007/08	closed*	3	closed*	<1	0	closed*	1
2008/09	closed		closed			closed	

\* Research fishing permitted in accordance with Conservation Measure 24-01.

## 5.2 Assessment of impacts on affected populations

12. None available for this fishery.

## 5.3 Identification of levels of risk

13. None available for this fishery.

## 5.4 Mitigation measures

14. None applied as this fishery is currently closed.

## 6. By-catch of birds and mammals

### 6.1 By-catch removals

15. There have been no observed seabird or marine mammal mortalities reported from Divisions 58.4.4a and 58.4.4b.

16. WG-IMAF assessed the risk level of seabirds in this fishery in Divisions 58.4.4a and 58.4.4b as category 3 (average) (SC-CAMLR-XXVIII, Annex 7, Table 14 and Figure 2).

## **6.2 Mitigation measures**

17. None applied as this fishery is currently closed.

## **7. Ecosystem implications/effects**

18. No evaluation available for this fishery.

## **8. Harvest controls and management advice**

### **8.1 Conservation measures**

19. The exploratory fishery for *Dissostichus* spp. in Divisions 58.4.4a and 58.4.4b is closed (Conservation Measure 32-10). Directed fishing for *Dissostichus* spp. in these divisions is prohibited at least until further scientific information is gathered and reviewed by the Scientific Committee and WG-FSA.

### **8.2 Management advice**

20. In 2007/08, one Japanese-flagged longliner conducted research fishing in accordance with a research plan submitted under Conservation Measure 24-01. The vessel caught 77 tonnes of *D. eleginoides* and <1 tonne of *D. mawsoni*.
21. In 2008, a Japanese proposal to carry out research fishing in Division 58.4.4 was submitted to the Scientific Committee which recommended that before conducting additional research in this area, the results of the recent longline survey be reported to WG-FSA, the design of a future survey be discussed and agreed at WG-SAM, and that comparable fishing trials be carried out in areas other than Division 58.4.4, to attempt the calibration of the trotline gear with the other longline gear (SC-CAMLR-XXVII, paragraph 8.8).
22. This work has been completed with the Japanese survey results and the revised research proposal has been reviewed by WG-SAM (SC-CAMLR-XXVIII, Annex 6, paragraphs 2.47 to 2.55). After taking into account the comments of WG-SAM-09, the proposal was submitted to WG-FSA for review as paper WG-FSA-09/12.
23. During the WG-FSA-09 meeting, Japan further revised the research proposal to survey *Dissostichus* spp. in 2009/10 as part of a 3–5 year tagging experiment.
24. Dr K. Taki (Japan) recalculated the necessary sample size as 81 tonnes for toothfish for this division that includes four SSRUs, taking into account the latest information on spawning stock biomass indices of the reference area (Subarea 48.4). To apply the mark and recapture studies, a tagging rate of five fish per tonne will be used. A total of 117 research hauls are allocated on a 10-minute latitude × 20-minute longitude grid point. A trotline system will be employed for 88 research hauls. In 29 hauls (25% of total sets), the experimental gear, which consists of three segments of trotline system and Spanish line

system respectively within one fishing line, will be used. He indicated that the sample size of 81 tonnes is necessary to obtain reliable stock estimate parameters and complete coverage of the survey area.

25. The Working Group agreed on the following points:

- (i) The Commission recalled the Scientific Committee's concern regarding the low levels of stocks of *Dissostichus* spp. in Division 58.4.4 and Subarea 58.6 and the high levels of IUU fishing (SC-CAMLR-XXI, paragraphs 4.106 and 4.108). The Commission agreed that directed fishing for *Dissostichus* spp. should be prohibited in these regions, and that such prohibition shall apply until at least such time that further scientific information is gathered and reviewed by the Scientific Committee and WG-FSA. Accordingly, Conservation Measures 32-10 (2002) and 32-11 (2002) were adopted to prohibit directed fishing for *Dissostichus* spp. in Division 58.4.4 and Subarea 58.6 respectively (CCAMLR-XXI, paragraph 11.36).
- (ii) Information on IUU activities indicated high levels of IUU fishing, and the estimated annual catch of *Dissostichus* spp. exceeded 1 000 tonnes in each season between 1997/98 and 2000/01. An estimated total of 7 116 tonnes of *Dissostichus* spp. has been removed by IUU fishing. There was no evidence of IUU fishing in 2003/04, 2007/08 and 2008/09.
- (iii) The Working Group noted that the majority of fish captured in the survey in Divisions 58.4.4a and 58.4.4b were between 55 and 150 cm in length. However, due to the lack of information on the selectivity of the gear, it was not possible to infer absolute abundance of size classes based on these data alone.
- (iv) The Working Group noted that the authors of WG-FSA-09/12 used a harvest rate of 3.8% of initial spawning stock biomass to estimate sustainable yields for the stock in Divisions 58.4.4a and 58.4.4b. The Working Group recalled that this figure was not derived from a stock-specific application of the CCAMLR decision rules for toothfish, but rather derived from analyses in WG-FSA-08/43, which estimated a harvest rate based on the ratio between the sustainable yield and  $SSB_0$  estimated in the Ross Sea (Subarea 88.1) in 2007. The Working Group agreed that the apparent harvest rate, derived from a stock where the CCAMLR decision rules were applied, would depend on the stock-specific biological characteristics of toothfish, the selectivity of the gear used in fishing the stock and also the status of the stock relative to its unfished state.

26. Dr D. Welsford (Australia) noted that it was inappropriate to apply a harvest rate of 3.8% to the stock in Divisions 58.4.4a and 58.4.4b, when this rate is derived from the Ross Sea, as the Ross Sea stock is estimated to be in a fish-down phase, and well above the target of 0.5 median  $SSB_0$ . He also noted that the productivity of *D. mawsoni* in the Ross Sea and of *D. eleginoides* in Divisions 58.4.4a and 58.4.4b is likely to be substantially different. He further noted that, as the stock in Divisions 58.4.4a and 58.4.4b had been depleted by IUU fishing, and is unlikely to have fully recovered to a pristine state in the six years since it was closed, any removal rate must be significantly lower than 3.8% to be precautionary. Preliminary modelling using the GYM indicates that a *D. eleginoides* stock at 40%  $SSB_0$

could sustain a harvest rate of ~1.6% if it is expected to recover to 0.5 SSB<sub>0</sub> over 25 years. Dr Welsford undertook to present the details of this analysis in a paper at the next meeting of WG-SAM.

27. Dr T. Ichii (Japan) noted that the proposed catch limit of 81 tonnes would not only be necessary to obtain reliable stock estimate parameters but would also be conservative so as not to impede the stock recovery of the division for the following reasons:

- (i) The sample size was calculated using a precautionary exploitation rate of 2.7 %, which is an average of the value of 3.8%, which was applied for Divisions 58.4.1 and 58.4.2 (WG-FSA-08/43), and 1.6% which was recommended by Dr Welsford. Considering that 3.8% is the sustainable exploitation rate when the current stock level is 50% of  $B_0$ , while 1.6% is the sustainable exploitation rate when the stock size is 40% of  $B_0$ , Dr Ichii believed that the value of 1.6 % may be overly precautionary.
- (ii) Length composition data showed young and adult toothfish in abundance.
- (iii) This division was closed to fishing based not on scientific data, but on the belief that the stock might have been depleted by IUU fishing (SC-CAMLR-XXI, paragraph 4.106), suggesting that it is unclear whether the stock was actually depleted at the time of closure of the fishery in 2002/03.
- (iv) Division 58.4.4 is considered to have been less attractive for IUU fishing since 2003/04 (SC-CAMLR-XXVII, Annex 5, Table 3) because a much higher catch rate has been obtained in adjacent divisions in the Indian Ocean, implying a possibility that the former division has not recently been subject to high levels of IUU fishing.

28. The Working Group agreed that the revised proposal had addressed most of the issues raised by WG-SAM, and that the spatial distribution of the sets would spread effort and tags evenly across the survey area, and that the proposed tagging rate of five tags per tonne would be a minimum rate. They noted that there was also an expectation that otoliths collected during the 2010 survey and the previous 2008 survey would be read using protocols developed by CON and presented to future meetings of WG-FSA. It also noted that there should be some longer-term commitment to the experiment and that, subject to the review of the 2010 survey, the vessel would be expected to return to the area in a future year (or years) to recapture the tagged fish.

29. The Working Group considered that if sufficient tags were recaptured, then an assessment could be carried out on the stock. However, it cautioned that the assessment of stock status would be uncertain because of the large unknown IUU catch and the likely sensitivity of the stock status to these estimates. The Working Group anticipated that the data could be collated for input into an integrated assessment framework such as CASAL and be submitted to WG-SAM for review by 2011 to 2012.

30. However, some members of the Working Group were concerned that the stock had been severely depleted and that the proposed level of catch may be deleterious to the stock. They noted that the required level of catch could be reduced, for example by surveying a subset of the total area, setting shorter lines, or tagging and releasing a higher proportion of the fish.

31. The Working Group was unable to reach consensus on an appropriate level of catch for the survey.