Appendix L

Fishery Report: *Dissostichus eleginoides* (TOP) Crozet Island inside the French EEZ (Subarea 58.6)

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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). Although the fishing season defined by France in its EEZ extends from 1 September to 31 August of the following year, the data reporting period used in this report is the CCAMLR season.

FISHERY REPORT: *DISSOSTICHUS ELEGINOIDES* CROZET ISLAND INSIDE THE FRENCH EEZ (SUBAREA 58.6)

1. Details of the fishery

1. The present longline fishery for *Dissostichus eleginoides* operates in the French EEZ around the Crozet Islands outside the 12 n mile zone and down to the 500 m isobath in Subarea 58.6 (Figure 1).

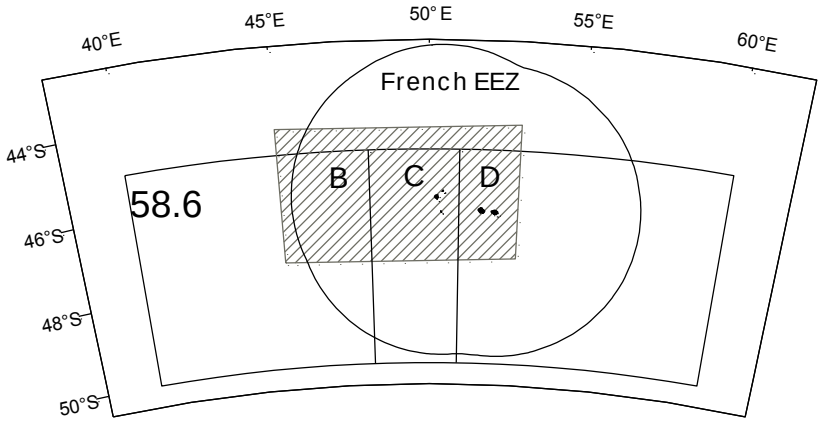

Figure 1: Map of Subarea 58.6 showing the location of the French EEZ, and SSRUs B, C and D established by CCAMLR.

1.1 Reported catch

2. A catch limit of *D. eleginoides* set by France in its EEZ in Subarea 58.6 for 2012 was 700 tonnes, and this was allocated to seven longliners. The catch for the current season reported to October 2012 was 480 tonnes, and the catch history is shown in Table 1. Fishing trials with trawlers (before 1979 by Japanese exploratory fishing and by French trawlers, after the establishment of the French EEZ, from 1983 to 1996 and in 2000) have not been continued. In Subarea 58.6, the French fishery has been conducted using longlines from 1996/97 (first joint French–Japanese survey cruise) to the present (annual regular fishing cruises). The fishery was open all year but was mainly active when the Kerguelen EEZ fishery was closed (February–March). A high level of depredation (Tixier et al., 2010) on *D. eleginoides* catches from killer whales (*Orcinus orca*) is the main reason why fishers avoid fishing in this subarea.

Table 1: Catch history for *Dissostichus eleginoides* in, or near, the French EEZ in Subarea 58.6. The IUU estimate is for all of Subarea 58.6, including the South African EEZ at the Prince Edward Islands. (Source: STATLANT data for past seasons, fine-scale data for current season.)

Season	Reported catch (tonnes)	Estimated IUU catch (tonnes)	Total removals (tonnes)
1977	6	0	6
1978	370	0	370
1983	17	0	17
1987	488	0	488
1988	21	0	21
1994	56	0	56
1995	115	0	115
1996	3	7875	7878
1997	413	11760	12173
1998	787	1758	2545
1999	877	1845	2722
2000	1017	1430	2447
2001	1091	685	1776
2002	1158	720	1878
2003	531	302	833
2004	537	380	917
2005	559	12	571
2006	775	55	830
2007	410	0	410
2008	823	224	1047
2009	885	0	885
2010	663	0	663
2011	703	*	703
2012	480	*	480

* Not estimated

1.2 IUU catch

3. Details of the IUU catches attributed to Subarea 58.6 are given in Table 1. IUU fishing was first detected in 1996 and peaked at an estimated 11 760 tonnes in 1997. Since 2005, IUU fishing occurred only outside the EEZ due to increased surveillance within the EEZ. In 2008, the IUU catch was estimated to be 224 tonnes from outside the EEZ. There was no evidence of IUU fishing from 2009 to 2012.

1.3 Size distribution of catches

4. Data from the longline fishery cover the period 1997 to the current season (Figure 2). Most *D. eleginoides* caught by longline range from 40 to 130 cm in length, with a mode at approximately 70–80 cm at the beginning of the series, and 55–80 cm in recent seasons.

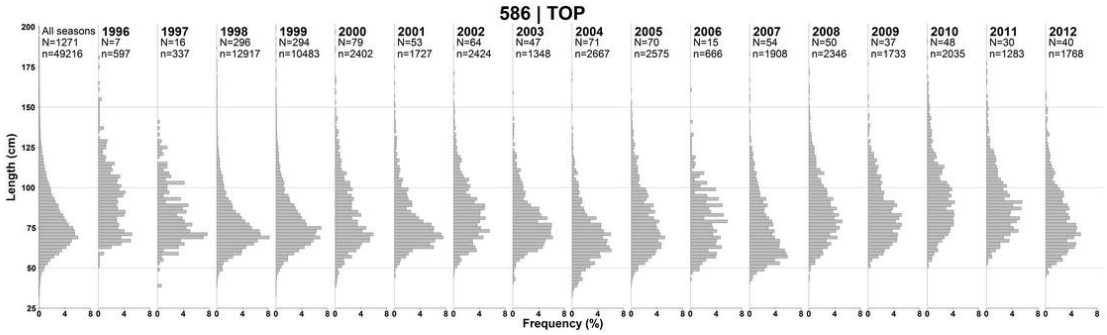

Figure 2: Length frequencies for *Dissostichus eleginoides* caught by longline in the French EEZ in Subarea 58.6. The number of hauls (N) and the number of fish measured (n) in each year are given at the top of each panel.

2. Stocks and areas

5. A tagging experiment (with 1 fish tagged per tonne) begun in 2006. To September 2012, 4 858 fish have been tagged, among which 222 were recaptured (Table 2). In addition, there have been two fish recaptured from the tagging program in Division 58.5.1, 16 from Division 58.5.2 and one from Subarea 58.7 (Figure 3). Despite these long-distance movements of sub-adult/adult fish, the proportion of exchange between stocks is still unknown and no fish from Crozet have been recovered on the Kerguelen Plateau.

Table 2: Releases of tagged fish inside Division 58.6 per calendar year and year of recaptures.

Year	Tagged	Recaptured							
		2005	2006	2007	2008	2009	2010	2011	2012
2005	91	0	1	0	0	0	1	0	0
2006	1 186		13	8	6	18	12	8	12
2007	502			3	13	7	5	4	1
2008	550				4	21	7	8	2
2009	690					10	17	11	4
2010	618						0	5	8
2011	727							4	9
2012	494								0
Total	4 858								222

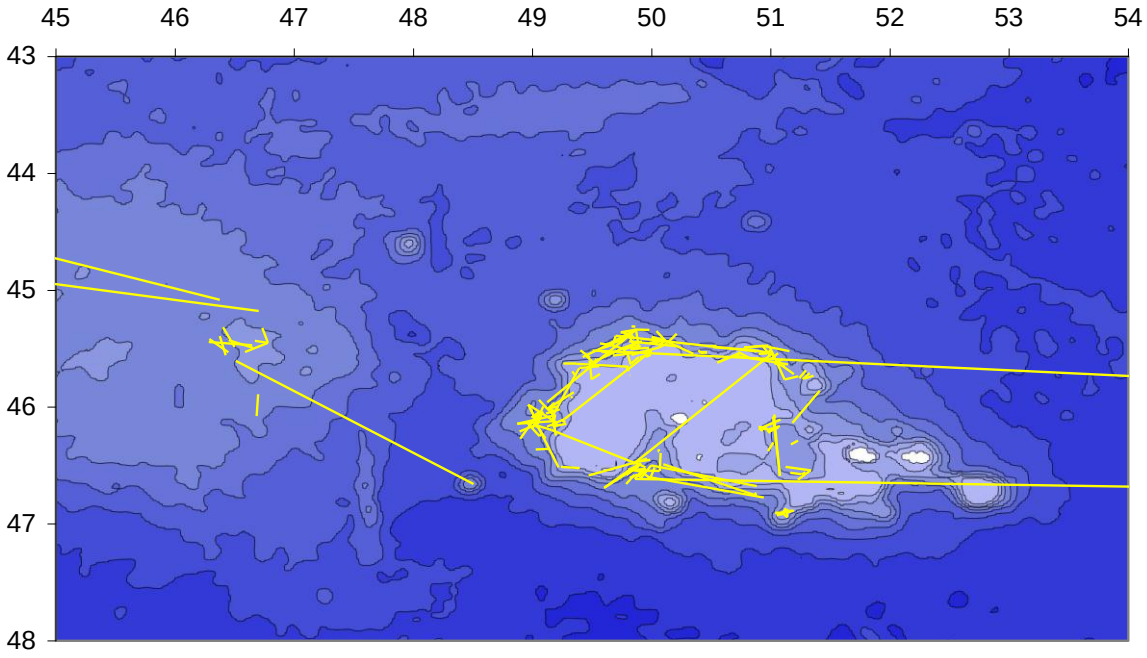

Figure 3: Movement of fish based on the tagging experiment in Subarea 58.6.

3. Summary of the longline fishery

6. The average (unstandardised) catch per hook decreased from 0.26 kg/hook in 2000 (the first year with enough sets to provide a reliable CPUE) to a minimum of 0.09 in 2003, since when it has fluctuated to the present with a maximum of 0.19 kg/hook in 2011. Effort by month and year from the longline fishery is summarised in Table 3. Fishing effort concentrated during February when the Kerguelen fishery was closed. The fishery occurred on the Crozet shelf slope and on the eastern part of the Del Cano rise (Figure 4). Specific French conservation measures have restricted the fishery outside the 12 n mile zone: no fishing shallower than 500 m and a size limit for toothfish of 60 cm TL. Every longliner has a fishery observer on board and landing occurs only in one place.

Table 3: Number of sets by month and year (C2 data).

Season	Month												Total
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
1997	0	0	0	0	0	0	0	0	0	0	2	67	69
1998	8	0	0	0	0	0	0	0	0	0	0	0	8
1999	0	0	0	0	0	0	0	0	0	9	4	0	13
2000	9	23	26	22	53	16	30	133	73	0	53	25	463
2001	72	175	43	73	37	0	0	86	48	41	32	4	611
2002	19	32	99	170	135	150	144	87	0	87	58	63	1044
2003	118	116	42	32	102	87	0	43	0	104	0	26	670
2004	30	42	205	50	18	40	87	74	46	27	0	49	668
2005	0	27	252	0	0	47	155	52	22	64	10	94	723
2006	30	86	267	0	39	132	160	0	8	86	0	68	876
2007	54	0	199	73	18	78	60	161	65	4	13	65	790

(continued)

Table 3 (continued)

Season	Month												Total
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
2008	0	0	225	70	118	217	40	58	88	22	4	65	907
2009	25	61	270	46	180	250	86	96	51	32	10	44	1151
2010	26	16	388	109	0	41	90	37	90	41	33	0	871
2011	-	66	467	17	-	38	15	-	-	34	22	35	694
2012	-	95	311	67	36	34	56	-	-	-	-	-	599
Total	391	739	2794	729	736	1130	923	827	491	551	241	605	10157

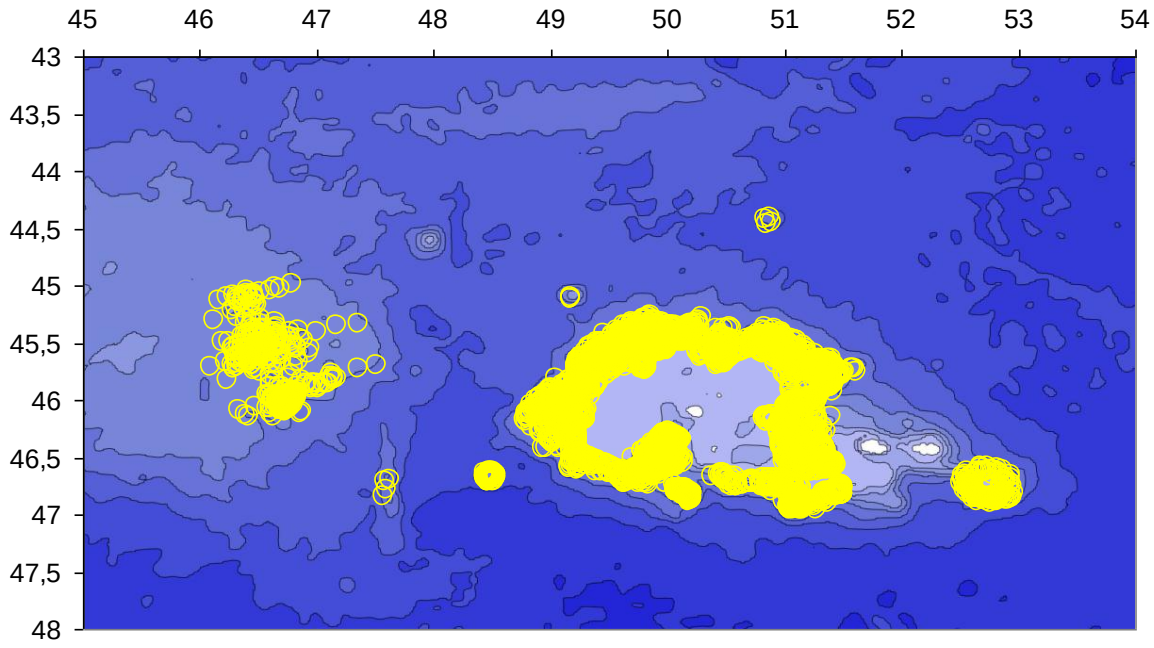

Figure 4: General map of fishing operations inside the EEZ in Subarea 58.6.

7. The effort was mainly in SSRUs C and D until 2003, and then became as important in SSRU B until 2006, and then declined in more recent years.

8. An analysis presented in WG-IMAF-09/12 estimated that the depredation by killer whales (*O. orca*) and sperm whales (*Physeter macrocephalus*) over the period 2003 to 2008 was 1 200 tonnes; this implies a depredation rate of 41%. Such a high level of depredation is of concern for the viability of the fishery.

9. A pot-trial cruise was conducted in February 2010 (WG-FSA-10/10) to try to find solutions to the depredation problem (and to contribute to reduce the seabird mortality). However, while whale depredation and seabird by-catch is eliminated using pot gear, King crab (*Lithodes murrayi* and *Paralomis aculeata*) by-catch becomes another major issue. Catch rates for the target species *D. eleginoides* were lower than those obtained with longlines.

4. Stock assessment

10. No formal stock assessment has been carried out for French EEZ in Subarea 58.6.

4.1 Research requirements

11. WG-FSA encouraged the estimation of biological parameters for Crozet, and the development of a stock assessment for this area, and encouraged France to continue its tagging program in Subarea 58.6.

5. By-catch

5.1 By-catch removals

12. By-catch removals of macrourids (*Macrourus carinatus*), rajids (*Raja taaf*) and morids (*Antimora rostrata*) from the longline fishery for *D. eleginoides* are detailed in Table 4. Only the latter species is fully discarded, the others being partly or totally processed. The spatial distribution of by-catch indicates specific areas of higher catch rates for particular species (WG-FSA-10/34).

Table 4: Catch history for by-catch species (macrourids, rajids and *Antimora rostrata*) taken in the longline fishery for *Dissostichus eleginoides* in the French EEZ in Subarea 58.6. (Source: fine-scale data.) Last season is incomplete.

Season	Macrourids reported catch (tonnes)	Rajids reported catch (tonnes)	*Antimora rostrata* reported catch (tonnes)
1999	1	3	0
2000	97	31	12
2001	99	6	1
2002	196	36	11
2003	147	92	19
2004	116	73	56
2005	132	93	67
2006	149	121	53
2007	117	83	43
2008	135	46	64
2009	193	46	79
2010	113	56	78
2011	93	29	22
2012	70	63	14

5.2 Assessments of impact on affected populations

13. No stock assessments of individual by-catch species were undertaken.

5.3 Mitigation measures

14. The Working Group recommended that areas with high by-catch rates should be avoided and noted that from 2012 vessels have received a recommendation to avoid the areas of high by-catch.

6. Incidental mortality of birds and mammals

6.1 Incidental mortality reported

15. There were 16 seabird mortalities observed inside the French EEZ in Subarea 58.6 in 2012 (WG-IMAF-12/66) all of which were white-chinned petrels (*Procellaria aequinoctialis*). By-catch rates (birds/thousand hooks) and estimated by-catch of seabirds are shown in Table 5.

Table 5: Estimated by-catch rates (birds/thousand hooks) and total extrapolated incidental mortality of seabirds in longline fisheries in the French EEZ at Crozet Islands in Subarea 58.6.

Fishing season	By-catch rate	Estimated by-catch
2002*	0.1672	1 243
2003*	0.1092	720
2004*	0.0875	343
2005	0.049	242
2006	0.0362	235
2007	0.065	314
2008	0.031	131
2009	0.015	93
2010	0.021	107
2011	0.009	31
2012	0.022	65

* The number of observed hooks has not been collected and the values given are from the total number of hooks set.

16. No incidental mortality of marine mammals was reported in Subarea 58.6 in 2012.

6.2 Identification of levels of risk

17. The level of risk of incidental mortality of seabirds in Subarea 58.6 is category 5 (high) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

6.3 Mitigation measures

18. Details of mitigation measures applied in previous seasons can be found in the Scientific Committee reports (SC-CAMLR-XXIII, Annex 5, paragraphs 7.35 to 7.45; SC-CAMLR-XXV, Annex 5, Appendix D, paragraph 14; SC-CAMLR-XXVI, paragraph 5.7; SC-CAMLR-XXVII, paragraphs 5.6 to 5.11; SC-CAMLR-XXVIII, paragraphs 3.46 to 3.50; SC-CAMLR-XXIX, paragraph 4.7).

19. Mitigation measures that were put in place during the last three seasons will be continued for 2013, however, new measures will also be applied (WG-IMAF-11/10 Rev. 1). These include:

(i) changes to the bird exclusion device to ensure it is effective in all weather conditions

(ii) closure of fishing areas and quota allocation reduction to vessels that have high by-catch rates

(iii) education and training will be strengthened by regular meetings between TAAF and fishing masters of vessels with high by-catch

(iv) data will continue to be collected and submitted using CCAMLR standard methods and forms

(v) a new population survey of at-risk seabird species, conducted in the Crozet archipelago during November 2011, will be compared to the results of a similar survey conducted in 2005.

7. Harvest controls and management advice

7.1 Conservation measures

20. Various national conservation and fisheries enforcement measures (in addition to those CCAMLR conservation measures that are applied in this fishery) are in force, such as:

- annual catch limit and limitation of number of longliners (seven)
- obligatory logbooks
- allocation of fishing effort (not more than two longliners simultaneously per 0.5° latitude × 1° longitude rectangle)
- one French observer on board each licensed vessel
- minimum depth limit (500 m)
- minimum legal size (60 cm)
- mitigation measures for the reduction of seabird mortality
- landings occur at one place (Réunion Island)
- skates to be cut off if not processed (started December 2006)
- port inspection.

7.2 Management advice

21. In 2012 WG-FSA:

(i) encouraged the estimation of biological parameters for *D. eleginoides* in Subarea 58.6 (French EEZ), and the development of a stock assessment for this area

(ii) encouraged France to continue its tagging program in Subarea 58.6

(iii) recommended that avoidance of zones of specific high by-catch should also be considered

(iv) encouraged the monitoring of the two boats responsible for the main part of the bird by-catch, including the use of spatial closure

(v) recommended that, as no new information was available on the state of fish stocks in Subarea 58.6 outside areas of national jurisdiction, the prohibition of directed fishing for *D. eleginoides*, described in Conservation Measure (CM) 32-11, remain in force

Reference

Tixier, P., N. Gasco, G. Duhamel, M. Viviant, M. Authier and C. Guinet. 2010. Interactions of Patagonian toothfish fisheries with killer and sperm whales in the Crozet Islands Exclusive Economic Zone: an assessment of depredation levels and insights on possible mitigation strategies. *CCAMLR Science*, 17: 179–195.