

**FISHERY REPORT: *DISSOSTICHUS ELEGINOIDES* PRINCE EDWARD ISLANDS
SOUTH AFRICAN EEZ (SUBAREAS 58.6 AND 58.7)**

CONTENTS

	Page
1. Details of the fishery	1
1.1 Reported catch (time series)	1
1.2 IUU catch	2
1.3 Size distribution of catches (time series)	3
2. Stocks and areas	3
3. Parameter estimation	3
4. Stock assessment	4
5. By-catch of fish and invertebrates	5
5.1 Estimation of by-catch removals	5
5.2 Assessments of impact on affected populations	6
5.3 Mitigation measures	6
6. By-catch of birds and mammals	6
6.1 Estimation of longline by-catch removals	6
6.2 Pot fishery by-catch	7
6.3 Mitigation measures	7
6.4 Interactions involving marine mammals with longline fishing operations	7
7. Harvest controls and management advice	8
References	8

FISHERY REPORT: *DISSOSTICHUS ELEGINOIDES* PRINCE EDWARD ISLANDS SOUTH AFRICAN EEZ (SUBAREAS 58.6 AND 58.7)

1. Details of the fishery

A licensed fishery within the South African EEZ at the Prince Edward Islands started in October 1996. Part of the South African EEZ is outside the CAMLR Convention Area (Area 51) and part falls within Subareas 58.6 and 58.7 and Division 58.4.4 (Figure 1). Most fishing in the South African EEZ takes place to the north and the east of the Prince Edward Islands in Subareas 58.6 and 58.7 and Area 51, and this Fishery Report focuses on Subareas 58.6 and 58.7. Up to seven operators have been licensed by South Africa to fish in any one year. However, since 2001/02, only two licensed vessels have fished each season, and only one vessel has been active since 2005/06. A second vessel entered the fishery in late 2010.

2. Although the fishery began in 1996, IUU fishing vessels were first detected in the area in 1995 and possibly 1994. Prior to 2001/02, the estimated IUU catch of toothfish exceeded the reported catch for most years (SC-CAMLR-XXVI, Annex 5, Appendix N, Table 2).

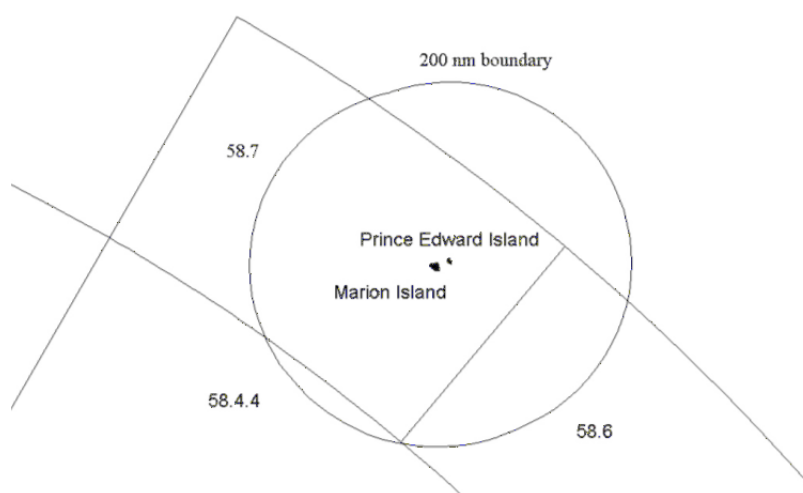


Figure 1: General map of the South African EEZ at the Prince Edward Islands and the boundaries of Subareas 58.6 and 58.7 and Division 58.4.4 in the CAMLR Convention Area. Area 51 lies to the north of Subareas 58.6 and 58.7.

1.1 Reported catch (time series)

3. The total annual catches taken in the South African EEZ in Subareas 58.6 and 58.7 in the Convention Area, and Area 51 outside the Convention Area, as reported to CCAMLR, are presented in Table 1.

Table 1: Catch history for *Dissostichus eleginoides* in Subareas 58.6 and 58.7 in the Convention Area, and Area 51 outside the Convention Area. (Source: STATLANT data for past seasons, fine-scale data for current season, WG-FSA-10/6 Rev. 1 and past reports for IUU catch in Subarea 58.7; IUU catches in Subarea 58.6 are described in the Crozet Island Fishery Report – Appendix Q).

Fishing season	Reported catch (tonnes)				Estimated IUU catch (tonnes)	Total removal (tonnes)
	Area 51	Subarea 58.6	Subarea 58.7	Total		
1995/96	0	73	869	942	4958	5900
1996/97	0	53	1193	1246	7327	8573
1997/98	0	267	637	903	598	1501
1998/99	0	275	301	576	173	749
1999/00	0	79	1015	1094	191	1285
2000/01	0	36	235	271	120	391
2001/02	0	67	98	165	78	243
2002/03	46	39	219	304	120	424
2003/04	33	71	133	237	48	285
2004/05	53	79	142	274	60	334
2005/06	22	27	124	172	0	172
2006/07	41	26	148	216	0	216
2007/08	21	55	69	145	0	145
2008/09	30	22	20	72	0	72
2009/10 ¹	47	22	15	84	0	84

¹ Two vessels are currently fishing.

4. The status of the resource within the South African EEZ was revised in 2007 (SC-CAMLR-XXVI, Annex 5, Appendix N; WG-FSA-07/34 Rev. 1). In that review, the removals from the South African EEZ were derived from SC-CAMLR-XXVI, Annex 5, Appendix N, Table 2.

1.2 IUU catch

5. The estimated IUU catch in Subarea 58.7 is presented in Table 1 (IUU catches in Subarea 58.6 are described in the Crozet Island fishery report (Appendix Q)), whereas the estimated IUU catch from the South African EEZ (as used in the assessment in WG-FSA-07/34 Rev. 1) is presented in SC-CAMLR-XXVI, Annex 5, Appendix N, Table 2.

6. IUU fishing was first detected in 1995 (and possibly 1994), and initially the estimated IUU catch within the South African EEZ substantially exceeded the reported catch (SC-CAMLR-XXVI, Annex 5, Appendix N, Table 2). The IUU catch in the South African EEZ prior to 2003 (SC-CAMLR-XXVI, Annex 5, Appendix N, Table 2) was estimated as the sum of the IUU catch estimated for Subarea 58.7 and 50% of that estimated for Subarea 58.6 (Brandão et al., 2002). Since 2003, IUU catch estimates are based on the number and duration of fishing activities of illegal vessels known, or believed, to have operated in the South African EEZ and on the average green-weight tonnages from vessels operating legally in that area in the corresponding years. Note that CCAMLR records indicated only one reported IUU vessel in this area during 2004, whereas other intelligence reports indicated that at least three IUU vessels were seen within the South African EEZ (WG-FSA-05/58). The

latest IUU reports record a single vessel in Subarea 58.6 in 2005/06, which may or may not have been within the South African EEZ (WG-FSA-07/10 Rev. 5). There was no evidence of IUU fishing in recent seasons.

1.3 Size distribution of catches (time series)

7. Catch-weighted length frequencies for *D. eleginoides* caught by longline are presented in Figure 2. The data cover the period 1995/96 to the current season, except for 2002/03 and 2004/05 where fine-scale catch and/or length data are not available in the CCAMLR database. Most *D. eleginoides* caught by longline range from 50 to 120 cm in length, with a mode at approximately 60–90 cm.

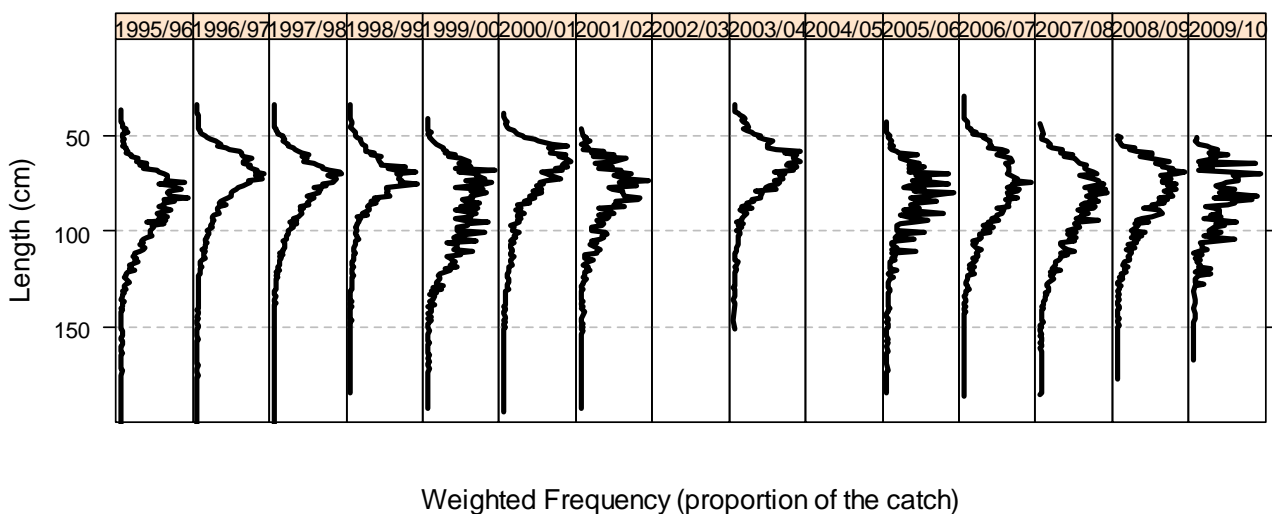


Figure 2: Catch-weighted length frequencies for *Dissostichus eleginoides* caught by longline in the South African EEZ in Subareas 58.6 and 58.7 (source: observer, fine-scale and STATLANT data; there were no fine-scale and/or length data available for 2002/03 and 2004/05).

2. Stocks and areas

8. The South African EEZ around the Prince Edward Islands is mainly in Subarea 58.7 but extends east into Subarea 58.6, south into Division 58.4.4, and north of the Convention Area into Area 51 (Figure 1). However, there are currently no fishing grounds in the southern half of the South African EEZ. The majority of the fishery occurs down to about 1 500 m, but fishing depths in excess of 2 000 m have been recorded. Subarea 58.6 also includes the Crozet Islands to the east of the Prince Edward Islands. The current stock assessments do not consider the possibility that these island groups share the same toothfish stock.

3. Parameter estimation

9. The parameters used in the assessment reviewed in 2007 are reported in SC-CAMLR-XXVI, Annex 5, Appendix N.

10. South Africa has voluntarily implemented CM 41-01 and requires each longline vessel to tag and release toothfish at the rate of one fish per tonne of green weight caught throughout the season.

11. Tagging rates, and recaptures by year since 2005/06, are given in Table 2.

Table 2: Number of toothfish tagged and the number of recaptures per year in the South African EEZ in Subareas 58.6 and 58.7.

Year	Tagged	Recaptured
2005/06	94	1
2006/07	128	1
2007/08	120	4
2008/09	140	0
2009/10	74	7
Total	556	13

4. Stock assessment

12. The assessment was reviewed in 2007 (see SC-CAMLR-XXVI, Annex 5, Appendix N and WG-FSA-07/34 Rev. 1). No assessment was carried out in 2010. A difficulty with assessments is that there are conflicting signals in the CPUE and catch-at-length data. An operational management procedure (OMP) approach for the fishery that addresses this uncertainty was presented to, and discussed by, WG-SAM (SC-CAMLR-XXVII, Annex 7, paragraphs 6.1 to 6.3; Brandão and Butterworth, 2009). The adoption of the OMP as a basis for management is currently being considered by South Africa.

13. A large reduction in *D. eleginoides* CPUE was observed shortly after inception of the longline fishery in Subareas 58.6 and 58.7, from 0.35 to 0.5 kg/hook in 1995/96 and 1996/97 to below 0.1 kg/hook in the early 2000s. Since 2007/08 there appears to have been a small increase in vulnerable stock size as evidenced by an increase in raw CPUE above 0.1 kg/hook. A similar trajectory in the CPUE series is observed in SSRUs 586A and B and Subarea 58.7 (Table 3 and Figure 3).

Table 3: Historic effort and *Dissostichus eleginoides* CPUE (kg/hook) for longline vessels only in Subareas 58.6 and 58.7.

Season	Effort (million hooks)			Raw CPUE (kg/hook)		
	58.6	58.7	Both	58.6	58.7	Both
1995/96	0.16	1.37	1.53	0.686	0.512	0.530
1996/97	0.40	3.10	3.50	0.242	0.403	0.384
1997/98	1.23	2.89	4.11	0.181	0.210	0.202
1998/99	0.66	0.54	1.21	0.104	0.050	0.080
1999/00	0.41	2.03	2.44	0.104	0.136	0.130
2000/01	0.13	0.80	0.93	0.036	0.063	0.059
2001/02	0.52	0.39	0.91	0.083	0.082	0.082
2002/03	0.00	0.00	0.00	-	-	-
2003/04	0.58	0.68	1.26	0.079	0.043	0.060
2004/05	0.00	0.00	0.00	-	-	-
2005/06	0.25	1.01	1.26	0.079	0.127	0.118
2006/07	0.58	1.98	2.56	0.060	0.078	0.074
2007/08	0.47	0.61	1.07	0.117	0.114	0.116
2008/09	0.23	0.18	0.41	0.098	0.113	0.104
2009/10	0.18	0.14	0.33	0.121	0.105	0.114

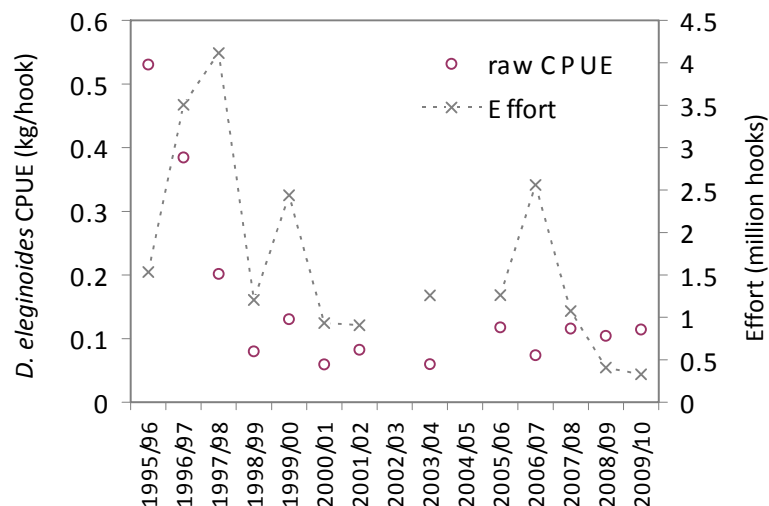


Figure 3: Historic effort and *Dissostichus eleginoides* CPUE (kg/hook) for longline vessels only in Subareas 58.6 and 58.7.

5. By-catch of fish and invertebrates

5.1 Estimation of by-catch removals

14. Estimated annual by-catch removals from the longline fishery for *D. eleginoides* in the South African EEZ in Subareas 58.6 and 58.7, and Area 51, are reported in Table 4. The Working Group noted that South Africa has voluntarily submitted accurate fine-scale data for all except two seasons (Figure 2) and encouraged South Africa to submit fine-scale data for those two seasons.

Table 4: Catch history for by-catch species (macrourids, rajids and other species) taken in the longline fishery for *D. eleginoides* in the South African EEZ in Subareas 58.6 and 58.7 in the Convention Area, and Area 51 outside the Convention Area (source: fine-scale data).

Season	Reported catch (tonnes)											
	Macrourids				Rajids				Other species			
	51	58.6	58.7	Total	51	58.6	58.7	Total	51	58.6	58.7	Total
1995/96	0	0	0	0	0	0	0	0	0	0	0	0
1996/97	0	0	0	0	0	0	0	0	0	0	0	0
1997/98	0	0	0	0	0	0	1	1	0	0	1	1
1998/99	0	0	0	0	0	0	0	0	0	0	0	0
1999/00	15	12	47	74	2	2	3	7	4	0	7	11
2000/01	8	2	13	22	0	0	0	1	1	0	1	2
2001/02	3	2	2	7	0	0	0	0	0	0	0	0
2002/03*	-	-	-	-	-	-	-	-	-	-	-	-
2003/04	0	0	0	1	0	0	0	0	0	0	0	0
2004/05	0	0	0	0	0	0	0	0	0	1	22	23
2005/06	2	1	8	12	0	0	0	0	1	0	0	1
2006/07	15	9	22	46	0	0	0	0	2	0	2	5
2007/08	2	3	5	10	0	0	0	0	1	0	2	2
2008/09	1	2	1	4	0	0	0	0	0	0	0	0
2009/10	2	1	1	4	0	0	0	0	0	0	0	1

* No fine-scale data

5.2 Assessments of impact on affected populations

15. It was not possible to assess the impacts on affected populations.

5.3 Mitigation measures

16. There are no mitigation measures in force to reduce fish and invertebrate by-catch.

6. By-catch of birds and mammals

6.1 Estimation of longline by-catch removals

17. There were no observed incidents of seabird mortality in the South African EEZ in Subareas 58.6 and 58.7 during the 2009/10 season (Table 5). This is the fifth consecutive year of no observed seabird by-catch in this fishery. No new estimates of potential seabird removals by IUU fishing were calculated in 2010. Previous estimates are summarised in SC-CAMLR-XXVI/BG/32 and SC-CAMLR-XXVI, Annex 6, Part II, Table 20.

Table 5: Estimated by-catch of seabirds in the South African EEZ in Subareas 58.6 and 58.7.

Fishing season	By-catch rate (birds/thousand hooks)	Estimated by-catch
1996/97	0.52	834
1997/98	0.194	528
1998/99	0.034	156
1999/00	0.046	516
2000/01	0.018	199
2001/02	0	0
2002/03	0.003	7
2003/04	0.025	39
2004/05	0.149	76
2005/06	0	0
2006/07	0	0
2007/08	0	0
2008/09	0	0
2009/10	0	0

18. WG-IMAF did not meet in 2010, however, in 2009, it assessed the level of risk of incidental mortality of seabirds in the fishery in the South African EEZ at the Prince Edward Islands (in both Subareas 58.6 and 58.7) as category 5 (high) (SC-CAMLR-XXVIII, Annex 7, Table 14 and Figure 2).

19. There were no observed incidental mortalities of marine mammals during the 2009/10 season.

6.2 Pot fishery by-catch

20. This fishery was active only in 2003/04 and 2004/05. No by-catch of seabirds or mammals was observed in this fishery.

6.3 Mitigation measures

21. South Africa has consistently required the application in this area of the mitigation measures recommended by CCAMLR with the exception of a closed season.

6.4 Interactions involving marine mammals with longline fishing operations

22. On one vessel, some limited observations by the industry in the 2004/05 season indicated a loss of two toothfish to toothed cetaceans for each whole toothfish landed when longlines were hauled. Longline operations are now concentrated in shallower waters to attempt to minimise such losses. The Working Group noted that this level of cetacean predation is much greater than suspected for other toothfish fisheries, and encouraged the deployment of a scientific observer by South Africa to gather further data on this.

23. No marine mammal injuries or deaths were reported during the 2008/09 season (see SC-CAMLR-XXVIII, Annex 7).

7. Harvest controls and management advice

24. In 2005, the Scientific Committee noted that the advice on the appropriate levels of future catch provided in WG-FSA-05/58 (see also WG-FSA-06/58 and 07/34 Rev. 1) was not based on the CCAMLR decision rules. Therefore, the Working Group was unable to provide management advice for the fishery in the South African EEZ at the Prince Edward Islands. The Working Group recommended that CCAMLR decision rules also be used in estimating yields for this fishery. The proposed operational management procedure addresses the concerns over the sensitivity of the ASPM to weightings used for different data sources and the estimation of recruitment levels for forward projections.

25. No new information was available on the state of fish stocks in Subareas 58.6 and 58.7 and Division 58.4.4 outside areas of national jurisdiction. The Working Group therefore recommended that the prohibition of directed fishing for *D. eleginoides*, described in CMs 32-10, 32-11 and 32-12, remain in force.

References

- Brandão, A. and D.S. Butterworth. 2009. A proposed management procedure for the toothfish (*Dissostichus eleginoides*) resource in the Prince Edward Islands vicinity. *CCAMLR Science*, 16: 33–69.
- Brandão, A., D.S. Butterworth, B.P. Watkins and D.G.M. Miller. 2002. A first attempt at an assessment of the Patagonian toothfish (*Dissostichus eleginoides*) resource in the Prince Edward Islands EEZ. *CCAMLR Science*, 9: 11–32.