

Fishery Report: *Dissostichus eleginoides* Prince Edward Islands EEZ (Subareas 58.6 and 58.7)

1. Details of the fishery

5.269 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 CCAMLR Convention Area (Area 51) and part falls within Subareas 58.6 and 58.7 and Division 58.4.4 (Figure 5.24).

5.270 Although the fishery began in 1996, intelligence reports indicated that IUU vessels were operating in the area in 1995 and possibly 1994. Since the start of the licensed fishery, the estimated IUU catch has exceeded the reported catch for most years (Table 5.64). Since the start of the fishery a maximum of five operators have been licensed by South Africa to fish in any one year. During the 2002/03 and 2003/04 fishing seasons, two licensed vessels were active in the fishery.

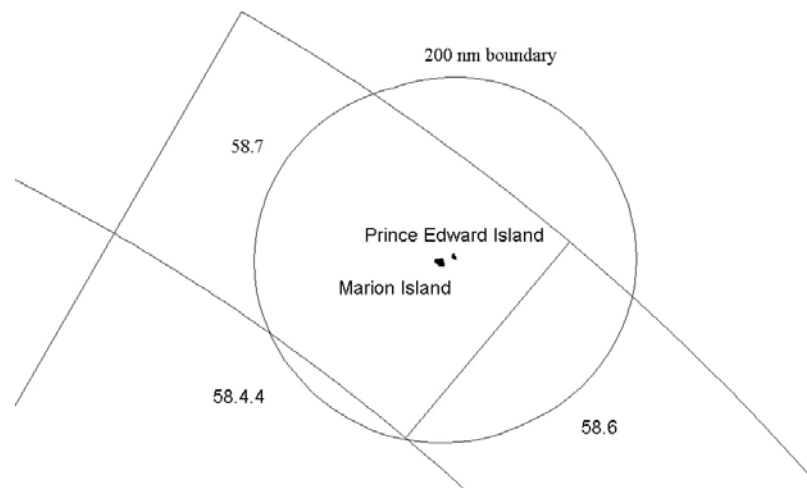


Figure 5.24: Map showing the position of the South African EEZ at the Prince Edward Islands and the boundaries of the relevant CCAMLR areas.

1.1 Reported catch (time series)

5.271 The total annual catches taken in Subarea 58.7 as reported to CCAMLR are presented in Table 5.64.

Table 5.64: Catch history for *Dissostichus eleginoides* in Subarea 58.7 (source: WG-FSA-04/5 Rev. 1 and SCIC-04/3 Rev. 2). Fishing season is from 1 December to 30 November.

Fishing season	Total reported catch (tonnes)	IUU catch (tonnes)	Total removals (tonnes)
1995/96	869	4958	5827
1996/97	1193	7327	8520
1997/98	637	598	1235
1998/99	301	173	474
1999/00	1015	191	1206
2000/01	235	120	355
2001/02	98	78	176
2002/03	219	138	357
2003/04	50	58	108

5.272 The status of the resource within the South African EEZ was assessed in WG-FSA-04/37. For that assessment, the removals from the South African EEZ were estimated (Table 5.65). The reported catch column includes catches taken in the South African EEZ within Subareas 58.7 and 58.6 as well as catches from Area 51 outside the CCAMLR region. In WG-FSA-04/37 the authors noted that the reported catches underestimate total mortality as losses through depredation by cetaceans are not included.

Table 5.65: Catch history for *Dissostichus eleginoides* in the South African EEZ as used in the assessment (source: WG-FSA-SAM-04/12 and WG-FSA-04/37). The limited data for 1996 have been pooled with the 1997/98 season.

Fishing season	Vessels (non-IUU)	Catch limit (tonnes)	Reported landed catch (tonnes)	IUU catch (tonnes)	Total extractions (tonnes)
1996/97	7	2 500	2 921	21 350	24 271
1997/98	4	3 000	1 011	1 808	2 819
1998/99	4	2 750	956	1 014	1 970
1999/00	3	2 250	1 562	1 210	2 772
2000/01	5	2 250	352	352	704
2001/02	2	600	200	306	506
2002/03	2	500	313	256	569
2003/04	2	500	97	156	253

1.2 IUU catch

5.273 The estimated IUU catch in Subarea 58.7 is presented in Table 5.64, whereas the estimated IUU catch from the South African EEZ (as used in the assessment in WG-FSA-04/37) is presented in Table 5.65.

5.274 IUU fishing has occurred since at least 1995 (and possibly 1994), and in most years the estimated IUU catch within the South African EEZ has exceeded the reported catch (Table 5.65). The IUU catch in the South African EEZ prior to 2003 (Table 5.65) 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). For 2003 and 2004 the 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 of vessels operating legally in that area in the corresponding years (WG-FSA-04/37). 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-04/37).

1.3 Size distribution of catches (time series)

5.275 Annual estimated catch length frequencies are presented in Figure 5.25.

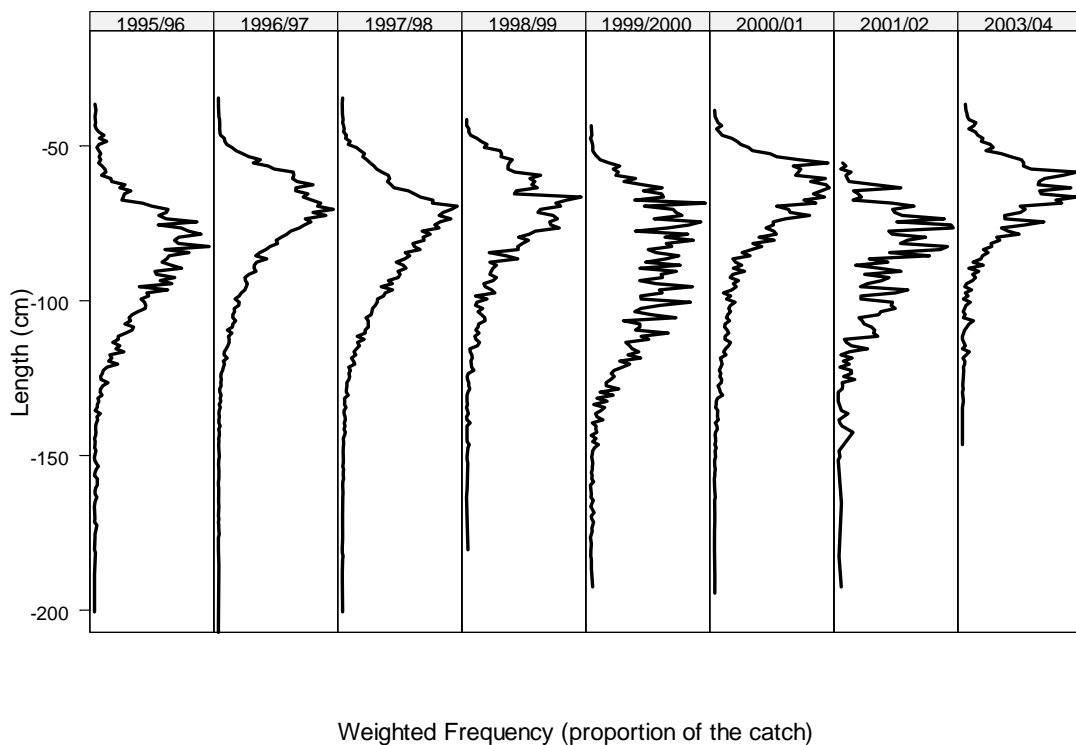


Figure 5.25: Catch-weighted length frequencies for *Dissostichus eleginoides* in Subarea 58.7 derived from observer, fine-scale and STATLANT data reported by 6 October 2004.

2. Stocks and areas

5.276 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 in to Area 51 (Figure 5.24), however there are currently no fishing grounds in the south 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.

3. Parameter estimation

3.1 Biological parameters

5.277 None of the parameters used in the assessment were derived specifically from this fishery, rather they have been assumed from work on toothfish in other areas within the CCAMLR Convention Area.

Table 5.66: Parameter values used in the assessment of the toothfish stock in the South African EEZ at the Prince Edward Islands (source: WG-FSA-04/37).

Component	Parameter	Value	Units
Natural mortality	M	0.2	y^{-1}
VBGF	K	0.066	y^{-1}
VBGF	t_0	-0.21	y
VBGF	L_{∞}	194.6	cm
Length to mass	' a '	2.5E-05	cm, kg
Length to mass	' b '	2.8	
Age at maturity	t_m	10	y

Standardised CPUE

5.278 CPUE was standardised by applying the GLM approach described in Appendix 1 of WG-FSA-04/37.

Table 5.67: Standardised longline CPUE by season for *Dissostichus eleginoides* in the South African EEZ at the Prince Edward Islands (source: WG-FSA-04/37).

Fishing season	Standardised CPUE
1996/97	3.628
1997/98	0.976
1998/99	0.851
1999/00	0.505
2000/01	0.306
2001/02	0.325
2002/03	0.409
2003/04	0.263

4. Stock assessment

4.1 Model structure and assumptions

5.279 An ASPM was used to assess the status of the *D. eleginoides* resource in the South African EEZ at the Prince Edward Islands (WG-FSA-04/37). The methodology is thoroughly presented in Appendix 1 of that paper. The Working Group noted that several refinements had been added since WG-FSA-SAM-04/12 was presented at WG-FSA-SAM-04.

4.2 Model estimates

5.280 Estimated exploited biomass and projections under three levels of future catches for the base-case ASPM model from WG-FSA-04/37 are presented in Figure 5.26. Further model estimates are available in WG-FSA-04/37.

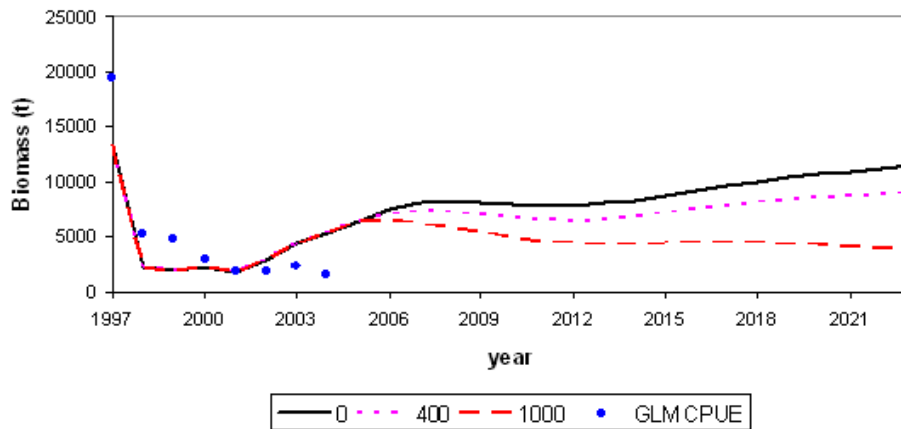


Figure 5.26: GLM-standardised CPUE indices to which the ASPM was fitted (divided by the estimated catchability q to express them in biomass units) and estimated exploitable biomass, together with projections under future annual catches of 0, 400 and 1 000 tonnes. Source: WG-FSA-04/37.

4.3 Sensitivity analyses

5.281 Several sensitivity analyses were explored in WG-FSA-04/37 by applying different weightings to the catch-at-length and CPUE data.

4.4 Discussion of model results

5.282 The Working Group considered that the results of the ASPM model were unstable and were very sensitive to the weightings used for the assessment, which were entirely arbitrary. The Working Group also noted that the estimates of yield provided in the paper were not based on the CCAMLR decision rules.

4.5 Future research requirements

5.283 The Working Group encouraged further development of this work. In particular they noted the importance of a full evaluation of the ASPM modelling approach (paragraph 4.15), and requested that the code for the model presented in WG-FSA-04/37 be lodged with the CCAMLR Secretariat.

5.284 The Working Group also noted the development of tagging studies in many other toothfish fisheries in the Convention Area and encouraged South Africa to consider implementing tagging in their EEZ.

5. By-catch of fish and invertebrates

5.1 Estimation of by-catch removals

5.285 Estimated annual by-catch removals for the South African EEZ in Subareas 58.6 and 58.7, but excluding Area 51, are reported in Table 5.68. The Working Group noted that the voluntary submission of fine-scale data was poor for some years and encouraged South Africa to submit more fine-scale data in future.

Table 5.68: Reported by-catch landings from toothfish directed longline fishing by South African vessels fishing in Subareas 58.6 and 58.7. Source: fine-scale and STATLANT data.

Fishing season	<i>Macrourus</i> spp.	Rajids	Other species
1995/96	0	0	0
1996/97	0	0	0
1997/98	0	1	1
1998/99	0	0	0
1999/00	203	18	54
2000/01	72	2	7
2001/02	8	0	0
2002/03	no fine-scale data submitted		
2003/04	1	0	0

5.2 Assessments of impact on affected populations

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

5.3 Mitigation measures

5.287 There are no mitigation measures in force.

6. By-catch of birds and mammals

6.1 Estimation of by-catch removals

5.288 Details of seabird by-catch (taken from Table 7.3) are summarised in Table 5.69. Estimated potential seabird removals in the IUU fishery are summarised in SC-CAMLR-XXIII/BG/23 and Table 7.15.

Table 5.69: 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

5.289 Ad hoc WG-IMAF has 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 (SC-CAMLR-XXIII/BG/21 and Table 7.17). For new and exploratory fisheries in areas of this risk level category the WG-IMAF recommendations are set out in Table 7.17.

6.2 Mitigation measures

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

6.3 Interactions involving marine mammals with longline fishing operations

5.291 Anecdotal reports indicate that catch losses caused by toothed cetaceans taking fish from lines as they are hauled are substantial.

5.292 WG-FSA-04/8 Rev. 1 reported one seal entangled, but not killed, during the 2003/04 season.

7. Management advice

5.293 The Working Group considered that the results of the ASPM model were unstable and were very sensitive to the weightings used for the assessment, which were entirely arbitrary. The Working Group also noted that the estimates of yield provided in the paper were 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.

5.294 The Scientific Committee should note the recommendations by ad hoc WG-IMAF with respect to mitigation of seabird mortalities (paragraphs 5.289 and 5.290).

5.295 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 Conservation Measures 32-11, 32-12 and 32-10, remains in force.