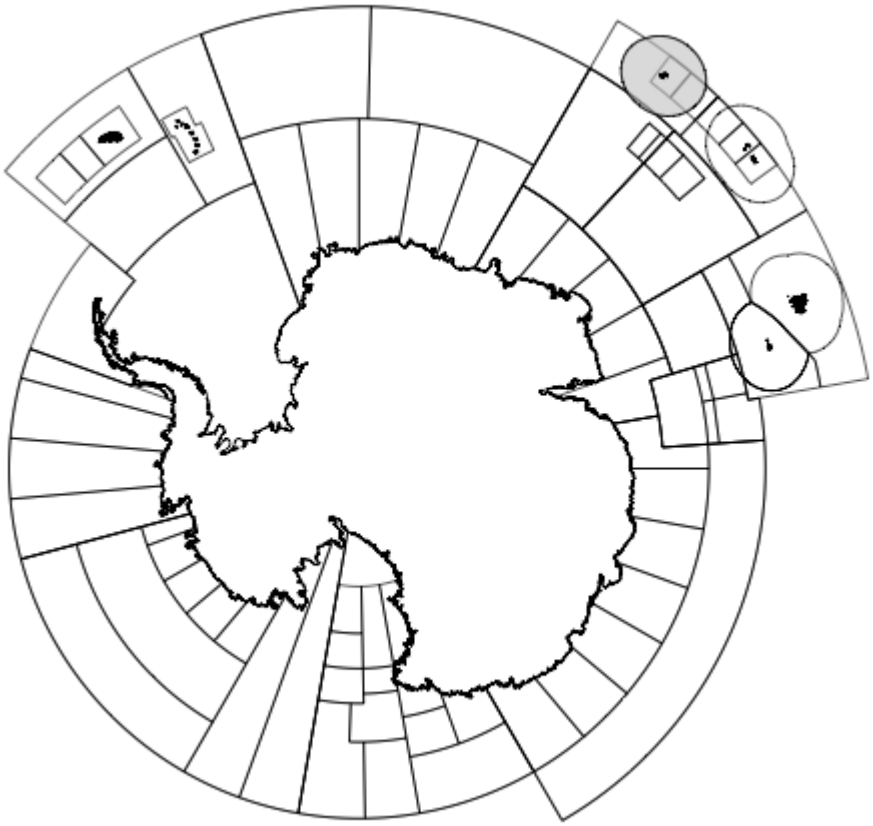
CCAMLR

Commission for the Conservation of Antarctic Marine Living Resources
Commission pour la conservation de la faune et la flore marines de l'Antarctique
Комиссия по сохранению морских живых ресурсов Антарктики
Comisión para la Conservación de los Recursos Vivos Marinos Antárticos

Fishery Report 2016: *Dissostichus eleginoides* Prince Edward Islands South African EEZ (Subareas 58.6 and 58.7 and part of Area 51)

FISHERY REPORT



The map above shows the management areas within the CAMLR Convention Area, the specific region related to this report is shaded.
Throughout this report the CCAMLR fishing season is represented by the year in which that season ended, e.g. 2015 represents the 2014/15 CCAMLR fishing season (from 1 December 2014 to 30 November 2015).

Fishery Report 2016: *Dissostichus eleginoides*
Prince Edward Islands, South African EEZ
(Subareas 58.6 and 58.7 and part of Area 51)

Introduction to the fishery

1. This report describes the licensed longline fishery for Patagonian toothfish (*Dissostichus eleginoides*) in the South African exclusive economic zone (EEZ) at the Prince Edward Islands, which includes a portion each of Subareas 58.6 and 58.7 and Division 58.4.4a and also extends into FAO Area 51, outside the CAMLR Convention Area. No current legal fishery exists outside areas of national jurisdiction in either Subareas 58.6 or 58.7 or Division 58.4.4a.

2. Reports of substantial illegal fishing prompted South Africa to establish a legal fishery around its EEZ in 1996 and five experimental permits, with a total catch limit of 2 500 tonnes, were issued for 1997.

3. Within the South African EEZs, catch limits for target and by-catch species, as well as vessel licensing, are assigned by South Africa. In 2005, South Africa licensed five operators with fixed proportional allocations and a catch limit of 450 tonnes, to undertake fishing in its EEZ at the Prince Edward Islands. Between 2006 and 2010, only one operator, holding 27% of the catch limit, had been active in the fishery but in 2010, a second vessel licensed to catch the remaining 73%, entered the fishery.

4. Some experimental pot fishing was undertaken during 2004 and 2005, but historically, most of the catch was taken with autoline and Spanish longline. In 2008, trotlines were introduced in response to high levels of catch depredation by killer whales (*Orcinus orca*) and by 2011 these have largely replaced Spanish longlines.

Reported catches

5. Reported catches of *D. eleginoides* are presented in Table 1. The highest reported catches are taken from the Subarea 58.7 sector of the EEZ. Catches decreased from 2005 to a low of 72 tonnes in 2009 after which catches increased to more than 200 tonnes and have remained steady to the present season.

6. In 2016 two vessels, the *El Shaddai* and the *Koryo Maru No. 11*, caught a combined total of 208 tonnes of *D. eleginoides* (Table 1).

7. Fishing effort in the South African EEZ is concentrated to the north and the east of the Prince Edward Islands with the highest catches (>1 000 tonnes) being recorded from the Subarea 58.7 sector. No targeted fishing activity is permitted within the Division 58.4.4a sector of the South African EEZ.

Table 1: Catch history for *Dissostichus eleginoides* in the South African EEZ (Subareas 58.6 and 58.7 and FAO Area 51) and estimated IUU catch in tonnes. (Source: STATLANT data and agreed estimates of IUU fishing (Subarea 58.7).)

Season	Reported catch (tonnes)				Estimated IUU catch (tonnes)	Total removal (tonnes)
	Area/subarea			Total		
	51	58.6	58.7			
1996	175	73	869	1116	4958	6074
1997	353	53	1193	1599	7327	8926
1998	1	267	637	904	598	1502
1999	62	275	301	638	173	811
2000	94	79	1015	1188	191	1379
2001	42	36	235	313	120	433
2002	34	67	98	199	78	277
2003	46	39	219	304	120	424
2004	33	71	133	237	48	285
2005	53	79	142	274	60	334
2006	22	27	124	172	0	172
2007	41	26	148	216	0	216
2008	21	55	69	145	0	145
2009	30	22	20	72	0	72
2010	74	77	72	224	0	224
2011	161	33	92	286	0	286
2012	141	32	221	394	0	394
2013	90	23	157	270	0	270
2014	90	18	258	366	0	366
2015	153	80	230	463	0	463
2016*	86	76	154	316	-	316

* Catch data to September 2016.

Illegal, unreported and unregulated (IUU) fishing

8. Although the illegal, unreported and unregulated (IUU) fishing in the South African EEZ at the Prince Edward Islands was first detected in 1995, the illegal exploitation of *D. eleginoides* is thought to have started in 1994 and continued until at least 2005.

9. An analysis presented by Brandão et al. (2002) estimated that the IUU catch of *D. eleginoides* for the South African EEZ in 1996 and 1997 was 21 350 tonnes, which is more than the total legal catch taken over the history of the fishery, including all IUU catch subsequent to 1997.

10. Estimates of IUU catch in Subarea 58.7 are presented in Table 1, while those estimates for Subarea 58.6 are described in the Fishery Report for the French EEZ at Crozet Island. There have been no official reports of IUU fishing in the South African EEZ since 2006 and, following the recognition of methodological issues in its assessment, no estimates of the IUU catch of *Dissostichus* spp. have been provided since 2011 (SC-CAMLR-XXIX, paragraph 6.5). However, the recovery of IUU fishing gear and unconfirmed reports of IUU vessels in Subarea 58.6 and Division 58.4.4 indicate that undetected IUU activity may continue to occur in this area.

Data collection

Biological data

11. The collection of biological data is conducted as part of the CCAMLR Scheme of International Scientific Observation. In longline fisheries targeting *D. eleginoides*, biological data collection includes representative samples of length, weight, sex and maturity stage, as well as collection of otoliths for age determination of the target and most frequently taken by-catch species.

Length distributions of catches

12. The length-frequency distributions of *D. eleginoides* caught by longline in the South African EEZ from 2007 to 2016 are presented in Figure 1. These length-frequency distributions are unweighted (i.e. they have not been adjusted for factors such as the size of the catches from which they were collected). The interannual variability exhibited in the figure may reflect differences in the fished population but is also likely to reflect changes in the gear used, the number of vessels in the fishery and the spatial and temporal distribution of fishing.

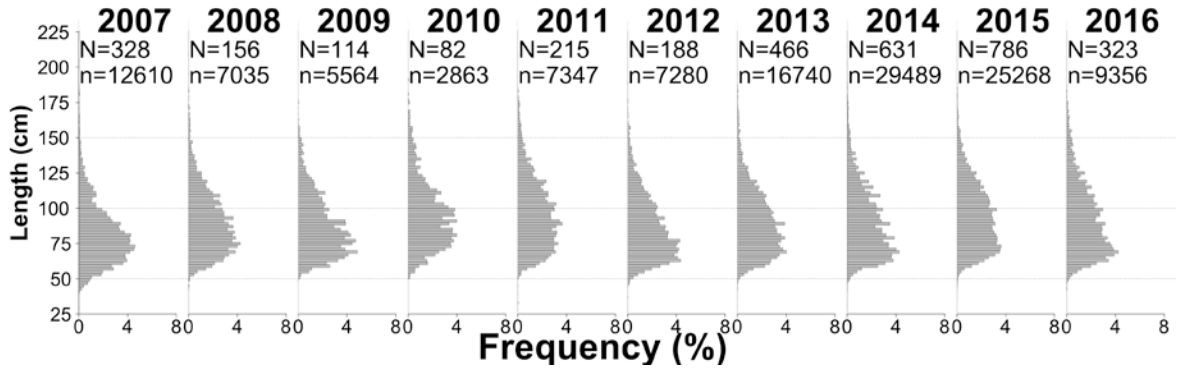


Figure 1: Annual length-frequency distributions of *Dissostichus eleginoides* caught in the South African EEZ from 2007 to 2016. The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are provided.

13. The majority of *D. eleginoides* caught ranged from 50 to 120 cm in total length, with a single strong mode at approximately 60–80 cm in 2004, shifting left from 2005 onward. The increased proportion of large *D. eleginoides* most likely reflects the gradual change in gear type from the use of Spanish longline to trotline.

Tagging

14. To date, a total of 992 *D. eleginoides* have been tagged and 33 have been recaptured in the South African EEZ, 10 of which were caught in 2013 (Table 2).

Table 2: The number of individuals of *Dissostichus eleginoides* tagged and recaptured in each year in the South African EEZ. (Data available up to 2013 only.)

	Season							
	2006	2007	2008	2009	2010	2011	2012	2013
Tagged	94	128	120	140	74	46	136	254
Recaptured	1	1	4	0	7	4	6	10
Required tagging rate	1	3	3	3	3	3	5	5

15. Only a single tagged fish has been recorded to have moved between the French and South African EEZs and the current management approaches used by France and South Africa do not specifically consider the possibility that these island groups share the same toothfish stock.

Life-history parameters

16. The life history of *D. eleginoides* is characterised by slow growth, low fecundity and late maturity. *Dissostichus eleginoides* are thought to spawn in deep water around sub-Antarctic islands, including in the vicinity of Prince Edward Islands and Crozet Islands.

Parameter estimates

17. There are no specific life-history parameters for *D. eleginoides* in the South African EEZ. However, for the purposes of stock assessment, the parameters estimated by Agnew et al. (WG-FSA-06/53) for this species in Subarea 48.3 have been adopted.

Stock assessment status

18. The status of *D. eleginoides* within the South African EEZ was first assessed in 2002 using an age-structured production model (ASPM) and was last reviewed by the Working Group on Fish Stock Assessment (WG-FSA) in 2007 (see SC-CAMLR-XXVI, Annex 5, Appendix N).

19. However, differences between the reported catch-per-unit-effort (CPUE) and catch-at-length data resulted in uncertainty in the assessment outputs. Thus, an operational management procedure (OMP) approach to address this uncertainty was developed in 2009 (SC-CAMLR-XXVII, Annex 7, paragraphs 6.1 to 6.3).

20. The OMP was not formally adopted by South Africa as a basis for management as only one of the five right holders (licensed to catch 27% of the catch limit) was active in the fishery between 2006 and 2010 and the catch limit was kept at 450 tonnes per annum from 2005 to 2010.

21. A revision of the OMP was attempted in 2011 but was hampered by the fact that the preferred gear type had shifted between 2008 and 2011, from Spanish longline to trotline

gear. In order to standardise the catch rates (CPUE) between gear types, a two-year experiment using a general linear mixed model (GLMM), was initiated in 2012 and a precautionary catch limit of 320 tonnes per annum was set:

(i) a research allocation of 68.8% of the annual catch limit (220 tonnes per annum) was set aside for collection of catch data from Spanish longline/trotline pairs in 2012 and 2013 with a target of 100 Spanish/trot pairs per year

(ii) for each Spanish longline set, a trotline must be set within 3 n miles and within a period of one week either before or after the Spanish longline set

(iii) to compensate for the expected loss of revenue associated with setting Spanish longline gear, vessels were eligible to hold the catch from two further trotline sets against the research allocation.

By-catch of fish and invertebrates

Fish by-catch

22. Catch limits for by-catch species groups (macrourids, rajids and other species) are set by South Africa. The catch histories for by-catch species since 2004 are provided in Table 3.

Table 3: Catch history for by-catch species (macrourids, rajids and other species), including number of rajids released alive, in the South African EEZ in the Convention Area, and Area 51 outside the Convention Area. (Source: fine-scale data to 16 September 2015.)

Season	Reported catch (tonnes)												
	Macrourids				Rajids					Other species			
	Area/subarea			Total	Area/subarea			Total	Number released	Area/subarea			Total
	51	58.6	58.7		51	58.6	58.7			51	58.6	58.7	
2004	0	0	0	0	0	0	0	0	-	0	0	0	0
2005	0	0	0	0	0	0	0	0	-	0	1	22	23
2006	2	1	8	11	0	0	0	0	-	1	0	0	1
2007	15	9	22	46	0	0	0	0	-	2	0	2	4
2008	2	3	5	10	0	0	0	0	-	1	0	2	3
2009	1	2	1	4	0	0	0	0	381	0	0	0	0
2010	3	3	2	8	0	0	0	0	314	1	0	0	1
2011	9	1	3	13	3	0	0	3	421	3	0	1	4
2012	3	2	12	17	0	0	1	1	4	0	0	1	1
2013	9	2	18	29	1	0	0	1	-	1	0	2	3
2014	7	1	18	26	0	0	0	0	-	2	0	4	6
2015	4	2	12	18	1	0	0	1	-	1	0	5	6
2016	7	2	10	19	1	0	1	2	-	1	0	2	3

23. The by-catch in the South African EEZ consists predominantly of macrourids, the majority of which are caught in the Subarea 58.7 sector of the EEZ. The maximum catch of 46 tonnes of macrourids, reported in 2007 (Table 3), equates to 21% of the catch of the target species reported in that year.

24. In 2016, 19 tonnes of macrourids and 1 tonne of rajids were reported from the South African EEZ (Table 3).

Invertebrate by-catch including VME taxa

25. Conservation Measures (CMs) 22-06 and 22-07 do not apply in the South African EEZ and, consequently, there are no vulnerable marine ecosystems (VMEs) or VME Risk Areas designated.

Incidental mortality of seabirds and marine mammals

Incidental mortality

26. There have been no reported incidents of bird mortality reported in the South African EEZ since 2012 when three white-chinned petrel (*Procellaria aequinoctialis*) were reported. Prior to that the only reported incidental mortality was of 43 white-chinned petrels and six yellow-nosed albatross (*Thalassarche chlororhynchos*) in 2004.

27. The level of risk of incidental mortality of birds in the fishery in the South African EEZ at the Prince Edward Islands (in both Subareas 58.6 and 58.7) is considered to be high (category 5) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).

28. While depredation of the catch, particularly by toothed cetaceans, can contribute up to 50% of loss in catch landings, there have been no reports of incidental mortalities of mammals over the past 10 seasons.

Mitigation measures

29. The requirements of CM 25-02 ‘Minimisation of the incidental mortality of birds in the course of longline fishing or longline fishing research in the Convention Area’ apply to this fishery. There is an exemption to the requirement for night setting by achieving the sink rates described in CM 24-02 and subject to a bird by-catch limit. South Africa has applied the mitigation measures recommended by CCAMLR within its EEZ, with the exception of a seasonal closure.

30. South Africa is currently in the planning phase of the development of a marine protected area (MPA) and three restricted areas within its EEZ around the Prince Edward Islands with the aim of reducing the by-catch of birds by the fishery and contributing to the long-term recovery of *D. eleginoides* (Lombard et al., 2007).

Ecosystem implications and effects

31. There is no formal evaluation available for this fishery.

Current management advice and conservation measures

32. The limits in force and the advice of WG-FSA to the Scientific Committee for the forthcoming season are:

(i) CCAMLR was unable to provide management advice for the fishery in the South African EEZ at the Prince Edward Islands for the forthcoming season as no new information was available on the state of fish stocks in Subareas 58.6 and 58.7 and Division 58.4.4a outside areas of national jurisdiction

(ii) an updated OMP will be used as the basis for management advice for the fishery in the South African EEZ

(iii) directed fishing for *D. eleginoides* in Subareas 58.6 and 58.7 and Division 58.4.4a, outside the South African EEZ (CM 32-02), shall be prohibited.

References

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.

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