

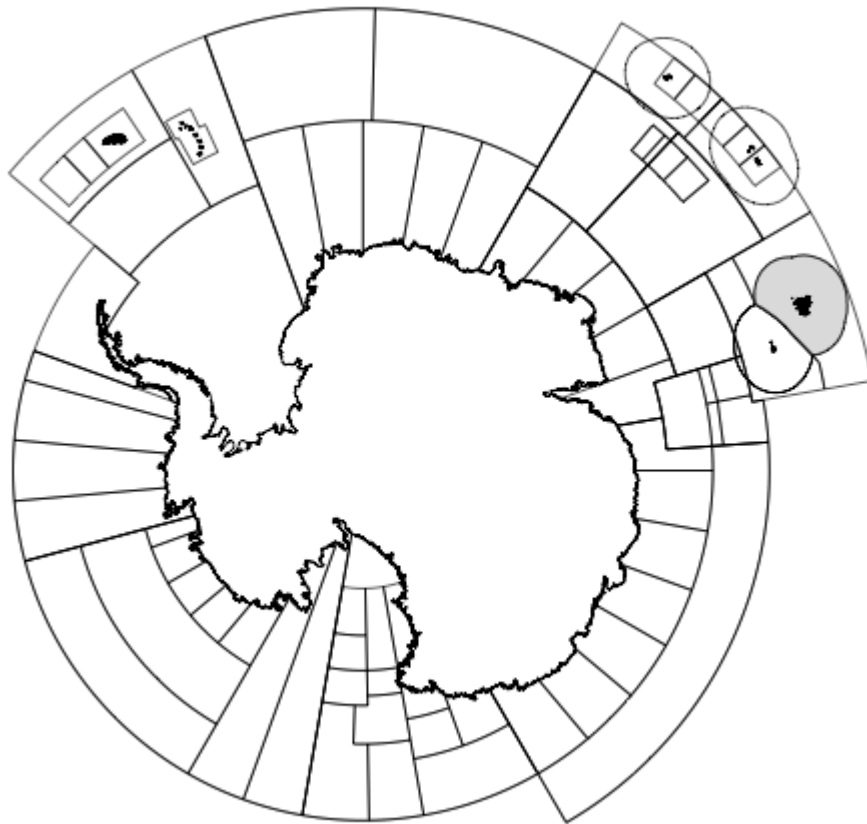


CCAMLR

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 2018: *Dissostichus eleginoides* Kerguelen Islands French EEZ (Division 58.5.1)

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 2018: *Dissostichus eleginoides* Kerguelen Islands, French EEZ (Division 58.5.1)

Introduction to the fishery

1. This report describes the licensed longline fishery for Patagonian toothfish (*Dissostichus eleginoides*) in the French exclusive economic zone (EEZ) established in 1978 around the Kerguelen Islands in Division 58.5.1.
2. The fishery, targeting *D. eleginoides*, began as a trawl fishery in 1985 but targeting other species between 1979 and 1984 caught small amounts of toothfish as by-catch. Trawling continued to 2001 and intermittently in 2006 and 2010; a longline fishery began in 1992 and continues to the present (Duhamel et al., 2011). The fishery is active throughout the year with the exception of a summer closure period (1 February to either 1 or 15 March) which has been in place since 2004.
3. Within the French EEZs, fishing seasons, catch limits for target and by-catch species, as well as vessel licensing, are allocated by France. The season extends from 1 September to 31 August. French management measures, annually established by TAAF, specific to the EEZ, have restricted the longline fishery to waters outside the 12 n mile zone and no shallower than 500 m.
4. For the 2018 season, a catch limit set by France of 5 050 tonnes was allocated among seven longline vessels.

Reported catch

5. Reported catches of *D. eleginoides* are presented in Table 1. The total catch reported up to February 2019 was 4 430 tonnes. The highest reported catch of 7 758 tonnes was recorded in 1992.
6. The average (unstandardised) catch per hook decreased from 0.37 kg/hook in 2000 to 0.18 in 2004 and remained stable at 0.23 kg/hook since 2011.
7. Fishing effort in Division 58.5.1 is widely distributed throughout the French EEZ.

Illegal, unreported and unregulated (IUU) fishing

8. Illegal, unreported and unregulated (IUU) fishing was first detected in this region in 1996 and in some years IUU catches have exceeded legal catches, resulting in total removals exceeding 10 000 tonnes in some seasons.
9. IUU fishing activity was detected in Division 58.5.1 (Kerguelen EEZ) during 2006, with one IUU-listed fishing vessel observed in the division. Two IUU-listed vessels were sighted during 2007 and three IUU-listed vessels were sighted during 2008. One IUU fishing vessel was observed at Lameyne Ridge (on the boundary of the Kerguelen EEZ) during winter 2007,

and reports from France indicate that IUU activities sometimes occurred here during each year from 2008 to 2012. One IUU-listed fishing vessel was sighted in Division 58.5.1 during 2010, two during 2012 and one during the 2013. No IUU-listed vessels were observed during 2014, 2015 and 2016, however, IUU fishing gear was recovered from the region during all three years. 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).

Table 1: Catch history of *Dissostichus eleginoides* in the French EEZ at Kerguelen Island (Division 58.5.1) and estimated IUU catch in tonnes. (Source: fine-scale data.)

| Season | Reported catch (tonnes) | | | Estimated IUU catch (tonnes) |
|--------|-------------------------|-------|-------|------------------------------|
| | Longline | Trawl | Total | |
| 1996 | 370 | 3304 | 3674 | 833 |
| 1997 | 628 | 4018 | 4646 | 6094 |
| 1998 | 929 | 3628 | 4557 | 7156 |
| 1999 | 840 | 3617 | 4457 | 1237 |
| 2000 | 2992 | 6127 | 9119 | 2600 |
| 2001 | 2370 | 4348 | 6718 | 4550 |
| 2002 | 4087 | 346 | 4433 | 6300 |
| 2003 | 5453 | 0 | 5453 | 5518 |
| 2004 | 5103 | 0 | 5103 | 536 |
| 2005 | 5022 | 0 | 5022 | 268 |
| 2006 | 4694 | 254 | 4948 | 144 |
| 2007 | 5350 | 0 | 5350 | 451 |
| 2008 | 4850 | 0 | 4850 | 720 |
| 2009 | 5244 | 0 | 5244 | 0 |
| 2010 | 4930 | 235 | 5165 | 22 |
| 2011 | 5224 | 0 | 5224 | * |
| 2012 | 4900 | 0 | 4900 | * |
| 2013 | 5381 | 0 | 5381 | * |
| 2014 | 5318 | 0 | 5318 | * |
| 2015 | 4401 | 0 | 4401 | * |
| 2016 | 5562 | 0 | 5562 | * |
| 2017 | 5095 | 0 | 5095 | * |
| 2018** | 4430 | 0 | 4430 | * |

* Not estimated.

** Data reported to February 2019.

Data collection

Biological data

10. 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

11. The length-frequency distributions of *D. eleginoides* caught in this fishery from 2008 to 2017 are presented in Figure 1 (only commercial longline considered). The majority of *D. eleginoides* caught by longline range from 50 to 100 cm in length, with a single strong mode for all seasons at approximately 70–80 cm. 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.

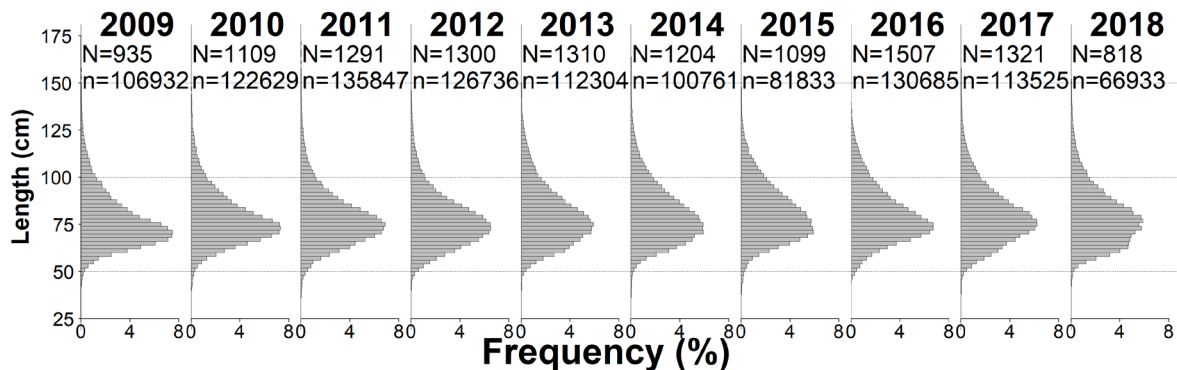


Figure 1: Annual length-frequency distributions of *Dissostichus eleginoides* caught in the French EEZ at the Kerguelen Islands in Division 58.5.1 from 2009 to 2018 (partial data). The number of hauls from which fish were measured (N) and the number of fish measured (n) in each year are provided.

Tagging

12. Within the French EEZ, vessels are required to tag and release toothfish at a rate of 1 fish per tonne of green weight caught throughout the season.

13. Tagging commenced in 2006 and to date, a total of 54 463 *D. eleginoides* have been tagged in the longline catches in the French EEZ in Division 58.5.1, of which 6 411 have been recaptured (Table 2). Only few tagged fish have been recovered outside the Kerguelen EEZ (34 in the Crozet EEZ). An additional 286 fish, which were tagged in the Australian EEZ at Heard Island (Division 58.5.2), have been recaptured in Division 58.5.1.

Table 2: The number of individuals of *Dissostichus eleginoides* tagged and recaptured in each season in the French EEZ in Division 58.5.1.

| Year | Tagged | Recaptured | | | | | | | | | | | | Total | |
|-------|--------|------------|------|------|------|------|------|------|------|------|------|------|------|-------|-----|
| | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | | |
| 2007 | 2894 | 1 | 5 | 26 | 17 | 11 | 4 | 10 | 4 | 6 | 3 | 2 | 1 | 90 | |
| 2008 | 1629 | | 4 | 10 | 85 | 58 | 55 | 37 | 16 | 12 | 7 | 9 | 5 | 393 | |
| 2009 | 4367 | | | 5 | 42 | 114 | 118 | 96 | 94 | 50 | 30 | 23 | 17 | 7 | 591 |
| 2010 | 4880 | | | | 26 | 132 | 139 | 139 | 83 | 48 | 54 | 30 | 22 | 673 | |
| 2011 | 5378 | | | | | 43 | 227 | 245 | 155 | 106 | 99 | 52 | 36 | 963 | |
| 2012 | 4987 | | | | | | 51 | 197 | 180 | 138 | 125 | 63 | 48 | 802 | |
| 2013 | 5445 | | | | | | 2 | 85 | 211 | 176 | 168 | 123 | 80 | 845 | |
| 2014 | 5400 | | | | | | | | 44 | 180 | 203 | 132 | 97 | 656 | |
| 2015 | 4503 | | | | | | | | | | | 185 | 101 | 541 | |
| 2016 | 5631 | | | | | | | | | | | 190 | 256 | 526 | |
| 2017 | 5021 | | | | | | | | | | | 64 | 230 | 294 | |
| 2018 | 4328 | | | | | | | | | | | | 37 | 37 | |
| Total | 54463 | | | | | | | | | | | | | 6411 | |

14. The tagging program undertaken by France in its EEZ in Division 58.5.1 has achieved a similar tag-recapture rate to the tagging program undertaken by Australia in Division 58.5.2, which indicates that tagged fish move mainly short distances, but some fish make longer forays around the slope, as well as long-distance movements outside the division. Fish from the tagging program at Heard Island (Division 58.5.2) have also shown movement of sub-adult/adult fish between zones (Heard to Kerguelen and also Crozet), but the proportion of exchange between stocks is relatively small (Williams et al., 2002; WG-FSA-07/48 Rev. 1).

Life-history parameters

Data collection

15. The life history of *D. eleginoides* is characterised by slow growth, low fecundity and late maturity. *Dissostichus eleginoides* appear to have protracted spawning periods, taking place mainly in winter, but which may start as early as late autumn and extend into spring. The areas that are considered to be the most likely spawning grounds for *D. eleginoides* at Kerguelen Islands are the western deep sectors, including Skiff Bank.

16. *Dissostichus eleginoides* occur throughout the Kerguelen Islands shelf, from shallow waters (<10 m) to depths of at least 2 000 m. As fish grow, they move to deeper water and are recruited to the trawl fishery on the shelf slopes at the start of the fishery and subsequently to the longline fishery in deeper waters. On the Kerguelen Plateau (Divisions 58.5.1 and 58.5.2), a general east–west deep-sea movement of adult fish occurs and spawning is restricted to the westerly zone during the early winter (Lord et al., 2006).

Parameter estimates

17. There are no specific recent life-history parameters for *D. eleginoides* in the French EEZ. However, the metapopulation of the Indian Ocean sector has been validated by Appleyard

et al. (2004) and thus it is likely that the parameters used in the stock assessment for Heard Island, such as growth rate and natural mortality, would be valid for the stock in Division 58.5.1. Age-specific data from Kerguelen otolith sampling are available since 2015.

Stock assessment status

18. Four biomass survey cruises (named POKER 1, 2, 3 and 4) have been conducted during 2006 (Duhamel and Hauteceur, 2009), 2010 and 2013 (see WG-FSA-14/07) and 2017 respectively to estimate biomass and recruitment of *D. eleginoides* on the whole shelf and surrounding banks (100–1 000 m). Such cruises are planned to be conducted again in the future.

19. Cooperative work between France and Australia on analyses of catch, effort and other data (survey, tagging) to be used to progress understanding of fish stocks and fishery dynamics for Divisions 58.5.1 and 58.5.2 is ongoing (see WG-SAM-11/20, 15/37).

20. The results of biomass surveys have been included in a CASAL stock assessment model (WG-FSA-11/28, 12/09, 14/36 Rev. 1, 15/68 and 16/54).

21. WG-FSA-17/60 presented an updated stock assessment of *D. eleginoides* at Kerguelen Islands (Division 58.5.1 inside the French EEZ) which included a revised tag-shedding parameter and a compensation for fish migration between Divisions 58.5.1 and 58.5.2 at an annual migration rate of 0.004 as developed at WG-SAM-17 (WG-SAM-17/11).

22. No new information was available on the state of fish stocks in Division 58.5.1 outside areas of national jurisdiction and thus the prohibition of directed fishing for *D. eleginoides*, described in Conservation Measure (CM) 32-13, shall remain in force for 2018.

By-catch of fish and invertebrates

Fish by-catch

23. Catch limits for by-catch (macrourids, rajids and other species) inside the French EEZ are set by France. Primary by-catch species from the longline fishery in the French EEZ in Division 58.5.1 are the macrourid *Macrourus carinatus*, rajid skates (*Bathyraja irrasa* and *B. eatonii*) and blue antimora (*Antimora rostrata*). The latter species is fully discarded, while the others are partly or totally retained. The spatial distribution of by-catch indicates specific areas of higher catch rates that differed between species (WG-FSA-10/34).

24. The catch histories for by-catch species since 2005 are provided in Table 3.

Table 3: Catch history for by-catch species (macrourids, rajids and *Antimora rostrata*) taken in the fishery for *Dissostichus eleginoides* in the French EEZ in Division 58.5.1. (Source: fine-scale data.) (2018:data to February 2019.)

| Season | Macrourids | Rajids | | <i>Antimora rostrata</i> |
|--------|-------------------------|-------------------------|-----------------------|--------------------------|
| | Reported catch (tonnes) | Reported catch (tonnes) | Number released alive | Reported catch (tonnes) |
| 2005 | 779 | 974 | - | 47 |
| 2006 | 686 | 597 | - | 54 |
| 2007 | 782 | 546 | 1954 | 56 |
| 2008 | 816 | 376 | 3593 | 68 |
| 2009 | 957 | 415 | 3432 | 45 |
| 2010 | 887 | 456 | 2 | 58 |
| 2011 | 860 | 437 | 535 | 52 |
| 2012 | 690 | 433 | 15878 | 26 |
| 2013 | 728 | 308 | 12510 | 67 |
| 2014 | 750 | 68 | 32730 | 72 |
| 2015 | 610 | 9 | 33660 | 69 |
| 2016 | 694 | 13 | 53460 | 56 |
| 2017 | 641 | 21 | 44277 | 50 |
| 2018 | 616 | 21 | 40206 | 34 |

Assessments of impact on affected populations

25. No stock assessments of individual by-catch species are presently undertaken, but biomass of a part of the stocks is now available from the biomass surveys (POKER 1, 2, 3, 4) and could help in the future.

Mitigation measures

26. The Working Group on Fish Stock Assessment (WG-FSA) recommended that, where possible, areas with high by-catch rates should be avoided, particularly those shown in WG-FSA-09/43. A plan of action to avoid high-concentration areas of by-catch has been proposed to the longliners during 2010 and results will be further analysed. The requirement for rajids to be ‘cut-off’ at the surface has been in force since 2014.

Incidental mortality of seabirds and marine mammals

Incidental mortality

27. CCAMLR mitigation measures are in force in the French EEZ. A summary of the historic bird mortality by longline in the French EEZ in Division 58.5.1 since 2007 is presented in Table 4. The three most common species injured or killed in the fishery were white-chinned petrel (*Procellaria aequinoctialis*), grey petrel (*P. cinerea*) and northern giant petrel (*Macronectes halli*). Night-setting requirements have been highly effective in removing the previously high levels of albatross mortality.

Table 4: Number of birds killed and injured in the longline fishery in the French EEZ in Division 58.5.1. (Source: Observer SISO IMAF table).

| Season | <i>Procellaria aequinoctialis</i> | <i>Procellaria cinerea</i> | <i>Macronectes halli</i> |
|--------|-----------------------------------|----------------------------|--------------------------|
| 2007 | 59 | 10 | 4 |
| 2008 | 313 | 14 | 5 |
| 2009 | 111 | 6 | 2 |
| 2010 | 74 | 15 | 9 |
| 2011 | 50 | 7 | 8 |
| 2012 | 43 | 5 | 2 |
| 2013 | 20 | 2 | 5 |
| 2014 | 5 | | |
| 2015 | 9 | 3 | 1 |
| 2016 | 12 | 7 | |
| 2017 | 19 | 1 | |
| 2018 | 13 | | |

28. Up to the end of July 2018 there were 13 bird mortalities observed inside the French EEZ in Division 58.5.1, all of which were white-chinned petrels (Table 4).
29. The level of risk of incidental mortality of birds in Division 58.5.1 is category 5 (high) (SC-CAMLR-XXX, Annex 8, paragraph 8.1).
30. There have been no reports of incidental mortalities of mammals since 2007.

Mitigation measures

31. The requirements of CM 25-02 ‘Minimisation of the incidental mortality of seabirds in the course of longline fishing or longline fishing research in the Convention Area’ apply to this fishery. France has applied the CCAMLR mitigation measures for the last three seasons and these will continue for the upcoming fishing season.
32. Additional measures will also be applied (WG-IMAF-11/10 Rev. 1), including:
- (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 demographic study on the white-chinned petrel will be undertaken at Kerguelen Islands, as well as the continued population counts of white-chinned petrels on the Kerguelen archipelago.

Ecosystem implications and effects

33. There is no formal evaluation available for this fishery, but fishery observers collect information about benthic taxa, including those considered as vulnerable marine ecosystem (VME) taxa.

Current management advice and conservation measures

34. In addition to those CCAMLR conservation measures that are applied in this fishery, various national conservation and fisheries enforcement measures are applicable, such as:

- annual fishing season closure (February and half of March)
- annual catch limit and limitation on the number of longline vessels allowed to operate in the fishery (seven)
- allocation of fishing effort permitting not more than one longliner simultaneously per 0.5° latitude \times 1° longitude rectangle
- obligatory vessel logbooks
- one French observer on board each licensed vessel
- minimum fishing depth limit of 500 m
- minimum legal size limit for *D. eleginoides* of 60 cm
- mitigation measures for the reduction of bird mortality
- a single catch landings site at Réunion Island
- unless retained for commercial processing, all skates are to be released alive
- mandatory port inspection.

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

- (i) WG-FSA-17 agreed that the catch limit set by France of 5 050 tonnes in 2018, which allows for average depredation rates (313 tonnes, based on the average of the estimated depredation from the 2004 season to the 2016 season), is consistent with the CCAMLR decision rules for the model runs presented. This advice was carried forward for 2019.
- (ii) No new information was available on the state of fish stocks in Division 58.5.1 outside areas of national jurisdiction and thus the prohibition of directed fishing for *D. eleginoides*, described in CM 32-02, shall remain in force for 2018.
- (iii) WG-FSA noted the continued progress with the development of the model and encouraged the continued expansion in the range of years with aged data in the

model. The Working Group noted that as the amount of age data in the model increases, there would be an increase in the robustness of the model fit. The Working Group requested more details on the time series of catches used in assessment (summarised in the Division 58.5.1 Fishery Report, Appendix 1) and that for future assessments the full model diagnostic summary developed by WG-SAM is presented.

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Time series of catches in tonnes used in the 2017 assessment (WG-FSA-17/60)

| Fishing seasons | Trawl shallow <500m | Trawl deep >500m | POKER Survey 100–1000m | Total trawl | Longline shallow 500–1250m | Longline deep >1250m | Total longline | IUU | Total | Estimated depredation % | | Total with depredation |
|-----------------|---------------------|------------------|------------------------|-------------|----------------------------|----------------------|----------------|------|-------|-------------------------|-----|------------------------|
| 1980 | 159 | - | - | 159 | - | - | - | - | 159 | - | - | 159 |
| 1981 | 47 | - | - | 47 | - | - | - | - | 47 | - | - | 47 |
| 1982 | 136 | - | - | 136 | - | - | - | - | 136 | - | - | 136 |
| 1983 | 121 | - | - | 121 | - | - | - | - | 121 | - | - | 121 |
| 1984 | 151 | - | - | 151 | - | - | - | - | 151 | - | - | 151 |
| 1985 | 6669 | 2 | - | 6671 | - | - | - | - | 6671 | - | - | 6671 |
| 1986 | 460 | - | - | 460 | - | - | - | - | 460 | - | - | 460 |
| 1987 | 3553 | 59 | - | 3612 | - | - | - | - | 3612 | - | - | 3612 |
| 1988 | 118 | 6 | - | 124 | - | - | - | - | 124 | - | - | 124 |
| 1989 | 1514 | 53 | - | 1567 | - | - | - | - | 1567 | - | - | 1567 |
| 1990 | 1031 | 136 | - | 1167 | - | - | - | - | 1167 | - | - | 1167 |
| 1991 | 1827 | 16 | - | 1843 | 2 | 107 | 109 | - | 1952 | - | - | 1952 |
| 1992 | 2398 | 4292 | - | 6690 | 456 | 982 | 1438 | - | 8128 | - | - | 8128 |
| 1993 | 898 | 1733 | - | 2631 | 9 | 84 | 93 | - | 2724 | - | - | 2724 |
| 1994 | 1718 | 2430 | - | 4148 | 15 | 944 | 959 | - | 5107 | - | - | 5107 |
| 1995 | 1316 | 2862 | - | 4178 | 10 | 1432 | 1442 | - | 5620 | - | - | 5620 |
| 1996 | 602 | 2922 | - | 3524 | 223 | 1007 | 1230 | 833 | 5587 | - | - | 5587 |
| 1997 | 1173 | 2501 | - | 3674 | 125 | 877 | 1002 | 6094 | 10770 | - | - | 10770 |
| 1998 | 1530 | 2505 | - | 4035 | 215 | 908 | 1123 | 7156 | 12314 | - | - | 12314 |
| 1999 | 1044 | 1999 | - | 3043 | 770 | 1073 | 1843 | 1237 | 6123 | - | - | 6123 |
| 2000 | 1153 | 1207 | - | 2360 | 1856 | 700 | 2556 | 2600 | 7516 | - | - | 7516 |
| 2001 | 1038 | 1440 | - | 2478 | 2175 | 720 | 2895 | 4550 | 9923 | - | - | 9923 |
| 2002 | 144 | 756 | - | 900 | 2763 | 1524 | 4287 | 6300 | 11487 | - | - | 11487 |
| 2003 | - | - | - | - | 3252 | 1758 | 5010 | 5518 | 10528 | - | - | 10528 |
| 2004 | - | - | - | - | 2352 | 2322 | 4674 | 536 | 5210 | 386 | 7.6 | 5596 |
| 2005 | - | - | - | - | 3480 | 1267 | 4747 | 268 | 5015 | 115 | 2.4 | 5130 |
| 2006 | - | - | - | - | 3318 | 1467 | 4785 | 144 | 4929 | 220 | 4.4 | 5149 |

(continued)

| Fishing seasons | Trawl shallow <500m | Trawl deep >500m | POKER Survey 100–1000m | Total trawl | Longline shallow 500–1250m | Longline deep >1250m | Total longline | IUU | Total | Estimated depredation % | Total with depredation | |
|-----------------|---------------------|------------------|------------------------|-------------|----------------------------|----------------------|----------------|-----|-------|-------------------------|------------------------|------|
| 2007 | 155 | 91 | 7 | 253 | 2171 | 2892 | 5063 | 451 | 5767 | 368 | 6.8 | 6135 |
| 2008 | - | - | - | - | 2659 | 2360 | 5019 | 720 | 5739 | 374 | 6.9 | 6113 |
| 2009 | - | - | - | - | 2487 | 2619 | 5106 | - | 5106 | 277 | 5.1 | 5383 |
| 2010 | - | 3 | - | 3 | 2494 | 2619 | 5113 | 22 | 5138 | 451 | 8.1 | 5589 |
| 2011 | 84 | 146 | 5 | 235 | 2305 | 2788 | 5093 | - | 5328 | 318 | 5.9 | 5646 |
| 2012 | - | - | - | - | 2685 | 2366 | 5051 | - | 5051 | 278 | 5.2 | 5329 |
| 2013 | - | - | 12 | 12 | 2490 | 2672 | 5162 | - | 5174 | 206 | 3.8 | 5380 |
| 2014 | - | - | - | - | 2437 | 2714 | 5151 | - | 5151 | 412 | 7.4 | 5563 |
| 2015 | - | - | - | - | 1843 | 3315 | 5158 | - | 5158 | 305 | 5.6 | 5463 |
| 2016 | - | - | - | - | 2038 | 3272 | 5310 | - | 5310 | 355 | 6.3 | 5665 |
| 2017 | - | - | - | - | 1851 | 3041 | 4892 | - | 4892 | 303 | 5.8 | 5195 |
| Projection | | | | | 2020 | 3030 | 5050 | | 5050 | 313 | 5.8 | 5363 |

(2018 catch limit)