APPENDIX O

INCIDENTAL MORTALITY OF MAMMALS AND SEABIRDS ASSOCIATED WITH FISHING (AD HOC WG-IMAF REPORT)

CONTENTS

INCIDENTAL MORTALITY OF MAMMALS AND SEABIRDS ASSOCIATED WITH FISHING (AD HOC WG-IMAF REPORT)

Intersessional work of ad hoc WG-IMAF

The Secretariat reported on the intersessional activities of ad hoc WG-IMAF according to the agreed plan of intersessional activities for 2004/05 (SC-CAMLR-XXIII, Annex 5, Appendix D). The report contained records of all activities planned and results of their completion and is available on the IMAF page of the CCAMLR website.

2. The Working Group thanked the Science Officer for his work on the coordination of IMAF activities and the technical coordinators for their extensive support. It also thanked the Scientific Observer Data Analyst for his work on the processing and analysis of data submitted to the Secretariat by international and national observers during the course of the 2004/05 fishing season.

3. The Working Group concluded that most tasks planned for 2004/05 had been successfully implemented. The list of current intersessional tasks was reviewed and a number of changes were agreed in order to consolidate specific tasks in future plans. The Working Group agreed that the plan of intersessional activities for 2005/06, compiled by the co-conveners and the Science Officer, be appended to its report (SC-CAMLR-XXIV/BG/28).

4. The Working Group noted that no intersessional work took place on issues identified last year on the development of the *Scientific Observers Manual* (SC-CAMLR-XXIII, Annex 5, Appendix D, task 6.6), however, the work proposed by WG-IMAF was subject to plans for a major review of the *Scientific Observers Manual* which had not yet been finalised by the Scientific Committee and its working groups. If required, this task could be carried forward to the next intersessional period.

5. The Working Group especially welcomed to the meeting Drs R. Mattlin (New Zealand) and J. Pierre (New Zealand) and Mr W. Papworth (ACAP) who were attending the meeting for the first time. The Working Group continued to appreciate Mr M. McNeill's (New Zealand) expert advice on operational aspects of fishing and encouraged analogous input from other Members, including in relation to trawl fisheries. Members were asked to review their representation on WG-IMAF intersessionally, to suggest additional members and to facilitate the attendance of their representatives at the meetings.

Incidental mortality of seabirds during regulated longline and pot fishing in the Convention Area

6. Data were available from all 31 longline cruises conducted within the Convention Area during the 2004/05 season (WG-FSA-05/7 Rev. 1).

7. The Working Group noted that the proportions of hooks observed were similar to those observed for last year for Subareas 48.3 (31% (range 20-62) compared with 28% (range 18–50)) and 88.1 and 88.2 (51% (range 23–100) compared with 61% (range 30–99)). For all other areas the observation rates and ranges increased from last year: Subarea 48.6, 31% (one

vessel) compared with 23%; Subarea 58.4, 56% (range 28–94) compared with 39% (one vessel); Division 58.5.2, 36% (range 31–41) compared with 34% (range 33–34); Subareas 58.6 and 58.7, 65% (one vessel) compared with 32% (range 27–37).

8. As usual, the total observed seabird catch rate was calculated using the total number of hooks observed and the total seabird mortality observed (Table 1). The estimated total catch of seabirds by vessel was calculated using each vessel's observed catch rate multiplied by the total number of hooks set.

9. The total number of observed mortalities was 56, and consisted of 6 (11%) yellow-nosed albatrosses, 1 (2%) wandering albatross, 43 (76%) white-chinned petrels and 6 (11%) southern giant petrels. The total extrapolated mortality for 2004/05 was 97 birds split between Subareas 48.3 (13 birds), 58.6 and 58.7 (76 birds), and Division 58.4.1 (8 birds) (Table 2). This was a 65% increase from the extrapolated 58 mortalities for 2003/04. The vast majority of the extrapolated mortality (78%) is attributed to one vessel, *Koryo Maru 11*, fishing in Subareas 58.6 and 58.7.

Mortality during the haul

10. The Working Group noted that extrapolations of incidental mortality combining data from seabirds caught on either the haul or the set are appropriate for quantifying total removals; however, data need to be split between haul and set to allow analysis of mitigation effectiveness.

11. The Working Group noted that the incidence of birds being caught injured and uninjured (i.e. birds that are caught on the haul), accounted for 68% of seabird captures in 2004/05 (Table 1). The proportion of seabirds caught on the haul suggests that an increased focus on haul mitigation measures is required.

Subarea 48.3

12. The total extrapolated seabird mortality was 13 birds compared with 27, 8, 27 and 30 birds in the last four years (Table 3). The overall catch rate was 0.0011 birds/thousand hooks compared to the rates of 2004 and 2001 (0.0015 birds/thousand hooks) and the rate for 2003 (0.0003 birds/thousand hooks). The four birds observed killed were southern giant petrels (Table 4). Total extrapolated captures decreased between 2003/04 and 2004/05. Changes in extrapolated capture totals presented to the Working Group in 2005 differed from those presented in 2004 for the 2003/04 year because the 2004 totals were produced using vessel capture rates with three decimal places, compared to using four decimals places in 2003 and 2005.

Subarea 58.4

13. The total extrapolated seabird mortality was eight birds, with a catch rate of <0.001 birds/thousand hooks from one vessel operating in Division 58.4.1 (Table 3). In 2003/04 longline fishing was undertaken for the first time in Subarea 58.4. No mortalities had been reported prior to 2004/05.

South African EEZ in Subareas 58.6 and 58.7

14. The total extrapolated seabird mortality for these subareas was 76 seabirds from the one vessel that fished there. The catch rate for this area was 0.149 birds/thousand hooks, compared to 0.025 and 0.003 in 2003/04 and 2002/03 respectively (Table 3). In earlier years (1997 to 2001) extrapolated mortalities and rates ranged between 834–156 birds and 0.52–0.018 birds/thousand hooks respectively.

Subareas 48.4, 48.6, 88.1 and 88.2 and Division 58.5.2

15. No seabird mortalities on longline vessels were observed in these areas. Incidental mortality of seabirds in Subareas 88.1 and 88.2 has been very low over the past eight years, with only one bird observed killed in 2003/04 (Table 3).

Incidental mortality of seabirds during regulated pot fishing in the Convention Area

16. No incidental mortalities were recorded during fishing for *Dissostichus eleginoides* on two cruises in Subareas 58.6 and 58.7.

Evaluation of levels of incidental mortality

French EEZs in Subarea 58.6 and Division 58.5.1

17. The requested French data for 2000/01 (SC-CAMLR-XXIII, paragraph 5.7) and 2004/05 have been submitted to the Secretariat in tabulated form analogous to the summaries prepared by the Secretariat for the rest of the Convention Area (WG-FSA-05/7 Rev. 1). Dr T. Micol (France) presented the French data on seabird incidental mortality and supporting papers (CCAMLR-XXIV/BG/22, BG/23, BG/24, BG/26 and BG/28).

18. CCAMLR-XXIV/BG/24 presented 2004/05 data involving observations of seabird mortality reported by captains (Tables 7 and 10), and national observers (Tables 8, 9 and 11).

2000/01 fishing season

19. The total reported (by captains) seabird mortality in 2000/01 for Division 58.5.1 was 1 917 birds (Table 5). The corresponding catch rate (reported birds/total hooks set) was 0.092 birds/thousand hooks. Data for Subarea 58.6 were not presented as they have not yet been analysed; these data will be submitted next year.

20. The reported seabird by-catch in Division 58.5.1 comprised 94% white-chinned petrels and 5% grey petrels. The remaining 1% comprised giant petrels, grey-headed albatrosses and black-browed albatrosses (Table 6).

2004/05 fishing season

21. Observers recorded seabird mortality on a proportion of the hooks set in the 2004/05 season. This recording was done in the same way as in the last six months of 2003/04 and differs in only minor detail from CCAMLR observer specifications.

22. The total reported seabird mortality from observers for Subarea 58.6 and Division 58.5.1 was 61 and 1 054 birds respectively (Table 8). The corresponding incidental mortality rates were 0.047 and 0.161 birds/thousand hooks.

23. The total seabird mortality reported by captains in Subarea 58.6 and Division 58.5.1 was 137 and 1 901 birds respectively (Table 7). The corresponding incidental mortality rates were 0.028 and 0.071 birds/thousand hooks.

24. Comparing the full year to last year's data is not possible directly as count methods are different. Data were compared when available in the same format for the same period. March was excluded as a period where 2003/04 data were a mix of both reporting methods. Comparing 2003/04 and 2004/05 for the period from September to February, captains' incidental mortality rates showed a decrease of 35% (0.071 to 0.047 birds/thousand hooks) and 57% (0.126 to 0.055 birds/thousand hooks) respectively in Subarea 58.6 and Division 58.5.1. Comparing 2003/04 and 2004/05 for the period from April to August, observers' incidental mortality rates showed an increase of 87% (0.006 to 0.011 birds/thousand hooks) and 21% (0.058 to 0.070 birds/thousand hooks) respectively in Subarea 58.6 and Division 58.5.1.

25. The discrepancy between the results presented in Tables 7 and 8 was addressed in CCAMLR-XXIV/BG/24. This paper suggested that French fishers should be commended for their degree of application of methods to manage seabird mortality. It also noted the relatively important difference this year between the data from observation of all longlines by captains and data from observation of 25% of lines by observers. The paper suggested that care is required in interpreting the extrapolated results and that the attention of captains may be less focussed on the observation of seabird mortality than that of observers.

26. The Working Group noted that in order to be consistent with CCAMLR procedures, the use of observer data only is recommended. Dr Micol indicated that from 2005/06 all French data on incidental mortality of seabirds will be collected only in a format that allows direct comparison with other CCAMLR areas and other fisheries outside the Convention Area (e.g. WG-FSA-04/72).

27. CCAMLR-XXIV/BG/24 suggested that the reduction to zero of IUU vessels in the French EEZs may have increased the abundance of birds around the small number of remaining authorised vessels, possibly increasing interactions, and thereby counteracting the improvements in mitigation measures.

28. The data on birds recorded by observers can be converted to estimates of total seabird mortality using reported data on the proportion of hooks observed (Table 9). The mean proportions of hooks observed in Subarea 58.6 and Division 58.5.1 were 25.5% (n = 20; range 19.3–38.0%) and 24.5% (n = 26; range 14.3–31.0%). For the 20 cruises in Subarea 58.6, the observed incidental mortality of 61 birds converts to an estimated mortality of 242 birds (0.049 birds/thousand hooks). For the 26 cruises in Division 58.5.1, the observed incidental mortality of 1 054 birds converts to an estimate of 4 387 birds killed (0.164 birds/thousand hooks).

29. The reported seabird by-catch in Subarea 58.6 comprised 89% white-chinned petrels and 11% grey petrels; in Division 58.5.1 it comprised 94% white-chinned petrels and 6% grey petrels (Table 10). Dr Micol pointed out that no albatrosses were caught during the past two years, probably due to use of mitigation measures such as night setting and use of several streamer lines.

30. The Working Group noted that an important proportion of birds (30%) was caught alive, indicating that they were caught on the haul. It was recognised that, in future, attention to mitigating captures on the haul would be required as part of efforts to achieve a continuing reduction in seabird mortality. The Working Group is in the process of developing improved recommendations for haul mitigation.

31. The Working Group noted that the CCAMLR totals included the dead and mortally injured birds in the 'total caught dead' numbers, whereas the French data included only 'dead' and 'alive' categories, the latter including both mortally injured and live birds. From raw data, 3 of 334 live birds were reported injured, and the remainder were released unharmed. The Working Group recommended the use of the CCAMLR methodology by French observers to allow for better estimates of overall mortality and to facilitate comparison with other fisheries in the Convention Area.

32. The Working Group had traditionally considered that in analogous CCAMLR areas, 25% of hooks observed was acceptable for the purposes of monitoring seabird incidental mortality rates and estimating total captures. However, for new and exploratory fisheries in high-risk areas, 40–50% hooks observed is suggested (SC-CAMLR-XXIII, Annex 5, Table 7.17) and this may be more appropriate in the circumstances of this fishery of high incidental mortality rates. Dr Micol indicated that increasing these rates may not be compatible with other observer tasks.

33. The Working Group noted that higher levels of coverage of hauls within a trip may also be needed to provide robust estimates of capture rates and their variances. The Working Group suggested that methods similar to those developed in WG-FSA-05/50 might be useful in this context.

34. The Working Group noted that there was considerable variation between vessels in the levels of reported seabird incidental mortality (Table 9). In Subarea 58.6, 120 birds (49% of the total) were reported from *Ship 3* (53 birds) and *Ship 6* (67 birds). In Division 58.5.1, 2 517 birds (57% of the total) were taken by *Ship 6* (1 403 birds) and *Ship 7* (1 114 birds).

35. Only one French vessel (*Ship 11*) was using integrated weighted lines (IWLs) for all sets, with an estimated 210 birds caught. This is a lower number than the other vessels in the same fishery but a higher rate (0.065 birds/thousand hooks) than catch rates of vessels using IWLs observed in other fisheries (0.01 birds/thousand hooks; WG-FSA-04/72).

36. CCAMLR-XXIV/BG/28 pointed out that new regulations entered into force in the French EEZ on 1 September 2005; and followed recommendations from the Scientific Committee (SC-CAMLR-XXIII, paragraph 5.7):

(i) weighting regimes as specified in Conservation Measure 25-02 are now applicable to autoliners, with fishers obliged to comply fully by 1 January 2006;

(ii) at least two streamer lines meeting the CCAMLR specification are compulsory. Some vessels use up to seven streamer lines;

(iii) in 2004/05 all vessels had observers on board who observed 25% of hooks set. This level of observer effort will be continued in 2005/06;

(iv) closure of Division 58.5.1, classified as a high-risk area, is maintained in February during the main seabird breeding season.

In addition, the discard of hooks is now forbidden, as is the use of black lines which were shown to catch more birds than white lines in the analysis of 2001–2003 data by Delord et al. (2005). Dr Micol indicated that as a result of the new regulations set out in CCAMLR-XXIV/BG/28, all vessels would use integrated line-weighting gear from 1 January 2006. The Working Group commended this initiative.

37. CCAMLR-XXIV/BG/22 discussed measures used by fishers to mitigate incidental mortality in the French EEZs. Among new measures, a new hook design will be tested as well as reconstituted coloured baits. Only the autoline vessel using Mustad gear has a lineshooter. As this equipment appears to decrease incidental mortality, other vessels will adopt it as soon as such gear is commercially available. New laser technology is also currently under trial as a potential deterrent to birds.

38. The Working Group noted that better understanding of the continuing high rates of seabird incidental mortality in the French EEZs would require a thorough analysis of recent data, similar to that carried out by Delord et al. (2005). This should assist in allowing further improvements to be made in reducing mortalities in the French EEZ fisheries.

39. The Working Group recommended that analysis of the 2005 data should include:

(i) consideration, as feasible, of the effects of time of year, area, moon phase, hour, sink rates, setting speed, bird abundance, streamer-line configuration, fishing gear configuration, hook type, line colour, line-weighting regime, offal discharge, sea state or wind, observer and vessel;

(ii) special attention to circumstances associated with sets or hauls where a large number of birds are caught.

40. It was requested that France report the results of this analysis to the next meeting of the Working Group.

41. Future analyses should also take account of the life status (alive, dead, injured) and mode of capture (e.g. hooked, foul-hooked, entangled) of the birds. Use of the CCAMLR definitions to determine the life status of the birds would allow consistent comparison with other Convention Areas of catch rates and circumstances.

42. In addition, the acquisition of data on all variables listed above should be considered in the development of improved data collection protocols for seabird incidental mortality in those areas.

43. The Working Group commended the initiatives taken by France for research and management relating to the incidental mortality of seabirds in its EEZs. It recommended that in future:

(i) observers continue to be deployed on 100% of vessels;

(ii) consideration be given to increasing the proportion of hooks observed (e.g. to 40–50%);

(iii) data collection protocols be improved, including incorporating the CCAMLR distinctions and definitions relating to dead and live seabird by-catch;

(iv) undertaking appropriate analysis of the 2005 data.

Information relating to the implementation of
Conservation Measures 25-01, 25-02 and 25-03

44. Information from observer reports relating to the implementation of Conservation Measures 25-01, 25-02 and 25-03 in 2004/05 were provided by the Secretariat in WG-FSA-05/7 Rev. 1, 05/8, 05/9 Rev. 2 and are summarised in Tables 1, 12 and 14 with a comparison with similar data from previous years provided in Table 13.

45. During the meeting, the Working Group undertook an evaluation of the data prepared by the Secretariat on the implementation of Conservation Measures 25-01, 25-02 and 25-03. During this process some examples of potential non-compliance were identified by the Working Group and in some cases corrected following a dialogue between the Secretariat and national coordinators of observer programs. The Working Group agreed that such dialogue may avoid the erroneous interpretation of ambiguous reporting leading to a misrepresentation of the level of compliance by individual vessels.

Conservation Measure 25-01 (1996) 'Regulation of the use and disposal of plastic packaging bands on fishing vessels'

46. Conservation Measure 25-01 requires that the use of plastic packaging bands is restricted to those vessels with on-board incineration facilities and that all bands be cut and disposed of using this facility. Information from observer reports indicated that whilst plastic packaging bands were disposed of appropriately on 10 vessels, on one vessel, the *Punta Ballenas*, some plastic packaging bands were disposed of overboard (WG-FSA-05/9 Rev. 2, Table 1).

Conservation Measure 25-02 (2003) 'Minimisation of the incidental mortality of seabirds in the course of longline fishing or longline fishing research in the Convention Area'

Line weighting – Spanish system

47. For the first time there was 100% compliance with the required line-weighting regime in all subareas and divisions (Table 13).

Line weighting – autoline system

48. All vessels fishing in Subareas 88.1, 88.2 and Division 58.4.2 south of 60°S in daylight met the requirement to achieve a consistent minimum line sink rate as described in Conservation Measure 24-02. As in previous years this line-weighting requirement has been fully achieved by all vessels (WG-FSA-05/9 Rev. 2, Table 6; SC-CAMLR-XXIII, Annex 5, paragraph 7.57).

Night setting

49. In Subareas 58.6 and 58.7, 100% of sets occurred at night, an increase from the 83% night-setting rate last year. In Subarea 48.3, 99% of sets occurred at night (98% in 2004) (Table 13); the *Protegat* undertook six of its 258 sets during the day. In Subareas 48.6, 88.1, 88.2 and Divisions 58.4.2 and 58.4.3b, all vessels demonstrated a consistent minimum line sink rate of 0.3 m/s and hence fished under Conservation Measure 24-02, which provides exemptions to night setting south of 60°S (WG-FSA-05/9 Rev. 2, Table 6).

Offal discharge

50. A single vessel, the *Antarctic III*, was observed discharging offal during one set and one haul in Subarea 88.1; offal discharge is prohibited in this subarea. In Subarea 48.3, the *Jacqueline* was observed discharging offal during one set; offal discharge during setting is prohibited under Conservation Measure 25-02 (Table 1).

Discard of hooks

51. Observers reported hooks being present in discards on six vessels; on three of these this was reported as a rare event. However, the observer report for the *Argos Georgia* indicated that this was a daily occurrence during the first half of the season; following a mid-season crew change the discarding of hooks stopped (WG-FSA-05/9 Rev. 2, Table 1).

Streamer lines

52. Compliance with streamer line design has increased from 64% (28 of 44 cruises) to 74% (23 of 31 cruises) this year, although this is not as high as the 92% (34 of 37 cruises) in 2003 (Table 12).

53. The cruises where streamer lines did not comply failed on streamer line lengths (7 cruises), attachment height (1 cruise), total length (1 cruise) and branched streamer spacing (1 cruise). One vessel failed on three different streamer line specifications (*Viking Bay*) and one vessel did not comply on two specifications (*Punta Ballena*).

54. Vessels fishing in Subareas 48.6, 58.6, 58.7 and Divisions 58.4.2 and 58.4.3b, used streamer lines on all sets. In Subarea 48.3, of 1 847 sets only one was undertaken without using a streamer line (*Protegat*). In Subareas 88.1 and 88.2, the *Antarctic III* undertook a single set without using a streamer line. On some occasions the *Protegat* used non-compliant streamers in Subarea 48.3 (Table 12).

55. Mr McNeill suggested that some instances of non-compliance with respect to streamer line length may result from the use of additional streamers on the seaward part of the line where the distance between the water and the line is less than 1 m, i.e. shorter than the minimum length specified in Conservation Measure 25-02.

56. The Working Group agreed that where the seaward part of the line had additional short streamers attached, in the absence of which the streamer lines would otherwise be fully compliant, measuring and reporting them as the minimum streamer length would provide a misleading indication of non-compliance.

Haul-scaring devices

57. Conservation Measure 25-02 (paragraph 8) requires that a device designed to discourage birds from accessing baits during the haul of longlines (haul-scaring devices) shall be employed in those areas defined by CCAMLR as average-to-high or high (level of risk 4 or 5) in terms of risk of seabird by-catch. These areas are currently Subareas 48.3, 58.6 and 58.7 and Divisions 58.5.1 and 58.5.2.

58. In Subarea 48.3, three vessels (*Jacqueline* (99 %), *Argos Georgia* (91%) and *Viking Bay* (53%)) did not use haul-scaring devices on all the hauls. In Subareas 58.6 and 58.7, 100% of hauls used scaring devices and in Division 58.5.2 the only longline vessel fishing in that area was equipped with a moonpool; hence no devices were required (Table 12).

59. The *Argos Georgia* and the *Viking Bay* were, coincidentally the only two vessels that killed birds in Subarea 48.3 and the detailed status of these birds (Table 12) indicated that they were killed during hauling.

General

60. In its report last year the Commission noted its concern regarding the reduced compliance with several elements of Conservation Measure 25-02 (CCAMLR-XXIII, paragraph 5.6); this year the level of compliance had increased for all elements, in particular in Subarea 48.3 with line weighting increasing to 100% from 87% last year and with overall streamer requirements increasing to 75% from 69% last year (Table 13).

61. The Working Group noted that if compliance with Conservation Measure 25-02 is interpreted strictly (i.e. 100% in all elements of the conservation measure), 12 of 25 vessels (48%) fully complied with all measures at all times throughout the Convention Area. This compares to 33% last year (Tables 1 and 12; WG-FSA-05/9 Rev. 2, Table 1). The fully compliant vessels were the *Argos Helena, Arnela, Avro Chieftain* (Australia), *Frøyanes, Galaecia, Globalpesca II, Janas, No. 707 Bonanza, Polarpesca I, San Aotea II, Shinsei Maru 3* and *Yantar*. As was noted last year, some vessels failed to comply by small margins, and the Working Group recommended that vessels should be advised to exceed the standards to prevent compliance failure (SC-CAMLR-XXIII, Annex 5, paragraph 7.253).

Conservation Measure 25-03 (2003) 'Minimisation of the incidental mortality of seabirds and marine mammals in the course of trawl fishing in the Convention Area'

62. The discharge of offal during the shooting or hauling of trawl gear is prohibited under Conservation Measure 25-03; however, two vessels fishing in Subarea 48.3 discharged offal at these times, the *Robin M Lee* (22% shots) and *InSung Ho* (13% shots and 4% hauls) (Table 14). For both of these vessels the incidence of offal discharge was higher than last year (SC-CAMLR-XXIII, Annex 5, paragraph 7.62).

Research into and experience with mitigation measures

63. WG-FSA-05/13 reported work in progress in an Australian tuna fishery of general relevance to seabird conservation in global tuna fisheries, including fisheries where Convention Area seabirds range. The report described the results of experiments testing the effects of line-weighting regimes and bait types on the sink rate of tuna branchlines. The research plan includes assessment of the effectiveness of bird-scaring streamer lines (in addition to efforts to expedite gear sink rates) as deterrent to *Puffinus* shearwaters, the importance of which was highlighted by the Working Group in 2004 (SC-CAMLR-XXIII, Annex 5, paragraph 7.88). Empirical evidence of the effectiveness of streamer lines as a deterrent to *Puffinus* shearwaters and other deep-diving species, such as white-chinned

petrels, is lacking. The Working Group welcomed progress in developing seabird by-catch mitigation for pelagic longline gear and recognised its importance in efforts to reduce seabird mortality in tuna fisheries operating in the migration ranges of Convention Area seabirds.

64. WG-FSA-05/P8 provided a review of mitigation of seabird–fisheries interactions in New Zealand's EEZ as well as international and high-seas fisheries with methodological similarities to those in New Zealand. The mitigation method, results of any trials or perceptions of efficacy, costs, benefits and recommendations for future research and management are included. Recommendations for mitigation in pelagic and demersal longline fisheries included: combinations of mitigation are likely to work best; offal (and fish waste) retention, paired streamer lines, line weighting and night setting were the most consistently effective methods at reducing seabird incidental mortality. Future research recommendations include refining existing methods that seem promising such as underwater setting, side setting, and novel methods still in the preliminary stages of testing (e.g. fish oil). The review also emphasised the importance of conducting mitigation research using properly designed controlled experiments.

Proposed research plan for Spanish system line weighting

65. In 2000, the Scientific Committee endorsed further work to develop line-weighting regimes to ensure sink rates that will preclude seabirds accessing bait. Such work could enhance the likelihood of permitting exemption from several of the mitigating measures currently in use in the Convention Area, noting in particular that the ultimate aim in managing seabird by-catch in the Convention Area will be to allow fishing at any time of day without seasonal closure of fishing grounds (SC-CAMLR-XIX, paragraphs 4.40 and 4.41; SC-CAMLR-XIX, Annex 5, paragraph 7.147).

66. WG-FSA-05/12 presented a research plan to improve the seabird by-catch mitigation effectiveness of the Spanish system of longline fishing. The plan also aims to explore methods to reduce the substantial amounts of fishing gear lost (and ghost fishing) by Spanish system vessels in the Convention Area. A similar proposal was submitted in 2001 (WG-FSA-01/29) which recognised that fishing in some high-risk areas of the Convention Area occurs only in winter, a low-risk time of year, and that effectiveness must be determined in high-risk areas at times of high risk to seabirds (e.g. summer).

67. In 2001, the Scientific Committee recommended that Members should accord this proposal high priority, noting its importance as a means to improving Conservation Measure 29/XIX (now Conservation Measure 25-02), and that the research would also contribute to advice on appropriate mitigation measures for use by vessels employing the Spanish system of longlining in other parts of the world, including in areas where birds from the Convention Area are currently being killed in large numbers (SC-CAMLR-XX, paragraph 4.63). The Commission endorsed the Scientific Committee's recommendation (CCAMLR-XX, paragraph 6.26), but opportunities and resources to conduct the proposed experiment have been lacking until now.

68. WG-FSA-05/12 proposed to conduct an experiment on a chartered vessel in Chile to determine the effects of setting speed, line-weight spacing and weight of line weights on the sink rate of Spanish system longlines. A new weight spacing (30 m) will be tested in an effort

to reduce the degree of lofting of the hookline from that which occurs with 40 m spacings as required by Conservation Measure 25-02. Lofting occurs when Spanish system gear is deployed and the hookline between weights lofts in the propeller turbulence, thereby allowing seabirds access to baited hooks and increasing the likelihood that they will be caught. A new line-weighting spacing/line weight/setting speed combination will then be tested, along with streamer lines, as a deterrent to black-browed albatrosses in the *D. eleginoides* fishery in southern Chile.

69. If the new regime eliminates albatross mortality, it will then be important to test the gear against white-chinned petrels, the most commonly killed seabird in Convention Area fisheries. Reducing white-chinned petrel by-catch is considered the best current indicator for efforts to improve seabird by-catch mitigation effectiveness for Convention Area seabirds.

70. It will be important to test the new line-weighting configuration against white-chinned petrels at a high-risk location in the Convention Area. The exact nature and timing of the tests will become clear following provision of a report from the vessel charter experiment and trial against black-browed albatrosses. Trials against white-chinned petrels in the Convention Area could conceivably take place in a conservative, step-wise manner involving (i) day-setting trials during winter, (ii) night-setting trials in the seabird breeding season, and (iii) day-setting trials in the seabird breeding season. Progress with this series of trials would be contingent on being able to achieve conservative predetermined seabird mortality targets before progressing to the next stage of the trials.

71. The Working Group strongly endorsed the research proposed in WG-FSA-05/12 to reduce seabird mortality in Spanish system fisheries operating in areas where Convention Area seabirds range. It noted that if these trials are successful in Chile, the conduct of subsequent trials in the Convention Area in a high-risk area for incidental mortality of seabirds and at a high-risk time of year would be appropriate.

Factors influencing line sink rate

72. WG-FSA-05/36 determined the '2-m access window', or the distance astern that longline hooks sink to a depth of 2 m, on eight small vessels (>7.9 to 16.8 m) for two demersal gear types (fixed gear and snap-on gear) used in Alaska. Seabirds in Alaska are most vulnerable to hooking while longlines are within 2 m of the surface. The capability of these vessels to deploy streamer lines and buoys according to performance standard guidelines was also determined. Vessel speed was found to be a primary determinant of both the distance astern that longline hooks were accessible to surface-foraging seabirds, and the performance standards of streamer lines. Using gear with similar sink rates, the 2-m access window ranged from 28 to 38 m for vessels setting gear at slower speeds (2 to 3.5 knots) to a mean of 90 m for vessels setting gear at faster speeds (up to 7.4 knots). Given the reduced size of the access window for vessels setting snap-on gear at slow speeds, the reduced aerial extent requirement for this gear type was shown to be justified in terms of risk to seabirds and practical to use, especially with a lighter streamer line.

73. The Working Group noted that these data suggest that 'the 2-m access window', which incorporates vessel speed and hookline sink rate into a single measure, provides an improved measure of risk to seabirds rather than sink rate alone, and that vessel speed is an important component of seabird risk to longline gear.

74. The Working Group then analysed vessel speed data for 4 715 longline gear deployments in 2004/05 for both Spanish and IWLs and estimated the 2-m access window for both gear types operating in the Convention Area (Figure 2). Assuming a sink rate to a depth to 2 m of 0.13 m/s for Spanish gear and a sink rate of 0.20 m/s to 2 m for IWLs, IWLs produced access windows that ranged from a low of 20.6 m at the minimum setting speed of 4 knots and a high of 41 m at the maximum setting speed of 8 knots and 32 m at the autoline average setting speed of 6.2 knots. In contrast, Spanish gear produced 2-m access windows ranging from a low of 32 m at the slowest setting speed of 4 knots and a high of 79 m at the maximum setting speed of 10 knots and 60 m at the average setting speed of 7.6 knots.

75. It is clear from this analysis that the 2-m access window, where birds are most vulnerable to hooklines, can vary at least two-fold depending on vessel speed for both gear types and that Spanish longline gear presents more risk to seabirds than IWLs.

76. Noting that vessel speed data are routinely collected for all longline sets and that sink rate data are available for a wide range of line-weighting scenarios, the Working Group recommended that the '2-m access window' analysis be used in concert with sink rate data to evaluate the merits of line-weighting scenarios and prescriptions for the aerial extent of streamer lines in future refinements of conservation measures. Accordingly, the collection of data by observers on vessel setting speed, longline sink rate and streamer line aerial extent remain priority tasks for observers.

Streamer line aerial extent

77. Following a Commission endorsement (CCAMLR-XXIII, paragraph 5.12(iii)) of requests for key data to allow for the eventual improvement of Conservation Measure 25-02, data on the aerial extent of streamer lines were collected uniformly for the first time in 2004/05. These data were collected once for each cruise by fishery observers. The aerial extent of the streamer line, which is the part of the line supporting the streamers, is the effective seabird deterrent component of the streamer line, and therefore, of great interest to the Working Group.

78. The Working Group noted that data on the aerial extent of streamer lines reported in Table 15 were highly variable across the fleet, ranging from a low of 7 m to a maximum of 150 m and further noted that most vessels (16 of 31) achieved an aerial extent of $\geq$50 m. Given the wide range of distances reported, in some cases for the same vessel fishing in different areas, the Working Group recommended that aerial extent data and other compliance features of streamer lines be collected more frequently according to a specific protocol in order to yield a reliable representation of how effectively streamer lines are deployed and a more realistic evaluation of streamer line compliance in CCAMLR longline fisheries.

79. The Working Group proposed that data on streamer line aerial extent and other streamer line features including the height of streamer lines at the stern, the length of streamer

lines, the number, spacing and length of individual branched streamers, be collected once every seven days. Further, it was suggested that these data be collected on a diagram-based data collection form to be developed by CCAMLR. Where sink rate data collection is required according to Conservation Measure 24-02, paragraph B2(ii), the Working Group recommended that streamer line data be collected in the course of sink rate data collection.

Individual branched streamers of streamer lines

80. The Working Group also discussed the most appropriate material for individual streamers noting that if the material used for streamers is too lightweight streamers may be rendered ineffective in moderate to high winds. In the Working Group's assessment of compliance to streamer line requirements in Conservation Measure 25-02, it was recognised that empirical information on the seabird deterrent effectiveness of various types of streamer line configurations against selected seabird species (e.g. black-browed albatross, white-chinned petrel) is lacking. It is therefore not currently possible to recommend adoption of streamer line configurations other than that recommended in Conservation Measure 25-02. The Working Group recognised the importance of the provision of such information and encouraged Members to conduct appropriate experiments on the design features of streamer lines with a view to being able to recommend refinements to the streamer line requirements in the conservation measure.

Shinsei Maru bottom-line system

81. The Working Group noted that the *Shinsei Maru* bottom-line system proposed in WG-FSA-05/26 appears similar to trot-line fishing gear used in other fisheries, but that details were lacking (mass of weights used, stern or side setting, setting speed, rate of loss of weights) to fully evaluate potential threats to seabirds in the Convention Area. The Working Group recommended that the scientific observer assigned to this vessel report how the gear is deployed and retrieved with special attention to gear and seabird behaviour during the haul and set. Ultimately a description of the gear similar to that in WG-FSA-05/54 would be beneficial to understanding the strengths and weaknesses of this fishing gear and its appropriateness for use in the Convention Area.

82. Moreno et al. (in press) characterised seabird interactions with similar gear in the Chilean artisanal fishery for toothfish. While heavily weighted individual vertical longlines sank quickly during line setting with minimal interactions with seabirds, hooklines were often exposed to seabird interactions during hauling, resulting in a substantial number of seabird fatalities. Given the substantial catch of seabirds during the haul in Convention Area longline fisheries (paragraph 10), the potential for increased interactions with the proposed gear during the haul is considerable.

83. The Working Group recognised the potential for the fishing method proposed in WG-FSA-05/26 to minimise exposure of baited hooks to seabirds during setting operations and therefore expressed support for the proposal; however, the Working Group strongly recommended that Conservation Measures 24-02 and 25-02 be applied to this fishing system novel to the Convention Area.

Seabird mitigation during the haul

84. Most seabirds were caught during the haul of longline operations, as indicated by their 'injured' or 'uninjured' status (Table 1). Thus, the Working Group suggested that development of effective haul scaring devices with prescribed standards are appropriate throughout the Convention Area and once developed could result in refinements to Conservation Measure 25-02. Currently Conservation Measure 25-02 (2003), paragraph 8, requires that a device designed to discourage birds from accessing baits during the haul of longlines be used in higher-risk areas for seabird by-catch (Subareas 48.3, 58.6 and 58.7 and Divisions 58.5.1 and 58.5.2), however, a specific haul mitigation device is not prescribed.

85. A Bird Excluder Device (BED) was used very successfully on the FV *Janas* while fishing in Division 58.5.2 to reduce seabird interactions with the hookline during hauling (Figure 3) in 2003 and 2004. No birds were captured during the haul while using this device. The concept of the BED is to prevent birds from swimming and flying towards the area where hooks emerge from the surface of the water. It consists of two arms hinged above the hauling area. Three-metre fluorescent streamers attached to the arms and suspended between the ends of each arm reach down to the water surface, effectively excluding birds from the hauling area. A line with purse seine floats on the surface of the water (also attached to the ends of the arms) forms a boundary fence surrounding the hauling area, preventing birds from swimming towards the danger zone. This setup cordons off the line-hauling area while eliminating the potential for fouling the BED with the hookline as it is hauled. The hinged arms allow for easy retrieval and deployment.

86. The Working Group recommended that haul mitigation devices such as the BED used on the *Janas* should be encouraged in all CCAMLR areas regardless of risk status to reduce the large proportion of bird captures during line hauling.

Longline sink rate testing prior to entering the CCAMLR Convention Area

87. In response to a Commission request (CCAMLR-XXIII, paragraph 10.24), the Working Group reviewed available data on the maximum length of longlines used in the Convention Area with respect to Conservation Measure 24-02 and longline sink rate testing prior to entering the CCAMLR Convention Area.

88. The data on the maximum length of the longline used showed a clear distinction between the Spanish longline system and the auto longline system (WG-FSA-05/80). Given the wide variation in maximum lengths exhibited in the data, it was considered more appropriate to use the mean longline length for fleet-wide application of line sink rate testing.

89. Noting the differences between the two longline fishing systems, the expert opinion of those involved in the development of line-weighting regimes and the review in WG-FSA-05/80, the Working Group recommended that the requirement for testing line sink rate prior to entering the Convention Area should be changed from the current requirement of the maximum length to be used in the Convention Area for all vessels to a minimum of 6 000 m for auto longline system vessels and 16 000 m for Spanish longline system vessels.

Revision of Conservation Measures 24-02 (2004)
and 25-02 (2003)

90. The Working Group agreed that IWLs should continue to be endorsed as a viable alternative and that the revisions to the provisions of Conservation Measure 24-02 made in 2004 were successfully implemented in 2005.

91. In reviewing its advice from 2004 (SC-CAMLR-XXIII, Annex 5, paragraphs 7.91 to 7.93), the Working Group noted that proposed changes to Conservation Measure 25-02 with respect to mandatory line-weighting prescriptions for autoline vessels were no longer considered appropriate. The rapid adoption of IWLs and the line sink rate testing regime had largely superseded the need for an external line-weighting regime for autoline vessels.

92. The Working Group considered proposing changes to Conservation Measure 25-02 to accommodate IWL provisions for autoline vessels, but recognised that no additional information on the specification of IWLs had been provided and suggested that a revision of Conservation Measure 25-02 in 2005 would be premature.

93. The Working Group recommended that research be undertaken in 2005/06 on IWLs to allow a more informed revision of Conservation Measure 25-02 in 2006, with the intention of combining Conservation Measures 24-02 and 25-02, if possible. It noted that research to relate the current values of line sink rate to values that include both vessel speed, streamer line aerial extent and sink rate is planned. This would allow more flexible prescriptions to be developed for the conservation measure (paragraph 73).

94. The Working Group recommended that Conservation Measure 24-02 be revised, via introduction of a specification of the length of longline to be tested prior to entering the CCAMLR Convention Area (paragraph 89).

95. The Working Group recommended that Conservation Measure 24-02 be revised as follows:

Replace paragraph A1(i) with:

(i) set a minimum of two longlines with a minimum of four TDRs on the middle one-third of each longline, where:

(a) for vessels using the auto longline system, each longline shall be at least 6 000 m in length;

(b) for vessels using the Spanish longline system, each longline shall be at least 16 000 m in length.

Replace paragraph B1(i) with:

(i) set a minimum of two longlines with a minimum of four bottle tests (see paragraphs B5 to B9) on the middle one-third of each longline, where:

(a) for vessels using the auto longline system, each longline shall be at least 6 000 m in length;

(b) for vessels using the Spanish longline system, each longline shall be at least 16 000 m in length.

Replace paragraph C1(i) with:

(i) set a minimum of two longlines with either a minimum of four TDRs, or a minimum of four bottle tests (see paragraphs B5 to B9) on the middle one-third of each longline, where:

(a) for vessels using the auto longline system each longline shall be at least 6 000 m in length;

(b) for vessels using the Spanish longline system each longline shall be at least 16 000 m in length.

Incidental mortality of seabirds during unregulated longline fishing in the Convention Area

96. As no information is available on rates of incidental mortality of seabirds from the unregulated fishery, estimates of the incidental mortality of seabirds during IUU fishing within the Convention Area present a number of difficulties, requiring various assumptions to be made.

97. In previous years, the Working Group has prepared estimates using both the average catch rate for all cruises from the appropriate period of the regulated fishery in a particular area and the highest catch rate for any cruise in the regulated fishery for that period. Justification for using the worst catch rate from the regulated fishery is that unregulated vessels accept no obligation to use any of the mitigation measures prescribed in CCAMLR conservation measures. Therefore catch rates, on average, are likely to be considerably higher than in the regulated fishery.

98. As no information is available on rates of incidental mortality of seabirds from the unregulated fishery, estimates have been made by bootstrapping the observed catch rates from fishing operations in 1996/97. The fleet in 1996/97 implemented relatively few mitigation measures and has been considered to provide the best estimate the Working Group has of likely catch rates in the unregulated fishery. The method used to prepare estimates of the incidental mortality of seabirds during IUU fishing within the Convention Area is described in full in SC-CAMLR-XXIV/BG/27 and in SC-CAMLR-XXII, Annex 5, paragraphs 6.112 to 6.117.

99. The Working Group agreed that the following values should be applied to the toothfish removals data to estimate seabird by-catch in IUU *Dissostichus* spp. fisheries in the Convention Area in 2005 (SCIC-05/10 Rev. 2), and also agreed that these values should be used to generate similar estimates for previous years. The resulting median and 95% confidence intervals for seabird incidental mortality rates (birds/thousand hooks) for the unregulated fishery are shown below. It should be noted that where incidental mortality rates

are not available for a regulated fishery within a statistical area, the rate for an adjacent area of similar level of risk (SC-CAMLR-XXIV/BG/27) has been used. Thus, because a regulated fishery has never existed in Division 58.4.3, the rate applied is that for Division 58.4.4.

Subarea/Division	Season	Lower 95%	Median	Upper 95%
48.3	Summer	0.39	0.741	11.641
	Winter	0	0	0.99
58.6, 58.7, 58.5.1, 58.5.2	Summer	0.45	0.55	1.45
	Winter	0.01	0.01	0.07
58.4.2, 58.4.3, 58.4.4	Summer	0.27	0.33	0.87
	Winter	0.006	0.006	0.042
88.1	Summer	0.27	0.33	0.87
	Winter	Not applicable, access not possible in winter		

100. The estimates of potential unregulated seabird by-catch in the Convention Area in 2004/05 and comparison with estimates for previous years are provided in detail in SC-CAMLR-XXIV/BG/27.

101. The overall estimated total for the whole Convention Area in 2004/05 indicates a potential seabird by-catch in the unregulated fishery of 4 415 (95% confidence interval range of 3 605 to 12 400) seabirds. The values for this and previous years are summarised in respect of different parts of the Convention Area in Table 18.

102. In comparison with estimates for previous years, calculated in identical fashion, the value for 2004/05 is similar to the value estimated for 2003/04 (SC-CAMLR-XXIII/BG/23). These are the lowest reported values since estimates started in 1996. This presumably reflects a commensurate reduction in toothfish removals or changes in the areas from where IUU fishing occurs.

103. Based on the data since 1996 (SC-CAMLR-XXIV/BG/27), an estimated total of 180 623 (95% confidence interval range of 147 013 to 529 722) seabirds have been killed by these vessels. Of these:

(i) 40 469 (95% confidence interval range of 32 728 to 128 460) were albatrosses, including individuals of four species listed as globally threatened using the IUCN threat classification criteria (BirdLife International, 2004);

(ii) 7 155 (95% confidence interval range of 5 844 to 20 054) were giant petrels, including one globally threatened species;

(iii) 113 270 (95% confidence interval range of 92 343 to 325 210) were white-chinned petrels, a globally threatened species.

104. As in previous years, it was emphasised that these values are very rough estimates (with potentially large errors). The present estimates should only be taken as indicative of the potential levels of seabird mortality occurring in the Convention Area due to unregulated fishing and should be treated with caution.

105. Nevertheless, even taking this into account, the Working Group endorsed its conclusions of recent years that:

(i) the levels of loss of seabirds from the populations of these species and species groups are still broadly consistent with such data as exist on the population trends of these taxa, including deterioration in conservation status as measured through the IUCN criteria;

(ii) although considerably reduced from previous years, such levels of mortality probably still continue to be unsustainable for some of the populations of albatrosses and giant and white-chinned petrels breeding in the Convention Area.

106. Many albatross and petrel species are facing potential extinction as a result of longline fishing. The Working Group again requested the Commission to continue to take action to prevent further incidental mortality of seabirds by unregulated vessels in the forthcoming fishing season.

Incidental mortalities of seabirds during longline fishing outside the Convention Area

107. Ms T. Neves (Brazil) presented information from a study conducted from 2000 to 2005 of captures of seabirds in Brazilian waters (WG-FSA-05/67). Fishing trips were observed with an average catch rate of 0.09 birds/thousand hooks during the period. In 2002, the catch rate was 0.2 birds/thousand hooks with 105 300 hooks observed, in 2003, 0.18 birds/thousand hooks with 56 700 hooks observed and in 2004, 0.03 birds/thousand hooks with 90 858 hooks observed. Species from the Convention Area were among those captured and among species returned by fishers from trips where observers were not present. Observations were from Brazilian domestic vessels only. It was noted that fishing captains were likely to adopt different practices when observers were present. Therefore, results represent minimum catch rates. Pelagic fishing effort by both Brazilian and foreign vessels in winter is concentrated south of 20°S and relatively close to the coast, where the propensity for bird capture is highest. Effort by foreign fishing vessels is higher than that of domestic vessels, particularly during the winter when birds are most likely to be caught.

108. The Working Group thanked Ms Neves for the presentation of the new information from Brazil as requested last year (SC-CAMLR-XXIII, Annex 5, paragraph 7.129), which shows that there is a high risk of capture of birds from the Convention Area, especially during winter.

109. Ms Neves noted that mitigation had been developed in cooperation with industry, including raising awareness of the issue through an education program, developing streamer lines, and developing blue-dyed bait. Both measures were voluntarily adopted during at least three years by part of the Brazilian domestic fleet. She indicated that concurrent to finalising the Brazilian NPOA-Seabirds, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) is also creating regulations and incentives for Brazilian fishers to mitigate incidental seabird mortality. It is hoped that this approach will ensure that voluntary measures adopted by the fleet thus far are encouraged and spread to the rest of the

fleet. In addition, the Special Secretariat of Aquaculture and Fisheries of the Presidency of the Republic (SEAP) is introducing sea turtle and seabird mitigation measures into the criteria for granting fishing licences to new foreign vessels. Some of these measures are obligatory for the National Funding Programme for the National Fishing Fleet (Profrota Pesqueira).

110. Prof. J. Croxall (UK) presented WG-FSA-05/56, a summary of seabird mortalities from the last two years for toothfish longlining from the Falkland/Malvinas Islands. Observer coverage was 59% of sets. All mortalities were black-browed albatrosses with estimated mortalities of 45 and 80 birds in 2002/03 and 2003/04 respectively. Rates of capture were 0.011 and 0.0005 birds/thousand hooks respectively. Target maximum rates of seabird by-catch for the fishery in the Falklands/Malvinas NPOA-Seabirds were 0.01 birds/thousand hooks by 2004/05 and 0.002 birds/thousand hooks by 2006/07. The rates measured meet these targets.

111. The Working Group noted there was no direct implication of the findings for the Convention Area breeding species, as all of the individuals reported in this study were likely to come from breeding sites outside. The fishery has moved to standardised steel weights, which improve the efficiency of line-weighting procedures, and are less likely to result in loss of fishing gear. The Working Group further noted that in the one case where a streamer line had temporarily not been used, high bird by-catch had resulted, indicating the need to continue to use streamer lines.

Research into the status and distribution of seabirds

112. Ms Neves presented information on seabird abundance off the Brazilian coast obtained through the Projeto Albatroz observer program between 2000 and 2005 (WG-FSA-05/67). Many of the species recorded in this study were species of importance to CCAMLR, including wandering albatrosses, white-chinned petrels, Cape petrels, southern fulmars, giant petrels and Wilson's storm petrels. Overall, the southern region of Brazil is an important foraging area, particularly during the autumn and winter months when seabird abundance is higher than during the breeding season. The results showed that the southern Brazilian area is important for the conservation of birds from four main breeding areas, including CCAMLR areas, Falkland/Malvinas Islands, Tristan da Cunha and New Zealand.

113. WG-FSA-05/14 presented results of a recent tracking study of albatrosses on Heard Island. In the summer of 2003/04, five light-mantled sooty albatrosses and 10 black-browed albatrosses breeding on Heard Island were tracked. The black-browed albatrosses foraged over shelf slope waters within 150 km of Heard Island and concentrated their foraging effort over the Gunnari Ridge which lies to the east of Heard Island. There is considerable spatial overlap with trawl and longline fisheries operations within the EEZ. The light-mantled sooty albatrosses foraged over 1 000 km to the south in productive waters between the southern boundary of the Antarctic Circumpolar Current and the northern edge of the pack-ice. This was the first time either albatross population from Heard Island had been tracked.

114. Specifically, the light-mantled sooty albatrosses from Heard Island foraged along the Antarctic shelf break/pack-ice edge, including in areas where new and exploratory fisheries operate in Divisions 58.4.1, 58.4.2 and 58.4.3. This new information has been incorporated into the risk assessments for these areas.

115. Considering the recent mortality of seven adult black-browed albatrosses in the icefish trawl fishery operating adjacent to Heard Island in Division 58.5.2 (WG-FSA-05/8) and the small size of this population (c. 600 pairs), it was noted that this satellite-tracking information provided important information for the understanding and management of incidental mortality in fisheries adjacent to Heard Island.

116. Dr S. Waugh (New Zealand) presented new research on the foraging ecology of albatrosses in relation to fishing activity. GPS loggers were used to track royal albatrosses foraging within the New Zealand EEZ and linked with real-time fishing locations from trawl fisheries. Linking individual's behaviour with fishing locations indicates a degree of attraction between birds and vessels actively fishing, and thus a wider range of target-species fisheries were potentially involved in interactions with royal albatrosses than had been previously indicated based on recoveries of dead birds from fisheries. In particular, royal albatrosses associated with deep-water vessels to a high degree than expected. A management response to this information has been an improved targeting of observer coverage to examine bird interactions.

117. The Working Group noted the important technological advances of the application of GPS technology to seabird foraging studies. Unlike information derived from satellite or geolocation information, there has been no global synthesis of Procellariiform distribution using GPS-derived spatial information. Importantly, GPS spatial assessments enable consideration of interactions between birds and fishing operations at much finer scales than previously possible. The Working Group envisaged the need for a workshop in the future to harmonise and consolidate practices and analyses in the rapidly increasing application of GPS technology to seabirds and the application of such studies to fisheries management.

118. As requested by the Working Group last year, BirdLife International submitted 'Tracking Ocean Wanderers: the Global Distribution of Albatrosses and Petrels', a report describing its global Procellariiform tracking initiative (WG-FSA-05/P10). The initiative was introduced last year (SC-CAMLR-XXIII, Annex 5, paragraph 7.144) and the full report is now available (www.birdlife.org). The Working Group congratulated BirdLife International and the data contributors for providing a comprehensive global assessment for the remote-tracking distributions of albatrosses and petrels.

119. Dr B. Sullivan (UK) reiterated a request for holders of new information on Procellariiform distribution to submit these to the database to ensure that it remains as relevant and up-to-date as possible for application to fisheries management initiatives.

120. As requested by the Working Group last year (SC-CAMLR-XXXIII, Annex 5, paragraph 7.145) BirdLife International provided an analysis of albatross and petrel distribution relevant to the CCAMLR Convention Area (WG-FSA-05/75). The results of this analysis highlight the importance of the Convention Area, particularly for breeding distributions of populations of wandering, grey-headed, light-mantled, black-browed and sooty albatrosses, and populations of both northern and southern giant petrels and white-chinned petrels. The distribution data also emphasise the importance for breeding albatrosses and petrels of regions north of Convention Area boundaries.

121. The CCAMLR subareas with the highest proportion of albatross and petrel distribution were Subareas 48.3 and 58.6, but the breeding ranges extend across the majority of the

Convention Area. The spatial risk assessments for CCAMLR subareas were revised based on this new and relevant information on the distribution of albatrosses and petrels vulnerable to interactions with fisheries (SC-CAMLR-XXIV/BG/26).

122. This new tracking information on Procellariiform seabirds enabled the Working Group to undertake a provisional gap analysis of albatross and petrel distribution data with respect to their occurrence in the Convention Area.

123. In this regard, and taking particular account of the size and location of populations and the likelihood of obtaining distributional data relevant to improving existing risk assessments, the Working Group suggested the following priorities for data acquisition:

(i) Breeding birds:

Priority A:

Grey-headed albatross	Crozet Islands, Kerguelen Islands
Indian yellow-nosed albatross	Crozet Islands, Prince Edward Islands
Light-mantled albatross	Auckland Islands, Campbell Island, Crozet Islands, Kerguelen Islands
Northern giant petrel	Chatham Islands, Crozet Islands, Kerguelen Islands, Macquarie Island
Southern giant petrel	Antarctic Peninsula, South Orkney Islands, Heard and MacDonald Islands
White-chinned petrel	Antipodes Island, Auckland Islands, Kerguelen Islands

Priority B:

Black-browed albatross	Crozet Islands
Campbell albatross	Campbell Island
Sooty albatross	Prince Edward Islands
Northern giant petrel	Campbell Island
Southern giant petrel	Falkland/Malvinas Islands, Macquarie Island, Prince Edward Islands, South Sandwich Islands

(ii) Non-breeding birds:

With the exception of data for grey-headed and black-browed albatrosses from South Georgia, acquisition of data from the at-sea distribution of non-breeding adults and juvenile birds from all major populations of each species breeding in the Convention Area is a very high priority.

The Working Group recommended that BirdLife International be requested to provide summary data on distribution of Southern Ocean seabirds from its tracking database at approximately three-year intervals, or when accumulation of data warrants.

124. WG-FSA-05/42 presented a review of research on seabird–fishery interactions commissioned by the New Zealand Ministry of Fisheries. The review considered recent research (from 1990 onwards) in five main topic areas (estimation of incidental mortality, methods for estimating population size and trends, the utility of genetic research, management efficacy and foraging information).

125. The aim of the review was to assist the New Zealand NPOA-Seabirds Science Advisory Group (SAG). SAG's objective was to advise the government on the research appropriate to meet the objectives of the NPOA. The group reviewed six research areas (population estimation and modelling, estimation of incidental mortality, molecular ecology, mitigation, foraging ecology, monitoring management efficacy) and considered two reviews by Ms R. Alderman (WG-FSA-05/42) and Dr L. Bull (WG-FSA-05/P8). The main findings, methodological recommendations and gaps were identified and set out for each research domain. Priorities were specified for seabird–fishery research. These latter items are subject to ongoing development and were used in the development of a five-year research plan undertaken by the Ministry of Fisheries and the Department of Conservation.

126. The Working Group noted that New Zealand's activities on research and conservation of albatrosses and petrels are of high significance to CCAMLR as this Member has the greatest diversity of breeding Procellariform species. The Working Group congratulated New Zealand's initiative, especially the ongoing and full engagement of the Ministry of Fisheries in seabird conservation issues.

127. Information summarising national research on seabirds (albatrosses and *Macronectes* and *Procellaria* petrels) was presented by Australia (WG-FSA-05/55), USA (WG-FSA-05/44) and New Zealand (WG-FSA-05/51). Reference to some research on petrels by France was included in CCAMLR-XXIV/BG/23. The UK submitted an electronic summary of national research to the Working Group. It was encouraged also to submit the data in hard-copy format in future.

128. Of countries known to be conducting relevant research, no reports were received from Argentina, France or South Africa. These countries were encouraged to provide input about their work that has relevance to the Convention Area.

129. It was noted that the UK data submission included reference to a multinational project undertaking molecular analyses of taxonomic relationships of *Macronectes* and *Procellaria* petrels; this study being coordinated by Dr P. Ryan (South Africa).

130. Dr Micol presented information on petrel populations on Crozet and Kerguelen Islands (CCAMLR-XXIV/BG/23). In order to assess the impact of the incidental mortality in the French EEZ, particularly on white-chinned and grey petrels, a study funded by fishing companies and France has been initiated by CNRS of Chizé. The two-year study, which started in 2004, aims to determine population trends, examine the impact of current and historical levels of fisheries-related seabird mortalities, and compare the relative impact of incidental mortality and fluctuations due to environmental variables. The work includes a complete census of white-chinned petrels on Possession Island (Crozet) with comparisons to 1983 population estimates. As no previous population estimates are available for Kerguelen, population sizes will be assessed over the two-year period. Analyses will also consider long-term demographic data, as well as new information on diet, satellite monitoring and fisheries interactions. Results are expected in early 2007.

131. ACAP agreed at the First Meeting of Parties (MOP1) in November 2004 that ACAP's Advisory Committee would review the population status, trends and demography of albatrosses (21 species) and petrels (7 species) listed in Annex 1 of the Agreement. Thus, an ACAP working group, chaired by Dr R. Gales (Australia), was formed to collect and collate information on breeding numbers and critical population and demographic parameters for each species. It was anticipated that this synthesis would enable gaps in information to be identified and facilitate the prioritisation of actions to collect information to fill these gaps.

132. Information provided by four Parties (Australia, New Zealand, South Africa and the UK) to ACAP consisted of population-specific data for 19 albatross and seven petrel species. The ACAP working group's preliminary review was provided to the first ACAP Advisory Committee meeting in July 2005. Information from Argentina was subsequently made available at the ACAP meeting but has not yet been incorporated in the review.

133. The review provided to WG-IMAF (WG-FSA-05/P2) includes information on breeding populations for ACAP species within Australian jurisdiction (Tasmania, Heard and Macquarie Islands). Demographic studies are under way for four of the albatross species and there are ongoing long-term population monitoring studies for albatrosses and petrels breeding on Macquarie Island and in Tasmania. Current trends for the ACAP species breeding on Macquarie Island indicate that these populations are either increasing or stable in numbers. Fewer data are available for the species breeding on Heard Island; in particular there is a lack of reliable information on population trends for the species breeding at this site.

134. Extensive information was provided by New Zealand for species breeding within its jurisdiction. Population estimates are available for most breeding sites, although for some species (e.g. light-mantled albatross), the reliability of these estimates is low. Very little information is available for a number of species including Pacific, white-capped and Salvin's albatrosses and Westland petrel. Information for these species is essentially restricted to limited point estimates of population size with no robust information on population trends. Population trend information is available for 18 of the 40 populations in the New Zealand region. Of these, 16 (89%) are reported as being either stable or increasing. The two populations that are reported to be in decline are Salvin's albatrosses at the Bounty Islands and grey-headed albatrosses breeding on Campbell Island.

135. South Africa submitted comprehensive information for the nine ACAP species breeding at both Marion and Prince Edward Islands. Considerably greater knowledge exists for the eight species breeding at Marion Island. The population trends of seven species at this

site are known with at least moderate reliability and, of these, four are stable and three (sooty albatross, southern giant petrel and white-chinned petrel) are decreasing. Information is most limited for grey and white-chinned petrels. Much less information was presented for species breeding at Prince Edward Island, with information essentially restricted to population estimates conducted in 2001/02.

136. The UK submitted data for Tristan da Cunha and Gough, the Falkland/Malvinas Islands and South Georgia. The most comprehensive dataset was available for South Georgia, derived largely from long-term demographic studies from Bird Island, but also with recent archipelago-wide surveys of wandering, black-browed and grey-headed albatrosses confirming long-term declines. There are reliable estimates of productivity, adults and juvenile survival from Bird Island for these three species and this will be available in the future for both giant petrels. Population trend information for six ACAP species breeding at South Georgia showed that most (five) are in decline, with only southern giant petrels being stable in numbers. There is very little information on demography, current population size and status of the light-mantled albatross and white-chinned petrel, except that the latter is in long-term decline.

137. Similarly, little is known about long-term demographic processes or status of the three Falkland/Malvinas Islands ACAP species except that the black-browed albatross has recently undergone a rapid decline, and a survey in 2004 of the southern giant petrel recorded many more birds than anticipated. At Tristan da Cunha/Gough the limited data on population size suggests that the Tristan, Atlantic yellow-nosed and sooty albatrosses are in decline, and the southern giant petrel and spectacled petrel are apparently increasing. With the exception of two (of three) albatross species breeding on Gough, there is very little data on vital rates.

138. Information from all sites is consistent in showing that considerably more information is available for albatross and giant petrel species, with very little information being available for *Procellaria* species.

139. Comparing the available regional data on population trends suggests that populations in the Australian and New Zealand region are generally more secure than populations elsewhere. For other ACAP populations the situation is more serious. The most extensive suite of data for ACAP species is from South Georgia, and at this site five of the six species for which data are available are in decline. This regional comparison highlights the serious predicament of populations breeding in the CCAMLR Convention Area compared with the generally less precarious situation of populations elsewhere.

140. The Working Group thanked ACAP and the chair of the Status and Trends Working Group for providing the information. The preliminary review indicates excellent progress toward a global revision of population status and underscores the considerable interest and relevance of the ACAP work to CCAMLR. It was noted that, with the exception of Argentina, all breeding species of most concern to CCAMLR are represented by signatories to ACAP. Thus, the Working Group recognised it was not necessary to update SC-CAMLR-XXIV/BG/22 ‘Summary of population data, conservation status and foraging range of seabird species at risk from longline fisheries in the Convention Area’.

141. The Working Group agreed that such information is best compiled and reviewed by ACAP and to avoid duplication, it was agreed that ACAP be the single repository for these data. ACAP would be requested to submit summary documents of albatross and petrel population status to WG-IMAF annually, or as appropriate.

142. The Working Group considered the potential for similar cooperation between WG-IMAF and ACAP in the area of taxonomic revision and molecular research. It was agreed that, at this stage, WG-IMAF would maintain the request to Members for information on relevant national seabird genetic research.

143. In relation to international initiatives coordinated by Prof. H. Caswell and Dr C. Hunter (USA) to develop new population models for albatrosses (see SC-CAMLR-XXIII, Annex 5, paragraph 7.153), Prof. Croxall reported that a second meeting of the working group had been held in March 2005 in the USA. The main developments at this meeting were: (i) fitting and evaluation of models using nine datasets for six albatross species; (ii) refining questions of interest into three broad groupings, viz: (a) life-history issues, primarily involving interactions between breeding frequency, productivity and survival; (b) management issues, especially consequences of 'catastrophe' years, estimation of potential biological removals, power to detect change and possible provision of best-practice advice; and (c) other issues involving effects such as density-dependence, environment, dispersal etc. The group's report will be tabled at the next ACAP meeting. The next meeting of the group will take place in France in May 2006.

International and national initiatives relating to incidental mortality of seabirds in relation to longline fishing

ACAP

144. WG-FSA-05/25 reported on the first meeting of the Advisory Committee of ACAP held in Hobart, Australia, from 20 to 22 July 2005 with four Parties (Australia, New Zealand, South Africa and UK), two Signatory States (Argentina and France) and three Range States (Norway, Ukraine and USA) in attendance. All are Members of CCAMLR, which was also represented as an invited observer (together with SCAR, BirdLife International and IASOS). The meeting was informed of recent ratifications by France and Peru and of progress towards ratification by Argentina, Chile and Norway. A full report of the meeting is available at www.acap.aq/index.php/acap/advisory_committee/first_advisory_committee_meeting.

145. Items of particular relevance to CCAMLR included:

(i) the review of data relevant to the assessment of status and trends of albatross populations by the ACAP Status and Trends Working Group (see paragraphs 131 to 141);

(ii) the establishment of a Taxonomy Working Group to review the status of existing and potential ACAP-listed taxa;

(iii) the establishment of a Working Group on Breeding Sites, to develop an inventory and assess the conservation status of all breeding sites of ACAP species;

(iv) commendation of the work CCAMLR has undertaken to address mitigation of seabird by-catch and recognition of the need for substantial progress in areas of application of other organisations with responsibility for the management of fisheries in which incidental mortality of ACAP species occurs;

(v) the desire to maintain a close working relationship with CCAMLR.

FAO IPOA-Seabirds

146. At the 26th (2005) meeting of FAO COFI 11 members reported on aspects of IPOA-Seabirds implementation. Reports ranged from implementation under way (Japan (which submitted a revised NPOA-Seabirds), New Zealand and the USA), NPOAs near completion (Brazil, Chile, Namibia and South Africa), IPOA-Seabird relevant activity (Australia, Canada, Peru and Uruguay) and two assessments (Mexico, El Salvador) which had concluded that an NPOA-Seabirds was unnecessary.

147. WG-FSA-05/38 reported on further substantial progress in the development of the Chilean NPOA with the completion of the second (of three) steps, involving development and testing of mitigation measures for each longline fishery (Patagonian toothfish, austral hake and swordfish) operating in the Chilean EEZ. For Patagonian toothfish the mitigation specifications include using streamer lines on all sets, weights of 8.5 kg every 40 m on the motherline and a setting speed of 6.5 knots. Further tests on the line-weighting specification and of paired streamer lines are also planned. The hake (and ling) fishery will only set at night and trials of streamer lines and line weighting are planned. The swordfish fishery will set at night, use a streamer line (≥100 m) and use 60 g weights at the swivel (sink rates of ≥0.23 m/s). Further tests of streamer lines and of interactions between line weighting and setting speed are proposed.

148. The main aim of the Chilean NPOA is to reduce, by 90% over three years, the rate and level of incidental mortality of seabirds observed in 2002. Analysis of data from 2004/05 suggests a 72% reduction but indicates that by-catch rates for black-browed albatross, of 0.113 birds/thousand hooks observed in 2004/05, suggest that further improvements in design and use of mitigation measures are needed to reduce this level to the nominal target of 0.05 birds/thousand hooks.

149. Ms Neves noted that the Brazilian NPOA-Seabirds (see SC-CAMLR-XXIII, Annex 5, paragraph 7.161) is about to be published; this version will incorporate some revision to statistics that have changed during the period in press.

Other international organisations and initiatives,
including non-governmental organisations

150. Ms K. Rivera (USA) introduced WG-FSA-05/45 reporting on a workshop held in November 2004 at the Fourth International Fisheries Observer Conference, to facilitate research and analysis of factors influencing by-catch of marine mammals, sea turtles and seabirds in longline fisheries, including by recommending the best practice in respect of data collection.

151. The Working Group noted that CCAMLR already requires the provision of the data recommended by the workshop. Nevertheless the recommendations would represent very valuable advice to RFMOs generally and the authors were encouraged to facilitate submission of the documentation and recommendations to all relevant RFMOs, especially those with areas of application adjacent to the Convention Area.

152. Dr Waugh presented WG-FSA-05/47 which reported on an initiative to provide training exchanges in seabird mitigation. The aim was to provide a placement for a fisher from a Latin-American country on board a vessel, with a proven record of seabird-friendly fishing techniques, in the New Zealand demersal longline ling fishery. The report of the selected fishing captain, Luis Uribe from Chile, indicated the benefit of the experience and contained important recommendations for informing other fishers of how to implement cost-effective techniques for reducing seabird by-catch.

153. The Working Group commended the New Zealand and USA sponsors of this initiative which had provided valuable insight into how to transmit conservation messages across language and cultural barriers. The Working Group would be interested to learn of any longer-term benefits within Chilean and Latin-American fishing constituencies.

154. Dr Sullivan informed the Working Group of a BirdLife International workshop held in Hobart, Australia, in October 2005 to develop an implementation plan for an international initiative (Operation Ocean Task Force) to work at sea and in onshore workshops to undertake mitigation research and collect baseline by-catch data, where required, and to assist fishers in the correct use of a range of mitigation measures available to reduce seabird mortality in longline and trawl fisheries. Many of the fisheries to be targeted in southern Africa and South America have incidental mortality of seabirds that breed in the Convention Area.

RFMOs, tuna commissions and international governmental organisations

155. The Working Group noted the review and analysis by BirdLife International (WG-FSA-05/P9), conducted during 2004 and launched at the FAO COFI meeting in March 2005, of the duties and performance of 14 RFMOs in reducing by-catch of albatross and other species. The evaluation criteria were based on the principles established in the Code of Conduct for Responsible Fisheries and the United Nations Fish Stock Agreement. Of the five RFMOs most important in terms of overlap with albatross distribution (in order of priority CCSBT, WCPFC, IOTC, ICCAT and CCAMLR), CCAMLR scored the most highly in almost every category (participation and transparency; target fish data and assessment; target fish management and status; combatting IUU fishing; commitment to reducing by-catch; by-catch data collection and by-catch mitigation).

156. The Working Group appreciated the value and importance of this independent external review and the testimony it provided to the effective, extensive and pioneering work of CCAMLR. The low performance levels of other RFMOs, especially the three tuna commissions, reinforced the concerns expressed by CCAMLR in recent years.

157. The Working Group recollected that for several years the Commission had strongly supported collaboration with those RFMOs with responsibilities for areas adjacent to the Convention Area where seabirds from the Convention Area, are, or may be, killed, in order to promote the adoption by these RFMOs of appropriate mitigation measures for the fisheries actually or potentially involved (e.g. CCAMLR-XXII, paragraph 5.17). The Working Group recollected its earlier advice, endorsed by the Commission, that the greatest threats confronting the conservation at sea of albatrosses and petrels breeding in the Convention Area are the levels of mortality likely to be associated with IUU longline fishing inside the Convention Area, and with longline fishing for species other than *Dissostichus* in areas adjacent to the Convention Area (CCAMLR-XX, paragraph 6.33; CCAMLR-XXIII, paragraph 5.22).

158. Last year, as a result of continuing failure to establish constructive dialogue with the main RFMOs responsible for regulating longline fishing (and associated by-catch of non-target species including seabirds) in areas adjacent to the Convention Area (CCAMLR-XXIII, paragraphs 5.26 to 5.29), the Commission adopted Resolution 22/XXIII:

(i) requesting the relevant RFMOs to implement and develop mechanisms for collecting, reporting and disseminating data on seabird incidental mortality;

(ii) urging CCAMLR Members also members of relevant RFMOs[1] (and especially new and developing ones) to ensure that the topic of seabird incidental mortality is placed on the agendas of the pertinent RFMO meetings, that areas of unknown or potential by-catch and the most effective mitigation measures to be used in these areas and circumstances are identified and that appropriate observer programs are in place to provide sufficient data for evaluation purposes.

159. To date (and since 18 November 2004) responses to the CCAMLR resolution and the accompanying letter from the Chair of the Commission have been received from CCSBT, IATTC and ICCAT.

160. However, it was noted that appreciable initial progress had been made intersessionally in terms of communication on by-catch (including seabird) issues with RFMOs (see paragraph 179).

161. Thus IOTC had now established a by-catch subgroup, the inaugural meeting of which had been attended by BirdLife International, presenting a paper on known and potential seabird–fishery interactions. IOTC had welcomed this input and further presentations, including advice on mitigation measures, were scheduled for the next meeting.

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[1] CCSBT: Australia, Japan, Republic of Korea and New Zealand.
WCPFC: Australia, European Community, France, Japan, Republic of Korea and New Zealand; USA as a Signatory; UK as a Participating non-member.
IOTC: Australia, European Community, France, India, Japan, Republic of Korea and the UK; South Africa as a Cooperating non-member.
ICCAT: Brazil, European Community, France, Japan, Republic of Korea, Namibia, Norway, Russia, South Africa, UK and the USA.
IATTC: France, Japan, Spain and the USA; European Community and the Republic of Korea as Cooperating non-members.

162. Similarly, for the recent meeting (October 2005) of ICCAT's by-catch subcommittee, BirdLife International tabled a paper on overlap of albatrosses and petrels with ICCAT longline fishing effort. About 10% (30–40 million hooks) of ICCAT's annual longline fishing effort overlaps albatross habitat, being greatest in the second and third quarters of the year and mainly involving Taiwanese and Japanese vessels.

163. In respect of ICCAT's resolution (of 2002), requesting members to provide its by-catch subcommittee with data to assess the impact of incidental catches of seabirds, proposals had been made to hold a workshop on this topic.

164. The response from ICCAT to the CCAMLR letter and Resolution 22/XXIII included a summary of fishing effort data south of 40°S in 2000–2002 which indicated that the main fleets involved are those of Taiwan (for albacore) and Taiwan and Spain (for swordfish).

165. In respect of WCPFC, Mr N. Smith (New Zealand) reported progress by this newly formed Commission on matters relating to the incidental mortality of seabirds. The WCPFC held its inaugural Commission meeting in December 2004. At that meeting the Commission directed its scientific experts to prepare estimates of the mortality of non-target species with an initial focus on seabirds, sea turtles and sharks.

166. In response, at its first Scientific Committee meeting in August 2005, the WCPFC established an Ecosystem and By-catch Specialist Working Group (EB-SWG). At its first meeting during August 2005 the EB-SWG considered two papers of interest to WG-IMAF:

(i) a paper, compiled by the Secretariat of the Pacific Community Oceanic Fisheries Programme, containing estimates of the incidental mortality of seabirds in the WCPFC Convention Area based on observer data;

(ii) a paper, compiled by Birdlife International, describing the distribution of albatrosses and petrels in the Western and Central Pacific and potential overlap with WCPFC longline fisheries.

167. The key recommendations resulting from the review of these papers by the EB-SWG and WCPFC Scientific Committee were that:

(i) current levels of observer data were inadequate to produce reliable estimates of incidental mortality of seabirds in the WCPFC Convention Area. Accordingly it would be necessary to implement higher levels of observer coverage, especially in longline fisheries in the more temperate waters of the WCPFC Convention Area, to allow reliable estimates of seabird incidental mortality to be made in future;

(ii) an ecological risk analysis should be conducted in order to prioritise species of sea turtles, sharks and seabirds and non-target fish species for future research.

The WCPFC Commission will consider these recommendations at its next meeting in December 2005.

168. In respect of CCSBT, the Working Group noted that the report and tabled papers from the Fifth Meeting of the ERS WG (February 2004 in New Zealand) had been approved by the CCSBT Commission and made available to CCAMLR.

169. The Working Group thanked CCSBT for this and noted that the papers contained valuable data on the timing, area and extent of fishing effort and estimates (from reports by national observers) of seabird by-catch and on the nature of mitigation methods currently in use.

170. The annual report from the Republic of Korea indicated that no data on seabird by-catch were reported and that there were no mandatory mitigation measures in use, though some vessels voluntarily used streamer lines. Some educational materials with respect to mitigation of by-catch of seabirds and sea turtles were in development.

171. The report from Chinese Taipei indicated that there is currently no reporting of seabird by-catch data, but that use of streamer lines is mandatory on all vessels fishing for southern bluefin tuna south of 30°S. The report also noted the workshop convened jointly with BirdLife International on seabird by-catch and mitigation which was reported to CCAMLR last year (SC-CAMLR-XXIII, Annex 5, paragraph 7.176).

172. The reports from Japan were particularly commended for the provision of data on effort and by-catch and on extensive research to investigate the utility of various mitigation measures, especially dyed bait. The Japanese reports indicated that:

(i) use of streamer lines (which may vary in design and detail of use) is mandatory on all vessels fishing for southern bluefin tuna south of 30°S;

(ii) all vessels use thawed bait and bait-casting machines;

(iii) virtually all vessels experience incidental mortality of seabirds;

(iv) enforcement of compliance with mitigation measures involved enforcement vessels observing 637 fishing operations on 31 vessels in 2002;

(v) observer coverage in 2001 and 2002 was 5.7–6.8% of cruises, 3.6–3.7% of sets and 2.9–3.2% of hauls.

173. The analysis of the level and rate of seabird by-catch indicates that in 2001 and 2002 respectively the estimated total seabird by-catch levels and rates were 6 516 (95% CI 3 376–10 378) birds (with an average rate of 0.139 birds/thousand hooks) and 6 869 (95% CI 3 811–10 213) birds (with an average rate of 0.181 birds/thousand hooks). The report suggested that the levels of by-catch have been broadly stable since 1995 at 6 000–9 000 birds per year with the estimated value of c. 14 000 birds in 2000 probably due to sampling error. Catch rates have varied by season and area and ranged from 0.026 to 0.312 birds/thousand hooks. The main areas fished in 2001 and 2002 were south of 40°S off South Africa (mainly in quarters 2 and 3), south of 40°S east of Australia (mainly in quarter 2) and from 25°S to 45°S west and southwest of Australia (mainly quarters 3 and 4). Seabird by-catch composition, based on a sample of 467 birds from 2001 and 2002 combined, comprised 74.1% albatrosses (amongst those identified to species (n = 281), 45.2% grey-headed albatross, 20.6% black-browed albatross, 10.0% shy albatross, 4.3% wandering albatross), 7.8% giant petrel and 13.7% smaller petrels (at least 50% of which were *Procellaria* species).

174. The Working Group expressed concern at the levels and rates of seabird (especially albatross) by-catch in the CCSBT fisheries. Given the low level of observer coverage, and that reports derived from birds brought on board vessels underestimate (sometimes substantially so) the number of birds actually killed, it is perfectly conceivable that if up to at least 9 000 seabirds are killed annually, this could represent 6 670 albatrosses (including c. 3 000 grey-headed albatrosses and 1 370 black-browed albatrosses), 690 giant petrels and at least 600 *Procellaria* petrels. Most of these birds are likely to be from populations breeding in the Convention Area.

175. Noting that the Japanese southern bluefin tuna fleet probably represents about two-thirds of the longline fishing effort in the overall CCSBT fishery, the total annual mortality of seabirds could approach, or even exceed, 13 500 seabirds including about 10 000 albatrosses.

176. The Working Group, while acknowledging the very approximate nature of these estimates and the substantial extrapolations involved, viewed these numbers with substantial concern. It re-emphasised the need for effective mitigation of seabird by-catch, not simply confined to the mandatory use of streamer lines but involving some combination of improved line weighting, night setting and offal management. Evaluation of the effectiveness of the improved mitigation, together with acquiring better estimates of seabird by-catch levels and rates, would require a more extensive and detailed program of data collection by observers.

177. In this context, the Working Group noted that the 26th Session of COFI (March 2005) had expressed strong support for a proposal by Japan that, with FAO technical cooperation, Japan and possibly other sponsors convene a joint meeting of the secretariats of the tuna RFMOs and their members. It had been agreed that the meeting should be held in January or February 2007 in Japan.

178. The Working Group noted that the provisional agenda for the meeting includes reviewing incidental catch-related measures and could be a valuable opportunity to explore implementation of consistent best-practice provisions for collection, analysis and dissemination of by-catch data, together with improved implementation of mitigation measures appropriate to the areas, times and target species involved. Members of CCAMLR, especially those also members of the participating RFMOs, were requested to support a thorough review of by-catch-related initiatives and requirements at this meeting. The Working Group also noted that it would be a valuable opportunity to promote knowledge of CCAMLR's work and concerns in this field.

179. Overall, the Working Group recognised that there had been a considerably enhanced level of interaction with tuna commissions during the last year and thanked all involved, especially Members of CCAMLR and non-governmental organisations for their role and assistance in achieving some progress in furthering the goals of CCAMLR. The importance of moving rapidly to interactive involvement in the collection of appropriate data and the application of appropriate mitigation throughout all relevant fleets was re-emphasised.

Incidental mortality of seabirds in relation to new and exploratory fisheries

Assessment of risk in CCAMLR subareas and divisions

180. As in previous years, the Working Group assessed the numerous proposals for new and exploratory fisheries and the potential for these fisheries to lead to substantial increases in seabird incidental mortality.

181. In order to address these concerns, the Working Group reviewed its assessments for relevant subareas and divisions of the Convention Area in relation to:

(i) timing of fishing seasons
(ii) need to restrict fishing to night time
(iii) magnitude of general potential risk of by-catch of albatrosses and petrels.

182. Comprehensive assessments of the potential risk of interaction between seabirds and longline fisheries for all statistical areas in the Convention Area are carried out each year and have been combined into a background document for use by the Scientific Committee and Commission (SC-CAMLR-XXIV/BG/26).

183. This year new data derived from an analysis of the distribution of albatrosses and petrels in the CCAMLR Convention Area (areas, subareas, divisions and subdivisions), based on data from BirdLife International's Global Procellariiform Tracking Database (WG-FSA-05/75) provided substantial information on the foraging ranges of seabirds that breed within the Convention Area. Additional information on the distribution of black-browed and light-mantled albatrosses from Heard Island was also provided (WG-FSA-05/14). This information was used to update the assessment of potential risk of interactions between seabirds and longline fisheries for Subareas 48.2, 48.4, 88.1 and 88.3 and Division 58.4.2. The revised assessments incorporating new information made available at the meeting (with changes/additions underlined) have been issued as SC-CAMLR-XXIV/BG/26.

New and exploratory longline fisheries operational in 2004/05

184. Of the 35 proposals last year for new and exploratory longline fisheries in seven subareas and divisions, only 25 were actually undertaken: by Japan and the Republic of Korea in Subarea 48.6; Chile, Republic of Korea, New Zealand and Spain in Division 58.4.1; Chile, Republic of Korea, New Zealand and Spain in Division 58.4.2; by Australia, Republic of Korea and Spain in Division 58.4.3a; by Chile, Republic of Korea and Spain in Division 58.4.3b; by Argentina, New Zealand, Norway, Russia, UK and Uruguay in Subarea 88.1; and by New Zealand, Norway and Russia in Subarea 88.2.

185. No seabird by-catch was reported to have been observed in fisheries in Subareas 48.6, 88.1 and 88.2, and Divisions 58.4.2, 58.4.3a and 58.4.3b. Two seabird mortalities and another bird released alive were observed caught on one vessel during day sets in Division 58.4.1. All birds were southern giant petrels. Clearly, the strict adherence in Subareas 48.6, 88.1 and 88.2, and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b to the specific requirements set out in Conservation Measures 24-02 and 25-02 with respect to line-weighting regimes, combined with fishing in areas of average-to-low and average risk, has proven successful in achieving zero or extremely low incidental by-catch of seabirds.

New and exploratory longline fisheries proposed for 2005/06

186. Following the annual review of the actual levels of risk adopted last year in SC-CAMLR-XXIII/BG/21, the Working Group suggested the following changes:

Subarea/Division	Current level of risk	Proposed level of risk
48.2	Average (3)	Average to high (4)
48.4	Low (1)	Average (3)
58.4.2	Average (3)	Average to low (2)
88.1 Overall risk No change	Average (3)	Average (3)
88.1 Northern sector No change	Average (3)	Average (3)
88.1 Southern sector	Average to low (2)	Low (1)
88.3	Low (1)	Average to low (2)

187. The assessment of the risk to seabirds posed by new and exploratory longline fisheries in the Convention Area is incorporated into the revised assessment SC-CAMLR-XXIV/BG/26 (an update of SC-CAMLR-XXIII/BG/21) and summarised in Figure 1 and Table 19, and also includes an assessment of recommended levels of observer coverage.

188. Thirty-nine applications for exploratory longline fisheries, submitted by 12 countries, were received by CCAMLR in 2005. No applications for new longline fisheries were received. The areas for which these proposals were received were:

Subarea 48.6	Japan, New Zealand
Division 58.4.1	Australia, Republic of Korea, New Zealand, Spain, Russia, Uruguay
Division 58.4.2	Australia, Chile, Republic of Korea, New Zealand, Spain
Division 58.4.3a	Australia, Chile, Republic of Korea, Spain
Division 58.4.3b	Australia, Chile, Republic of Korea, Spain, Uruguay
Subarea 88.1	Argentina, Republic of Korea, New Zealand, Norway, Russia, South Africa, Spain, UK, Uruguay
Subarea 88.2	Argentina, Republic of Korea, New Zealand, Norway, Russia, Spain, UK, Uruguay.

189. All the areas listed above were assessed in relation to the risk of seabird incidental mortality according to the approach and criteria set out in SC-CAMLR-XXIV/BG/26. A summary of risk level, risk assessment, the Working Group's recommendations relating to mitigation measures, including fishing season and any inconsistencies between these and the proposals for new and exploratory longline fisheries in 2005, is set out in Table 20.

190. Applications fell into two categories:

(i) Those that provided sufficient information to indicate that the proposals fully comply with relevant seabird by-catch minimisation conservation measures (Conservation Measures 24-02 and 25-02, and the relevant measures in the 41-series) and do not conflict with the IMAF assessment. Applications submitted by Australia (CCAMLR-XXIV/17, 18, 19, 20), Chile (CCAMLR-XXIV/25, 26),

Japan (CCAMLR-XXIV/10), New Zealand (CCAMLR-XXIV/13, 14, 15), South Africa (CCAMLR-XXIV/16), Spain (CCAMLR-XXIV/9) and the UK (CCAMLR-XXIV/21) were assessed as being fully compliant.

(ii) Those that contain insufficient information to be certain that the proposals fully comply with relevant seabird by-catch minimisation conservation measures, but which express sufficient sentiment to indicate that this is the intention. Applications by Argentina (CCAMLR-XXIV/12), Chile (CCAMLR-XXIV/27, 28), Republic of Korea (CCAMLR-XXIV/22), Norway (CCAMLR-XXIV/11), Russia (CCAMLR-XXIV/31) and Uruguay (CCAMLR-XXIV/23, 24, 29, 30) fall into this category.

191. Applications in the second category usually state intent to comply with relevant conservation measures but then indicate elsewhere that their fishing plans do not comply. Typical examples include:

(i) fishing seasons simply stated as '2005/06', and not acknowledging that seasonal restrictions apply to some of the divisions and subareas;

(ii) stating an intent to fish outside fishing seasons without seeking a derogation by meeting the line sink rate requirements prescribed in Conservation Measure 24-02;

(iii) stating an intent to fish during the day without seeking a derogation from paragraph 4 of Conservation Measure 25-02 through implementation of the provisions of Conservation Measure 24-02.

192. In cases where Members were intending to fish using multiple vessels operated by more than one company, there were inconsistencies in the level of information provided within subareas or divisions, and hence the level of compliance with relevant seabird by-catch minimisation conservation measures, provided in the applications. Members were requested to take greater care in future submissions to ensure the intent to comply with relevant seabird by-catch measures was clear.

193. Members who have submitted applications falling into the second category should be requested to confirm with the Secretariat that their proposals fully comply with relevant seabird by-catch minimisation conservation measures and do not conflict with the IMAF assessment for the subareas and divisions in which they wish to fish. To assist in this for this year and submissions in future years, a checklist was developed by the Working Group. Members are requested to advise that their applications:

(i) comply with the requirements of Conservation Measure 25-02 in order to minimise seabird by-catch;

(ii) comply fully with measures specified in Conservation Measure 24-02 if an exemption is sought from setting longlines at night, or fish outside specified fishing seasons (if applicable);

(iii) comply fully with measures specified in Conservation Measures 41-04, 41-05, 41-06, 41-07, 41-09, 41-10 and 41-11 (as applicable to the relevant subarea or division) if specified seabird by-catch levels are reached when fishing during daytime setting and/or fishing outside normal fishing seasons.

194. Setting of longlines within the Convention Area during daylight hours or outside normal fishing seasons using currently approved fishing gear still represents a risk for seabirds, even in areas of low to average risk. In all instances where the provisions of Conservation Measure 24-02 are applied, there remains the need for continued review of performance with respect to incidental mortality of seabirds during fishing operations. The Working Group recommended that any vessel operating under the provisions of this conservation measure, and which catches a total of three (3) seabirds, as defined in SC-CAMLR-XXII, Annex 5, paragraphs 6.214 to 6.217, shall revert to night setting in accordance with Conservation Measure 25-02. Similar provisions were specified in previous years.

195. With respect to the prescription of a seabird by-catch level, the Working Group noted the successful implementation of the definition of the status of birds 'caught' (SC-CAMLR-XXII, Annex 5, paragraph 6.214 to 6.217). The Working Group recommended the continued use of the definition and requested feedback from scientific observers on the ability to apply this definition whilst at sea.

Other incidental mortality

Interactions involving marine mammals with longline fishing operations

196. WG-FSA-05/7 Rev. 1 indicated that three southern elephant seal mortalities were observed on the *Avro Chieftain*. While fishing in Division 58.5.2, one was caught by a hook in the mouth and another fell off the line prior to reaching the surface and was of unknown life status. The third was entangled in a longline in Division 58.4.3a.

197. WG-FSA 05/9 Rev. 2 reported that two Antarctic fur seals became entangled in a longline on the vessel *Viking Bay* in Subarea 48.3; both were released alive.

198. WG-FSA-05/11 reviewed interactions between cetaceans and longline fishing operations. The most frequent types of interactions were of sperm whales and killer whales taking fish from lines; there were only two occurrences of incidental mortality of cetaceans reported: one dolphin and one small whale; both unidentified.

199. The interactions between toothed whales and longline vessels appear to present a very limited risk of incidental mortality of cetaceans, perhaps because sperm and killer whales are capable of breaking longlines.

200. However, the Working Group noted that the loss of fish and gear as a result of interactions with cetaceans may have two implications:

(i) the risk to cetaceans from entanglement in broken sections of longlines;

(ii) the number of hooks that enter the water may increase to compensate for reduced catches and therefore increase the risk to non-target species.

Interactions involving seabirds with trawl fishing operations

Finfish

201. In 2005, 11 bird mortalities (9 black-browed albatrosses, 1 white-chinned petrel and 1 southern giant petrel) were reported in the Subarea 48.3 icefish fishery from four vessels; in addition, 14 birds were released alive, uninjured (Table 16). This compares to 87 bird mortalities (and 132 released alive) in 2004 and 36 bird mortalities (and 15 released alive) in 2003. The rate of mortalities for this subarea in 2005 was 0.04, compared to the 0.37 and 0.20 birds per tow recorded in 2004 and 2003 respectively (Table 17).

202. In 2005, eight bird mortalities were observed in the icefish/toothfish fishery in Division 58.5.2 from two vessels (5 black-browed albatrosses and 3 white-chinned petrels (Table 16)). The capture rate in this division was 0.01, compared to zero in 2004 and 0.005 birds per tow in 2003.

203. Mr B. Baker (Australia) reported that a further five bird mortalities had occurred in the icefish/toothfish trawl fishery in Division 58.5.2 (2 black-browed albatrosses and 3 white-chinned petrels). These were reported to the observer by the vessel crew and hence have not been included in the capture totals. The Working Group noted that the substantial increase in black-browed albatross mortalities in this division was a concern, given the proximity of the small population of this species at Heard Island, and its vulnerability to population decrease through fisheries mortalities (WG-FSA-05/14).

204. The Working Group noted that the reduction in seabird mortality in the icefish fishery in Subarea 48.3 could be due to a combination of a reduced seabird abundance, associated with the reduction in icefish catches, and the continued adoption of mitigation measures. Information from the description of mitigation measures from the reports of scientific observers indicated that in addition to streamer lines, the *Insung Ho* and the *Betanzos* also used a Brady Baffler and the *Dongsan Ho* also used a water cannon.

205. The Working Group also noted that there was a reduced level of reporting by observers on the effort of crews to thoroughly clean the net before shooting operations; changes should be made to the Cruise Report Forms to improve this situation.

206. There were two new trawl mitigation measures trialled in the 2005 season that showed potential to reduce seabird entanglements. A system of net binding (paragraph 207) was used on the *Sil* and *Robin M Lee* to reduce entanglements and mortality that occur during shooting operations, and the *Argos Vigo* used a free floating panel attached over the top of the net to cover mesh sizes ranging from 135 to 400 mm. There were insufficient data to determine the effectiveness of these methods but it was noted that both methods had potential to further reduce seabird mortality in the fishery.

207. WG-FSA-05/59 reported on the trials of the effectiveness of net binding, streamer lines and net modifications to reduce seabird interactions with trawl nets in the *Champsocephalus gunnari* fishery in Subarea 48.3:

(i) The use of 3–ply sisal string with a breaking strength of 110 kg to bind the net prior to setting prevented the net from spreading and lofting at the surface and increased the net sink rate; the string broke when the trawl doors were paid away.

(ii) Streamer lines failed to protect the net during the haul as tension could not be maintained in the lines to keep them aloft as the vessel slowed, stopped or went in reverse during hauling.

(iii) Reducing mesh size from 200 to 140 mm in an effort to reduce seabird interactions with the net and adding chains to each side of the body of the net to sink the net more quickly caused damage to the net.

208. The Working Group noted that binding the net with sisal string is potentially highly effective, easily accomplished and should be easily implemented as a mitigation measure by the icefish trawl fleet.

Krill

209. In krill fisheries in 2005 in Subareas 48.2 and 48.3 only one incidental mortality of a Cape petrel was recorded; one Antarctic fulmar was caught on a warp splice and released uninjured. The rate of capture was 0.003 birds per tow in Subarea 48.2. Information from the report of a scientific observer from the krill fishery in Subarea 48.3 included anecdotal records of collisions with trawl warps during hauling; collisions generally appeared to be light.

General

210. The Working Group noted that currently there appeared to be a relatively limited level of offal discharge in the trawl fisheries in the Convention Area; however, observer reports indicated that more information is required to assess the extent and timing of offal discharge and the potential interactions with seabirds.

211. The Working Group recalled (WG-FSA-04/79) that observations of trawl warp strike rates require dedicated observer effort with an appropriate level of coverage, given the high level of within- and between-tow variance, to accurately estimate seabird interactions and mortality. In order to better understand the interactions between seabirds and vessels in relation to discharge when the trawl warps are in the water, i.e. in addition to the times of setting and hauling, the following forms should be included in the observer cruise report:

(i) deck discards – including all discarded fish and associated waste discarded from the deck during all trawling operations;

(ii) factory discharge – all materials discarded from the factory during all trawling operations.

212. During the intersessional period the Working Group will develop data collection protocols for the investigation of interactions between seabirds and trawl warps for consideration by WG-IMAF in 2006.

213. Pilot trials to test a range of mitigation measures to reduce seabird strikes on warp cables and net sonde cables in the Bering Sea pollock trawl fishery identified several promising methods. A boom with straps hanging to the water placed in the offal stream forward of the warps was considered to have potential at reducing warp cable strikes. Paired streamer lines were also identified as potentially reducing strikes with warp cables (as reported in WG-FSA-04/79 outside the Convention Area in the South Atlantic). Streamer lines were also effective at reducing contacts with the net sonde cable, as was a snatch block system that lowered the exit point of the netsonde cable to the trawl deck level. Trials are planned to further test these methods.

214. Detailed data collection protocols designed to monitor seabird interactions with both the warps and net developed for the New Zealand southern squid trawl fishery (WG-FSA-05/41) were tested using data collected in the summer of 2004/05 (WG-FSA-05/40). It was noted that of the 106 dead or injured birds recorded during the trials, approximately half occurred on the warp cable and half were due to net entanglements. Data modelling identified the presence and rate of offal discharge as the primary factor related to warp cable strikes.

215. The Working Group recommended that at future meetings, assessments of incidental mortality of seabirds and marine mammals in the icefish, toothfish and krill trawl fisheries be undertaken collectively as part of a generic review of the trawl methodology for mitigation purposes. This approach, assessing the gear rather than the target fishery, has been useful in the development of mitigation methods in longline fisheries. Fishery-specific and species-specific attributes would be considered when appropriate.

Interactions involving marine mammals and trawl fishing operations

Toothfish

216. There was a single Antarctic fur seal caught and released alive in the toothfish trawl fishery in Division 58.5.2.

Krill

217. In 2004/05, 95 Antarctic fur seals were observed caught during krill fishing operations in Area 48, of which 74 were released alive (WG-FSA-05/8, Table 4) compared to 156 of which 12 were released alive last year (SC-CAMLR-XXIII, Annex 5, paragraph 7.229). The observer coverage was not sufficient to extrapolate a total mortality in the fishery.

218. The Working Group recalled that in considering this subject last year it was unable to recommend a particular source of mitigation (SC-CAMLR-XXIII, Annex 5, paragraph 7.243) and welcomed the paper by Hooper et al. (2005) in which various seal-exclusion devices, with information regarding their success, were described.

219. Information from observer reports with details of the mitigation methods used in 2004/05 were available from three vessels:

(i) the *Insung Ho* used a net bag at the opening of the net that was designed to prevent entry into the net (as described in Hooper et al., 2005). This vessel caught 69 seals of which 64 were released alive;

(ii) the *Top Ocean* used a seal excluder device that consisted of a mesh panel sewed diagonally inside the posterior intermediate sections of the trawl nets intended to conduct pinnipeds upward toward one of three approximately 75 cm diameter oval holes cut into the top of the net. However, the manner in which seals were entangled, in both the excluder panel and side meshes of the intermediate net (usually with their heads forced through the mesh or their snouts and flippers entangled), suggested that the holes at the top of the net may not have been apparent to the seals. There were 24 Antarctic fur seal captures reported from this vessel, of which 16 were dead;

(iii) the *Niitaka Maru* implemented the MARUHA system (SC-CAMLR-XXIII, Annex 5, paragraph 7.239), although the report of the observer indicated that the opening in the roof of the net was smaller than described last year. There were two fur seals caught and released alive on this vessel.

220. The observer report from the *Foros* indicated that it did not implement any specific mitigation measures and no Antarctic fur seal mortality was reported. However, the observer pointed out that it was not possible to observe the codend emptying process and therefore the recording of seal mortality is likely to have been compromised.

221. The Working Group discussed the information on the mitigation devices used in the fishery this year, and acknowledged that, as last year, there was insufficient information available with which to evaluate the relative design and efficacy of different seal mitigation systems.

222. The Working Group recalled that, given the increasing evidence of seal entrapment in krill fisheries and the apparent efficacy of some of the seal exclusion methods tested last year, the Scientific Committee last year recommended that:

(i) every vessel fishing for krill should employ a device for excluding seals or facilitating their escape from the trawl net;

(ii) observers should be required on krill trawl vessels to collect reliable data on seal entrapment and on the effectiveness of devices used to mitigate this (SC-CAMLR-XXIII, paragraph 5.37).

223. In 2004/05 observer reports were received from four of the nine vessels fishing for krill in Area 48. Observer data from the *Top Ocean* (USA) covered 100% of its fishing period predominantly in Subarea 48.2. The reports from UK observers on the other three vessels were from the period of time that those vessels were fishing in Subarea 48.3 and covered a smaller proportion of their overall time fishing in Area 48 (*Insung Ho* 23%, *Niitaka Maru* 17% and *Foros* 16%).

224. Based on the experience of WG-IMAF in addressing the design and implementation of mitigation measures for the reduction of incidental mortality of seabirds in longline fisheries, concern was expressed that the current level of observer coverage is likely to be insufficient to allow resolution of seal entanglement problems. In addition, the Working Group felt that, given this low level of observer coverage, it is not feasible to estimate the total Antarctic fur seal mortality in the krill fishery.

225. The Working Group reiterated the recommendations made by the Scientific Committee last year, in particular for observers on krill vessels to collect reliable data on seal entrapment and on the effectiveness of devices to mitigate this (SC-CAMLR-XXIII, paragraph 5.37), which should allow a very substantial resolution of the problem. A minimum requirement would be to have observations from each vessel in the fishery in order to assess the type and efficacy of the mitigation measures employed on a vessel-by-vessel basis. This would also enable provision of information on the rate of seabird trawl warp strikes by birds in this fishery (see paragraph 209).

226. The Working Group recommended 100% observer coverage on krill trawl vessels to obtain reliable data on seal entrapment and on the effectiveness of associated mitigation devices.

227. In circumstances where a short-term solution to the current problem is not available, the Working Group considered potential criteria relevant to developing solutions in the future based on experience with sea lion mitigation in New Zealand (WG-FSA-05/48). The Working Group noted that attempts to develop seal mitigation devices for use in trawl fisheries should consider the following points or issues:

(i) any mitigation device should be tested, preferably in a flume tank, to ensure that it does not adversely affect the dynamics of the net during deployment, tow and retrieval, i.e. that the system is implementable;

(ii) the device must be easy to use and must comply with all applicable health and safety standards in order to achieve operator buy-in;

(iii) the excluder device must not have a significant adverse effect on the quantity and quality of the target species;

(iv) the device must be shown to successfully expel the non-target species;

(v) animals that are directed out of the net through the device must be shown to survive, i.e. the device must have a negligible effect on survivability.

228. Without successfully addressing the first three points, it is unlikely that the fishing industry will fully implement the exclusion device. Without addressing the last two points, there is no way to demonstrate post-release survivability, i.e. the efficacy of the device to release non-target species safely and efficiently.

229. In the present circumstances however, the Working Group recognised that the effectiveness of existing measures could be adequately assessed if sufficient data and reports from observers were available. Devices currently in use in the krill fishery already appear to

be implementable, safe and without discernable effect on the target species. More data are needed on exclusion/expulsion of non-target species, together with information on potential survivorship of ejected animals.

230. While welcoming consideration of principles derived from experience with sea lions in New Zealand, the Working Group:

(i) observed that the species involved is classified as globally threatened, unlike Antarctic fur seals;

(ii) noted that within an overall goal of eliminating non-target by-catch, the management actions involved should be consistent with the level of risk to populations and species concerned. It recollected the discussion on the topic last year (SC-CAMLR-XXIII, paragraphs 5.25 to 5.33).

Other business

Proposal for testing new streamer line designs

231. The Working Group reviewed SC-CAMLR-XXIV/8. In doing so it recognised that comments were necessary in respect of:

(i) procedures involving the role and responsibilities of observers;

(ii) procedures for proposals to test mitigation measures which would require exemption from some element of existing conservation measures;

(iii) the details of the proposal itself.

232. The Working Group expressed concern that this proposal had arisen from circumstances wherein the observer had given a fishing master 'permission to trial [a] vessel streamer line' which did not meet the specification of the conservation measure, despite the fact that streamer lines complying with the CCAMLR specification were on board.

233. The Working Group recollected the long history of development of streamer line design and application and the very extensive review in 2003 that had led to the latest revision of the specifications for streamer line design and use.

234. In regard to proposals to test new mitigation methods (or modifications thereof) it recollected that up to 2002 the relevant conservation measure (e.g. 25-02 (2002)) contained a clause specifying that 'other variations in the design of streamer lines may be tested on vessels carrying two observers' and that 'testing should be carried out independently of actual commercial fishing'.

235. When the conservation measure was comprehensively revised in 2003 this clause was no longer included and this may have led to some confusion. The Working Group recommended that further testing of modifications to mitigation methods which would require exemption from the provisions of current conservation measures should require prior

provision to CCAMLR of full details of the proposed research and experiments, as had been done in relation to line-weighting experiments. The Working Group therefore recommended that, to avoid any further confusion, the Scientific Committee confirm that:

(i) the role of scientific observers does not include the ability to agree to fishing-related practices that are in contravention of CCAMLR conservation measures without relevant prior exemptions having been agreed by CCAMLR;

(ii) full proposals for any such testing shall be notified to WG-FSA in advance of the fishing season in which the trials are proposed to be conducted.

236. In respect of the specific proposal in SC-CAMLR-XXIV/8, the Working Group noted that:

(i) it was not feasible or appropriate for the Working Group to devise specific experimental protocols for applicants;

(ii) it was prepared to comment on the content and design of experiments proposed by applicants provided these were available two weeks in advance of the start of the meeting so that there was sufficient time for appropriate expert consultation;

(iii) consequently it was not recommended that a test of the streamer line designs outlined in Annex 1 of SC-CAMLR-XXIV/8 should proceed in the 2005/06 fishing season.

237. The Working Group further noted, in respect of the proposed streamer line designs, that:

(i) the existing conservation measure would allow the use of the colours, number and spacing of streamers being proposed for testing;

(ii) the absence of swivels would certainly lead to the operational problems described. In areas and times of higher risk of seabird by-catch than at the time of year when the design had been used, mitigation performance would likely be substantially reduced;

(iii) an important objective of Conservation Measure 25-02 is to ensure optimal aerial coverage, and a line only half the length of that currently recommended would likely be seriously defective in this regard;

(iv) proper testing of the proposed streamer line designs would need to include circumstances of much higher risk of seabird by-catch than that applying in Subarea 48.3 during the currently approved fishing season in winter months.

238. Accordingly, the applicants were advised to consider carefully whether it was worthwhile seeking to conduct in future appropriate trials of streamer lines of the designs proposed.

Toothfish fishing proposal for Subarea 48.4

239. WG-FSA-05/57 proposed a mark–recapture experiment to estimate toothfish population size in Subarea 48.4 which would involve longline fishing in April.

240. The risk assessment in respect of seabird by-catch for this subarea was revised in 2005 from level 1 to level 3 (SC-CAMLR-XXIV/BG/26 and paragraph 186). The new risk-assessment level would require longline fishing to be prohibited during the breeding season of southern giant petrel (October to March), except when fishing is undertaken under Conservation Measure 24-02. This advice would not appear to conflict with the timing of fishing proposed in the application.

Management Advice

241. Management advice is provided in section 7 of the main text of WG-FSA's report.

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Table 1: Observed incidental mortality of seabirds in the longline fisheries for *Dissostichus* spp. in Subareas 48.3, 48.6, 58.6, 58.7, 88.1, 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b and 58.5.2 during the 2004/05 season, including related mitigation information. Sp – Spanish method; Auto – autoliner; N – night-time setting; D – daytime setting (including nautical dawn and dusk); O – opposite side to hauling; S – same side as hauling; * – information obtained from cruise report.

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			No. of birds observed caught						Observed seabird mortality (includes injured birds)[1] (birds/thousand hooks)			Streamer line in use %		Offal discharge during	
			N	D	Total	%N	Obs.	Set	% observed	Dead		Injured		Uninjured		N	D	Total	N	D	Set (%)	Haul (%)
										N	D	N	D	N	D							
Subarea 48.3																						
Argos Georgia	1/5–28/8/05	Sp	280	0	280	100	451.2	1452.4	31	0	0	1	0	12	0	0.002	0	0.002	100		(0)	O (10)
Isla Santa Clara	10/5–4/8/05	Sp	185	0	185	100	278.2	1145.4	24	0	0	0	0	0	0	0	0	0	100		(0)	O (100)
Jacqueline	2/5–24/8/05	Sp	204	0	204	100	292.2	1406.2	20	0	0	0	0	1	0	0	0	0	100		(1)	O (99)
Koryo Maru No. 11	2/5–16/8/05	Sp	186	0	186	100	399.9	1638.0	24	0	0	0	0	0	0	0	0	0	100		(0)	O (97)
Polarpesca I	13/5–21/8/05	Sp	221	0	221	100	255.1	1262.4	20	0	0	0	0	0	0	0	0	0	100		(0)	O (99)
Protegat	1/5–21/8/05	A	252	6	258	98	937.4	1510.9	62	0	0	3	0	0	0	0	0	0	99.6	100	(0)	O (90)
Viking Bay	1/5–21/8/05	Sp	222	0	222	100	387.5	1224.9	31	0	0	0	0	3	0	0.007	0	0.007	100		(0)	O (83)
Argos Helena	1/5–29/8/05	A	297	0	297	100	451.2	2228.4	28	0	0	0	0	0	0	0	0	0	100		(0)*	S (0)*
Total						99	11868.5	11868.5	31							0.0011	0	0.0011				
Subarea 48.6																						
Shinsei Maru No. 3	23/1–18/3/05	Sp	33	85	118	28	224.3	709.2	31	0	0	0	0	1	1	0	0	0	100	100	(0)*	O (0)*
Total						28	224.3	709.2	31							0	0	0				
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b																						
Arnela	3/12–16/3/05	Sp	11	161	172	6	605.9	1614.9	37	0	0	0	2	0	1	0	0.005	0.005	100	100	(0)	O (65)
Globalpesca II	19/12–2/3/05	Sp	0	90	90	0	647.1	1090.2	59	0	0	0	0	0	0	0	0	0		100	(0)	O (0)
Galaecia	16/12–10/3/05	Sp	5	113	118	4	413.1	1445.9	28	0	0	0	0	0	0	0	0	0	100	100	(0)	O (23)
No. 829 Yeon Seong	20/12–21/2/05	Sp	19	89	108	17	911.7	1191.1	76	0	0	0	0	0	0	0	0	0	100	100	(0)	S (0)
Janas	5/3–29/3/05	Ao	6	40	46	13	127.6	235.6	54	0	0	0	0	0	0	0	0	0	100	100	(0)	(0)
Avro Chieftain	4/9–7/9/05	Ao	10	0	10	100	25.3	67.0	37	0	0	0	0	0	0	0	0	0	100		(0)	O (0)
Galaecia	15/4–6/7/05	Sp	41	72	113	36	979.2	1673.5	58	0	0	0	0	0	0	0	0	0	100	100	(0)	O (100)
No. 707 Bonanza	26/12–10/3/05	Sp	5	105	110	4	986.0	1043.7	94	0	0	0	0	0	0	0	0	0	100	100	(0)	O (0)
Total						26	4695.9	8361.9	56							0	<0.001	<0.001				
Division 58.5.2																						
Avro Chieftain	25/7–1/9/05	A	57	54	111	50	236.0	756.3	31	0	0	0	0	0	0	0	0	0	100	100	(0)	O (0)
Avro Chieftain	10/5–1/7/05	A	-	-	150		350.9	851.5	41	0	0	0	0	0	0	0	0	0	100*	100*	(0)	O (0)
Total							586.9	1607.8	36							0	0	0				
Subareas 58.6, 58.7																						
Koryo Maru No. 11	24/2–1/4/05	Sp	72	0	72	100	336.0	510.0	65	25	0	25	0	2	0	0.149	0	0.149	100		(0)	O (99)
Total						100	336.0	510.0	65							0.149	0	0.149				
Subareas 88.1, 88.2																						
Antartic III	5/12–5/2/05	A	0	168	168	0	415.0	671.2	61	0	0	0	0	0	0	0	0	0		99	(1)	S (1)
Argos Helena	4/12–4/3/05	A	2	160	162	1	202.3	869.1	23	0	0	0	0	0	0	0	0	0	100	100	(0)	(0)
Janas	1/12–6/2/05	A	0	172	172	0	335.6	782.8	42	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Paloma V	27/12–1/3/05	Sp	0	132	132	0	461.5	1184.6	38	0	0	0	0	0	0	0	0	0		98	(0)	(0)
Punta Ballena	14/1–13/3/05	A	0	124	124	0	585.1	747.6	78	0	0	0	0	0	0	0	0	0		100	(0)	(0)
San Aotea II	4/12–14/2/05	A	0	196	196	0	313.2	743.2	42	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Frøyanes	29/12–1/3/05	A	0	191	191	0	251.7	804.1	31	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Volna	18/12–18/3/05	Sp	0	132	132	0	1181.2	1181.2	100	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Yantar	18/12–18/3/05	Sp	-	-	168		474.1	1142.1	41	0	0	0	0	0	0	0	0	0		100*	(0)	(0)
Avro Chieftain	31/12–6/2/05	A	0	83	83	0	143.3	365.1	39	0	0	0	0	0	0	0	0	0		100	(0)	(0)
San Aspiring	25/12–23/2/05	A	2	114	116	1	313.6	647.5	48	0	0	0	0	0	0	0	0	0		100	(0)	(0)
Total							4676.5	9138.4	51							0	0	0				

1 Birds 'caught' as defined by the Commission in 2004 (CCAMLR-XXIII, paragraphs 10.30 and 10.31).

Table 2: Extrapolated incidental mortality of seabirds, for those vessels on which incidental mortalities of seabirds were observed, in Subareas 48.3, 58.6 and 58.7 and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b during the 2004/05 season.

Vessel	Hooks observed (thousands)	Hooks set (thousands)	Percentage of hooks observed	% Night sets	Extrapolated number of incidental seabird mortalities		
					Night	Day	Total
Subarea 48.3							
Argos Georgia	451.2	1 452.4	31	100	4	0	4
Viking Bay	387.5	1 224.9	31	100	9	0	9
Subtotal					13	0	13
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b							
Arnela	605.9	1 614.9	37	6	0	8	8
Subtotal					0	8	8
Subareas 58.6, 58.7							
Koryo Maru No. 11	336.0	510.0	65	100	76	0	76
Subtotal					76	0	76
Total					89	8	97

Table 3: Total extrapolated incidental mortality of seabirds and observed mortality rates (birds/thousand hooks) in longline fisheries in Subareas 48.3, 48.4, 48.6, 58.6, 58.7, 88.1 and 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b and 58.5.2 from 1997 to 2005 (- indicates no fishing occurred).

Subarea	Year								
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Subarea 48.3									
Extrapolated mortality	5 755	640	210*	21	30	27	8	27	13
Observed mortality rate	0.23	0.032	0.013*	0.002	0.002	0.0015	0.0003	0.0015	0.0011
Subarea 48.4									
Extrapolated mortality	-	-	-	-	-	-	-	-	0
Observed mortality rate	-	-	-	-	-	-	-	-	0
Subarea 48.6									
Extrapolated mortality	-	-	-	-	-	-	-	0	0
Observed mortality rate	-	-	-	-	-	-	-	0	0
Subareas 58.6, 58.7									
Extrapolated mortality	834	528	156	516	199	0	7	39	76
Observed mortality rate	0.52	0.194	0.034	0.046	0.018	0	0.003	0.025	0.149
Subareas 88.1, 88.2									
Extrapolated mortality	-	0	0	0	0	0	0	1	0
Observed mortality rate	-	0	0	0	0	0	0	0.0001	0
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b									
Extrapolated mortality	-	-	-	-	-	-	-	0	8
Observed mortality rate	-	-	-	-	-	-	-	0	<0.001
Division 58.5.2									
Extrapolated mortality	-	-	-	-	-	-	0	0	0
Observed mortality rate	-	-	-	-	-	-	0	0	0

* Excluding *Argos Helena* line-weighting experiment cruise.

Table 4: Species composition of seabird mortalities (injured and dead)[1] in longline fisheries in Subareas 48.3, 58.6 and 58.7 and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b, during the 2004/05 season. N – night-time setting; D – daytime setting (including nautical dawn and dusk); DCR – yellow-nosed albatross; DIX – wandering albatross; MAI – southern giant petrel; PRO – white-chinned petrel; () – % composition.

Vessel	Dates of fishing	No. seabird mortalities by group						Species composition (%)			
		Albatrosses		Petrels		Total		DCR	DIX	MAI	PRO
		N	D	N	D	N	D				
Subarea 48.3											
Argos Georgia	1/5–28/8/05	0	0	1	0	1	0			1 (100)	
Viking Bay	1/5–21/8/05	0	0	3	0	3	0			3 (100)	
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b											
Arnela	3/12/04–16/3/05	0	0	0	2	0	2			2 (100)	
Subareas 58.6 and 58.7											
Koryo Maru No. 11	24/2–1/4/05	7	0	43	0	50	0	6 (12)	1 (2)		43 (86)
Total (%)		3	0	8	2	11	2	6 (11)	1 (2)	6 (11)	43 (76)

[1] Birds ‘caught’ as defined by the Commission in 2004 (CCAMLR-XXIII, paragraphs 10.30 and 10.31).

Table 5: Observed incidental mortality, reported by captains, of seabirds in the longline fisheries for *Dissostichus* spp. in Division 58.5.1 during the 2000/01 season (September to August). Sp – Spanish method; Auto – autoliner; N – night-time setting; D – daytime setting (including dawn and dusk); NC – not collected.

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			Hooks baited (%)	No. of birds caught [1]						Reported seabird mortality (birds/1 000 hooks)			Streamer line in use %		Offal discharge during haul (%)
											Dead		Alive		Total							
			N	D	Total	%N	Reported	Set	% Observed		N	D	N	D	N	D	N	D	Total	N	D	
Ship 3	4/10–18/11/00	Auto	83	0	83	100	3 568.9	3 568.9	100	NC	0	0	NC	0	0	0	0.000	0	0.000	NC	0	(0)
Ship 3	26/1–10/2/01	Auto	32	0	32	100	1 241.1	1 241.1	100	NC	294		NC	0	294	0	0.237	0	0.237	NC	0	(0)
Ship 8	21/10–2/12/00	Auto	174	0	174	100	2 234.2	2 234.2	100	NC	0	0	NC	0	0	0	0.000	0	0.000	NC	0	(0)
Ship 8	12/2–18/3/01	Auto	122	0	122	100	1 546.6	1 546.6	100	NC	363	0	NC	0	363	0	0.235	0	0.235	NC	0	(0)
Ship 8	17/4–14/5/01	Auto	61	0	61	100	1 908.4	1 908.4	100	NC	191	0	NC	0	191	0	0.100	0	0.100	NC	0	(0)
Ship 8	15/6–29/6/01	Auto	27	0	27	100	925.2	925.2	100	NC	3	0	NC	0	3	0	0.003	0	0.003	NC	0	(0)
Ship 9	8/10–20/11/00	Sp	34	0	34	100	2 862.6	2 862.6	100	100	458	0	NC	0	458	0	0.160	0	0.160	NC	0	(0)
Ship 9	14/12/00–28/1/01	Sp	42	0	42	100	1 477.5	1 477.5	100	100	47	0	NC	0	47	0	0.032	0	0.032	NC	0	(0)
Ship 9	23/4–2/5/01	Sp	10	0	10	100	381.2	381.2	100	100	0	0	NC	0	0	0	0.000	0	0.000	NC	0	(0)
Ship 9	24/5–28/6/01	Sp	33	0	33	100	2 243.4	2 243.4	100	100	54	0	NC	0	54	0	0.024	0	0.024	NC	0	(0)
Ship 10	14/2–12/4/01	Sp	54	0	54	100	2 346.1	2 346.1	100	100	507	0	NC	0	507	0	0.216	0	0.216	NC	0	(0)
Total						100	20 735.2	20 735.2	100		1 917						0.092	0	0.092			

1 Birds ‘caught’ as defined by the Commission in 2004 (CCAMLR-XXIII, paragraphs 10.30 and 10.31).

Table 6: Species composition, as reported by captains, of incidental mortality of seabirds in longline fisheries in Division 58.5.1 during the 2000/01 season (September to August). N – night-time setting; D – daytime setting (including dawn and dusk); PRO – white-chinned petrel; MAH – northern giant petrel; PCI – grey petrel; DIC – grey-headed albatross; DIM – black-browed albatross; () – % composition.

Vessel	Dates of fishing	No. birds killed by group								Species composition (%)				
		Petrels		Albatrosses		Penguins		Total						
		N	D	N	D	N	D	N	D	PRO	MAH	PCI	DIC	DIM
Ship 3	4/10–18/11/00	0	0	0	0	0	0	0	0					
Ship 3	26/1–10/2/01	292	0	2	0	0	0	294	0	292 (99.3)			2 (0.7)	
Ship 8	21/10–2/12/00	0	0	0	0	0	0	0	0					
Ship 8	12/2–18/3/01	363	0	0	0	0	0	363	0	363 (100)				
Ship 8	17/4–14/5/01	191	0	0	0	0	0	191	0	145 (74.9)	2 (1.0)	44 (23.0)		
Ship 8	15/6–29/6/01	3	0	0	0	0	0	3	0			3 (100)		
Ship 9	8/10–20/11/00	458	0	0	0	0	0	458	0	458 (100)				
Ship 9	14/12/00–28/1/01	44	0	3	0	0	0	47	0	44 (93.6)				3 (6.4)
Ship 9	23/4–2/5/01	0	0	0	0	0	0	0	0					
Ship 9	24/5–28/6/01	54	0	0	0	0	0	54	0		2 (3.7)	52 (96.3)		
Ship 10	14/2–12/4/01	507	0	0	0	0	0	507	0	507 (100)				
Total (%)		1912	0	5	0	0	0	1917	0	1809 (94.4)	4 (0.2)	99 (5.2)	2 (0.1)	3 (0.2)

Table 7: Incidental mortality, reported by captains, of seabirds in the longline fisheries for *Dissostichus* spp. in Subarea 58.6 and Division 58.5.1 during the 2004/05 season (September to August). Sp – Spanish method; Auto – autoliner; N – night-time setting; D – daytime setting (including nautical dawn and dusk); NC – not collected.

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			Hooks baited (%)	No. of birds caught						Reported seabird mortality (birds/1 000 hooks)			Streamer line in use %		Offal discharge during haul (%)
											Dead		Alive		Total							
			N	D	Total	%N	Reported	Set	% Observed		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 58.6																						
Ship 1	9/9–13/9/04	Auto	10	0	10	100	90.9	90.9	100.0	85.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 1	4/2–9/2/05	Auto	12	0	12	100	104.8	104.8	100.0	NC	8	0	1	0	9	0	0.0763	0	0.0763	100	0	0
Ship 1	15/2–23/2/05	Auto	19	0	19	100	197.4	197.4	100.0	NC	1	0	4	0	5	0	0.0051	0	0.0051	100	0	0
Ship 1	19/5–25/6/05	Auto	71	0	71	100	674.1	674.1	100.0	89.9	3	0	1	0	4	0	0.0045	0	0.0045	100	0	0
Ship 2	5/11–11/11/04	Auto	14	0	14	100	104.9	104.9	100.0	85.0	0	0	31	0	31	0	0.0000	0	0.0000	100	0	0
Ship 2	4/2–10/2/05	Auto	20	0	20	100	126.5	126.5	100.0	95.0	9	0	1	0	10	0	0.0711	0	0.0711	100	0	0
Ship 2	10/5–18/5/05	Auto	23	0	23	100	201.3	201.3	100.0	96.0	0	0	3	0	3	0	0.0000	0	0.0000	100	0	0
Ship 2	23/7–11/8/05	Auto	48	0	48	100	335.9	335.9	100.0	90.4	0	0	7	0	7	0	0.0000	0	0.0000	100	0	0
Ship 3	20/1–22/2/05	Auto	65	0	65	100	672.0	672.0	100.0	95.0	50	0	6	0	56	0	0.0744	0	0.0744	100	0	0
Ship 4	1/9–3/9/04	Sp	4	0	4	100	31.2	31.2	100.0	100.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 5	3/9–8/9/04	Auto	13	0	13	100	101.7	101.7	100.0	95.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 5	6/2–9/2/05	Auto	7	0	7	100	77.9	77.9	100.0	NC	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 5	15/2–25/2/05	Auto	32	0	32	100	183.5	183.5	100.0	NC	14	0	0	0	14	0	0.0763	0	0.0763	100	0	0
Ship 5	31/5–21/6/05	Auto	43	0	43	100	427.5	427.5	100.0	94.0	2	0	3	0	5	0	0.0047	0	0.0047	100	0	0
Ship 6	20/11–29/11/04	Auto	35	0	35	100	175.5	175.5	100.0	85.6	18	0	0	0	18	0	0.1026	0	0.1026	100	0	0
Ship 6	2/2–23/2/05	Auto	45	0	45	100	363.5	363.5	100.0	92.4	15	0	17	0	32	0	0.0413	0	0.0413	100	0	0
Ship 7	4/2–25/2/05	Auto	54	0	54	100	381.2	381.2	100.0	NC	12	0	15	0	27	0	0.0315	0	0.0315	100	0	0
Ship 7	17/6–29/6/05	Auto	30	0	30	100	232.3	232.3	100.0	95.0	0	0	1	0	1	0	0.0000	0	0.0000	100	0	0
Ship 11	16/2–25/2/05	Auto	26	0	26	100	136.8	136.8	100.0	96.1	1	0	0	0	1	0	0.0073	0	0.0073	100	0	0
Ship 11	20/6–12/7/05	Auto	61	0	61	100	304.0	304.0	100.0	96.2	4	0	2	0	6	0	0.0132	0	0.0132	100	0	0
Total						100	4 922.7	4 922.7	100.0		137		92		229							

(continued)

Table 7 (continued)

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			Hooks baited (%)	No. of birds caught						Reported seabird mortality (birds/1 000 hooks)			Streamer line in use %		Offal discharge during haul (%)
			N	D	Total	%N	Reported	Set	% Observed		Dead		Alive		Total							
											N	D	N	D	N	D	N	D	Total	N	D	
Division 58.5.1																						
Ship 1	17/9–16/11/04	Auto	166	0	166	100	1369.3	1369.3	100.0	85.0	47	0	12	0	59	0	0.0343	0	0.0343	100	0	0
Ship 1	22/12/04–31/01/05	Auto	100	0	100	100	903.2	903.2	100.0	NC	18	0	22	0	40	0	0.0199	0	0.0199	100	0	0
Ship 1	1/3–13/3/05	Auto	33	0	33	100	348.5	348.5	100.0	NC	61	0	10	0	71	0	0.1750	0	0.1750	100	0	0
Ship 1	18/4–14/5/05	Auto	72	0	72	100	645.9	645.9	100.0	88.5	27	0	1	0	28	0	0.0418	0	0.0418	100	0	0
Ship 2	8/9–2/11/04	Auto	153	0	153	100	1185.6	1185.6	100.0	85.0	16	0	74	0	90	0	0.0135	0	0.0135	100	0	0
Ship 2	30/11/04–31/1/05	Auto	161	0	161	100	1198.1	1198.1	100.0	95.8	32	0	61	0	93	0	0.0267	0	0.0267	100	0	0
Ship 2	1/3–6/5/05	Auto	175	0	175	100	1498.8	1498.8	100.0	96.4	108	0	23	0	131	0	0.0721	0	0.0721	100	0	0
Ship 2	5/6–19/7/05	Auto	126	0	126	100	1000.8	1000.8	100.0	91.8	25	0	15	0	40	0	0.0250	0	0.0250	100	0	0
Ship 3	25/9–12/12/04	Auto	158	0	158	100	2070.6	2070.6	100.0	90.3	98	0	15	0	113	0	0.0473	0	0.0473	100	0	0
Ship 3	1/3–13/4/05	Auto	83	0	83	100	1122.5	1122.5	100.0	95.0	64	0	1	0	65	0	0.0570	0	0.0570	100	0	0
Ship 3	19/5–27/6/05	Auto	79	0	79	100	1082.6	1082.6	100.0	NC	39	0	17	0	56	0	0.0360	0	0.0360	100	0	0
Ship 5	11/9–8/11/04	Auto	146	0	146	100	1217.0	1217.0	100.0	95.0	131	0	11	0	142	0	0.1076	0	0.1076	100	0	0
Ship 5	15/12/04–30/1/05	Auto	142	0	142	100	1057.3	1057.3	100.0	NC	44	0	23	0	67	0	0.0416	0	0.0416	100	0	0
Ship 5	1/3–6/3/05	Auto	22	0	22	100	140.1	140.1	100.0	NC	54	0	6	0	60	0	0.3854	0	0.3854	100	0	0
Ship 5	14/4–29/5/05	Auto	107	0	107	100	1071.9	1071.9	100.0	92.7	65	0	34	0	99	0	0.0606	0	0.0606	100	0	0
Ship 6	4/9–16/11/04	Auto	199	0	199	100	1666.8	1666.8	100.0	88.4	165	0	15	0	180	0	0.0990	0	0.0990	100	0	0
Ship 6	11/1–29/1/05	Auto	46	0	46	100	429.3	429.3	100.0	88.2	78	0	7	0	85	0	0.1817	0	0.1817	100	0	0
Ship 6	1/3–30/3/05	Auto	78	0	78	100	694.5	694.5	100.0	90.9	190	0	15	0	205	0	0.2736	0	0.2736	100	0	0
Ship 6	8/5–5/7/05	Auto	159	0	159	100	1315.5	1315.5	100.0	93.2	57	0	12	0	69	0	0.0433	0	0.0433	100	0	6
Ship 7	13/9–6/12/04	Auto	189	0	189	100	1975.4	1975.4	100.0	91.7	19	0	NC	0	NC	0	0.0096	0	0.0096	100	0	0
Ship 7	12/1–31/1/05	Auto	50	0	50	100	450.9	450.9	100.0	NC	127	0	4	0	131	0	0.2817	0	0.2817	100	0	0
Ship 7	1/3–5/4/05	Auto	98	0	98	100	840.0	840.0	100.0	NC	276	0	24	0	300	0	0.3286	0	0.3286	100	0	0
Ship 7	11/5–13/6/05	Auto	88	0	88	100	755.5	755.5	100.0	95.0	8	0	16	0	24	0	0.0106	0	0.0106	100	0	0
Ship 11	29/10/04–13/1/05	Auto	202	0	202	100	1377.0	1377.0	100.0	NC	39	0	0	0	39	0	0.0283	0	0.0283	100	0	0
Ship 11	1/3–15/5/05	Auto	174	0	174	100	1286.1	1286.1	100.0	95.7	107	0	2	0	109	0	0.0832	0	0.0832	100	0	0
Ship 11	10/6–14/6/05	Auto	12	0	12	100	86.0	86.0	100.0	97.7	6	0	1	0	7	0	0.0698	0	0.0698	100	0	0
Total						100	26 789.1	26 789.1	100.0		1 901		421		2 303							

Table 8: Observed incidental mortality of seabirds in the longline fisheries for *Dissostichus* spp. in Subarea 58.6 and Division 58.5.1 during the 2004/05 season (September to August). Sp – Spanish method; Auto – autoliner; N – night-time setting; D – daytime setting (including nautical dawn and dusk); NC – not collected.

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			Hooks baited (%)	No. of birds caught						Reported seabird mortality (birds/1 000 hooks)			Streamer line in use %		Offal discharge during haul (%)
											Dead		Alive		Total							
			N	D	Total	%N	Reported	Set	% Observed		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 58.6																						
Ship 4	1/9–3/9/04	Sp	4	0	4	100	8.0	31.2	25.6	100.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 5	3/9–8/9/04	Auto	13	0	13	100	26.7	101.7	26.2	95.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 2	5/11–11/11/04	Auto	14	0	14	100	20.3	104.9	19.3	85.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 1	9/9–13/9/04	Auto	10	0	10	100	22.6	90.9	24.8	85.0	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 6	20/11–29/11/04	Auto	35	0	35	100	44.0	175.5	25.1	85.6	6	0	0	0	6	0	0.1364	0	0.1364	100	0	0
Ship 2	4/2–10/2/05	Auto	20	0	20	100	26.9	126.5	21.2	95.0	3	0	1	0	4	0	0.1117	0	0.1117	100	0	0
Ship 5	6/2–9/2/05	Auto	7	0	7	100	20.0	77.9	25.7	NC	0	0	0	0	0	0	0.0000	0	0.0000	100	0	0
Ship 5	15/2–25/2/05	Auto	32	0	32	100	49.0	183.5	26.7	NC	9	0	0	0	9	0	0.1837	0	0.1837	100	0	0
Ship 1	4/2–9/2/05	Auto	12	0	12	100	27.1	104.8	25.8	NC	5	0	1	0	6	0	0.1848	0	0.1848	100	0	0
Ship 1	15/2–23/2/05	Auto	19	0	19	100	48.2	197.4	24.4	NC	0	0	3	0	3	0	0.0000	0	0.0000	100	0	0
Ship 6	2/2–23/2/05	Auto	45	0	45	100	85.2	363.5	23.4	92.4	10	0	17	0	27	0	0.1173	0	0.1173	100	0	0
Ship 7	4/2–25/2/05	Auto	54	0	54	100	100.3	381.2	26.3	NC	7	0	12	0	19	0	0.0698	0	0.0698	100	0	0
Ship 3	20/1–22/2/05	Auto	65	0	65	100	166.1	672.0	24.7	95.0	13	0	2	0	15	0	0.0782	0	0.0782	100	0	0
Ship 11	16/2–25/2/05	Auto	26	0	26	100	45.5	136.8	33.3	96.1	1	0	0	0	1	0	0.0220	0	0.0220	100	0	0
Ship 2	10/5–18/5/05	Auto	23	0	23	100	46.8	201.3	23.2	96.0	0	0	1	0	1	0	0.0000	0	0.0000	100	0	0
Ship 1	19/5–25/6/05	Auto	71	0	71	100	256.3	674.1	38.0	89.9	2	0	1	0	3	0	0.0078	0	0.0078	100	0	0
Ship 5	31/5–21/6/05	Auto	43	0	43	100	96.5	427.5	22.6	94.0	2	0	1	0	3	0	0.0207	0	0.0207	100	0	0
Ship 7	17/6–29/6/05	Auto	30	0	30	100	55.5	232.3	23.9	95.0	0	0	1	0	1	0	0.0000	0	0.0000	100	0	0
Ship 11	20/6–12/7/05	Auto	61	0	61	100	76.3	304.0	25.1	96.2	3	0	2	0	5	0	0.0393	0	0.0393	100	0	0
Ship 2	23/7–11/8/05	Auto	48	0	48	100	84.2	335.9	25.1	90.4	0	0	7	0	7	0	0.0000	0	0.0000	100	0	0
Total						100	1305.3	4922.7	25.5		61						0.0467		0.0467			

(continued)

Table 8 (continued)

Vessel	Dates of fishing	Method	Sets deployed				No. of hooks (thousands)			Hooks baited (%)	No. of birds caught						Reported seabird mortality (birds/1 000 hooks)			Streamer line in use %		Offal discharge during haul (%)
			N	D	Total	%N	Reported	Set	% Observed		Dead		Alive		Total							
											N	D	N	D	N	D	N	D	Total	N	D	
Division 58.5.1																						
Ship 5	11/9–8/11/04	Auto	146	0	146	100	356.5	1217.0	29.3	95.0	66	0	11	0	77	0	0.1851	0	0.1851	100	0	0
Ship 2	8/9–2/11/04	Auto	153	0	153	100	367.3	1185.6	31.0	85.0	6	0	31	0	37	0	0.0163	0	0.0163	100	0	0
Ship 1	17/9–16/11/04	Auto	166	0	166	100	337.0	1369.3	24.6	85.0	24	0	6	0	30	0	0.0712	0	0.0712	100	0	0
Ship 6	4/9–16/11/04	Auto	199	0	199	100	444.7	1666.8	26.7	88.4	104	0	10	0	114	0	0.2339	0	0.2339	100	0	0
Ship 7	13/9–6/12/04	Auto	189	0	189	100	491.3	1975.4	24.9	91.7	14	0	8	0	22	0	0.0285	0	0.0285	100	0	0
Ship 3	25/9–12/12/04	Auto	158	0	158	100	450.5	2070.6	21.8	90.3	61	0	5	0	66	0	0.1354	0	0.1354	100	0	0
Ship 11	29/10/04–13/1/05	Auto	202	0	202	100	326.8	1377.0	23.7	NC	11	0	6	0	17	0	0.0337	0	0.0337	100	0	0
Ship 2	30/11/04–31/1/05	Auto	161	0	161	100	274.1	1198.1	22.9	95.8	9	0	23	0	32	0	0.0328	0	0.0328	100	0	0
Ship 5	15/12/04–30/1/05	Auto	142	0	142	100	283.5	1057.3	26.8	NC	20	0	23	0	43	0	0.0705	0	0.0705	100	0	0
Ship 5	1/3–6/3/05	Auto	22	0	22	100	36.6	140.1	26.1	NC	27	0	5	0	32	0	0.7377	0	0.7377	100	0	0
Ship 1	22/12/04–31/1/05	Auto	100	0	100	100	210.8	903.2	23.3	NC	11	0	20	0	31	0	0.0522	0	0.0522	100	0	0
Ship 1	1/3–13/3/05	Auto	33	0	33	100	85.8	348.5	24.6	NC	19	0	10	0	29	0	0.2214	0	0.2214	100	0	0
Ship 6	11/1–29/1/05	Auto	46	0	46	100	84.9	429.3	19.8	88.2	41	0	7	0	48	0	0.4831	0	0.4831	100	0	0
Ship 6	1/3–30/3/05	Auto	78	0	78	100	156.3	694.5	22.5	90.9	170	0	15	0	185	0	1.0877	0	1.0877	100	0	0
Ship 7	12/1–31/1/05	Auto	50	0	50	100	115.0	450.9	25.5	NC	98	0	3	0	101	0	0.8522	0	0.8522	100	0	0
Ship 7	1/3–5/4/05	Auto	98	0	98	100	215.7	840.0	25.7	NC	171	0	24	0	195	0	0.7928	0	0.7928	100	0	0
Ship 3	1/3–13/4/05	Auto	83	0	83	100	160.8	1122.5	14.3	95.0	30	0	1	0	31	0	0.1866	0	0.1866	100	0	0
Ship 11	1/3–15/5/05	Auto	174	0	174	100	310.2	1286.1	24.1	95.7	35	0	2	0	37	0	0.1128	0	0.1128	100	0	0
Ship 2	1/3–6/5/05	Auto	175	0	175	100	330.5	1498.8	22.1	96.4	32	0	7	0	39	0	0.0968	0	0.0968	100	0	0
Ship 1	18/4–14/5/05	Auto	72	0	72	100	195.7	645.9	30.3	88.5	12	0	1	0	13	0	0.0613	0	0.0613	100	0	0
Ship 5	14/4–29/5/05	Auto	107	0	107	100	261.9	1071.9	24.4	92.7	38	0	15	0	53	0	0.1451	0	0.1451	100	0	0
Ship 7	11/5–13/6/05	Auto	88	0	88	100	189.3	755.5	25.1	95.0	2	0	15	0	17	0	0.0106	0	0.0106	100	0	0
Ship 3	19/5–27/6/05	Auto	79	0	79	100	273.8	1082.6	25.3	NC	31	0	17	0	48	0	0.1132	0	0.1132	100	0	0
Ship 6	8/5–5/7/05	Auto	159	0	159	100	315.4	1315.5	24.0	93.2	12	0	4	0	16	0	0.0381	0	0.0381	100	0	6
Ship 11	10/6–14/6/05	Auto	12	0	12	100	22.3	86.0	25.9	97.7	1	0	1	0	2	0	0.0449	0	0.0449	100	0	0
Ship 2	5/6–19/7/05	Auto	126	0	126	100	236.2	1000.8	23.6	91.8	9	0	15	0	24	0	0.0381	0	0.0381	100	0	0
Total						100	6 532.8	26 789.1	24.5		1 054						0.1613		0.1613			

Table 9: Extrapolated incidental mortality of seabirds for those vessels on which seabird mortalities were observed in Subarea 58.6 and Division 58.5.1 during the 2004/05 season (September to August).

Vessel	Hooks observed (thousands)	Hooks set (thousands)	Percentage of hooks observed	% Night sets	Estimated number of birds caught dead		
					Night	Day	Total
Subarea 58.6							
Ship 1	22.6	90.9	24.8	100	0	0	0
Ship 1	27.1	104.8	25.8	100	19	0	19
Ship 1	48.2	197.4	24.4	100	0	0	0
Ship 1	256.3	674.1	38.0	100	5	0	5
Ship 2	20.3	104.9	19.3	100	0	0	0
Ship 2	26.9	126.5	21.2	100	14	0	14
Ship 2	46.8	201.3	23.2	100	0	0	0
Ship 2	84.2	335.9	25.1	100	0	0	0
Ship 3	166.1	672.0	24.7	100	53	0	53
Ship 4	8.0	31.2	25.6	100	0	0	0
Ship 5	26.7	101.7	26.2	100	0	0	0
Ship 5	20.0	77.9	25.7	100	0	0	0
Ship 5	49.0	183.5	26.7	100	34	0	34
Ship 5	96.5	427.5	22.6	100	9	0	9
Ship 6	44.0	175.5	25.1	100	24	0	24
Ship 6	85.2	363.5	23.4	100	43	0	43
Ship 7	100.3	381.2	26.3	100	27	0	27
Ship 7	55.5	232.3	23.9	100	0	0	0
Ship 11	45.5	136.8	33.3	100	3	0	3
Ship 11	76.3	304.0	25.1	100	12	0	12
					242	0	242
Division 58.5.1							
Ship 1	337.0	1369.3	24.6	100	98	0	98
Ship 1	210.8	903.2	23.3	100	47	0	47
Ship 1	85.8	348.5	24.6	100	77	0	77
Ship 1	195.7	645.9	30.3	100	40	0	40
Ship 2	367.3	1185.6	31.0	100	19	0	19
Ship 2	274.1	1198.1	22.9	100	39	0	39
Ship 2	330.5	1498.8	22.1	100	145	0	145
Ship 2	236.2	1000.8	23.6	100	38	0	38
Ship 3	450.5	2070.6	21.8	100	280	0	280
Ship 3	160.8	1122.5	14.3	100	209	0	209
Ship 3	273.8	1082.6	25.3	100	123	0	123
Ship 5	356.5	1217.0	29.3	100	225	0	225
Ship 5	283.5	1057.3	26.8	100	75	0	75
Ship 5	36.6	140.1	26.1	100	103	0	103
Ship 5	261.9	1071.9	24.4	100	156	0	156
Ship 6	444.7	1666.8	26.7	100	390	0	390
Ship 6	84.9	429.3	19.8	100	207	0	207
Ship 6	156.3	694.5	22.5	100	755	0	755
Ship 6	315.4	1315.5	24.0	100	50	0	50
Ship 7	491.3	1975.4	24.9	100	56	0	56
Ship 7	115.0	450.9	25.5	100	384	0	384
Ship 7	215.7	840.0	25.7	100	666	0	666
Ship 7	189.3	755.5	25.1	100	8	0	8
Ship 11	326.8	1377.0	23.7	100	46	0	46
Ship 11	310.2	1286.1	24.1	100	145	0	145
Ship 11	22.3	86.0	25.9	100	4	0	4
					4387	0	4387

Table 10: Species composition of birds killed in longline fisheries in Subarea 58.6 and Division 58.5.1 during the 2004/2005 season (September to August) as reported by captains. N – night-time setting; D – daytime setting (including nautical dawn and dusk); PRO – white-chinned petrel; PCI – grey petrel; () – % composition.

Vessel	Dates of fishing	No. birds killed by group						Species composition (%)			
		Albatross		Petrels		Total		PRO		PCI	
		N	D	N	D	N	D				
Subarea 58.6											
Ship 1	9/9–13/9/04	0	0	0	0	0	0				
Ship 1	4/2–9/2/05	0	0	0	0	0	0				
Ship 1	15/2–23/2/05	0	0	0	0	0	0				
Ship 1	19/5–25/6/05	0	0	0	0	0	0				
Ship 2	5/11–11/11/04	0	0	0	0	0	0				
Ship 2	4/2–10/2/05	0	0	14	0	14	0	14	(100)		
Ship 2	10/5–18/5/05	0	0	8	0	8	0	8	(100)		
Ship 2	23/7–11/8/05	0	0	1	0	1	0	1	(100)		
Ship 3	20/1–22/2/05	0	0	15	0	15	0	15	(100)		
Ship 4	1/9–3/9/04	0	0	12	0	12	0	12	(100)		
Ship 5	3/9–8/9/04	0	0	50	0	50	0	50	(100)		
Ship 5	6/2–9/2/05	0	0	1	0	1	0	1	(100)		
Ship 5	15/2–25/2/05	0	0	0	0	0	0				
Ship 5	31/5–21/6/05	0	0	3	0	3	0			3	(100)
Ship 6	20/11–29/11/04	0	0	2	0	2	0			2	(100)
Ship 6	2/2–23/2/05	0	0	0	0	0	0				
Ship 7	4/2–25/2/05	0	0	4	0	4	0			4	(100)
Ship 7	17/6–29/6/05	0	0	0	0	0	0				
Ship 11	16/2–25/2/05	0	0	18	0	18	0	18	(100)		
Ship 11	20/6–12/7/05	0	0	9	0	9	0	9	(100)		
Division 58.5.1											
Ship 1	17/9–16/11/04	0	0	131	0	131	0	126	(96.2)	5	(3.8)
Ship 1	22/12/04–31/1/05	0	0	16	0	16	0	12	(75.0)	4	(25.0)
Ship 1	1/3–13/3/05	0	0	47	0	47	0	45	(95.7)	2	(4.3)
Ship 1	18/4–14/5/05	0	0	165	0	165	0	164	(99.4)	1	(0.6)
Ship 2	8/9–2/11/04	0	0	32	0	32	0	32	(100)		
Ship 2	30/11/04–31/1/05	0	0	44	0	44	0	44	(100)		
Ship 2	1/3–6/5/05	0	0	54	0	54	0	52	(96.3)	2	(3.7)
Ship 2	5/6–19/7/05	0	0	18	0	18	0	18	(100)		
Ship 3	25/9–12/12/04	0	0	61	0	61	0	61	(100)		
Ship 3	1/3–13/4/05	0	0	78	0	78	0	78	(100)		
Ship 3	19/5–27/6/05	0	0	190	0	190	0	187	(98.4)	3	(1.6)
Ship 5	11/9–8/11/04	0	0	127	0	127	0	127	(100)		
Ship 5	15/12/04–30/1/05	0	0	276	0	276	0	270	(97.8)	6	(2.2)
Ship 5	1/3–6/3/05	0	0	64	0	64	0	61	(95.3)	3	(4.7)
Ship 5	14/4–29/5/05	0	0	107	0	107	0	104	(97.2)	3	(2.8)
Ship 6	4/9–16/11/04	0	0	108	0	108	0	99	(91.7)	9	(8.3)
Ship 6	11/1–29/1/05	0	0	27	0	27	0	16	(59.3)	11	(40.7)
Ship 6	1/3–30/3/05	0	0	65	0	65	0	43	(66.2)	22	(33.8)
Ship 6	8/5–5/7/05	0	0	8	0	8	0	8	(100)		
Ship 7	13/9–6/12/04	0	0	39	0	39	0	39	(100)		
Ship 7	12/1–31/1/05	0	0	57	0	57	0	1	(1.8)	56	(98.2)
Ship 7	1/3–5/4/05	0	0	6	0	6	0			6	(100)
Ship 7	11/5–13/6/05	0	0	25	0	25	0			25	(100)
Ship 11	29/10/04–13/1/05	0	0	19	0	19	0	18	(94.7)	1	(5.3)
Ship 11	1/3–15/5/05	0	0	98	0	98	0	98	(100)		
Ship 11	10/6–14/6/05	0	0	39	0	39	0	39	(100)		
Total (%)		0	0	2038	0	2038	0	1870	(91.8)	168	(8.2)

Table 11: Species composition of birds observed killed in longline fisheries in Subarea 58.6 and Division 58.5.1 during the 2004/05 season (September to August). N – night-time setting; D – daytime setting (including nautical dawn and dusk); PRO – white-chinned petrel; PCI – grey petrel; () – % composition.

Vessel	Dates of fishing	No. birds killed by group						Species composition (%)	
		Albatross		Petrels		Total		PRO	PCI
		N	D	N	D	N	D		
Subarea 58.6									
Ship 1	9/9–13/9/04	0	0	0	0	0	0		
Ship 1	4/2–9/2/05	0	0	5	0	5	0	5 (100)	
Ship 1	15/2–23/2/05	0	0	0	0	0	0		
Ship 1	19/5–25/6/05	0	0	2	0	2	0		2 (100)
Ship 2	5/11–11/11/04	0	0	0	0	0	0		
Ship 2	4/2–10/2/05	0	0	3	0	3	0	3 (100)	
Ship 2	10/5–18/5/05	0	0	0	0	0	0		
Ship 2	23/7–11/8/05	0	0	0	0	0	0		
Ship 3	20/1–22/2/05	0	0	13	0	13	0	13 (100)	
Ship 4	1/9–3/9/04	0	0	0	0	0	0		
Ship 5	3/9–8/9/04	0	0	0	0	0	0		
Ship 5	6/2–9/2/05	0	0	0	0	0	0		
Ship 5	15/2–25/2/05	0	0	9	0	9	0	9 (100)	
Ship 5	31/5–21/6/05	0	0	2	0	2	0		2 (100)
Ship 6	20/11–29/11/04	0	0	6	0	6	0	6 (100)	
Ship 6	2/2–23/2/05	0	0	10	0	10	0	10 (100)	
Ship 7	4/2–25/2/05	0	0	7	0	7	0	7 (100)	
Ship 7	17/6–29/6/05	0	0	0	0	0	0		
Ship 11	16/2–25/2/05	0	0	1	0	1	0	1 (100)	
Ship 11	20/6–12/7/05	0	0	3	0	3	0		3 (100)
Division 58.5.1									
Ship 1	17/9–16/11/04	0	0	24	0	24	0	22 (91.7)	2 (8.3)
Ship 1	22/12/04–31/1/05	0	0	11	0	11	0	11 (100)	
Ship 1	1/3–13/3/05	0	0	19	0	19	0	19 (100)	
Ship 1	18/4–14/5/05	0	0	12	0	12	0	7 (58.3)	5 (41.7)
Ship 2	8/9–2/11/04	0	0	6	0	6	0	4 (66.7)	2 (33.3)
Ship 2	30/11/04–31/1/05	0	0	9	0	9	0	9 (100)	
Ship 2	1/3–6/5/05	0	0	32	0	32	0	29 (90.6)	3 (9.4)
Ship 2	5/6–19/7/05	0	0	9	0	9	0		9 (100)
Ship 3	25/9–12/12/04	0	0	61	0	61	0	61 (100)	
Ship 3	1/3–13/4/05	0	0	30	0	30	0	29 (96.7)	1 (3.3)
Ship 3	19/5–27/6/05	0	0	31	0	31	0	31 (100)	
Ship 5	11/9–8/11/04	0	0	66	0	66	0	62 (93.9)	4 (6.1)
Ship 5	15/12/04–30/1/05	0	0	20	0	20	0	20 (100)	
Ship 5	1/3–6/3/05	0	0	27	0	27	0	26 (96.3)	1 (3.7)
Ship 5	14/4–29/5/05	0	0	38	0	38	0	23 (60.5)	15 (39.5)
Ship 6	4/9–16/11/04	0	0	104	0	104	0	103 (99.0)	1 (1.0)
Ship 6	11/1–29/1/05	0	0	41	0	41	0	41 (100)	
Ship 6	1/3–30/3/05	0	0	170	0	170	0	167 (98.2)	3 (1.8)
Ship 6	8/5–5/7/05	0	0	12	0	12	0		12 (100)
Ship 7	13/9–6/12/04	0	0	14	0	14	0	13 (92.9)	1 (7.1)
Ship 7	12/1–31/1/05	0	0	98	0	98	0	98 (100)	
Ship 7	1/3–5/4/05	0	0	171	0	171	0	169 (98.8)	2 (1.2)
Ship 7	11/5–13/6/05	0	0	2	0	2	0	2 (100)	
Ship 11	29/10/04–13/1/05	0	0	11	0	11	0	11 (100)	
Ship 11	1/3–15/5/05	0	0	35	0	35	0	33 (94.3)	2 (5.7)
Ship 11	10/6–14/6/05	0	0	1	0	1	0		1 (100)
Total (%)		0	0	1115	0	1115	0	1044 (93.6)	71 (6.4)

Table 12: Compliance, as reported by observers, of streamer lines with the minimum specifications set out in Conservation Measure 25-02 (2003) during the 2004/05 season. Y – yes; N – no; - – no information; A – autoliner; Sp – Spanish; MP – moon pool; * – conservation measure not applicable in this area.

Vessel name (Nationality)	Dates of fishing	Fishing method	Compliance with CCAMLR specifications	Compliance with details of streamer line specifications				Length of streamers (m)	Streamer line in use % setting		Haul scaring device used %
				Attachment, height above water (m)	Total length (m)	No. streamers per line	Spacing of streamers per line (m)		Night	Day	
Subarea 48.3											
Argos Georgia	1/5–28/8/05	Sp	Y	Y (7)	Y (152)	6	Y (5)	Y (1–6.7)	100		91
Isla Santa Clara	10/5–4/8/05	Sp	Y	Y (7)	Y (151)	8	Y (5)	Y (1–7)	98		100
Jacqueline	2/5–24/8/05	Sp	Y	Y (8)	Y (150)	9	Y (5)	Y (1–7)	100		99
Koryo Maru 11	2/5–16/8/05	Sp	Y	Y (8)	Y (150)	10	Y (5)	Y (1–8)	100		100
Polarpesca I	13/5–21/8/05	Sp	Y	Y (7.5)	Y (162)	7	Y (5)	Y (2–7)	100		100
Protegat	1/5–21/8/05	A	N	Y (7.5)	Y (150)	12	Y (5)	N (0.5–7)	99	100	100
Viking Bay	1/5–21/8/05	Sp	N	N (6.5)	N (83)	50	Y (2)	N (0.8)	100		53
Argos Helena	1/5–29/8/05	A	Y	Y (7.4)	Y (150)	13	Y (5)	Y (1–8)	100		MP
Subarea 48.6											
Shinsei Maru 3	23/1–18/3/05	Sp	Y	Y (7.1)	Y (155)	6	Y (5)	Y (5–7)	100	100	100*
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b											
Arnela	3/12/04–16/3/05	Sp	Y	Y (7.5)	Y (152)	13	Y (5)	Y (1–7)	100	100	48*
Globalpesca II	19/12/04–2/3/05	Sp	Y	Y (7)	Y (150)	12	Y (5)	Y (1–6.5)	100		0*
Galaecia	16/12/04–10/3/05	Sp	Y	Y (7.1)	Y (150)	6	Y (2)	Y (1–6.5)	100	100	0*
829 Yeon Seong	20/12/04–21/2/05	Sp	N	Y (7)	Y (150)	10	Y (5)	N (1–4)	100	100	100*
Janas	5/3–29/3/05	A	Y	Y (7)	Y (165)	19	Y (1.5)	Y (1–7)	100	100	0*
Avro Chieftain	4/9–7/9/05	A	Y	Y (7)	Y (150)	10	Y (4.5)	Y (1–7)	100		MP*
Galaecia	15/4–6/7/05	Sp	Y	Y (7)	Y (162)	9	Y (5)	Y (1–6.5)	100	100	0*
No. 707 Bonanza	26/12/04–10/3/05	Sp	Y	Y (7)	Y (150)	25	Y (5)	Y (1–6.5)	100	100	100*
Division 58.5.2											
Avro Chieftain	25/7–1/9/05	A	Y	Y (7)	Y (150)	10	Y (4.5)	Y (1–7)	100	100	MP
Avro Chieftain	10/5–1/7/05	A	Y	Y (7)	Y (150)	10	Y (4.5)	Y (1–7)	100	100	MP
Subareas 58.6, 58.7											
Koryo Maru 11	24/2–1/4/05	Sp	N	Y (8)	Y (150)	7	N (6.5)	Y (3–7.5)	100		100
Subareas 88.1, 88.2											
Antarctic III	5/12/04–5/2/05	A	Y	Y (8)	Y (150)	5	Y (5)	Y (7)		99	0*
Argos Helena	4/12/04–4/3/05	A	Y	Y (7)	Y (150)	7	Y (5)	Y (1–9)	100	100	MP*
Janas	1/12/04–6/2/05	A	Y	Y (7)	Y (165)	26	Y (1.5)	Y (1–7)		100	0*
Paloma V	27/12/04–1/3/05	Sp	Y	Y (8)	Y (150)	11	Y (5)	-		98	0*
Punta Ballena	14/1–13/3/05	A	N	Y (7)	Y (150)	5	N (6)	N (2–6)		100	0*

(continued)

Table 12 (continued)

Vessel name (Nationality)	Dates of fishing	Fishing method	Compliance with CCAMLR specifications	Compliance with details of streamer line specifications				Length of streamers (m)	Streamer line in use % setting		Haul scaring device used %
				Attachment, height above water (m)	Total length (m)	No. streamers per line	Spacing of streamers per line (m)		Night	Day	
Subareas 88.1, 88.2											
San Aotea II	4/12/04–14/2/05	A	Y	Y (7)	Y (165)	14	Y (5)	Y (1–7)		100	1*
Frøyanes	29/12/04–1/3/05	A	Y	Y (7)	Y (150)	16	Y (5)	Y (1–8)		100	0*
Volna	18/12/04–18/3/05	Sp	N	Y (7)	Y (150)	5	Y (5)	N (2–5)		100	0*
Yantar	18/12/04–18/3/05	Sp	Y	Y (7)	Y (150)	8	Y (5)	Y (1–6.5)	-		0*
Avro Chieftain	31/12/04–6/2/05	A	N	Y (7.6)	Y (242)	17	Y (2)	N (2–6.3)		100	MP*
San Aspiring	25/12/04–23/2/05	A	N	Y (7.5)	Y (169)	17	Y (5)	N (0.5–7.5)	100	100	0*

Table 13: Summary of scientific observations relating to compliance with Conservation Measure 25-02 (2003), based on data from scientific observers from the 1996/97 to the 2004/05 season. Values in parentheses are % of observer records that were complete. na – not applicable.

Subarea/season	Line weighting (Spanish system only)			Night setting (% night)	Offal discharge (%) opposite haul		Streamer line compliance (%)										Total catch rate (birds/thousand hooks)	
	Compliance %		Median weight (kg)	Median spacing (m)			Overall		Attached height		Total length		No. of streamers		Distance apart		Night	Day
Subarea 48.3																		
1996/97	0	(91)	5.0	45	81	0	(91)	6	(94)	47	(83)	24	(94)	76	(94)	100	(78)	0.18	0.93
1997/98	0	(100)	6.0	42.5	90	31	(100)	13	(100)	64	(93)	33	(100)	100	(93)	100	(93)	0.03	0.04
1998/99	5	(100)	6.0	43.2	80[1]	71	(100)	0	(95)	84	(90)	26	(90)	76	(81)	94	(86)	0.01	0.08[1]
1999/00	1	(91)	6.0	44	92	76	(100)	31	(94)	100	(65)	25	(71)	100	(65)	85	(76)	<0.01	<0.01
2000/01	21	(95)	6.8	41	95	95	(95)	50	(85)	88	(90)	53	(94)	94	94	82	(94)	<0.01	<0.01
2001/02	63	(100)	8.6	40	99	100	(100)	87	(100)	94	(100)	93	(100)	100	(100)	100	(100)	0.002	0
2002/03	100	(100)	9.0	39	98	100	(100)	87	(100)	91	(100)	96	(100)	100	(100)	100	(100)	<0.001	0
2003/04	87	(100)	9.0	40	98	100	(100)	69	(94)	88	(100)	93	(94)	[7]		100	(100)	0.001	0
2004/05	100	(100)	9.5	45	99	100	(100)	75	(100)	88	(100)	88	(100)	[7]		100	(100)	0.001	0
Subarea 48.6																		
2003/04	100	(100)	7.0	20	41[6]	No Discharge		0	(100)	100	(100)	100	(100)	[7]		0	(100)	0	0
2004/05	100	(100)	6.5	19.5	29[6]	No Discharge		100	(100)	100	(100)	100	(100)	[7]		0	(100)	0	0
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b																		
2002/03	Auto only		na	na	24[5]	No Discharge		100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
2003/04	Auto only		na	na	0[5]	No Discharge		100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	0
2004/05	33[9]	(100)	7.9	40	26[5]	No Discharge		88	(100)	100	(100)	100	(100)	[7]		88	(100)	0	<0.001
Division 58.4.4																		
1999/00	0[9]	(100)	5	45	50	0	(100)	0	(100)	100	(100)	0	(100)	100	(100)	100	(100)	0	0
Division 58.5.2																		
2002/03	Auto only		na	na	100	No Discharge		100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
2003/04	Auto only		na	na	99	No Discharge		100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	0
2004/05	Auto only		na	na	50[8]	No Discharge		100	(100)	100	(100)	100	(100)	[7]		100	(100)	0	0
Subareas 58.6, 58.7																		
1996/97	0	(60)	6	35	52	69	(87)	10	(66)	100	(60)	10	(66)	90	(66)	60	(66)	0.52	0.39
1997/98	0	(100)	6	55	93	87	(94)	9	(92)	91	(92)	11	(75)	100	(75)	90	(83)	0.08	0.11
1998/99	0	(100)	8	50	84[2]	100	(89)	0	(100)	100	(90)	10	(100)	100	(90)	100	(90)	0.05	0
1999/00	0	(83)	6	88	72	100	(93)	8	(100)	91	(92)	0	(92)	100	(92)	91	(92)	0.03	0.01
2000/01	18	(100)	5.8	40	78	100	(100)	64	(100)	100	(100)	64	(100)	100	(100)	100	(100)	0.01	0.04
2001/02	66	(100)	6.6	40	99	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
2002/03	0	(100)	6.0	41	98	50	(100)	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	<0.01	0
2003/04	100	(100)	7.0	20	83	100	(100)	50	(100)	50	(100)	100	(100)	[7]		100	(100)	0.03	0.01
2004/05	100	(100)	6.5	20	100	100	(100)	0	(100)	100	(100)	100	(100)	[7]		0	(100)	0.0149	0

(continued)

Table 13 (continued)

Subarea/season	Line weighting (Spanish system only)			Night setting (% night)	Offal discharge (%) opposite haul	Streamer line compliance (%)										Total catch rate (birds/thousand hooks)	
	Compliance %		Median weight (kg)	Median spacing (m)		Overall		Attached height		Total length		No. of streamers		Distance apart		Night	Day
Subareas 88.1, 88.2																	
1996/97	Auto only		na	na	50	0	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1997/98	Auto only		na	na	71	0	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1998/99	Auto only		na	na	1[3]	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1999/00	Auto only		na	na	6[4]	No Discharge		67	(100)	100	(100)	67	(100)	100	(100)	0	0
2000/01	1	(100)	12	40	18[4]	No Discharge		100	(100)	100	(100)	100	(100)	100	(100)	0	0
2001/02	Auto only		na	na	33[4]	No Discharge		100	(100)	100	(100)	100	(100)	100	(100)	0	0
2002/03	100	(100)	9.6	41	21[4]	1 incidence by 1 vessel		100	(100)	100	(100)	100	(100)	100	(100)	0	0
2003/04	89	(100)	9	40	5[4]	24% by 1 vessel		59	(100)	82	(100)	86	(100)	[7]		100	(100)	0	<0.01
2004/05	33[9]	(100)	9.0	45	1[4]	1% by 1 vessel		64	(100)	100	(100)	100	(100)	[7]		64	(100)	0	0

[1] Includes daytime setting – and associated seabird by-catch – as part of line-weighting experiments on *Argos Helena* (WG-FSA-99/5).
[2] Includes some daytime setting in conjunction with use of an underwater-setting funnel on *Eldfisk* (WG-FSA-99/42).
[3] Conservation Measure 169/XVII allowed New Zealand vessels to undertake daytime setting south of 65°S in Subarea 88.1 to conduct a line-weighting experiment.
[4] Conservation Measures 210/XIX, 216/XX and 41-09 (2002, 2003, 2004) permit daytime setting south of 65°S in Subarea 88.1 if able to demonstrate a sink rate of 0.3 m/s.
[5] Conservation Measure 41-05 (2002, 2003, 2004) permits daytime setting in Division 58.4.2 if the vessel can demonstrate a sink rate of 0.3 m/s.
[6] Conservation Measure 41-04 (2003, 2004) permits daytime setting in Subarea 48.6 if the vessel can demonstrate a sink rate of 0.3 m/s.
[7] Conservation Measure 25-02 (2003) was updated and the requirement for a minimum of five streamers per line was removed.
[8] Conservation Measure 41-08 (2004) permits daylight setting with the use of an integrated weighted line of at least 50 g/m.
[9] Conservation Measure 24-02 (2004) exempts vessels from line weighting requirements if they comply with sink rates or have an integrated weighted line of 50 g/m.

Table 14: Offal discharge observed during net shooting and hauling operations in the Convention Area during the 2004/05 season.

Vessel name	Area	Cruise dates	Offal discharged during (%)	
			Net shooting	Net hauling
No. 207 Insung	48.3	7/12–30/12/04	9 (13)	3 (4)
Robin M Lee	48.3	17/12/04–23/1/05	6 (22)	

Table 15: Aerial extent of streamer lines reported by observers during the 2004/05 season. * – information from observer cruise reports.

Vessel name	Dates of fishing	Fishing method	Aerial extent of streamer line
Subarea 48.3			
Argos Georgia	1/5–28/8/05	Spanish	30*
Isla Santa Clara	10/5–4/8/05	Spanish	40
Jacqueline	2/5–24/8/05	Spanish	37
Koryo Maru 11	2/5–16/8/05	Spanish	20
Polarpesca I	13/5–21/8/05	Spanish	30*
Protegat	1/5–21/8/05	Auto	70
Viking Bay	1/5–21/8/05	Spanish	25
Argos Helena	1/5–29/8/05	Auto	45
Subarea 48.6			
Shinsei Maru 3	23/1–18/3/05	Spanish	30
Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.3b			
Arnela	3/12/04–16/3/05	Spanish	70
Globalpesca II	19/12/04–2/3/05	Spanish	75
Galaecia	16/12/04–10/3/05	Spanish	10
No. 829 Yeon Seong	20/12/04–21/2/05	Spanish	-
Janas	5/3–29/3/05	Auto	65
Avro Chieftain	4/9–7/9/05	Auto	80
Galaecia	15/4–6/7/05	Spanish	7
No. 707 Bonanza	26/12/04–10/3/05	Spanish	150
Division 58.5.2			
Avro Chieftain	25/7–1/9/05	Auto	80
Avro Chieftain	10/5–1/7/05	Auto	80
Subareas 58.6, 58.7			
Koryo Maru 11	24/2–1/4/05	Spanish	50
Subareas 88.1, 88.2			
Antarctic III	5/12/04–5/2/05	Auto	-
Argos Helena	4/12/04–4/3/05	Auto	45
Janas	1/12/04–6/2/05	Auto	65
Paloma V	27/12/04–1/3/05	Spanish	-
Punta Ballena	14/1–13/3/05	Auto	50
San Aotea II	4/12/04–14/2/05	Auto	70
Frøyanes	29/12/04–1/3/05	Auto	60
Volna	18/12/04–18/3/05	Spanish	125
Yantar	18/12/04–18/3/05	Spanish	90
Avro Chieftain	31/12/04–6/2/05	Auto	45
San Aspiring	25/12/04–23/2/05	Auto	60

Table 16: Seabird mortality totals and rates (BPT: birds/trawl) and species composition of incidental mortality, recorded by observers in the CAMLR Convention Area trawl fisheries for the 2004/05 season. KRI – *Euphausia superba*; ANI – *Champsocephalus gunnari*; TOP – *Dissostichus eleginoides*; DIC – grey-headed albatross; DIM – black-browed albatross; PRO – white-chinned petrel; MAH – northern giant petrel; PWD – Antarctic prion; DAC – Cape petrel; MAI – southern giant petrel.

Season	Area	Vessel	Cruise dates	Trawls observed	BPT	Dead							Total dead	Alive (combined)
						DIC	DIM	PRO	MAH	PWD	DAC	MAI		
2005	48.2	*Top Ocean* (KRI)	5/5–31/5/05	156	0.01						1		1	0
		Atlantic Navigator (KRI)	28/1–11/5/05	157	0.00								0	0
		Total		313	0.003								1	0
	48.3	*Betanzos* (ANI)	20/12/04–26/1/05	37	0.03		1						1	2
		Dongsan Ho (ANI)	20/12/04–7/1/05	33	0.15		4	1					5	0
		InSungHo (ANI)	4/12/04–7/1/05	45	0.07		3						3	6
		No. 207 Insung (ANI)	7/12–30/12/04	34	0.03		1						1	6
		Argos Vigo (ANI)	17/12–31/12/04	40	0.00								0	0
		Robin M Lee (ANI)	17/12/04–23/1/05	26	0.00								0	0
		Sil (ANI)	27/11/04–22/1/05	38	0.03				1				1	0
		Total		253	0.04								11	14
	48.3	*Niitaka Maru* (KRI)	19/6–22/7/05	257	0.00								0	0
		InSungHo (KRI)	10/7–19/8/05	97	0.00								0	1
		Foros (KRI)	20/6–9/7/05	75	0.00								0	0
		Niitaka Maru (KRI)	16/8–19/8/05	25	0.00								0	0
		Total		454	0.00									
	58.5.2	*Austral Leader* (ANI/TOP)	16/1–12/2/05	224	0.00								0	0
		Austral Leader (ANI/TOP)	24/3–12/4/05	67	0.03		2						2	0
		Southern Champion (ANI/TOP)	22/1–6/2/05	163	0.00								0	0
		Southern Champion (ANI/TOP)	2/3–31/3/05	262	0.02		3	3					6	0
		Southern Champion (ANI/TOP)	22/4–25/5/05	103	0.00								0	0
		Southern Champion (ANI/TOP)	30/5–6/7/05	303	0.00								0	0
		Total		1122	0.01								8	0

Table 17: Seabird mortality totals and rates (BPT: birds/trawl) and species composition of incidental mortality, recorded by observers in the CAMLR Convention Area trawl fisheries over the last five seasons. DIC – grey-headed albatross; DIM – black-browed albatross; PRO – white-chinned petrel; MAH – northern giant petrel; PWD – Antarctic prion; DAC – cape petrel; MAI – southern giant petrel.

Season	Area	Target species	Trips observed	Trawls observed	BPT	Dead							Total dead	Alive (combined)
						DIC	DIM	PRO	MAH	PWD	DAC	MAI		
2001	48.1	*E. superba*	2	427	0								0	0
	48.3	*C. gunnari*	6	350	0.26	5	46	41					92	40
	58.5.2	*D. eleginoides* and *C. gunnari*	7	1387	0.00								0	0
2002	48.3	*E. superba*	5	755	0.00								0	0
	48.3	*C. gunnari*	5	431	0.16		18	49		1			68	52
	58.5.2	*D. eleginoides* and *C. gunnari*	6	1111	0.00								0	1
2003	48.3	*E. superba*	6	1073									0	0
	48.3	*C. gunnari*	3	182	0.20	1	7	28					36	15
	58.5.2	*D. eleginoides* and *C. gunnari*	8	1309	0.005		2	2			2		6	11
2004	48	*E. superba*	1	521	0.00								0	0
	48.3	*E. superba*	6	566	0.00								0	0
	48.3	*C. gunnari*	6	238	0.37	1	26	59				1	87	132
	58.5.2	*D. eleginoides* and *C. gunnari*	5	1215	0.00								0	13
2005	48.2	*E. superba*	2	313	0.003						1		1	0
	48.3	*C. gunnari*	7	253	0.04		9	1	1				11	14
	48.3	*E. superba*	5	454	0.00									
	58.5.2	*D. eleginoides* and *C. gunnari*	6	1122	0.01		5	3					8	0

Table 18: Extrapolated potential incidental mortality of seabirds in the IUU *Dissostichus* spp. fishery in the Convention Area from 1996 to 2005. Lower and upper refer to 95% confidence limit.

Subarea/ Division	Year	Extrapolated potential incidental mortality of seabirds		
		Lower	Median	Upper
48.3	2005	24	45	736
	1996–2004	1 811	3 441	56 031
58.4.2	2005	171	209	557
	1996–2004	537	655	1 748
58.4.3	2005	1 225	1 495	3 992
	1996–2004	522	636	1 699
58.4.4	2005	1 020	1 244	3 321
	1996–2004	2 866	3 497	9 338
58.5.1	2005	444	542	1 446
	1996–2004	46 988	57 332	153 081
58.5.2	2005	204	248	663
	1996–2004	31 857	38 870	103 787
58.6	2005	39	48	128
	1996–2004	44 888	54 769	146 238
58.7	2005	382	466	1 243
	1996–2004	12 475	15 221	40 640
88.1	2005	97	119	314
	1996–2004	392	479	1 264
Totals	2005	3 605	4 415	12 400
	1996–2004	142 335	174 899	513 826
Total		145 941	179 314	526 226

Table 19: Summary of IMAF assessment of risk to seabirds posed by new and exploratory longline fisheries in the Convention Area (see also Figure 1).

Risk level	Mitigation requirements	Observer coverage
1 – low	• Strict compliance with standard seabird by-catch conservation measure[1]. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirement[2]. • No offal dumping.	20% of hooks hauled 50% of hooks set
2 – average to low	• Strict compliance with standard seabird by-catch conservation measure[1]. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping.	25% of hooks hauled 75% of hooks set
3 – average	• Strict compliance with standard seabird by-catch conservation measure[1]. • Restrict longline fishing to period outside at risk species breeding season where known/relevant unless line sink rate requirement is met at all times. • Daytime setting permitted subject to strict line sink rate requirements and seabird by-catch limits. • No offal dumping.	40% of hooks hauled[2] 95% of hooks set
4 – average to high	• Strict compliance with standard seabird by-catch conservation measure[1]. • Restrict longline fishing to the period outside any at risk species breeding season(s) . • Strict line sink rate requirements at all times. • No daytime setting permitted. • No offal dumping.	45% of hooks hauled[2] 95% of hooks set
5 – high	• Strict compliance with standard seabird by-catch conservation measure[1]. • Restrict longline fishing to period outside at risk species breeding season. • Closed areas as identified. • Strict line sink rate requirements at all times. • No daytime setting permitted. • Strict seabird by-catch limits in place. • No offal dumping.	50% of hooks hauled[2] 100% of hooks set

[1] Conservation Measure 25-02 with the possibility of exemption to paragraph 4 as provided by Conservation Measure 24-02.
[2] This is likely to require the presence of two observers.

Table 20: Summary of IMAF risk assessment in relation to proposed new and exploratory longline fisheries in 2005/06 (five-point risk scale as defined in SC-CAMLR-XXIII/BG/21).

Area	Risk scale	Mitigation requirements	Proposal assessment
48.6 north of ca. 55°S	2 – average to low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposal from Japan (WG-FSA-05/26 and CCAMLR-XXIV/10) conflicts with the IMAF assessment. Proposal from New Zealand (CCAMLR-XXIV/13) does not conflict with the IMAF assessment.
48.6 south of ca. 55°S	1 – low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirement. • No offal dumping at any time.	Proposal from Japan (WG-FSA-05/26 and CCAMLR-XXIV/10) conflicts with the IMAF assessment. Proposal from New Zealand (CCAMLR-XXIV/13) does not conflict with the IMAF assessment.
58.4.1	2 – average to low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from Australia (CCAMLR-XXIV/17), Chile (CCAMLR-XXIV/25), Spain (CCAMLR-XXIV/9) and New Zealand (CCAMLR-XXIV/14) do not conflict with the IMAF assessment. Proposals from the Republic of Korea (CCAMLR-XXIV/22) and Uruguay (CCAMLR-XXIV/29) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.
58.4.2	2 – average to low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from Australia (CCAMLR-XXIV/18), Chile (CCAMLR-XXIV/26), Republic of Korea (CCAMLR-XXIV/22), Spain (CCAMLR-XXIV/9) and New Zealand (CCAMLR-XXIV/14) do not conflict with the IMAF assessment. Proposal from the Republic of Korea (CCAMLR-XXIV/22) does not contain sufficient information to be certain it does not conflict with the IMAF assessment.

(continued)

Table 20 (continued)

Area	Risk scale	Mitigation requirements	Proposal assessment
58.4.3a	3 – average	• Strict compliance with standard seabird by-catch conservation measure. • Restrict longline fishing to May through August (outside the September through April albatross, giant petrel and white-chinned petrel breeding season) unless line sink rate requirements met at all times. • Daytime setting permitted subject to strict line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from Australia (CCAMLR-XXIV/19) and Spain (CCAMLR-XXIV/9) do not conflict with the IMAF assessment. Proposals from Chile (CCAMLR-XXIV/27) and the Republic of Korea (CCAMLR-XXIV/22) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.
58.4.3b	3 – average	• Strict compliance with standard seabird by-catch conservation measure. • Restrict longline fishing to May through August (outside the September through April albatross, giant petrel and white-chinned petrel breeding season) unless line sink rate requirements met at all times. • Daytime setting permitted subject to strict line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from Australia (CCAMLR-XXIV/20) and Spain (CCAMLR-XXIV/9) do not conflict with the IMAF assessment. Proposals from Chile (CCAMLR-XXIV/28), Republic of Korea (CCAMLR-XXIV/22) and Uruguay (CCAMLR-XXIV/23) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.
88.1 north of 65°S	3 – average	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season, but line sink rate requirements to be met at all times. • Daytime setting permitted subject to strict line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from New Zealand (CCAMLR-XXIV/15), South Africa (CCAMLR-XXIV/16), Spain (CCAMLR-XXIV/9) and the UK (CCAMLR-XXIV/21) do not conflict with the IMAF assessment. Proposals from Argentina (CCAMLR-XXIV/12), Republic of Korea (CCAMLR-XXIV/22), Norway (CCAMLR-XXIV/11), Russia (CCAMLR-XXIV/31) and Uruguay (CCAMLR-XXIV/30) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.

(continued)

Table 20 (continued)

Area	Risk scale	Mitigation requirements	Proposal assessment
88.1 south of 65°S	1 –low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from New Zealand (CCAMLR-XXIV/15), South Africa (CCAMLR-XXIV/16), Spain (CCAMLR-XXIV/9) and the UK (CCAMLR-XXIV/21) do not conflict with the IMAF assessment. Proposals from Argentina (CCAMLR-XXIV/12), Republic of Korea (CCAMLR-XXIV/22), Norway (CCAMLR-XXIV/11), Russia (CCAMLR-XXIV/31) and Uruguay (CCAMLR-XXIV/30) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.
88.2	1 – low	• Strict compliance with standard seabird by-catch conservation measure. • No need for restriction of longline fishing season. • Daytime setting permitted subject to line sink rate requirements and seabird by-catch limits. • No offal dumping at any time.	Proposals from New Zealand (CCAMLR-XXIV/15), Spain (CCAMLR-XXIV/9) and UK (CCAMLR-XXIV/21) do not conflict with the IMAF assessment. Proposals from Argentina (CCAMLR-XXIV/12), Republic of Korea (CCAMLR-XXIV/22), Norway (CCAMLR-XXIV/11), Russia (CCAMLR-XXIV/31) and Uruguay (CCAMLR-XXIV/30) do not contain sufficient information to be certain they do not conflict with the IMAF assessment.

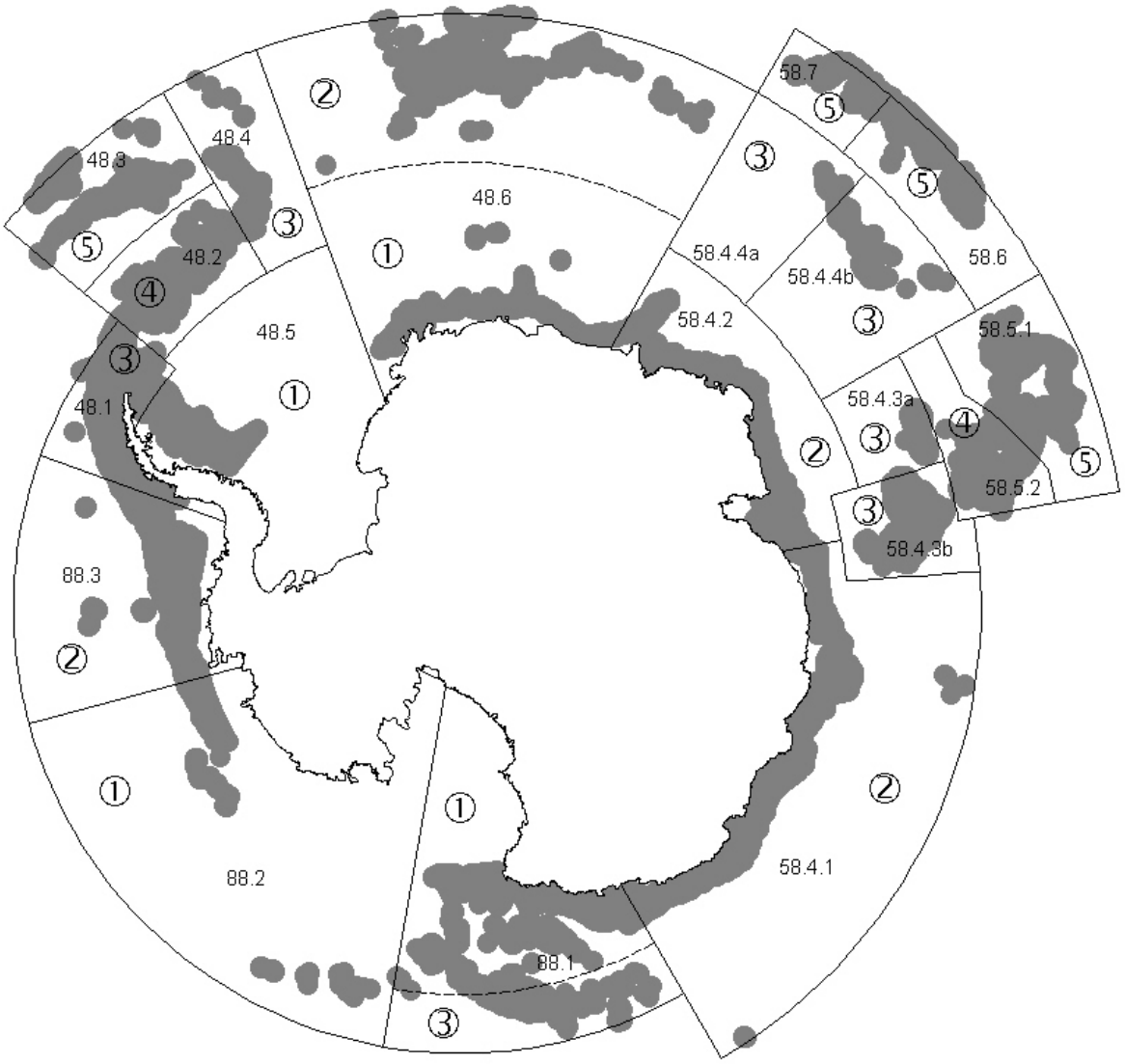

Figure 1: Assessment of the potential risk of interaction between seabirds, especially albatrosses, and longline fisheries within the Convention Area. 1: low, 2: average to low, 3: average, 4: average to high, 5: high. Shaded patches represent seabed areas between 500 and 1 800 m.

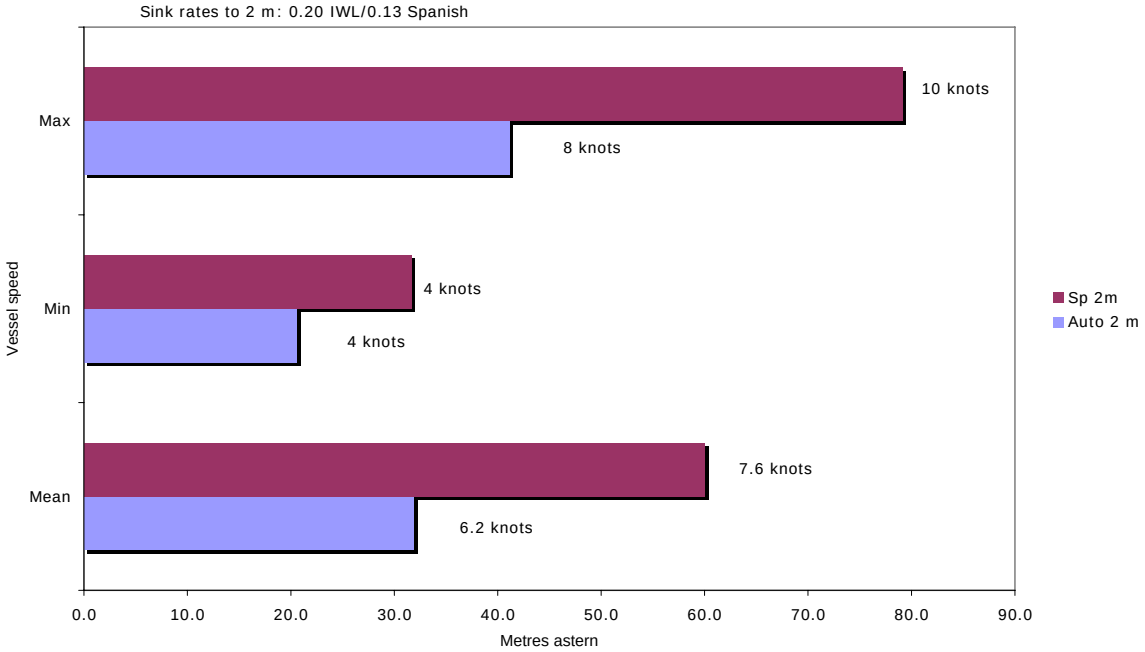

Figure 2: Two-metre access window for IW autoline and Spanish longline gear for maximum, minimum and average vessel speeds for each gear type in the 2004/05 CCAMLR fisheries. Seabirds are most vulnerable to capture when hooklines are within 2 m of the surface.

Figure 3: Bird Excluder Device used on the FV *Janas*.